

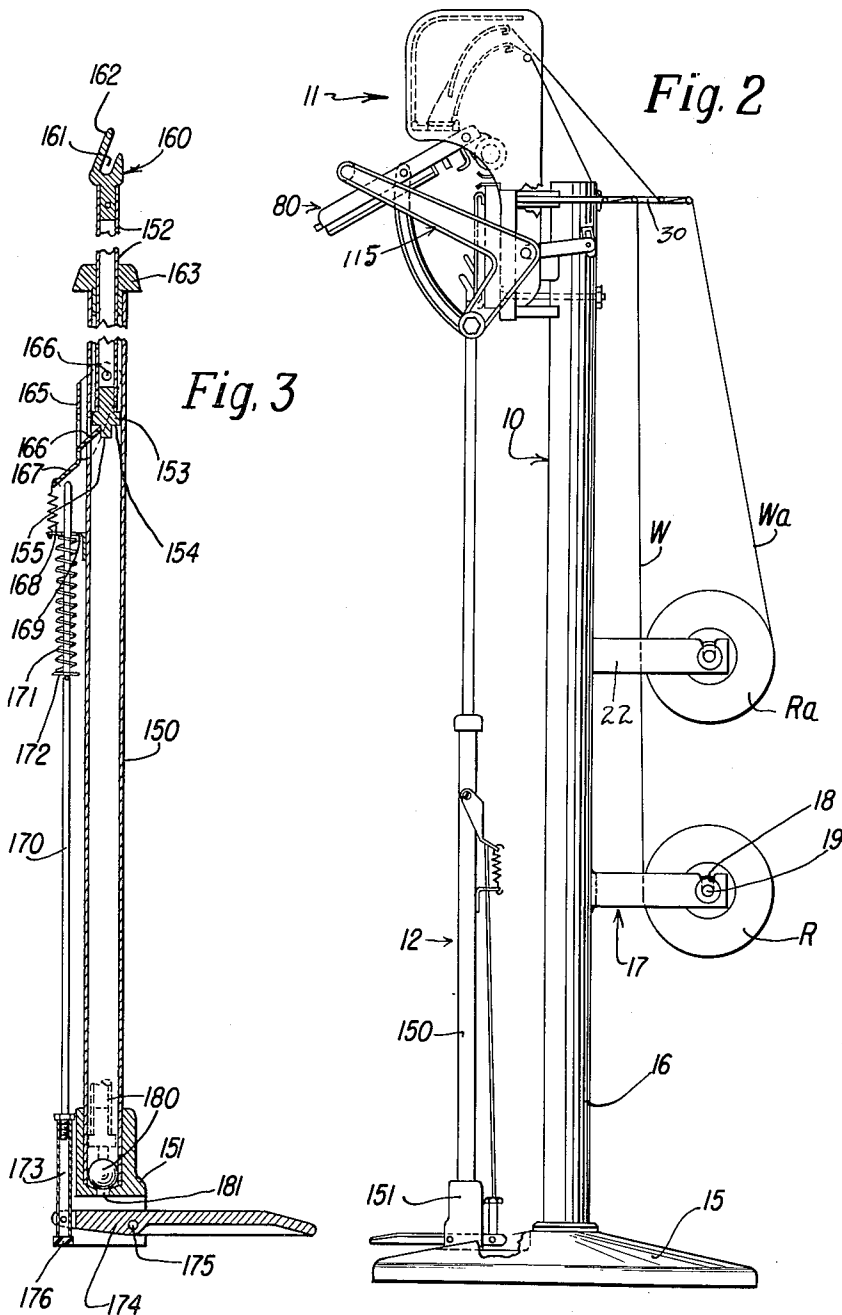
March 6, 1962

W. F. MITCHELL
BAG FORMING MACHINE

3,023,558

Filed June 2, 1958

5 Sheets-Sheet 2



