United States Patent

Kamins et al.

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[54] APPARATUS FOR AUTOMATIC MANUFACTURE OF HANDLE BAGS

[72] Inventors: **Seymour Kamins**, Oceanside; **Norman Rosenberg**, Bayside; **Per Bentsen**, Bronx, all of N.Y.

[73] Assignee: **CTP Industries Inc.**, Brooklyn, N.Y.

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[52] **U.S. Cl.**.....**93/8 WA**, 93/33 H, 93/35 H

[51] **Int. Cl.**.....**B31b 1/86**, B31b 1/20, B31b 1/72

[58] **Field of Search**.93/8 W, 8 WA, 33, 33 H, 35 VL

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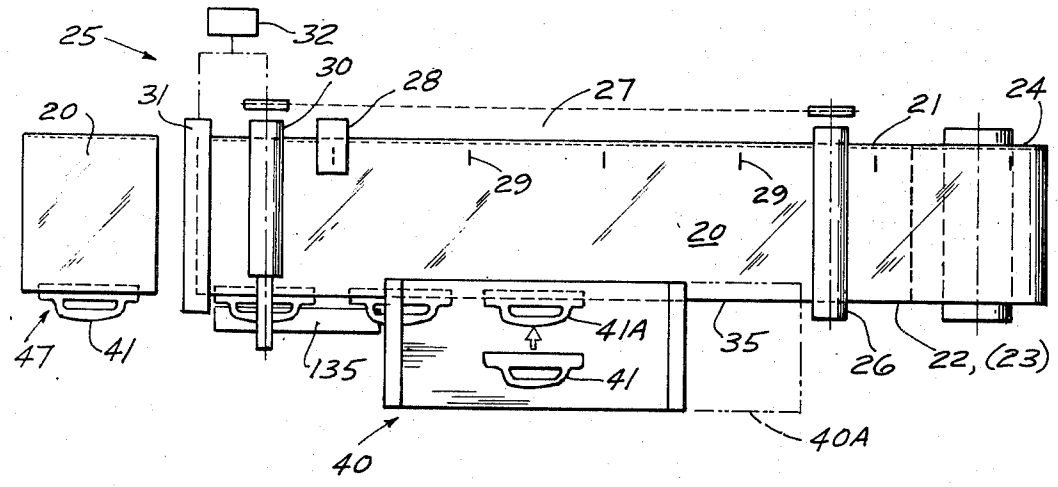
Primary Examiner—Wayne A. Morse, Jr.

Attorney—William D. Hall, Elliott I. Pollock, Fred C. Philpitt, George Vande Sande, Charles F. Steininger and Robert R. Priddy

[57] **ABSTRACT**

Apparatus for the automatic manufacture of thermoplastic carrier bags of the type formed of thin film of thermoplastic material and having a thermoplastic handle and closure means secured to the inner walls of the bag at its mouth. The machine includes apparatus for transporting a double layer bag blank of thermoplastic material, inserting a combined handle and closure means into the open edge of the blank and heat sealing each side thereof to a respective wall of the blank. Thereafter, the bag blank, with handle and closure means attached thereto, is transported to a further station at which a combined sealing and cutting operation occurs to form separate bags whose side edges are now sealed. A magazine is provided for storing a plurality of such handle and closure means and means is provided for feeding one at a time into the bag blank. The apparatus includes means for adjusting in a plurality of different ways the position of each handle and closure means as it is fed into the bag blank.

5 Claims, 14 Drawing Figures



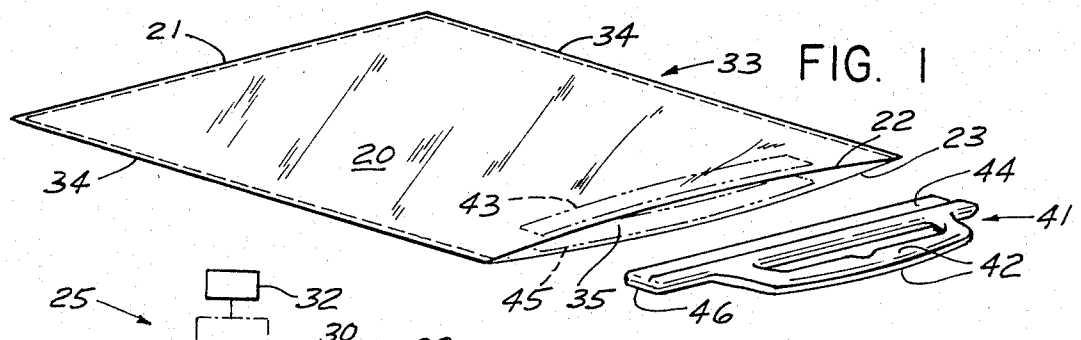


FIG. 1

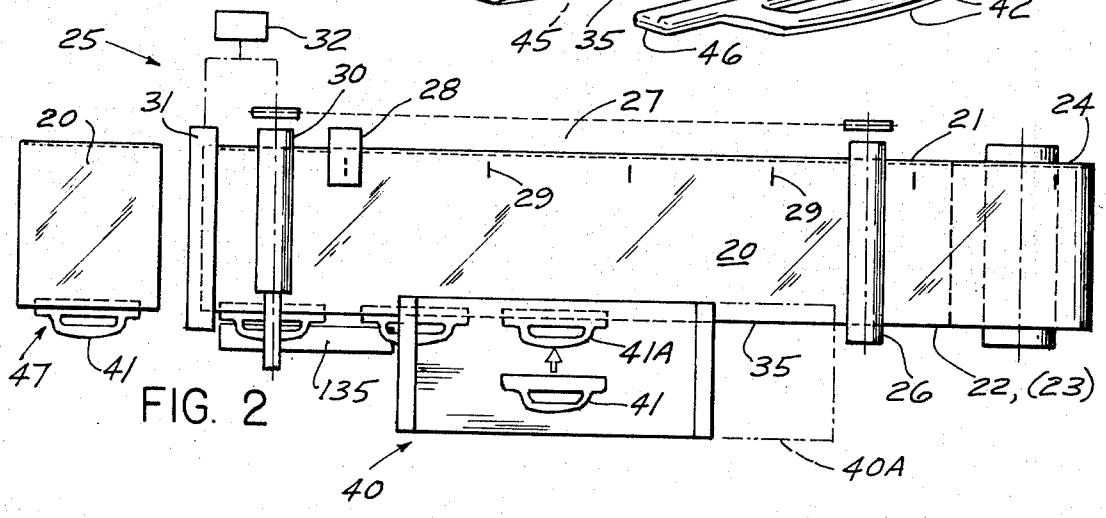


FIG. 2

OPERATION	TIME SLOT
FILM TRANSPORT (26,30) ON	
CUT-OFF & SEAL (31)	COOLING
FILM SPREADER (132) OPEN	
HANDLE POSITIONER (104) IN	
CLAMPING (96) IN	
HANDLE HEAT SEAL (113) ON	COOLING
HANDLE HOLD-BACK (121) ON	

