ABSTRACT: A folded web of thermoplastic material, such as polyethylene, is fed to a bag-making machine set up to produce side weld bags. The folded edge of the web encounters a gussetting attachment which forms a reverse fold at this edge. Downstream of the gussetting attachment an apparatus is provided for removing a generally triangular web portion from the gusseted margin of the web by a heated cutting and sealing bar having a configuration corresponding to the removed web portion. During removal of a web portion, hereinafter sometimes referred to as a slug or a chip, areas coming in contact with the cutting and sealing bar are rendered molten. Immediately after removal, the chip is brought in firm contact with a paper web which is located immediately below the thermoplastic web and the molten edges of the chip become attached to the paper web. During each cycle of the bag machine the paper web is indexed to present an additional area for reception of a chip. The chips are attached to the paper web in shingled or overlapping relation. The web portion carrying the waste slugs or chips is fed to any suitable waste receptacle that may be located adjacent the bag machine.
METHOD AND APPARATUS FOR MAKING SQUARE BOTTOM BAGS FROM THERMOPLASTIC WEB MATERIAL

SUMMARY OF THE INVENTION

A bag machine which can be adapted to utilize the subject matter disclosed in the present application is shown and described in U.S. application Ser. No. 760,048 filed Sept. 16, 1968 and assigned to the assignee of the present invention. The bag produced by the present invention is shown and described in Canadian Pat. No. 672,445 issued on Oct. 15, 1963 and Pat. No. 699,592 issued Dec. 8, 1964. The disclosure of the United States application and the Canadian patents are included herein by reference.

The square bottom bag-making mechanism of the present invention is adapted for use with a bag machine which is arranged to produce side weld bags. In making bags of this type the bag-making machine has an unwind stand supporting rolls of suitable thermoplastic web. The unwind web passes through a folding board which constrains the web to fold along its longitudinal median, if so-called even-edged bags are desired, or along a line spaced from and parallel to the longitudinal median of the web, when it is desired to produce lipped bags. The present disclosure will make reference to lipped bags.

After the thermoplastic web has been folded it encounters a gusseting mechanism, the details of which are described in detail in the above-referenced U.S. application. In producing a gusset the margin defined by the longitudinal fold is tucked inwardly between the adjacent panels of the folded web thereby providing at the gusseted portion four layers of web. When viewed in transverse cross section the gusseted portion of the web assumes a shape similar to the letter “W”. Accordingly at the gusset four layers of web are provided.

After the gusset is formed that margin of the web containing the gusset comes under the influence of a heated reciprocating cutting and sealing bar. The seal bar is shaped to remove a generally triangular slug or chip from the thermoplastic web and at the same time the molten edges of the cutout portion are brought in forcible contact with a web of paper underlying the thermoplastic web and the seal bar. Such action fixes the slug or chip to the web of paper and, as the seal bar is raised, the web of paper is indexed so that a subsequent chip or slug may be welded to the web of paper. The slugs removed from the gusset portion of the thermoplastic web assume a shingled array on the web of paper. Thereafter the thermoplastic web is moved in step-by-step fashion between a linear transversely extending seal bar which makes the side welds of the bag with the side weld passing through the intersection of or the apex of the triangular cutout portion of the web. After formation of the side weld the bag is completed and it assumes a configuration substantially identical to that shown in FIG. 14 of Canadian Pat. No. 699,592.

Accordingly it is one feature of the present invention to provide an apparatus for making square bottom bags from heat-sealed thermoplastic material by removing a generally triangular slug or chip from the gusseted portion of such web. Producing square bottom bags in this manner differs substantially over the methods shown in the reference Canadian patents which in some embodiments shows a seal bar having a Y-configuration to produce the side weld simultaneously with an angled sealed portion. By performing these steps sequentially the present invention provides a convenient method of removing the slugs or chips and securing them on a web of paper which can be easily disposed of in an easily removable container positioned adjacent the bag machine. Use of the methods shown in the Canadian patent makes chip removal difficult since the presence of the seal roll for producing the side weld simultaneously with the weld at the bag gusset does not provide space to place a convenient chip or slug removal system.

