Aug. 12, 1930. H. ANDERSON 1,772,823

BAG SEALING MACHINE

Filed April 8, 1929 10 Sheets-Sheet 1

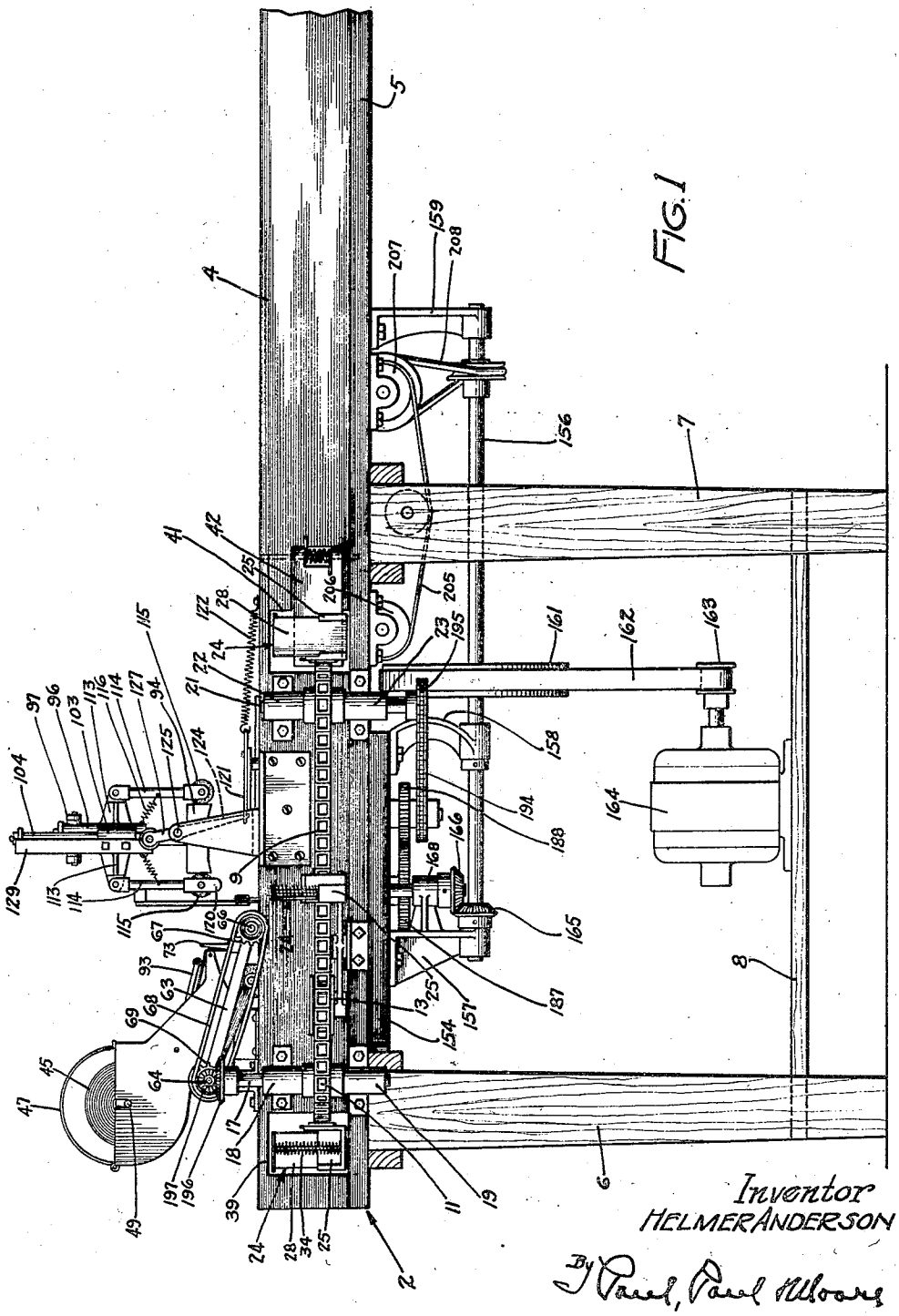


FIG. 1

Inventor
HELMER ANDERSON

By Paul, Paul & Moore

ATTORNEYS

Aug. 12, 1930. H. ANDERSON 1,772,823

BAG SEALING MACHINE

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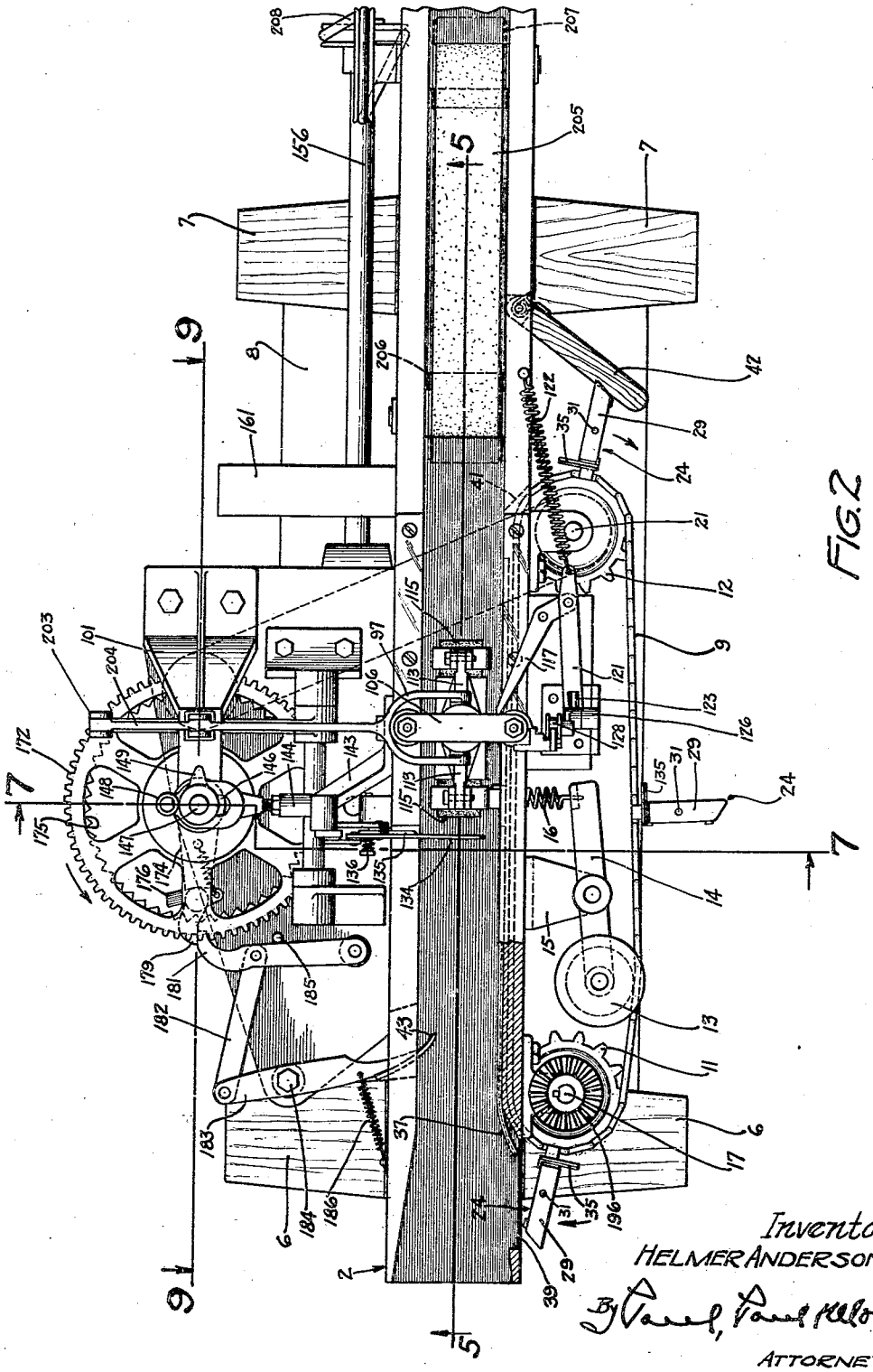


FIG 2

Inventor
HELMER ANDERSON
By Parker, Parker & Kellogg
ATTORNEYS

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BAG SEALING MACHINE

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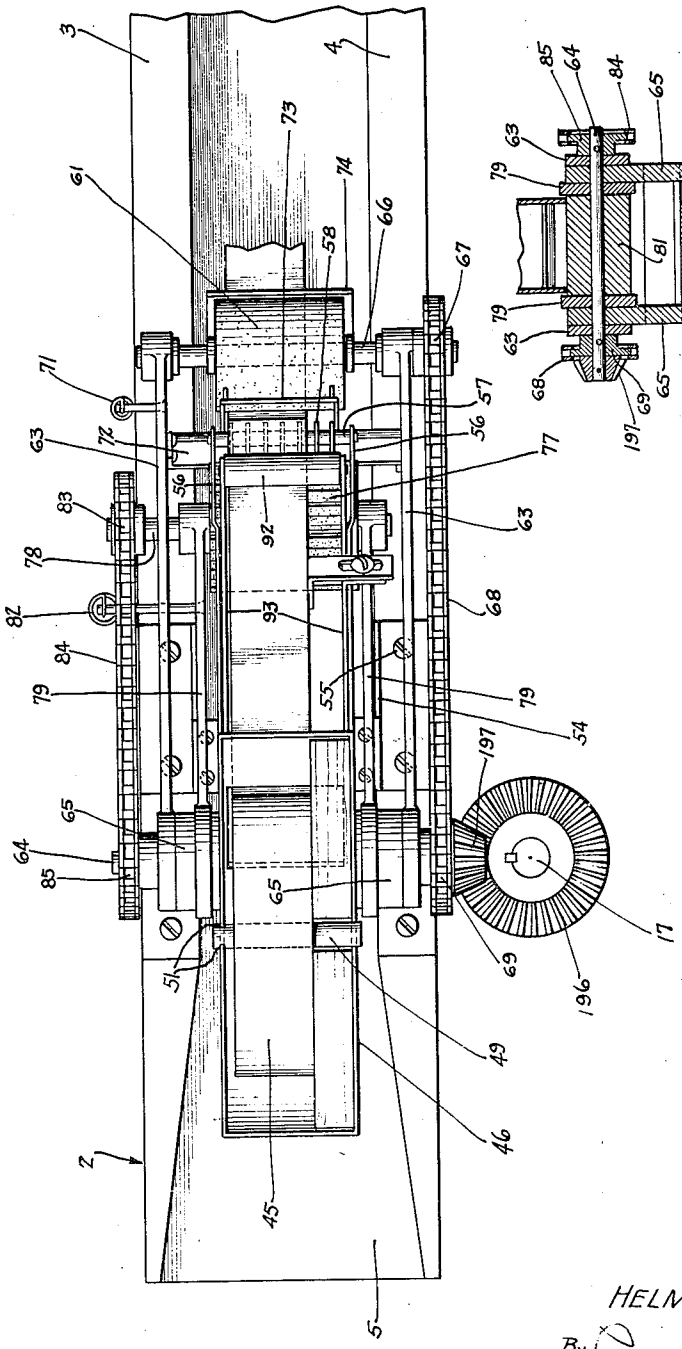


