MACHINE FOR MAKING BAGS FROM A CONTINUOUS WEB

Filed Sept. 17, 1957

12 Sheets-Sheet 6

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MACHINE FOR MAKING BAGS FROM A CONTINUOUS WEB

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Application September 17, 1957, Serial No. 684,508

17 Claims. (Cl. 53—28)

This invention is concerned with a new and novel machine for forming pouches or bags for certain specified items from a web, and for sealing said items within the bags without disturbing or interfering with the web.

Particularly this invention is concerned with a machine that makes a bag, opens the bag or pouch, seals the bag or pouch, and then severs or cuts the pouch from a long group of previously formed pouches.

The principal objects of the within invention is to provide an apparatus that will on one machine form a pouch or bag of a previously determined size so that there will be a substantial saving in time and labor.

Another object of the within invention is to provide a machine for forming a pouch or bag wherein it is impossible that any damage can occur to the subject matter or item that is placed within the pouch.

There is still another object of the within invention to provide a machine for making bags and pouches which may utilize any type of material that has the qualities of being able to be heat-sealed.

It is an additional object of the within invention to provide a machine that forms the pouch or bag from a continuous web or roll of sheet material, and that does not cut or separate the pouches or bags from the sheet material entirely until such time as the bag or pouch has been filled and completely closed.

It is yet another object of the within invention to provide means in a bag making machine for varying the speed of operation so that the speed may be synchronized to the ability of the feed mechanism or the person making the insertion of the contents into the pouch. It is contemplated that the feed may be automatic or semi-automatic and accordingly the operation of the machine depends upon the ability of the feed to insert the subject matter into the pouch.

It is still another object of the within invention to provide a bag or pouch making machine that has a means for varying the size of the bag or pouch to be formed.

It is still an additional object of the within invention to provide a machine that forms a pouch or bag that is sealed so that it is impervious to the elements. It is contemplated that the material used in the bag will have impervious characteristics. In the event that the material employed in making the bag is not of that type, it is contemplated that the sealing means in the within machine will, in any event, prevent dust and dry types of external forces from gaining admittance to the bag. Conversely, the bag that is formed by the within machine lends itself to vacuum type packaging. Likewise, the bag also lends itself to the type of packaging where gases, or lubricant when required, may be inserted therein and sealed.

An additional object of the within invention is to provide a method in forming many bags or pouches and at the same time to have these bags or pouches of the exact same dimensions. The within invention employs means that will prevent error in dimension, and every bag or pouch that is formed is absolute in dimension. On this subject, the invention teaches a novel way of sealing the web or material that forms the bag and at the same time while the feeding is taking place, the bags are sealed, margin cut and the bags eventually severed from each other.

Another feature of the within invention is an arrangement of clamps that clamp and also other clamps that move and clamp so that the web may be controlled at all times, and further so that the web as it is formed into a pouch or bag is automatically held open, and after insertion of the subject matter or goods is automatically closed, moved to the next succeeding position, and finally severed from the web.

An additional object of the within invention is the ability of the sealed bag to retain air, or to be slightly inflated. This creates a slight pressure on the inside of the bag and prevents the contents within the bag from becoming crushed or damaged.

Another object of the within invention is the ability of the bag resilient and distorted to various shaped contents below the clamps without distorting the alignment of the connected web.

The above objects and other objects are obtained by the use of a machine that forms the web or film material into a fold whereby it is fed along the machine; and as it is fed, segments of the web are sealed. The segments are cut vertically to a point below the horizontal surface so that each segment of the roll is in a sense a separate bag, but still is connected to the other segments by means of a marginal area which will hereinafter be explained in detail. After the segment or bag has been sealed vertically and fed along the machine, the two side surfaces are open so as to form an open pouch or bag. The contents may be then inserted manually or automatically, and at that point the segment or bag is fed to a few more positions before it is ultimately sealed tight around its upper edge and at the same time the marginal area that has not been previously cut and which has connected it to the previous bags or segments is finally severed and the finished bag with its contents is dropped down into a chute ready for ultimate delivery or packaging.

Many other objects and advantages of the within invention will be apparent as the specification is followed and understood, and the novel features of the apparatus are more particularly pointed out and disclosed in the following detailed description, in which:

Figure 1 is a perspective view of the machine showing the front thereof and also the right side.

Figure 2 is a schematic view of the feed or web of the machine as it passes from one position to the next and ultimately to the concluding position.

Figure 3 is also a schematic view, but of the side elevational view of Figure 2.

Figure 4 is a top plan view of the last sealer assembly in its open position.

Figure 5 is a schematic view in plan showing the motion of the reciprocating clamp assembly.

Figure 6 is a plan view of the pouch opening assembly.

Figure 7 is a plan view of the stationary clamp assembly.

Figure 8 is a schematic view in plan of the primary sealer assembly.

Figure 9 is a side elevational view of the view shown in Figure 4.

Figure 10 is a side elevational view of the view shown in Figure 5.

Figure 11 is a side elevational view of the view shown in Figure 6.

Figure 12 is a side elevational view of the view shown in Figure 7.

Figure 13 is a side elevational view of the primary sealer assembly as shown in Figure 8.

Figure 14 is a perspective view of the conventional type folding assembly for the roll or web of material.

Figure 15 is a side elevational view of the pouch or...
Figure 16 is a side elevational view of the pouch or bag as it is being formed after it has been sealed by the primary assembly unit as shown in Figure 8, but which unit provides a cutter that does not cut all the way but that leaves a margin as shown and cuts parallel to the top edge.

Figure 17 is a perspective view of the primary sealer actuating assembly.

Figure 18 is a perspective view showing the clamp and bag opening actuating mechanism.

Figure 19 is a perspective view of the rear of the machine and also showing the left side of the machine.

Figure 20 is a perspective view showing the right side of the machine and featuring the web feed mechanism.

Figure 21 is a top perspective view of the portion of the machine disclosing the reciprocating clamp assembly and the last sealer assembly.

Figure 22 is a side perspective view of the rear of the machine showing in more detail the transmission mechanism and the primary sealer actuating mechanism.

Figure 23 is a top perspective view showing in more detail the top of the primary sealer assembly, the stationary clamp assembly, the feeding stations, and the reciprocating clamp assembly and the last sealer assembly.

Figure 24 is a top plan view of the motion converting system for the primary sealing assembly.

Figure 25 is a rear elevational view of the entire machine.

Figure 26 is a schematic view of the transmission and motion system of the machine.

