Jan. 2, 1968 W. H. F. GROB 3,361,041

METHOD AND APPARATUS FOR MAKING GUSSETED HEADER BAGS

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FIG. 1A.

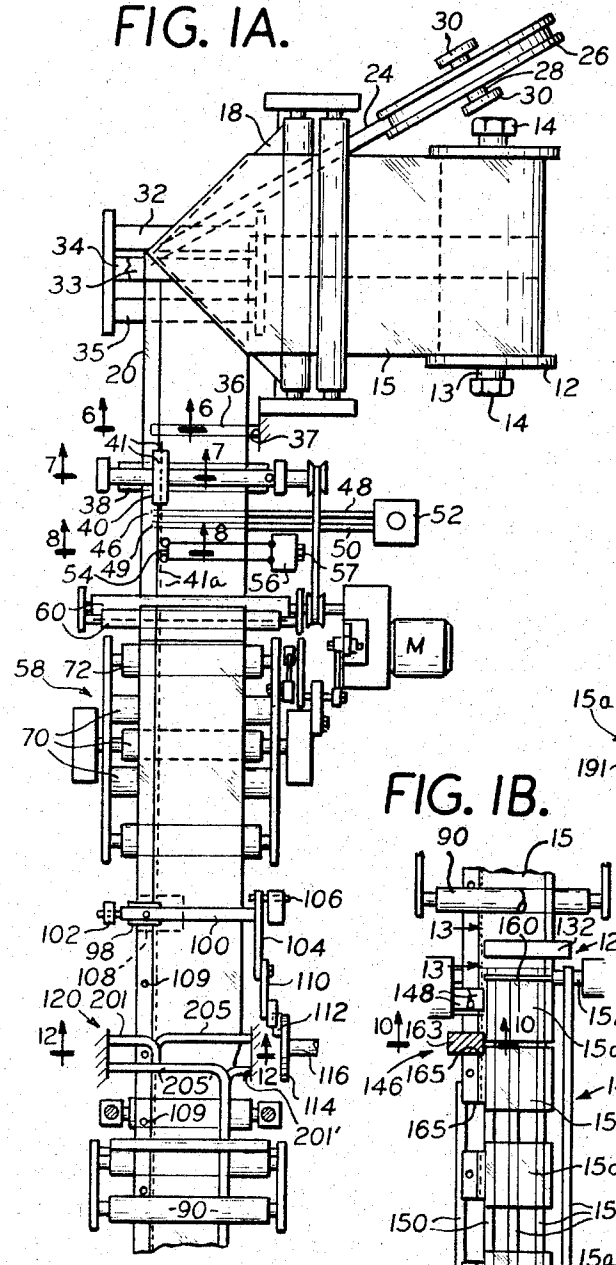


FIG. 2.

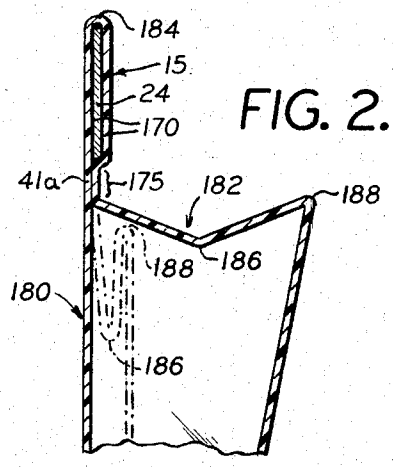


FIG. 3.

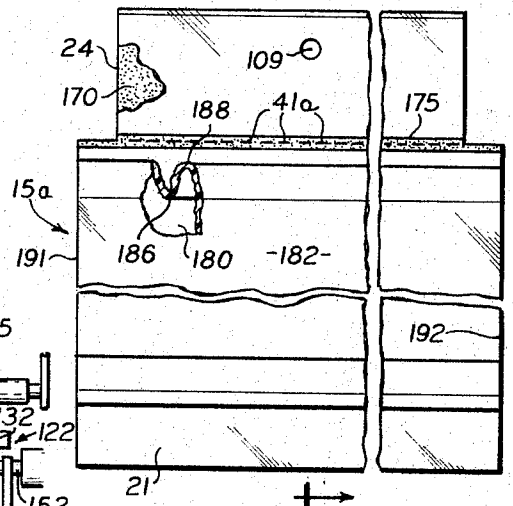
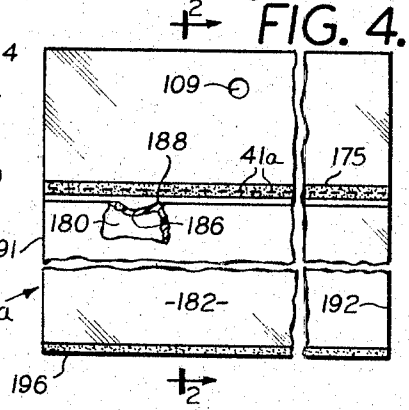


FIG. 1B.