FIG. 3

FIG. 17

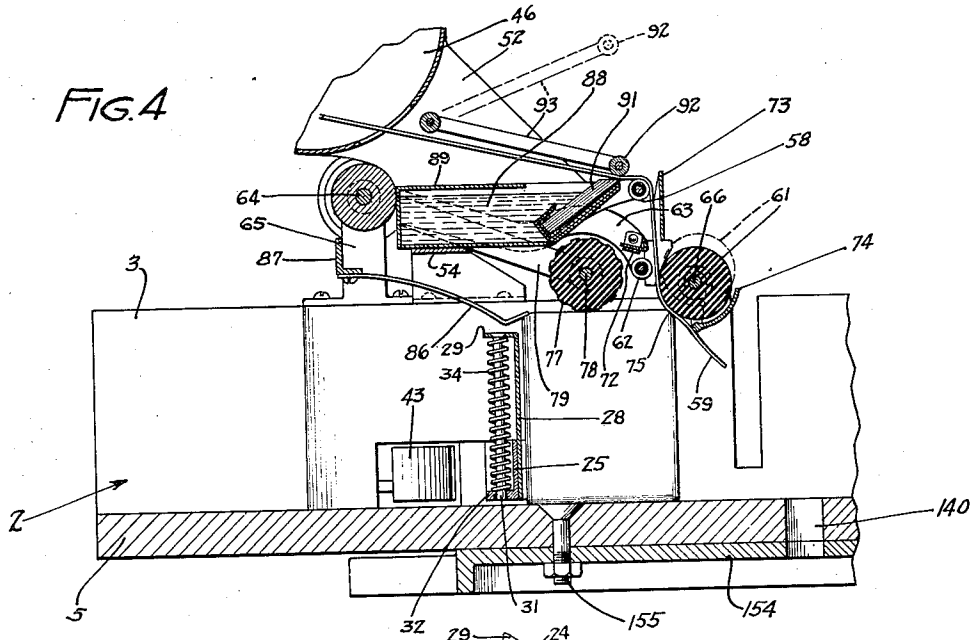
Inventor
HELMER ANDERSON
By Vard, Vard & Attorneys
Attorneys

Aug. 12, 1930. H. ANDERSON 1,772,823

BAG SEALING MACHINE

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FIG. 4



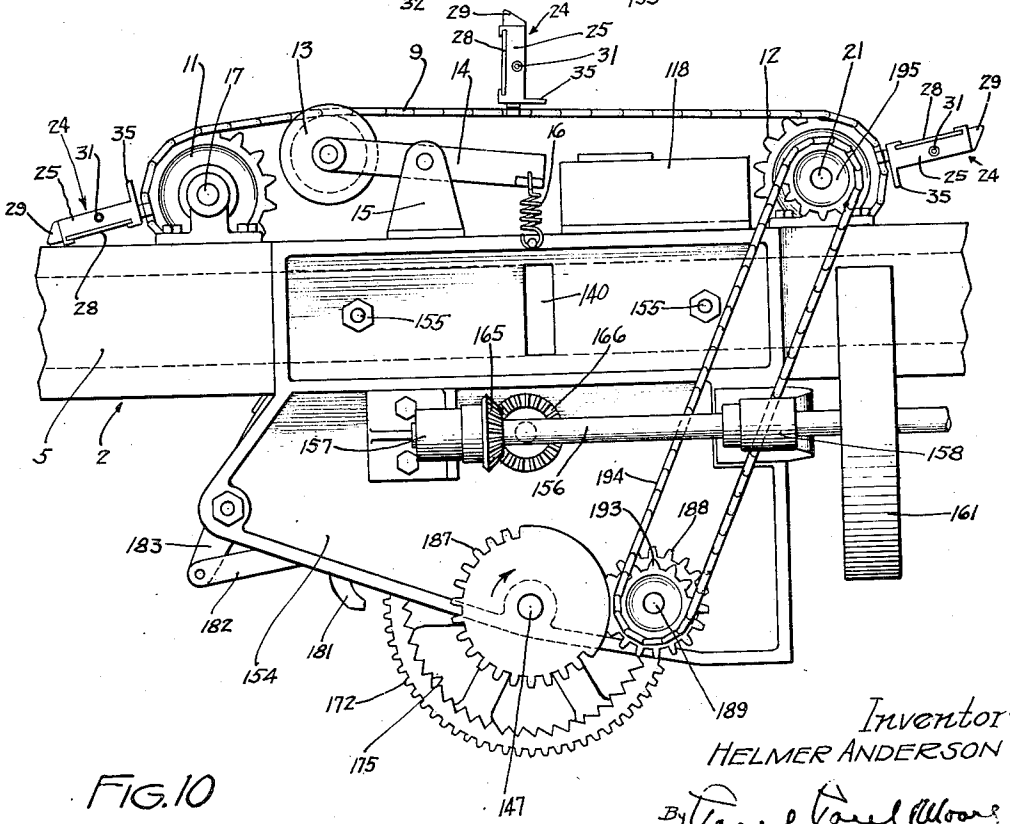


FIG. 10

Inventor
HELMER ANDERSON
By Parker, Parker & Moore
ATTORNEYS

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BAG SEALING MACHINE

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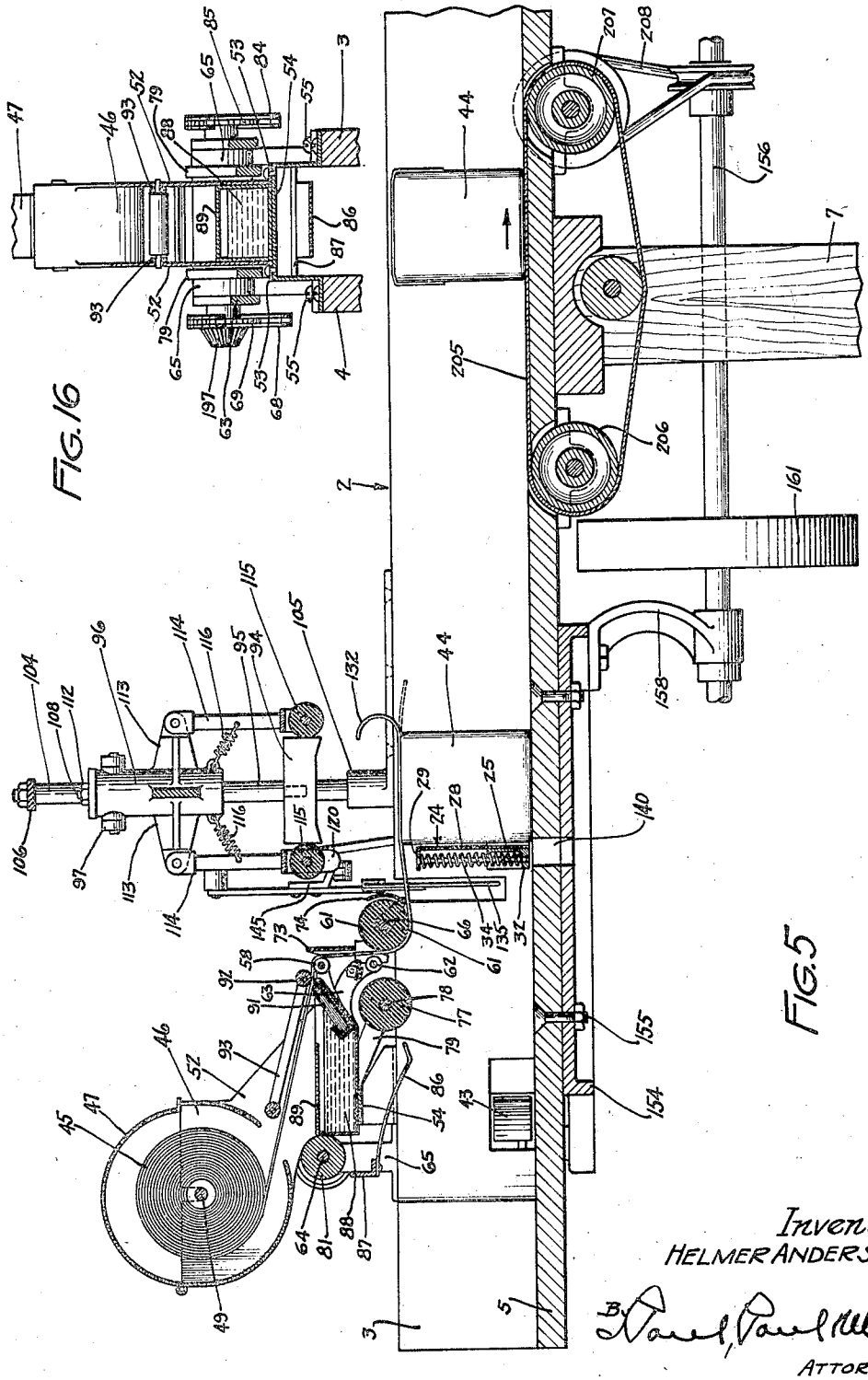


