

March 22, 1949.

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2,465,044

APPARATUS FOR MAKING BAGS

Filed June 6, 1945

3 Sheets-Sheet 1

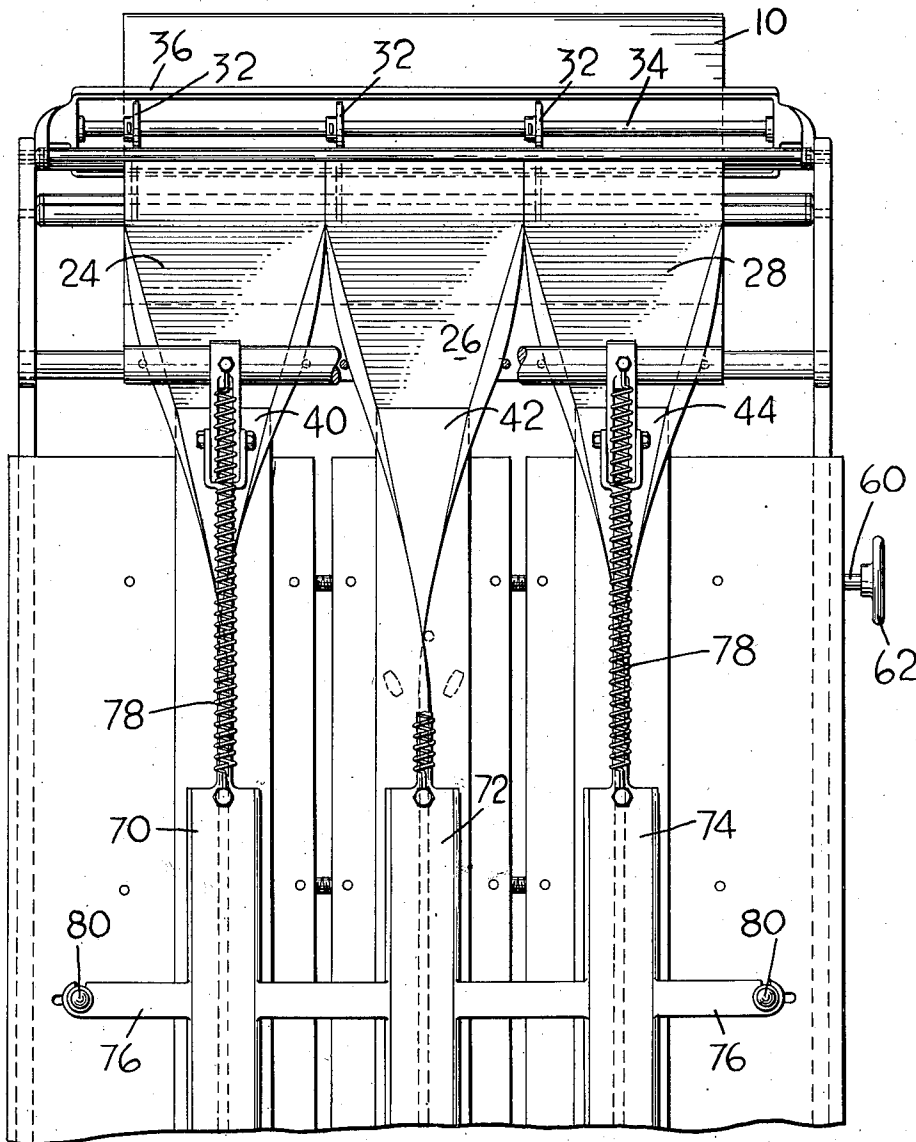


Fig. 1

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3 Sheets-Sheet 2

