Feb. 5, 1935. A. POTDEVIN 1,989,943

APPARATUS FOR USE IN CONNECTION WITH THE MAKING OF BAGS

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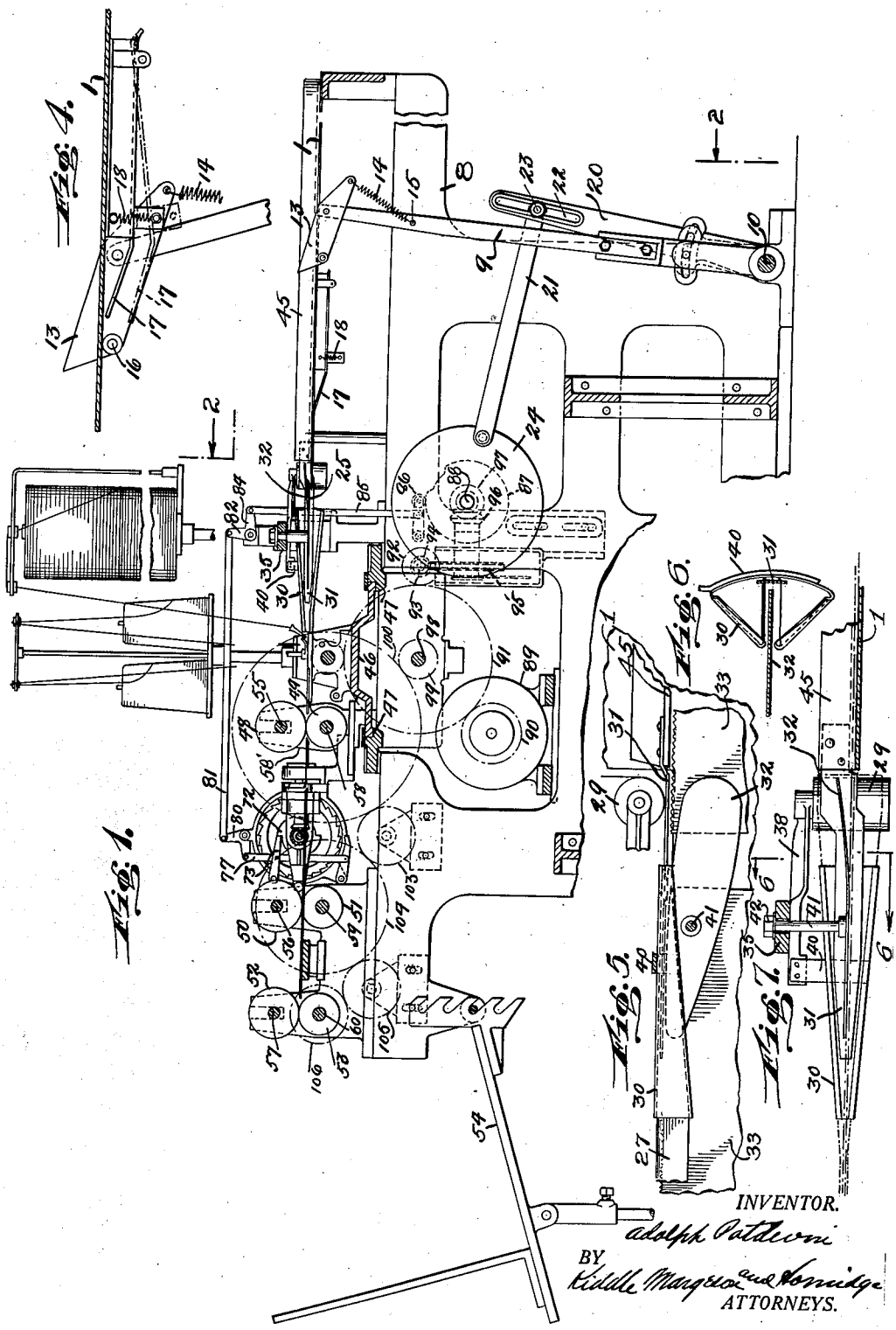


Fig. 1.

Fig. 4.

Fig. 6.

Fig. 5.

Fig. 7.

INVENTOR.
Adolph Potdevin
BY
Kidder Margeson and Hemidge
ATTORNEYS.