It is a further feature of the present invention to locate the seal bar of a square bottom bag attachment a substantial distance from the thermoplastic web whenever the bag machine operation is interrupted. By providing this feature injury to the thermoplastic web, due to the heat generated by the seal bar, is prevented. To achieve this function the present invention provides a pneumatically operated actuator whose operation is controlled by the control circuit of the bag machine. In the event web development is arrested the pneumactic actuator is pressurized to lift the seal bar approximately 2 inches above the surface of the thermoplastic web.

It is a further and equally important feature of the present invention to provide a square bottom bag attachment which is easily adjustable longitudinally and transversely of the bag machine in order to accurately locate the seal bar of the square bottom bag attachment.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a perspective of a portion of a bag machine incorporating the square bottom bag attachment of the present invention;

FIG. 2 is an enlarged partial plan view of the attachment shown in FIG. 1;

FIG. 3 is a elevation with portions broken away, of FIG. 2 taken substantially along the line 3-3;

FIG. 4 is a longitudinal section taken substantially along the line 4-4 of FIG. 3;

FIG. 5 is a fragmentary view illustrating the drive for intermittently feeding the slug-carrying paper web;

FIGS. 6, 7 and 8 show, respectively, the seal bar in its lowered web-contacting position, in its raised position during indexing of the thermoplastic web and in the high-lift position which occurs when operation of the bag machine is interrupted;

FIG. 9 is a schematic of the electrical and pneumatic circuit for controlling operation of the square bottom bag attachment;

FIG. 10 is a perspective of a completed bag; and

FIG. 11 is an enlarged plan showing removed ships or slugs attached to a portion of the paper web.

In FIG. 1 there is shown a fragmentary portion of a bag machine, generally designated by the numeral 20, which is set up to make side weld bags by providing a linear transversely extending heated seal bar 22 under which is intermittently moved a thermoplastic web TW moved in a direction indicated by the arrow D. The bag machine 20 includes side frame members 24 and 26 supporting a square bottom bag attachment 28 which is mounted for transverse and longitudinal adjustment relative to the web TW. The manner in which this is accomplished will be described presently.

Directly below the seal bar 22 an intermittently rotating seal roll 30 is provided for supporting the web TW and it is mounted for rotation in the side frames 24 and 26. The web TW supplied to the bag machine is folded on itself along a line parallel to its longitudinal median to define a lower panel LP and a upper panel UP with the lower panel being longer, when measured along a line normal to the direction of web movement, by an amount designated by the letter L indicated the tip of a completed bag. The folded web is then subjected to the action of a gusseting mechanism 32 which tucks the folded edge of the web inwardly forming a gusset indicated by the dash line 34. For details concerning the construction and operating of the gusseting mechanism 32 reference should be made to the U.S. application hereinafore noted. For purpose of the present disclosure, however, it will be observed that the gusseting mechanism comprises a elongate support member 36, carrying and extending between, gusseting plates 38 thus locating these plates in vertically spaced relationship. A gusseting wheel 40 is located between the plates 38 and it is supported for rotation with such rotation being occasioned by movement of a web TW. Such an arrangement of the gusseting plates 38 and the gusseting wheel 40 constrains the folded edge of the web to tuck inwardly forming the gusset 34.
Still referring to FIG. 1 it will be observed that the square bottom bag attachment 28 is carried by the side frames 24 and 26 and it is mounted for longitudinal and transverse adjustment relative to the bag machine frame. The attachment 28 comprises a frame structure 42 made of transverse bars 44 and 46 interconnected at one end by a crossmember 48 and at the other end (FIGS. 4 and 5) by a rotatable unwind shaft 50 and a shaft 52 carrying a feed roll 56. The shafts 50 and 52 are rotatably mounted in opposed plates 60 and 62 which are secured to the transverse bars 44 and 46, respectively. An elongate shaft 64 carrying pinions 66 and a handwheel 68 is rotatably supported in the crossmember 48 and a short bearing block 70 attached to the transverse bar 46. The pinions 66 are in meshing engagement with racks 72 secured to the inner surfaces of the side frame members 24 and 26. From the above-described construction it will be readily appreciated that rotation of the handwheel 68 effects longitudinal movement of the attachment 28.

