July 29, 1941. L. BISCHOFF 2,250,699

MACHINE FOR MAKING SATCHEL-BOTTOM BAGS

Original Filed June 23, 1936 3 Sheets-Sheet 1

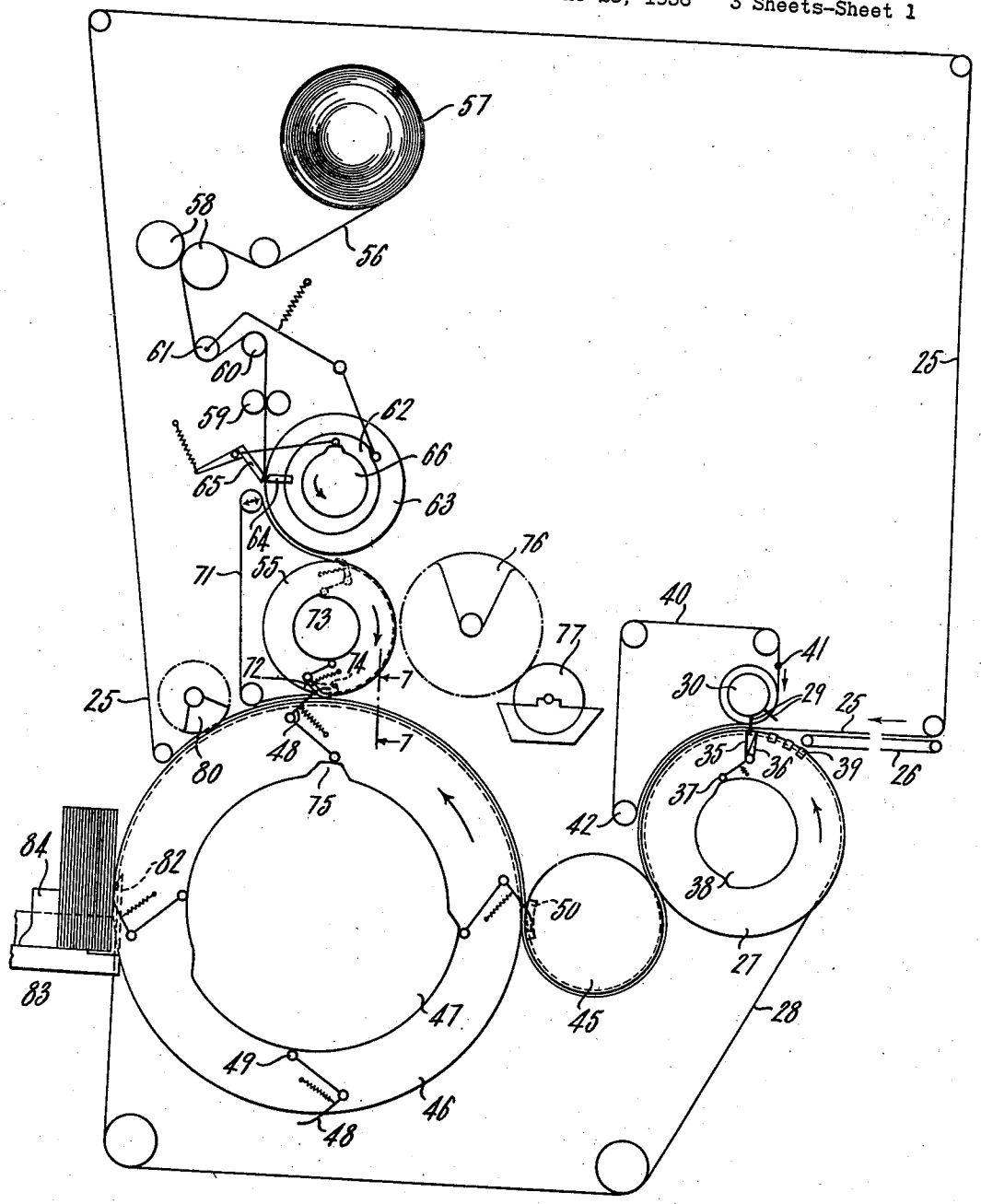


Fig. 1.