FIG. 16

FIG. 5

Inventor
HELMER ANDERSON

By Paul, Paul & Woods
ATTORNEYS

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BAG SEALING MACHINE

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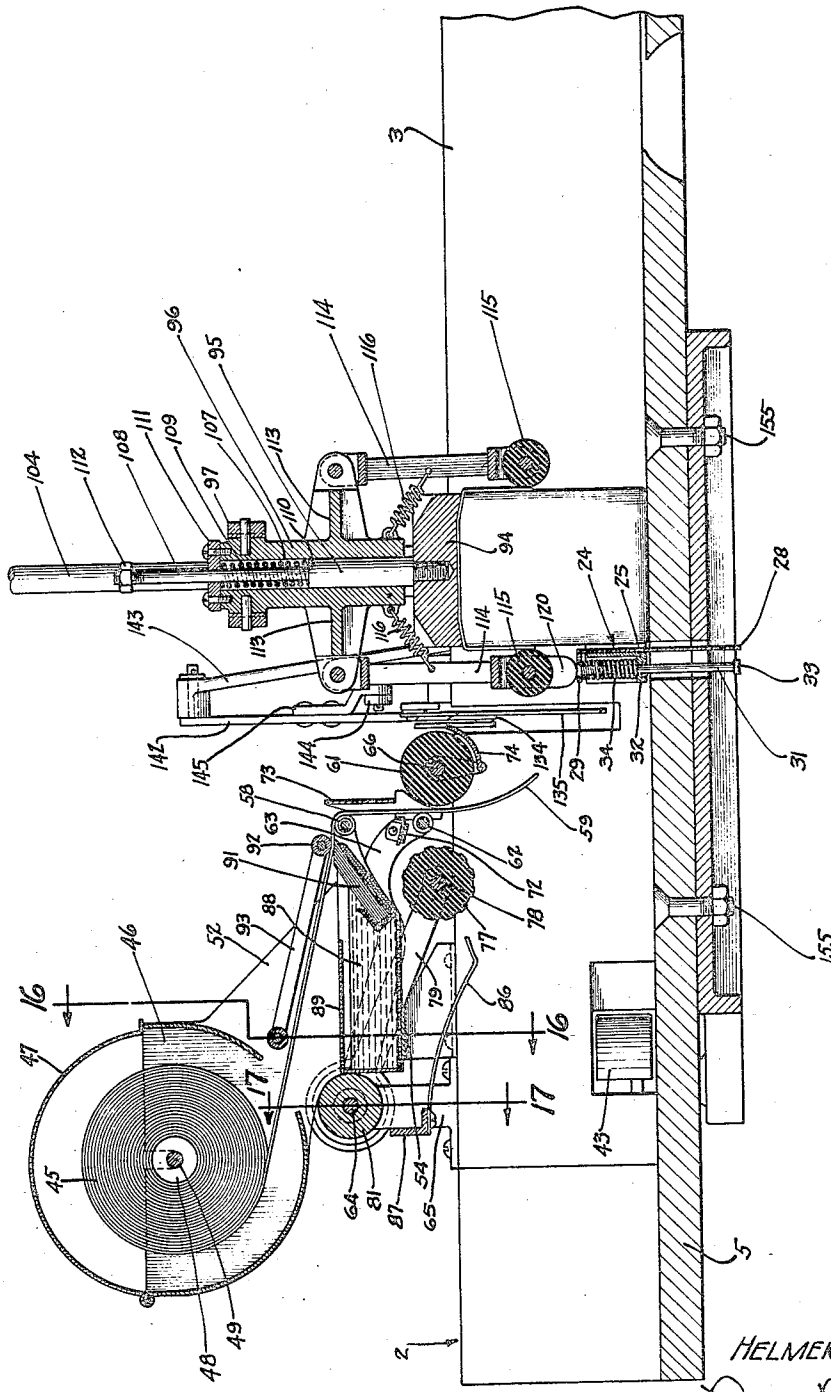


FIG. 6

Inventor
HELMER ANDERSON
By Paul, Paul & Woods
ATTORNEYS

Aug. 12, 1930. H. ANDERSON 1,772,823

BAG SEALING MACHINE

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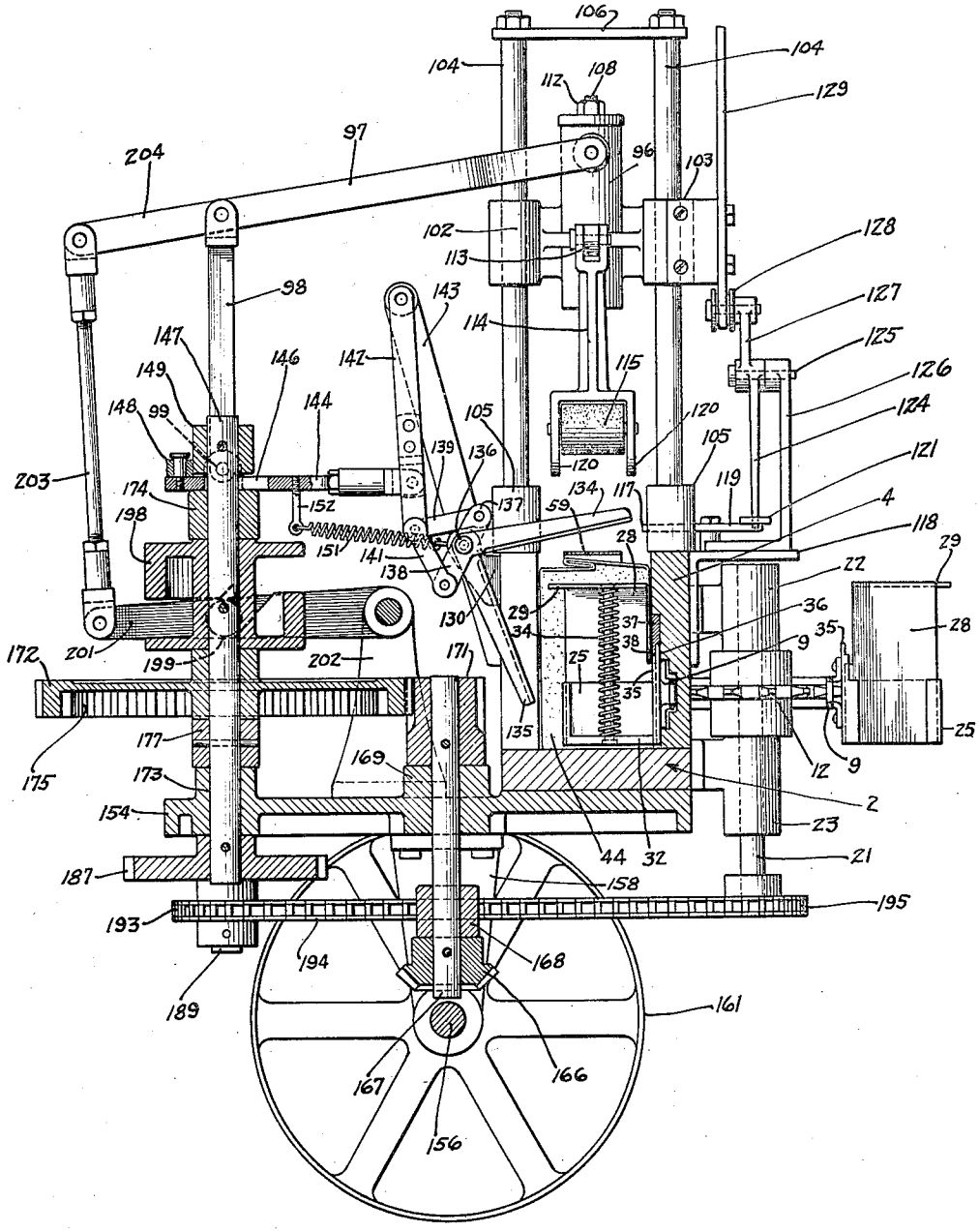


FIG. 7

Inventor
HELMER ANDERSON
By Davis, Powell & Moore
ATTORNEYS

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BAG SEALING MACHINE

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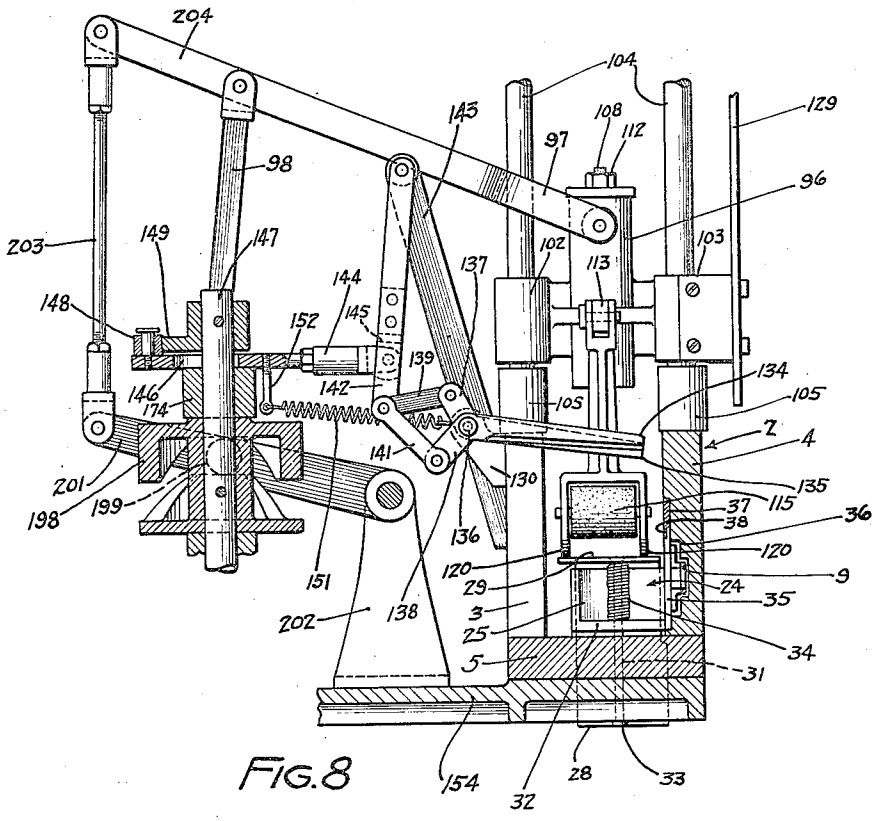