To provide for transverse adjustment of the attachment 28 a base plate 74 is slidably mounted on the transverse bars 44 and 46. To lock the base plate in its adjusted transverse position cross clamps 75 are provided.

Referring to FIG. 4 it will be observed that each clamp comprises a generally rectangular bar 76 underlying the lower surface of the transverse bars 44 and 46. A screw 78 is threaded into each bar 76 and is provided with a handwheel 80 which when turned in the appropriate direction tightens the end of the screw 78 against the transverse bars 44 and 46 thereby clamping the attachment 28 in the desired position. While the clamping arrangement shown is designed for simplicity of operation and economy of manufacture it is to be appreciated that a rack and pinion arrangement such as used for longitudinal adjustment of the attachment can also be provided to effect transverse adjustment.

A web of paper designated by the letters PW is unwind from a paper roll 82 in the direction indicated by the arrow E and it is directed by idler rolls 84 and 86 to travel over the upper surface of the base plate 74 toward the feed roll 56. Supported on the base plate 74 is a generally U-shaped bridge member 88 having mounted thereon an upwardly extending post 90 provided with a laterally extending cantilevered portion 92 which together support pneumatic cylinders 94 and 96. A box 98 is provided for containing suitable electrical connections the purpose for which will be hereinafter described.

The rod of the cylinder 96 is secured to a crosshead 100 of generally triangular configuration. Attached to and extending downwardly from the crosshead 100 are rods 102 carrying at their lower ends a right-angle seal bar 104. The seal bar is vertically reciprocated by the cylinder 96 in time relation with the intermittent movement of the thermoplastic web TW and it is effective to remove a triangular slug or chip of the thermoplastic web to produce wedgelike notches 106 in the web TW as shown in FIG. 1.

The chip or slug removed by the seal bar 104 is fused onto the paper web PW and such action is illustrated on enlarged scale in FIG. 11. Referring to this FIG. it will be noted that four slugs of thermoplastic web are shown. One of them is drawn in solid line and it is indicated by the numeral 108. When the cutting and sealing bar 104 is forcibly driven downwardly by the cylinder 96 the thermoplastic web is severed by heat and pressure along lines 110 and 112 which intersect and define one angle of the triangular slug or chip 108. The margins 110 and 112 are rendered molten by the action of the cutting and sealing bar 104 and since they are brought in firm engagement with the paper web PW, the result is that the chip or slug 108 becomes attached to the web PW.

Downstream of attachment 28 (to the left as viewed in FIG. 1) it will be observed that the folded and gusseted thermoplastic web TW is provided with a series of the wedgelike notches 106 defining an apex 114. The distance the thermoplastic web is indexed to produce a bag is determined by the distance between the apex 114. The action of the straight cutting and sealing bar 22 is coordinated to sever the web along a line passing through the apex 114. This is shown in FIG. 1 where upstream of the reciprocating seal bar 22 the resulting bags produced by the apparatus are shown and are indicated by the letter B.

According to the above description it should be readily apparent that the present invention provides a mechanism, associated with a side weld bagging machine, for producing thermoplastic bags which when expanded and filled with product define a square bottom configuration, and that the slugs or chips removed from the thermoplastic web are attached to a disposable paper web thereby providing an economical and commercially acceptable arrangement for disposing the waste product. Such an arrangement obviously improves the working conditions of the environment, substantially reduces the possibility of machine malfunction and the cost of maintaining the working environment clean.

