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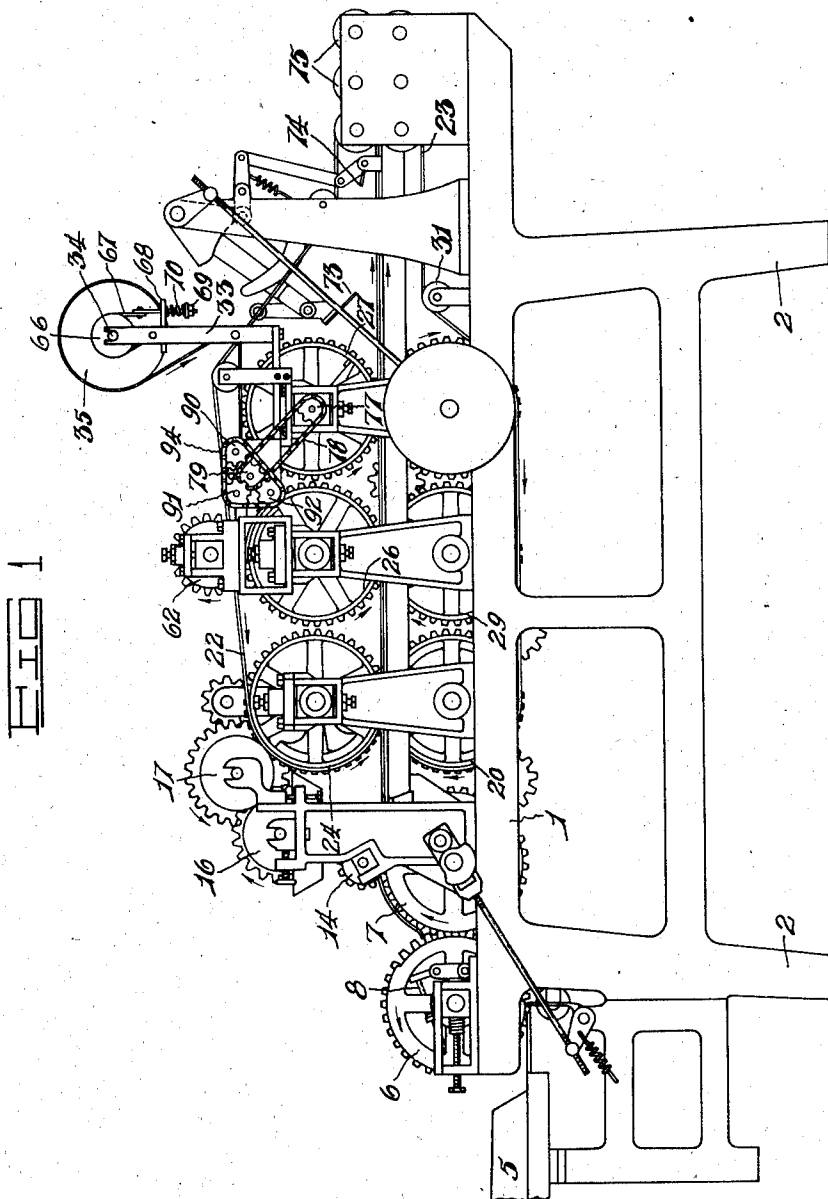
H. H. CRAWFORD

