Nov. 25, 1969 W. S. PEPPLER 3,479,930

AUTOMATIC STRETCH BAG MACHINE

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FIG. 1.

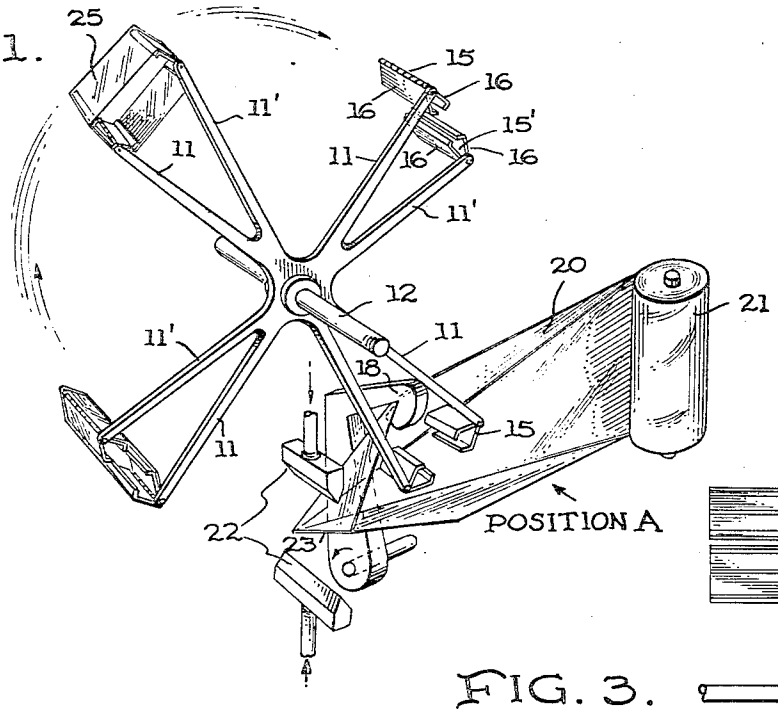


FIG. 3.

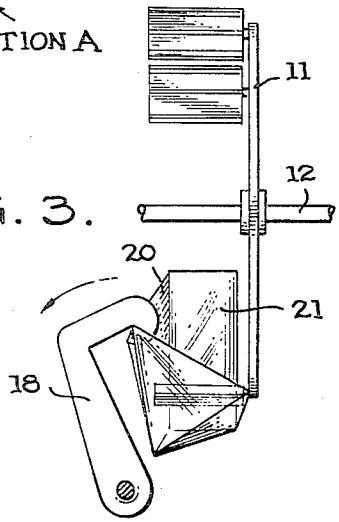
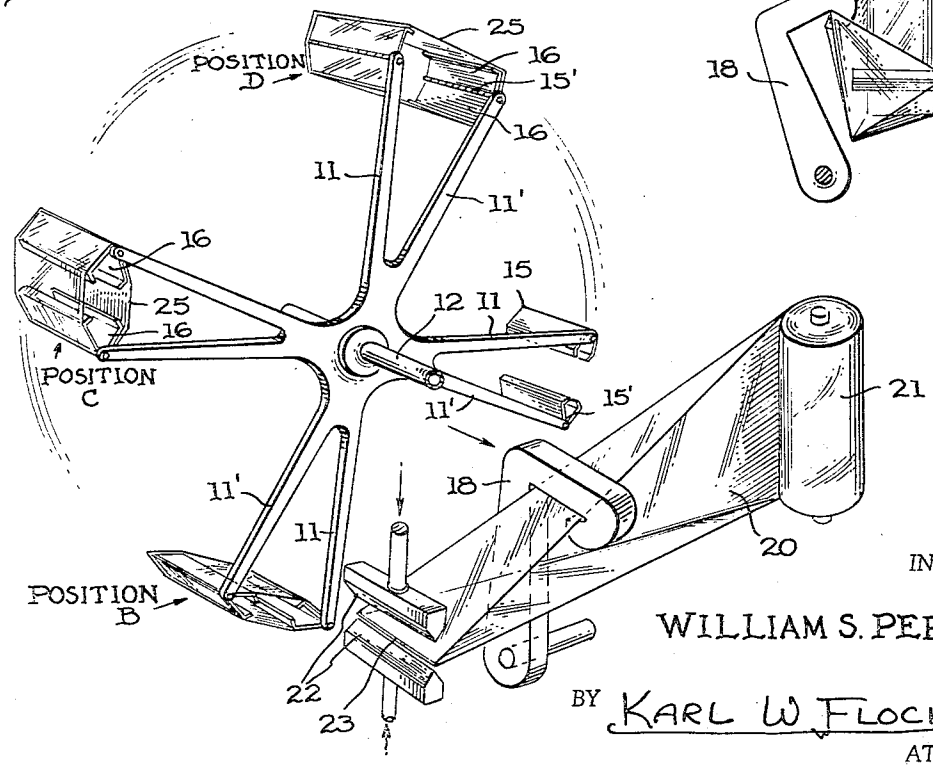