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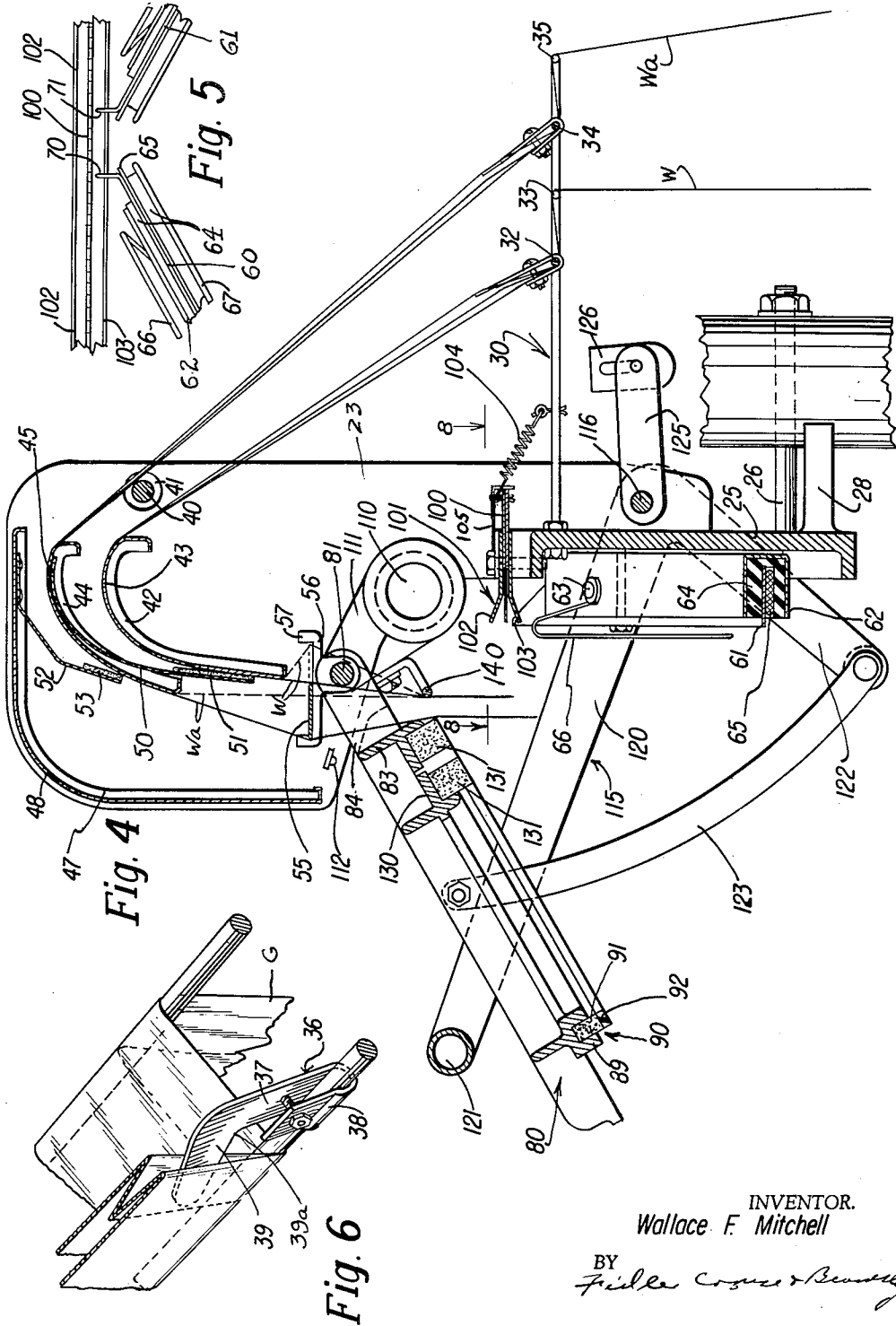
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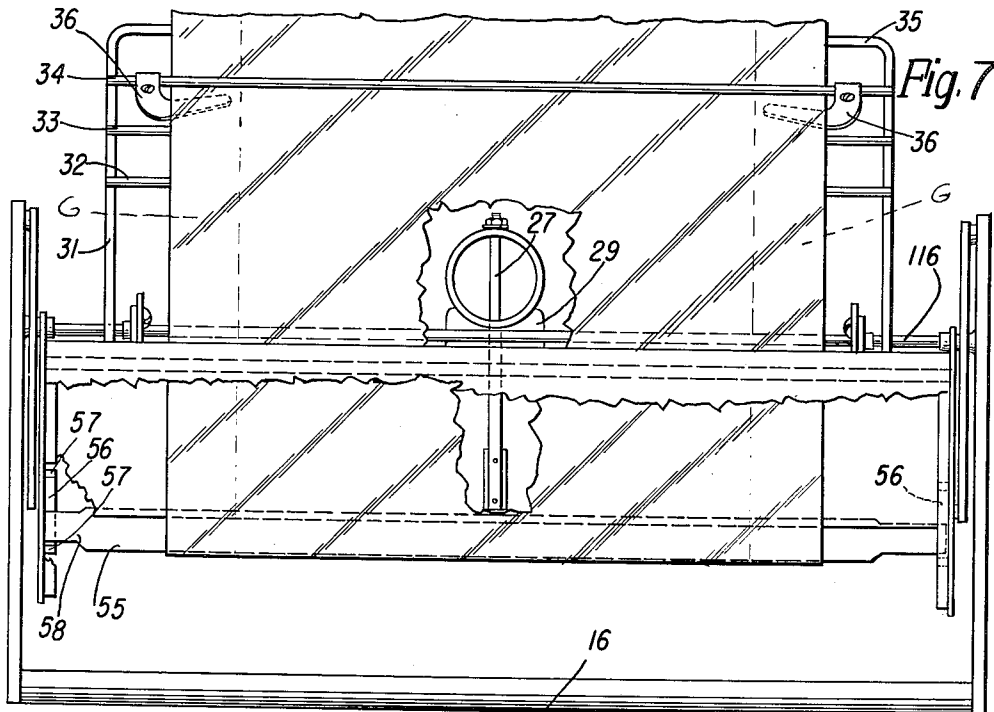