**MACHINE FRAME**

In the embodiment disclosed herein the machine is mounted upon a base 1. In order to support various moving parts of the machine, a particular type of frame has been designed. A front post 2 connects with a front post strut 8 which is interconnected with another front support post 2. Post 2 is normally mounted on the base and in any instance where the roll is of a longer size because of the desired width or dimension of the material that is employed for making the bag, it is necessary occasionally to have a wider dimension between the two support posts 2. Accordingly in the embodiment shown a front post arm 13 has been employed to extend out from the base in order to properly support the front post 2. A short distance away from the post 2 are the vertical center support posts 3. The center support posts 3 are connected with the center post top strut 18 which is interconnected with the web feed outboard post 4. The paper feed outboard post 4 makes a right angle and is interconnected with the lower side strut 5. An upper strut 6 interconnects the members 4 and 2 and with the member 5 forms a rectangular shape frame. A similar arrangement may be seen by looking at the views of Figures 19 and 25. A horizontal tie strut 7 interconnects the members 4 in the front and in the rear.

The rear support post 9 is vertical and mounted upon base 1. It interconnects with the horizontal track 11, and also with the roller rack support 10. The rear anchor support bar 17 interconnects the frame member 11 with the rear support post 9 and is employed as an anchor for the lower end of diagonal support member 12.

The bracket 14 is the center anchor support for the overlap bar 10. At either end of overlap bar 10 are the rear anchor supports 16 and the center anchor 3.

At one end of the bar 10 is the rear anchor support 16. Between the center anchor support 14 and the bar 10 is the center anchor support bar 15 which holds up bar 10. An additional bracket 19 supports and steadies housing 57 mounted on bracket support 77.

**THE MOTOR AND TRANSMISSION SYSTEM**

The motor 25 in the embodiment shown is a conven-

...tional electric motor with an electrical cord 69 that has a preferred horsepower of 94. It can be easily seen, of course, in the views of Figure 1 and Figure 25. It is also accessible in the view of Figure 20. On the end of the motor shaft of motor 25 is the motor pulley 26. Circumscribing the motor pulley 26 is the motor belt 27. The belt 27 circumscribes the worm driving pulley 28 and the worm driving pulley is mounted on a worm drive shaft 29. The worm drive shaft 29 enters into the worm transmission gear box 30. This gear box 30 is a stepdown transmission system from 0:1. The mechanical advantage gained in this gear box is about 30 horsepower.

The connecting into the worm drive shaft 31. This can be very easily seen in the view of Figures 25, 19, and particularly in the view of Figure 22.

The main drive shaft 31 has at its end a crank 33. The crank 33 is inserted into the paper feed oscillating arm 32 which has an elongated opening therein. In the elongated opening of the arm 32 there is a crank stud 35. Proximate the gear box 30 there is a solenooid box 34. Inside of the solenooid box 34 is a solenooid that controls the one revolution clutch 72 for cycling the operation of the machine. This will be explained in more detail hereinafter.

Moutning the gear box 31 is a sealer cam 50. The sealer cam 50 actuates the sealer cam lever 35 which in turn moves the teeth or tooth segment 35c. This can be seen in the view of Figure 26 which will be explained hereinafter.

The main drive shaft bearing 36 is in the center of the machine. It is to be noted that this is also a support for the drive shaft 31 and also a bearing for support for the sealer cam lever 35. The drive shaft 31 has a front bearing 37. The drive shaft 31 also has a rear bearing 38. These bearings support the drive shaft and allow it to rotate therein.

Reference is now made to the view of Figure 1 wherein a cable control cam lever 39 controls the size of the container opening. This is also shown in detail, somewhat, in view of Figure 18. As can be seen from the various views of the drawing, there are several control cables throughout the machine which are necessary to the operation thereof and which will be explained in detail hereinafter.

When the cam lever 39 actuates the various cables it is necessary to have the cables return to their normal positions. The cable control bias spring 40 performs this function for the cam lever 39. In the cable control cam lever 39 is a slot 41. In the slot 41 is an adjustment bolt 42. The location of the adjustment bolt 42 in the slot 41 effectively controls the stroke of the slide 128 and thereby controls the amount of opening in the pouches as they are passed down the machine toward the chute 131. It is obvious that the reason for changing the size of the opening in the pouch is because different types of containers may be inserted therein, through the chute 68. The cam 43, of course, actuates the arm 39. In order to make the cam 43 adjustable, there is mounted next to it on the shaft 31 a cam adjusting clamp 44. This is of the conventional type. The purpose of this adjustment is, of course, for getting the stroking to be synchronized or to be timed properly when other functions are taking place at the same time.

Reference is made particularly to the view of Figure 18: There is a cam 47 which comprises two cams, face to face, between the clamps 48. This permits the dwell upon the periphery of the cams to be adjustable. Forward of the cam assembly 47 is the cable control 45 for closing and holding the bar clamps 122 and 130. Attached to this cable control 45 is the cam roll stud 45s, which is actuated, obviously, by the cam 47. The cable control bias spring 46 functions so that it will return cable control 45 to its normal position after having been actuated by the cam assembly 47.
In Figure 19 can be seen the cam adjusting clamp 49 mounted proximate the sealer cam 50. This can also be seen in the view of Figure 25. Reference is now made to the view of Figure 18. On a shaft 54 is a shaft 54 which is interconnected with a cable 53 connecting hood housing 21. Rod 54 passes through the cable connecting housing 21 and interconnected with the coupling block 22. Cable 134 is interconnected into the coupling block 22. Also interconnected into the coupling box 22 is the cable 135.

Reference is made to the view of Figure 25 which also discloses the various cables. Proximate and to the right of the coupling block 22 is another coupling block 23. From the coupling block 23 arises the cables 129 and 125.

FEED AND SEALING MECHANISM

A horizontal feed rack 58 can be seen in the view of Figure 20 and also Figure 22. In Figure 24 rack 58 is shown interconnected with arm 59 by means of the pin 172. Rack 58 receives its motion from vertical rack 56 through gear 55 as shown in Figure 26. The other end of the arm 59 is connected with the sealer mechanism conversion shaft 60. This latter connection is seen both in the views of Figures 22, 29, and 26. At each end of shaft 60 is a rack pinion 61, which will hereinafter be referred to as the lower rack pinion to distinguish it from the upper rack pinion 62. A rack pinion 62 meshes with the teeth of the pinion 61. As can be seen in the view of Figure 22 the rack 62 is on both sides of the machine and above the main drive shaft 31.

In the view of Figure 1 sprocket 63 can be seen, mounted on the shaft 60. A chain 64 meshes with the lower sprocket 63 and completes its orbit by meshing with the upper sprocket 65 which is mounted on the upper shaft 50. This latter structure is apparent in the view of Figure 1 and, in detail, in the views of Figures 23 and 26. The upper rack 67 is somewhat similar to the lower rack 62. The pinion 65 on shaft 90 meshes with the upper rack 67 and also on each side of the machine for the reasons that will be explained in detail hereinafter.

Reference is now made to the view of Figure 22 to show the general location of the components to be discussed and to the view of Figure 24 to show the detail of structure of said components. The rack gear stud shaft 70 which is inside of the pinion 74 in housing 73 meshes with center slide 71 and outer slides 75 and the other of the two studs meshes with the center slide 71 and the outer slide 76. The segment 356, actuating rack 24, is attached to the outer end of center slide 71 as shown in Figure 26.