FIG. 8

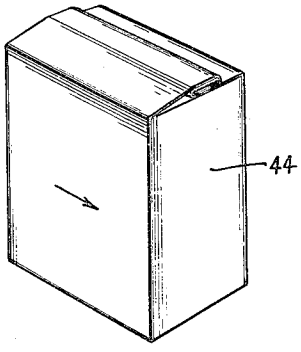


FIG. 13

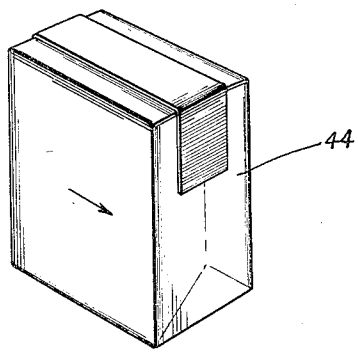


FIG. 14

Inventor
HELMER ANDERSON
By Paul, Paul & Moore
Attorneys

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BAG SEALING MACHINE

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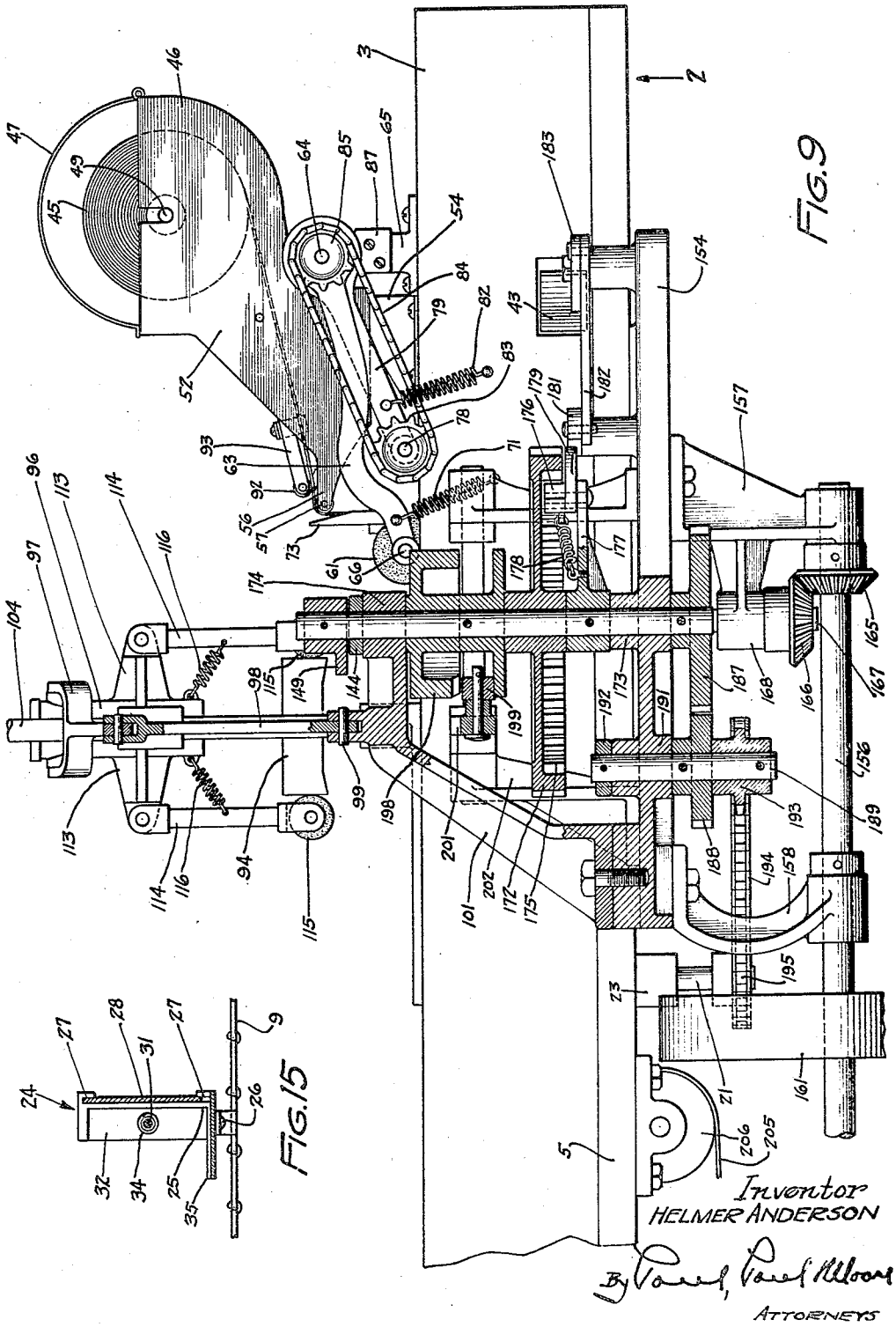


FIG. 9

FIG. 15

Inventor
HELMER ANDERSON

By Parker, Carlisle & Wilson

Attorneys

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BAG SEALING MACHINE

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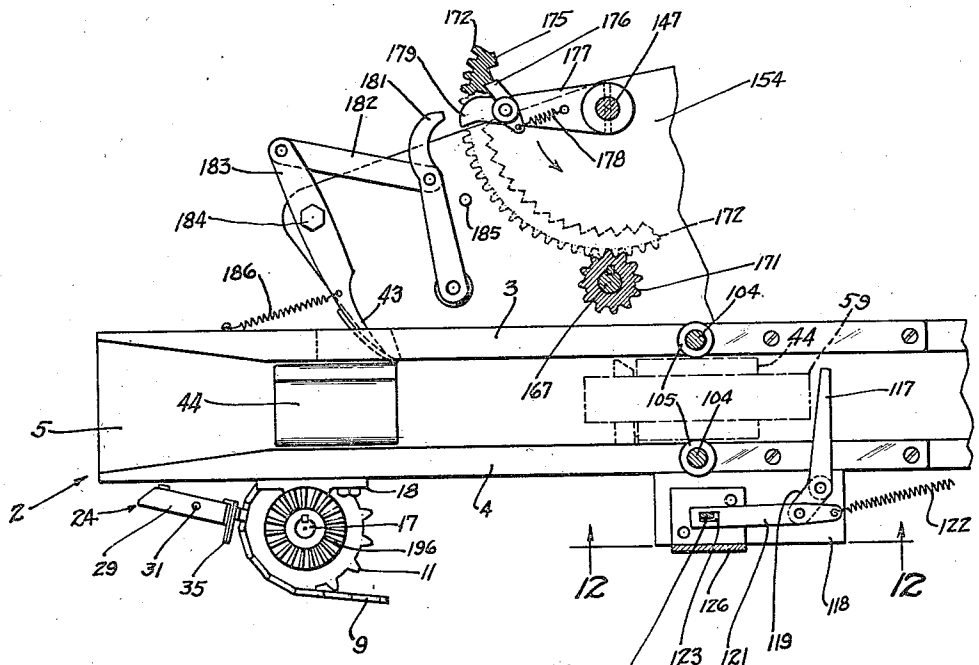


FIG. 11

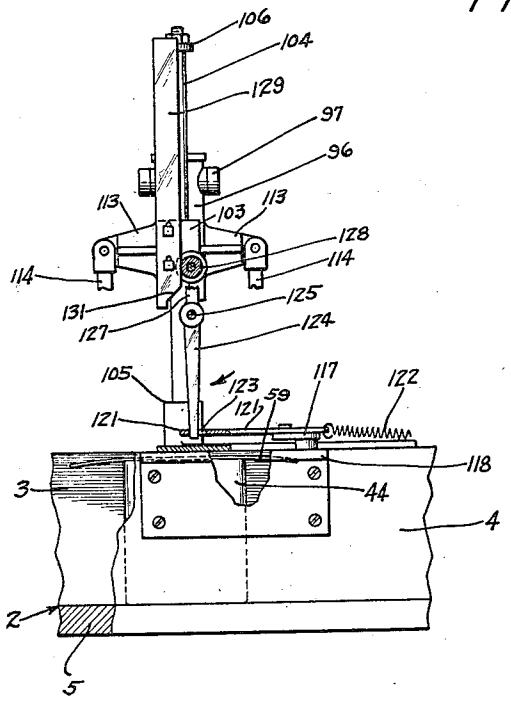


FIG. 12

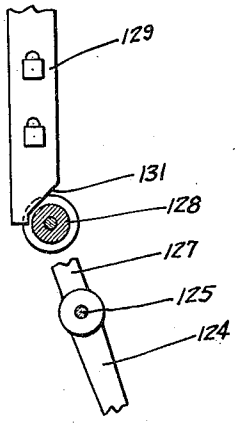


FIG. 18

Inventor
HELMER ANDERSON
By Paul, Paul & Woodard
ATTORNEYS

Patented Aug. 12, 1930 1,772,823

UNITED STATES PATENT OFFICE

HELMER ANDERSON, OF MINNEAPOLIS, MINNESOTA, ASSIGNOR TO GENERAL MILLS, INC., OF MINNEAPOLIS, MINNESOTA, A CORPORATION OF DELAWARE

BAG-SEALING MACHINE

Application filed April 8, 1929. Serial No. 353,460.

This invention relates to an improved machine adapted for sealing the tops of bags subsequent to the closing of the bag top by suitable means.

An object of the invention is to provide a bag sealing machine adapted to automatically apply a strip of gummed tape to the closed top of a filled bag, said strip of tape having its central portion secured to the bag top and the ends thereof being bent downwardly and secured to opposite sides of the bag, thereby sealing the bag in a manner to positively prevent leakage of the material therefrom, even when roughy handled in transit.

A further object is to provide a machine for sealing filled bags, after the open tops of the bags have been suitably prepared for sealing, said machine including means for supporting a roll of gummed tape, one end of which is positioned in the path of the bags, so that each bag, as it is fed through the machine, will engage the depending end portion of the tape and move the ungummed side thereof into engagement with the periphery of a pressure roller which functions to firmly press the moistened tape against the folded or closed top of the bag to cause it to adhere thereto, after which the tape is severed and the ends thereof bent downwardly and firmly pressed against the opposite sides of the bag by suitable means, and, in which position the tape ends are temporarily held to allow the adhesive ample time to set.

A further object is to provide a bag sealing machine particularly adapted for use to seal the closed tops of small paper bags, filled with such material as flour, the sealing of the closed bag top being accomplished by applying a strip of gummed tape to the top and upper side portions of the bag, and the mechanism for applying and securing the tape to the bag top causing the bags to be uniformly sealed and shaped, when discharged from the machine.

Features of the invention reside in the means provided for supporting and feeding the tape; the means for severing the tape; the means for straightening the leading end of the tape in the event that it should curl upwardly; the means for intermittently feeding the bags through the machine; the means for temporarily holding the severed strip of tape in contact with the top and side walls of the bag; and in the general construction and organization of the various parts of the machine.

