United States Patent

[11] **3,611,883**

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[54] **APPARATUS AND METHOD FOR MAKING BAGLIKE CONTAINERS WITH BOXLIKE TOP**
11 Claims, 8 Drawing Figs.

[52] **U.S. Cl.** ..... **93/8 WA,** 93/8 W, 93/33 R, 93/35 H, 93/36.01, 93/56 PD, 93/58 P
[51] **Int. Cl.** **B31b 1/72,** B31b 1/86, B31b 1/90
[50] **Field of Search** ..... 93/8 OW, 8 WA, 33, 35 H, 35 VV, 36.01, 56 PD, 58 P; 229/14 BA

[56] **References Cited**

UNITED STATES PATENTS

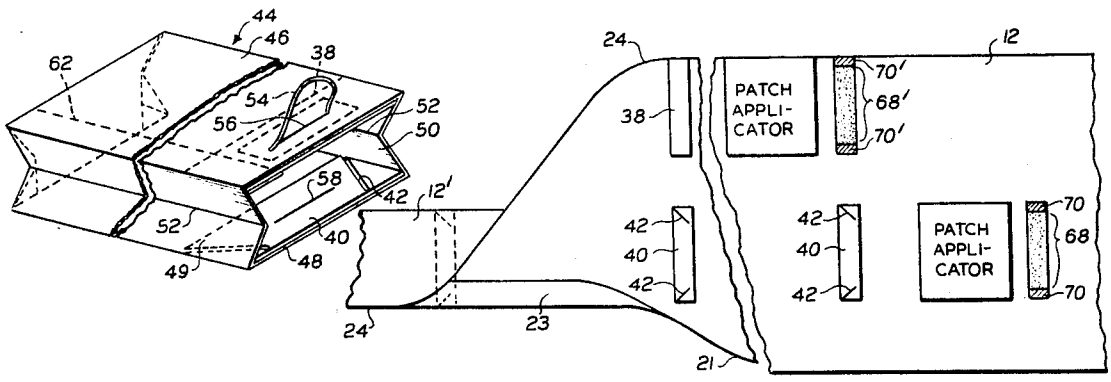
2,143,957	1/1939	Petter	93/36.01 X
2,216,527	10/1940	Weiss	229/14 BA
2,586,514	2/1952	Canno	93/35 H
3,253,389	5/1966	Miller	93/56 PD
3,342,116	9/1967	Roesner	93/56 PD
3,354,606	11/1967	Miller	93/56 PD
3,392,636	7/1968	Lindley	93/8 WA
3,406,853	10/1968	McLeod	93/36.01 X

FOREIGN PATENTS

1,018,716	1/1953	France	93/35 (H)
1,158,815	12/1963	Germany	93/8 (WA)

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ABSTRACT: This apparatus for making containers applies patches to a web and then folds the web into a tube which is severed and formed into containers on a conventional bagmaking machine. The patches are located at the top of each "-bag" and extend across the full width of the front and back of the bag and downwardly for a distance equal to the width of the sides of the bag so that the upper end of the container folds like a box to provide that style of container which has a bag bottom and a box top. The combining of the patch-applying apparatus and the bagmaking machine produces superior containers at lower cost.