FIG. 14

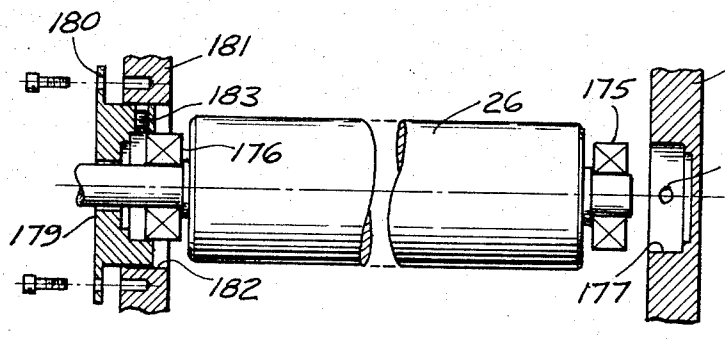


FIG. 13

INVENTORS
SEYMOUR KAMINS
NORMAN ROSENBERG
PER BENTSEN
BY
Hall, Pollock & VanderSande
ATTORNEY

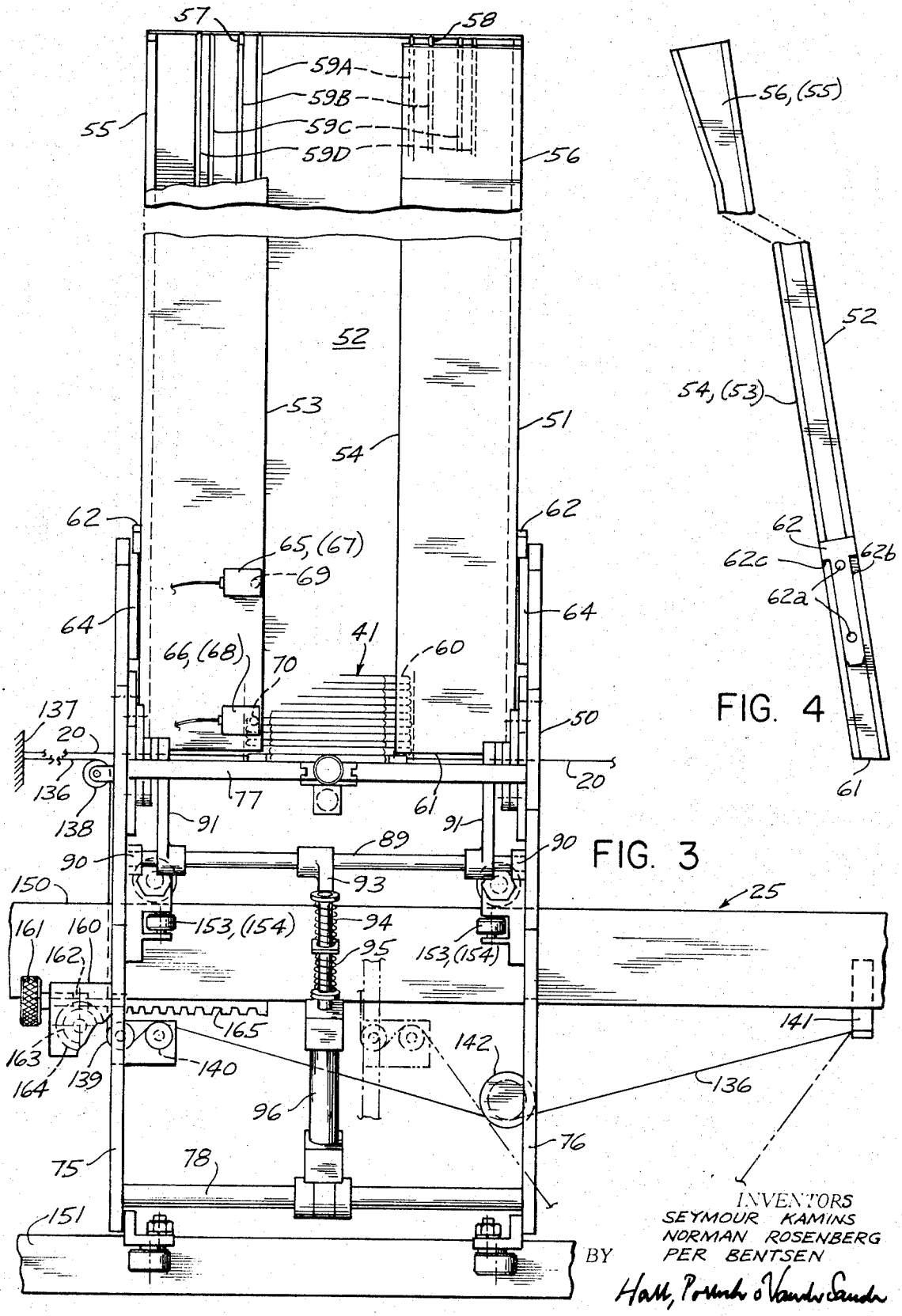


FIG. 3

FIG. 4

INVENTORS
SEYMOUR KAMINS
NORMAN ROSENBERG
PER BENTSEN
BY
Hall, Pollock & Vandersande
ATTORNEY