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APPARATUS FOR APPLYING SUPPLEMENTAL MEMBERS TO BAG ENDS

Filed Dec. 21, 1939

4 Sheets-Sheet 1



INVENTOR

Harry H. Crawford
By *Martin O. Manion*
ATTORNEY

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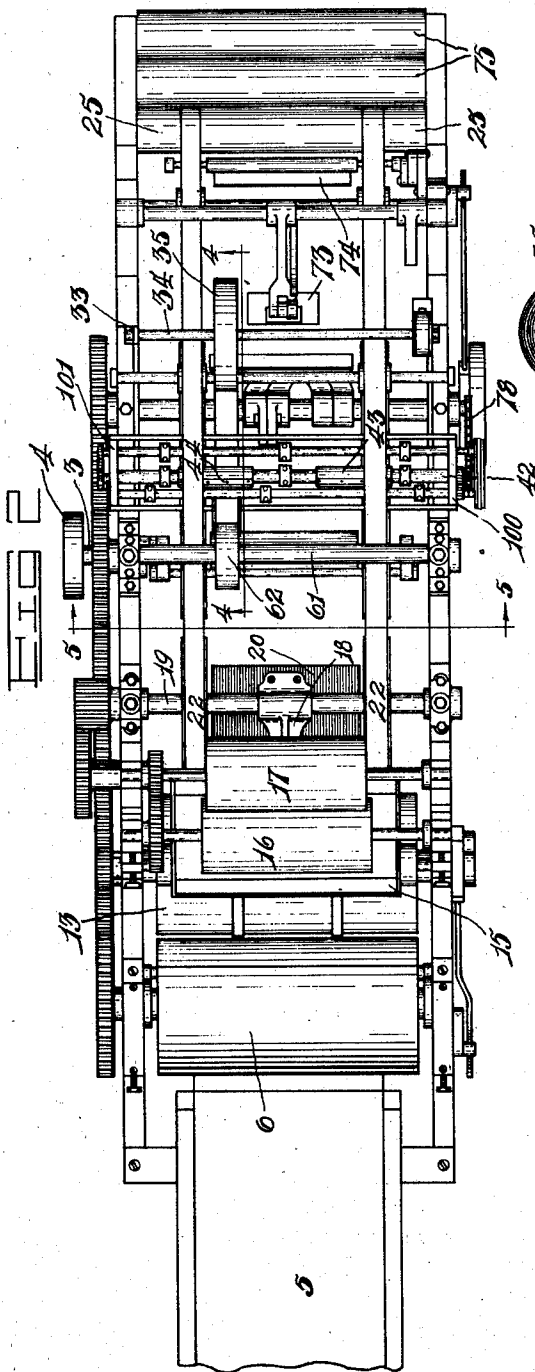
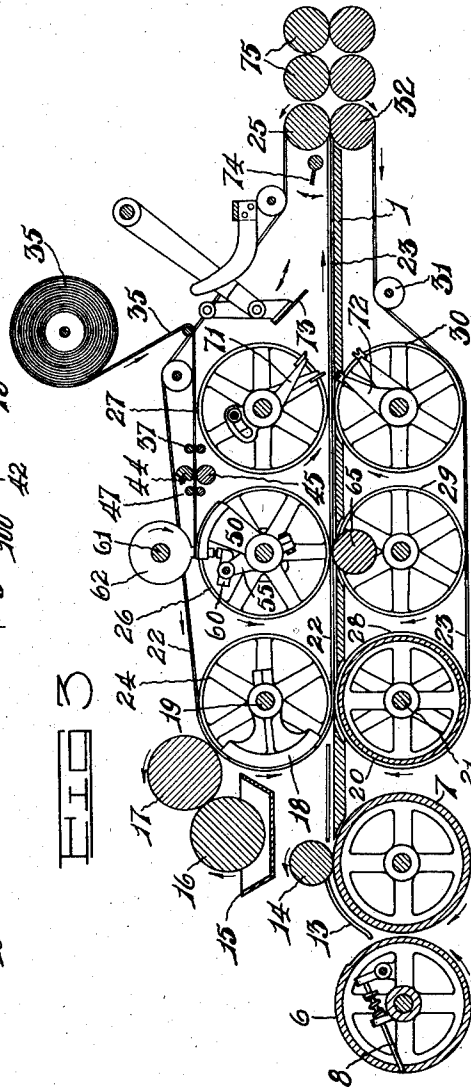
H. H. CRAWFORD