In describing the specific constructional details of the square bottom bag attachment reference will be made to FIGS. 2 through 5. Referring first to FIGS. 2 and 3 it will be seen that the base plate 74 is provided with a cavity 116 in communication with a conduit 118 connected to an elbow 120. The conduit 118 is connected to a vacuum source to establish a value of pressure in the cavity of 116 below atmospheric pressure. The use of vacuum serves to pull the paper web PW in firm engagement with a platen 122 overlying the cavity 116. A portion of the paper web is subjected to the action of vacuum by virtue of providing a series of ports 124 in the platen 122. As shown in FIG. 2 the ports 124 lie along lines defining a right angle and are closely spaced from the margin of a right angle insert 126 which is made of silicone rubber. It will also be observed from examination of FIG. 2 that the heated sealing and cutting bar 104 lies within the projected area of the insert 126. As is known to those skilled in the art use of silicone rubber allows cutting and sealing of thermoplastic webs without causing sticking of the web on the anvils. The series of holes 124 therefore exert a force on the paper web distributed along lines which are closely adjacent and conform to the shape of the cutting and sealing bar 104. Such a configuration of the ports prevents lifting of the paper web when the seal bar 104 is moved upwardly by the cylinder 96. To assure smooth wrinkle-free feeding of the web TW over the insert 126 a deflector plate 127, attached to the base plate 74, is provided.

The mechanism supplying and feeding the paper web PW to the attachment 28 is shown best in FIG. 4. Reference to this FIG. will reveal that the paper roll 82 is mounted on the unwind shaft 50 and it is associated with a drag brake 130 which serves to restrain rotation of the roll 82 so that some value of tension is always maintained on the paper web PW. From the roll 82 the paper web PW engages an idler roll 132 which directs the web below the base plate 74 and thence the web makes contact with idler rolls 84 and 86 guiding the web PW to pass over the insert 126 supported in the platen 122. The web, PW is then directed around the roll 56 and around a roll 133. Rolls 56 and 133 are in contact to thereby provide nip pressure utilized to feed the paper web. As shown in FIG. 2 the rolls 56 and 86 are rotatably mounted in plates 134 and 136 which are in turn suitably fastened to the base plate 74.

Intermittent feeding of the paper web is necessary since a free or clean area of web is necessary in order to fuse a slug or chip thereto as described above. Feeding of the paper web PW will be described in connection with the structure illustrated in FIGS. 4 and 5. Since FIG. 4 is a longitudinal section of the attachment 28, it is to be understood that some of the parts are not shown however the parts omitted are duplicates of those illustrated. In FIG. 4 it will be observed that a shaft 137, rotatably supporting the roll 133, is mounted on one end of arms or links 138 (only one of which is shown) while the other end of the links 138 are pivotally supported on a shaft 160 carried by plates 60 and 62. By this arrangement the weight of arms 130, the roll 133 and the shaft 137 apply nip pressure to the web passing between the rolls 56 and 133.
The roll 56 is indexed by a mechanism 142 which is operated in time relation with the actuation of the cylinder 96. The particular details of the arrangement will be described in connection with FIG. 9. Referring to FIG. 5 it will be seen that the mechanism 142 comprises a pneumatic actuator 144 secured to a bracket 146 bolted to the plate 62. The actuator is supplied with pressure fluid by a conduit 148 which causes the rod 150 of the actuator to project outwardly therefrom while retraction of the rod 150 is occasioned by a spring 152, shown in FIG. 9. The end of the rod 150 is pivotally connected to a lever arm 154 by a connector 156 having a pivot bolt 158 extending therethrough. The arm 154 provides an input to a clutch 160 which imparts unidirectional rotation to the shaft 52 connected thereto to effect intermittent rotation of the roller 56 each time the actuator 144 is supplied with fluid pressure. The particular clutch employed in the practice of this invention is conventional in nature.