Fig. 7

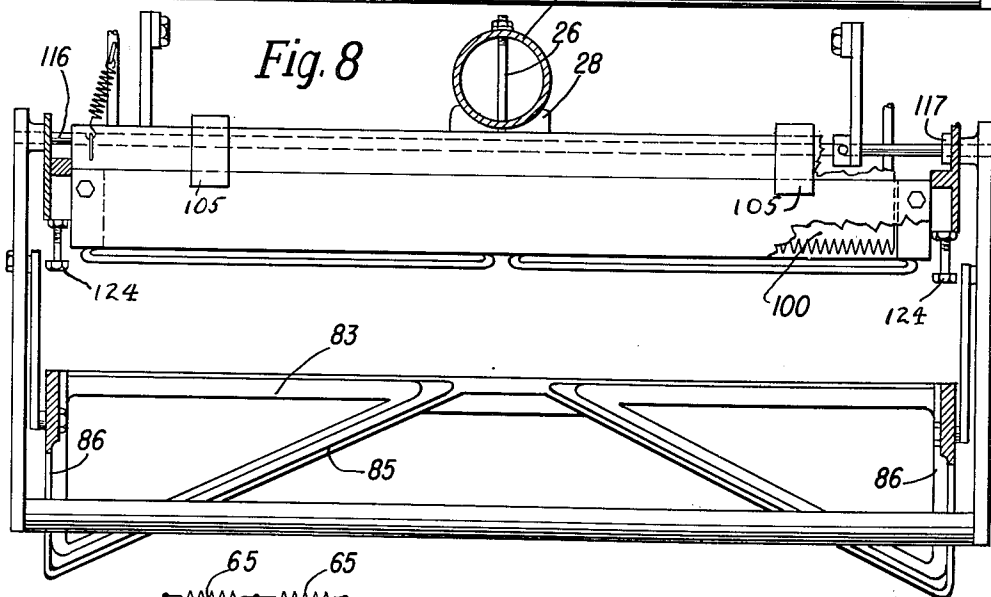


Fig. 8

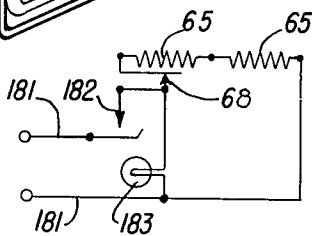


Fig. 9

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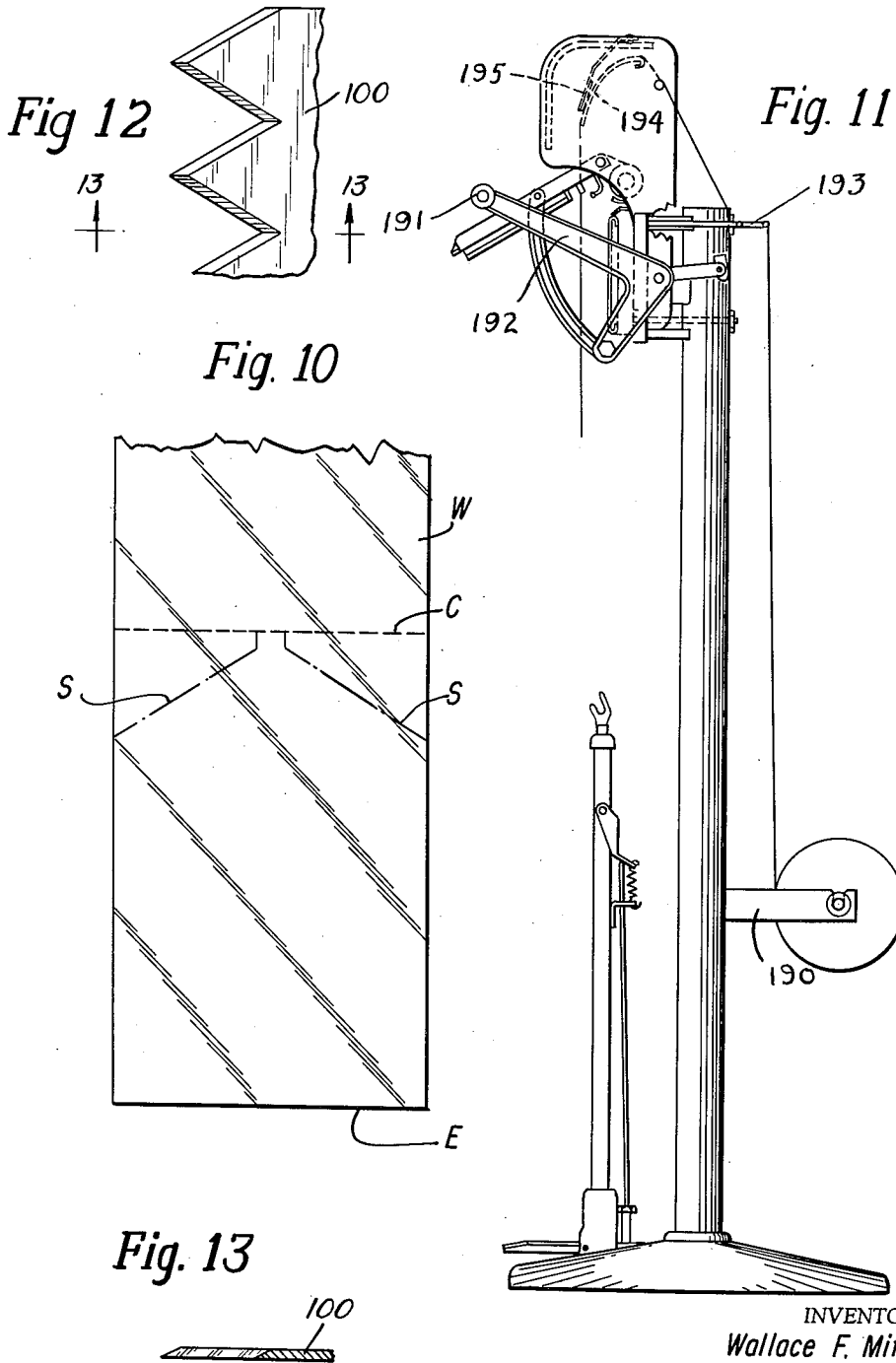


Fig. 13

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3,023,558

BAG FORMING MACHINE

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5 Claims. (Cl. 53—241)

This application relates to bag forming machines and has to do more particularly with an improved machine for forming bags in situ about articles to be packaged from flexible tubular stock in web form.

Machines of the type to which this invention relates are commonly employed for bagging hangered garments. Such machines commonly include supporting means for a roll of flexible tubular covering stock in web form, means for heat-sealing and severing the tubular stock throughout at least the major portion of its width along a line spaced from the end of the web, to form a pocket, means for severing the pocket from the web, means for supporting an article below the closure forming means in position to receive the tubular stock thereover, and means for guiding the web from the roll on the frame to the heat-sealing and severing means.

An object of the present invention is to provide an improved machine of the foregoing character.

Another object is to provide a machine of the foregoing character having various novel features which singly and in combination contribute to improved results in the operation of the machine.

A further object is to provide a machine for forming bags from flexible tubular stock in web form adapted to selectively employ either one of two different stocks, both supported in operative position in the machine, the selection of the particular stock being effected merely by advancing the selected stock into bag-forming position.

Another object is to provide a machine for forming bags from flexible tubular stock in web form of the type wherein the stock is advanced past cutting means for cutting a length of stock from the web and past means for closing the tubular stock throughout the major portion of its width at a selected zone, in which machines either one of two stocks may be selected for forming the bag by merely advancing such stock into position for the bag-forming operation and in which means are provided which are effective upon advancing movement of either of the two stocks in the machine for retracting the other stock away from the cutting means, so that only the selected stock is cut.

Another object is to provide a machine for forming bags from flattened, tubular, flexible stock in web form having a gusset in either one or both side edges, which machine is provided with means for automatically opening the gusset or gussets as the web is advanced from the supply roll to the bag-forming means.

A further object is to provide a machine for forming bags from flexible stock in web form wherein novel means are provided for exerting a uniform tension on the web between a supply roll and bag-forming means and which prevents reverse movement of the web away from the bag-forming means and toward the supply zone.

Still another object is to provide a machine for forming bags from flexible stock in web form around an article to be packaged, which machine has a novel support for the article which is movable between an upper active position to receive the bag over the article and a lower position wherein the bagged article may be removed from the support and wherein is provided novel means for releasably holding the article support in its upper position.

Still another object is to provide a machine for forming bags from flexible heat-sealing tubular film stock

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in web form wherein novel means are provided for sealingly closing the web across at least the major portion of its width and for severing a length of stock from the web to form a bag, which means is simple in construction and effective in operation.

A further object is to provide a machine for forming bags from flexible heat-sealing, tubular, film stock in web form and having at least one heated blade for heat sealing the stock to form a pocket and for severing the pocket from the web to provide a bag, wherein novel means are provided for moving the web into heat-sealing relation with the blade and for maintaining the web spaced from the heat-sealing means except during the heat-sealing and severing operation.

Still another object is to provide a machine for forming bags from flexible, heat-sealing tubular film stock in web form having at least one heated blade for heat sealing and severing the stock to form a bag, wherein is provided novel means for guarding the blade to prevent accidental contact between the blade and the web or the blade and the hand of the machine operator.

A further object is to provide a machine for forming bags from flexible stock in web form which has novel means for guiding the web from a supply roll to bag forming means and for maintaining sufficient tension on the web to prevent wrinkling or reverse movement of the web.

Still another object is to provide a machine for forming bags from flexible stock in web form of the type having a platen pivoted on a fixed support for carrying a portion of the bag-forming mechanism for swinging movement into cooperative relation with another portion carried on the fixed support, in which machine the platen is counterbalanced so that it is normally urged to a position away from the fixed support but can be moved toward the fixed support with a relatively small, substantially uniform manually applied force.