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4 Sheets-Sheet 2



INVENTOR
Harry H. Crawford
BY *Martin J. Manion*
ATTORNEY

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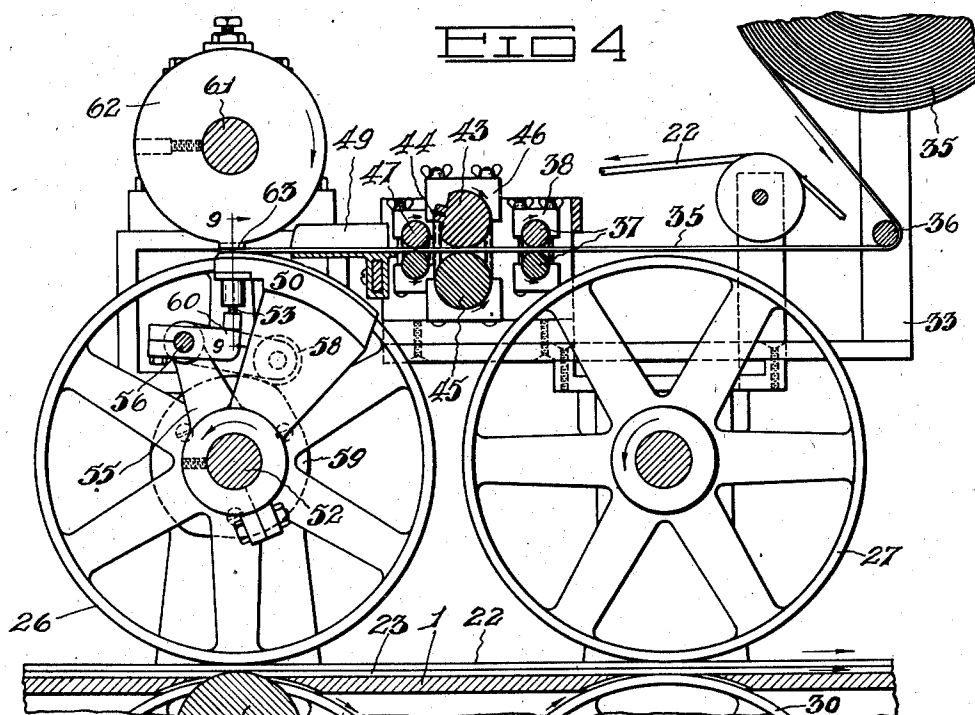
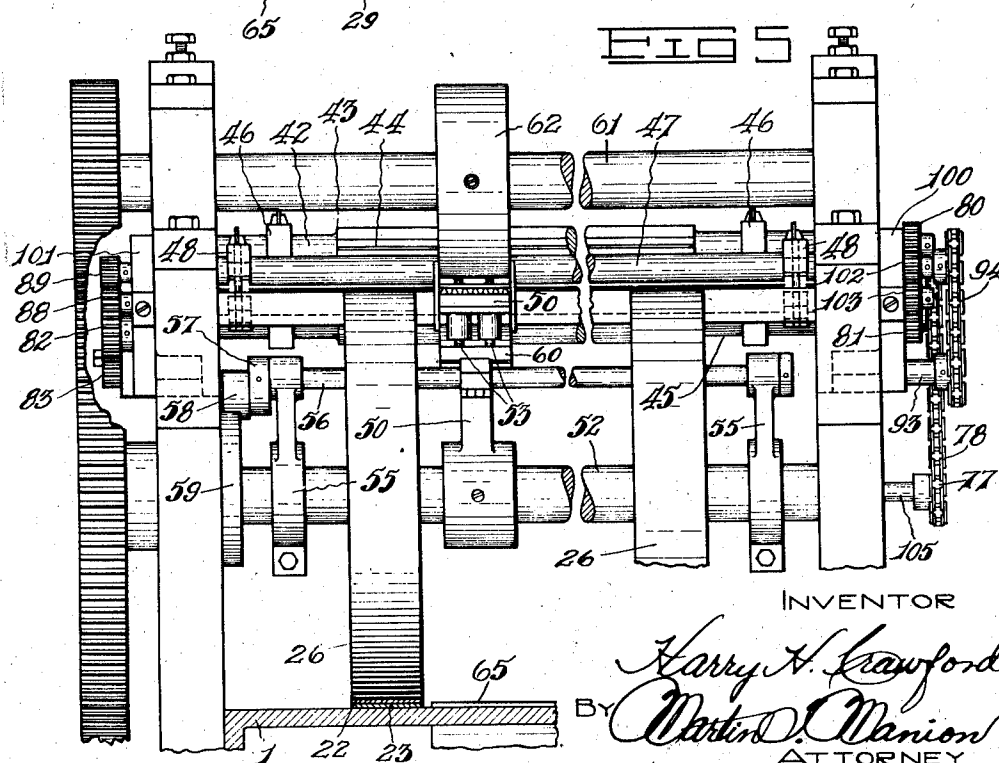
H. H. CRAWFORD

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4 Sheets-Sheet 3



INVENTOR

Harry H. Crawford
By *Martin D. Manion*
ATTORNEY

Sept. 15, 1942.