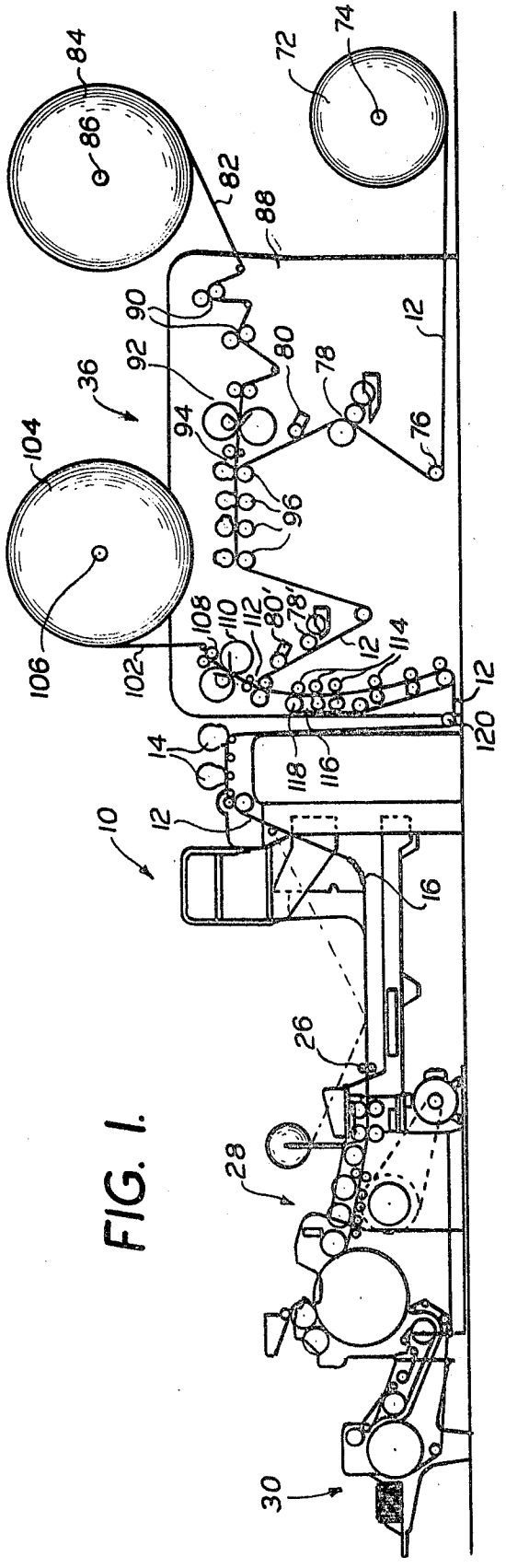


FIG. 1.

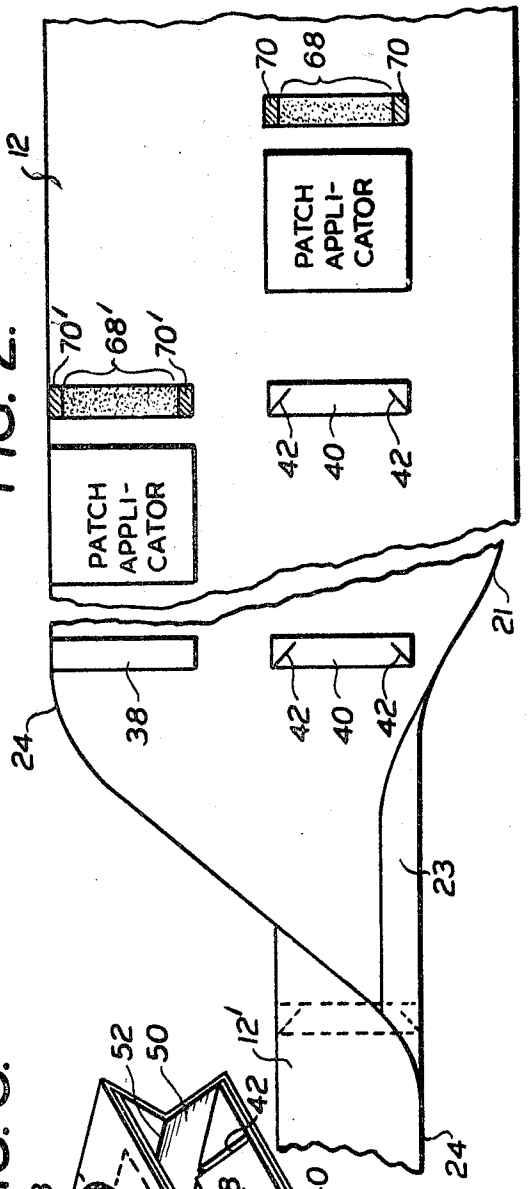


FIG. 2.