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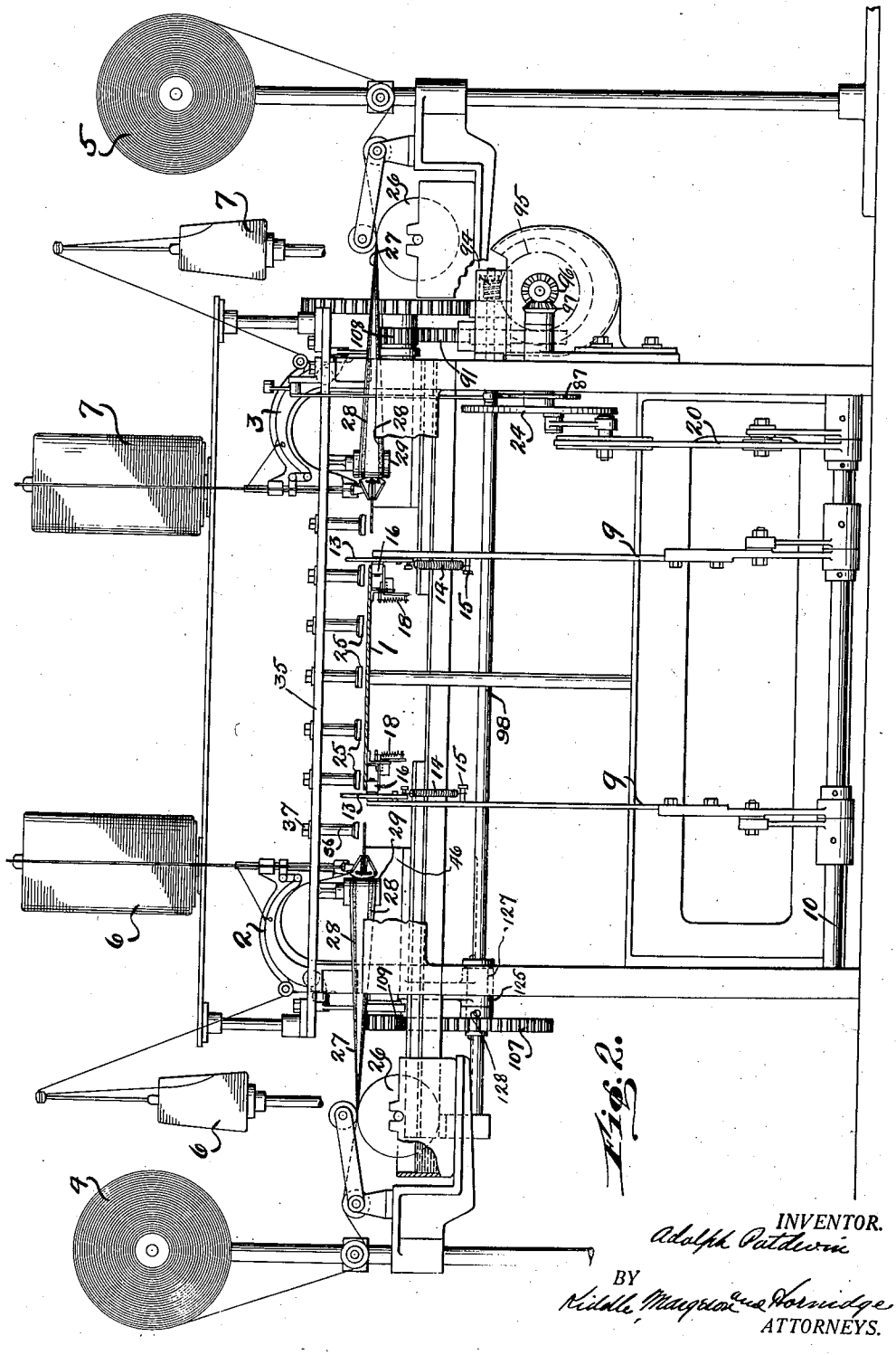


Fig. 2.

INVENTOR.
Adolph Potdevin
BY
Riddle, Thompson and Hornidge.
ATTORNEYS.