Other objects of the invention will appear from the following description and accompanying drawings and will be pointed out in the annexed claims.

In the accompanying drawings, there has been disclosed a structure designed to carry out the various objects of the invention, but it is to be understood that the invention is not confined to the exact features shown, as various changes may be made within the scope of the claims which follow.

In the drawings:

Figure 1 is a side elevation of my improved machine;

Figure 2 is a plan view of Figure 1 with the tape holder and moistening mechanism omitted;

Figure 3 is an enlarged detail plan view showing the tapeholder and moistening mechanism;

Figure 4 is a detail view showing the receiving end of the machine with a bag positioned therein and the upper forward corner thereof engaged with the tape;

Figure 5 is a sectional view on the line 5—5 of Figure 2, showing a bag positioned beneath the presser foot and about to be engaged thereby;

Figure 6 is a view showing the presser foot engaged with the top of the bag to firmly hold the tape in contact therewith;

Figure 7 is a cross-sectional view on the line 7—7 of Figure 2, showing the tape severing mechanism in normal position, and the means for operating the same;

Figure 8 is a view showing the tape severing mechanism after it has been actuated to sever the tape;

Figure 9 is a sectional view on the line 9—9 of Figure 2, showing a part of the operating mechanism;

Figure 10 is a bottom view of the operating mechanism;

Figure 11 is a detail plan view showing the

trip engaged by a bag to initially start the machine, and also showing the means provided for straightening the tape before the plunger descends;

Figure 12 is a detail sectional view on the line 12—12 of Figure 11;

Figure 13 is a perspective view of a filled bag showing the bag top closed and ready to be sealed;

Figure 14 is a view showing a bag after it has been sealed;

Figure 15 is an enlarged detail sectional view showing one of the flights provided on the intermittently operable conveyer chain;

Figure 16 is a sectional view on the line 16—16 of Figure 6;

Figure 17 is a vertical sectional view on the line 17—17 of Figure 6; and

Figure 18 is a detail view showing the tape straightening mechanism in normal position.

Frame

The frame of the novel bag sealing machine featured in this invention comprises a trough-like conveyer 2, having side walls 3 and 4 and a bottom 5. The conveyer 2 is here shown mounted upon suitable legs 6 and 7, preferably having their lower portions tied together by suitable means as, for example, a platform 8. In the drawings, I have shown the machine frame, including the conveyer 2, as being constructed of wood, but it is to be understood that the frame may be constructed of any suitable material such, for example, as metal.

Bag feeding mechanism

The means provided for feeding the bags through the machine is shown in Figures 1, 2, 7, 10, and 11, and comprises a conveyer chain 9, operatively mounted upon sprockets 11 and 12. An idler wheel 13 is engaged with the chain 9 for taking up slack therein. This idler is mounted on an arm 14, pivotally supported on a bracket 15, here shown as being secured to the side wall 4 of the conveyer 2. A spring 16 is connected to the arm 14 and functions to constantly urge the idler 13 into engagement with the conveyer chain 9, as shown in Figures 2 and 10. The sprocket wheel 11 is secured to a shaft 17, rotatably mounted in bearings 18 and 19 secured to the side wall 4 of the conveyer 2, as shown in Figure 1. The sprocket wheel 12 is secured to a shaft 21, rotatably mounted in similar bearings 22 and 23, also secured to the side wall of the conveyer 2.

The conveyer chain 9 is provided with a plurality of flights 24, spaced equidistant apart as shown in Figure 2. Each flight comprises a guide member 25 suitably secured to a link of the chain, as indicated at 26 in Figure 15. Vertical guide grooves 27 are provided in the member 25 adapted to receive a slide 28, provided at its upper portion with an overhanging flange 29 having one end of a rod 31 secured thereto. The lower end of this rod passes through the lower portion 32 of the guide member 25, and is adapted for sliding movement therein. The lower end of the rod 31 is provided with a head 33, adapted to engage the portion 32 to limit upward movement of the slide 28. A suitable compression spring 34 is coiled about the rod 31 to retain the slide 28 in its uppermost position, as shown in Figure 5. The flights 24 are adapted to engage the bags, when delivered in the receiving end of the conveyer 2, and to convey them to the tape applying mechanism.

Means are provided for retaining the flights 24 in substantially right angular relation to the longitudinal center line of the conveyer 2, so as to cause the bags to be fed through the conveyer with the sides thereof substantially parallel to the side walls 3 and 4 of the conveyer. To thus retain the flights in right angular relation to the longitudinal center line of the conveyer 2, each member 25 is provided with an upstanding flange 35, adapted to travel in a longitudinal recess 36 provided on the inner lower surface of the side wall 4, and is retained in proper position therein by means of a metal bar 37, having a flange 38 overhanging the upper edge of the flange 35, as shown in Figure 7. The bar 37 is sunk into the inner surface of the wall 4, so as not to interfere with the passage of the bags through the conveyer. The end of the bar 37 adjacent to the receiving end of the conveyer is curved outwardly into an opening 39, provided in the side wall 4 of the conveyer so as to receive the flange 35 of each flight member 25, as the flights pass through the opening 39 and into the conveyer. By thus guiding the flight member 25 as it travels through the conveyer 2, the bags will be retained in right angular relation to the side walls of the conveyer, as they pass therethrough, thereby causing the bags to be uniformly sealed and shaped.

An opening 41 is provided in the side wall 4 of the conveyer 2 adjacent to the sprocket 12, to permit the flights to pass through the wall 4 to the exterior of the conveyer, as shown in Figures 1 and 2. This opening is normally partially closed by a spring-retained door 42, shown partially open in Figure 2.

A trip 43 has one end projecting into the conveyer 2 adapted to be engaged by the bag 44, as shown in Figure 11. This trip is operatively associated with the machine operating mechanism, which will subsequently be described, so that each time it is actuated by a bag, the conveyer chain 9 will be started to feed the bag from the full to the dotted line position, shown in Figure 11.

Tape supporting and moistening mechanism

The gummed tape is preferably furnished

in the form of a roll 45, adapted to be supported in a magazine 46 having a member 47 hinged to the top thereof, as shown in Figures 5 and 6. The roll of tape is usually furnished with a core 48, apertured to receive a pin 49 upon which the roll of tape is rotatably mounted. The pin 49 is provided at one end with opposed slots 51, adapted to receive the edges of the side walls of the magazine 46, as particularly shown in Figure 3. The side walls of the magazine are slotted to receive the pin 49, as shown.

The magazine 46 comprises spaced wall portions 52 here shown as having flanges 53 formed at the lower edges which are suitably secured to a bridge 54 supported upon the upper edges of the side walls 3 and 4 of the conveyer 2. The bridge 54 may secured to the walls 3 and 4 by such means as screws 55. The side walls 52 of the tape magazine 46 are provided with extensions 56 connected together by means of a rod 57, having a peripherally grooved roller 58 mounted thereon, over which the tape travels, as shown in Figures 5 and 6. The free end 59 of the tape passes downwardly from the roller 58, between a combined pressure and feed roller 61, and a grooved roller 62, into the path of the traveling bags. The rollers 61 and 62 are supported between a pair of spaced arms 63, each having one end supported upon a shaft 64, rotatably mounted in bearing brackets 65 secured to the side walls. The pressure roller 61 is secured to a shaft 66 rotatably mounted in bearings provided on the arms 63. A sprocket 67 is secured to the shaft 66 and has a chain 68 connecting it with a similar sprocket 69, secured to the shaft 64 as shown in Figure 17. A spring 71 is connected to one of the arms 63 and exerts a downward pull thereon to cause the roller 61 to firmly press the tape against the top of the bag, when the bag passes therebeneath. The peripheral speed of the roller 61 is equal to the speed of the bag, as it is fed therebeneath by the conveyer chain 9, so that there is no slippage between the periphery of the roller 61 and the bag top.

The purpose of the grooved roller 62 is to prevent curling and twisting of the moistened portion of the tape, as the tape leaves the roller 58. It is an inherent characteristic of the tape to tend to curl and twist when moistened. The roller 62 is so located with respect to the feed roller 61, that when the moistened end of the tape is positioned between these two rollers, as shown in Figure 6, the gummed side thereof may engage the grooved periphery of the roller 62, which will prevent the tape from curling. When a bag top engages the moistened end portion 59 of the tape and moves it into engagement with the feed roller 61, as shown in Figure 4, the tension in the tape, caused by the feeding action of the roller 61 and the movement of the bag, may cause the gummed side of the tape to temporarily become disengaged from the roller 62, until the tape is severed and the moistened free end 59 thereof again assumes the position shown in Figure 6, whereupon the gummed side thereof may again engage the grooved periphery of the roller 62.

A tie member 72 is interposed between and suitably secured to the arms 63, as shown in Figures 3 and 6. This tie member supports a guide 73 which functions to guide the free end of the tape into alinement with the folded top of the bag. A segment 74 is pendently supported upon the shaft 66, as shown in Figure 6, and functions to prevent the end portion 59 of the tape from wrapping around the periphery of the roller 61. This segment is mounted in such a manner that when the bag moves into engagement with the tape, as indicated at 75 in Figure 4, and moves to the position shown in Figure 5, the segment 74 will swing out of the way of the tape. As soon as the tape is severed and the free end 59 thereof assumes the position shown in Figure 6, the segment 74 will return to its normal position, as shown. Means (not shown) are preferably provided for limiting the return movement of the segment 74 so that it will come to rest in the position shown in Figure 6.

Means are provided for feeding the tops of the bags at the same speed as the lower portions thereof are fed through the conveyer 2 by the flights 24, provided on the conveyer chain 9. Such means consists of a corrugated roller 77 secured to a shaft 78, supported by spaced arms 79, each supported at one end upon the shaft 64, as shown in Figures 3, 6, and 17. A spacer 81 is preferably interposed between the arms 79, to retain the parts in proper position on the shaft 64. A tension spring 82 has one end secured to one of the arms 79 and its other end to the side wall 3 of the conveyer 2, and constantly exerts a downward pull on the roller 77.

The corrugated feed roller 77 is driven by a sprocket 83, secured to the shaft 78 and has a chain 84 connecting it with a sprocket 85 secured to the shaft 64, as shown in Figures 9 and 17. The peripheral speed of the roller 77 is the same as that of the roller 61, and it functions to hold the folded or closed top of the bag in position as the latter is fed into engagement with the tape and the pressure roller 61, as shown in Figure 4. A leaf spring 86 has one end secured to a cross member 87, secured to the bearing brackets 65, as shown in Figure 4. The free end of this spring is positioned to be engaged by the bags as they pass through the conveyer 2, for the purpose of holding the closed tops of the bags in position until they are engaged by the corrugated feed roller 77.