In operation when pressure fluid is applied to the conduit 148 the rod 50 is extended to the right, as viewed in FIG. 5, causing rotation of the shaft 52 through the clutch 160. When line 148 is connected to exhaust the spring 152 retracts the rod 150 rotating the arm 154 of the clutch but during this direction of movement no rotation is imparted to the shaft 52 since in this direction of movement the clutch slips. The actuator 144 is extended and retracted in time relation with movement of the thermoplastic web TW such that when the thermoplastic web is indexed the actuator 144 supplied with pressure fluid moving the paper web PW a sufficient amount to receive a subsequent slug or chip.

In accordance with another feature of the present invention the bag attachment 28 raises the seal bar 104 a substantial distance above the plane in which the thermoplastic web travels whenever the bag machine is stopped for any forseeable reason. The manner in which such action is coordinated with the operation of the bag machine will be explained in connection with the showing of FIG. 9. For the present however the structural arrangement for achieving this result we described with reference to FIG. 4. The post 90 is formed with a bore 162 keyed for reception of an elongate key 164. Slidably mounted within the bore is a column 166 which is rigidly attached, by means of a bolt 168, to the bridge member 88. The cylinder 94 includes the usual outwardly extending rod 170 which is rigidly attached to the column 166 by a threaded connection 172. This connection is fixed by a locknut 174. The head end and rod end of the cylinder 94 are supplied by conduits 176 and 178, respectively, which are made of flexible plastic tubing. When the attachment 28 assumes its high-lift position the head end of the cylinder 94 is supplied with pressure fluid through the conduit 176. Under these circumstances the post 90 and the apparatus carried thereby moves vertically upwardly relative to the column 166. The relationship of parts under these circumstances are shown in FIG. 8.

In FIG. 4 it will be observed that the seal bar 104 is provided with an electric heater 180 which is thermostatically controlled to provide sufficient heat to seal and sever the thermoplastic web while maintaining the heat at a level which will prevent burning of the paper web PW.

The crosshead 100 is connected to the rod 182 of the cylinder 96 by a threaded connection 184 and it is also supplied with a locknut 186. The cylinder 96 is connected to conduits 188 and 190 which supply pressure fluid to the head end and rod end thereof, respectively. The cylinder 96 actuates the seal bar 104 through a short stroke for bringing the seal bar in engagement with the gusseted portion of the thermoplastic web TW to produce the wedgelike notches 106.

To prevent misalignment of the seal bar 104 a guide bar 192 is secured to the cantilevered portion 92 of the post 90. The bar is slidably received in a closely fitting U-shaped slot 194 formed in the crosshead 100. By this arrangement possible turning action of the seal bar 104 relative to the longitudinal axis of the cylinder 96 is reliably prevented.

In FIGS. 6, 7 and 8 there is shown the relationship of structure of the attachment 28 during normal operation of the bag machine and the relationship assumed when the bag machine is stopped. First referring to FIG. 6 it will be seen that the seal bar 104 is in firm engagement with the platens 122 which occurs when a slug or chip is being removed from the thermoplastic web TW and attached to the paper web PW.

This is achieved when the head end of the cylinder 96 is supplied with pressure fluid by a conduit 188 while the conduit 190 connects the rod end of the cylinder 96 to exhaust. In FIG. 7 the seal bar 104 is shown in its raised position which is assumed when the web TW is indexed. In raising the seal bar 104 the head end of the cylinder 96 is connected to exhaust while the rod end is supplied with pressure fluid by the conduit 190. During normal operation of the square bottom bag attachment 28 pressure fluid is continually supplied to the rod end of the cylinder 94 through the conduit 178 while the head end is connected to exhaust through the conduit 176. In this way the post 90 is held in firm engagement with the supporting bridge member 88. Under these conditions the cylinder 94 may be said to perform the function of a fluid clamp.