FIG. 4.



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METHOD AND APPARATUS FOR MAKING GUSSETED HEADER BAGS

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FIG. 5.

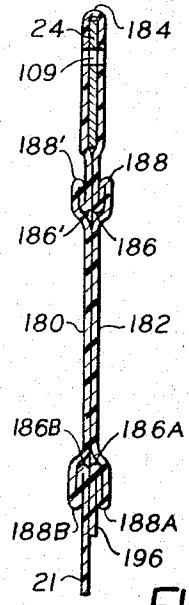


FIG. 6.

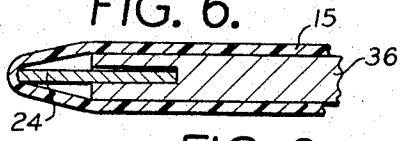


FIG. 8.

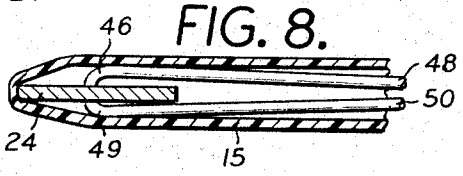


FIG. 7.

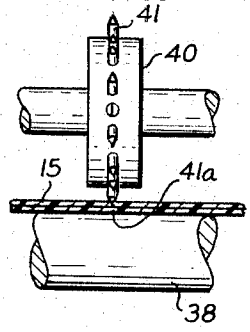


FIG. 9.

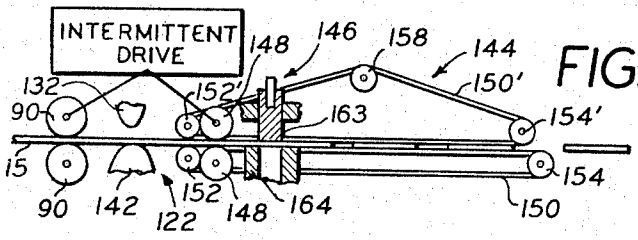


FIG. 10.

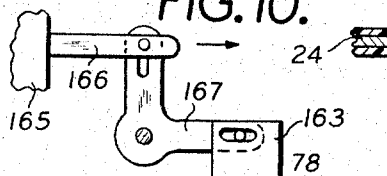


FIG. 12.

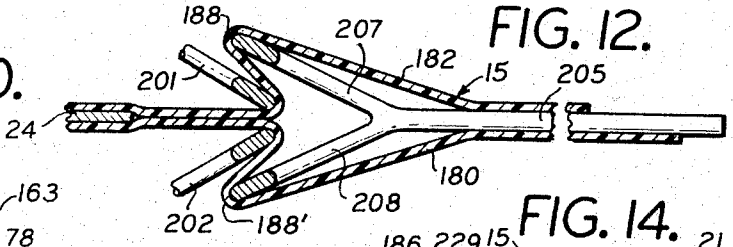


FIG. 14.

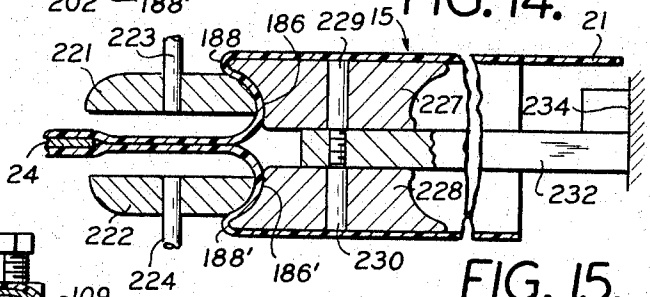


FIG. 11.

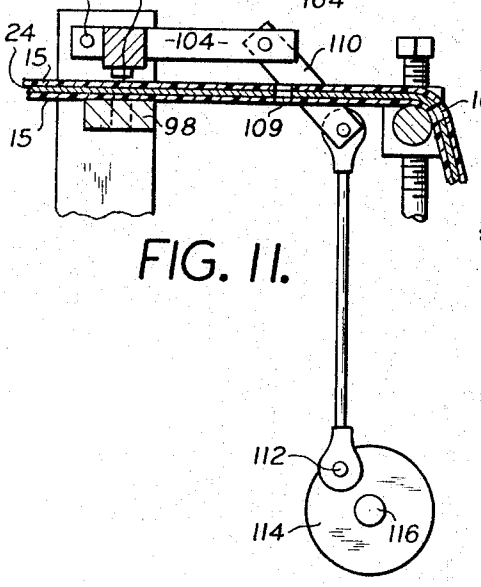


FIG. 13.