FIG. 2.



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FIG. 4.

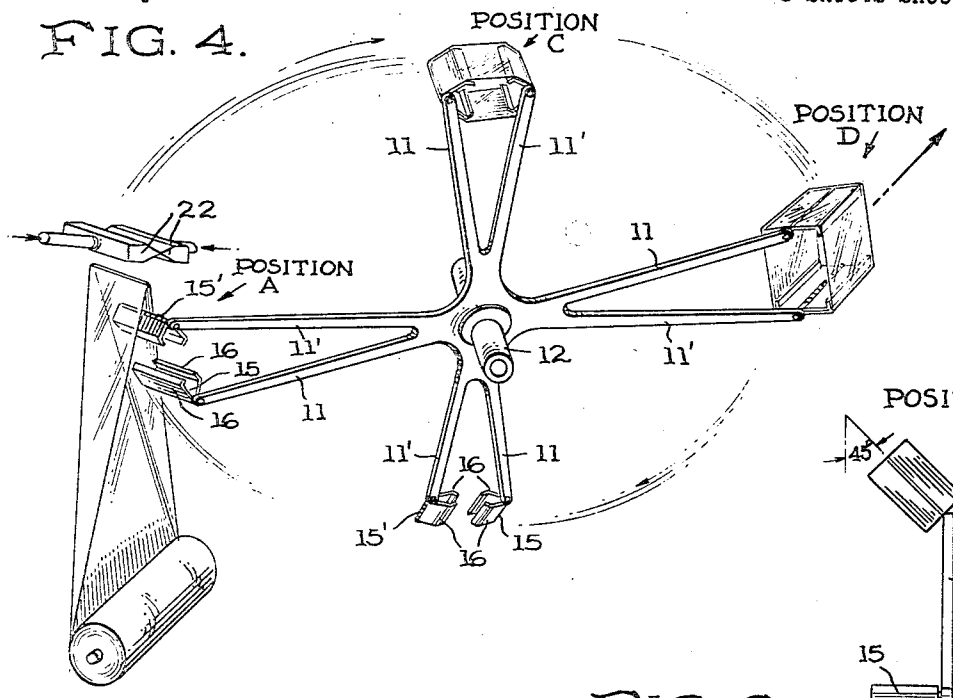


FIG. 6.

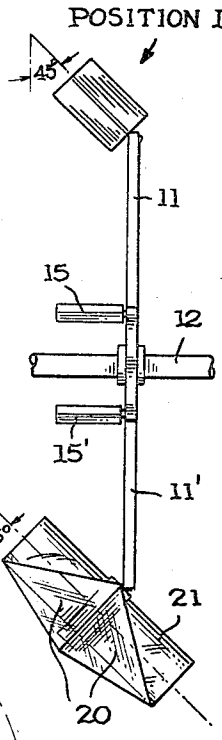
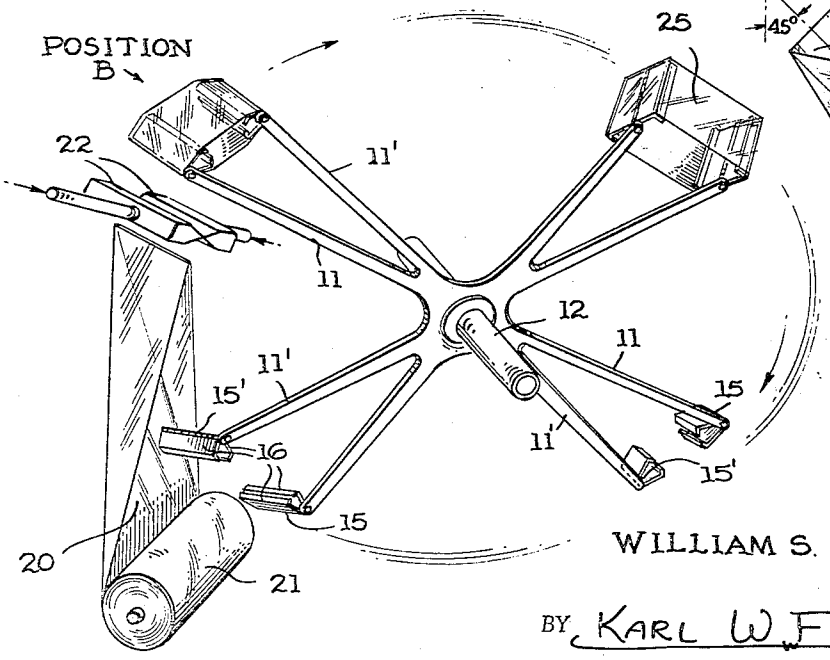