Feb. 5, 1935. A. POTDEVIN 1,989,943

APPARATUS FOR USE IN CONNECTION WITH THE MAKING OF BAGS

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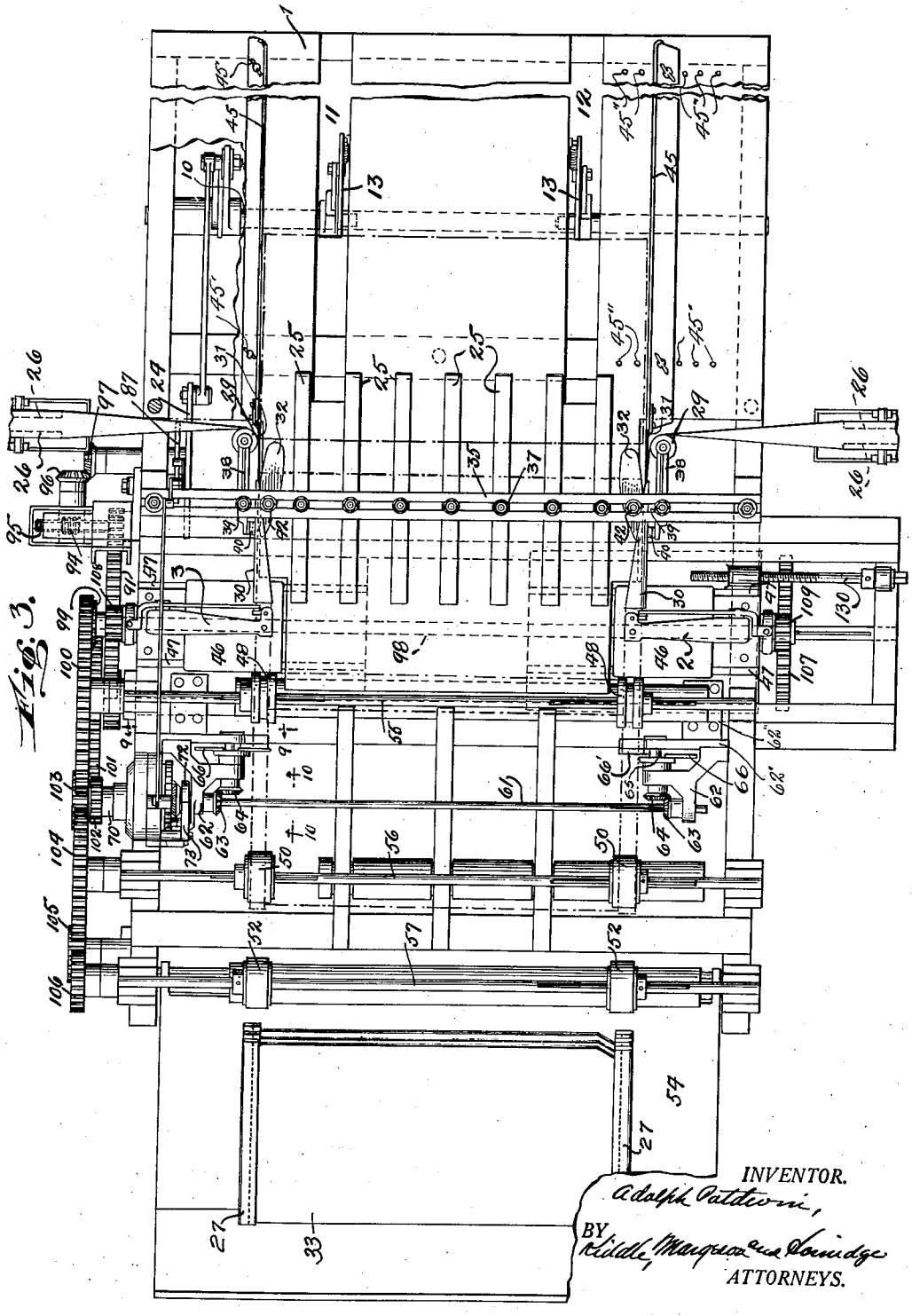


Fig. 3.

INVENTOR.
Adolph Potdevin,
BY Riddle, Marquess and Damidge
ATTORNEYS.