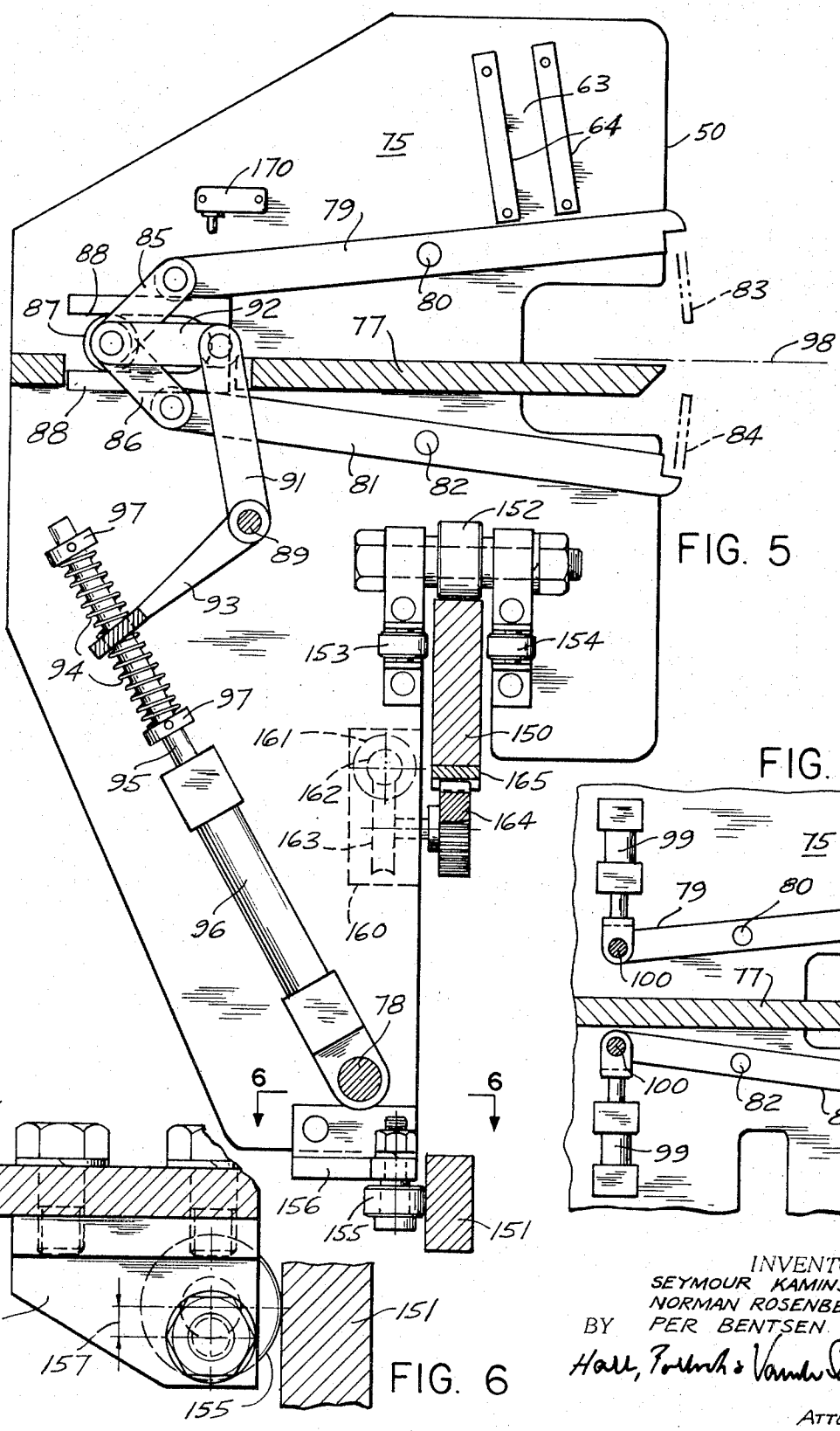


FIG. 5

FIG. 7

FIG. 6

INVENTORS
SEYMOUR KAMINS
NORMAN ROSENBERG
BY PER BENTSEN
Hall, Pollock & Vande Sande
ATTORNEY