When operation of the bag machine is interrupted for any reason the circuit is conditioned to energize a fluid control valve 196 (FIG. 9) to connect the conduit 178 to exhaust and simultaneously therewith connect the conduit 176 to the source of fluid pressure thereby raising the seal bar 104 to a supine position column 66. As will be observed by inspection of FIG. 8, which shows the high-lift position, the seal bar 104 is lifted a substantial distance above the surface of the thermoplastic web. This prevents thermal damage to the thermoplastic web.

One manner in which the high-lift cylinder 94, the stroke length 96 and the actuator 144 may be interconnected electrically and pneumatically is shown in FIG. 9. Reference to this FIG. will reveal a manually operable selector switch SW1 provided with contacts C1, C2 and C3 which condition the circuit to operate the control valve 196 and a similar control valve 198 for what will be termed normal operation (contacts C1), actuating the cylinder 94 to raise the post 90 and achieve the high-lift condition (contacts C2), and admit pressure fluid to the rod end of cylinder 94 through conduit 178 to lower the post 90 (contact C3). Contacts C2 and C3 of switch SW1 are used for purposes of setup and maintenance.

Power from the main circuit of the bag machine is supplied to the circuit shown in FIG. 9 by lines L1, L2, L3 and L4. A switch SW2 in a line 200 is operated by a cam 202 in contact with a follower 204. The cam 202 is secured to the drive train of the bag machine. Control valves 196 and 198 are provided with solenoids 208 and 210, respectively, which when energized move spools 212 and 214 to the right (as viewed in FIG. 9) compressing springs 216 and 218.

Air under pressure is supplied to the fluid circuit by conduit 220 while pressure air is exhausted to the atmosphere from the cylinder 94 by a conduit 222 and from the cylinder 96 and the actuator 144 by a conduit 224. During normal operation, that is, while web development is in progress, the switch SW1 is manually adjusted to electrically connect L2 and L3 to conductors 199 and 200. Under these circumstances solenoid 208 remains energized thereby maintaining the spool 212 positioned to establish communication of the conduit 178 with the source of pressure fluid admitted by the conduit 220.

While in this position the spool 212 connects the head end of the cylinder 94 through the conduit 176 to the exhaust conduit 222 maintaining the post 90 in its lowered position.

During operation of the bag machine the switch SW2 is opened and closed by the action of the cam 202 and a solenoid 226. Such action energizes and deenergizes the solenoid 210 causing the spool 214 of the control valve 198 to be reciprocated. The spool 214 is shown in the position it assumes when the solenoid 210 is energized. In this position the conduit 188 is in communication with the conduit 220 and the exhaust conduit 224 is in communication with the
Pressure fluid supplied to the cylinder 96 by the conduit 188 forces the cutting and sealing bar 104 in firm engagement with the thermoplastic web removing a slug or chip and fusing the slug or chip onto the paper web.

When the cam 202 and the spring 226 open the switch SW2, the solenoid 210 is deenergized causing the spool 214 to be moved to the left due to the force supplied by the spring 218. With the spool 214 in this position, pressure fluid supplied by the conduit 220 is communicated to the conduit 148 and 190 while conduit 188 is connected to the exhaust conduit 224. It should be noted that the clutch operated by actuator 144 rotates the shaft 52 a limited amount for feeding the paper web PW during the increment of time that the solenoid 210 is deenergized raising the seal bar 104 a limited amount. The valves are tuned so that indexing of the web PW occurs immediately after the seal bar 104 starts lifting.

When the switch SW1 is adjusted to engage contacts C2, solenoids 208 and 210 are deenergized rendering the pressure fluid supplied by the conduit 220 to raise the seal bar 104 and the post 90 to its high-lift position. When the switch SW1 is adjusted to make contact with contact C3 the solenoid 208 is energized moving the spool 212 to establish communication between conduits 178 and 220 lowering the post 90. As mentioned above, contacts C2 and C3 are utilized during set up and maintenance of the attachment 28.