Many of the elements in the drawings have been somewhat concealed because of housings and other elements appearing in front of them to the viewer. Accordingly the schematic view of Figure 26 has been employed to show many of the moving parts which are actually the heart of the machine. Often times reference will be made hereinafter to elements that cannot be seen in some of the views referred to and these elements will be obvious in the view of Figure 26.

The sealer clamping drive racks 81 mesh with the sealer clamping gear 82, which is mounted on the lower end of shaft 84. The shaft 84 oscillates and is often referred to hereinafter as the sealer clamping pinion shaft. A block 83 extends downwardly from the sealer clamping drive racks 81 and is dimensioned to fit within the confines of the opening slide of sealer rack cam tracks 176 and 171. Bias spring 173, mounted on stud 174, controls the return motion of slides 71, 75 and 76.

In Figure 17 can be seen the sealer lower drive bracket 85. Shaft 84 enters the sealer lower drive bracket 85 and has mounted somewhat within the bracket the pinion 86d which meshes with the reciprocating lower racks 87 which as will be explained hereinafter operates the sealer assembly. Up above 86d on shaft 84 is the pinion 86. Pinion 86 meshes with the reciprocating upper racks 89 which also assist in the operation of the sealer assembly. A top bracket 94 is similar in structure to the lower bracket 85. (See Figure 5.) It is necessary to keep the upper and lower portions of this assembly that we are now discussing in a stationary and secure position. A fixed post 88 ties these brackets together to satisfy this requirement. Mounted on racks 87 and 89 are the sealer spring clamps 91. These can be seen clearly in the view of Figure 17, Figure 1 and particularly the location of the clamps 91 can be seen by looking at the racks 89 and 87 in the schematic view of Figure 26.

Reference is now made to the schematic view of Figure 2 and the right side thereof wherein is shown the top view of the sealer spring clamp 91. In order to obtain the heat for sealing, the clamp 91 has a heating head mounted thereon and within the heating head is a heating element 92. This is shown schematically and is well known and conventional. The structure can be seen in the views of Figures 8 and 13. Mounted on brackets 95 and 94 is a guide shoe 93. The purpose of the guide shoe 93 is to steady the apparatus in a lateral position. In Figure 21 is shown the last sealer assembly connecting rods 95. These can be seen schematically in the views of Figure 2, and the structure can also be seen in the view of Figure 23.

The last sealer assembly (see Figure 21) comprises the last sealer bracket housing 102 which is mounted on the rollers 105. The heater element 103 is mounted in the last sealer head 136. The heater clamp 104 is opposite head 136. The temperature of the heater element 103 is controlled by a thermostat 106 by the position of the adjustment of the knob 108.

As can be seen, the discharge bottom board 133 is made of two pieces and guides the bag with the contents therein down the machine towards the chute 131. The board 133 also helps support the bag in the event that the material therein may give it extra weight. With the type of bags that are formed in this machine it is preferred, as already mentioned, to use a material that is easily sealed by heat. Accordingly, near the end of the machine is located a last sealer head 136 which has in it a heating element for sealing the two top edges of the bag that were opened previously by the head 128.

As can be seen in the view of Figure 1, the far end of the machine is mounted on rollers 105 which are connected by support 107. Also supporting the last sealer head 136 is the support 137. Reference may also be made to the view of Figure 21.

THE WEB FOLDING AND FEEDING MECHANISM

Reference is now made to the views of both Figure 1 and particularly the details in the view of Figure 20. The web roll tension belt shaft 78 has mounted thereupon the web roll break tape 112. The tape 112 exerts a tension upon the roll of web or paper 111 which is mounted on the shaft 110. At both ends of the shaft 110 are the web roll flanges 79 for preventing the roll of web or paper from sliding laterally on its roll. The shaft 110 mounted for easy, frictionless support on the web roll support bracket 80.

The web or paper for making the pouch material 111 passes over the paper guide roll 113 before being folded over the V-shaped paper folder 114. After the paper 111 passes over the V-shaped paper folder 114, the web of paper material is brought together between the vertical guide roll 115. The adjustment 116 controls the movement of the or tilt of the vertical guide roll 115. The adjustment 116 is clearly shown in the views of Figures 1 and 14. The adjustment 116 is mounted into the bar 13 and is controlled by the movement of the nut 116 on the bar 18. There is a further adjustment for the vertical guide roll 115 which is indicated in the lower portion of Figure 1 as 117. This will be referred to as a locking bolt 117. There is, of course, one on each side of the machine.
POUCH OPENING CABLE DRIVE

Reference is made particularly to the view of Figure 18, at this point. In Figure 18 can be seen the fixed rack 118 which will be referred to as the pouch opening cable rack 118. There is a rack 118 on each side of the machine. Meshing with the rack 118 is the pouch open cable pinion 119 which is mounted on the pouch open cable pinion shaft 120. The pouch open cable pinion shaft 120 moves within the slot 119a which is mounted in the pouch opening support vertical member 152. Behind the vertical bar 152 is a sliding bar on each side thereof which is indicated by the numeral 120a and which can be seen in the view of Figure 1.

At the top of this slide bar 120a is fixed securely the inner cable of the cable housing assembly 129. The bar moves with the shaft 120. Obviously the cable inside of the cable housing 129 will also move. The reason for the rack and the pinion arrangement and the shaft 120 is to give a balance to keep an equal amount of motion on both sides of the machine in both of the cables 129. As the operation of the machine is explained hereinafter, this will be explained in more detail.

WEB FEED CONTROL MECHANISM BEFORE POUCH OPENING

The heart of the motion of the machine is obtained by the paper feeding clamps 121. These clamps 121 which can be seen schematically in the view of Figures 4–13 and also in the view of Figure 23 have a unique motion. The clamps 121 will move in a clamped position in a predetermined distance down the machine with the paper web, will open, and then will return to their previous positions and start the cycle all over again. This will be explained in the operation of the machine hereinafter. Working closely with the clamps 121 are the stationary web holding clamps 122. Clamps 121 are supported by the bracket 105 and are directly connected to roller heads 91 and 92 near the top, and to the lower end of top roller heads 103 and 104. These clamps 122 do not move down the machine, but they do open and close. Their motion is synchronized properly and timed properly with the movement of the clamps 121. That is to say, when the clamps 121 are not holding the paper web, the clamps 122 are in closed position and are holding the web. This gives the clamps 121 an opportunity to return to their normal position prior to starting the cycle.

In order for the clamps 122 to open and close, it is necessary that a mechanism push and pull them from their outside to their inside position. Accordingly, reference is made to the view of Figure 23 wherein is shown the push and pull rack slides 123 and 124. These rack slides 123 and 124 are controlled by the cable assembly which is indicated by the numeral 134 in Figure 19.

The rack slides 123 and 124 are assisted into their outermost position by the spring action of the springs 123a and 124a. (See Figure 23.)