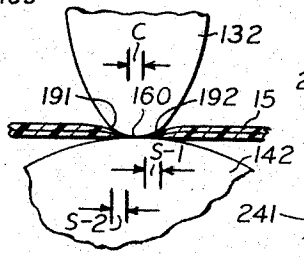
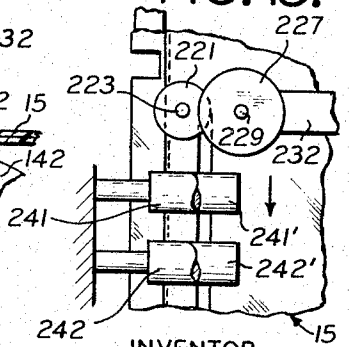


FIG. 15.



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United States Patent Office 3,361,041 Patented Jan. 2, 1968

3,361,041

METHOD AND APPARATUS FOR MAKING GUSSETED HEADER BAGS

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Filed Jan. 13, 1964, Ser. No. 337,446
12 Claims. (Cl. 93—8)

This invention relates to the making of bags, especially plastic bags, with a header by which the bag is hung from a storage or display hook, and with gussets for folds immediately below the header for expanding the width of the bag for holding bulky merchandise.

The usual type of header bag is made of a web of heat sealable plastic material, such as polyethylene, and the web is folded lengthwise near its middle with a reinforcing or stiffening strip located within the fold. The web is heat sealed and severed along transversely extending and longitudinally spaced regions to form separate bags which are open at their bottoms; the bottom being the part most remote from the fold of the web. After filling, the bottoms are heat sealed to close the bags.

This invention will be described as applied to improvements in that kind of bag, but it will be understood that some features of the invention are applicable to other bag manufacture within the scope of the appended claims.

In order to make a bag of the character indicated, capable of holding bulky merchandise, the bags are made with another fold in one or both sides, immediately below the reinforcing strip, to form a gusset in the folded side so that the bag can open to a much larger inside cross section. Putting such folds or gussets in the bags has presented difficulties in the manufacture of the bags by usual methods. The continuous processes used for manufacturing put tensions on the web and with the usual cut-off methods, the tensions tend to pull the gusset folds out of the bags.

It is an object of this invention to provide an improved method of making header bags with gusset folds immediately below the header; and the improvement relates more particularly to the way in which the folded web is cut to form separate bags.

It is another object of the invention to provide a continuous process for making header bags with gusset folds and for severing the bag blanks from one another by a method and with apparatus that prevents tension on the web from distorting the gusset folds. In the preferred construction the bags are severed from one another in successive steps and in correlation with a delivery conveyor so as to leave a portion of the width of the folded web unsevered until after there is no longer any substantial tension on the folded web.

Other objects, features and advantages of the invention will appear or be pointed out as the description proceeds.

In the drawing, forming a part hereof, in which like reference characters indicate corresponding parts in all the views:

FIGURE 1 (shown in two parts 1A and 1B to fit the sheet) is a diagrammatic plan view of apparatus for making bags in accordance with this invention;

FIGURE 2 is a sectional view of a portion of the bag illustrating the way in which it opens up because of the folds below the header;

FIGURE 3 is a front view of one of the bags made in accordance with this invention, the bag being shown in its empty condition;

FIGURE 4 is a view similar to FIGURE 3 but showing the way in which the bag becomes narrower when filled with bulky merchandise;

FIGURE 5 is a sectional view taken on the line 5—5 of FIGURE 3;

FIGURES 6, 7 and 8 are enlarged, fragmentary, diagrammatic sectional views taken on the lines 6—6, 7—7 and 8—8, respectively, of FIGURE 1;

FIGURE 9 is a diagrammatic view of the apparatus for shearing notches in the folded web and for conveying bags from the apparatus;

FIGURE 10 is another view of the apparatus shown in FIGURE 9, this other view being an enlarged sectional view taken on the line 10—10 of FIGURE 1;

FIGURE 11 is an enlarged diagrammatic view showing the punch for making holes in the header in the apparatus illustrated in FIGURE 1;

FIGURE 12 is a greatly enlarged sectional view on the line 12—12 of FIGURE 1 and illustrating the folding of the front and back panels of the bag;

FIGURE 13 is an enlarged diagrammatic sectional view on the line 13—13 of FIGURE 1;

FIGURE 14 is a view similar to FIGURE 12 but showing a modified form of the invention; and

FIGURE 15 is a fragmentary, diagrammatic top plan view of the modified construction shown in FIGURE 14.

The bag making apparatus shown in FIGURE 1 includes a spool 12 rotatedly supported on an axle 13 from a fixed frame 14. A web 15 of plastic material, preferably polyethylene, is wound on the spool 12, and this web 15 is withdrawn from the spool and passes over a folder guide 18 which folds the web 15 along a line 20 parallel to the longitudinal edges of the web and offset sufficiently from the center line of the web so that one side of the fold extends some distance beyond the others to provide a flap 21 (FIGURE 5).