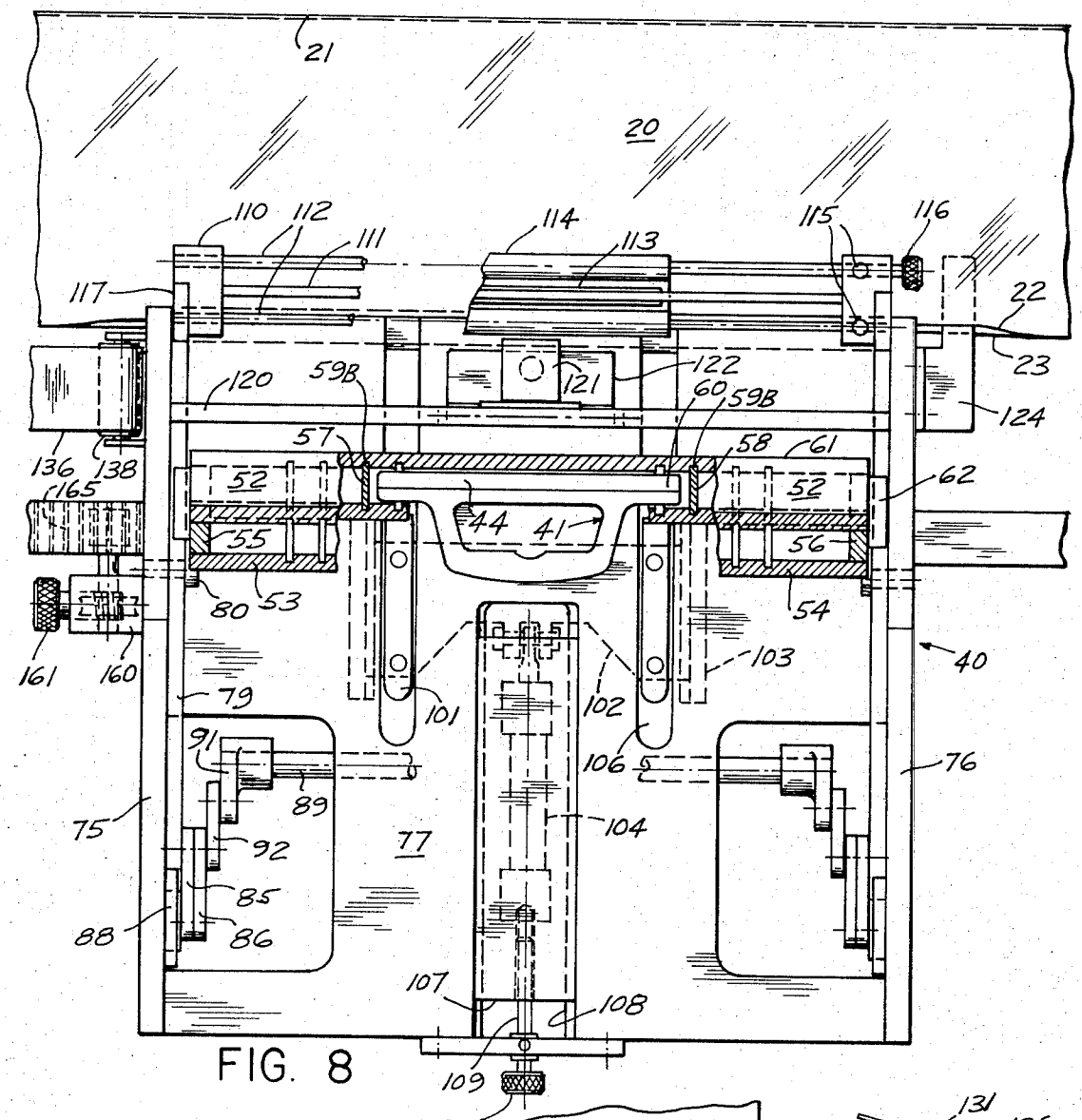


FIG. 8

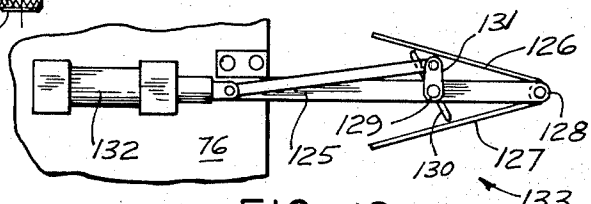


FIG. 12

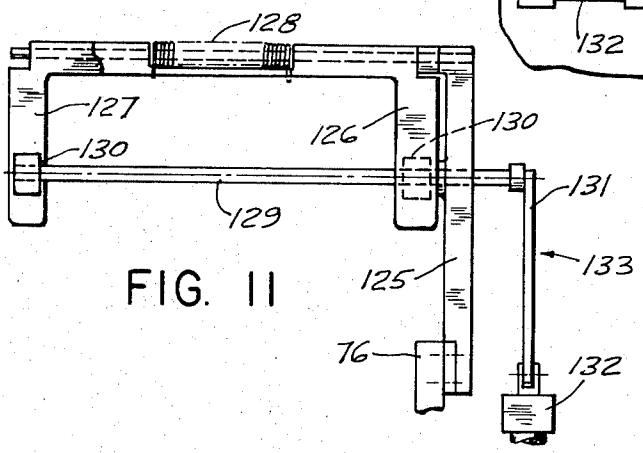


FIG. 11

INVENTORS
SEYMOUR KAMINS
NORMAN ROSENBERG
BY PER BENTSEN
Hall, Pollard & Vande Sande
ATTORNEY

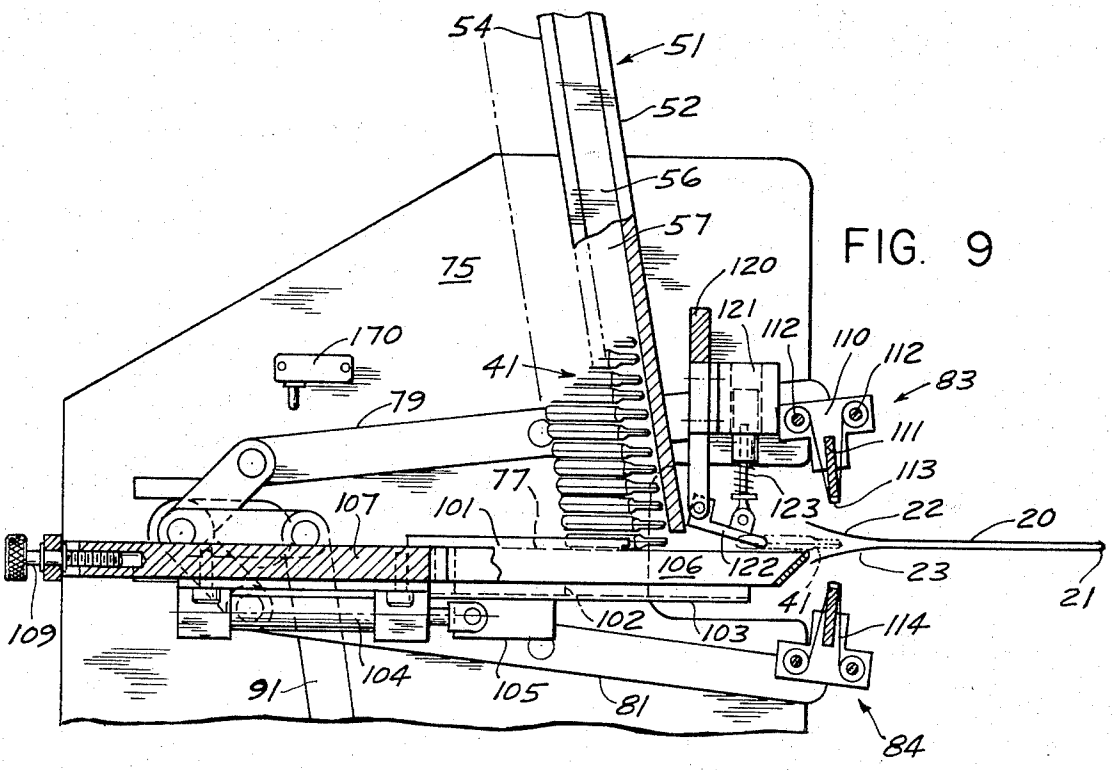


FIG. 9

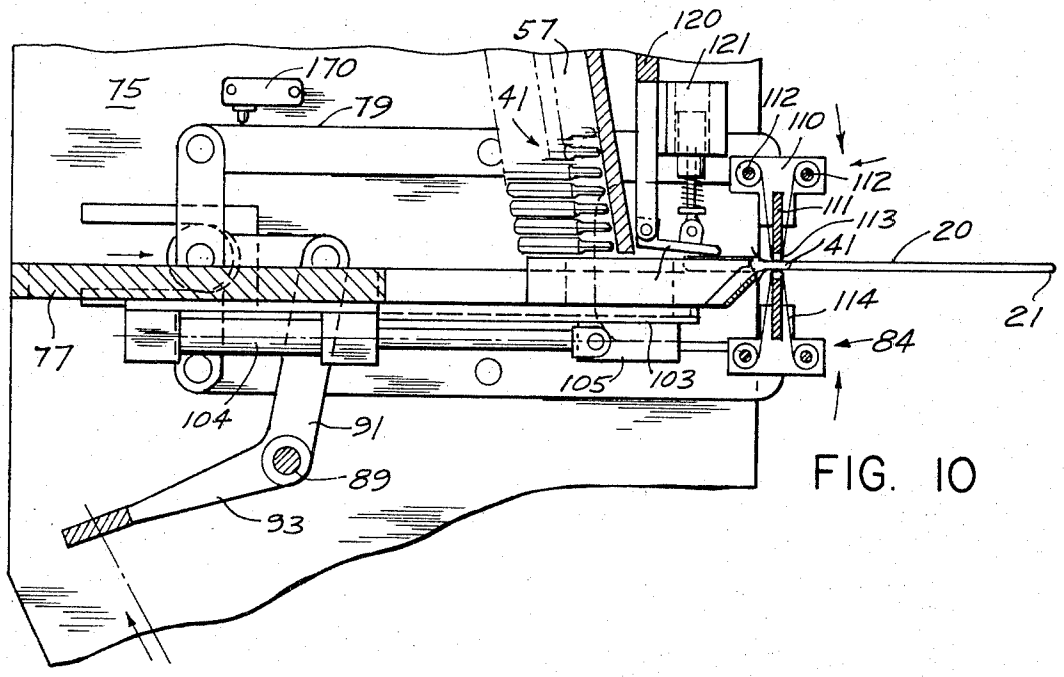


FIG. 10

INVENTORS
SEYMOUR KAMINS
NORMAN ROSENBERG
BY PER BENTSEN
Hall, Pollock & Vande Sande
ATTORNEY

APPARATUS FOR AUTOMATIC MANUFACTURE OF HANDLE BAGS

SUMMARY OF THE INVENTION

Carrier bags which are formed of a thin-film thermoplastic material and which have heat sealed thereto a combined handle and closure means are now well-known in the art. The handle and closure means generally comprises two mateable parts, each comprising a longitudinal sealing strip and an integrally formed U-shaped handle portion. The sealing strip of each part is adapted to be heat sealed to an inside bag wall at the bag mouth, and the two handle portions are provided with an interlocking means so as to enable the two to be snapped together so that the bag mouth may be tightly closed as desired but also may be repeatedly opened and closed by the user.