POUCH OPENING MECHANISM

As the bags or pouches have been formed and are passing down the machine towards the chute 131, it is necessary at a particular location to have the bag opened. Accordingly, there is also provided in the machine an ingenious arrangement for opening the bags before the garment or the item is to be inserted. Reference is made particularly to the view of Figure 23 wherein is shown the pouch opening slide 127 which controls the opener arrangement 128. The opener arrangement 128 can be very easily and clearly understood by the view of Figure 6 and Figure 11. Actually, there is a clasp at the bottom of 128 which pulls the bag apart as the slide arrangement 127 moves outwardly. The machine is so timed that the bag opening will remain apart for part of one cycle when using an automatic feeding system until the next bag is moved into position. This, of course, is subject to being set for timing by the operator and which will be explained hereinafter. The cable 129 which has been referred to previously controls the motion of the pouch opening slide 127 which ultimately opens and closes the bag. It is rather obvious that if the bag does not have any slack when the opening head 128 grabs the bag and spreads the two sides apart, the bag is likely to tear if it is not made of a resilient or strong material.

Reference is made to views of Figure 4 and Figure 5 and also the view of Figure 23 wherein is shown the clamps number 130.

These clamps 130 operate similarly to clamp 122 in that they open and close. However, upon closing, they push rearwardly; that is to say that they push back towards the bag forcing the bag next to it to have slack so that when the head 128 is grabbing the bag to spread it apart and open it, there will be slack available in the bag so that it will not tear. Once the bag has been filled, the clamps 130 recover the previous allowed slack in the web. The filled bag is passed along to a point on the machine above the discharge chute 131; and when the machine finally seals the top of the bag and severs the bag from the other bags in the web, it is dropped down the chute 131.

In the drawings, particularly in Figure 1 the item to be used in the bags has been shown as folded shirts which are given the number 132.

A discharge bottom board 133 which can be seen schematically in the Figures 1, 9, 10, 11 and 12, acts as a support and guide for the bag that has become filled with the contents.

WEB FEED CONTROL MECHANISM AFTER POUCH OPENING

The reciprocating paper clamp assembly 130, is controlled by the rack slide bar 139. The rack slide bar 139 is on each side of the machine, and the two slide bars 139 are tied together by the tie bars 138 which are fixed and do not move except with the racks, or slide bars 139. Slides 139 obtain their reciprocating motion from the fixed pinion 140 which is mounted to rotate on the shaft 141. Connected to the rack 139 is a block 143 which interconnects with the inner cable of the cable 125. The cable 125 has mounted at its end a block 142 which prevents the cable from moving more than a predetermined distance between the coupling 143 and its own housing 125.

The block 142 is connected on the side of the reciprocating paper clamp frame 151. Cable 150 controls the motion of the rack slide assembly which consists of a center slide rack 144 which meshes through the pinions not shown with the outer slide racks 145. The pinions which are not shown are located within the housing 149 and are conventional and mesh with the teeth part of which are shown on the racks 144 and 145. Mounted on the slides 144 and 145 are the clamp supports on couplers 146 and 147 respectively. These clamp supports or couplers are secured to the clamping assembly 130. That is to say that when 130 moves in and out, it is moved in and out because of the motion of the sliding racks 144 and 145, which are secured thereto through the couples or clamps 146 and 147. There are located on the slides 145 bias springs 148 which return the slides to their normal position upon completion of the web and when under the couplings of the cable 135. The slides 144 and 145 are secured, guided, and controlled by the bearing slots 149 of which there are four strategically located at the end of each slide, 144 and 145, and attached to the slack rack 139. Reference is made to the view of Figure 23 wherein a bias spring 150 is used for tensioning the cable 125. This spring 150 is, of course, employed to return the cable 125 to its normal position.
As previously mentioned, when the bag is open on the head 128, it is necessary for the bag to remain open sufficiently long enough for the operator or the device that will eventually feed the subject matter into the bag to carry out its function. One revolution clutch 72 clearly shown in the view of Figure 22 has been employed to carry out this function.

The one revolution clutch 72 will continue to keep the machine in its open cycle until such time as the operator energizes an electrical circuit which will cause the clutch to disengage and permit the machine to continue in its ordinary function. It is contemplated in this embodiment of the machine that a human operator will feed the material to the bag and that she or he will engage an electrical button to cycle the machine and control the operation of the one revolution clutch 72. In an automatic arrangement, obviously, the one revolution clutch 72 would be either eliminated or modified, and the only requirement would be the synchronization of the filling of the pouch.

**OPERATION OF MACHINE**

(a) *Web feeding*

In operation the paper or material that is going to be used to form the pouch or the bag is loaded onto the shaft 110. The paper roll shaft 110 is mounted on the brackets 80. The shaft 110 will roll loosely and freely on the brackets 80, subject to the tension exerted upon it by the spring loaded belt 112 which is tied to an adjustable tension on shaft 78. It is, of course, also anchored on the horizontal bar 8. This is seen in the view of Figure 1 along the right side thereof. The operator then takes the end of the paper or web and draws it over the guide roll 113, and weaves it around and over the V-shaped paper guide 114 as shown in the view of Figure 14. The web is then drawn through the vertical roll 115. At this stage there is a fold along the bottom and the two lateral sides of the web. (See Figures 1 and 19.)

(b) *First sealing operation*

The web is then taken by the operator and placed at the beginning of the first sealer mechanism which is shown in the view of Figure 2 with the notations Figures 8 and 13. The sealer mechanism 91 and 92 is proximate the web that is fed between and through the roll 115 as already mentioned. The sealer spring clamp assembly 91 and the heater element 92 are pushed together so that they are on each side of the folded web and force the folded web to contact with each of its sides. The heat from the heating head 92 will cause the sides of the web to seal under the high temperature of the heat in the head 92. In order to get the heat sealer head 92 to contact the heat sealer element 91 the following operation takes place with respect to the various transmission parts in the machine.

The motor 25 has been turned on and is operating the pulley 25 which, in turn, is transmitting motion into the gear box 30 which rotates the main drive shaft 31. The main drive shaft 31, as already mentioned, has mounted thereupon it the crank lever 33.

Reference is made at this point to the view of Figure 26 as well as the views of Figure 22 and Figure 20. As has already been explained, there is a slotted opening in the arm 32. The location of the crank 33 in this opening determines the size of the stroke of the crank. As will be explained hereinafter, the size of the stroke determines the width of the bag. The shaft 31 is rotating and operates the crank 33 so that the crank 33 moves the lever arm 32. The lever arm 33 is integral with the vertical rack slide 56. The amount of stroke of the lever 32 determines the amount of displacement or motion of the rack slide 56; that is to say that the rack slide 56 will move the distance that the stroke of arm 32 is moved. It is obvious from the view of Figure 26 that the rack 56 moves only in a vertical direction, upwardly and downwardly. Rack 56 meshes with the pinion 55. Pinion 55 is in a fixed position and accordingly imparts motion because it meshes with rack 56. The motion imparted by the pinion 55 to rack 56 causes rack 56 to move in the direction of the arrows in a plane perpendicular to the plane in which the rack 56 has been moving. The rack 56 is tied integrally with the sealer mechanism conversion shaft 50. As can be seen, the shaft 60 rides on the two pinions 61. The pinions 61 move on the fixed racks 62. Mounted also on the shaft 60 is a sprocket 63. The sprocket 63 has meshing with it a chain 64 which meshes with the rack 65. The upper sprocket 65 is mounted on the upper sealer conversion shaft 90. Also mounted on shaft 90 are the pinions 66 which ride and rotate over the fixed racks 67.