The means provided for moistening the

gummed side of the tape is shown in Figures 4, 5, and 6, and comprises a small reservoir 88, here shown as having its top partially closed by a wall 89. A suitable brush 91 is shown mounted at one end of the reservoir 88, adapted to be engaged by the gummed side of the tape. The lower portion of the brush is submerged in the water or liquid contained in the reservoir 88. If desired, other means may be employed for moistening the gummed side of the tape.

The reservoir 88 is preferably demountably supported between the side walls 52 of the tape magazine 46, so that it may readily be removed therefrom when necessary. A small roller 92 is supported between arms 93, pivotally mounted on the side walls 52 of the magazine 46. This roller is adapted to engage the top ungummed surface of the tape and hold it in contact with the brush 91, so that the entire width of the gummed surface of the tape will be moistened, as it passes over the brush.

Tape securing mechanism

The mechanism for securing the tape to the tops of the bags is best shown in Figures 5 and 6, and comprises a presser foot 94, terminally secured to a plunger 95 reciprocally mounted in a cross head 96, operable by means of a forked arm 97 pivotally supported upon a standard 98. This standard has its lower end pivotally supported at 99 upon a bracket 101, as shown in Figure 9. The cross head 96 is provided with guides 102 and 103 adapted to receive spaced rods 104, having their lower ends mounted in suitable brackets 105, here shown as being secured to the top edges of the side walls 3 and 4 of the conveyer 2, shown in Figure 5. The upper ends of the rods 104 are tied together by means of a cross member 106.

The plunger 95 is slidable in a bore 107 and has a reduced portion 108 around which a compression spring 109 is coiled, as shown in Figure 6. One end of this spring is seated against the annular shoulder 110, provided on the plunger 95, and the other end thereof is seated against a plate 111, secured to the upper end of the cross head. This plate also provides a closure for the bore 107. The spring 109 normally retains the plunger in extended position, as shown in Figure 6. A nut 112 is secured to the upper end of the reduced portion 108 of the plunger 95, to limit the downward movement of the plunger. Suitable means, not shown, are provided to prevent relative rotation of the plunger 95 in the bore 107. The lower face of the presser foot 94 is preferably formed as shown in Figures 5 and 6, so as to shape the top of the bag in a manner to prevent buckling or wrinkling of the tape at the corners of the bag, when the tape is applied and secured to the closed bag top.

Oppositely extending arms 113 are provided on the cross head 96, and each has an arm 114 pivotally connected therewith. The lower ends of the arms 114 are forked and support a pair of flexible rollers 115, adapted to roll downwardly on the sides of the bag and firmly press the ends of the severed piece of tape against the bag to secure these ends thereto. Each arm 114 is provided with a tension spring 116 which constantly tends to pull the arms inwardly so that, as they are moved downwardly, they will exert a pressure against the sides of the bag to firmly secure the tape thereto, as shown in Figure 6. The relative positions and timing of the presser foot 94 and the rolls 115 is such that the presser foot will engage the top of the bag before the rollers 115 engage the tape ends, thereby firmly holding the tape against the top of the bag, as the rollers 115 are rolled downwardly against the sides of the bag to secure the tape ends thereto (see Figures 5 and 6). The spacing between the walls 3 and 4 of the conveyer 2, is preferably such as to prevent the bag walls from bulging laterally, as a result of the pressure applied to the top of the bag by the presser foot 94.

The forked end of the arm 114, positioned towards the receiving end of the conveyer 2, is provided with depending extensions 120, adapted to engage the flanges 29, provided on the slides 28 of the flights 24. Each time the cross-head 96 is moved downwardly, these extensions engage the flange of the flight positioned therebeneath, thereby depressing said slide into a clearance aperture 140, provided in the bottom wall of the conveyer as shown in Figure 5. Figure 8 illustrates the extensions 120 engaged with a flange 29.

Tape straightening device

Means are provided for straightening out the leading end of the tape before the presser foot 94 moves into engagement with the strip of tape positioned on the bag, in the event that the end of the tape tends to curl upwardly, which it sometimes does, when the roll of tape is about exhausted. Such means is shown in Figures 7, 11, and 12, and comprises a finger 117, pivotally supported upon a bracket 118 secured to the side wall 4 of the conveyer 2. The finger 117 has an offset end portion 119 pivotally connected to a bar 121, having one end of a spring 122 connected with one end thereof, as shown in Figures 1 and 12. The opposite end of the spring 122 is suitably secured to the side wall 4 of the conveyer. The opposite end of the bar 121 has a slot 123 therein, adapted to receive the lower end of an arm 124, which is pivotally mounted upon a stud 125, supported by a standard 126 secured to the bracket 118. The arm 124 has an extension 127 provided with a grooved roller 128 adapted to ride upon the edge of a bar 129. This bar has a cam 131 provided

at its lower end as shown in Figure 12. The bar 129 is suitably secured to the guide 103.

The finger 117 is operated by movement of the cross head 96. When the cross head is in its uppermost or normal position, the grooved roller 128 will move to the position shown in Figure 18, because of the action of the spring 122, thereby swinging the finger 117 from the position shown in Figure 11, to that shown in Figure 2. Each time that the cross head 96 moves downwardly, from the position shown in Figure 5 to that shown in Figure 6, the cam 131 at the lower end of the bar 129 will engage the grooved idler 128, and move it to the position shown in Figure 12, whereby the arm 125 will be oscillated to move the finger 117 from the position shown in Figure 2 to that shown in Figure 11. Such movement of the finger 117 will cause the latter to engage the upturned end of the tape, shown in full lines at 132 in Figure 5, and thereby straighten this end to the position shown in dotted lines, thus permitting the roller 115 at the right hand side of the presser foot, when viewed as shown in Figure 5, to engage the ungummed top of the tape and bend the end thereof downwardly into engagement with a side of the bag.

Tape severing mechanism

The means provided for severing the tape is shown in Figures 7 and 8, and comprises a pair of jaws 134 and 135, pivotally connected together by means of a pivot 136 and operable in much the same manner as a pair of shears. The pivot 136 is supported in a bracket 130 secured to the side wall 3 of the conveyer 2. The jaws 134 and 135 are provided with extensions 137 and 138, respectively, having links 139 and 141 connecting them to an arm 142, having its upper end pivotally supported upon an arm 143, secured to the side wall 3 of the conveyer 2. A connecting rod 144 has one end pivotally connected to the arm 142 by means of a bracket 145, secured to the arm 142, as shown in Figure 5. The other end of the connecting rod 144 is provided with an elongated opening 146 adapted to receive the upper end of an operating shaft 147, shown in Figures 7, 8, and 9.

An anti-friction roller 148 is shown mounted on the connecting rod 144, and is adapted to ride on a cam 149 secured to the upper end of the shaft 147. A tension spring 151 has one end connected to the connecting rod 144, by such means as an eyebolt 152, and the opposite end of the spring is connected to the bracket 130, upon which the jaws 134 and 135 are mounted. This spring constantly urges the connecting rod 144 in a direction to open the jaws 134 and 135, as shown in Figure 7. When the cam 149 engages the roller 148, the connecting rod will be moved from the position shown in Figure 7 to that shown in Figure 8, thereby causing the jaws to close, with the result that the tape will be severed. The tape-severing operation takes place just before the rollers 115 engage the tape ends to bend them downwardly against the sides of the bag. The extensions 137 and 138, provided on the jaws 134 and 135, respectively, are so proportioned that when the jaws are operated by movement of the connecting rod 144, the cutting edges thereof will meet substantially in the plane of the tape, thereby severing the tape without moving it out of its line of travel.

Operating mechanism

The operating mechanism is here shown supported upon a cast plate 154, suitably secured to the bottom wall 5 of the conveyer 2, by suitable bolts 155. A drive shaft 156 is mounted in hangers 157 and 158 secured to the plate 154. A third hanger 159 supports one end of the drive shaft, as shown in Figure 1. A drive pulley 161 is secured to the shaft 156 and has a belt 162 connecting it with a flanged pulley 163, provided upon a motor 164. The motor 164 is here shown mounted upon the platform 8, connecting together the legs 6 and 7 of the machine frame.

A bevel pinion 165 is secured to the drive shaft 156 and meshes with a pinion 166 secured to a shaft 167, supported in bearings 168 and 169, as shown in Figure 7. A pinion 171 is secured to the upper end of the shaft 167 and meshes with a spur gear 172, loosely mounted upon the operating shaft 147, and adapted for continuous operation, when the motor is functioning. The lower end of the shaft 147 is supported in a bearing 173, provided in the plate 154, and its upper portion is supported in a bearing 174, provided on the upper end of the bracket 101, as shown in Figure 9. The bracket 101 is suitably secured to the plate 154, as shown in Figure 9.

The spur gear 172 is provided with an internal ratchet gear 175, the teeth of which are adapted to be engaged by a dog 176, pivotally mounted upon an arm 177 secured to the shaft 147, as shown in Figure 11. The dog 176 has a spring 178 which constantly urges the dog into engagement with the teeth of the ratchet 175. A projection 179 is provided on the dog 176. This projection lies in a lower plane than the plane in which the dog 176 lies, so as to pass the teeth of the spur gear 172, as shown in Figure 9. The projection 179 is adapted to be engaged by one end of an abutment arm 181, pivotally mounted on the plate 154 and having a link 182 connecting it with the end portion 183 of the trip lever 43, as shown in Figure 11. The trip lever is pivotally mounted on a stud 184, secured to the plate 154, as shown in Figures 2 and 11. A stop pin 185 is positioned to be engaged by the abutment arm 181 to limit movement thereof in one direction. A spring 186 tends to retain the trip lever 43 in its nor-

mal position, shown in Figure 2. When thus positioned, the abutment arm 181 will be engaged with the stop pin 185, and its terminal will be engaged with the projection 179, thereby moving the dog 176 out of engagement with the teeth of the ratchet 175, and thereby causing interruption of the arm 177, and therefore the operating shaft 147.