A strip 24 of reinforcing material, preferably cardboard, is fed into the fold in a manner such as illustrated in FIGURE 1. The strip 24 is withdrawn from a spool 26 supported by an axle 28 which is carried by a fixed frame 30.

The strip 24 can be fed into the fold across the spool 12, but the construction illustrated makes the apparatus more compact and facilitates the feeding of the strip by feed rolls 32 and 33 that grip the web 15 directly and the strip 24 by pressure of the folded web against the strip.

Beyond the feed rolls 32 and 33, the folded web 15, with the reinforcing strip 24 located in the fold, passes around a guide roll 34 and then across other guide rolls 35 to change the direction of travel of the folded web from a vertical course to a horizontal course.

In order to hold the reinforcing strip 24 firmly in the fold of the web 15, there is a rod 36 supported from a fixed support 37 and extending into the folded web 15 between the folds. The rod 36, which is best shown in FIGURE 6, has a slotted end and the reinforcing strip 24 fits into the slot and is held against the fold of the web by pressure from the bottom face of the slot.

Beyond the rod 36, the folded web passes over a roll 38 at a perforating station. Immediately above the roll 38 there is a perforating wheel 40 located in position to make a row of intermittent perforations through the web along a line immediately adjacent to the edge of the reinforcing strip 24. These perforations, which are optional, are used only on bags where it is desirable to have the mechandise compartment severable from the compartment that carries the reinforcing strip; that is, from the header of the bag. This permits the mechandise-carrying portion of the bag to be torn from the header without removing the header from its pin, rod or other support on a merchandising rack.

The perforations provided by cutters 41 on the perforating wheel 40, best shown in FIGURE 7, extend through both layers of plastic in the upper portion of the plastic

bags that are made from the folded web, or through a sealed zone that separates the upper and lower compartments of the bag from one another so that tearing of the bag from its support does not break the seal that encloses the merchandise-carrying compartment of the bag. A reference numeral 41A designates the perforations made by the cutters 41 on the perforating wheel 40.

In order to prevent the reinforcing strip 24 from sliding out of the upper compartment, where the upper compartment is open at both ends, adhesive is used to bond the strip 24 to the web 15. This adhesive is preferably applied to both surfaces of the reinforcing strip 24, though it can be applied to only one surface, if desired. In the construction illustrated in FIGURE 1, the adhesive is applied to the upper surface of the strip 24 through a nozzle 46 (FIGURE 8) at the discharge end of a long tube 48 extending into the fold of the web. Adhesive may be applied to the bottom of the strip 24 through a nozzle 49 at the end of another tube 50.

These tubes 48 and 50 are supported from a location outside of the web and preferably from an adhesive supply tank 52 (FIGURE 1). The tubes 48 and 50 are preferably made long enough to accommodate webs of maximum width for which the apparatus is suitable. The nozzles 46 and 49 have some clearance, around at least a portion of their lips, from the strip 24 so that they apply lines of adhesive with sufficient depth to permit the adhesive to spread over the surface of the strip 24 when the layers of plastic web are pressed firmly against the lines of adhesive at the next feed-roll station.

Before the webs pass through the next feed-roll station, however, they travel across and in contact with a sealer 54. This sealer illustrated is a runner, which consists of a hot wire which is heated by electrical resistance, and the electric current is supplied from transformers or other supply sources located in the housing 56 located at the sealing station along the path of travel of the web. A wheel coated with polytetrafluoroethylene may be used in place of the hot wire sealer 54. The amount of current supplied to the sealer 54 is correlated with the resistance of the sealer and the speed and gauge of the web 15. The heat is adjustable by controller 57 and it is also correlated with the kind of material used for the web 15, but the sealing by means of this hot wire 54 can be carried out only with thermo plastic materials capable of heat sealing by heat supplied through one layer of the plastic to the next layer. Such seals are easily made on polyethylene webs so long as the amount of heat from the sealers is kept within a temperature range that does not burn or melt through the layers of the webs.

In the process of the invention, as thus far described, the web moves with continuous and uniform motion. For subsequent operations it is desirable to have the webs move with intermittant motion and it is necessary, therefore, to provide a slack accumulator 58.

The slack accumulator 58 may be of a number of different types, and the detailed construction of the slack accumulator need not be illustrated or described for a complete understanding of this invention. It is sufficient to understand that the folded web 15 travels back and forth around a number of rolls 70, some of which are movable toward and from others so as to accumulate loops of the web when necessary to keep the web moving continuously at the feed rolls 60. Eventually the folded web travels around a final roller 72 of the slack accumulator and continues its advance, with intermittant motion, toward other stations of the apparatus.