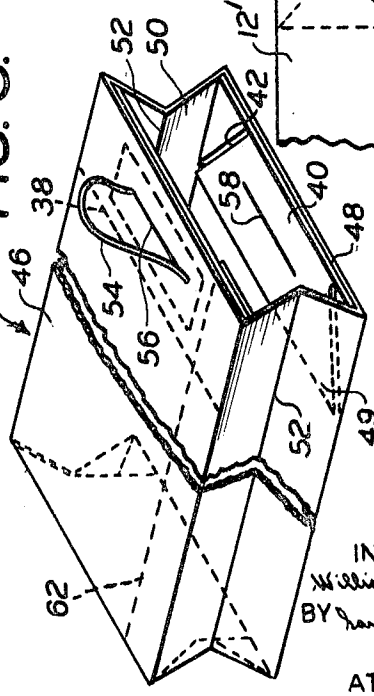
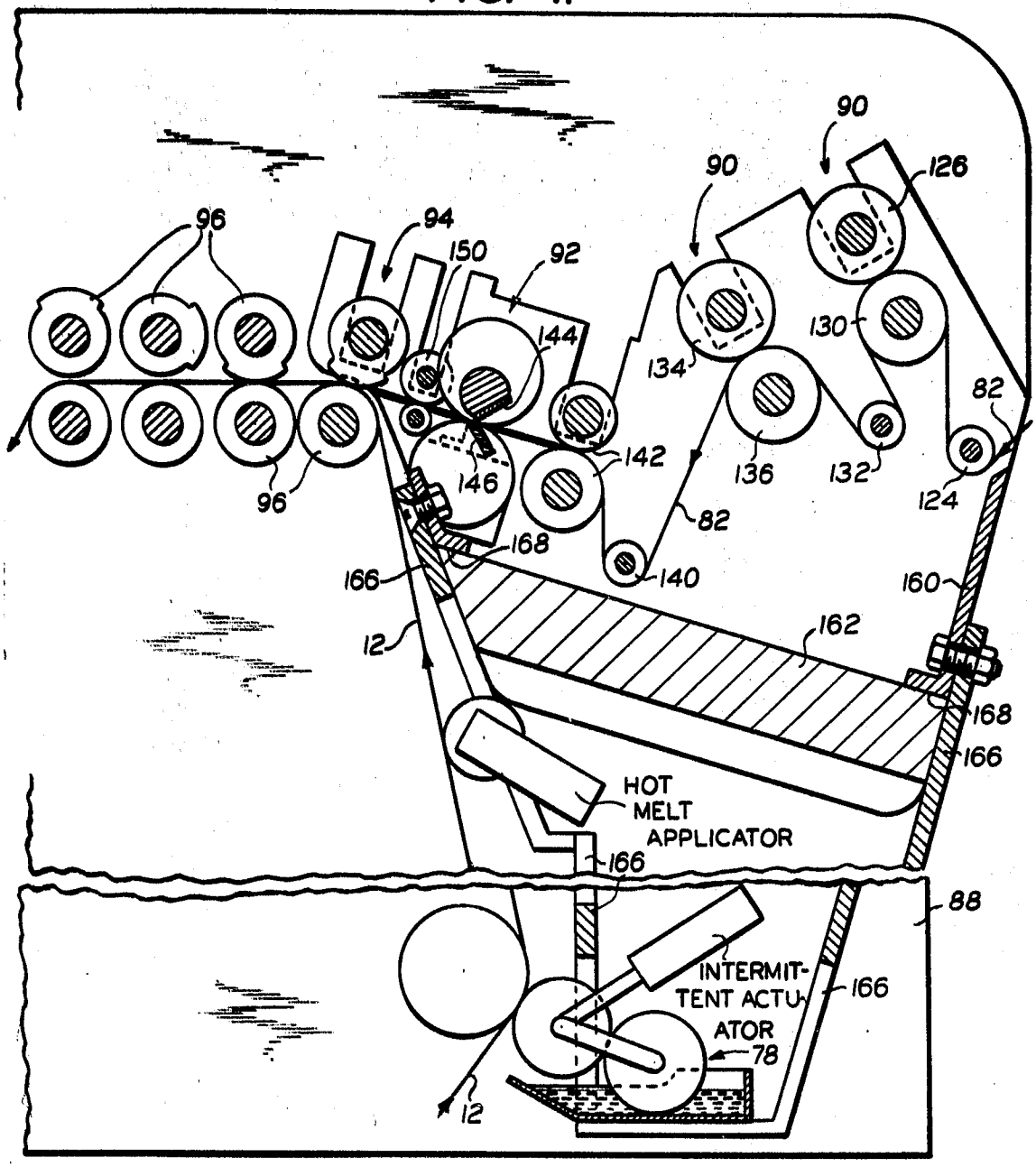


FIG. 3.

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FIG. 4.



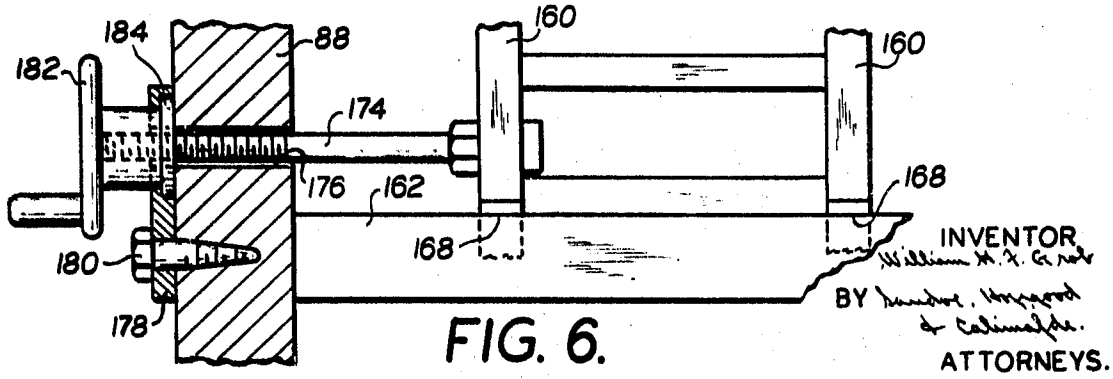


FIG. 6.

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FIG. 5.