It is obvious that as the rack 56 reciprocates back and forth under the motion of the lever shaft 33, it transmits a rotary motion to the shaft 60 and of course obviously to the sprocket 63. The sprocket 63 since it is turning also turns the chain 64 which turns the sprocket 65 on the upper shaft 90. Since the sprocket 65 on the upper shaft 90 is integral with the shaft 90, the shaft 90 will rotate the pinions 66, and accordingly the pinions 66 will move on the fixed racks 67.

It is interesting to note at this point that the shaft 60 and the shaft 90 are in a plane which is perpendicular to the rack 62 and the rack 67. The reason that the shaft 90 and the shaft 60 are in the same plane is because the various elements are mounted thereupon; and as a result, the motion of shaft 90 and shaft 60 must be identical. Otherwise, the various component parts that interconnect between these shafts and that are mounted thereupon would bend out of shape, or would not be in perfect alignment or proper registration.

Reference is made at this point to the view of Figure 3 wherein is shown the lower sealer drive bracket 85 and the upper sealer drive bracket 94. Inside of these brackets 85 and 94 are slots for receiving the lower reciprocating rack 87 and the upper reciprocating rack 89. It is also important to note that the lower bracket 85 is mounted upon the shaft 60 and that the upper bracket 94 is mounted upon the shaft 90. Obviously, as the shafts 90 and 60 rotate and reciprocate back and forth over their respective racks, the brackets 85 and 94 rotate with them.

The sealer clamps, element 91 and head 92 are mounted on each side of the machine. The sealer element 91 has its upper portion interconnected with the rack slide 89 and has its lower portion interconnected with the rack slide 87. On the other side of the machine, the sealer head 92 has also its upper portion interconnected with the slide 89 and at the lower portion, the slide 87.

In the view of Figure 26, it is shown that the rack slides 89 and also the rack slides 87 mesh with the pinions 86 and 86d respectively on the shaft 84. It is obvious that when one slide rack 89 is moving in one direction the other rack 89 must move in the opposite direction. This is a similar situation at the lower portion where the rack 87 in the front is moving in one direction and the rack 87 in the rear must move in the other direction. It is also obvious that the sealer element 91 must be connected on one side of the shaft 84 and that the sealer head 92 must be connected on the other side of the shaft 84 so that the movement of 91 and 92 will be either away from each other or toward each other.

The shaft 84 controls the reciprocating motion of the racks 87 and 89 which control the proximity of the sealer clamps, element 91 and head 92. The shaft 84 obtains its rotary motion from the gear 82. The gear 82 obtains its motion from the racks 81 which obtain their motion from the moving in and out of the sprocket 170 and 171 as already mentioned. The slides 170 and 171 are mounted on the slide assembly comprising the rack slides 71, 75 and 76. These slides 71, 75 and 76 obtain their motion from the cam lever segment 35a which obtains its mo-
tion from the cam 50 which is mounted on the main drive shaft 31.

It is rather obvious that when the cam 50 actuates the cam segment 35a, eventually there will be rotational motion of the shaft 84 and of course the moving back and forth of the racks 89 which are mounting the sealer clamps element 91 and head 92. When the racks 89 and 87 are moving back and forth the sealer clamps 91 and 92 are moving back and forth to a point where they contact each other, emit heat, seal the forward edge of one bag, and the rearward edge of the preceding bag and then separate.

An important feature in this operation is the fact that the slide racks 89 under the control of the shaft 84 do not move while the upper shaft 90 and the lower shaft 60 are moving forwardly on the racks 67 and 62 respectively. The reason that the shaft 84 is not moving is because there is no lateral motion forcing the slides 170 and 171 together since at that point the cam 50 is not transmitting any motion to the segment 35a.

(c) First cutting

At the time that the first sealer assembly clamps, element 91 and head 92, are making engagement with each other and making the seal along the seam, there is also a cutting operation that takes place. This is done by a conventional type of saw tooth knife that runs down the length of the clamp element 91. Actually there are two segments of the clamp element 91 on each side of the blade, and when the clamp element 91 contacts the surface through the plane of the clamp head 92, the saw tooth blade will continue to push forward into the inlet in the clamp head 92, cutting the web that might be located in between the two clamps. As previously stated, this is not a new method of cutting and is well known in other machines. The knife cutting edge, which is conventional, has an idiosyncrasy which is peculiar to this machine and which makes this machine the success that it is. Near the upper margin of the web or it might be said near the upper portion of the blade there is a half moon shape in the blade.

Reference is made to the views of Figures 15 and 16 which shows what the paper or web looks like after the blade has cut through the area where the bag edges have been sealed. It is to be noted that because of the shape of the blade, there is a half moon shape cut in the upper margin of the web or paper. At this point, reference is made to the view of Figure 16. It can be seen from the view of Figure 16 that the half moon shape has no edge facing vertically of the bag but rather parallel of the top surface edge of the bag. With this type of a cut, the web or the paper will not tear or rip from the weight that may be placed in it or from the pull that is put upon it as it passes down the machine. It is this type of cut that assists in making the operation of this machine so efficient.

(d) Last sealing and final cutting

Eventually the bag, which still remains open at the top, reaches the end of the machine through certain clamping operations which will be explained shortly. Because the last sealer assembly which seals the horizontal top margin of the bag operates synchronously both in time and location with the first sealer clamps 91 and 92, it is expedient at this time to explain the operation of the last sealer clamps 136 and 134. When the bag has reached the position nearest the chute 131, the garment has already been inserted therein and it is time to seal and set the bag. The last sealer clamps 136 and 134 seal the bag as shown in Figure 15 by the horizontal lines therein and also cut the uncut portion above the half moon shape, separating the bag completely from the other connected bags which are shown in the view of Figure 3.

The operation of the last sealer clamps 104 and 136 is quite similar to the operation of the first sealer clamps 91 and 92. It is to be kept in mind, however, that the heating elements and the sealing clamps in this instance are horizontal rather than vertical. In order to impart motion to the last sealer clamps 104 and 136, reference is again made to the schematic view of Figure 26. In Figure 26 as can be seen the vertical shaft 84 is rotating as previously described. Attached to the shaft 84 at the top is a gear 86a. Meshing with the gear 86a are two racks 100 which face each other. These racks 100 mesh with another gear 86b which gear 86b is again meshed on a vertical shaft 99. At the top position of the vertical shaft 99 is another gear 86c which meshes with the racks 96. It is obvious that the location of the shaft 84 will cause the racks 100 to impart motion to the gear 86b which will impart motion through the shaft 99 to the gear 86c which will impart motion to the racks 96.