The web 15 is pulled through the apparatus, beyond the slack accumulator 58, with a step-by-step movement imparted to it by feed rollers 90 which move the web, with each operation, for a distance equal to the intended width of each individual bag that is to be made from the web. The intermittantly-operated feed rollers 90 withdraw slack from the slack accumulator 58 when they are operating, and the slack accumulates in the slack accumulator 58 when there is an interruption in the operation of the feed rollers 90.

The operation of the intermittant feed rollers 90 and that of the constantly or uniformly operating feed rolls 60 is so correlated that there is very little change in the speed of the feed rolls 60 as the result of the movement of the slack accumulator. Thus the operation of the feed rolls 60 does not vary in speed sufficiently to cause any perceptible change in the fused seal produced by the sealer 54 which seals off the top compartment for the bag.

Beyond the slack accumulator 58, web 15 passes a hole-punching station which the web passes over a block 98. The block 98 is located under the header portion of the folded web and there is a bar 100 supported at one end from a bearing 102 (FIGURE 1) and at the other end of the bar there is an actuator arm 104 which rocks about a fulcrum 106 to move a punch 108 toward and from the block 98.

The actuator arm 104 is moved by a pneumatic motor or by a linkage 110 from a crank pin 112 on a fly wheel 114. This fly wheel is rotated by an axle 116 in timed relation with the feed rolls of the apparatus so as to bring the punch 108 down into the opening in the block 98 when the web 15 is at rest between intermittant movements. Thus the punch 108 makes a hole 109 in the header portion for each individual bag so that the bag can be hung from a pin or rod on a display rack.

Beyond the hole-punching station there is a folding station 120 where guides fold the web 15 in a manner that will be described in connection with FIGURE 12 after a description of the bag that results from this folding step.

The web 15 continues its intermittant travel to a sealing and cut-off station 122. At this station there is a hot element 132 (FIGURES 1 and 13) located over the folded web 15 and this hot element 132 extends from the sealed-off compartment containing the strip 24 and across the remaining width of the folded web. A roller 142 is located under the hot element 132 and this roller 142 supports the web 15, as shown in FIGURE 13. When the hot element 132 is brought down against the web 15, it melts its way through the web to sever the plastic along the lines at which the web is divided into separate bags.

FIGURE 13 shows the hot element 132 in contact with the web 15 and pressing the web against the backing roller 142. At the location where the hot element 132 exerts its maximum pressure against the web 15, the web is melted across a region indicated by the dimension C. On both sides of this region indicated by the dimension C, there are regions where the web 15 is heated highly enough to seal the upper and lower portions of the web together but not hot enough to melt through the plastic. The region on the advanced side of the melt is indicated by the dimension S–1; and the sealed region behind the melted region is indicated by the dimension S–2 in FIGURE 13. Thus the hot element 132 not only severs individual bags from one another at the region below the sealed-off compartment containing the strip 24 but it seals the front side of one bag and the rear side of the next adjacent bag.

The roller 142 is preferably made of a soft plastic material capable of temporarily withstanding the temperature of the hot element 132 as this element melts its way through the polyethylene and momentarily touches the roller 142. The hot element is lifted away from the roller 142 immediately upon completing the melting through of the web 15. Various materials can be used for the roller 142. Polytetrafluroethylene has proven very satisfactory in practice.

Beyond the sealing and severing station 122, the folded web 15 passes to a conveyor 144. Along the course of this conveyor 144 there is a notching station 146 and there are feed rolls 148 which extend only part way across

the folded web and which apply tension to the portion of the folded web 15 at the header sides of the folded web, that is, the part which has not yet been severed by the hot element 132.

The conveyor 144 consists of a wide endless belt or, in the preferred construction illustrated, a group of narrow parallel belts 150 which are actually spaced from one another along rollers 152 and 154 at opposite ends of the conveyor and around which the belts 150 change their direction of travel. This construction of the lower portion of the conveyor 144 is shown in both FIGURE 1 and FIGURE 1B; but in FIGURE 1 the upper part of the conveyor is removed, for clearer illustration.

FIGURE 9 shows the upper portion of the conveyor 144 and this upper portion consists of endless belts 150′ which are located immediately above the belts 150 of the lower part of the conveyor and which run on rollers 152′ and 154′. There is also a tensioning roller 158 for the belts of the upper part of the conveyor 144.

The conveyor 144 is located in position to receive that portion of the width of the web 15 which has been severed from the continuous length of the web by the hot element 132 along a severance line 160. The conveyor belts 150 and 150′ run with continuous motion and at a slightly faster lineal speed than the top speed of the intermittant movement of the folded web 15 as it is advanced by the feed rolls 90. However, the belts 150 and 150′ do not grip the folded web tightly and there is slippage since the uncut portion of the folded web at the header side of the web prevents the partially severed bag blanks 15*a* from advancing any faster than the header portion of the folded web which is still connected to the continuous length of web ahead of the sealing and severing station 122.