Other objects and advantages of the invention will appear from the following description taken in connection with the appended drawings wherein:

FIGURE 1 is a front elevational view of one form of machine constructed in accordance with my invention;

FIG. 2 is a side elevational view of the machine of FIG. 1 with the garment support shown in its upper position;

FIG. 3 is an enlarged, vertical, sectional view through the garment support portion of the machine;

FIG. 4 is a fragmentary, enlarged, vertical, sectional view taken along the line 4—4 of FIG. 1;

FIG. 5 is an enlarged, fragmentary view showing certain details;

FIG. 6 is an enlarged, fragmentary, perspective view showing one of the gusset openers;

FIG. 7 is an enlarged top plan view of the machine, with the top cover removed and parts broken away to show the interior construction;

FIG. 8 is an enlarged, horizontal sectional view taken along line 8—8 of FIG. 4;

FIG. 9 is a wiring diagram of the electrical connections of the machine;

FIG. 10 is a view of a portion of the web showing the lines of heat sealing and severing and the line of cutting which operations are effected by the machine to form the bag;

FIG. 11 is a view similar to FIG. 2 only showing a second embodiment of the invention;

FIG. 12 is a fragmentary top plan view of the cutter blade showing a portion of the blade; and

FIG. 13 is an enlarged sectional view taken along line 13—13 of FIG. 12.

Referring particularly to FIGS. 1 and 2, the machine of the present invention includes generally a pedestal 10

supporting at its upper end a bag forming head 11 and includes also a garment support 12 upstanding from the base of the pedestal. The pedestal 10 preferably includes a base 15 preferably of circular form from which extends an upstanding vertical column 16 which supports certain of the members hereinafter described more in detail.

Means are provided for supporting two separate rolls R and Ra of flexible, tubular film stock from which the bags are to be formed. This film stock is heat-sealing and preferably transparent. One material which I have found is especially well suited for use in forming bags in accordance with my invention is polyethylene film. A plurality of stock roll supports are provided so that stocks of different widths or of different colors may be supported simultaneously on the pedestal. Two such supports are shown, and the machine is provided with mechanism hereinafter described for selectively using material from either of the stock rolls for forming the bags. The tubular film stock is folded flat and preferably is formed with side pleats or gussets G (FIG. 6) along its side edges which, when the bag is formed from the stock, provides a bag having a substantial thickness readily to accommodate the article to be packaged and to provide a neat and attractive appearing package. A lower stock roll support 17 is preferably formed from a rigid metal strap bent into U-shaped form and secured to the column 16 at its midpoint, as by welding. The arms of the roll support 17 are provided adjacent their outer ends with upwardly opening notches 18 adapted to receive therein a shaft 19 for supporting the roll R of stock. The shaft 19 preferably is provided with a pair of collars 20 at each end spaced apart sufficiently so that the arm of the roll support 17 may receive the portion of the shaft between the two collars, with the collars limiting axial movement of the shaft in the roll support so that the shaft cannot be dislodged from the roll support once it is inserted in the notches. The roll R is supported on the shaft 19 by a pair of cones 21 of known construction which are adapted to be adjustably secured on the shaft and which enter the ends of the roll to support the same in a known manner.

The second roll support 22 is formed similarly to the roll support 17 but is disposed above the latter a sufficient distance to permit it to carry the roll Ra above the first roll R without interference between the rolls or the web W extending from the roll R.

The head 11 includes a main plate 25 (FIG. 4) which is arranged generally vertical and which is secured to the column 16 as by bolts 26 and 27 (FIGS. 7 and 8) extending through the column and through the plate, the latter being provided with rearwardly extending lugs 28 and 29, having arcuate rear edges adapted to receive and bear against the column 16 to hold the plate in properly oriented position with respect to the column 16. Secured to and upstanding from the plate 25 is a pair of side plates 23, 23 (FIG. 1) which are adapted to support certain of the members, as hereinafter described more in detail.

The vertical plate 25 serves to support certain members hereinafter described, including a pair of heater blades for heat sealing and severing the film stock to form a pocket therein over the garment to be bagged; a slidable knife for severing the web across the width thereof to sever the formed pocket from the web; platen means for cooperation with the heated blades; and means for gripping the web for cutting by the cutter; and guide means for guiding the webs from the supply roll to the bag forming means, all as hereinafter described more in detail.

Disposed above the uppermost stock roll support 21 is a web guide 30 (FIGS. 4 and 7) formed preferably of rod stock and of generally U-shaped form and secured in the vertical plate 25 in a suitable manner. The web guide 30 is provided with three crossbars 32, 33, and 34 extending between and secured to the arms of the U-shaped member 31. The end portion 35 forms a fourth cross member.

Slidably secured on each of the cross members 32 and

34 is a pair of gusset openers 36 (FIG. 7) which are disposed adjacent the ends of the crossbars 32 and 34. Each gusset opener 36 (FIG. 6) includes a body portion 37 having one end 38 bent up into the form of a U and the other end extending laterally from the end of the body portion to form a finger 39. The finger 39 is so shaped that its rear or inner edge 39a, which is the edge which engages the gusset, is inclined rearwardly at an angle of approximately 20° to a line perpendicular to the direction of travel of the web. Thus, the inner or tip end of the finger engages the gusset first and spreads the inner plies of material forming the gusset. The U-shaped end 38 is clamped about the corresponding crossbar by suitable means, such as a screw and nut in order to hold the gusset opener in the desired angular and longitudinal positions on the crossbar. The gusset opener 36 is adapted to have its finger extend into the gusset G of the web from the side thereof and to open the gusset as the web is pulled past the finger in a manner hereinafter described.

A side plate bracing rod 40 (FIG. 4) extends between the two side plates 23, 23 near the upper ends thereof and is secured in sockets 41 integral with the side plates 30 and 31 respectively.

The side plates 23, 23 are provided with aligned arcuate flanges 42, one of which is shown in FIG. 4, extending inwardly from the inner faces of the side plates and which serve to support an apron-like web guide 43 of arcuate form which extends entirely across the machine between the two side plates 23, 23.

A second pair of flanges 44, one of which is shown in FIG. 4, are provided above first flanges 42 and are generally similar thereto and serve to support a second web guide 45, generally similar to and generally concentric with the web guide 43 and above and forwardly beyond the latter.

A third pair of flanges 47, one of which is shown in FIG. 4, extend inwardly from the inner faces of side plates 23, 23, which flanges are located above and forwardly beyond the other flanges 42, 44 and which serve to support an apron-like cover 48 in a manner generally similar to that in which the web guides 43 and 45 are supported, and generally concentric therewith.

Each of the web guides 43 and 45 and the cover 48 is formed with inturned flanges at its upper and lower edge portions, which flanges are spring engaged over the end edges of the flanges 42, 44 and 47 respectively, so that the web guides and cover may be readily removed from their positions on the respective flanges.

