

Nov. 2, 1943.

A. POTDEVIN

2,333,440

BAG MAKING MACHINE

Filed Jan. 17, 1940

3 Sheets-Sheet 1

Fig. 1.

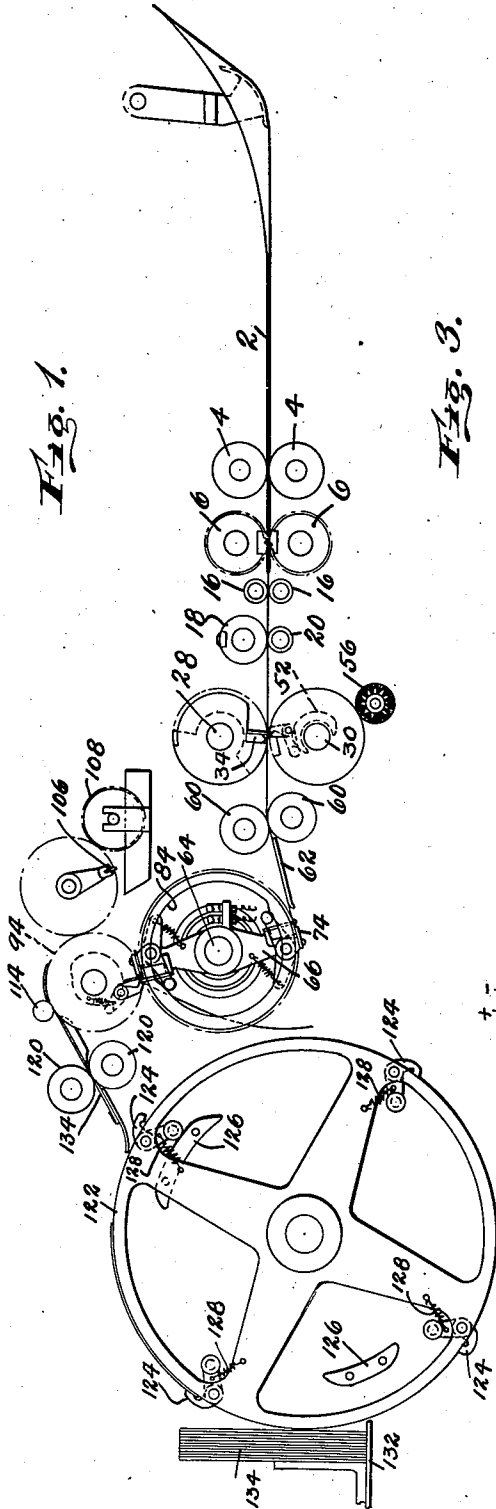
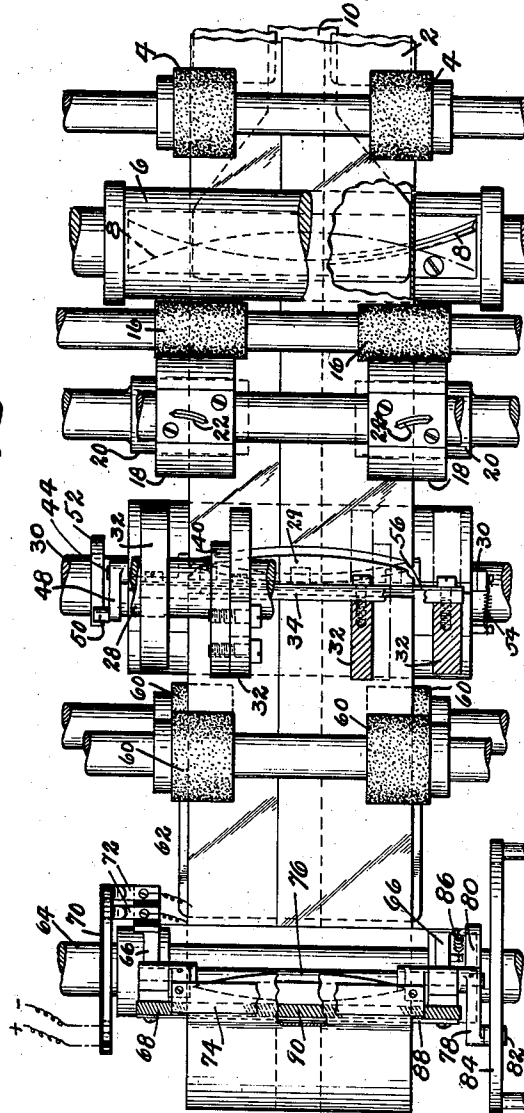