The drive for the conveyer chain 9 is shown in Figures 9 and 10, and comprises an intermittent gear 187, secured to the operating shaft 147 and adapted to mesh with an intermittent pinion 188, secured to a stub shaft 189 rotatably mounted in a bearing 191, provided in the supporting plate 154. The shaft 189 is retained in the bearing 191 by means of a collar 192, secured to the upper end thereof. A sprocket 193 is secured to the lower end of the stub shaft 189 and has a chain 194 connecting it with a sprocket 195, secured to the lower end of the shaft 21, as shown in Figures 1 and 10.

The tape feeding and moistening mechanism is operated by means of a gear 196 secured to the upper end of the shaft 17 and meshing with a pinion 197, secured to the shaft 64. By thus driving the tape feeding and moistening mechanism, it will be operated only when the conveyer chain 9 operates to feed a bag from the full to the dotted line position shown in Figure 11.

The means for operating the cross head 96, supporting the presser foot 94 and rolls 115, is shown in Figures 7 and 8, and comprises a grooved cam 198 secured to the operating shaft 147, and engageable with a roller 199 secured to an arm 201. This arm has one end pivotally supported upon a standard 202 secured to the plate 154. The other end of the arm 201 has a connecting rod 203 connecting it with the end portion 204 of the forked arm 97. The groove in the cam 198 is so shaped that for each revolution of the operating shaft 147, the forked arm 97 will make one complete stroke.

Operation

In the operation of this novel bag sealing machine, the bags, after having been suitably prepared or closed for sealing, are delivered to the receiving end of the conveyer 2 by suitable means, not shown. As each bag engages the trip lever 43, (see Figure 11), the abutment arm 181 is moved out of engagement with the projection 179 of the dog 176, thereby permitting the spring 178 to move the dog 176 into engagement with the teeth of the ratchet 175, whereupon the arm 177 and shaft 147 will commence to rotate in synchronism with the spur gear 172. Such rotation of the operating shaft 147 will cause the intermittent gear 187 to rotate in the direction indicated by the arrow in Figure 10, until the toothed portion of its periphery engages the pinion 188, whereupon the chain 194 will be actuated to operate the conveyer chain 9. As soon as the toothed portion of the intermittent gear 187 moves out of engagement with the intermittent pinion 188, the conveyer chain 9 will come to rest in the position shown in Figures 2 and 5, thereby causing a bag to be positioned directly beneath the presser foot 94, as shown in Figure 5.

As the bag is fed beneath the tape holding and moistening mechanism, as shown in Figure 4, the upper forward corner of the bag will engage the gummed side of the tape and move the opposite or ungummed side of the tape into engagement with the presser roller 61, which will hold the tape firmly in contact with the closed top of the bag and prevent it from relatively slipping thereon. The corrugated roll 77 feeds the top of the bag at a speed equal to that of the flights 24 of the conveyer chain 9, so that when the upper forward corner of the bag engages the roll 61, the bag 44 cannot tilt backwardly. When the bag reaches the rest position, shown in Figure 5, the cam 198 will actuate the forked arm 97, thereby causing the presser foot to move downwardly into engagement with the section of tape positioned on the top of the bag and pressing it firmly against the bag. As soon as the presser foot engages the top of the bag, its downward movement will be interrupted, but the rollers 115 will continue downwardly with the cross head 96, causing them to engage and press the ends of the tape firmly against the sides of the bag, in which position they will be temporarily held until the next bag actuates the trip lever 43.

Before the rollers 115 engage the tape, however, the tape severing mechanism is actuated to cut the tape. The tape straightening device is also actuated to straighten the leading end of the tape, in the event that it is curled or turned upwardly, as shown in full lines in Figure 5. When the next following bag engages the trip lever 43, the cross head will be moved upwardly and the conveyer chain 9 will be subsequently operated to move the sealed bag onto a suitable belt conveyer 205, mounted upon rollers 206 and 207, and operable by means of a belt drive 208, connected with the drive shaft 156. The speed of the belt conveyer 205 is relatively faster than the speed of the conveyer chain 9, so as to move the sealed bags out of engagement with their respective flights before the flights pass through the opening 41 provided in the wall 4 of the conveyer 2, to a position exteriorly of the conveyer, as shown in Figure 2. The sealed bags may be discharged from the conveyer 2 to a suitable receiving means, not shown. The bags when sealed, will appear as shown in Figure 14. Figure 13 illustrates a manner of folding the bag tops, preparatory to delivering the bags to the sealing machine.

The various mechanisms of the machine are so timed with relation to one another that the bags cannot possibly become jammed in

the conveyer 2, if properly delivered thereto. By the employment of this novel bag sealing machine, the operation of sealing the bags is greatly expedited, as compared to present methods of manually sealing the bags. The bags will also be uniformly sealed and shaped, whereby the bags will present a neat appearance when placed on display.

I claim as my invention:

1. In a bag sealing machine, the combination of a bag feeding means, a driven member positioned in proximity to said bag feeding means and adapted to be engaged by a bag being fed through the machine, means for supporting a supply of gummed tape with a portion of the tape positioned between said driven member and an approaching bag, whereby the traveling bag will engage said tape portion and move it into engagement with said driven member and cause a portion of the tape of be applied in closing relation to the bag, and means for preventing the bag from tilting backwardly when it engages said driven member.

2. In a bag sealing machine, the combination of a bag feeding means, a driven roller positioned over said bag feeding means and adapted to be engaged by the closed top of a bag being fed through the machine, means for supporting a supply of gummed tape with a portion of the tape positioned between said roller and an approaching bag, whereby the traveling bag will engage said tape portion and move it into engagement with said roller and cause a portion of the tape to be applied in closing relation to the bag top, and means for holding the bag in position when it engages said roller.

3. In a bag sealing machine, the combination of a conveyer for feeding the bags, a driven roller positioned over said conveyer and adapted to be engaged by the closed top of a bag being fed through the machine, means for supporting a supply of gummed tape with a portion of the tape positioned between said roller and an approaching bag, whereby the traveling bag will engage said tape portion and move it into engagement with said roller and cause a portion of tape to be applied in closing relation to the bag top, said roller being adapted to firmly press the tape into contact with the closed bag top whereby a portion of tape will be fed from said tape-supporting means, and means for severing the tape.

4. In a bag sealing machine, the combination of a conveyer for feeding the bags, a driven roller positioned over said conveyer and adapted to be engaged by the closed top of a bag being fed through the machine, means for supporting a supply of gummed tape with a portion of the tape positioned between said roller and an approaching bag, whereby the traveling bag will engage said tape portion and move it into engagement with said roller, said roller being adapted to press the tape against the closed bag top as the bag passes the roller, thereby causing said gummed tape portion to adhere to the closed bag top, the adhering of the tape to the traveling bag top causing a portion of the tape to be fed from said tape-supporting means, and means for severing the tape.

5. In a bag sealing machine, the combination of a conveyer for feeding the bags, a power driven roller positioned over said conveyer and adapted to be engaged by the closed top of a bag being fed through the machine, means for supporting a supply of gummed tape with a portion of the tape positioned between said roller and an approaching bag, whereby the traveling bag will engage said tape portion and move it into engagement with the periphery of said roller and cause a portion of tape to be applied in closing relation to the bag top, said roller being adapted to firmly press said gummed tape portion into contact with the closed bag top whereby the traveling movement of the bag will cause a portion of tape to be fed from said tape-supporting means for application to a succeeding bag top, and means for preventing curling of the moistened tape end.

6. In a bag sealing machine, the combination of a conveyer for feeding the bags, a power driven roller positioned over said conveyer and adapted to be engaged by the closed top of a bag being fed through the machine, means for supporting a supply of gummed tape with a portion of the tape positioned between said roller and an approaching bag, whereby the traveling bag will engage said tape portion and move it into peripheral engagement with said roller and cause a portion of the tape to be applied in closing relation to the bag top, said roller being adapted to hold the tape in contact with the closed bag top to prevent relative slippage between the bag and the tape, and whereby a portion of tape will be fed from said tape-supporting means for application to the closed top of a succeeding bag, means for severing the tape, and means for preventing curling of the moistened tape end.

7. In a machine for sealing closed bags, the combination of means for feeding the bags, means for supporting a supply of tape with a portion of said tape positioned to be engaged by a bag traveling through the machine, means for holding a portion of the tape in contact with the bag, whereby the traveling movement of the bag will cause a section of tape to be applied to the bag top, and means for bending the tape downwardly against the sides of the bag.

8. In a machine for sealing closed bags, the combination of means for feeding the bags, means for supporting a supply of tape, a portion of said tape being positioned to be engaged by a bag traveling through the ma-

chine, means for holding the tape in contact with said bag, whereby the traveling movement of the bag will cause a section of tape to be applied to the bag top, means for severing the tape, and movably mounted means adapted to bend the ends of said tape section downwardly against opposite sides of the bag.

9. In a machine for sealing closed bags, the combination of means for feeding the bags, means for supporting a supply of tape with a portion of said tape depending into the path of a traveling bag, and a pressure roller adjacent to said depending tape portion, said roller being positioned so as to cause a bag traveling through the machine to move said depending tape portion into peripheral engagement therewith, whereby said roller will roll over the top of the bag and firmly press the tape thereagainst, the holding of the tape against the closed top of the bag causing a portion of tape to be fed from said tape-supporting means.

10. In a machine for sealing closed bag tops, the combination of means for successively feeding the bags, means responsive to the traveling movement of each bag to cause a strip of tape to be fed into position for application to a closed bag top, means for severing the tape, and mechanism operatively connected with said feeding means and automatically operable to press a severed strip of tape into contact with the closed bag top and opposite walls of the bag to secure the tape thereto.

11. In a machine for sealing closed bags, the combination of means for supporting a supply of gummed tape, means for moistening the tape, means for moving a bag into engagement with the moistened tape, means for firmly pressing the tape against the top of the bag as the bag passes beneath said tape-supporting means, and means for pressing the ends of said tape downwardly into engagement with the sides of the bag.

12. In a machine for sealing closed bags, the combination of means for supporting a supply of gummed tape, means for moistening the tape, a driven pressure roller adjacent to which one end of said tape is positioned, means for moving the bag into engagement with the gummed side of said tape and subsequently moving the tape into engagement with the periphery of said pressure roller, whereby said roller will firmly press the moistened tape against the closed top of the bag, means for severing the tape, and means for pressing the moistened ends of the severed tape against the sides of the bag to secure them thereto.