Feb. 5, 1935. A. POTDEVIN 1,989,943

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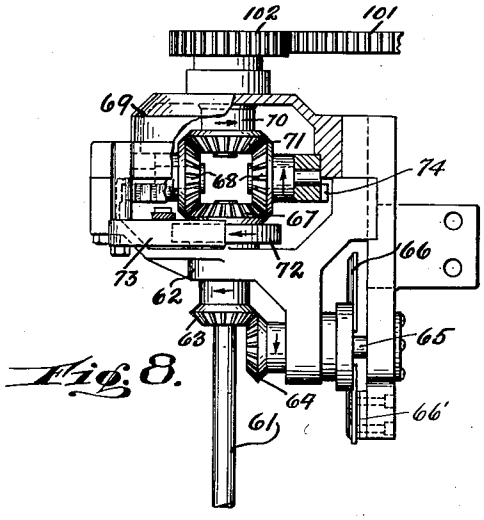


Fig. 8.

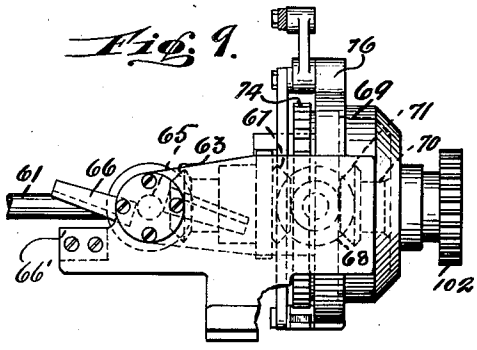


Fig. 9.

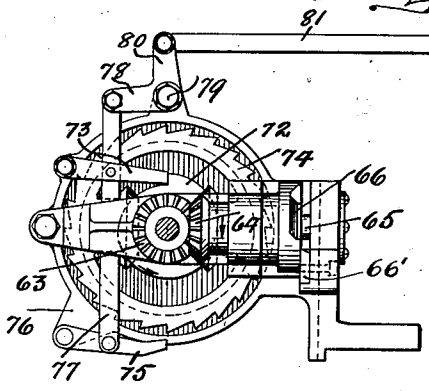


Fig. 10.

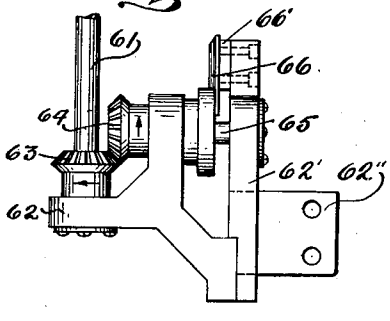


Fig. 11.

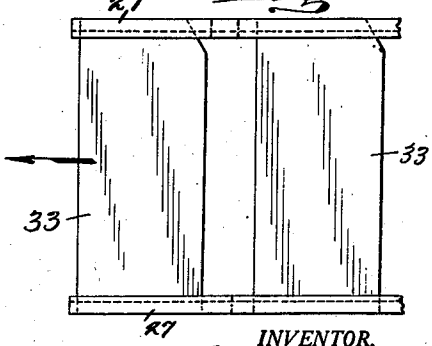


Fig. 12.

INVENTOR.
Adolph Potdevin,

BY
Kiddle, Mangeon and Hornidge.
ATTORNEYS.

Patented Feb. 5, 1935 1,989,943

UNITED STATES PATENT OFFICE

1,989,943

APPARATUS FOR USE IN CONNECTION WITH THE MAKING OF BAGS

Adolph Potdevin, Garden City, N. Y., assignor to Potdevin Machine Company, Brooklyn, N. Y., a corporation of New York

Application April 22, 1932, Serial No. 606,839

13 Claims. (Cl. 164—68)

This invention is directed to an improved apparatus for use in connection with the making of paper bags being primarily directed to an apparatus for holding a paper tape over the ends of the bag and stitching the same in place.

A further object of the invention is the provision of an apparatus of the character above generally indicated in which means are provided for advancing the bags successively to an apparatus for sewing paper tape along the ends of the bag and cutting the paper tape as each bag is finished, the tape being supplied in a continuous strip from a supply roll.