Fig. 3.



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3 Sheets-Sheet 2

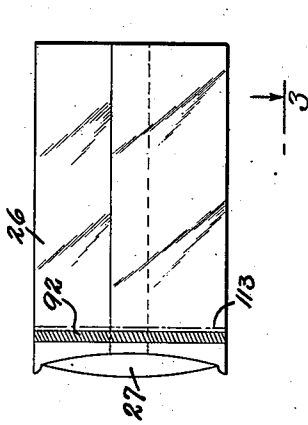


Fig. 8.

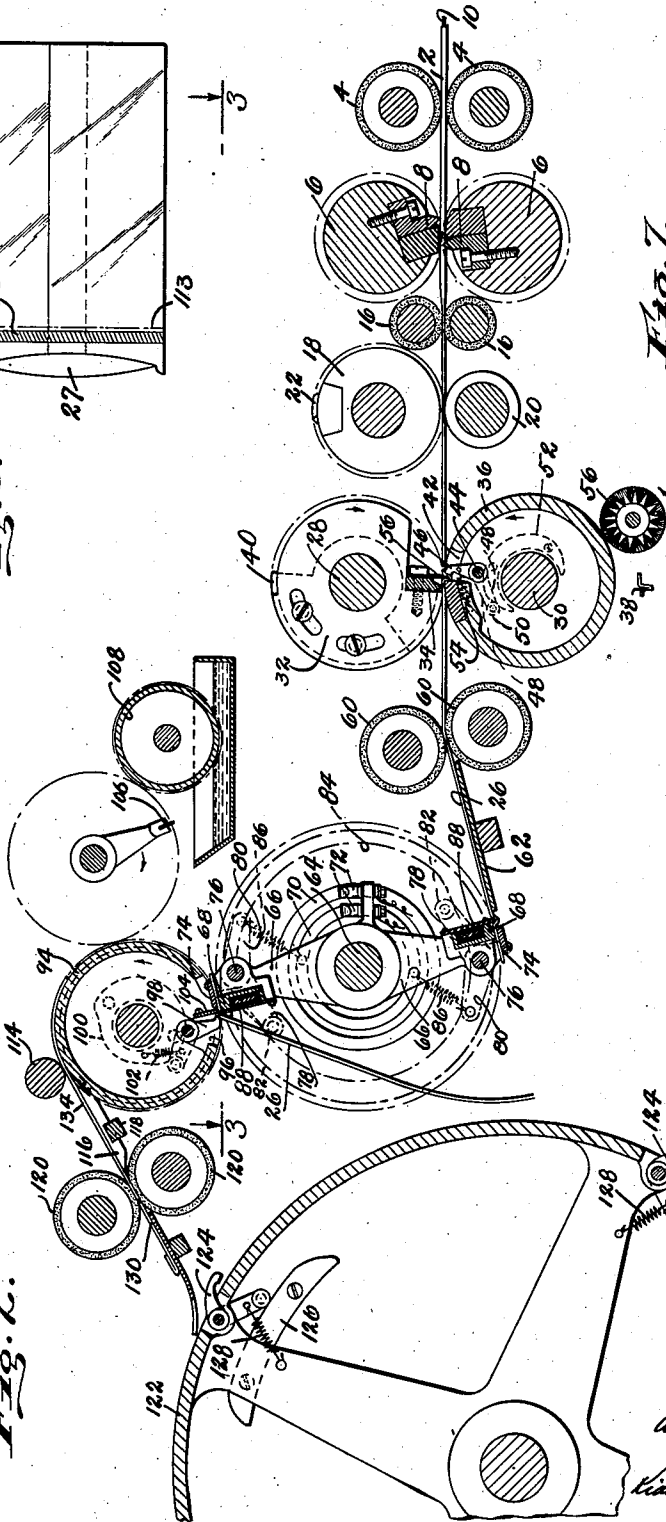