FIG. 5.



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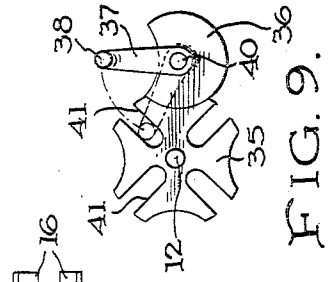


FIG. 9.

FIG. 8.

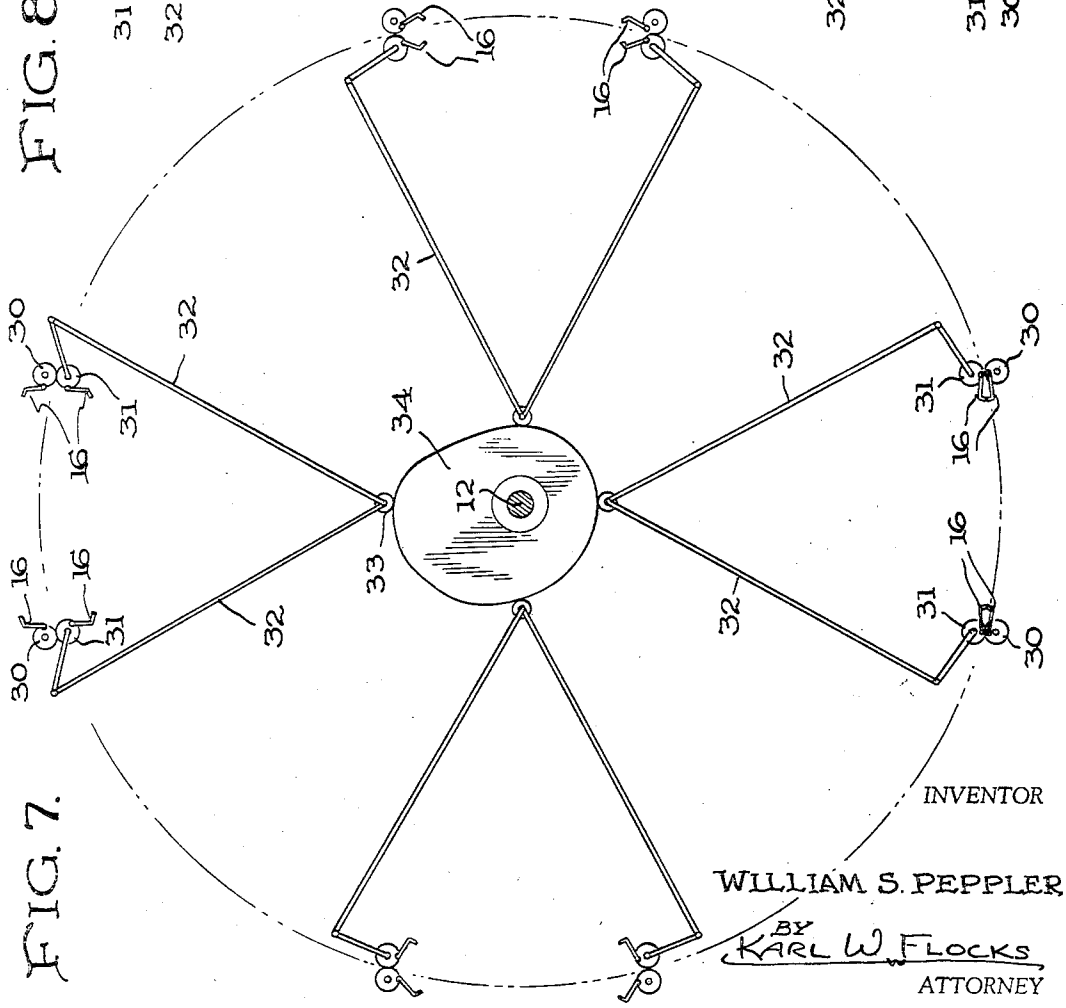


FIG. 7.