In the drawings accompanying this application:

Fig. 1 is a side elevational view of my improved apparatus;

Fig. 2 is an end elevation of the apparatus;

Fig. 3 is a plan view;

Fig. 4 is a detail of one of the pushers employed for advancing the bag to the sewing apparatus;

Fig. 5 is a detail of the folding apparatus for the paper tape;

Fig. 6 is a section on the line 6—6 of Fig. 7;

Fig. 7 is a plan view of the apparatus of Fig. 5;

Fig. 8 is a detail of the cutting mechanism;

Fig. 9 is a view substantially on the line 9—9 of Fig. 3;

Fig. 10 is a view substantially on the line 10—10 of Fig. 3;

Fig. 11 is another view of the cutting mechanism; and

Fig. 12 is a plan view of the bags with the paper strips sewn across the ends thereof.

Referring to the drawings in detail, my improved machine comprises a feed table 1 which is elevated at a convenient distance above the floor, and along which the bags are advanced successively to a pair of sewing machines intermediate the ends of the machine. These sewing machines are well known commercial apparatus and will not be described in any detail. They are designated 2 and 3 on the drawings.

The paper tape which is to be folded over and stitched to each end of the bag is taken from rolls 4 and 5 and the thread employed in sewing this tape to the bags is taken from bobbins 6 and 7.

Pivoted to the bottom of the frame 8 of the machine are vertically extending pusher arms 9. Two or more of these arms are provided, as will be seen from Fig. 2, for instance, the arms being adjustably affixed to a rock shaft 10 which is mounted in the lower part of the machine frame.

The table 1 is slotted longitudinally as shown at 11 and 12, for instance, and on the upper end of each of the arms 9 is pivoted a pusher 13, which, under certain conditions to be hereinafter pointed out, projects above the top of the table through the slots 11 and 12. Each of these pushers is provided at its rear end with a spring 14 the other end of this spring being attached to a pin 15 on the pusher arm. Each pusher is provided also with a roller 16 at its forward end, these rollers riding along the underside of the table 1 on movement of the pushers to the left, as viewed in Figs. 1 and 4 for instance. Near the end of their travel these rollers engage the forward end of a rail 17 resiliently mounted below the table 1, this rail being held in its upward position, as shown in full lines in Fig. 4, by a spring 18. After the pushers have reached their limit of forward movement they are reversed, and on their reverse movement the rollers 16 will ride along the underside of the rail 17 so as to retract the pushers out of the slots 11 and 12 entirely, the pushers pivoting to their original position as shown as they ride off the rear or tail end of the rail 17, so that on the next forward movement of the pushers the rollers will travel along the upper side of the rail with the pushers projecting through the slots 11 and 12 as before.

The rod 10 carrying the pusher arms 9 is rocked through the medium of an arm 20, the lower end of which is fast to the shaft 10, link 21 adjustably secured to arm 20 by a slot and bolt connection 22 and 23 and a crank 24. The drive for this crank will be referred to later on.

The provision of the slot 22 and bolt 23 by which the link 21 is connected to the arm 20 enables the travel or throw of the pushers 13 to be varied so as to accommodate the machine to bags of different widths, it being appreciated that the bags are fed laterally to the sewing machines, as distinguished from lengthwise.

The bags as they are advanced by the pushers 13 pass under hold-down plates 25.

At each side of the machine I provide means for applying paper tape to the ends of the bag, the tape being stitched to the bag as the bags progress through the machine. The paper tape, as has already been mentioned, is taken from supply rolls 4 and 5 mounted on suitable standards at each side of the machine. Each tape as it passes into the machine travels over the face

of a gluing roller 26 where glue is applied to the edges of the paper, as shown in Fig. 2 for instance, the paper being designated 27 and the glue or other adhesive 28. The paper, after receiving its coating of glue, passes around a roller 29 which is set at an angle of 90° to the plane of the paper, and from thence the paper passes into a trough-shaped folding member 30, this member, as seen in Fig. 7 for instance, gradually decreasing in width until at the discharge end thereof it is just about the width of a double thickness of the tape and the thickness of the bag.

Extending into this trough-like folding member is a plate 31 which is spaced from the top of the member 30, the paper passing between this plate 31 and the inner face of the member 30.