Ludwig Bischoff
Inventor
By:- Samuel Astrolenk
his attorney

July 29, 1941. L. BISCHOFF 2,250,699

MACHINE FOR MAKING SATCHEL-BOTTOM BAGS

Original Filed June 23, 1936. 3 Sheets-Sheet 2

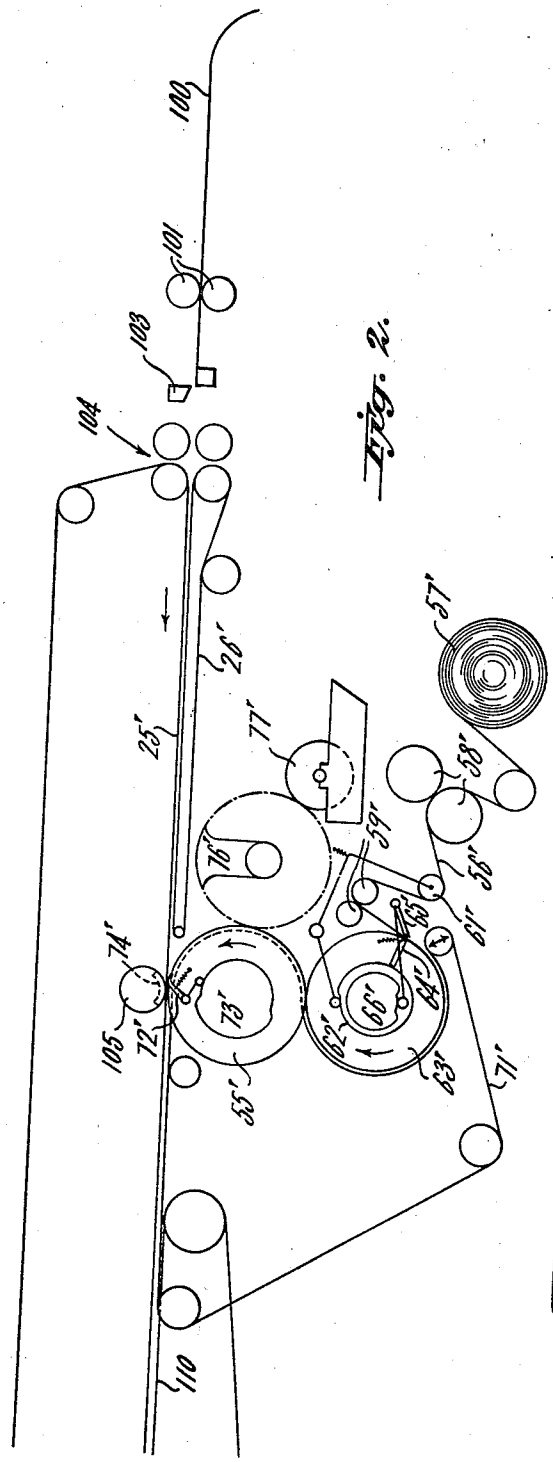


Fig. 2.