Secured to and depending from the inner and lower face of the web guide 45 is a spring finger 50 which carries at its lower end a friction pad 51 in position to engage against the web W extending around the web guide 43 and to hold the web firmly against the web guide. The finger and pad serve to prevent reverse feeding of the web W relatively to the web guide 43.

In a similar manner a spring finger 52 is secured to the inner surface of the cover 48 and carries a friction pad 53 adapted to bear against the web Wa passing over the web guide 45 and to hold the web against such guide and prevent reverse feeding of such web.

Disposed below the lower ends of the foremost web guide 45 is an automatic separating means or web shortener, the purpose of which is explained more in detail hereinafter. The web shortener or separator includes a bar 55 extending across the entire width of the machine between the side plates 30 and 31 and slidably supported in flanges 56, 56 (FIGS. 4 and 7) extending inwardly from the side plates 23, 23, each of which flanges 56, 56 has upturned ends 57, 57. The flanges 56, 56 support the bar 55 for movement in a front and rear direction in a horizontal plane, in accordance with a force transmitted thereto by one or the other of the webs W or Wa, as hereinafter explained, and the upturned ends 57 limit the extent of such movement. Referring more particularly to FIG. 7, it will be seen that the bar 55 is

formed with reduced ends 58 which permit the desired extent of movement of the bar in a fore and aft direction in the flanges 56, 56.

Means are provided for heat-sealing and severing the web across a major portion of its width, along lines extending divergently downwardly from two points spaced slightly to the sides of the center line of the web, in order to form a closure along such lines corresponding generally to the slope of the shoulders of a hangered garment to be enclosed within the bag or closure formed by the machine. To this end, a pair of heated sealing and severing blades 60, 61 (FIGS. 1, 4 and 5) are supported on the vertical plate 25 in position to be engaged, upon suitable operation of the machine, by one or the other of the webs W or Wa, whichever is selected for forming a bag as hereinafter explained. The sealing and severing blades 60 and 61 are disposed below and slightly to the rear of the webs as the latter normally hang downwardly from their respective web guides 43 and 45 so that neither of the webs engages the sealing and severing blades until it is pressed thereagainst in a manner to be described hereinafter.

Inasmuch as the sealing and severing blades 60 and 61 and their mountings and connections are generally similar, only one such assembly will be described in detail, it being understood that the other is similar except as hereinafter pointed out in detail. The blade 61 (FIG. 4) is disposed in a U-shaped support 62 preferably formed of metal and suitably secured to the front face of the plate 25. The blade 61 is clamped in the support 62 as by a screw 63, a quantity of suitable heat-insulating material 64 such as asbestos being interposed between the blade 61 and the support 62. An electrical heating element 65 is clamped against one face of the blade 64 and is electrically connected to a source of power, in a manner hereinafter explained, in order to heat the blade 61. The blade 61 projects, at its forward position, beyond the insulation and support so as to expose the edge for engagement by the selected web in order to permit the web to be heat-sealed and severed along a line corresponding to the bottom of the edge of the blade. The edge of the blade 61 preferably is coated with "Teflon" which prevents the stock from sticking to the blade.

Guard members 66, 67 are provided which preferably take the form of rods which are secured at their ends to the respective outer faces of the support 62. The guard members 66, 67 have straight portions extending parallel to and in locations forwardly beyond the edge of the blade 61, in order to prevent accidental contact between the hands of the operator and the blade. They also prevent contact between the web and the blade except when the web is pressed against the blade.

The heat-sealing and severing element 60 is generally similar to the element 61 just described and is supported and heated in a similar manner. However, the blade 60 is connected in series with an adjustable thermostat 68 (FIG. 1) carried on the support 62 and which maintains the blade at a suitable temperature.

The heating elements 65, 65, blades 60 and 61 are connected in series and adapted to be connected to a suitable source of electric power (not shown) whereby the two blades are simultaneously heated.

As previously stated, the two blades 60 and 61 are inclined downwardly and outwardly from adjacent the vertical center line of the machine and the web engaging edges thereof lie in a common vertical plane. The upper and inner end portions of the blades 60 and 61 are formed as shown at 70 and 71 (FIG. 5) with upwardly extending, vertically arranged portions which are spaced apart a sufficient distance to form a bag neck as hereinafter explained. Thus, the blades 60 and 61 are shaped to seal and sever the web along two lines, each of which has a vertical portion and an outwardly and downwardly inclined portion extending from the lower end of the vertical portion. Referring to FIG. 10, there is shown

diagrammatically a section of the web W whereon the lines of heat-sealing and severing are indicated by the dot-dash lines S.

Means are provided for pressing the selected web against the heat-sealing and severing blades, which means takes the form of a pair of pads mounted for movement toward and away from the blades. Referring now particularly to FIGS. 2 and 4 there is provided a platen or frame 80 which is pivotally mounted on the main plate 25 by a rock shaft 81 which extends between and is journaled in the side plates 23, 23.

The platen 80 is normally biased in a position away from the main plate 25, as illustrated particularly in FIG. 4 of the drawings. This is effected by a counterweight 110 extending between and carried by a pair of arms 111 secured on the rock shaft 81 adjacent the two ends thereof. The counterweight 110 and the arms 111 are of such weight that the platen 80 and the actuating means therefor (hereinafter to be described) are substantially balanced thereby, so that very little force is required to swing the platen from its outer position into its inner position against the vertical plate 25. Preferably the counterweighting is such that the platen 80 is slightly biased upwardly and outwardly away from the main plate 25 and abuts against stops on the two side plates 23, 23, which stops may be provided with resilient bumpers such as provided by rubber buttons 112, 112.

Suitable manual actuating means are provided for rocking the platen from its outer position into its position against the members carried by the vertical plate 25. Such mechanism includes a pair of bellcrank levers 115, 115 secured on a rock shaft 116 journaled in bearings 117 (FIG. 8) integral with and extending inwardly from the inner faces of the side plates 30 and 31. Each rock shaft 115 has a long arm 120 extending forwardly and the outer ends of the two arms 120 are joined by an operating bar or handle 121 which extends across the width of the machine in position above the platen whereby it may be readily grasped by the operator using either hand or both hands to move the platen into heat-sealing and severing position. While the operator could of course use both hands to operate the actuating means, this is entirely unnecessary, as only a relatively small force is required.

The shorter arm 122 of each bellcrank lever is connected by an arcuate link 123 to the platen, the link 123 being pivotally connected to the outer end of the arm 122 and to the platen at points approximately midway of the platen in a direction from its pivot point outwardly. The links 123 preferably are of arcuate form in order that they may clear the pivot of the bellcrank lever, namely, the rock shaft 116, when the links are in their rearmost position.