Extending into the folding or forming members 30 is a plate 32 providing a guide plate for the bags, which in Fig. 5 I have designated 33, the bags as they are advanced through the machine passing along the side of this guide plate 32. The paper tape as it leaves the roller 29 is flat and at right angles to the end of the bag. As the bag and tape advance through the folder or former 30 the tape is folded over the bag end to emerge from the folder 30 as illustrated in Fig. 5.

The hold-down plates 25 are adjustably mounted on the underside of a slotted bar 35 extending transversely of the machine and fastened at each end to the side frames of the machine. The plates are simply held to this bar by a bolt 36 passing through the slot in the bar and a nut 37. It will be appreciated that this permits of each plate being adjusted independently of the others. The rollers 29 are adjustably supported on the transverse bar 35 by brackets 38 and bolts and nuts 39. These brackets 38 also support the trough-like members 30, the brackets being provided with a strap 40 which may be secured to the member 30 in any suitable manner.

The members 32 above referred to are adjustably carried by the transverse bar 35, being attached thereto by bolt 41 and nut 42.

The plates 31 which lie within the trough-shaped members 30 are carried by guide plates 45 extending longitudinally of the machine, along each side thereof, the plates 45 directing the end of the bag properly into the apparatus as the same progresses into that part of the machine where the tape is applied to the bag ends, and being set so as to hold the bags away from the tape until both have moved into that part of the machine where the tape is applied. These plates 45 are held in place on the machine frame by thumb screws 45'. One of the plates 45 is adapted for adjustment transversely of the machine, to accommodate bags of different lengths, by providing a plurality of holes 45'' for receiving thumb screws 45'.

It will be appreciated, therefore, that rollers 29, brackets 38 and member 30 are adjustable as a unit. It will be seen also that guide 45 and plate 31 are adjustable as a unit independently of rollers 29, brackets 38 and member 30, and that the plate 32 is likewise adjustable independently of each of these members.

The base 46 of each sewing machine is also adjustable transversely of the machine, being mounted in guideways 47 so that the machines may be adjusted transversely of the machine for the purpose of accommodating bags of different lengths.

The bags as they pass from the sewing machines pass between feed rollers 48 and 49, 50 and 51, and 52, 53, the latter discharging the bags upon a receiving platform 54. The rollers 48, 50 and 52 are adjustably mounted on shafts 55, 56 and 57, respectively, while the rollers 49, 51 and 53 are adjustably mounted on shafts 58, 59 and 60, respectively.

One set of rollers 48 and 49 is adjustable with adjustment of the sewing machine base on that side of the machine, the bearing for shafts 55 and 58 carrying rollers 48 and 49 being provided in member 58' which is rigid with base 46 of the sewing machine.

The rolls 48 and 49 travel slightly faster than the machine feed to exert a gentle pull on the paper. Likewise the rolls 50 and 51 travel slightly faster than rolls 48 and 49 to keep paper taut, while rolls 52 and 53 are further overspeeded to effect quick discharge.

Intermediate the feed rollers 48 and 49 and feed rollers 50 and 51 is the cutting off mechanism illustrated in detail in Figs. 8 to 11, inclusive. By reference to these figures and to Figs. 1 and 3 it will be seen that 61 designates a shaft extending transversely of the machine and mounted in bearing members 62. This shaft is provided at each end with a bevel gear 63 adjustable on the shaft and meshing with a bevel gear 64 on the outer end of a stub shaft 65 mounted in bearing members 62 and 62', each of these stub shafts carrying a cutter 66 at its inner end. One of these cutters comprises two blades as seen in Fig. 9 cooperating with fixed blade 66', while the other is similar but comprises only one blade. The blades are operated intermittently to sever the paper tape adjacent the side of each bag after the tape has been sewn in place thereon.

The shaft 61 at one end projects through its bearing 62 and is provided with a bevel gear 67. This gear is in constant mesh with two pinion bevel gears 68 mounted in a rotatable housing 69. In line with the shaft 61 is a stub shaft 70 extending through the housing 69 and carrying bevel gear 71 in constant mesh with the two bevel pinions 68. This provides a differential arrangement whereby if the housing 69 is permitted to rotate no rotation will be imparted to the gear 67 and hence to the shaft 61, whereas if the housing be held against rotation then rotation can be imparted to the shaft 61.