The feed rolls 148 are power driven and operate intermittantly in the same way as the feed rolls 90 and by gripping the header portion of the web 15, these feed rolls 148, which are beyond the sealing and severing station 122, provide a firm drive for advancing the folded web beyond the sealing and severing station 122 without exerting a pull on the gusset portion of the web.

Immediately beyond the stand of feed rolls 148, the folded web passes, with intermittant motion, the notching station 146 where a movable die element 163 move downwardly into the cavity of a fixed die element 164 to cut a notch 165 in the remaining unsevered portion of the folded web 15. This notch 165 extends across the entire remaining unsevered portion of the strip so that the successive bag blanks 15*a* are completely free of one another after passing the notching station 146.

FIGURE 10 shows the movable die element 163 connected with an actuator 165 which operates the movable die element 163 through a plunger 166 and crank mechanism 167. Various mechanisms can be used for operating the die element 163. The actuator 165 is preferably a pneumatic cylinder and it is operated by supplying working fluid to it in timed relation with the intermittent drive of the rollers 90 and 148 (FIGURES 1 and 9).

FIGURE 2 shows the construction at one end of one of the bags of this invention. The web 15 is shown folded over the strip 24 and connected to the strip by adhesive 170. This adhesive, which is preferably applied over both faces of the strip 24 throughout their entire area produces a laminated construction for the header of the bag and thus provides a maximum stiffness.

Below the strip 15, the web is heat sealed across a zone 175. The perforations 41A, previously described, extend through the web at a location intermediate to the upper and lower limits of the zone 175.

For purposes of discussing the construction of the bag, the portion of the web 15 on one side of the fold will be referred to as a back panel 180 of the bag and the portion of the web on the other side of the fold will be referred to as a front panel 182. The original fold of the web at the top of the header will be referred to as the "first" fold 184 to distinguish it from other folds which will be described in connection with the construction of the bag.

In FIGURE 2 there is a "gusset" formed by making a second fold 186 in the front panel 182 where the material of the web is folded outwardly and then upwardly as shown in dotted lines in FIGURE 2. A third fold 188 is then made in the front panel 182 by folding the material forwardly and downwardly as also shown in dotted lines in FIGURE 2. The advantage of these folds is that when the bag is filled with merchandise, it can open up as shown in full lines in FIGURE 2 to provide a substantial volume of space between the front panel 182 and the back panel 180 below the third fold 188.

FIGURE 3 is a front view of the empty bag. The notches which were cut out at the notching station 146 leave the strip 24 and the parts of the web 15 which cover it substantially shorter than the width of the body of the bag below the zone 175. When the front panel 182 is moved upwardly away from the back panel 180 as illustrated in solid lines in FIGURE 2, this causes the side edges 191 and 192 to move inwardly to the positions shown in FIGURE 4. Thus the body of the bag, when the bag is filled, is substantially equal to the length of the header above the zone 175.

The extent to which the side edges 191 and 192 move inwardly depends upon how much the front panel 182 is moved away from the back panel 180; and this in turn depends upon the vertical extent of the portion of the front panel 182 between the second fold 186 and the third fold 188. There is, therefore, a correlation between the amount of material which should be removed at the notching station 146 (FIGURE 1) and the distance between the second fold 186 (FIGURE 2) and the third fold 188. In practice, the amount of material removed by notching the folded web preferably has a length, measured in the direction of the length of the web, equal to approximately two times the distance, in a vertical direction, between the folds 186 and 188. This correlation is approximate, and in the preferred construction the longitudinal length of the notches is somewhat longer than the distance between the folds 186 and 188.

With folds 186 and 188 in the front panel 182, and with no corresponding folds in the back panel 188, the header is in line with the back panel 180 and this produces a neat package when hung from a hook or rod of a merchandising rack. For bags having even greater volume to the merchandise enclosed therein, other folds 186′ and 188′ are made in the back panel 180, as shown in FIGURE 5. When the front and back panels of the bag shown in FIGURE 5 are pulled away from one another, there is an even greater reduction in the width of the bag and for bags having such a gusset construction for both the front and back panels, the notching of the web to shorten the header should be even greater; the longitudinal length of the notches being approximately four times the distance between the folds 186 and 188.