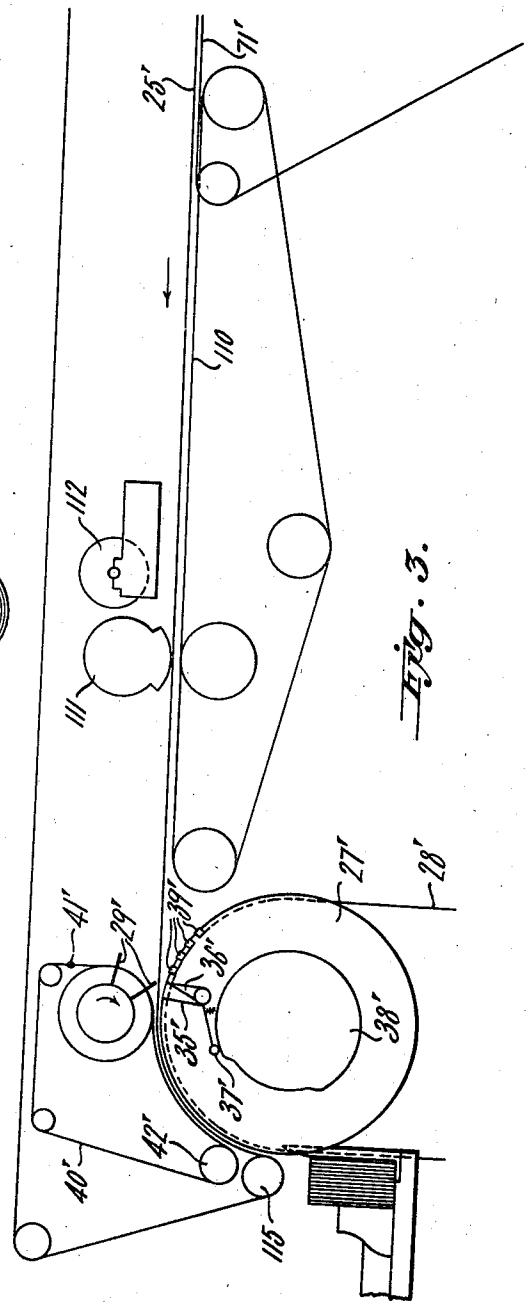


Fig. 3.

Ludwig Bischoff
Inventor
By:- Samuel A. Troland
his attorney

July 29, 1941. L. BISCHOFF 2,250,699

MACHINE FOR MAKING SATCHEL-BOTTOM BAGS

Original Filed June 23, 1936 3 Sheets-Sheet 3

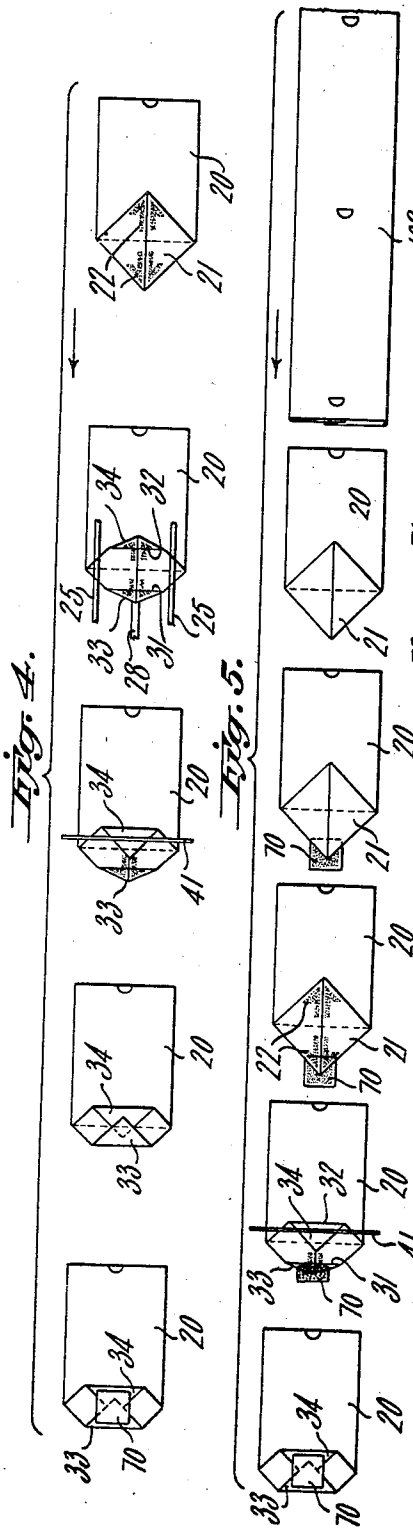


Fig. 4.

Fig. 5.

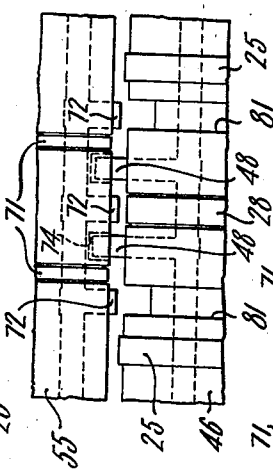


Fig. 7.

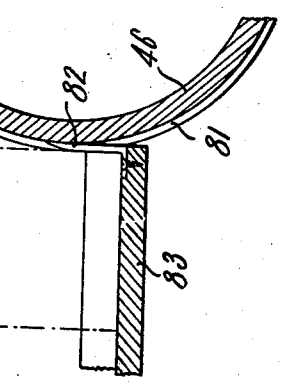


Fig. 6.

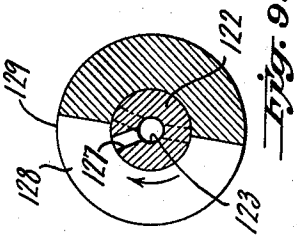


Fig. 9.