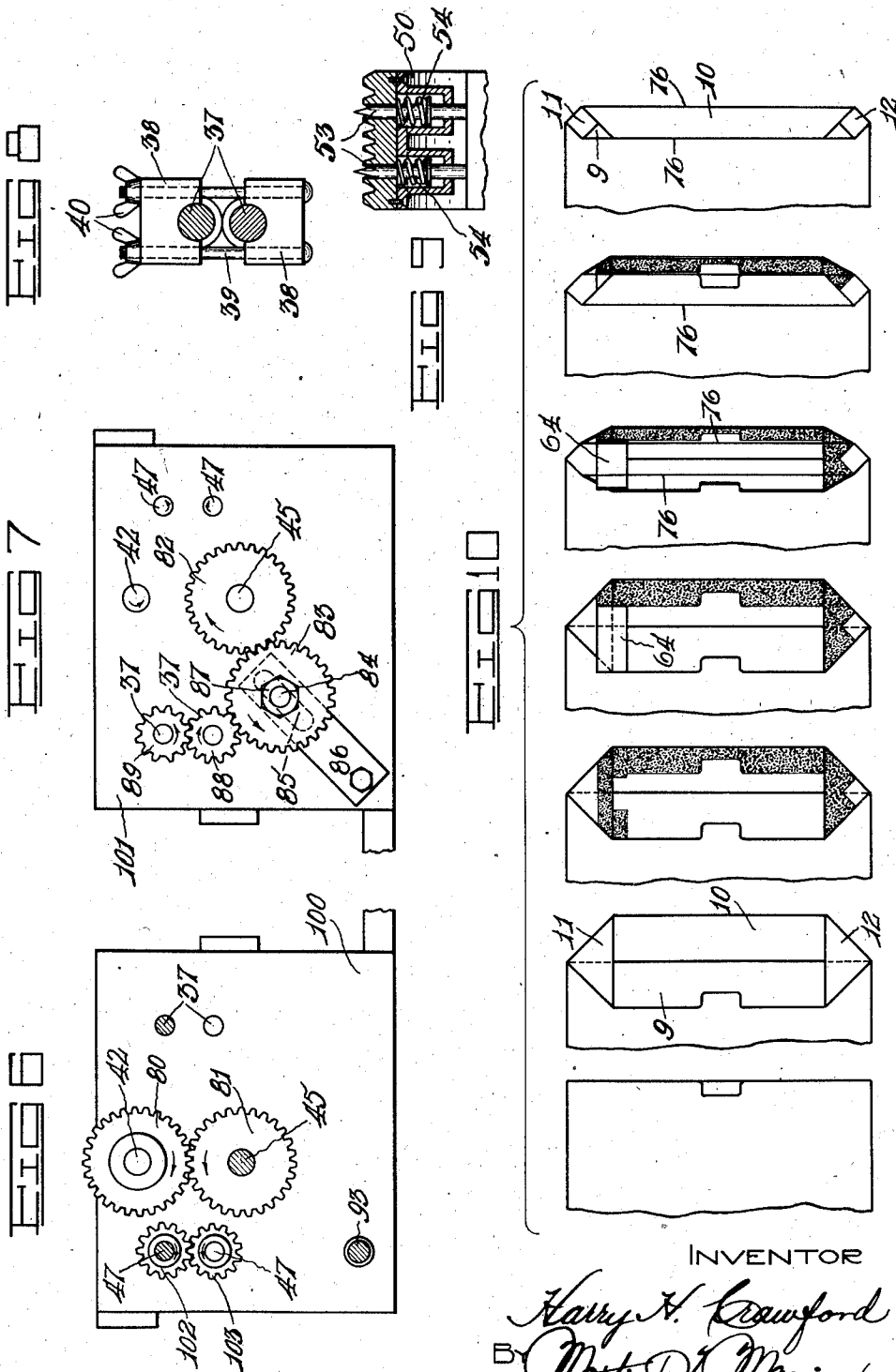
H. H. CRAWFORD

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4 Sheets-Sheet 4



INVENTOR

Harry H. Crawford
Martin D. Mauion
ATTORNEY

UNITED STATES PATENT OFFICE

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APPARATUS FOR APPLYING SUPPLEMENTAL MEMBERS TO BAG ENDS

Harry H. Crawford, Wellsburg, W. Va., assignor,
by mesne assignments, to St. Regis Paper Company,
New York, N. Y., a corporation of New York

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2 Claims. (Cl. 93—8)

This invention relates broadly to apparatus for adding supplemental members to paper bag ends, and more particularly to apparatus for inserting, positioning and affixing a flexible extension to the valve flap of a paper valve bag.

One of the objects of the invention is to provide such an apparatus which is inexpensive and durable, and which may readily be associated with a bag bottoming machine of conventional type.

Another object of the invention is to provide an apparatus of the character referred to which is continuous in operation and in which there is no interruption of mechanical movement of the associated mechanism.

Another object is to provide apparatus which positively inserts, positions and affixes the valve extension to the valve flap at the valve corner of a paper bag.