A pair of stops 124, 124 (FIG. 8) are provided adjacent the opposite sides of the machine which project from the end plate in position to limit the inward movement of the platen 80 toward the side plate 25 in order to prevent any damage to the machine from excessive force applied to the platen-actuating mechanism. Such stops preferably take the form of screws threaded into bosses in the main plate 25 and projecting horizontally outwardly therefrom a suitable distance to be engaged by the platen. The screws are adjustable in order to provide adjustment of their positions to the desired extent dictated by the position to which it is desired to halt the platen.

The platen 80 includes a frame (FIGS. 4 and 8) which is formed with a crossbar 83 extending across the width of the machine and which has side arms 84 extending therefrom which have bores for receiving the rock shaft 81. Extending downwardly and divergently outwardly from the bar 83 in positions corresponding to the positions of the sealing and severing blades is a pair of bars 85, 85 which are joined at their outer ends by side bars 86, 86 to the ends of the crossbar 83. The inclined bars

85, 85 are formed with grooved channel-like portions 89 in each of which is secured, as by a suitable adhesive, a pad 90 adapted to be moved into engagement with the corresponding sealing and severing blade and including a principal portion 91 formed of a spongy, heat-resistant plastic, such as "Ureafoam," and having a facing 92 of highly heat-resistant, smooth plastic material such as "Teflon."

Means are provided for mechanically cutting the selected web, throughout its entire width, at a point above the lines of heat-sealing and severing in order to provide a straight end edge on the web for forming the lower edge of the bag, as indicated at E in FIG. 10. To this end a cutter blade 100 is slidably supported in a sheath or guard 101 secured on the upper edge of the vertical plate 25. The sheath 101 includes a pair of blades 102 and 103 which are secured together and to the plate 25 as by bolts, and are spaced throughout their lengths sufficiently to admit the blade 100 therebetween. At their outer, forward end portions the guard members 102 and 103 are divergent so that their forward end edges are spaced at appreciable distances above and below the cutter blade 100. The members 102 and 103 serve as clamping members, as hereinafter explained, for clamping the web during the cutting operation.

The cutter blade 100 is formed with a series of teeth (FIG. 8) along its forward edge which are of triangular shape and preferably have tooth angles of approximately 45°, that is to say the angle between the two edges of a single tooth is 45°. Also, the forward cutting edges of the teeth are formed or tapered each at an angle of 45° from the faces of the blade to provide an extremely sharp and effective cutting edge, as illustrated in FIGS. 12 and 13.

The blade 100 is normally retracted by a pair of springs 104, 104, one of which is shown in FIG. 4, connected respectively between an end portion of the blade 100 and between a fixed portion of the machine, as for example, the corresponding arm 31 of the web guide 30. Rearward movement of the blade 100 is limited by a pair of stops 105, each of which takes the form of a strap secured to the upper surface of the upper guard member 102 and having a down-turned flange at its rearward end.

Carried on the rock shaft 116 is a pair of arms 125, each of which carries a pair of pressure members 126, adapted when the bellcrank is rocked to press against the rear edge of the cutter blade and project the same from its sheath and into engagement with the web to cut the web. The pressure members 126 are supported on the ends of their respective arms 125 for both rocking and slidable adjustment in order to permit adjustment to provide the desired engagement between the pressure members and the blade and the desired extent of movement of the blade in its sheath.

The platen frame 80 (FIG. 4) is formed with a channel portion 130 extending along the crossbar 83 substantially throughout the length thereof, which portion is adapted to receive a pair of spaced pads 131, formed of spongy material such as a spongy plastic, for example, "Ureafoam," and which are positioned to engage respectively against the edges of the upper and lower clamping members 102 and 103 when the platen is rocked toward its inner position thereby clamping between such pads 131 and the clamping members 102 and 103 the web which extends downwardly past the clamping blades.

A short section of spongy plastic (not shown) having a suitable heat resisting face similar to the members 90 and 91 is disposed in the channel portion 130 at the central portion thereof and spanning the distance between the upper ends of the pads 90 and 91 in position to engage against the vertical portions 70, 71 of the blades 60 and 61.

Carried on the platen 80 close to the rock shaft 81 is a movable web guide 140 formed as a U-shaped member and having the base portion of the U spaced rearwardly from and parallel to the adjacent edge of the pad

131. The web guide 140 is so arranged that when the platen is in its outer position the web guide 140 maintains away from the heater blades either of the webs that extend downwardly in front of the heater blades. However, since the web guide 140 is fixed to and movable with the platen 80, when the platen 80 is moved inwardly into cooperation with the heater blade, the web guide permits that web which extends past and beyond the heater blades to be moved into engagement with the heater blades by the pad 90. Also, the portion of the web which is opposite the pad 131 is permitted to be moved thereby into engagement with the clamping elements 102 and 103. Accordingly, whichever web extends past the cutter blade and the heater blades is held out of engagement therewith until the heat-sealing and severing and the cutting operations are performed.

The garment support 12 is located forwardly of the main column 16 and is adapted to support a hangered garment in position to have the tubular web drawn thereover, throughout a portion of the length of the garment, prior to heat-sealing and severing the web stock, whereafter the completed bag may be drawn down completely over the garment to enclose the same. The garment support is so constructed that a portion of the support may be elevated to receive the hangered garment thereon for enclosing the garment in the bag, whereafter the support may be released and allowed to move downwardly to permit ready removal of the bagged garment therefrom.

The garment support 12 (see especially FIG. 3) is supported in and extends vertically upwardly from the base 15 in alignment with the column 16 and forwardly thereof. The garment support includes a hollow post 150 supported in a socket 151 secured on the base 15. The socket 151 preferably has a pair of flanges 152 (FIG. 1) which form an integral portion of the socket and are bolted to the base 15 to support the socket. The socket 151 is of non-circular cross-section, preferably square, and the post 150 is of similar shape so that it is prevented from rotating in the socket. It is understood of course that both the socket and post may be formed of circular cross-section, in which event it is necessary to provide means for holding the post against rotation in the socket.

A rod 152 which is formed preferably from tubing is telescoped within and slidable in the post 150 and has at its lower end a foot 153 which preferably has a portion extending in the rod 152 and secured therein in a suitable manner. The foot 153 preferably is shaped to conform to the shape of the interior of the post 150 and prevent rotation of the rod 152 in the post 150. Additionally, the foot 153 is provided with a shoulder 154 and a downwardly projecting stem portion 155 for a purpose hereinafter explained. The foot 153 may be formed in any suitable manner, and where the rod 152 is of tubular construction the head may be constituted by a plug having a portion extending telescopically into and secured in the lower end of the rod 152. On the other hand, where the rod 152 is formed of solid material (not shown) the foot may be secured thereto in a suitable manner, as by welding to the lower end of the rod 152.