Fast on the shaft 61 is a ratchet 72 cooperating with a pawl 73. At its inner end the housing 69 is provided with a ratchet 74 which is adapted to cooperate with the pawl 75. The two pawls 73 and 75 are pivotally mounted on a mount 76 which is stationary and are connected to each other for simultaneous operation by a bar 77. The pawls are so arranged that when the pawl 73 is in engagement with its ratchet 72 the pawl 75 will be out of engagement with its ratchet 74 and vice versa.

The connecting member or bar 77 at its outer end, as viewed in Fig. 10, is pivoted to one arm 78 of a bell crank lever pivoted to the mount 76 at 79. The other arm 80 of this bell crank lever is pivotally connected to a link 81, the opposite end of which is pivotally connected to one arm 82 of a bell crank lever pivoted at 83 on the machine frame, the other arm 84 of this bell crank lever being connected through the link 85 with a cam follower 86 cooperating with the face of a cam 87 on the same shaft 88 with the crank 24 which drives the pusher mechanism for the bags as above described.

It will be seen that when the cam 87 is rotated the pawls 73 and 75 will be actuated intermittently, alternately to release ratchet 72 and lock ratchet 74.

At the side of the machine opposite the differential just described bearing members 62 and 62' are attached by member 62'' to the sewing machine base 46.

It will be apparent from the foregoing that adjustment of the sewing machine will at the same time and to the same degree effect adjustment of the rollers 48 and 49 and cutting mechanism adjacent thereto.

89 designates the driving motor for the machine. The shaft of this motor is provided with a gear 90 meshing with a gear 91 meshing with gear 92 on a shaft 93 which carries a worm 94. This worm meshes with worm gear 95 on a short shaft carrying bevel gear 96 meshing with bevel gear 97 on the shaft 88 carrying the cam 87 as well as the crank 24.

The shaft 98 carrying the gear 91 carries a gear 99 meshing with gear 100 on the shaft 58 of the feed roller 49. This shaft 58 carries a gear 101 meshing with gear 102 which is on the shaft 70. The gear 100 also meshes with an intermediate gear 103 meshing with gear 104 on the shaft 59 of the feed roller 51 and the gear 104 in turn meshes with an intermediate gear 105 meshing with a gear 106 on the shaft 60 of the feed roller 53.

The shaft 98 which carries the gear 91 is provided at its other end with a gear 107. The gear 91 meshes with a small gear 108 while the gear 107 meshes with a small gear 109, the gears 108 and 109 being the drive gears of the two sewing machines. The shaft 98 which carries the gears 91 and 107 it will be appreciated extends entirely across the machine.

125 designates a sleeve on shaft 98, adjacent gear 107 which drives sewing machine gear 109, this sleeve being carried by hanger 126 attached to sewing machine base 46. Inside sleeve 125 is a headed bushing 127 keyed to shaft 98. This bushing passes through the gear 107, and the hub of the latter is secured thereto, as for instance by screw 128. Consequently when the sewing machine base 46 is adjusted gear 107 will be adjusted and hence remain in mesh with sewing machine gear 109.

Adjustment of the sewing machine base 46, rollers 48 and 49 and the one bladed cutting mechanism is effected by threaded rod 130.

From the foregoing it will be appreciated that all parts of my machine, the setting of which must be changed when shifting from one sized bag to another, have been made adjustable without, however, disturbing the drive mechanism for the machine.

In operation the bags are fed successively to the table 1 and advanced by the pushers 13 to the sewing machines. As the ends of the bags enter the forming member 30 it will be appreciated that they pass between the plate 32 and the side of the forming member, the guides 31 properly directing the bag into this forming mechanism. As the bags advance the tape from the rolls 4 and 5 is also advanced, passing through the forming mechanism 30 where it is folded over the ends of the bag, the tape having previously been glued at the gluing rolls 26. Consequently when the bag reaches the sewing machines the paper tape has been folded over the ends of the bag and pasted down. As the bags pass through the sewing machines the tape is sewn in place and by the time this sewing operation is completed the cam 87 has moved to such position that the pawl 75 will be in engagement with the ratchet 74 to prevent the housing of the differential mechanism, which constitutes a part of the drive for the cutters, from rotating. Consequently the pinion 67 will be driven, to drive the shaft 61 rotating the cutters 66 and severing the tape. The rotation of these cutters is only momentary, further rotation of the cam 87 shifting the pawl 75 out of engagement with the ratchet 74 and the pawl 73 into engagement with the ratchet 72, this latter operation preventing further rotation of the cutters without, however, necessitating stopping the gear 102. The bag is then passed by the feed rollers 50, 51, 52, 53 to the discharge platform 54.