Another object is to provide apparatus whereby the valve extension referred to is affixed to the valve flap by paste, glue or other similar adhesive without the necessity of a pasting operation in addition to that already performed by a conventional bag bottoming machine.

Another object is to provide apparatus which may readily and conveniently insert valve flap extensions in various sizes and widths of bags.

The full nature of the invention and other features thereof will be understood from the accompanying drawings and the following description. In said drawings—

Figure 1 is a side elevational view of a conventional bag bottoming apparatus with the instant invention associated therewith;

Figure 2 is a top plan view of the same;

Figure 3 is a longitudinal vertical sectional view taken through the apparatus, various parts being omitted so as to clearly illustrate the most pertinent elements involved in the invention;

Figure 4 is an enlarged sectional view taken on line 4—4 of Fig. 2;

Figure 5 is an enlarged sectional view taken on line 5—5 of Fig. 2;

Figure 6 is a detail view of the gear mechanism on one side of the apparatus for driving the tape feed rolls and tape cutting rolls;

Figure 7 is a detail view of the gear mechanism on the opposite side of the apparatus for driving the tape feed rolls and tape cutting rolls;

Figure 8 is a detail view of one of the pillow blocks in which the feed rolls are journaled;

Figure 9 is an enlarged sectional view taken on line 8—8 of Fig. 4; and

Figure 10 is a diagrammatic view of the valve

end of a paper bag illustrating the various successive stages of fabrication in accordance with the present invention.

Referring to said drawings, the reference numeral 1 designates the bed plate of the apparatus, which latter is supported by legs 2. Extending laterally is a drive shaft 3, suitably journaled in appropriate bearings provided in the frame, said shaft being adapted to be driven by any suitable means, as the pulley wheel 4. Suitable intermeshing gears are provided, as shown at the top of Fig. 2 of the drawings, whereby the entire bottoming mechanism is synchronously actuated.

A bag to be bottomed is fed to the apparatus from the table 5 upwardly between the oppositely rotating, opening rolls 6 and 7. At this stage of the fabrication the valve end of the bag tube appears as shown at the left of Fig. 10. As the bag passes into the opening rollers 6 and 7, the forward wall of the bag tube is carried forwardly by grippers borne by the roll 7 while the rear wall becomes attached to pins 8 which protrude from the periphery of the roll 6. In this manner the walls of the bag end are spread apart and thus form opposite bottom flaps 9 and 10 and opposite corner flaps 11 and 12, as shown in the second figure from the left in Fig. 10. The bottom flap 9 is then released from opening roll 6 by automatic retraction of the engaging pins 8, and the thus formed bag passes beneath a guide 13 beneath a pressing roll 14 where it is pressed in this condition.

A reservoir 15 for containing the glue or paste is provided above the pressing roll 14. Rotatable and partially submerged in the adhesive is a roll 16. An amount of the paste adheres to the surface of the roll 16 and is transmitted to a second adhesive roll 17 with which it contacts.

As the bag emerges from the pressing roll 14 and is moved forwardly, the opened bottom end hereinbefore described is presented beneath a rotating segmental pasting plate 18 which is fixed to a shaft 19. The peripheral surface of the pasting plate is designed during its rotation to receive a quantity of the paste borne by the adhesive roll 17 and to deposit the paste on the open end of the bag bottom in that area shown stippled in the third from the left figure of Figure 10 of the drawings. Obviously, the face of the pasting plate has a contour similar to the said stippled area. A backing roll 20 carried by a shaft 21 is provided beneath the pasting plate 18.

As the bag leaves the pasting plate and its backing roll and continues to move forwardly, its

opposite longitudinal edges are received between upper and lower traveling belts. Both upper and lower pair of belts 22 and 23, respectively, occupy spaced parallel relation, and are spaced apart a distance slightly less than the width of the bag so that a narrow strip of the opposite longitudinal edge portions of the bag may be engaged therebetween and each of the upper pair of belts 22 travels over pulleys 24 carried by the shaft 19 and about a pulley roller 25, as well as pulleys 26 and 27. As viewed in Fig. 3, the belt 22 travels in a counter-clockwise direction.

Each of the lower pair of belts 23 travels over pulleys 28 carried by the shaft 21 and about pulleys 29, 30, 31 and 32. As viewed in Fig. 3, the belt 23 travels in a clockwise direction. Obviously, vertically aligned belts of the two pair contact each other as they travel forwardly of the apparatus and in this manner the bags are supported and transported therebetween.