Fig. 7.

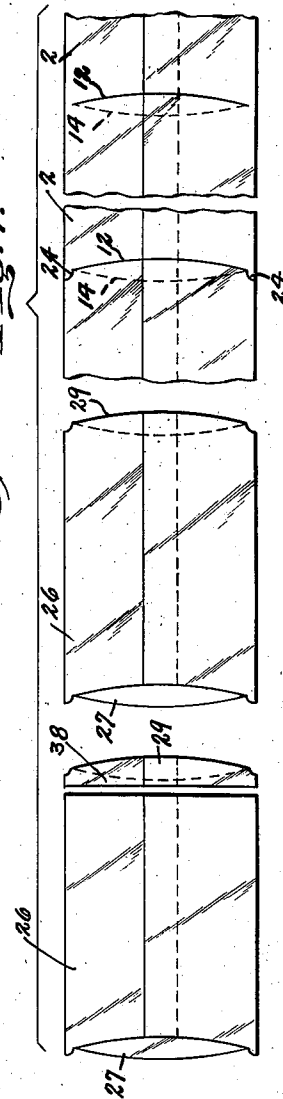


Fig. 6.

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3 Sheets-Sheet 3

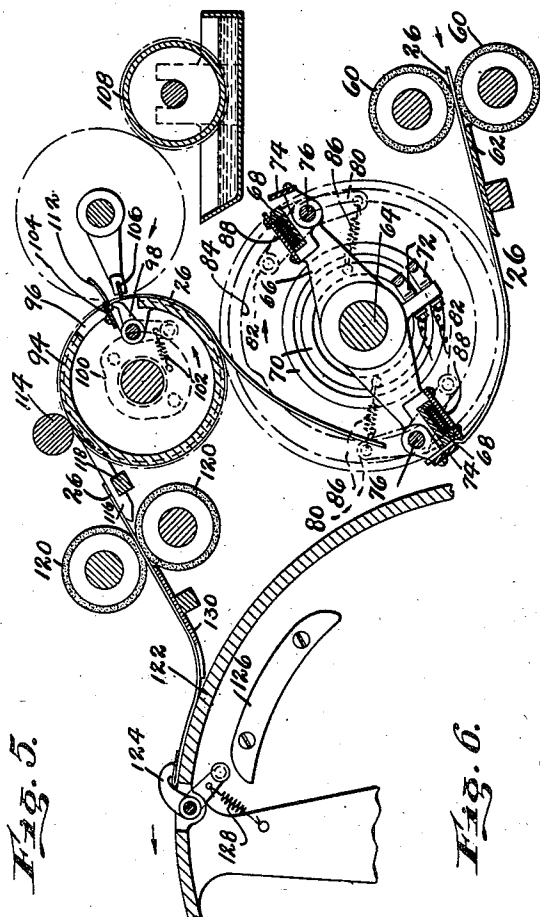


Fig. 5.