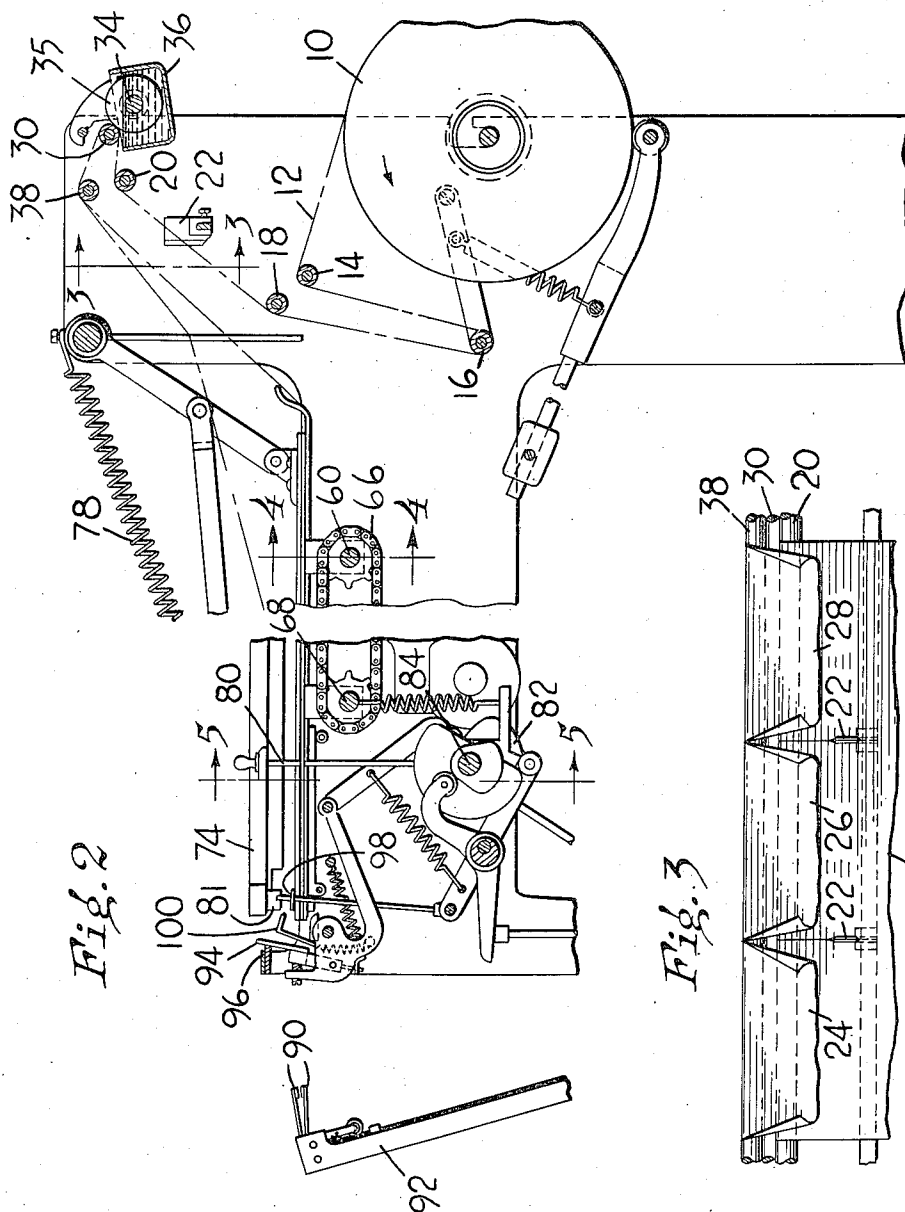


Fig. 2

Fig. 3

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3 Sheets-Sheet 3

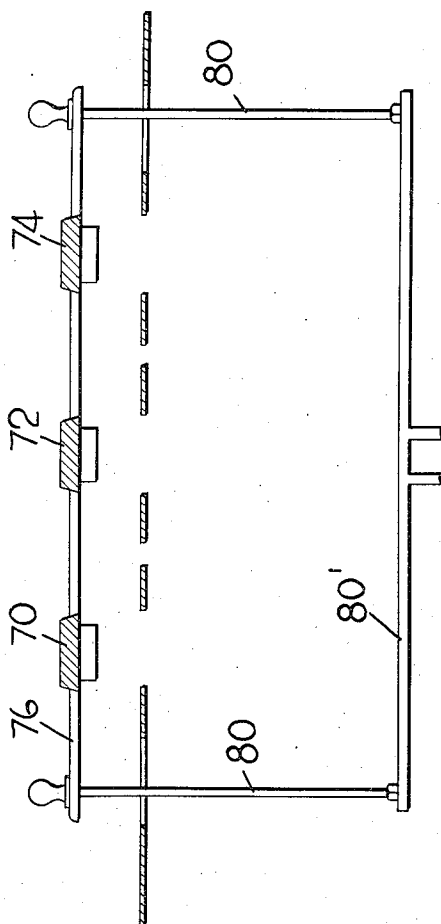
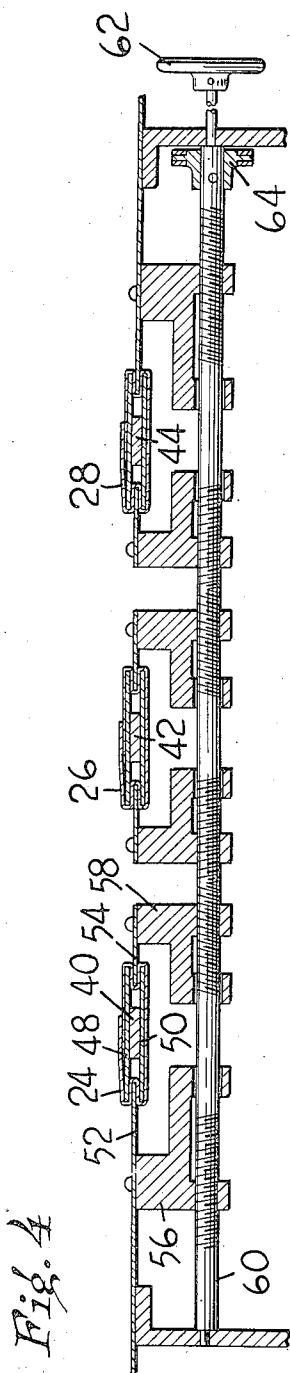