Reference is made at this point to the view of Figure 2 wherein is shown the sealer head 136 and the clamp 104. The sealer head 136 and clamp 104 are, respectively, mounted on each of the racks 96. As can be seen, the racks 96 move, one of them is moving in one direction and the other in the opposite direction. The head 136 and the clamp 104 move toward each other giving the same type of operation as the clamp and head in the first sealer assembly, 91 and 92.

The operation of the last sealer assembly is therefore very similar to the operation of the first sealer assembly. This is because of the tie rods 95 which are shown schematically in the view of Figure 15. The tie rods 95 push the sealer mechanisms back and forth and parallel to the motion of the moving paper or web.

(e) Web control mechanism

Although we have gone out of step so to speak with the operation, because it was expedient to do so, the actual next step after the web has been initially sealed by the clamps 91 and 92 is for the web to move down the machine towards the feed chute 68. Naturally there is no bag formed until the first sealer clamps, element 91 and head 92 have sealed two sides of the bag together. This can be seen clearly in the view of Figure 3. If the bag has been sealed on both edges, it must be carried down the machine so that the garment 132 may be inserted and so that eventually the last sealer clamps 104 and 136, already explained, will operate and disengage the bag so that it may drop down the chute 131. It is the mechanism that carries the completed but open pouch down the machine that we will now describe.

The clamps 121 are physically connected to the last sealer clamps 91 and 92 and the last sealer clamps 104 and 136. Actually a single clamp 121 is on each side of the machine and each clamp 121 runs through the length of the machine. Clamp 121 is connected to the last sealer clamps at 109 and the first sealer at the side of the sealer spring element 91 and the head 92. As can be seen both the first and last sealers will move one complete position or the width of a bag. The heater element takes the length of time of the movement of one position to complete its operation of sealing the two sides of the web together. Accordingly the clamps 121 will move one position down the machine. As soon as the sealing clamps 104 and 136 in the last assembly and 91 and 92 in the first assembly separate, clamps 121 will separate also and will return back down the machine to their previous position before starting another cycle. Reference is made to the views of Figures 4–8 which clearly show how the horizontally positioned clamps 121 will travel with the sealer assemblies and the operations thereof.

In Figure 8 is shown the top view so to speak in a schematic arrangement of the clamping element 91 and the clamping head 92 of the first sealer assembly. The arrows indicate the motions that elements 91 and 92 take during the sealing operation. Similarly, the view
of Figure 4 shows the last sealer assembly arrangement and the heating elements and head 104 and 136. The arrows again indicate the motion that element 104 and head 136 take. Reference is also made now to the view of Figure 5 and the lower view of Figure 10 which shows the motion of the clamps 121. As can be seen, the clamps 121 operate synchronously with the motion of the sealer assemblies as shown in Figure 8 and Figure 4. That is to say, that when the sealer assemblies of both Figures 8 and Figure 4, being the first and last sealer assemblies, move inwardly and contact the web or paper, move forwardly, outwardly, and return, the clamps 121 follow the same motion.

It is obvious that when the clamps 121 are in their outward position, other clamps or means must be used to hold the bags or pouches together as the bags move down the machine. Accordingly, the reciprocating clamps 130 are employed. As can be seen in the view of Figure 5, the reciprocating clamps 130, are always in a closed position when the clamps 121 are in an open position. When the clamps 121 close, the clamps 130 open.

Reference is made to the view of Figure 12 which shows the position of clamps 122. Clamps 122 move in the direction of the arrows which are along the slide racks 124 and 123. It can be seen in Figure 12 that when the clamps 121 are in an outward position, the clamps 122 are in an inward or closed position. The clamps 122 are employed to hold the web until the clamps 121 have completed the cycle as shown by the arrows in Figure 5. It is apparent that at all times either the clamps 122 or the clamps 121 are holding the web and supporting it as shown in the view of Figure 3.

(f) Pouch opening

The next step in the operation of the machine is the opening of the pouch or bag to permit the garment to be placed therein. Reference is made to the view of Figure 6 that shows how the pouch or bag is opened. In order to have the pouch or bag open in the position as shown in Figure 6, it is necessary to push back on the bag with clamps. The clamps 130 are used to push back and are indicated in Figure 10 while holding the web. The path of the clamps 130 is shown in the view of Figure 5. Clamps 130 operate synchronously with clamps 122 insofar as the closing and opening motion is concerned. However, clamps 130, after they have closed, and made engagement with the web, back up in the direction of the arrows of Figure 5. When clamps 130 back up in the direction of the arrows of Figure 5, being located as shown in Figure 3, at the position of the garment 132, the back up operation pushes back the web, providing slack so that the bag opener 123, as shown in Figures 6 and 11, will slip, and apart the top seams of the pouch which has already been formed by the first heater clamps 91 and 92. As can be seen in the view of Figure 6, the opening is sufficiently large to enable the garment 132 to be inserted therein. Clamps 122 and 130 are operated by the various cables which have been referred to and described. The operation of the clamps through the cables and from the transmission system is as follows:

THE OPERATION OF THE CLAMPS 122

The clamps 122 are controlled by the cables 134. The cables 134 are actually within a housing and are connected nearest the clamps 122 at the holding clamp frame 43 which is shown clearly in the view of the Figure 19. The lower end of cables 134 is connected to the cable coupling block 22 which can be seen in the view of Figure 25.

At this point, reference is made to view of Figure 18 which at the top, just below the notation Figure 18, can be seen the lower portion of the cable coupling block 22. The cable coupling block 22 is secured to the shaft referred to previously as the cable drive connecting shaft 54. The shaft 54 is connected to shaft 45a in the cam lever 45. The cam lever 45 is actuated by the cam 47 which is mounted on the main drive shaft 31. It is obvious that when the cam 47 actuates and engages the lever 45, it transmits motion to the lever 45 and to the shaft 54 and accordingly actuates the cable 134. At the top beyond the holding clamp frame 153 the cable 134 is connected integrally with the slide rack 123. A pinion, not shown meshes with the teeth on the rack 123 which also meshes with another slide 124. This portion of the machine can be seen in the view of Figure 4.

Clamps 122 are secured to the slide racks 123 and 124. When the racks 123 and 124 move, they move in opposite directions to each other. Obviously, since the clamps 122 are secured to each of these slide racks, the clamps 122 will open and close as the racks 123 and 124 are moved by the cable 134. It is obvious that the cam 47 controls the timing of the motion of the cable 134.