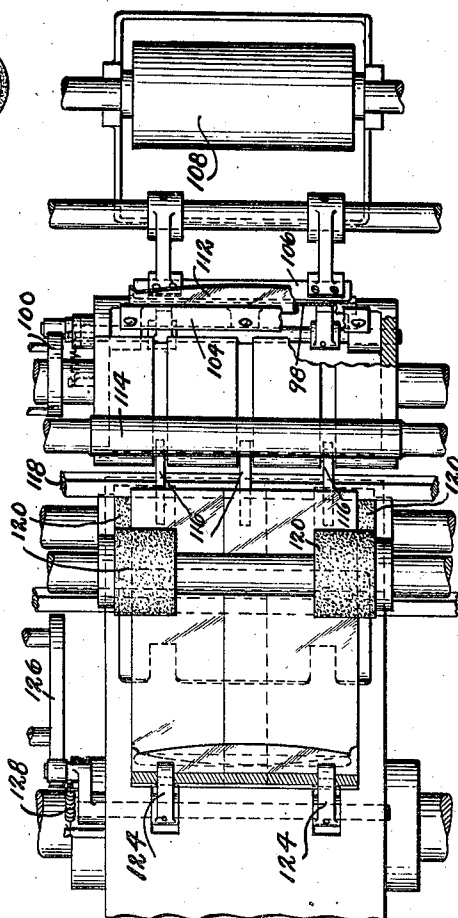


Fig. 6.

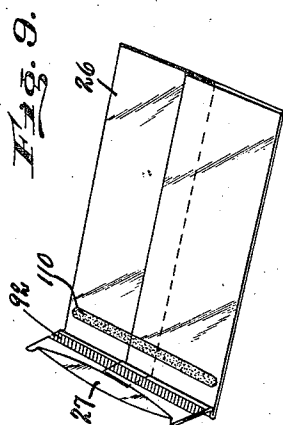


Fig. 9.

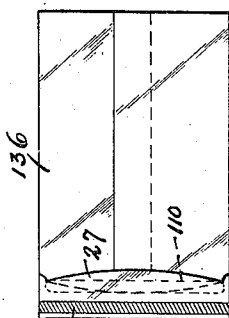


Fig. 10.

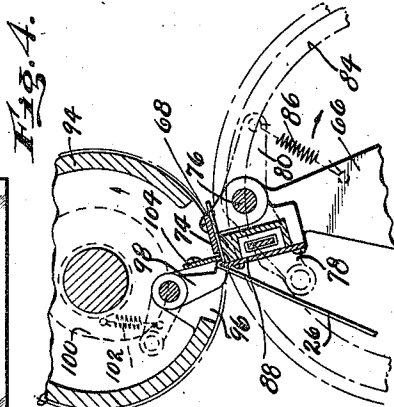


Fig. 4.

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UNITED STATES PATENT OFFICE

2,333,440

BAGMAKING MACHINE

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corporation of New York

Application January 17, 1940, Serial No. 314,222

6 Claims. (Cl. 93—18)

This invention is directed to the making of bags, and is more particularly directed to the makings of bags wherein, when desired, the bag is heat sealed before bottoming. This method is particularly well adapted for use in connection with the making of bags from cellulose acetate, cellulose hydrate, glassine and the like, in that the application of heat to such materials enables the same to be fused for the purpose of providing a heat seal.

More specifically the present invention provides apparatus for making bags, wherein the bag making material moves forward continuously from a supply roll, and as it advances through the machine it is tubed and divided into bag lengths to provide a paste lip at the end to be bottomed. When desired the end to be bottomed may be heat sealed before bottoming, and the open end of the bag length trimmed. The finished bags are stacked as they are discharged from the end of the machine.

The accompanying drawings illustrate one form of apparatus suitable for practicing my invention.

Fig. 1 is a somewhat diagrammatic view in elevation of the entire machine;

Fig. 2 is a view similar to Fig. 1 but on a larger scale with many of the parts in section;

Fig. 3 is a plan view taken substantially in the plane 3—3 of Fig. 2;

Fig. 4 is a fragmentary view in partial section of the heat sealing mechanism;

Fig. 5 is a part sectional elevational view of the heat sealing and bottoming mechanisms;

Fig. 6 is a plan view of Fig. 5;

Fig. 7 shows in plan, for purposes of illustration, the several steps which may be involved in division of tubing into bag lengths;

Fig. 8 shows a bag length in plan after heat sealing;

Fig. 9 shows the bag length of Fig. 8 in process of being bottomed; and

Fig. 10 shows the completed bag.