The complete bag shown in FIG. 10 is partially expanded to illustrate the shape it assumes at its bottom. The bottom panels of the bag are designated as 34a and 34b and are defined by fold 34, folds 34c and 34d and welded edges 110a and 112a produced by the cutting and sealing bar 104. In making bags of this nature the web TW is provided with a printing pattern which applies inot that portion of the web which will constitute panels 34a and 34b. Ink on this portion prevents welding or fusing of margins 110a and 112a thus allowing the bag to expand to its square bottom configuration.

Having thus described the invention, that which is believed to be new, and for which protection by letters patent is desired, is:

I claim:

1. An apparatus for making square bottom bags of thermoplastic web material comprising means for forming a gusseted web, which is intermittently fed by a bag machine, a heated cutting and sealing bar operative when the thermoplastic web is at rest, for removing a triangular portion of such web from the gusseted portion thereof, means underlying the thermoplastic web and engaged by said cutting and sealing bar for retaining the removed triangular portion of the web, a heated bar for transversely cutting and sealing a thermoplastic web at longitudinally spaced intervals along a line that intersects the apex of the removed triangular portions, means for reciprocating said first-mentioned cutting and sealing bar, said retaining means including a paper web payed out from a supply roll, means for intermittently advancing said paper web in timed relation with the reciprocation of said first-mentioned cutting and sealing bar to present a clean or free zone of paper so that a subsequent triangular portion of the thermoplastic web can be attached to the paper web.

2. An apparatus for making square bottom bags of thermoplastic web material comprising means for forming a gusseted web, which is intermittently fed by a bag machine, a heated cutting and sealing bar operative when the thermoplastic web is at rest, for removing a triangular portion of such web from the gusseted portion thereof, means underlying the thermoplastic web and engaged by said cutting and sealing bar for retaining the removed triangular portion of the web, a heated seal bar for transversely cutting and sealing the thermoplastic web at longitudinally spaced intervals along a line which intersects the apex of the removed triangular portion, and a platen engageable by said cutting and sealing bar, said retaining means including means for moving a paper web over said platen.

3. An apparatus for making square bottom bags of thermoplastic web material comprising means for forming a gusseted web, which is intermittently fed by a bag machine, a heated cutting and sealing bar operative when the thermoplastic web is at rest, for removing a triangular portion of such web from the gusseted portion thereof, means underlying the thermoplastic web and engaged by said cutting and sealing bar for retaining the removed triangular portion of the web, a heated seal bar for transversely cutting and sealing the thermoplastic web at longitudinally spaced intervals along a line that intersects the apex of the removed triangular portions, and means for supporting and moving a paper web relative to said cutting and sealing bar.

4. An apparatus for making square bottom bags from a longitudinally folded intermittently moving thermoplastic web having the folded margin tucked inwardly to form a gusset, said apparatus comprising a reciprocable heated cutting and sealing bar having web-engaging edges disposed to define an angle of 90°, said seal bar engageable with a platen located to underlie at least the gusseted portion of the thermoplastic web and effective to momentarily render selected portions of the web molten, a paper web located between said platen and said thermoplastic web, and means for feeding said paper web in timed relation to the reciprocation of said seal bar, said seal bar being effective to remove a portion of said thermoplastic web from the gusseted portion thereof with said portion being of a triangular configuration whose sides are defined by the gusseted margin of the web and intersecting margins at substantially 45° thereto which intersect at the gusset fold, said triangular portion becomes attached along its molten margins when brought in contact with said paper web.

5. The apparatus of claim 1 wherein the triangular portions of thermoplastic web assume an overlapping or shingled relationship on said paper web.

6. The apparatus according to claim 2 wherein said holding means comprises a series of ports in communication with a source of vacuum.

7. The apparatus according to claim 1 further comprising a fluid-operated actuator for reciprocating said cutting and sealing bar to effect removal of such triangular portions, and a fluid-operated actuator rendered effective to move said cutting and sealing bar a relatively substantial distance away from the thermoplastic web.

8. The apparatus according to claim 7 wherein control means are provided for operating said fluid actuators.