THE RECIPROCATING OPERATION OF CLAMPS 130 WITH THE POUCH OPENING

The opening and closing of the clamps 130 on the web is controlled by the cable 135. Cable 135 receives its motion from the cable coupling unit 23 just behind the cable 134. Cable 135 is connected nearest the clamps at the top of the machine through to the bracket frame 151 which can be seen clearly in the view of Figures 19 and 21. Reference is now made to the view of Figure 21 wherein at the bottom thereof is shown a cable 135 entering a frame 151. Through the frame the cable 135 engages the slide rack 144. The slide rack 144 has teeth upon its outer edges. The teeth upon the outer edges of the slide 144 mesh with a pinion not shown and the pinion not shown, engages the teeth of the outer slide racks 145. The clamps 130 are secured to the outer rack slides 145 by means of the bracket clamps 147. The center slides 144 is secured to the clamps 130 by means of the clamp bracket 146. When the cable 135 is actuated off the transmission shaft by the cam 47, it imparts motion to the center slide 144 shown in Figure 21. The center slide 144 as it moves operates pinions on each of its sides which turn and which mesh with the outer slide racks 145. The outer slide rack 145 accordingly move in an opposite direction from the center slide 144. Because the clamps 130 are secured to the outer slides 145 and the center slide 144, the opposite motion of the slide 144 from the slides 145 will cause the moving in and out of the clamps 130.

The clamps 130 as indicated in the schematic diagram of Figure 5 also move besides in an outward and inward direction, in a forward and rearward direction. The cables that control the forward and rearward direction of the clamps 130 are shown in the view of Figures 19 and 21. This cable is referred to as cable 125. Cable 125 derives its original motion from the cam 43 which is shown clearly in the view of Figure 18. The cam 45 operates the lever arm 39 which has a slot therein. Inside of the slot is a moveable stud 42. The moveable stud 42 connects with a slide 119a in the bracket 152. This slide 119a operates the shaft 120 which operates the gear 119 and the rack 118. Slide 128b which is shown in the view of Figure 1 and which is in the slot 119a connects with the cable coupler 23. The cable 125 is interconnected with the cable coupler 23 and it is connected at the top of the machine as shown in the view of Figure 21 with the cable housing support 142. It is also interconnected with the cable coupling 143. The cable coupling 143 is connected with the rack 139 meshes with the gear 140 which is integrally mounted on the shaft 141. The cable 125 through the coupler 143 moves the rack slide 139. As can be seen in the view of Figure 21, the shaft 141 extends across the machine and has a similar arrangement on the far
side, not shown. Accordingly a similar rack slide 139 is on the other side of the machine and receives this motion through the transmission and rotation of the shaft 141. Both of the slide racks 139 move back and forth with the cable 125. The displacement of the motion of the rack 139 is the displacement of the cable 125. There are several elements mounted on the rack slides 139 including the clamps 130 as can be seen in the view of Figure 21. The reciprocating clamps 130 are mounted completely between the two slide racks 139. The bearings 149 are integrally attached on each side of the machine to slide racks 139 and accordingly move and oscillate or reciprocate back and forth with the motion of the slide racks 139. Slides 144 and 145 are mounted in the bearing block 149. Accordingly the motion of the reciprocating clamps 130 is controlled both by the cable 125 and 135.

As previously mentioned the operation of the reciprocating clamps 130 has a unique function. Just prior to the opening of the pouch or bag by the bag or pouch opener 128, it is necessary to push back on the bag as shown in the view of Figure 6. The reason for this is to obtain slack so that when the bag or pouch opener 128 separates the sides of the web, it will not tear the bag or pouch. Motion is given by the use of the cable 129. Reference is made to the view of Figure 21 which shows that the cables 129 receive their motion from the cam 43 as did the cable 125. The cables 129 obtain their motion from the coupler 23 which is already mentioned and described in the operation and the cable 125 obtains this motion through the slide and slot 120a and 119a. Cables 129 go from the coupler 23 to the pouch opening bracket 126 which is seen clearly in the view of Figures 19 and 23. Cables 129 are connected to the pouch opening slide 127 as shown clearly in the view of Figure 2 where it is indicated Figures 6 and 11. As can be seen the slide 127 supports the pouch opener 128.

SUMMARY

Hereinafore in this specification the separate functions of the machine have been explained independently of each other. Actually several operations are being carried out simultaneously.

When the clamps 121 have closed and start to move towards the chute 131 away from the web roll 111, the following functions are taking place simultaneously: (1) The first sealer assembly, 91 and 92, clamps the two sheets of the web together, and start to seal the vertical margins to form the bag and cut same as described.

(2) The last sealer assembly, 104 and 156, clamps the top horizontal margin of the last bag and severs same from the other connected bags.

(3) The other intermediate bags are being carried by the clamps 121 to respective positions between the sealing assemblies and also beneath the filling station.

(4) When the clamps 121 have moved to their furthest position of their stroke, clamps 130 and clamps 122 clamp the web and hold it while clamps 121 separate and reciprocate back toward their starting position.

(5) At the moment clamps 130 engage the web, they push back the web. At this same moment of this pushing back on the web by clamps 130 the pouch openers 128 are separating. It is noted that the backward motion of clamps 130 and the outward motion of pouch openers 128 are synchronized because they both receive their motion from cam 43. While this pouch opening is going on clamps 122 are holding the web stationary in front of the pouch opening. As soon as the pouch opening operation has been completed (clamps 130 have reached their furthest posterior position and bag openers have reached their outermost position), the machine stops because of the one revolution clutch 72. At this time, the operator inserts the contents into the bag. The operator, after having done so, energizes solenoid 34 which releases one revolution clutch 72 and the machine starts another cycle. The following takes place simultaneously:

1. The pouch openers 128 close back.

2. The clamps 130 return to their forward position and remain clamped on the web until the heat sealer assembly on clamps 121 contacts the web.

3. Clamps 121 are returning to their starting position.

It is to be understood that the embodiment herein disclosed is by a method of hand filling. It is contemplated and within the spirit and scope of this invention that the machine may be automatically fed and thereby eliminating the use of a clutch and intermittent operation.

Dimensions in the drawing have been exaggerated to teach more clearly the invention.

We claim:

1. A bag making, filling and closing machine comprising a source of web material, means for folding the web material, means for sealing the web material so as to close the web on the forward and rearward edges of two bags in a single operation, means for severing the two sealed edges simultaneously with the sealing so as to leave an uncut portion along the mouth edge of the bag, means for forming, the partially formed and partially cut bags into a filling position, means for opening the mouth of the bag in preparation for filling, and means for finally sealing the top edge of the bag and finally severing same from the web.

2. A bag making, filling and closing machine comprising a source of web material, means for folding the web material so as to have a closed portion, means for advancing the web material predetermined distances intermittently, a first sealing means for closing the rearward vertical edge of one bag and the forward vertical edge of a proximate bag, said sealing means operating while said web is being advanced, said sealing means including additional means for cutting the web so as to sever the bags centrally between the seals and so as to leave the bags connected to each other along the open mouth of the bag, means for opening the mouth of the bag, means for sealing the mouth of the bag and means for severing the bag from the web.