Referring to the drawings in detail: The bag making material, cellulose acetate, cellulose hydrate and like material, may be taken from any suitable source of supply and is moved continuously forward through the machine. As it passes into the machine adhesive is applied thereto so that as it advances through the tubing mechanism it is formed into a tube. This is well-known practice, and has not been illustrated. The tubed material, designated 2, continuously advances between a pair of forwarding rollers 4 and from thence to a pair of rollers 6.

Each of these rollers carries a cutting knife 8 which cooperates with a plate 10 slidably carried by the former plate. The function of the members 8 and 10 is partially to divide the tubing 2 into bag lengths transversely of the tubing, as shown at 12 and 14 in Fig. 7. During the operation of the members 8 and 10 the leading portion of the tubing extends between the rollers 16. As the tubing advances beyond the rollers 16 it passes between rollers 18 and 20, the rollers 18 carrying cutters 22 while the rollers 20 are smooth faced. The machine is so timed that when the perforated areas of the tubing reach a position between the rollers 18 and 20, the cutters 22 will have rotated to operative position to cut through the tubing 2 at the edges, as shown at 24 in Fig. 7, thereby to complete the severing or dividing operation. A bag length as thus provided is shown in Fig. 7 where it has been designated 26.

The next step in the practice of my invention may be to trim the trailing end of each bag length, it being apparent from the drawings that at this stage each end of the bag length is provided with a projecting lip. The lip at the leading end, which is later to be used as a paste lip, has been designated 27, the lip at the trailing end has been designated 29. When the trailing end of each bag length is to be trimmed, I provide upper and lower driven shafts 28 and 30, respectively, beyond the rollers 18 and 20. The shaft 28 carries a plurality of spaced discs 32 which in turn carry a trimmer plate or knife 34 projecting from the periphery thereof. The trimmer knife cooperates with the surface of an anvil cylinder 36 which is carried by the lower shaft 30, to cut off or trim the trailing end of a bag length when the same passes between the discs and cylinders. In Fig. 7 I show the bag length 26 with the end 38, including the lip 29, severed or trimmed therefrom. The discs 32 are adjustably secured to a disc 40 on the shaft 28 so as to permit of adjustment of the discs circumferentially to adjust the trimmer knife, as will be understood.

When the trailing ends of the bag lengths are trimmed as above outlined, I provide means for effecting positive discharge of the trimmed or severed ends 38 of the bag lengths. As will be seen from the drawings, the periphery of the anvil cylinder 36 is provided with a slot 42 extending longitudinally thereof. Within the cylinder and extending lengthwise thereof below the slot 42 is a rod 44. This rod carries a clamp or gripper jaw 46 which extends radially of the cyl-

inder into the slot 42. One end of the rod 44 carries an arm 46, provided with cam follower roller 50 which follows fixed cam 52. The cam 52 is set so that with the parts as shown in Fig. 2 the gripper 46 is closed by spring 54. On rotation of the cylinder 36 through an angle of about 180° the gripper jaw 46 will open.

The discs 32 above referred to carry a tucker plate 56 which trails the trimmer blade 34, this plate providing for tucking the material of the trailing end of the bag length between the gripper 46 and the side of the slot 42, so that as the piece 38 is trimmed off the trailing end of the bag, this piece will be gripped to the cylinder 36 and be carried around with it for about a half turn, when the gripper opens, leaving the piece 38 free to fall out by gravity. Further to insure that the trimming 38 will leave the cylinder 36 as the gripper 46 opens, I provide a rotary brush 58 adjacent to the bottom of the cylinder. This brush is rotated oppositely to and in contact with the cylinder 36 so as to brush the trimmings 38 from the cylinder, as will be apparent.