In the past, the art of manufacture of such bags has provided for the initial manufacture of the bags themselves but without handles by using well-known techniques and conventional bag-making machinery. Subsequent to the manufacture of the bags, they have been subjected to a wholly, or at least partially, manual operation wherein the bag mouth is opened, a combined handle and closure means inserted thereinto, and with each handle portion thereafter heat sealed to the bag walls. It will be appreciated that this is a time-consuming and thus costly method of manufacture which has resulted in an overall cost for such bags which is in excess, by a substantial margin, of the cost of bags manufactured by the machine of this invention. Although machines are also known which do have the capability of inserting web handles into an opened bag mouth and thereafter heat sealing such handles to the bag walls, such machines are not capable of providing a wide range of adjustment of the handle feeding mechanism in a convenient, easily controllable manner, and thus such prior art machines have been of high cost and are, moreover, not readily adaptable to quick alteration so as to accommodate different sizes and shapes of handles and bags.

SUMMARY OF THE INVENTION

The invention provides a machine which makes possible the completely automatic manufacture of carrier bags with thermoplastic handles. The machine starts with a roll of a thin film of thermoplastic material, forms such material into a continuous double layer web or blank, and opens the web to automatically insert thereinto a combined handle and closure means. After properly positioning the handle and closure means, and while both the web of material and the handle are stationary, a heat sealing means acts upon the bag walls to seal them to the inserted handle and closure means after which each bag portion is passed to a further location on the machine where each individual bag portion is separated from the adjacent portion to thereby form successive handle bags.

Although the method of handle bag manufacture as briefly described above has been known for some time, there has heretofore been no machine available which is designed specifically for the job of automatic handle bag manufacture and which provides the several advantages of the machine of this invention. For example, the machine of this invention is readily adapted to accommodate handles and bags of various sizes. The magazine in which the handles are stored for subsequent feeding into the bag mouth is very readily adjustable in position, being movable longitudinally along the machine by riding upon a pair of rails. At the same time, a vertical adjustment of the handle position as it is fed into the bag mouth can readily be effected as well by providing for the tilting, both forward and back, of the handle magazine. In addition, the extend of "throw" of the handle feed mechanism may very readily be adjusted as well so as to control the position of the handle and closure means within the bag mouth. In addition, a handle storage means is provided which may very readily be removed from the machine and replaced with one of a different size which is designed to accommodate handles of different lengths or configurations.

BRIEF DESCRIPTION OF THE DRAWINGS

In describing the invention, reference will be made to the accompanying drawings in which:

FIG. **1** is a perspective view of a bag as manufactured without a handle and, adjoining the bag, is shown a handle and closure means adapted for insertion into the bag mouth;

FIG. **2** is a schematic plan view of the invention as applied to the bag-making machine;

FIG. **3** is a front elevation, partially broken away, of the handle feed mechanism of this invention;

FIG. **4** is a side elevational view of the handle carrying means of the magazine;

FIG. **5** is a partial elevation section view of the handle magazine of FIG. **3**;

FIG. **6** is a plan sectional view taken along the section line **6—6** of FIG. **5**;

FIG. **7** is a partial elevational sectional view of an alternate form of handle clamping means;

FIG. **8** is a plan view, partially broken away of the apparatus of FIG. **3**;

FIG. **9** is a partial elevational sectional view of the handle magazine apparatus of FIG. **3**;

FIG. **10** is the same view as FIG. **9** but showing an alternate position of the apparatus in its cycle of operation;

FIG. **11** is a plan view of an alternate means for spreading the bag mouth to receive a combined handle and closure means;

FIG. **12** is a side elevational view of the apparatus of FIG. **11**; and

FIG. **13** is a partially broken sectional view of a means for removing a draw roll form the apparatus of the invention.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

Referring first to FIGS. **1** and **2**, FIG. **1** illustrates the type of thermoplastic carrier bag which is manufactured automatically by the apparatus of this invention, and FIG. **2** illustrates diagrammatically the manner in which such bags are made by the machine of this invention. In FIGS. **1** and **2**, a sheet of thin-film thermoplastic material **20** having a fold at **21** and upper and lower edges **22** and **23** is supplied from a reel **24** to a bag-making machine **25**. Quite commonly, the bag-making machine **25** includes the capability of using a thin film material which is not folded over in which

event the bag-making machine itself provides for the folding over of the film so as to form a double layer bag blank.

The machine **25** of FIG. **2** includes a draw roll **26**, a clear area **27** in which various operations can be performed and in which registration of the bag blank and its forward movement can be controlled as by a photocell **28** which detects markings **29** imprinted on the film, another draw roll **30**, a sealing and cut-off means **31**, and a drive means **32** for synchronizing the aforementioned components both when pulling the film forward and for at times momentarily stopping the progress of the film for handle insertion, handle sealing, and bag cut-off operations. The bag **33** which is produced by the machine thus has sealed edges **34** and an open end **35**.

The handle inserting and sealing apparatus of the invention is indicated diagrammatically at **40** in FIG. **2** between the draw rolls **26** and **30** and is located adjacent the open edge of the film at **35**. The apparatus **40** includes means for feeding handles **41**, one at a time, and cyclically in synchronism with cut-off and sealing means **31** to position each individual handle **41** at **41***a* inside the open side **35** of the film **20** and subsequently to heat seal the film at both edges to both sides of the handle and closure means **41**.

The handle and closure means **41** comprises two mateable portions **42** which are provided with a closure means such as a plurality of studs and recesses which releasably engage each other when the two handle portions are pressed together. Once the handle and closure means is inserted into the bag mouth, the portion **43** on one of the bag walls is heat sealed to the longitudinal sealing strip **44** of one of the two handle portions while the oppositely disposed portion **45** on the opposite bag wall is similarly heat sealed to the longitudinal sealing strip **46** on the opposed handle portion **44**. The resulting bag, with handle and closure means secured thereto and with each bag separated from the strip, is shown at **47**.

The apparatus **40** is provided, as will subsequently be described, with means for adjustably controlling the position of the handle as it is fed into each bag mouth, and such adjustment means is capable of controlling the position in any of three mutually perpendicular axes. As will be shown, the adjusting means, while permitting convenient adjustment, is of relatively simple construction and is also readily serviceable.