Ordinarily the folds 186, 188, 186′ and 188′ are made in the panels of the bag at the upper part of the bag and there are no corresponding folds near the bottom of the bag. However, for maximum volume within the bag, other folds can be made near the bottom edge of the front and back panels as shown in FIGURE 5. These corresponding folds in the front panel 182 are indicated by the reference characters 186A and 188A; and the corresponding folds in the back panels 180 are indicated by the reference characters 186B and 188B. The folds 186A and 186B are made far enough from the lower edge of the front panel 182 so that the downwardly folded portion of the web will not extend as far as the bottom edge of the front panel. The extending portion 21 of the back panel 80 is left to facilitate filling of the bag. After the bag has been filled, it is heat sealed at the location 196, across the full width of the bag, and the extending portion 21 is generally cut off after the bag has been sealed closed.

FIGURE 12 shows one way in which the folds 186, 188, 186' and 188' can be made. There are guide wires located above and below the folded web at the folding station 120.

The fold 186 is made around a guide wire 201 and the fold 186' is made around a guide wire 202. There is a bracket 205 which extends between panels 180 and 182 from the side of the web opposite the strip 24; and this bracket carries a guide 207 around which the fold 188 forms and a guide 208 around which the fold 188' forms.

It will be understood that the web is threaded through the apparatus when the end is originally introduced through the various stations, so as to produce the folds illustrated in FIGURE 12. Continued pull on the web by the feed rolls 90 causes it to form the folds 186, 188, 186' and 188' as the web travels through the apparatus. It will be understood that the folds can be made in the web by other folding means and that they can be made in the portion of the web that travels with continuous motion if desired. The structure shown in FIGURE 12 is merely representative of means for folding the web as it travels through the apparatus to produce the bags illustrated and described. Similar guides with a prime appended make the bottom folds.

FIGURE 14 shows a modified construction of the apparatus for folding the web. There are wheels 221 and 222 supported by axles 223 and 224, respectively, having circumferential portions about which the folds 186 and 186' are formed. These wheels 221 and 222 cooperate with other wheels 227 and 228 located inside the folded web 15 and supported on axles 229 and 230, respectively, carried by a support 232 that extends beyond the flap 21, and that is connected to a fixed support 234.

The wheels 227 and 228 have peripheral portions about which the folds 188 and 188' form. Thus the wheels 221 and 222 perform the function of the guide wires 201 and 202 of FIGURE 12; and the wheels 227 and 228 take the place of the guide wires 207 and 208.

These wheels 221, 222, 227 and 228 may be driven, but are preferably idlers. The positions of the wheels can be reversed, that is, the wheel 221 can be located within the folded web and the wheel 227 located outside so that the fold 186 forms about the peripheral portion of the wheel 227 while the fold 188 forms about the peripheral portion of the wheel 221. A similar correlation will exist for the wheels 222 and 228, if reversed as to locations.

FIGURE 15 is a top plan view of the wheels 221 and 227. Beyond these wheels which form a folding station, there are upper rolls 241 and 242 and lower rolls 241' and 242' forming roll passes that cooperate with the feed rolls 90 to hold the folds in the web until the web is sealed at the sealing and cut-off station 122. The sealing of the web along the side edges 191 and 192 holds the folds because the confronting inside surfaces of the folded web are heat sealed to one another to close both sides of the bags that are formed at the station 122 by the cutting off and sealing of the folded web.

The feed rolls 148 (FIGURES 1 and 9) located beyond the sealing and severing station 122 are particularly advantageous when forming the gussets in accordance with the guides shown in FIGURE 12. When the gussets are formed by rolls as in FIGURES 14 and 15, there is somewhat better control of the folds which form the gussets, but the feed rolls 148 are still useful in that they provide a pull for advancing the folded and partially severed web beyond the sealing and severing station 122 and into the belts of the conveyor 144, or onto whatever other type of friction conveyor is to be used for conducting the bags away at the delivery end of the apparatus.

The preferred embodiment of the invention has been illustrated and described, but changes and modifications can be made, and some features can be used in different combinations without departing from the invention as defined in the claims.

What is claimed is:

1. In the manufacture of reinforced header, side weld bags by folding a continuous web along a longitudinal line at a mid region between the longitudinal edges of the web, feeding a reinforcing strip into the fold, sealing the confronting faces of the web together along the length of the strip, and beyond the edge of the strip that is remote from the fold of the web, to form a header for the bags, and also sealing the confronting faces of the web together beyond the header along transverse regions extending from the vicinity of the first line of sealing and across the folded web away from the strip to form the side welds for the bags, and severing the length of the folded web along lines intermediate the longitudinal limits of each of said transverse sealed regions, and also severing the folded web and strip across the remainder of the transverse width of the folded web and as a continuation of the lines intermediate the longitudinal limits of said transverse regions, the improvement which comprises

(a) advancing the folded web by a friction grip of the folded web across most of the width of the folded web before the web is severed,

(b) severing the web at a first station along said line intermediate the longitudinal limits of each transverse region while leaving the header unsevered,

(c) severing the header at a second station at a substantial distance beyond the first station,

(d) advancing the folded web between the first and second stations by a firm friction feeding grip of the header and by a substantially light friction feeding force against the web across the severed portion of its width beyond the header, and

(e) beyond the second station advancing the completely severed bags to a delivery station.