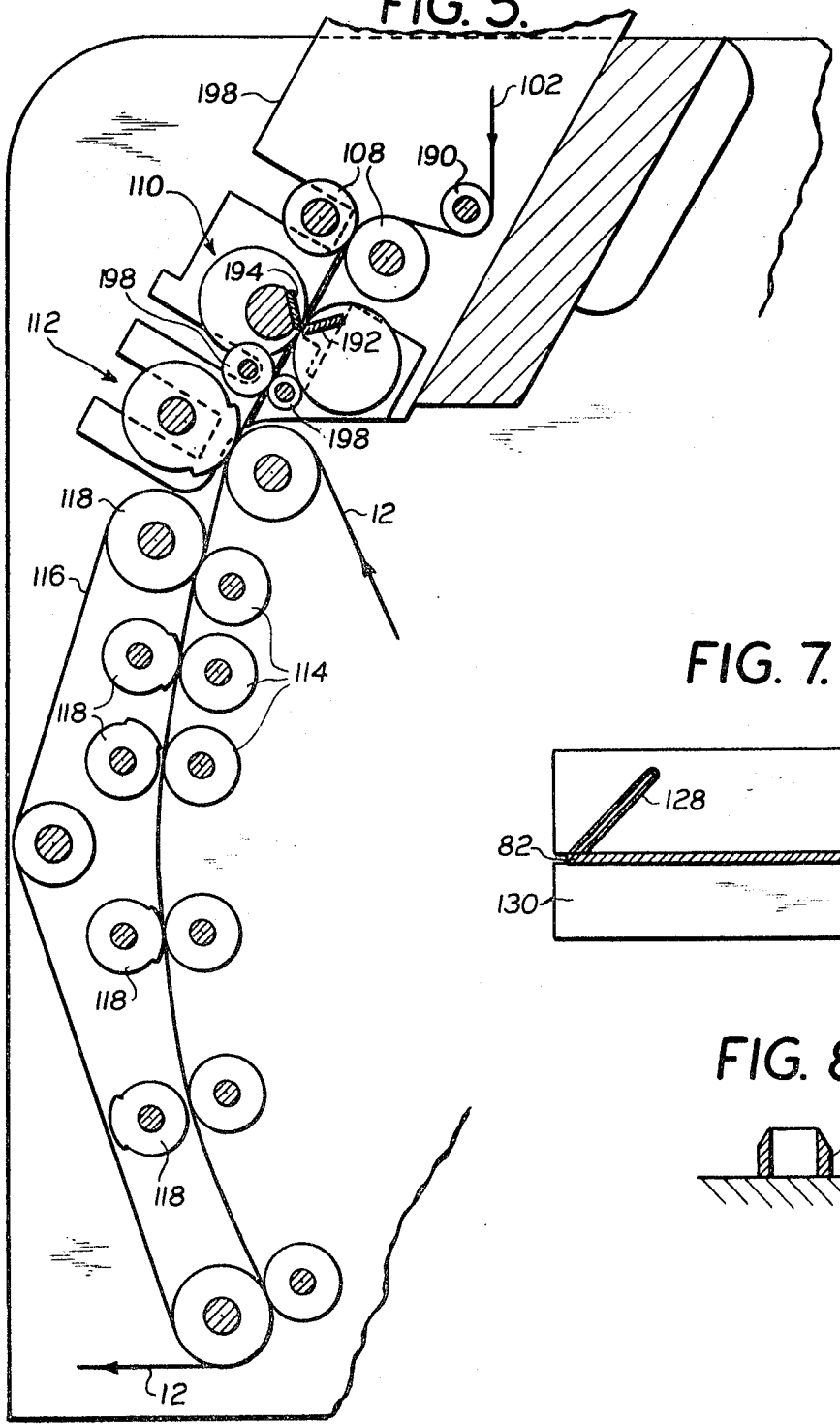


FIG. 7.

FIG. 8.

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APPARATUS AND METHOD FOR MAKING BAGLIKE CONTAINERS WITH BOXLIKE TOP

BACKGROUND AND SUMMARY OF THE INVENTION

by

A container that has become popular with stores and other users has a bottom portion constructed like a bag and has stiffening panels extending down from the upper ends of front and back panels of the container for a distance equal to the width of the sidewalls of the container so that the top can be folded closed like a folding box. A handle on the stiffened upper portion of the front of the bag extends through an opening in the upper portion of the back of the bag that is folded down over the front and this handle holds the folded panels together and keeps the container closed.

Such containers have been made by special machinery which has required limitations on the kind of bottom that can be made and on the rate of production. This invention provides apparatus that can be combined with a conventional bagmaking machine to produce a container having a better bottom construction and a boxlike upper end; to make the containers at higher rates of production; and to make them with existing bagmaking machines having a special patch applicator through which the web travels on its way to the bagmaking machine.