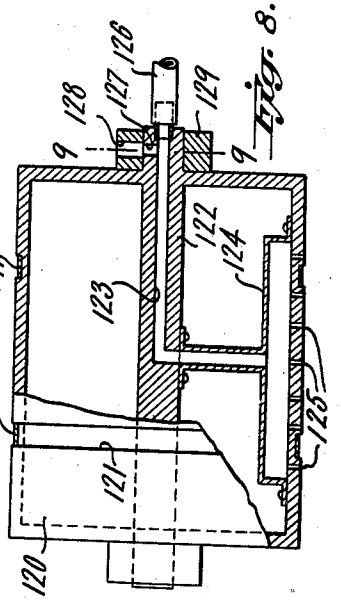


Fig. 8.

Ludwig Bischoff
Inventor
By:- Samuel Ostrolenk
his attorney

Patented July 29, 1941 2,250,699

UNITED STATES PATENT OFFICE

2,250,699

MACHINE FOR MAKING SATCHEL-BOTTOM BAGS

Ludwig Bischoff, Rockville Centre, N. Y., assignor to Oneida Paper Products, Inc., New York, N. Y., a corporation of New York

Original application June 23, 1936, Serial No. 86,750. Divided and this application March 2, 1940, Serial No. 321,957

2 Claims. (Cl. 93—27)

This invention is a division of my application Ser. No. 86,750, filed June 23, 1936.

This invention relates primarily to machines for making satchel-bottom bags, and comprises more particularly mechanism for sealing the bottoms of such bags. Bags of this type are generally made by forming a web of paper into a tube by longitudinally folding the web and adhering its edges to each other, after which the tube is divided into tubular blanks of the desired length, one end of each blank being closed to form a bag.

The particular apparatus of the present invention is designed to receive a partially formed satchel-bottom bag, i. e., a tubular blank segregated from the main tube and having a diamond fold formed at one end and lying in the plane of the blank, to form a satchel-bottom thereon and to seal the bottom by applying a patch thereto.

The present invention has particular utility in connection with the manufacture of bags formed of transparent cellulosic materials, but is not to be considered as limited to such materials. Much difficulty has been experienced in the manufacture of bags from such materials since these materials do not readily adhere to each other and powdered commodities tend to escape through the bottom closure. The present invention overcomes the difficulty heretofore encountered with such materials by not only forming an efficient closure, but by applying an efficient sealing patch to cover the parts of the bottom closure at which leakage is most likely to occur. The sealing patch may be made of transparent cellulosic materials when applied to bags of transparent cellulosic material, or may be of the same material as that used in any other bag, or different materials may be used in the patch and in the bag. An advantage of this construction is that a pleasing effect may be obtained by using colored patches, or advertising may be displayed thereon.

The present invention embodies means operating upon the diamond-folded end of a bag blank progressed bottom foremost through the machine, first to crease both points of the diamond fold transversely of the bag in such a manner as to cause the points to project above the plane of the blank, secondly to grip the leading point at its crease in such a manner as to insure its projecting upwardly above the plane of the blank, thirdly to whip the trailing point of the diamond fold down upon the intermediate portion thereof by mechanism traveling faster than the blank, fourthly to present the leading point of the diamond fold between convergent traveling surfaces whereby to press the leading point down upon the intermediate portion of the diamond fold partially to cover the trailing point, and fifthly, in the process of performing these operations or subsequently thereto, to apply a patch to the bottom of the bag which covers the overlapped points of the diamond fold.

The mechanism operates in a continuous manner with proper synchronism of all parts whereby patches are adhesively secured to successive bag bottoms and the finished, sealed bags discharged from the machine in completed condition.

While the invention is particularly directed to apparatus for accomplishing the operations stated, there is nevertheless a new method by which these operations are performed.

Objects and advantages of the invention will be apparent from the hereinafter detailed description and claims when read in conjunction with the accompanying drawings wherein like parts are referred to by like numerals throughout.

Referring to the drawings:

Fig. 1 is a diagrammatic showing of a machine accomplishing the present invention;

Fig. 2 is a diagrammatic showing of part of a modified machine for accomplishing the present invention;

Figure 3 is a diagrammatic showing of the remaining portions of the machine partially shown in Fig. 2;

Fig. 4 is a plan view of a blank as progressively operated upon by the mechanism of Fig. 1;

Fig. 5 is a similar plan view showing the sequence of operations in the mechanism of Figs. 2 and 3;

Fig. 6 is a diagrammatic section of a portion of the mechanism of Fig. 1;

Fig. 7 is a detail view taken along line 7—7 of Fig. 1, looking in the direction of the arrows;

Fig. 8 is a view partly in section of a modified part which can be substituted for a part common to both modifications of the machine; and

Fig. 9 is a cross-section taken on line 9—9 of Fig. 8.