3. A bag making, filling and closing machine comprising a source of continuous web material, means for forming a double web and closing the bottom edge of said double web, means for intermittently advancing the double web predetermined distances, means for vertically securing the web together at the extremities of forming adjacent sides of separate bags, means for partially cutting the secured adjacent sides from one another, whereby a plurality of connected bags are formed in the web, means for securing the top edge of the last bag in the web and cutting same from the web, and means for synchronizing the function of the top edge securing means with the vertical securing means whereby the said functions of said means are taking place simultaneously as the web advances.

4. A bag making, filling and closing machine comprising a source of continuous web material, means for forming a double web and closing the bottom edge of said double web, means for intermittently advancing the double web predetermined distances, vertical means for securing the double web together and forming adjacent sides of separate bags, said vertical means providing means for partially cutting the adjacent sides of said bags from one another, said vertical means operating as the web is advancing, whereby a plurality of connected bags are formed in the web, means for severing the top edge of the last bag in the web, said horizontal means providing means for severing the last bag from the web, a control means for causing said vertical and horizontal means to operate simultaneously as the web advances.
A bag making, filling and closing machine comprising a source of continuous web material, means for forming a double web and closing the bottom edge of said double web, means for intermittently advancing the double web predetermined distances, vertical means for securing the double web together and forming adjacent sides of separate bags, means for partially cutting the adjacent sides of said bags from one another whereby a plurality of partially connected bags are formed in the web, a filling station, means for opening said bag beneath the filling station, means for securing the top edge of the last bag in the web, means for causing said bags to advance while the web is stopped, means for separating the unclosed top of the double web while said web is advancing, means for closing the top of the double web while said web is advancing, and means for finally severing the newly closed bag from the web.

A bag making, filling and closing machine comprising a source of continuous web material, means for forming a double web and closing the bottom edge of said double web, means for intermittently advancing the double web predetermined distances, vertical means for securing the double web together and forming adjacent sides of separate bags, means for partially cutting the adjacent sides of said bags from one another whereby a plurality of partially connected bags are formed in the web, a filling station, means for opening said bag beneath the filling station, means for securing the top edge of the last bag in the web, means for causing said bags to advance while the web is stopped, means for separating the unclosed top of the double web while said web is advancing, means for closing the top of the double web while said web is advancing, and means for finally severing the newly closed bag from the web.
said web to their previous position, means for closing said opening means, and control means for operating said returning means and said closing means simultaneously, horizontal means for securing said last bag from the web, and a control means for causing said vertical means and said horizontal means to operate simultaneously as the web advances.

12. A bag making, filling and closing machine comprising a source of continuous web material, means for forming a double web and closing the bottom edges thereof, web feeding clamps for intermittently advancing the double web predetermined distances, a web feeding clamp being on each side of the double web, means for moving the web feeding clamps toward the web from each side so as to contact and hold the web and means for advancing said clamps and said web predetermined distance while contacting the web, means for separating the web feeding clamps, means for returning the web feeding clamps to their previous position prior to contacting the web, means for holding the web when said feeding clamps are separated, means for horizontally closing the web at predetermined locations, means for partially cutting the web at said locations, said last two means functioning while said web is advancing, a filling station, reciprocating clamp means for causing slack in the top edge of the bag beneath the filling station, said reciprocating means consisting of a plurality of members located on opposite sides of said web, means for engaging each of said members with the web, means for moving said members with the web toward the direction of the source of said web, means for opening the top edge of said bag located between the inner surfaces of said double web, means for separating said opening means, means for returning said members and said web to their previous position, means for closing said opening means, and control means for operating said returning means and said control means simultaneously, horizontal means for securing the top edge of the last bag in the web, means for severing the last bag from the web, and control means for causing said vertical means and said horizontal means to operate simultaneously as the web advances.

13. A bag making, filling and closing machine comprising a source of continuous web material, means for forming a double web, and closing the bottom edges of said double web, web feeding clamps for intermittently advancing the double web predetermined distances, a web feeding clamp being on each side of the double web, means for moving the said feeding clamp toward the web from each side so as to contact and hold the web, and means for advancing the said clamps and the web said predetermined distance while said clamps are contacting the said web, means for separating the web feeding clamps from the web, means for returning the web feeding clamps to their previous position prior to contacting the web, a plurality of holding clamps, one of each of said holding clamps being on each side of the double web, means for causing said holding clamps to engage the web when said web feeding clamps are separated, and forming adjacent sides of separate bags, vertical means for securing the double web together and forming adjacent sides of separate bags, said vertical means providing separate means for partially cutting the adjacent sides of said bags from one another, said vertical means operating as the web is advancing, whereby a plurality of connected bags are formed in the web, a filling station, clamping means for causing slack in the top edge of the bag beneath the filling station, said clamping means consisting of a plurality of members located on opposite sides of said web, means for engaging each of said members with the web, means for moving said members with the web toward the direction of the source of said web, means for opening the top edge of said bag located between the inner surfaces of said double web, means for separating said opening means, means for returning said members and said web to their previous position, means for closing said opening means, and control means for operating said returning means and said closing means simultaneously, horizontal means for securing the top edge of the last bag in the web, means for severing the last bag from the web, and a control means for causing said vertical means and said horizontal means to operate simultaneously as the web advances.

14. A bag making, filling and closing machine comprising a source of continuous web material, means for forming a double web, means for advancing the double web predetermined distances, means for vertically securing the surfaces of the double web at predetermined locations, means for partially cutting the web at said locations, means for causing said web to move simultaneously as the web advances so that the end of the cut is parallel with the top edge of the web, whereby the area between the parallel cut and the top edge connects the newly formed bags together in the web.

15. A bag making, filling and closing machine comprising a source of continuous web material, means for holding the web web material so as to have a closed portion, means for advancing the web material predetermined distances intermittently, a first sealing means for causing the rearward vertical edge of one bag and the forward vertical edge of a proximate bag, said sealing means operating while said web is being advanced, said sealing means including additional means for cutting the web so as to sever the bags centrally between the seals and so as to provide a cut that is continuous and turns in a parallel direction to the top edge of the web and to provide the bags are connected to each other along the top portion of the web, a filling station, means for causing slack in the top edge of the bag beneath the filling station, means for opening the bag beneath the filling station, horizontal means for securing the top edge of the last bag in the web, means for severing the bag from the web, and a control means for causing said vertical means and said horizontal means to operate simultaneously as the web advances.

16. A method of making a bag comprising the steps of folding a web so that there are two face to face surfaces, securing the web vertically at predetermined distances, cutting the web in the middle of each of said seals and making said cut continue above the seal and changing the direction of said cut so that it is parallel to the top edge of said web, whereby said bags remain connected to each other, and sealing the top edge of said bag below and adjacent to said parallel cut whereby a tear in the web occurs between the parallel cut and the seal will reopen said bag.

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