The patch applicator of this invention operates on an unfolded web which is to be folded longitudinally to form the tube from which bag blanks can be severed in the usual way. The patches are preferably applied to surfaces that become the inside of the bag, and in the preferred construction the patches are just below the locations at which the tube is severed. This leaves the front and back panels of the bag extending slightly above the stiffening strips so that the container, when open, has a "soft lip."

Another feature of the invention is the application of wide patches to a moving web with adhesive that requires some time to set, but with the patches held in position on the areas that form the upper portions of the bag at spots or limited areas by fast-setting adhesive or "hot melt" while the other adhesive sets during the travel of the web through the apparatus.

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

BRIEF DESCRIPTION OF DRAWING

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

FIG. 1 is a diagrammatic view of apparatus for making containers in accordance with this invention;

FIG. 2 is a greatly enlarged detail view illustrating the location of patches by the apparatus shown in FIG. 1 and illustrating the manner in which the web is folded;

FIG. 3 is an isometric view of a container made by the apparatus of this invention, the container being shown part way open to illustrate its interior;

FIG. 4 is a greatly enlarged view of the portion of the apparatus of FIG. 1 that supplies patches on one side of the centerline of the web;

FIG. 5 is a greatly enlarged detail view showing the apparatus that supplies the patches on the other side of the centerline of the web;

FIG. 6 is a greatly enlarged transverse sectional view showing the manner in which the apparatus is adjusted to accommodate webs of different width for making containers of different size;

FIG. 7 is a greatly enlarged detail view of a cutter shown in FIG. 4; and

FIG. 8 is a greatly enlarged sectional view taken on the line 8–8 of FIG. 7.

DESCRIPTION OF PREFERRED EMBODIMENT

FIG. 1 shows diagrammatically a bagmaking machine 10 to which a web 12 is supplied from presser rollers 14. The web is folded by a former 16 to form a tube 12', the folding being illustrated in FIG. 2. One edge 21 is folded over to form a short sealing lap 23 and an opposite edge 24 of the web is folded over to overlap the sealing lap 23 and to reach substantially to the fold of the sealing lap 23. The former 16 provides gussets at the sides of the tube for forming the side panels of the container in accordance with conventional practice. Thus the bagmaking machine forms the web 12 into a longitudinally seamed tube 12'; adhesive being applied to the sealing lap 23 in a conventional manner.

The folded tube 12' is advanced through a roll pass 26 into a station 28 of the bagmaking machine where the end of the tube 12' is folded to form a square bottom, and the tube is then severed at a predetermined location adjacent to stiffening strips which have been previously applied, as will be further explained. The successive containers cut from the tube are supplied by the bagmaking machine to a delivery station 30 where they are stacked and removed for packing and shipping.

The bagmaking machine 10 is a conventional machine commonly used for making square bottom bags, this being the type of bag best suited for making containers having baglike lower portions and boxlike upper portions. It will be understood, however, that the bagmaking machine 10 can be any bagmaking machine that folds a web into a longitudinally seamed tube from which bags are made by closing the bottom and severing the bag regardless of the type of bottom which may be desired for special types of box-bag containers.

The apparatus shown in FIG. 1 includes also a patch applicator 36 through which the web 12 travels before entering the bagmaking machine 10. In the patch applicator 36 a patch of paperboard 38, or equivalent stiffening material, is applied to the web 12 on one side of the centerline of the web, as shown in FIG. 2. Another patch 40 is supplied to the web on the other side of the centerline. The patch 40 has incised lines 42 which provide hinge lines along which the patch 40 can bend for purposes which will be explained. FIG. 3 shows the purpose of the patches 38 and 40. In FIG. 3 a container 44, made by the apparatus of this invention, is shown part way open to expose a portion of the inside of the container. This container has a front panel 46 and a back panel 48, joined by side panels 49 and 50 which are folded along fold lines 52 when the container is originally manufactured and delivered by the bagmaking machine in a flat condition for stacking.

The patch 38 is located at a part of the front panel 46 adjacent to the mouth or upper end of the container 44. This patch 38 is bonded to the inside of the panel 46 over a substantial area and preferably over the entire area of the confronting faces of the patch 38 and panel 46; and the patch 38 serves as a stiffening panel for the upper end of the front panel 46. Similarly, the patch 40 is bonded to the back panel 48 over a substantial and preferably the entire area of the patch 40 which confronts the back panel 48. This panel 40 serves as the stiffening panel for the back panel 48.

When the container 44 is open so that the side panels are parallel to one another, the container is closed by folding the upper end of the front panel inwardly along a fold at the bottom of the stiffening panel 38. Since the stiffening panel 38 has a height equal to the width of the side panels 49 and 50, this brings the upper edge of the front panel 46 into a position adjacent to the back panel 48 at a location approximately level with the bottom edge of the patch or stiffening panel 40.