In the manufacture of bags by the machine of Fig. 1, and according to the process disclosed in Fig. 4, a bag blank 20 provided with a diamond fold 21 at one end lying in the plane of the blank, the points of which are provided with adhesive as at 22, the folding of which and the application of adhesive thereto having been accom-

plished by known means common in the art, is introduced between tapes 25 and 26 traveling in the direction of the arrows, the diamond fold of the blank being foremost. The lower belts 26 pass about guide rolls located near to the surface of a revolving crimping drum 27, about a portion of which the bag is progressed while gripped against the surface of the drum by the tapes 25, which are spaced so as to engage the blank close to its longitudinal edges, and a tape 28 which is guided in a groove in the drum 27 so as to engage the opposite surface of the bag close to its center. A pair of crimping blades 29 upon a rotating shaft 30 cooperate with the crimping drum 27 to form creases 31 and 32 in the diamond-folded portion, thereby defining a leading point 33 and a trailing point 34 which by reason of the formation of the fold lines by the crimping blades naturally project upward above the plane of the blank between the tapes 25. The foremost crimping blade tucks the folded portion between a clamping surface 35 formed on drum 27 and a clamping blade 36 operated by a cam follower 37 and a fixed cam 38 to clamp the foremost crease immediately upon the formation thereof and positively carry the bag around the axis of the drum. The second creasing blade 29 presses against one of a series of rubber bars 39, each designed for a certain size of bag. Traveling chains 40 pass about the shaft 30 and are guided outside of tapes 25. Chains 40 carry a folding bar 41 extending transversely of the blank and traveling in the direction of the arrow at a higher rate of speed when adjacent the drum so that immediately after the fold line 32 is formed the folding bar 41 engages the upstanding point 34 and whips it down onto the main portion of the diamond fold where the adhesive 22 tends to retain it. Chains 40 pass about a guide roll 42 and carry the bar back to engage the next bag. Immediately after the bottom leaves the vicinity of guide roll 42 it is engaged between the surface of a transfer roll 45 and the surface of drum 27, the surface of the transfer roll engaging the leading point 33 and pressing it down into overlapping engagement with the trailing point. Blade 36 is now released and the bag is held between belt 28 and transfer roll 45 while the adhesive partially sets.

At the other side of roll 45 there is provided a feeding drum 46 rotating in the direction of the arrow and having associated therewith a stationary cam 47. Four sets of feeding fingers 48 are carried by the feeding drum 46, and are provided with cam followers 49 operating the fingers in accordance with the contour of a stationary cam 47. As the fingers 48 approach the nip between drum 46 and roll 45 they are held in raised position and fit into a recess 50 in the surface of the roll. The leading edge of the bottom of the bag is introduced under the tips of the feeding fingers 48 which immediately grip the bag. The bag is now progressed by the feeding drum 46 and the tapes 25 and 28 to a point adjacent a patch applying cylinder 55.

The patch applying cylinder is supplied with patches severed from a strip 56 unwound from a roll 57 by feed rolls 58 and 59. The strip passes about a fixed tensioning roll 60 and a movable slack-providing roll 61, which is operated by a cam 62 fixed to a rotating knife carrier 63, in order that slack may be provided in the strip at the instant a patch is severed between the rotating blade 64 and a cooperating blade 65 operated by a second cam 66 likewise rotating with the knife carrier 63. The foregoing patch cutter and slack providing means is the same as mechanism for accomplishing the same purpose disclosed in my prior United States Letters Patent No. 2,037,110, dated April 14, 1936. As the patch 70 is separated from the strip 56 it is fed between the surface of the knife carrier 63 and tapes 71 engaging its longitudinal edges. The patch applying cylinder 55 is positioned between the knife carrier 63 and the feeding drum 46 and is provided with one or more fingers 72 operated by a stationary cam 73 to grip the leading edge of the patch (as shown in dotted outline), as in the said patent. As the finger travels around toward the feeding drum the cam does not alter its position, but at about the instant that the finger reaches the periphery of the drum 46 it is raised by a high point on the cam. Likewise, the bag gripping finger 48 is sharply raised by a high point 75 of cam 47 and extends into an opening 74 in the patch applying drum. The high point 75 of cam 47 is of short extent so that as a patch is positioned over the bottom of the bag and released by finger 71 it is immediately clamped onto the bag bottom by the gripping fingers 48. The patch is provided with adhesive before it reaches the bag by a conventional applying roll 76 engaging a fountain roll 77.