2. The manufacture of bags as described in claim 1 characterized by advancing the folded web to the first station by friction grip across the unsevered portions of its width by rolling contact with the folded web on opposite sides thereof and with some pressure against the folded web, and the advancing of the folded web beyond the first station and by force applied across the severed portion of its width being by friction forces that exert less pressure against the web than does the rolling contact, said friction forces travelling with the web for substantial distances along the courses that the web follows as it advances in the direction of its length.

3. The manufacture of bags as described in claim 1 characterized by cutting out of the header at the second station a substantial longitudinal length of the header for the width of the header from the fold to a location beyond the edge of the strip that is remote from the fold.

4. The manufacture of bags as described in claim 1 characterized by imparting a second and reverse fold to at least one side of the folded web along the length of the web and adjacent to the side of the header which is remote from the fold of the web, and subjecting the width of the web having the second fold to the light feeding force beyond said first station.

5. The manufacture of bags as described in claim 4 characterized by the web being advanced with continuous movement at the region of folding and along other locations at which adhesive is fed into the fold to laminate the strip of the web, and the folded web being advanced intermittently for another portion of its travel in the region of the first station and with slack accumulation between the regions of continuous and intermittent movement, the intermittent movement to said first station being imparted to the folded web by said friction grip across most of the width of the folded web, and a part of the pull forward of the intermittent movement beyond said first station being imparted to the folded web by said firm friction grip across the unsevered header between the first and second stations.

6. The method of making reinforced header, side weld bags from a longitudinally folded web that is advanced in the direction of its length with continuous motion through-

out part of the bag-making processes and with intermittent motion during a latter part of the process with slack accumulation between the regions of continuous and intermittent motion, severing the folded web at two longitudinally-spaced locations where the motion is intermittent, most of the transverse width of the web being severed, and sealed on both sides of the severance, at a first station and the remainer of the transverse width, including the header, being severed at a second station.

7. The method of making bags as described in claim 6 characterized by imparting a reverse fold to at least one side of the folded web in the direction of the length of the web and at a location spaced tranversely of the fold of the web to supply a gusset for greater cross section of each bag when filled, the cut at the first station including the part of the web width that includes the reverse fold.

8. In a bag-making machine including means for feeding a web and folding it progressively lengthwise at a mid region between the longitudinal edges of the web, means for feeding a continuous reinforcing strip into the fold, means for sealing the confronting faces of the web together along the length of the strip and beyond that edge of the strip which is remote from the fold in the web, other means for sealing the confronting faces of the web together along transverse regions extending from the vicinity of the longitudinal sealing and across the folded web away from the strip, and means for severing the folded web into separate bags, the improvement which comprises

(a) the means for severing being divided between two stations,

(b) including means at a first station for severing the web intermediate the longitudinal limits of said transverse regions while leaving the reinforcing portions of the folded web intact, and

(c) including other means at a second station for severing the web across the width from the folded edge to the beginning of the severance performed at the first station,

(d) the first and second stations being at a substantial distance from one another lengthwise of the strip,

(e) the means for feeding the web including intermittently-operated rolls extending across substantially the full width of the folded web ahead of the first severing station, and

(f) including other intermittently-operated feed means between the first and second stations gripping the folded web across the reinforced width thereof.

9. The bag-making machine described in claim 8 characterized by conveyor means beyond both of the severing stations with friction means that advance the web and the severed portions thereof by friction substantially less than the grip of the feeding means ahead of the first and second stations, respectively.

10. The bag-making machine described in claim 8 characterized by the means for severing the reinforced portion of the web at the second station including means for cutting out a substantial longitudinal length of the web and the reinforcing strip across the full width from the folded edge of the web to a location beyond the edge of the strip that is remote from the fold of the web.

11. The bag-making machine described in claim 8 characterized by means beyond the original region of folding of the web but ahead of the first severing station for imparting a second and reverse fold to at least one side of the folded web along the length of the web and adjacent to that edge of the strip which is remote from the first fold of the web, and the means for feeding the web including elements ahead of the first severing station that exert a relatively light friction pull on the portion of the web that has the second fold therein.

12. The bag-making machine described in claim 11 characterized by means for bonding the folded web to the strip to laminate the strip and web, said means for bonding being ahead of the means for imparting the second fold, the means for feeding the web including also continuously-operating elements for advancing the web and strip past the means for bonding and including also intermittently-operated elements for advancing the strip with a step-by-step movement past the means for imparting a second and reverse fold and to the first and second severing stations.

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