At its upper end the rod 152 carries a head 160 suitably secured thereto and having a notch 161 therein adapted to receive the hooked portion of a garment hanger in the manner illustrated in FIG. 1, the garment hanger being shown in broken lines, since it does not form a part of the bagging machine.

The head 160 has a portion 162 rearwardly of the notch formed to extend above the portion forwardly of the notch, in order to facilitate guiding the hooked portion of the garment hanger into the notch.

The rod 152 is guided for vertical sliding movement by a head bushing 163 secured in the upper end of the post 150 in order to prevent it from rocking or vibrating. Means are provided for releasably maintaining the rod

152 in its upper position, which position is shown in FIG. 3 of the drawings. Such means takes the form of a flanged latch 165 pivotally supported on the upper portion of the post 150 as by a pair of pivot screws 166 extending through the latch flanges and into the post 150. The latch has a tang 166 adapted to engage under the shoulder 154 of the foot 153 of the rod 152. The latch 165 also has an outer end portion 167, bent away from the main body, to which end portion is connected a spring 168, the other end of which is connected to a fixed bracket 169 on the post 150, whereby the spring 168 yieldably urges the latch into latching position.

Means for releasing the latch are provided which include a releasing rod 170 which is vertically slidable in the bracket 169 with its upper end in position to engage the under surface of the outer end portion 167 of the latch 165 and raise it to swing the latch out of latching position. The rod 170 is normally urged downwardly by a spring 171 which is compressed between the bracket 169 and a washer 172 secured on the rod 170. At its lower end the rod 170 is threaded into a tube 173 which is pivotally connected to a pedal 174 pivoted on the socket 151 by a pivot pin 175. The tube 173 preferably carries at its lower end a cushioning pad 176 which may be formed of rubber or other resilient material to cushion the fall of the rod 170. It will be seen that when the pedal 174 is depressed it raises the tube 173 and connected rod 170 against the downward biasing action of the spring 171 to move the latch out of latching position.

Means are preferably provided for cushioning the fall of the rod 152 when it is released from its upper position and returned by gravity to its lower position (as seen in FIG. 11). Such means takes the form of a resilient cushioning element 180 which may be a ball formed from rubber or a synthetic material having characteristics similar to relatively soft rubber. The purpose of such cushioning member is to permit the rod 152 to drop without causing appreciable noise or injury to the rod. The ball 180 is of such size as to fit conveniently in the lower end of the tube 150 and against the seat formed in the socket 151 having a small opening 181 which vents the interior of the tube 150 to atmosphere.

The electrical connections of the machine are illustrated diagrammatically in FIG. 9. The circuit includes a pair of leads 181 which are adapted to be connected to a source of electric power (not shown) as by a conventional plug (not shown). Included in series between the leads is a main switch 182 which is mounted on the machine and preferably on the vertical plate 25 (FIG. 1). Connected in series with the main switch 182 is the thermostatic switch 68 and the two heater elements 65. A pilot light 183, which preferably also is mounted on the vertical plate 25 (FIG. 1), is connected in parallel with the heater elements 65 and in series with the main switch 182 to indicate when the main switch 182 is closed and the circuit is energized.

In the operation of the machine a roll of tubular, flexible, heat-sealing material of suitable characteristics, as for example, polyethylene, is mounted on one or the other of the stock roll shafts. Where it is desired to employ the machine for bagging garments with either one of two different sizes or colors of materials, two rolls are mounted on the machine as illustrated in FIG. 2. The material in the form of a web W is pulled from the first roll R and threaded through the web guide 30, the material being led over the cross-bar 33 and under the cross-bar 32 and then over the web guide 43 and then downwardly and forwardly of the rock shaft 81 rearwardly of the shortener bar 55 and forwardly of the web guide 140. The web W then falls freely, as illustrated particularly in FIG. 4 of the drawings. Where two stock rolls are employed, the material is pulled from the second and upper roll Ra, in the form of a web Wa, and is led over the rear cross member 35 of the web guide and under the cross-bar 34 and then over the upper web guide 45

and downwardly past the web shortener bar 55 forwardly thereof and forwardly of the movable web guide 140. The webs W and Wa are shown in full lines in FIG. 4 in the approximate positions which they assume when the web shortener bar 55 is in its forward position. When it is shifted to its rearward position, the webs W and Wa assume the approximate positions indicated by the broken lines.

When a hangered garment is to be packaged it is supported on the rod 152, the hook portion of the hanger carrying the garment being engaged in the notch 161, as illustrated in FIG. 1, wherein the hanger is shown in a position on the rod, the showing of the garment being omitted for the purpose of clarity, it being understood, however, that the garment is carried on the hanger in the usual fashion. The rod 152 is elevated manually to its upper position (as shown in FIG. 2 of the drawings) wherein the hanger and the upper portion of the garment are disposed only slightly below the lower edge of the vertical plate 25, and in position to receive the tubular web thereover. The selected web is manually drawn downwardly over the garment support and the hanger and garment carried thereon a sufficient distance so that the lower end of the web extends close to the lower end of the garment carried on the hanger. In this connection it will be noted that the extent to which the web is drawn over the garment is not critical, but it is preferable that it be drawn over the garment a sufficient distance so that when the bag is formed and released by the machine it will completely cover the garment. In this connection, it will be seen that the upper ends of the two shoulder supporting portions of the hanger are disposed below the cutter blade a predetermined distance. The web should be drawn down to a distance above the lower end of the garment on the hanger which is no greater than and preferably less than the distance between the upper ends of the shoulder portions of the garment and the corresponding portions of the cutter blades. Thus, when the bag is formed and released and is drawn down over the garment, it is moved a distance equal to the distance between the cutter blades and the corresponding shoulder-supporting portions of the hanger on the support. In other words, the distance between the lower end of the web and the lower end of the garment when the web is in its initial condition and unsevered should be at least equal to and preferably less than the distance that the bag moves after it has been severed from its position forming a part of the web to its position as a bag pulled down over the garment.

After the web has been drawn down over the garment in a preliminary manner, as above explained, the platen 80 is moved inwardly, by manually applied force on the bar 121, to cause the pads 90 to move inwardly and move the selected web against the heated blade to thereby heat-seal and sever the web along the lines of the heater blades. The temperature of the heater blades is such that it is necessary to maintain the web in contact with the heater blades for only a very short time in order to effect the heat-sealing and severing. This period is not critical and it is necessary only that the web be maintained against the heater blade for a sufficient length of time to insure adequate heat-sealing and severing. On the other hand, if the web is maintained against the blade for a longer period than necessary, there is no adverse action, the heat-sealing and severing having been completed.