As hereinbefore recited, the primary object of the instant invention is to insert in, deposit on, and affix to, the flap of the bag valve an inwardly extending auxiliary flexible member, preferably paper, which will serve as a valve flap extension and serve as an effective means for preventing in a completed and filled bag seepage of the bag contents through the valve. The mechanism for accomplishing this function, and which forms the essential feature of this invention, may be described as follows:

Extending upwardly from the apparatus are oppositely disposed uprights 33 which support the opposite ends of a rod 34. Fixed to said rod and rotatable therewith is a roll or spool of closely wound paper tape 35. The tape 35 is threaded beneath a guide rod or roller 36 and to and through a pair of feed rollers 37 whose opposite ends are suitably journaled in bearing plates 100 and 101 supported by the frame. Pillow blocks 38, whose exerting tension is regulated by bolts 39 and wing nuts 40, provide bearings for the feed rolls and afford the desired rigidity thereto.

A shaft 42 has its opposite ends journaled in the bearing plates 100 and 101 and has intermediate its ends two spaced enlarged portions 43. Each of these enlarged portions 43 is longitudinally slotted so as to receive a cutting blade 44, which latter is held in place by machine screws, bolts, or the like. Located beneath the cutter shaft 42 is a backing roll 45 whose opposite ends are also supported by and journaled in the plates 100 and 101. Pillow blocks 46, substantially similar to the pillow blocks 38, serve as journals for the cutter shaft 42 and backing roll 45.

The valve for the bag may be located at either corner of the bag bottom. As shown in the drawings and as herein described for purposes of explanation, the valve is to be located in the corner occupied by corner flap 11.

The tape 35 is fed from the feed rollers 37 to and through one of the cutters 44 and its backing roll 45 and thence through another set of feed rollers 47 similar to the feed rollers 37. Said rollers 47 are also provided with pillow blocks 48.

From the feed rollers 47 the tape passes over a channel guide 49 where its terminal extremity is adapted to be introduced between the bite of a segmental shoe 50 and a complemental backing disc 62. The feed rollers 47 may, if desired, be omitted, and the tape may be fed solely by the feed rollers 37.

The segmental shoe 50 has its hub fixed to a shaft 52 and is rotatable therewith. Provided

in spaced apertures in the forward end of the shoe 50 are a pair of pins 53 whose outer ends are sharpened to a point, as shown in Fig. 9. The pins 53 are normally maintained withdrawn from protruding relation with respect to the peripheral face of the shoe by encircling, coiled compression springs 54.

Fixed to the shaft 52 are spaced bearing brackets 55 in which is journaled a rocker shaft 56 on one end of which is attached a rocker arm 57 and its roller 58. The roller 58 is adapted to contact and be acted upon during rotation of shaft 52 by a fixed cam 59 which is stationarily attached to the frame of the apparatus.

Fastened to the rocker shaft 56 intermediate its ends and in alignment with the shoe 50 is an L-shaped arm 60, the vertical leg of which is disposed beneath and contacts the lower ends of the pins 53.

Fixed to a shaft 61 disposed above the shoe 50 is the disc 62 in a portion of whose circumference is provided a plane boss 63. This disc 62 is designed to serve as a backing for the shoe 50.

During rotation of the shaft 52, and as the forward end of the shoe 50 approaches the disc 62, the roller 58 of the rocker arm 57 engages the elevated race of the cam 59 thereby slightly rotating the rocker shaft 56 and its arm 60, thus elevating the vertical leg of said arm, which, in turn, contacts and elevates the pins 53 against the tension of the springs 54 so that the outer pointed ends of said pins protrude beyond the peripheral surface of the shoe 50, as shown in Fig. 9. In the meantime, the disc 62, which, incidentally, has a speed ratio of two to one with respect to the speed of rotation of the shoe 50, has been rotated to a point where its plane boss 63 registers with the pins 53. The terminal extremity of the tape 35 is pierced by the pins 53 and the tape is thus engaged by and becomes fastened to the shoe 50. It might here be mentioned that the boss 63 is provided with two spaced, parallel, longitudinally extending grooves to accommodate and permit passage of the pins 53.

As the tape 35 approaches the shoe 50 from the feed rolls 47, the forward portion of the tape will be severed from the remainder by engagement with the rotating cutter 44. There is thus severed from the spool of tape and attached to the shoe a section of tape 64 of the desired length to be inserted in the bag corner to serve as an extension for the valve flap.