The triangular portions of the patch or panel 40 beyond the incised lines 42 are then bent inwardly and downwardly to fold the upstanding parts of the side panels 49 and 50 flat against the already folded upper end of the front panel 46. The patch or panel 40 between the incised lines 42 is then folded inwardly and downwardly parallel to the already-folded upper end of the front panel to complete the closing of the boxlike end of the container 44. A handle 54, extending outwardly through a slit 56, is inserted through a complementary slit 58 in the back panel 48 and its stiffening patch or panel 40, and is pulled up tight to hold the folded upper portions of the con-

tainer together. Bags can also be made using a stapled handle on face 46, without slit 56. The stapled handle on face 46 is then inserted into slit 58. This container construction, at its upper or boxlike end, is similar to other containers which are well known in the art. A common slitter on the bagmaking machine makes the slits 56 and 58 simultaneously to insure their exact registry.

The container 44 differs from prior art containers in that it has a single lap seam 62 and has a differently folded bottom which is that of a square bottom bag whereas special apparatus for making box-bag containers of the prior art has formed containers with double side seams and a different type of bottom from a conventional bag. A conventional bag bottom is stronger than the container bottoms which have been formed by special machinery for making box-bag containers and the manufacture of the container of this invention from a web which is folded longitudinally provides for higher speed production than has been possible with the special machines of the prior art.

Referring again to FIG. 2, it will be understood that successive patches 38 and 40 are applied to the web at distances dictated by the bagmaking machine. These distances are equal to the length of web used by the bagmaking machine for each container and must allow for the amount of web which is folded into the bottom of the bag.

Before the patches 38 and 40 are applied to the web 12, adhesive is applied to the areas where each of the patches 38 and 40 are to be placed. In the preferred construction of the invention, areas of adhesive 68 are applied first and these areas are sufficient to cover the full height of the patch (the horizontal dimension in FIG. 2); but not the full width (the vertical dimension in FIG. 2). Just before the patch 38 or 40 is applied to the web, and after the adhesive 68 has been applied, the areas beyond both ends of the adhesive 68, indicated by the reference characters 70, are coated with a quick-setting adhesive or "hot melt" so that when the patch 38 or 40 is applied, the patch will be held securely by the quick-setting adhesive to prevent its displacement on the web during travel through the apparatus and while the slower setting adhesive 68 is setting. This expedient permits the use of adhesive 68, which is of lower cost than quick-setting adhesive, over most of the area of each of the patches. Another feature of the preferred embodiment is that the patches 40, which have the triangular end portions connected with the main part of the patch by only limited connections left after cutting the incised lines 42, are attached to the part of the web which is not folded over by the former. Thus the patches 38, which are stronger because of their continuous construction, are the ones which are subjected to the folding-over movement in the former of the bagmaking machine.

Referring again to FIG. 1, the web 12 is supplied from a reel 72 supported on an axle 74. This reel unwinds as the web 12 is fed toward the left in FIG. 1 around a guide roll 76 and through an adhesive applicator 78 which applies the first adhesive to the web. The web then passes a second adhesive applicator 80 which applies the quick-setting adhesive.

Strip material 82, unwound from a reel 84 on an axle 86 supported from a frame 88 of the apparatus, travels through incising roll passes 90 to a cutter station 92. Just beyond the cutter station, the strip material 82 is cut to from the patches 40 (FIGS. 2) and these patches are supplied to the web at an applicator station 94 which includes a series of presser rolls and tapes passes 96 for holding the patch in contact with the web at least long enough for the quick-setting adhesive firmly to bond the patch to the web.

Strip material 102 for making the patches 38 (FIG. 2) is unwound from a reel 104 on an axle 106 supported from the frame 88 of the apparatus. This strip material 102 passes through feed rolls 108 to a cutter station 110 and then to an applicator station 112 where the patches cut from the strip material 102 are applied to the web 12.

The web 12 then passes downwardly between pressure rolls 114 and a belt 116 which runs against other pressure rolls 118. This combination of rolls 114 and 118 with the belt 116 maintains the patches 38 in firm contact with the web at least long enough for the quick-setting adhesive to securely bond the patch to the web. At the lower end of the endless belt 116, the web 12 passes around a guide roll 120 and travels upwardly to other pressure rolls 114 at the entrance to the bagmaking machine 10.

FIG. 4 shows, on a larger scale, but still diagrammatically, the apparatus for applying the patches 40. The strip material 82 travels around a guide roll 124 and then passes upwardly to the incising roll passes 90. The first of these incising rolls passes includes a roll 126 which has cutters 128 incising from its peripheral surface at 45° to the width of the roll 126, as shown in FIG. 7. These cutters 128 cut the incised lines 42 (FIG. 2) for the patches 40. There is a backup roll 130 (FIGS. 4 and 7) on the side of the strip 82 opposite the cutter roll 126.