The apparatus **40** comprises a main assembly **50**, as shown in FIG. **3**, which performs the handle insertion and sealing operation and also supports a handle magazine **51**. The magazine **51** includes a front plate **52**, back plates **53** and **54** (see FIG. **3**), end plates **55** and **56**, and pocketing plates **57** and **58**. Pairs of slots **59***a*, **59***b*, **59***c*, and **59***d* accommodate the above-mentioned plates **57** and **58** at different positions, thereby forming a compartment of controllable width so as to accommodate handle and closure means of varying lengths. For example, when using handles whose longitudinal sealing strips have a length such as is shown in FIG. **3** at **41**, the plates **57** and **58** are respectively inserted in slots **59***b* and it will be understood that handles of greater length may require the positioning of the members **57** and **58** in either slot **59***c* or **59***d*, whereas shorter length handles may require positioning of members **57** and **58** in the slots **59***a*. It will be noted in FIG. **3** that the bottom edge **61** of the magazine **51** is positioned slightly above the top of the lowermost handle. This permits only the bottom handle to be pushed out from under the stack of handles by a means subsequently to be described.

The vertical position of the magazine **51** may readily be adjusted so as to vary the distance of its bottom edge **61** above the upper surface of member **77** so as to adjust to varying thicknesses of handles. This is accomplished by providing shouldered key members **62** on each side of the magazine which are adjustable in position by means of bolts **62***a*. The narrow portion **62***b* slides within slots **63** formed by the bars **64** which are secured to the main assembly **50** as shown in FIG. **5**. However, the shoulder portions **62***c* do not fit within the slot **63** and thus provide a stop which controls the vertical position of the magazine and, from the description previously given, it will be appreciated that the preferred position is one in which the spacing between the lowermost edge **61** of the magazine and the topmost surface of member **77** is slightly in excess of the thickness of the handle and closure means which is to be fed into the double-layer web.

Each magazine may further be provided with photoelectric cells **65** and **66** which receive light from light sources **67** and **68**, respectively. The light sources **67** and **68** are placed behind the plate **52** and illuminate the photocells through apertures **69** and **70** in both the front and back plates. When the magazine is full of handles, light from both light sources is prevented from impinging upon the associated photocell, but when the supply of handles is reduced to a level where the upper cell **65** receives light from its associated light source **67**, a warning buzzer or other signal (not shown) is triggered to indicate to the operator that additional handles should be inserted into the magazine. If the supply of handles is allowed to go lower yet, to a level where the cell **66** receives light from its associated light source **68**, another circuit may be triggered which will stop further operation of the entire machine and thereby prevent inadvertent operation of the machine without handles which wastes material.

The apparatus **50** comprises two vertical plates **75** and **76** which are bolted to a horizontal table surface **77**. As shown in FIG. **5**, each of a pair of upper rocker arms **79** is spindled at bearings **80** on the two side plates **75** and **76**. A pair of lower arms **81** is similarly spindled to the same plates at bearings **82**. At the work end of the arm, heat sealing assemblies **83** and **84** are diagrammatically illustrated in FIG. **5**. At the actuating end of the arm, the arms are linked by a pair of rotatable members **85**, **86** to a pair of cam rollers **87** which are limited to a horizontal traverse only as a result of their being engaged in a pair of guides **88** attached respectively to plates **75** and **76**.

A rod **89** is supported in a pair of bearings **90** (see FIG. **3**) and is provided with a pair of cranks **91** with each crank being coupled, in turn, with members **85** and **86** by a respective one of a pair of members **92**. At the center of rod **89**, another crank **93** is provided, which is engaged between springs **94** on the piston **95** of an air cylinder **96**, the air cylinder **96** being supported pivotally at the center of rod **78**. Collars **97** may be adjusted on actuator rod **95** for both optimum posi-

tion and spring pressure in the operating position. Shaft 78 (FIG. 3) is fixedly coupled to the side members 75 and 76.

It will be apparent from the disclosures of FIGS. 3 and 4 that actuation of the cylinder 96 in such a manner as to cause its piston 95 to be driven outwardly, will cause crank arms 91, and 93, to rotate clockwise about shaft 89, thereby causing cam rollers 87 to move to the right in FIG. 5 and thereby rotating both members 79 and 81 about their respective pivots 80 and 82 so as to cause the heat sealing assemblies 83 and 84 to move equal distances over arcuate paths toward the plane of the bag as indicated at 98. Similarly, retraction of piston 95 causes both heat sealing assemblies to move equal distances over arcuate paths away from the plane of the bag at 98. It will thus be appreciated that the mechanism thus far described not only permits both the heat sealing assemblies 83 and 84 to be moved away from the plane 98 during times other than when sealing is taking place, but will always result in the assemblies 83 and 84 being brought together at the plane 98 so that heat sealing can be effected without moving vertically the bag and the handle inserted therein for sealing.

FIG. 7 illustrates an alternate apparatus for obtaining essentially the same result as with the apparatus of FIGS. 3 and 5 already described. Thus, FIG. 7 shows two air cylinders 99 which are pivotally supported and engage with the ends of the rods 79 and 81 at their ends journaled at 100. The rods, being pivotally supported at 80 and 82, thus move over equal arcuate paths at their far ends and thus permit heat sealing assemblies comparable to 83 and 84 of FIG. 5 to be moved toward the film plane. For clarity, the springs and collars are omitted in FIG. 7, but it should be understood that they may be installed in a manner similar to that shown in FIG. 5.

Referring now to FIGS. 8, 9, and 10, the means for moving each handle 41 from the bottom of the stack of handles in magazine 50 comprises two pusher bars 101, a connecting plate 102 which is slidable in ways 103 attached underneath plate 77, and an air cylinder 104 connected to plate 102 at plate bracket 105. Bars 101 extend through slots 106 in plate 77 and bear against the longitudinal sealing strip portions 60 of the handle. Actuation of the air cylinder 104 moves the bottommost handle in the stack from the position shown in FIG. 9 to the position shown in FIG. 10.

It is desirable that a means be provided which will permit accurate adjustment of the extent of forward movement of each handle 41 under the influence of pusher bars 101 in order that each handle assembly 41 will be accurately positioned relative to the mouth of the bag. This is accomplished by mounting the air cylinder 104 on plate 107 which is slidable on ways 108 in plate 77, said plate 107 being made adjustable by a threaded locking means 109. This adjustment means permits the use of a cylinder with a fixed amount of throw of its piston while at the same time permitting accurate adjustment of the extent of forward movement of each handle assembly upon the actuation of the cylinder 104. Thus, the cylinder body itself is mounted on the plate 107, and the position of the latter plate 107 can be adjusted in or out relative to the mouth of the bag by turning the adjusting screw 109 by means of knurled handle 109*a*. In this way, the ultimate position of the piston of the actuated cylinder is adjusted and thus also the final position of each handle assembly 104 within the bag mouth.