Continued rotation of the shoe 50 will bring the severed strip of tape 64 directly over the valve corner of a bag which is continuously traveling forwardly between the belts hereinbefore mentioned. As the strip 64 is about to contact the pasted area of the bag flaps, the roller 58 of the rocker arm 57 reaches the low, non-contacting race of the cam, thereby permitting the springs 54 to retract the pins 53 to disengage them from the strip of tape 64.

Simultaneously with the retraction of the pins 53 the forward end of the strip 64 is transferred from the shoe and deposited on the previously pasted valve corner in a position partially overlying the bottom flap 10 and extending over and inwardly of the valve flap 11. Continued rotation of the shoe and forward travel of the bag will deposit and affix the remaining portion of the strip 64 wherein it completely overlies the bottom flap 9, as shown in the fourth figure from the left in Fig. 10. The face of the shoe 50 is preferably provided with longitudinal extending, parallel

grooves or furrows so as to reduce the surface area which may accidentally be fouled by paste.

An appropriate backing roller 65 is provided beneath the shoe to support the bag during the valve extension affixing operation.

As hereinbefore stated, the spool of tape 35 is fixed to the rod 34. In order that the tape 35 will be furnished only as needed and to prevent the spool from becoming accidentally and loosely unwound, a brake drum 66 is fastened to the rod 34 adjacent one end thereof. One end of a flexible brake band 67 is attached to the upright 33 and the brake band is passed over the drum 66 while its opposite end is fastened to a bracket 68 by a bolt and nut 69. Interposed between the nut 69 and bracket 68 is a compression spring 70 whereby tension of the brake band on the drum may be increased or decreased to control the feed of the tape from the spool and prevent its chance unwinding.

After the valve extension 64 is affixed, as aforesaid, the belts carry the bag forwardly between creasing means whereby the two bottom flaps 9 and 10 of the bag are longitudinally creased to define the depth of the bag end which is equivalent to the width of the valve in the bag being fabricated and to afford a crease in said flaps for facilitating folding of the flaps in the formation of the bag bottom. The creasing means consist of upper male blades 71 and lower female plates 72 adapted during rotation of their respective shafts to engage the bag end and place therein the creases or fold lines 76 depicted in the third figure from the right in Fig. 10. The action of the creasing means also has a tendency to press or anchor the valve extension 64 in place.

As the creased bag moves forwardly between the belts, the upstanding rear flap 9 is engaged by the forward movement of a horizontally oscillating closure arm 73 so that portion of the bottom flap 9 located outwardly of the crease line 76 is folded down onto the paste, as shown in the second figure from the right in Fig. 10.

As the bag continues to move forwardly uninterruptedly, it passes beneath a vertically oscillating flapper arm 74 which engages the upstanding bottom flap 10 and presses that portion thereof located outwardly of the crease line 76 downwardly into contacting relation with the exposed face of the bottom flap 9, as shown in the first figure from the right in Fig. 10.

At this point the bag leaves the belts and enters a series of pressing rollers 75 which act to exert pressure on the folded bottom so that it will be permanently maintained in this condition by the adhesive.

The mechanism for applying the valve extension is adapted to be conveniently adjusted so that bags with different sizes or widths of valves may be fabricated. Obviously, the length of the strip of tape 64 required depends upon the depth of the bag. The mechanism for driving the feed rolls 37 and 47, as well as the cutter 44 and its backing roll 45, comprises a sprocket wheel 77 borne by the end of a shaft 105. The sprocket wheel is fitted on the tapered end of the shaft 105 and held in place by a nut (not shown) threaded on the end of the shaft 105. Thus, the nut may be retracted and the sprocket wheel 77 loosened on the shaft to afford free rotation of the sprocket 77 when altering the timing of the associated mechanism to adjust to a valve of different size.

A sprocket chain 78 connects the sprocket 77 with a sprocket wheel 79 fixed to the end of the

backing roller 45, and the shaft 42 carrying the cutter blade 44 is driven by means of a gear 80 which meshes with a gear 81 borne by the roller 45. The mechanism above described is located exteriorly of the face of the bearing plate 100.

A gear 82 is carried by the opposite end of the roller 45 exteriorly of the opposite bearing plate 101 and meshes with an idler gear 83 which is received on a stud spindle 84. The spindle 84 is longitudinally movable in a slot 85 provided in a bracket arm 86, which latter is bolted to the plate 101. A nut 87 maintains the spindle 84 stationary in the slot 85.