Beyond the incising roll pass 90, the strip 82 passes over another guide roll 132 and then passes between rolls 134 and 136 which remove the chips cut by the cutters 128.

The strip 82 travels around another guide roll 140 and through feed rolls 142 which deliver the strip material to the cutting station 92 at which there are knives 144 and 146 of a flying shear which is operated in timed relation with the feed rolls and the speed of the bagmaking projecting to cut successive patches from the strips 82 as the adhesive-coated areas of the web 12 reach the applicator station 94. The spacing of the cutter station 92 and the applicator station 94 is selected to enable the length of the severed patches to span the space between feed rolls 150 and the presser rolls 96 through which the web 12 with the patches applied passes in a manner already explained.

The apparatus which carries the reel of strip material 82, the incising roll passes 90, cutting station 92 and the feed rolls 150 of the applicator station, together with the adhesive applicator 78 and 80, are carried by a frame 160 which is part of the main frame 88 but which is movable on a fixed support 162 of the main frame 88. Guides 166 hold the movable frame 160 in position on the fixed support 162 as bearing surfaces 168 of the frame 160 slide along the fixed support 162.

The purpose of this adjustment of the frame 160 on the fixed support 162 is to accommodate the apparatus for webs of different width.

FIG. 6 is a diagrammatic view showing apparatus for shifting the movable frame portion 160 on the fixed support 162 to move the patch applying apparatus transversely of the web for webs of different width. A lead screw 174, secured at one end to the movable frame portion 160, extends through an opening 176 in the fixed frame 88 and through a plate 178 attached to the frame 88 by fastening means 180.

The lead screw 174 threads through the hub of a handwheel 182 which is held against endwise movement by a flange 184 that rotates in a counterbore 186 in the inside surface of the plate 178. Thus the plate 178 prevents axial movement of the wheel 182 axially toward the left in FIG. 6, and the confronting surface of the frame 88 prevents axial movement of the hand wheel toward the right. Rotation of the wheel 182, therefore, shifts the screw 174 and the movable frame portion 160 one way or the other depending upon the direction of rotation of the wheel.

It will be understood that the shifting of the movable frame portion 160 changes the positions of all of the apparatus for applying the patches 40 (FIG. 2), but does not move the web. The adjustment is made to accommodate the patch applicator to narrower and wider webs. It is, of course, necessary to change the rolls, including those of the incising roll passes 90, and the flying sheer rolls 144 and 146 to make shorter patches when the change is to a narrower web and to make larger patches when the change is to a wider web. Changes in the size of the presser rolls 96 may also be required.

FIG. 5 shows the way in which the strip 102 feeds downwardly from its supply reel to a guide roll 190 and through power driven feed rolls 108 to the cutter station 110 where cutters 192 and 194 are of a flying shear cut the strip

102 to form the patches 38 (FIG. 2). Feed rolls 198 transfer the severed patches to the applicator station 112. In place of the flying shears, incising rolls followed by a "snap-off" feed roll can be used.

A frame 198 that carries the supply reel of the strip 102, the guide roll 190, the feed rolls 108, cutter station 110, feed rolls 198, applicator station 112 and adhesive applicators 78' and 80' (which are similar to the applicators 78 and 80 already described) is adjustable transversely of the web by apparatus not illustrated but which may be the same as that described in FIGS. 4 and 6.

It will be apparent from an inspection of FIG. 2 that if the width of the web 12 is changed and the tube formed from the web is fed to the bagmaking machine along the same centerline as the tube 12', the change in positions for the application of patches corresponding to the patches 40 is changed much less than the position for the application of patches corresponding to the patches 38. With a limited range of web widths, the apparatus for applying the patches 40 or their equivalent need not be adjustable transversely of the web; but the apparatus for applying the patches 38 or their equivalents must be adjusted for a change in web width, and the adjusting apparatus has a greater range of movement than that for the patches 40 or their equivalents, if in fact this latter apparatus has any adjustment.

The preferred embodiment of the invention has been illustrated and described, and the invention is defined in the appended claims.

1. Apparatus for making a container having front and back panels joined by side panels that fold to bring the front and back panels together when the container is in a flat condition, the container having a baglike closed bottom portion and a folding boxlike open upper end portion that folds in to close the container, including in combination, means for supplying a web of material from which the container panels are made, a bagmaking machine that folds the web along longitudinal fold lines to make a tube having front, back and side panels and a longitudinal seam, means seam, for cutting the tube into individual container blanks and for folding the lower end of each blank to form a baglike bottom, two patch applicators through which the web passes on its way to the bagmaking machine, holders for reels of paperboard of substantially the same width as the front and back panels of the container, means for feeding the paperboard from each reel to the web at a different patch applicator station, cutting means along the patch of the paperboard and near the patch applicator stations for severing the paperboard strips into successive panels of a height approximately equal to the width of the side panels of the container, pressure means at said stations for applying parallel rows of successive severed panels to the web at predetermined spaced locations corresponding to top areas of the front and back panels of the finished containers, one of the applicators applying its patches on one side of the centerline of the web and the other of said applicators applying its patches on the other side of the centerline of the web with the patches spaced from one another by a distance substantially equal to the width of the side panels.