Fig. 5

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2,465,044

APPARATUS FOR MAKING BAGS

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Application June 6, 1945, Serial No. 597,740

1 Claim. (Cl. 93—27)

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It is an object of this invention to provide an improved method of making bags or tubes, which, without increase of web speed will greatly increase the production of a bag machine.

It is a further object of this invention to provide an improved machine for carrying out the method aforesaid.

It is a further object of this invention to provide a method and machine whereby a single web of bag forming material may be used to produce a plurality of continuous tubes from which bag or tube lengths may be severed.

The above and other objects will be made clear from the following detailed description taken in connection with the annexed drawings in which:

Figure 1 is a plan view illustrating the basic step in the simultaneous formation of multiple tubes;

Fig. 2 is a side elevation of the improved machine; and includes the subject matter of Fig. 1;

Fig. 3 is a section on the line 3—3 of Fig. 2;

Fig. 4 is a section on the line 4—4 of Fig. 2; and

Fig. 5 is a section on the line 5—5 of Fig. 2.

The inventive concept of the instant case is entirely independent of mechanical details. As disclosed, most of the machine details are based on the patent to Schultz et al. 2,346,191, but if it is desired to dispense with a turned over bottom end merely to have the bags closed by a flat, fin type seam, the mechanism of Salfisberg 2,192,527 would be preferable. Fundamentally, the present invention contemplates the use of multiple tubers in conjunction with a single unitary cutoff and, if desired, with a single unitary transverse sealer and folder. The invention is described herein with reference to an installation accomplishing all of these functions and involving the use of heat sealing. It will be obvious to anyone skilled in the art, however, that the invention is readily adaptable to the use of paste rather than heat sealing, and that the use of the invention may terminate either with the cutoff or with cutoff plus the formation of a bottom seam, or with cutoff plus formation of a bottom seam plus a folding over of the bottom. As a matter of fact, any conventional feeding and bottoming apparatus may be employed.

Referring now to Figs. 1 and 2, there is shown a roll 10 of sheet material. A web 12 is fed from the roll 10 and passes over a guide roll 14, a tensioning roll 16 and a guide roll 18. From the guide roll 18 the web passes over an additional guide roll 20. Interposed between the guide rolls

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18 and 20 are a series of fixed slitter knives 22 which divide the web 12 into a plurality of strips 24, 26, and 28. While the use of fixed knives 22 has been illustrated, it is obvious that rotary cylinders, band knives, or any other suitable arrangement could be substituted in place of the knives 22.

From guide roll 20 the strips 24, 26, and 28 pass over a backing roll 30. Pasting rolls 32 are adjustably mounted on the shaft 34 and dip into a vat of adhesive 36. The rolls 32 apply a narrow strip of paste to each of the webs 24, 26, and 28. Obviously, if the web 12 be formed of heat sealable material and heat sealing is used to close the longitudinal seam of the web tubes, the rolls 32 and vat 36 may be eliminated.

From the backing roll 30 the strips 24, 26, and 28 pass over a guide roll 38, thence to individual tubing mechanisms 40, 42 and 44.

If it is desired to form the tubes with gusseted or bellows folds at the sides, the mechanism illustrated in Fig. 4 is used. The tubing mechanisms 40, 42, and 44 are identical, and only one of these, therefore, will be described. The tuber 40 consists of a central spacing member to which is secured an upper forming plate 48 and a lower forming plate 50. The plates 48 and 50 have a width equal to the width of the ultimate tube. These plates are spaced slightly by member 46. Tuck in plates 52 and 54 are mounted to enter the space between the plates 48 and 50 for the purpose of guiding the material of strip 24 to form gusseted or bellows folds. The plate 52 is mounted on a frame member 56, while the plate 54 is mounted on a frame member 58. The frame member 56 engages right hand threads 61 of a rod 60, while the member 58 engages left hand threads 61' on the same rod. A hand wheel 62 serves to turn the rod 60, and therefore through the respective left and right hand threads to adjust the spacing between plates 52 and 54 so as to adjust the depth of the gusset folds. A sprocket 64 is keyed to the shaft 60, and by means of a chain 66, drives a similar shaft 68 which engages the frame members 56 and 58 precisely in the manner of shaft 60, but at a point spaced therefrom in order to assure uniform adjustment of the plates 52 and 54.