Beyond the trimming mechanism are a pair of transfer rollers 60, the bag lengths passing between these rollers, then across a plate 62 into position to be picked up by the mechanism which transfers the bag lengths to bottom clamp cylinder 94, this mechanism being so constructed that the bag lengths can be heat sealed when desired before bottoming.

Referring to this mechanism, 64 designates a driven shaft extending transversely of the machine. Fast on this shaft, adjacent the ends thereof, are a pair of rotors 66. Extending from the ends of one rotor to the ends of the other rotor are plates 68 capable of being electrically heated. The commutator and brushes for these plates are designated 70 and 72, respectively. Cooperating with the outer face of each hot plate or heating element is a clamping and presser jaw 74. Each presser jaw is carried by a rock shaft 76. Each of these rock shafts carries arms 78 and 80. Each arm 78 carries a cam follower roller 82 which cooperates with an internal, fixed cam 84, for closing the jaws 74. The arms 80 carry springs 86 for opening the jaws. Beside each heating element is a plate 88 projecting slightly beyond the outer face of each heating element. The outer face of each plate 88 is knurled, as illustrated at 90, and, if desired, the face of each jaw 74.

The machine is so timed that, as the leading end of each bag length passes beyond the plate 62 in the forward advance of the bag lengths, one end of the rotors 66 with the jaw 74 and plate 88 in open position will be rotated into position so that the end of the bag length will enter between the jaw and plate, and the jaw will close under the action of the cam 84, to attach the bag length to the rotors. If the bag length is to be heat sealed the circuit to the plate 88 is closed so that the material of the bag length as it is transferred to the bottom clamp cylinder 94, suspended from the rotors, is heated and fused to provide a heat seal 92 across the bag length, as seen in Fig. 8, where the plate 88 contacts the material of the bag length. While good results are obtained if the face of the plate 88 and/or the face of the jaw 74 be smooth, even better results are obtained if either or both of these faces be knurled.

Each bag length 26 suspended from the rotors is moved forward for about a half turn of the rotors 66 until picked up by the bottom clamp cylinder

94, above referred to. This cylinder is provided in its periphery with a longitudinal slot 96. Extending into this slot is a movable gripper jaw 98, closed by a fixed cam 100 and opened by a spring 102. The movable jaw 98 cooperates with a fixed jaw 104.

As above pointed out, the plates 88 which lie beside the plates 68 project slightly beyond the face of the same, so that when the clamped end of the bag length comes up to the bottom clamp cylinder 94, the material of the bag length just to the rear of the clamping jaw 74 will be tucked by the plate 88 between the gripper 98 and fixed jaw 104, the presser jaw 74 opening at the same instant, thereby to transfer the bag length to the bottom clamp cylinder 94.

The bag length is carried by the cylinder 94 past paste-applying bar 106 receiving its paste from paste roller 108, this bar applying a stripe of paste 110 to the bag length transversely thereof. As the rotating bottom clamp cylinder advances, the bag length, clamped to the cylinder 94 to the rear of its leading end 112, is carried around until the gripper 98 is about abreast of the driven bottom folding roller 114, whereupon the end of the bag length is released and passes between this roller and fingers 116, the latter being mounted on a bar 118 extending transversely of the machine. As the end of the bag length passes under the roller 114 the turned-back end 112 of the bag length including the paste lip 27 will be pressed down upon the adhesive stripe 110. The line along which the turned-back end 112 is folded is designated 113 in Fig. 8. The bottomed bag length then passes between delivery rollers 120 which forward the same to delivery cylinder 122.

The delivery cylinder 122 is provided with a plurality of grippers 124, each of which is cam-opened and spring-closed, by cams 126 and springs 128, respectively. The bag lengths are advanced, by the rollers 120 previously mentioned, along the plate 130, and as the end of each length projects beyond the plate it is gripped by one of the grippers 124. The gripper cylinder carries the bottomed bag lengths to the delivery station 132 where the bags are stacked in a stack 134. A finished bag is illustrated in Fig. 10 where it has been designated 136.