When the platen is moved inwardly to force the web against the heater blade, the pad 131 moves the selected web against the edges of the clamp members 102 and 103 to clamp the web thereagainst and at the same time the pressure members 126 are moved against the rear edge of the blade 100 to eject the blade from its sheath 101 and cause it to sever the web along a line perpendicular to the longitudinal axis of the web, whereby the severed portion of the web—which at this time is formed as a pocket substantially closed at its upper end—is released

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and may be drawn downwardly over the garment in the form of a garment-enclosing bag.

Referring now to FIG. 10 of the drawings, it will be seen that the web is heat-sealed and severed along the lines S, S, by the heat-sealing and severing blades. At the same time, the web is severed along the line C to release the bag thus formed by the heat-sealing and severing blade. Because of the fact that the upper ends of the heater blades terminate slightly below the cutter blade 100, the generally triangular portions of the web which lie between the lines S, S, and the line C are attached to the bag thus formed at short, vertical portions adjacent the juncture of the lines S and C. Such triangular portions may be readily detached from the bag manually. On the other hand, such triangular portions may be mutually engaged and tied in order to provide a sealed upper end for the neck of the bag which is formed by the vertical portions of the heat-sealing and severing blades where such is desired.

The foregoing operation may be repeated as desired. However, where it is desired to form a bag from the other web, for example the web *Wa*, it is only necessary to exert manually a downward force on such other web *Wa*. Such downward force tends to straighten or "shorten" the selected web *Wa* and moves the web selector bar 55 rearwardly, which causes the free end of the non-selected web *W* to move upwardly so that its lower end is above the knife blade (when the cut is made) and the lower end of the web *Wa* is below the knife blade. The bagging operation using the web *Wa* is effected in the manner above-described, and a bag is formed around the garment, as explained hereinabove. In this connection, it will be noted that the non-selected web is moved by the action of pulling down the selected web, to a position above the cutter blade, so that the cutter blade does not cut through the non-selected web and there is no shredding of the non-selected web.

After the bag has been formed around the hangered garment, as explained hereinabove, the garment support is lowered by depressing the pedal 174 by foot pressure which allows the garment hanger supporting rod 152 to drop by gravity to its lower position. At the time that the pedal is depressed the operator holds the garment hanger which supports the garment with the formed bag therearound so that it does not drop with the garment-supporting rod 152. In view of the fact that the garment-supporting rod 152 is lowered a very substantial distance from its upper to its lower position, it is withdrawn to a substantial extent from within the bagged garment thus allowing the bagged garment to be removed readily from the garment support by merely moving the hangered garment forwardly from the garment support.

When it is desired to form a bag around another garment the garment-supporting rod 152 is elevated to its upper position wherein it is automatically latched by the latching means and a hanger carrying another garment is placed on the garment support in the manner above described in order to prepare the machine for the formation of another bag around the second garment.

While the preferred form of the invention embodies a machine such as illustrated in FIGS. 1 to 9, and described hereinabove, the invention also contemplates the provision of a garment bagging machine employing only a single roll of film stock. Such a machine is illustrated in FIG. 11, which machine it will be seen is similar in most respects to the machine illustrated in FIGS. 1 to 9. However, the machine of FIG. 11 has only a single stock roll support 190 and only a single guiding means for guiding the web into position and past the heat-sealing and severing means.

Moreover, in either the form illustrated in FIGS. 1 to 9, or in FIG. 11, I may substitute in lieu of the actuating bar 121 a pair of handles 191, 191 (one of which is shown) which extend outwardly from the bellcrank levers 192, either one of which or both handles may be manual-

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ly grasped in order to actuate the bellcrank lever to move the platen 89 into engagement with the heat-sealing and severing blade and to actuate the cutter blade.

It will also be noted that instead of providing a web guide having four cross members adapted to guide two different webs in spaced relation from the stock rolls to the web guides carried by the head only a single web guide 193 is provided and also only a single web guide 194 similar to the web guide 45 is carried by the head. A single friction member 195 carried by the cover (not shown) in a manner similar to the friction member 50 illustrated in FIGS. 1 to 9 in connection with the web guide 45 shown in such figures is provided for cooperation with the web guide 194.

The remainder of the machine illustrated in FIG. 11 preferably is similar in all respects to the machine illustrated in FIGS. 1 to 9 of the drawings.

All of the portions of the machine are preferably formed from suitable metals, except when otherwise stated. That is to say, all of the parts are metal except the pads, the heat insulating members, the electrical insulation, the cushioning pad and the cushioning element. The base, column roll supports, shafts, web guide, post, rod, latch, and the like, preferably are formed of steel. The vertical plate, platen and actuating members, socket and pedal preferably are formed of light metal such as aluminum.

I claim:

1. In a machine for forming a closure about an article from flexible stock in web form including a support, means on the support for mounting two rolls of stock, means for supporting below a closure-forming station an article to be enclosed, means for guiding the stock from a roll on each of said roll mounts to the closure-forming station, and means for severing the web between said rolls and said closure-forming station, the improvement including web-retracting means between said roll supports and said severing means actuated by the application of a force on the end portion of either of the webs in a forward feeding direction to move the free end of the other web in a reverse feeding direction.

2. The invention as set forth in claim 1 wherein said web-retracting means includes a bar shiftably supported on said support in position between and transversely of the two webs, said bar being of a width greater than the spacing between the webs provided by said web guide means whereby a forward feeding force on either web urges the bar in a direction to displace the other web laterally and move its free end in a reverse feeding direction.

3. The invention as set forth in claim 1 wherein said web-retracting means includes a bar shiftably supported on said support in position between and transversely of the two webs, said bar being of a width greater than the spacing between the webs provided by said web guide means whereby a forward feeding force on either web urges the bar in a direction to displace the other web laterally and move its free end in a reverse feeding direction and means for limiting the shifting movement of said bar in either direction.

4. In a machine for forming a closure about an article from flexible stock in web form including a support, means on the support for mounting a roll of flattened tubular stock having a gusset in at least one side edge thereof, means for supporting below a closure-forming station an article to be enclosed and means for guiding the stock from a roll on the roll support to the closure-forming station the improvement which comprises a gusset opening member and means mounting said member on said support between said roll-mounting means and said closure-forming station for sliding and pivotal adjusting movement and in position to engage in the gusset of the web and open the gusset as the web is fed toward the closure forming station.

5. In a machine for forming a closure about an article

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from flexible stock in web form including a support, means on the support for mounting a roll of flattened tubular stock having a gusset in at least one side edge thereof, means for supporting below a closure-forming station an article to be enclosed and means for guiding the stock from a roll on the roll support to the closure-forming station, the improvement which comprises a web guide bar mounted on said support between said roll-mounting means and said closure-forming station and a gusset opening member mounted on said web guide bar for sliding adjustment in a direction toward and away from the path of movement of said web, and positioned to engage in the gusset of the web and open the gusset as the web is fed toward the closure-forming station.

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