It will be appreciated that by changing the worm gear 95 the machine can be changed over to accommodate bags of different widths.

It will be understood that changes may be made in the mechanism above described within the purview of my invention.

What I claim is:—

1. In apparatus of the class described, the combination of a stationary cutter, an intermittently operated movable cutter adapted to cooperate with the stationary cutter, and a differential drive for the movable cutter.

2. In apparatus of the class described, the combination of a stationary cutter, an intermittently operated movable cutter cooperating therewith and a positively controlled differential drive for the movable cutter.

3. In apparatus of the class described, the combination of a stationary cutter, an intermittently operated movable cutter cooperating therewith, and a cam-controlled differential drive for the movable cutter.

4. In apparatus of the class described, the combination of a stationary cutter, an intermittently operated rotatable cutter cooperating therewith, and a cam-controlled differential drive for said cutter.

5. In apparatus of the class described, the combination of a stationary cutter, a rotatable cutter cooperating therewith, a shaft carrying said rotatable cutter, differential mechanism for driving said shaft, pawl and ratchet mechanism controlling the operation of the said differential, and a driven cam for controlling said differential.

6. In apparatus of the class described, a cutter, means to feed past the cutter spaced articles connected by a tape, means for positively rotating the cutter intermittently to sever the connecting tape, cam-controlled mechanism out of the path of the moving articles for effecting operation of the cutter when the articles reach a predetermined position in their travel, and cam-controlled means to prevent a second operation of the cutter until the articles have advanced a predetermined distance.

7. In an apparatus of the class described, the combination of a cutter, a differential mechanism for driving the cutter, and cam-controlled pawl and ratchet mechanism controlling the differential to effect intermittent rotation of the cutter.

8. In apparatus of the class described, the combination of a cutter, means for intermittently and positively rotating said cutter, feeding means to feed past the cutter spaced articles connected by a tape, a drive for the feeding means, and a control for the cutter actuated by said drive whereby the cutter is positively actuated at the proper instant to sever the connecting tape.

9. In apparatus of the class described, the com-

bination of a cutter, means for intermittently and positively rotating said cutter adjustable feeding means to feed past the cutter spaced articles connected by a tape, a drive shaft for the feeding means, and a cam driven from said shaft to effect intermittent rotation of the cutter in timed relation to the feeding means thereby to sever the said tape between connected articles.

10. In apparatus of the class described, the combination of a stationary cutter, a rotatable cutter adapted to cooperate with the stationary cutter, pawl and ratchet mechanism for driving said rotatable cutter intermittently and positively, a pawl and ratchet mechanism for locking said rotatable cutter against rotation and a cam for effecting the alternate operation of said pawl and ratchet mechanisms.

11. In apparatus of the class described, the combination of a stationary cutter, an intermittently rotated movable cutter adapted to cooperate with the stationary cutter, pawl and ratchet mechanism for intermittently rotating said movable cutter, pawl and ratchet mechanism for locking said rotatable cutter against rotation and cam controlled mechanism for effecting simultaneous movement of said pawls alternately to rotate the cutter and lock the cutter against rotation.

12. In apparatus of the class described, a cutter, means to feed past the cutter spaced articles connected by a tape, a drive for the feeding means, means for positively rotating the cutter intermittently to sever the said connecting tape, and means out of the path of the tape connected articles and controlled by said drive for controlling the cutter actuating mechanism to effect operation of the cutter when the articles reach a predetermined position in their travel.

13. In apparatus of the class described, the combination of a rotatable cutter, adjustable means to feed past the cutter spaced articles connected by a tape, a drive shaft for said feeding means, and means driven from said shaft and out of the path of the advancing articles but timed with the travel thereof for positively and intermittently rotating the cutter at intervals corresponding to predetermined positions of the traveling articles to sever said connecting tape.

ADOLPH POTDEVIN.