A bar 120 secured between the two side plates 75 and 76 supports a solenoid 121 which actuates a pressure plate 122 pivotally supported at a bracket extension of bar 120. A spring-biased sliding means 123 is introduced between the solenoid armature and plate 122. At the time that the cylinder 104 is actuated to push a handle into the bag mouth, the solenoid 121 is actuated also so as to rotate the free end of the pressure plate 122 downwardly about its pivot and thereby exert a frictional force against the forward-moving handle assembly 41. This is necessary in order to ensure that the handle has its forward movement restrained since otherwise it would continue to move by inertia further into the mouth of the bag beyond the stopping position of the piston of cylinder 104, it being remembered that the piston moves the handles forward with extreme rapidity so that the moving handle acquires an appreciable inertia. However, after the sealing operation if completed, and it is intended to move the bag blank with attached handle to the next station, it is then desired that all restraining pressure on the handle be removed and, at such time, the solenoid 121 is de-energized so as to rotate the pressure plate 122 upwardly above its pivot point and thereby remove any pressure from the handle.

It will be appreciated that a means must be provided to separate the two layers of the bag blank prior to attempting to insert a handle assembly therebetween. This can be readily accomplished as shown in FIG. 8 by providing a bar 124 which is secured to the handle inserting apparatus and which includes a projecting portion which lies between the two layers of film 22 and 23 so as to separate them. However, it has been found that the use of a separating member such as 124 may at times produce certain difficulties, chiefly that of producing a ripple or distortion in the film which prevents it from being fed smoothly and without wrinkles through the machine. This problem may be avoided by employing a means such as is illustrated in FIGS. 11 and 12. A bracket 125 is provided which is pivotally supported on an upper spreader yoke 126 and a lower spreader yoke 127. The yokes are biased toward each other by a helical spring 128. Interposed between the yokes is a pivotal member 129 spindled in bracket 125 and having arms 130 and connected by a crank 131 to an air cylinder 132. In FIG. 12, the apparatus is shown in the position it assumes when the air cylinder 132 has its piston extended so as to rotate member 129 and separate the two spreader yokes 126 and 127. Such apparatus, when inserted between the two opposed thermoplastic films, causes the film to be spread along its sealing length so that its edges remain parallel and even. During the time that the film is moved, the spreader yokes 126 and 127 are, of course, closed, and it will be noted that these members 126 and 127 and also the crank arm 131 all lie totally within the thickness of bracket 125 so that film abrasion and distortion is minimized.

Heat sealing assemblies 83 and 84 each comprise a pair of brackets 110 attached to arms 79 and 81, respectively, and supporting between the brackets a

bar 111 and two rotatable members 112. At the edge of bar 111 is affixed a heating unit 113 of the Calrod type from which electrical connections (not shown) are brought forth. A woven teflon belt 114 wound around one member 112 and passing over either 113 is tightly re-wound on the other member 112. The belt is therefore renewable at the heating edge by loosening said screw 15 and turning knob 116. The aforementioned assemblies 83, 84 are removable at fasteners 117 for interchangeability when handles of differing lengths are needed.

After the handle is attached to the bag mouth, it is necessary to provide a support for the bag mouth which is now weighted with the weight of the handle. In FIG. 2, such support is generally indicated as a platform 135. However, as will subsequently be shown, it is a feature of this invention that the apparatus 40 shall be adjustable longitudinally along the machine so as to accommodate bags and handles of different sizes, and it may therefore be necessary to move the apparatus 40 to a position 40*a* as shown in FIG. 2. With such movement to the position 40*a*, it still becomes desirable to provide a support for the handle and bag immediately adjacent the handle sealing station. This is accomplished, as shown in FIG. 3, by providing a belt 136 which is secured at its one end at 137 to a fixed support and which then passes around rollers 138, 139 and 140 and is finally attached at its other end to a fixed bracket support 141. Interposed between roller 140 and attachment point 141 is a weighted idler roller 142 which rests upon the belt 136. Thus, as the apparatus 40 is moved in position to right or left in FIG. 3, it can be seen that there will at all times be a section of belt 136 immediately adjacent the lefthand edge of the apparatus 40 and extending over to the fixed support 137 which is capable of supporting the bag and the attached handle, and such support is at all times available irrespective of the position of the apparatus 40.

Referring to FIGS. 3, 5 and 6, the apparatus shown is provided with an upper rail 150 and a lower rail 151. Brackets which are attached to side plates 75 and 76 each spindle a load-bearing roller 152 and a pair of guide rollers 153, 154, whose axis of rotation is at right angles to that of support roller 152. It can readily be seen that the center of gravity of the apparatus of FIG. 5 is well above and to the left of the rollers 152. Accordingly, only one additional roller 155 need be provided at the bottom, and this roller is spindled at each bracket 156 secured to the bottom of plates 75, 76, and with the roller 155 engaging the bottom rail 151.

The film plane has been indicated in FIG. 5 by the reference character 98, and it is apparent that each handle assembly should be fed forward generally along or in the plane of the film at 98. However, it will be recognized that the film plane 98 represents an ideal and that the exact plane between the two layers of film at which the handle should be inserted may differ slightly above or below the ideal at 98. In order to provide adjustment to accommodate for variation in the vertical position of feed of each handle assembly, an adjustment means is provided which effectively permits rocking the entire apparatus of FIG. 5 about its support at the upper edge of the upper rail 150 by interposing an adjustable eccentric 157 between bracket 156 and roller 155. This effectively permits adjustment of the center of rotation of roller 155 relative to the forward edge of member 75, thereby permitting a slight rocking of the entire apparatus so that a clockwise rocking about its support will tend to lower the plane at which successive handle assemblies are fed forward whereas counterclockwise rotation will have the opposite effect.

The apparatus 40 may be positioned along the rails by providing a housing 160 on plate 75 which supports a shaft having a worm control knob 161 and a worm 162 inside the housing and cooperating with a worm wheel 163 which through its shaft operates a pinion 164 engaged with rack 165 positioned along the bottom edge of rail 150. It will thus be appreciated that rotation of the knurled wheel 161 permits, in effect, a micrometer adjustment of the position of the apparatus 40 along the rails 150 and 151.

Such accurate positioning is required because of the necessity of having the center of each handle means positioned within the web at a predetermined multiple, i.e. one and one-half, two and one-half, etc. bag widths from the position of the cutting and sealing knife.

A microswitch 170 is shown in FIGS. 9 and 10. In FIG. 9, the switch remains unactuated, but in FIG. 10, the bar 79 has moved upwardly to a position where the switch is actuated. With the apparatus in the position shown in FIG. 10, the heat sealing assemblies 83 and 84 are in a position to heat seal the bag walls to the longitudinal sealing strips of the handle assemblies, and actuation of switch 170 as shown in FIG. 10 provides an input signal to a current pulse generation (not shown) to supply a predetermined pulse of current to the sealing sub-assemblies 83, 84.