The patch holding tapes 71 leave the surface of the feed drum 46 substantially as soon as gripping fingers 48 engage the bag and the bag bottom with the patch applied thereto is then pressed between the surface of the drum 46 and a pressing roll 80 thereby assuring even application of the patch and its firm adherence to the bag. The tapes 25 then leave the surface of the feeding drum 46 and return to the initial point of introduction of bag blanks to the machine. The bag is now held between the surface of the drum 46 and the fingers 48. The drum 46 is provided with grooves 81 into which extend stationary strippers 82 mounted upon a magazine 83. The tape 28 extends away from the surface of roll 46 substantially parallel to the strippers 82, which arrangement assists the strippers in positioning the leading edge of the bag in the magazine 83. At the instant that the leading edge of the bag reaches the bottom of the magazine the fingers 48 are raised by cam 47 and are then held in raised position until they engage another blank at transfer roll 45. The finished bags are retained in upright position between the stripper fingers 82 and a receding, pressing anvil 84, by which the finished bags with the applied patches are held in the magazine until the adhesive finally sets.

The foregoing embodiment of the invention may be preferred for reasons of lack of horizontal space and freedom of vertical arrangement in the bag plant, or may be made necessary by reason of the arrangement and type of bag tubing and diamond-folding mechanism available in the bag plant. The following form of the invention may be more desirable by reason of a different plant arrangement, but nevertheless embodies a practical, working arrangement having the same advantages as the previous form, but operating in a different sequence. The machine of the second embodiment is shown in Figs. 2 and 3 and the sequence of operation is shown in Fig. 5.

Referring to these figures, there is diagrammatically disclosed a former 100 about which a web is drawn by rolls 101, formed into a continuous tube 102 and cut into tubular blanks by a shear 103. At 104 the blanks 20 are provided

with a diamond fold 21 by known means. The mechanism 104 passes the blanks between traveling tapes 25' and 26' with the diamond-folded portion foremost. Tapes 26' extend close to the surface of a patch applying cylinder 55' located tangentially to the tapes 25'. The patch applying cylinder 55' is supplied with patches 70 cut from a web 56' drawn from a roll 57' of the patch material by pairs of feed rolls 58' and 59'. The web is drawn about a slack providing roll 61' operated by a cam 62' fixed to a knife carrier 63' so that slack is provided in the web 56' at the instant of cutting. The knife carrier carries a rotating blade 64' which cooperates with a movable blade 65' operated by a cam 66' also fixed to the knife carrier. As the patch 70 is severed from the web it is fed between the surface of the knife carrier and travelling tapes 71' which grip the longitudinal edges of the patch and present the leading edge of the patch beneath the finger 72' carried by the patch applying cylinder 55' and operated by a stationary cam 73' in the manner previously described. As the patch travels about the surface of the cylinder 55' it is provided with adhesive by an applying roll 76' engaging a fountain roll 77'. As the finger comes into engagement with the leading edge of a bag it is raised by cam 73' into a recess 74' provided in a pressing roll 105. The mechanism is timed to adhere the patch to the lower surface of the foremost point of the diamond fold. The bag is then progressed between the tapes 25' and 71' until the tapes 71' return to the patch forming mechanism and the bag is then gripped between tapes 25' and a lower feeding belt 110. As the bag is progressed it passes beneath an adhesive applier 111 rotating into periodic engagement with a fountain roll 112 and applying adhesive as at 22 to the surface of the diamond fold. Belts 110 extend close to the surface of a crimping drum 27' which is provided with a clamping surface 35', a clamping finger 36', a finger operating cam follower 37' engaging a fixed cam 38', and a set of rubber bars 39' similar to and for the purposes of corresponding parts described in connection with the crimping drum 27. The tapes 25' are guided partially around the surface of drum 27' and engage the outer edges of the bag as previously described. Crimping blades 29' mounted upon a shaft 30' provide transverse creases 31 and 32 which define upstanding points 33 and 34 in the diamond folded portion of the bag, the foremost crease 31 being gripped between the surface 35' and the finger 36' positively to progress the bag. Spaced chains 40' guided about the surface of shaft 30' and a guide roll 42' carry a bar 41' which is travelling at a higher rate of speed than the bag and which whips the trailing point 34 down onto the intermediate portion of the diamond-folded end as previously described. Tapes 25' are guided about a roll 115 positioned closely adjacent to the surface of drum 27' and thereafter return to the initial position. The foremost point 33 with the attached patch 70, which is held in substantially upright position by the clamping surface and clamping finger, is engaged between the converging, traveling surfaces of drum 27' and roll 115 and thereby smoothly adhered to the intermediate portion of the diamond fold and the trailing point 34. Immediately thereafter finger 36' is released by cam 38' and the bags are ejected from the machine into a magazine as previously described or into other mechanism of known construction.