As shown in Fig. 4, the other sets of tuck-in plates, namely those associated with tubers 42 and 44, are arranged with similar mountings, frame members 56' and 56'' being engaged by right hand threads and frame members 58' and 58'' being engaged by left hand threads numbered identically with the threaded portions 61 and 61'

associated with tuber 40. Hence, when wheel 62 is rotated, not only are the respective tuck-in plates of each pair adjusted toward or away from one another, but the adjacent plates such as 58 and 56' belonging to successive adjacent pairs, are also moved relative to one another so as to maintain the central line between the plates of each pair in a constant position.

Overlying each of the tubers 40, 42 and 44 are heating members 70, 72 and 74, united for unitary motion by a pivoted frame member 76. Springs 78 serve normally to hold the heater members 70, 72 and 74 away from the tubers 40, 42 and 44. At the forward extremity there is provided a heater member 81 running transverse the machine and overlying all three of the tubes 24, 26, and 28. The heater member 81, of course, moves with the heater members 70, 72 and 74, and is also supported by the springs 78. A pair of rods 80 extend from the frame member 76 and at their lower ends engage a transverse member 80' which in turn engages a cam 82 on a main shaft 84. The cam 82 serves, therefore, to rock the frame 76 about its pivots, and therefore, to bring the heating elements 70, 72, 74 and 81 into engagement with the tubes 24, 26, and 28.

At the forward end of tubers 40, 42, and 44 there is a single unitary mechanism for withdrawing consecutive tube lengths from the machine, for severing these lengths and for turning over a portion of the free end of each of the tubes for engagement with the transverse heater element 81. As disclosed herein, this mechanism is identical with that disclosed in the aforementioned patent to Schultz et al. 2,346,191, dated April 11, 1944, and will, therefore, be described only generally herein. The mechanism for advancing the tube lengths comprises pairs of grippers 90 mounted on a rocking frame 92. The frame 92 and the grippers 90 are actuated by suitable linkages from the cam shaft 84. The frame 92 brings the grippers into position to grip each of the tubes 24, 26 and 28. At this time, each pair of grippers 90, grips the tube to which it is juxtaposed, and as the frame 92 rocks back to the position illustrated in Fig. 2, the grippers 90 draw a length of tube over the tubers 40, 42 and 44. When the frame 92 reaches its rear-most position, the tubes are severed by a movable cutter plate 94 which engages a stationary cutter plate 96. The plate 94 is also actuated from the cam shaft 84. The line of cut is so located with respect to the free ends of tubers 40, 42, and 44, as to leave a predetermined length of tube extending beyond the ends of the tubers. By the time the cutting action is ended, a movable templet 98 has moved to overlie the front edge of the forming plates, to bear down on the tubes 24, 26, and 28. The projecting portions of these tubes are now folded over the upper forming plates of tubers 40, 42 and 44 by a folding finger 100. When the folding operation is completed, the finger 100 is withdrawn and the cam shaft 84 through the rods 80 draws down the heating elements 70, 72, 74 and 81 into contact with the tubes 24, 26, and 28. The heating ele-

ments 70, 72 and 74 form longitudinal seams in the tubes 24, 26, and 28, while the transverse heating element 81 seals the turned over ends of the tubes against the respective tube bodies. The rocking frame 92 then brings the grippers 90 over to grasp the just sealed tube ends, and the cycle is repeated.

The invention has been illustrated with respect to the preliminary slitting of a large roll. This is particularly advantageous in dealing with printed stock, since a single printing operation of a single web produces all of the stock required for the total number of bags to be formed. This results in a substantial saving in the overall cost of material. It is within the purview of this invention, however, to utilize three independent rolls and to eliminate the slitting step. It is also within the purview of this invention to utilize spreader bars to secure a greater lateral separation of the tubes to provide a greater range of gusset adjustability, if desired. If this is done, however, it will be necessary to offset the printed patterns for the several strips even on a single supply roll, so as to compensate for the length of paper occupied by the spreader pairs. As illustrated herein, the invention involves the use of three webs. Clearly, the invention is applicable to two webs or to as many more than three as may prove to be practicable. It is clear from the foregoing, that the invention is susceptible of considerable modification of the details disclosed herein. The invention is not, therefore, to be considered limited by the details of the disclosure, but only as set forth in the subjoined claim which is to be broadly construed.

I claim:

A bag making machine comprising: means for advancing a web of bag material intermittently, means for slitting said web into a plurality of strips each of proper width to form a tube, a plurality of tube forming mechanisms in side by side relationship and each comprising a pair of gusset-tucking plates, unitary, manually operable means for simultaneously adjusting the members of each pair of plates toward and away from one another said means also simultaneously altering the spacing between adjacent plates of adjacent pairs of plates; means guiding each of said strips through one of said tube forming mechanisms to form tubes therefrom, means for simultaneously severing a length from each of said tubes and means for simultaneously sealing the remaining end of each of said tubes.

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