Referring to FIGS. 2 and 13, it can be seen that the draw rolls 26 and 30 are so positioned that access thereto for removal from the machine and replacement may be difficult and time-consuming In fact, with some of the prior art machines, several hours of labor may be required to remove a draw roll and replace it. The means of assembly of the draw rolls of this invention as shown in FIG. 13 greatly reduces the amount of time and effort required to effect this machine repair. Thus, as shown in FIG. 13, bearings 175 and 176 are press fitted on the shaft of draw roll 26. Bore 177 in machine member 178 receives bearing 175. A collar 179 is bored to receive bearing 176. Collar 179 is flanged at 180 for bolting to machine member 181. The diameter of the collar and of its clearance hole 182 in member 181 are suitably sized to pass the roller through for removal. To secure the outer races of the bearing against rotation, set screw 183 or other means known in the art may be employed.

FIG. 14 schematically illustrates the basic cycle of operation of the apparatus of the invention. It will be apparent to one skilled in the art that a multiple cam switch (not shown) operated from the main drive shaft (not shown) of the machine may be used to provide various timing functions and as is also generally known in the art, various successive operations are actually overlapped in their time relationship so as to provide as short a cycle time as possible. As FIG. 14 illustrates, the beginning of the cycle may be considered as the time when the film layers 22, 23 are transported by the draw rolls 26 and 30. When the film has been transported the required distance, as determined by the photocell 28, the film is stopped and the sealing bar 31 (FIG. 2) is

lowered to perform a side seal and cut-off operation. At the same time, the film spreader (see **132**, FIG. **12**) is actuated to separate the two layers of film **22**, **23**. Shortly after the film spreader has started to open the bag mouth, the handle positioning operation is commenced by actuation of cylinder **104**, at which time the solenoid **121** may also be actuated to provide a restraining force against the handle assembly as it is pushed into the bag mouth. Shortly thereafter, the cylinder **96** is actuated in order to bring the heat seal sub-assemblies **83**, **84** together to thereby seal the bag walls to the handle assembly. The heating elements **113** are energized shortly thereafter to provide an impulse of heat for effecting the sealing operation. Then the current is shut off to allow the molten plastic to solidify under pressure to effect a good heat seal; as the sealing jaws begin to open, the film again is transported. During the aforementioned heat and dwell cycle, the film spreader is retracted, the handle positioner is also retracted, the handle restraining plate is lifted, and all other mechanisms are returned to their original position to start their next cycle.

What I claim is:

1. Apparatus for the automatic manufacture of bags having handles secured to the inside bag walls at the mouth of the bag comprising in combination,

means for intermittently moving a double layer bag blank in the form of a continuous web past a handle inserting and securing station,

handle inserting means mounted for movement in the direction of travel of the web and including a magazine for storage of a plurality of said handles in stacked relationship,

said last-named means intermittently and in timed relationship to the movement of said web moving at least one handle into the web mouth,

means exteriorly of said web for securing said handle in said bag web to a wall of the bag blank,

means for sealing said web at spaced intervals to form successive bags and also to separate said successive bags,

said web and said handles both being formed of a thermoplastic material and said handle inserting means supporting heat sealing means which intermittently contacts at least one outer surface of said web to heat seal it to the handle inserted between the layers of said web,

each said handle comprising two detachably secured portions each having a longitudinal sealing strip and said heat sealing means comprising two longitudinal heating bars and means for moving said two bars simultaneously toward the plane of said web to heat seal each layer of said web to a respective sealing strip,

each said heating bar being mounted adjacent the end of at least one pivotally supported rocker arm,

and means for at times rotating both said rocker arms through equal arcs to move said heating bars relative to the plane of said web.

2. The apparatus of claim 1 in which said rocker bar rotating means comprises a cylinder, a crank arm rotated by actuation of said cylinder, a cam member guided in a slot which permits cam movement only in a direction substantially in the plane of said web, and a pair of links coupling said cam member to each of said rocker arms.

3. Apparatus for the automatic manufacture of bags having handles secured to the inside bag walls at the mouth of the bag comprising in combination,

means for intermittently moving a double layer bag blank in the form of a continuous web past a handle inserting and securing station,

handle inserting means mounted for movement in the direction of travel of the web and including a magazine for storage of a plurality of said handles in stacked relationship,

said last named means intermittently and in timed relationship to the movement of said web moving at least one handle into the web mouth,

means exteriorly of said web for securing said handle in said bag web to a wall of the bag blank,

means for sealing said web at spaced intervals to form successive bags and also to separate said successive bags,

and means exteriorly of said web becoming at times effective to exert a frictional restraining force against movement of said handle in response to said handle inserting means through the intervening material of the web,

said restraining means including a pressure plate, a solenoid for at times actuating said pressure plate, and a spring for moving said pressure plate in a direction opposite to that imparted to said plate by said solenoid.

4. Apparatus for the automatic manufacture of bags having handles secured to the inside bag walls at the mouth of the bag comprising in combination,

means for intermittently moving a double layer bag blank in the form of a continuous web past a handle inserting and securing station,

handle inserting means mounted for movement in the direction of travel of the web and including a magazine for storage of a plurality of said handles in stacked relationship,

said last-named means intermittently and in timed relationship to the movement of said web moving at least one handle in to the web mouth,

means exteriorly of said web for securing said handle in said bag web to a wall of the bag blank,

means for sealing said web at spaced intervals to form successive bags and also to separate said successive bags,

and means for spreading apart the two layers of said web to permit insertion therebetween of said handle,

said spreading means comprising two hinged plates inserted between the layers of said web and having a length in the direction of web movement which is in excess of the length of the handle,

said spreading means being located at the point of handle insertion,

and means for at times forcing said plates apart about said hinge to separate the layers of the web.

5. Apparatus for the automatic manufacture of bags having handles secured to the inside bag walls at the mouth of the bag comprising in combination,

means for intermittently moving a double layer bag blank in the form of a continuous web past a handle inserting and securing station,

handle inserting means mounted for movement in the direction of travel of the web and including a magazine for storage of a plurality of said handles in stacked relationship,

said last-named means intermittently and in timed relationship to the movement of said web moving at least one handle into the web mouth,

means exteriorly of said web for securing said handle in said bag web to a wall of the bag blank,

means for sealing said web at spaced intervals to form successive bags and also to separate said successive bags,

said handle inserting means including means for adjusting the extent of travel of each said handle into the span between the layers of said web,

said adjusting means comprising a cylinder having a piston with a predetermined length of its stroke,

means coupled to said cylinder for pushing the bottom most handle in said magazine forwardly into the space between the layers of said web,

and means for adjusting the position of said cylinder relative to said magazine.

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