13. In a machine for sealing closed bags, the combination of a conveyer adapted to feed the bags, means for supporting a supply of gummed tape over said conveyer with one end thereof positioned in the path of the bags, means for moistening the tape, a pressure roller, said roller being positioned so that an approaching bag will engage the gummed side of the tape and move the opposite side of said tape into engagement with the periphery of said pressure roller, whereby the latter will roll over the top of the bag and firmly press the tape against the bag top to cause the tape to adhere thereto, means for severing the tape, and means for bending the ends of the tape downwardly into engagement with opposite walls of the bag.

14. In a machine for sealing closed bags, the combination of a conveyer, means for supporting a roll of gummed tape with one end of the tape positioned in the path of the traveling bags, a pressure roller mounted over said conveyer, means for driving said roller, the free end of said tape being disposed between said pressure roller and an approaching bag, whereby the bag will move the tape into engagement with the periphery of said roller, as the bag travels through the machine, thereby causing a portion of the tape to be secured to the top of the bag, means for severing the tape, and spring-actuated rollers adapted to bend the end portions of the severed tape section inwardly into engagement with opposite walls of the bag, and temporarily holding said end portions in such engagement to allow the adhesive to set.

15. In a machine for sealing closed bags, the combination of a conveyer adapted to feed the bags, a magazine mounted over said conveyer and adapted to support a supply of gummed tape, means for moistening the tape, a pressure roller mounted over the conveyer and cooperating with said conveyer to feed the bags through the machine, a portion of said tape being positioned in the path of the bags, whereby said tape portion will be pressed firmly against the top of the bag, as the bag passes beneath said pressure roller, means for severing the tape, means for holding the severed portion of the tape firmly against the top of the bag, and means for bending the tape ends downwardly into engagement with opposite walls of the bag and temporarily holding said ends in such engagement until they are secured to said bag walls.

16. A machine for sealing bag tops, the combination of a conveyer adapted to feed the bags, means for supporting a roll of gummed tape with one end of the tape positioned in the path of the traveling bags, means for moistening the tape, means for applying a section of gummed tape to the top of the bag with the ends of said tape section projecting outwardly beyond opposite walls of the bag, means for severing the tape, a presser foot adapted to engage the severed tape section and firmly hold it against the top of the bag, and cooperating rollers operable to bend the projecting ends of said tape section into engagement with opposite walls of the bag.

17. In a machine for sealing closed bag

tops, the combination of a conveyer comprising a chain having a plurality of flights thereon adapted to engage the bags and feed them through the machine, means for applying a section of gummed tape to the top wall of the bag, means for straightening the ends of said tape section, and means for bending the tape ends downwardly into engagement with opposite walls of the bag to cause them to adhere thereto.

18. In a machine for sealing closed bag tops, the combination of a conveyer adapted to feed the bags, means for supporting a supply of gummed tape over said conveyer with one end of the tape positioned in the path of the bags, means for moistening the tape, a pressure roller, said roller being positioned so that an approaching bag will engage the gummed side of the tape and move the opposite side of said tape into engagement with the periphery of said pressure roller, whereby the latter will roll over the top of the bag and firmly press the tape against the top wall thereof to cause it to adhere thereto, means for severing the tape, and a feed roller adapted to engage the top of the bag and cooperating with said conveyer to successively feed the unsealed bags to said pressure roller, said feed roller preventing the bags from tilting backwardly, when engaging said presser roller.

19. In a machine for sealing closed bag tops, the combination of a conveyer, means for supporting a roll of gummed tape with an end of the tape positioned in the path of the traveling bags, a pressure roller mounted over said conveyer, means for driving said roller, the free end of said tape being disposed between said pressure roller and an approaching bag, whereby the bag will move the tape into engagement with the periphery of said roller, as the bag travels through the machine, thereby causing a portion of the tape to be secured to the top of the bag, a corrugated feed roller located in advance of said pressure roller and cooperating with said conveyer to feed the bags to said pressure roller in an upright position, means for severing the tape, and spring-actuated rollers adapted to bend the end portions of the severed tape section downwardly into engagement with opposite walls of the bag, to cause them to adhere thereto.

20. In a machine for sealing closed bag tops, the combination of a conveyer comprising a chain having a plurality of flights thereon adapted to engage the bags and feed them through the machine, means for applying a section of gummed tape to the closed bag top, means for straightening the ends of said tape section, means for bending the tape ends downwardly into engagement with the opposite walls of the bag, and means for intermittently actuating said conveyer.

21. In a machine for sealing closed bag tops, the combination of a conveyer adapted to feed the bags, means for supporting a supply of gummed tape with an end of the tape positioned in the path of the traveling bags, means for applying a section of said tape to the closed top of each bag, the free end of said tape being disposed between the tape-applying means and an approaching bag whereby the bag will move the tape into engagement with said tape-applying means and cause a section of tape to be applied to the closed bag top, a cross head mounted for reciprocal movement over said conveyer, a presser foot mounted for independent movement in said cross-head and adapted to press the tape against the bag, and means carried by said cross head adapted to bend the projecting end portions of said tape section downwardly into engagement with opposite walls of the bag, when said cross-head is operated to cause said end portion to adhere thereto.

22. In a machine for sealing closed bag tops, the combination of a conveyer adapted to feed the bags, means for supporting a supply of gummed tape with a portion of the tape positioned in the path of the traveling bags, means for moistening the tape, means responsive to traveling movement of the bags to cause a portion of the moistened tape to be applied to the closed top of each bag, means for severing the tape, a cross-head mounted for reciprocal movement over said conveyer, a presser foot mounted for independent movement in said cross head, and yieldable means carried by said cross head and adapted to engage the projecting end portions of said tape section and bend them downwardly into engagement with opposite sides of the bag, said presser foot being adapted to engage said tape section before said tape end engaging means engage the end portions of said tape section, whereby said tape section will be secured to the top and side walls of the bag without wrinkling.

23. In a machine for sealing closed bag tops, the combination of a conveyer adapted to feed the bags, means for supporting a supply of gummed tape with a portion of the tape positioned in the path of the traveling bags, means for moistening the tape, means responsive to traveling movement of the bags to cause a portion of the moistened tape to be applied to the closed top of each bag, means for severing the tape, a cross head mounted for reciprocal movement over said conveyer, a presser foot yieldably mounted in said cross-head and adapted for independent movement, and rollers yieldably mounted on said cross head and adapted to engage the projecting end portions of said tape section, whereby said rollers will cooperate with said presser foot to secure the section of gummed tape to the top and side walls of said bag to seal the closed top thereof.

24. In a machine for sealing closed bags, the combination of a conveyer comprising a chain having a plurality of extensible flights thereon adapted to engage and feed the bags through the machine, operating means for intermittently actuating said conveyer chain, a trip located at the receiving end of said conveyer adapted to be engaged by each bag as it is delivered to the machine, movement of said trip by a bag causing said operating means to function, means for supporting a roll of gummed tape over said conveyer, means for moistening said tape and applying a section thereof to the closed top of a bag, as the latter travels through the machine, means adjacent to said tape-applying mechanism adapted to sever the tape, means adapted to firmly press said severed tape section against the closed bag top, and spring-actuated rollers adapted to bend the projecting end portions of said severed tape section downwardly into engagement with opposite walls of the bag.

25. In a machine for sealing closed bags, the combination of a conveyer comprising a chain having a plurality of extensible flights thereon adapted to engage and feed the bags through the machine, operating means for intermittently actuating said conveyer chain, a trip located at the receiving end of said conveyer adapted to be engaged by each bag as it is delivered to the machine, movement of said trip by a bag causing said operating means to function, means for supporting a roll of gummed tape adjacent to said conveyer, means for moistening said tape and applying a section thereof to the closed top of a bag, as the latter travels through the machine, means adapted to sever the tape, means adapted to firmly press said severed tape section against the closed bag top, spring-actuated rollers adapted to bend the projecting end portions of said severed tape section downwardly into engagement with opposite walls of the bag, and means adapted to straighten the ends of said tape before said rollers engage therewith.

26. In a machine for sealing closed bags, the combination of a conveyer having a plurality of flights thereon adapted to engage the bags and feed them through the machine, operating means for intermittently actuating said conveyer chain, a trip adapted to be engaged by the bags to cause said operating means to function, means for applying a section of tape to the top of each bag with the end portions of said tape section projecting beyond opposite walls of the bag, means for severing the tape, a cross head mounted for vertical movement over said conveyer, a presser foot yieldably mounted in said cross head, arms pendently supported on said cross head and each having a roller at the lower end thereof, yieldable means constantly urging said arms inwardly, said operating means causing each bag to temporarily come to rest directly beneath said presser foot, whereby downward movement of said cross head will cause said presser foot to engage the section of tape applied to the top of the bag and firmly hold it in contact therewith, while continued downward movement of said cross head will cause said pendently supported rollers to engage the projecting ends of said tape section and bend them downwardly and firmly press them against the opposite walls of the bag, whereby said tape section will be secured to the bag to provide a seal therefor.

27. In a machine for sealing closed bags, the combination of a conveyer, means for operating said conveyer to cause the latter to intermittently feed the bags through the machine, a trip associated with said operating means and adapted to be engaged by each bag as it is delivered to said conveyer, whereby said operating means will be started, means for applying a section of gummed tape to the top wall of each bag, a cross head mounted for vertical movement over said conveyer, a presser foot yieldably mounted in said cross head and adapted to engage the top of each bag, upon downward movement of said cross head, tape cutting means located between said tape-applying mechanism and said cross head and operable upon downward movement of said cross head, to sever the tape and means for bending the ends of said tape section into engagement with opposite walls of the bag.

28. In a machine for sealing closed bags, the combination of a conveyer, means for operating said conveyer to cause the latter to intermittently feed the bags through the machine, a trip associated with said operating means and adapted to be engaged by each bag as it is delivered to said conveyer, whereby said operating means will be started, means for applying a section of gummed tape to the top wall of each bag, a cross head mounted for vertical movement over said conveyer, a presser foot yieldably mounted in said cross head and adapted to engage the top of each bag, upon downward movement of said cross head, tape cutting means located between said tape-applying mechanism and said cross head and operable upon downward movement of said cross head, to sever the tape, means for bending the ends of said tape section into engagement with opposite walls of the bag, and means operable by downward movement of said cross head to straighten the end portions of said severed tape before being engaged by said tape and bending means.

In witness whereof, I have hereunto set my hand this 4th day of April 1929.

HELMER ANDERSON.