2. The apparatus described in claim 1 characterized by adhesive applicators ahead of the patch applicator stations in position to apply adhesive over areas for securing the patches to the web at said predetermined spaced locations.

3. The apparatus described in claim 2 characterized by the adhesive applicator being along the path of the web and including means for applying adhesive to the web over an area that corresponds to most, but not all, of the area to be occupied by the patch, and a second adhesive applicator along the path of the web and including means for applying adhesive to at least part of the remaining area to be occupied by the path and on which no adhesive was applied by the first adhesive applicator, the second adhesive applicator including means for holding an adhesive that sets faster than the adhesive applied by the first adhesive applicator whereby the adhesive from the second applicator holds a patch in place while the adhesive from the first adhesive applicator sets.

4. The apparatus described in claim 1 characterized by cutters along the path of travel of the paperboard of one of the patch applicators for cutting the board along hinge lines that leave triangular areas at opposite ends of the path for folding forward to control the bending in of the side panels of the container at the upper end thereof when the upper ends of the panels are folded in one over the other to close the upper end of the container, said cutters being disposed to cut at approximately 45° to the direction of extent of the board as it comes from its reel.

5. The apparatus described in claim 4 characterized by the patch applicator that has the cutters being on the side of the centerline of the web over which the other part is folded to make the tube that provides the container blanks.

6. The apparatus described in claim 4 characterized by the patch applicators having means for imparting relative transverse adjustment to them with respect to one another to change the transverse spacing of the patches for operation with webs of different width making containers have side panels of different widths.

7. The apparatus described in claim 6 characterized by each of the patch applicators including a frame that carries all of the elements of the patch applicator, a base on which each of the frames has movement transverse of the web and relative to the path of movement of the web, the means for imparting relative transverse adjustment including an actuator and means for transmitting motion with a mechanical advantage that gains force to shift the position of the frame of at least one of the patch applicators on its base.

8. The apparatus described in claim 6 characterized by the patch applicators being at staggered locations along the path of movement of the web, one patch applicator being ahead of the other by a distance evenly divisible by the length of a container blank, and at least one of said patch applicators being adjustable into a position that overlaps, transversely of the web, the extent of the other patch applicators transversely of the web for bringing the patch applicators closer together when operating on webs of minimum width

9. The apparatus described in claim 8 characterized by two adhesive applicators along the path of travel of the web through each of the patch applicators, the first of the adhesive applicators in each patch applicator including a roller that applies adhesive to the area of the web to which the patch is to be applied in that patch applicator, the roller having a width slightly less than the width of the patch, and the second adhesive applicator for each patch applicator having means for applying adhesive to the area of the web to which the patch is to be applied but beyond the area to which adhesive is applied by the roller of the first adhesive applicator, the second adhesive applicator being closer to the patch applicator station than is the first adhesive applicator and including means for applying an adhesive that sets faster than the adhesive applied by the first adhesive applicator for holding a patch in place during the travel of the web while the adhesive from the first applicator is becoming set.

10. The apparatus described in claim 1 characterized by driving mechanism for the bagmaking machine and the patch applicators coordinated to operate the means for cutting the tube in the bagmaking machine to sever the container blanks at locations which leave the upper ends of the front and back panels spaced slightly beyond the upper edges of the patches whereby the containers have soft top edges.

11. The apparatus described in claim 1 characterized by means for slitting the patches of one row at a center region of the patch with the slit extending part way from the center region toward the ends of the patch that are adjacent to the side panels of the bag, the means for slitting the patch being located along the path of travel of the web and beyond the patch applicator station whereby the slit extends through both the patch and the web.

UNITED STATES PATENT OFFICE

CERTIFICATE OF CORRECTION

Patent No. 3,611,883 Dated October 12, 1971

Inventor(s) William H. F. Grob

It is certified that error appears in the above-identified patent and that said Letters Patent are hereby corrected as shown below:

Column 2, line 19, "packing" should read -- packaging --.

Claim 1, line 47, "patch", first occurrence, should read -- path --. Claim 3, line 69, "path" should read -- patch --. Claim 4, line 6, "path" should read -- patch --.

Signed and sealed this 17th day of October 1972.

(SEAL)
Attest:

EDWARD M.FLETCHER,JR.
Attesting Officer

ROBERT GOTTSCHALK
Commissioner of Patents

FORM PO-1050 (10-69)

USCOMM-DC 60376-P69
* U.S. GOVERNMENT PRINTING OFFICE : 1969 O—368-334.