In Figs. 8 and 9 there is disclosed a modified part which can be substituted for the patch applying cylinder 55 of Fig. 1, or 55' of Fig. 2, and comprises suction operated means for engaging and applying the patch to the bag. A drum 120 is provided with grooves 121 within which the patch feeding tapes 71 are guided while passing about the drum. The shaft 122 is provided with a passage 123 communicating with a chamber 124 fixed to the inner surface of the drum. The chamber communicates with the outer surface of the drum through a line of perforations 125 extending longitudinally of the drum. The passage 123 communicates with a conduit 126 extending to a vacuum pump or other means for producing suction within the chamber 124. A by-pass 127 communicates with an opening 128 in a collar 129 during a portion of the cycle of rotation as shown in Fig. 9. As the leading edge of a patch 70 is presented to the drum 120 by the tapes 71 and knife carrier 63 the by-pass 127 is blocked by the solid portion of collar 129, as shown, and the immediate differential in pressure within the chamber 124 causes the leading edge of the patch to be fed by the drum until the by-pass again reaches the opening 128, at which time the patch has been adhered to the leading point 33 of the diamond fold (Fig. 4) or to the bottom of the bag (Fig. 5).

Having described the illustrated embodiments of my invention it will be readily apparent to those skilled in the art that other modifications in arrangement and detail may be substituted for those shown. All such alterations, modifications are rearrangements as come within the scope of the following claims are a part of my invention.

I claim:

1. In a machine for manufacturing satchel-bottom bags, a crimping drum having spaced belts passing partially thereabout for holding the longitudinal edges of a diamond-folded bag blank against the surface of the drum, said drum being provided with clamping means and a resilient block in spaced relation, in combination with a pair of creasing blades mounted adjacent the surface of said drum, the foremost of said blades being adapted transversely to crease the foremost point of the diamond-fold and to tuck the crease so formed into said clamping means and the second of said creasing blades being adapted to crease the trailing point of the diamond-fold by pressing the same against said resilient block, means traveling faster than said bag blank to overtake and whip the said trailing point down onto the intermediate portion of the diamond-fold, a roll adjacent said crimping drum presenting therewith converging travelling surfaces adapted to fold the foremost point of said diamond-fold into overlapping relation with the trailing point, and means located prior to the foregoing mechanism for adhesively securing a patch to the foremost point of said diamond-fold with the patch extending beyond the said point whereby the patch will be caused to cover the overlapped points when positioned by said foregoing mechanism.

2. In a machine for manufacturing satchel-bottom bags, a crimping drum having spaced belts passing partially thereabout for holding the longitudinal edges of a diamond-folded bag blank against the surface of the drum, said drum being provided with clamping means and a resilient block in spaced relation, in combination with a pair of creasing blades mounted adjacent the surface of said drum, the foremost of said blades being adapted transversely to crease the foremost

point of the diamond-fold and to tuck the crease so formed into said clamping means and the second of said creasing blades being adapted to crease the trailing point of the diamond-fold by pressing the same against said resilient block, means traveling faster than said bag blank to overtake and whip the said trailing point down onto the intermediate portion of the diamond-fold, a roll adjacent said crimping drum presenting therewith converging traveling surfaces adapted to fold the foremost point of the diamond-fold into overlapping relation with the trailing point, and means located prior to the foregoing mechanism for forming a patch and adhesively securing said patch to the foremost point of the diamond-fold with the patch extending beyond said point whereby the patch will be caused to cover the overlapped points when positioned by said foregoing mechanism.

LUDWIG BISCHOFF.