The idler gear 83 meshes with a pinion 88 carried by the end of the lower feed roll 37, and said pinion 88, in turn, meshes with a pinion 89 carried by the end of the upper feed roll 37.

Located on the end of the upper feed roll 37 opposite to the end carrying the pinion 89 and exteriorly of the plate 100 is a sprocket wheel 90. A sprocket wheel 91 is also fixed to the end of the upper feed roll 47, while an idler sprocket wheel 92 is carried by a stud spindle 93 protruding from the face of the plate 100. A sprocket chain 94 connects each of the sprockets 90, 91 and 92 and in this manner the feed rolls 47 are actuated by power transmitted from the feed rolls 37, since rolls 47 are rotated by pinions 102 and 103 which mesh with each other.

The feed rolls 37 and 47 uncoil the tape 35 from the spool and supply it to the deposition shoe 50 as required. The tape 35 does not contact the rolls 45 and 42, or the latter's enlargement 43. Thus, the speed of rotation of the feed rolls 37 and 47 governs the length of tape 35 which will have passed beneath the cutter 44 between each of its complete severing revolutions.

If a longer strip of tape 35 is required for a larger bag, the speed of the feed rolls may be increased by substituting a larger gear 82 and adjusting the position of the idler gear 83 accordingly. Thus, a longer strip of tape will be passed beneath the cutter between each complete revolution of the latter. Conversely, if a shorter strip of tape is required for a smaller bag, a smaller gear 82 may be utilized. The pivoted arm 86 and its slot 85 permits the idler gear 82 to be adjusted to mesh with the gear 82 and pinion 88 regardless of the size of the gear 82 used.

In the event the valve of the bag is to be located in the corner of the bag occupied by the corner flap 12, instead of in the corner occupied by the flap 11, as hereinbefore described, the spool of tape 35 will be moved so as to be aligned with the other cutter 44, and the shoe 50 and its appurtenant elements will be likewise shifted. Additionally, the adhesive supplied to the bottom of the bag will necessarily have to be altered accordingly.

It will be understood that the apparatus is capable of depositing, locating and affixing valve extensions other than that type herein specifically referred to. As a matter of fact, the apparatus is adapted to mechanically and automatically insert substantially any character of supplemental element in a bag bottom.

The bottoming apparatus with which the present invention is associated in combination is of conventional type, and the bottoming apparatus per se, as well as its gearing, has herein been described and illustrated in the drawings in a somewhat general manner.

The operation of the apparatus is continuous, and the bag is progressively and continuously

moved through the machine and the tape continuously furnished thereto without interruption. The machine is designed to operate at comparatively high speeds without undue strain or injury to any of the mechanism.

What is claimed is:

1. Apparatus of the character described comprising means for spreading apart the two sides of an end of a bag and folding the corners inwardly over the spread apart sides, means for applying adhesive to areas of the folded sides and corners, mechanism for depositing a supplemental extension to one of said folded corners comprising a spool of tape from which the extension is formed, continuously operated feed rolls for furnishing tape to a continuously actuated shear, means for conducting a severed length of tape forming the extension to the deposition means, said deposition means comprising a rotating shaft to which is fixed a segmental shoe, tape engaging means borne by said shoe, a rocker arm journaled in bearings fixed to said shaft and having a rocker arm fixed to one end thereof and operable over a fixed cam, a member borne by said rocker arm adapted to contact the tape engaging means, said rocker arm, rocker shaft and member being adapted to be moved by said cam during rotation of the rotating shaft to a position where they actuate said tape engaging means so that the latter protrude from the

periphery of the shoe to engage the severed section of tape and attach the latter to the shoe at one station of its rotation, and other means for retracting said tape engaging means at another station of its rotation so as to release the tape from the shoe and permit it to be deposited by the rotating shoe in the adhesive on one of the folded corners of the bag.

2. Apparatus of the character described comprising means for spreading apart the two sides of an end of a bag and folding the opposite corners inwardly over the spread apart sides, means for applying adhesive across the inwardly turned corners and along the edge of one of the spread apart sides, means for holding a roll of tape, cutting off successive lengths of the tape, and applying each cut off length to the spread bag end and against the adhesive on one of the inturned corners, the mechanism being proportioned to furnish and apply a length of tape reaching from the edge of the unpasted side flap to a point substantially in line with the inner side of the paste across the other side flap, and means for there-after folding over first the unpasted side flap and then the pasted side flap upon the unpasted flap, whereby the bag end is formed with one pasting operation and the applied tape leaves a valve opening at one corner of the bag.

HARRY H. CRAWFORD.