It is to be understood that changes may be made in the details of construction and arrangement of parts, herein illustrated and described, without departing from the spirit and scope of my invention.

What I claim is:

1. Bag making apparatus comprising in combination, mechanism for continuously dividing tubing into bag lengths, forwarding mechanism for the bag lengths, trimming mechanism for trimming the trailing end of each bag length, heat sealing mechanism for heat sealing the opposite end of each bag length, and bottoming mechanism for bottoming the heat sealed ends of the bag lengths, the heat sealing mechanism delivering the heat-sealed bag lengths to the bottoming mechanism.

2. Bag making apparatus comprising mechanism for dividing bag making material into bag lengths, forwarding mechanism for the bag lengths, heat sealing mechanism for heat sealing the flat unfolded leading end of each bag length as the bag lengths are in transit, said heat sealing mechanism comprising a pair of rotors carrying a hot plate, gripper jaws for gripping the flat unfolded leading end of each bag length at the area

to be heat sealed, and pressing the same against the hot plate for sealing the opposed walls of the bag length to each other, and bottoming mechanism for picking up the sealed bag lengths from the sealing mechanism at the sealed end.

3. Bag making apparatus comprising mechanism for dividing bag making material into bag lengths, forwarding mechanism for the bag lengths, heat sealing mechanism for heat sealing one end of each bag length in transit, said heat sealing mechanism comprising a pair of rotors carrying a hot plate, positively closed gripper jaws for gripping the end of each bag length at the area to be heat sealed, and clamping the same against the hot plate for the sealing operation, and bottoming mechanism for picking up the heat-sealed bag lengths from the heat sealing mechanism.

4. Bag making apparatus comprising mechanism for dividing bag making material into bag lengths, forwarding mechanism for the bag lengths, heat sealing mechanism for heat sealing one end of each bag length in transit, said heat sealing mechanism comprising a hot plate, gripper jaws for gripping the end of each bag length at the area to be heat sealed and clamping the same against the hot plate for the sealing operation, means for advancing the sealed bag length, and bottoming mechanism for picking up the heat-sealed bag lengths from the heat sealing mechanism at the heat-sealed ends of the bag lengths.

5. Bag making apparatus comprising mechanism for dividing bag making material into bag lengths, forwarding mechanism for the bag lengths, a bottoming cylinder, means for delivering the bag lengths from the forwarding mechanism to the bottoming cylinder, said means comprising a pair of rotors, gripper jaws carried

thereby, said jaws comprising a fixed jaw and a movable jaw, a cam for positively actuating said movable jaw, a plate lying beside the fixed jaw adjacent the jaw opening, said jaws as the rotors are actuated carrying the leading end of the bag lengths to the bottoming mechanism with each bag length suspended from the rotors by said jaws, gripper jaws carried by the bottoming mechanism, said plate tucking the bag lengths into said last mentioned gripper jaws to transfer the bag lengths to the bottoming mechanism as the first mentioned gripper jaws are automatically opened.

6. In bag making apparatus comprising mechanism for forwarding bag lengths and bottoming mechanism, transfer mechanism for transferring the bag lengths from the forwarding mechanism to the bottoming mechanism, said transfer mechanism comprising in combination a shaft extending parallel to the axis of rotation of the bottoming mechanism, a pair of rotors in spaced relation on said shaft and affixed thereto, so as to rotate therewith, a pair of gripper jaws carried by said rotors and extending transversely of the machine from the outer end of one rotor to the outer end of the other rotor, cam mechanism for operating said jaws as the end of a bag length comes up to the transfer mechanism, thereby to grip the bag length at its leading end to suspend the bag lengths successively from the rotors, and gripper jaws carried by the bottoming mechanism adapted to receive and grip the leading end of each bag length to the rear of the said previously gripped portion of the bag as the rotors bring the same adjacent the bottoming mechanism, thereby to effect transfer of the bag lengths successively to the bottoming mechanism.

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