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AUTOMATIC STRETCH BAG MACHINE

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Int. Cl. B31b *1/32, 1/64*
U.S. Cl. 93—8 7 Claims

ABSTRACT OF THE DISCLOSURE

An automatic stretch bag machine having turret mounted forming bars or spreaders which meet with a film supply fed from a roll and after sealing and cut-off of the film takes place through the action of a pair of jaws, forming bars, within the bag formed from the film, spread the bag during the rotation of the forming bars and the bag, thereby moving bags successively into positions to be filled.

The present invention relates to bagging machines and has particular reference to an improved bag expanding machine which forms and stretches the bag prior to product insertion.

The conventional method of bagging products makes use of pre-made bags. In addition to the added cost of the bag manufacturing operation, the individual bags are difficult to handle reliably in automatic bagging machines.

At present where a tight, contour fit is desired over the product, bags of stretchable film are manually placed on bag expanding means which stretch the bag prior to product insertion. This type of packing is now commonly used, for example, in poultry packaging.

In the present invention, the method of forming and filling bags is automatically accomplished with the present apparatus which keeps positive control of each bag by forming it over a forming or spreading means that carries it to the product insert position while opening the bag for loading.

Accordingly, the present invention is directed to a method and apparatus for forming a bag from a plastic film which may be supplied in roll form and then automatically expanding this bag while moving it to a position at which a product is inserted therein.

These, as well as further objects and advantages which are inherent to the invention, will become apparent from the following description, reference being had to the accompanying drawings wherein:

FIGS. 1 and 2 are perspective views of one embodiment of a portion of the machine of the present invention during steps in its operation;

FIG. 3 is a partial left side elevational view of a portion of FIG. 1;

FIGS. 4 and 5 are another embodiment of a portion of the machine of the present invention during steps in its operation;

FIG. 6 is a partial top plan view of the portion of the machine in FIG. 5;

FIGS. 7 and 8 are schematic diagrams of front and side views respectively of linkages and gearing for coordinating the movements of the portions of the machine shown in FIGS. 1–6; and

FIG. 9 is a detailed illustration of the Geneva drive viewed along line 9—9 in FIG. 8.

Referring first to the portion of the machine for forming and stretching bags having the embodiment illustrated in FIGS. 1–3, this type of machine is of great help in the handling of clinging type plastic films which are normally used in stretch bag packaging. Such plastic films, because of their clinging quality, can be very troublesome to handle and may not be handled as simply as materials having some rigidity which may be handled by other machines now in use.

As illustrated in FIGS. 1–3 and also in another embodiment shown in FIGS. 4–6, a plurality of pairs of arms **11** and **11'** are mounted for rotation on shaft **12**. On the outer ends of each of arms **11** and **11'** there are located forming bars **15** and **15'** respectively, in opposed relationship to each other. Each of forming bars **15** and **15'** are pivotally mounted on arms **11** and **11'** respectively and comprise jaw elements **16** which are so positioned as to have the jaw elements **16** of each of forming bars **15** and **15'** open with these jaws on the forming bars facing each other.

In the embodiment illustrated in FIGS. 1-3, the forming bars **15** and **15'** in the form of cantilevered carriers are pivotally mounted on arms **11** and **11'** respectively at right angles to those arms. In another embodiment as illustrated in FIGS. 4–6, the forming bars **15** and **15'** are mounted at a different angle to respective arms **11** and **11'**. In the case illustrated in those latter figures, forming bars **15** and **15'** are angled 135° away from respective arms **11** and **11'**. This angling of the forming bars eliminates the use of picker arm **18** which is used in the embodiment shown in FIGS. 1–3 but not needed in the other embodiment shown in FIGS. 4–6.

A plastic film **20** which may be of a clinging type of film, is supplied from a film supply **21** shown in roll form. This film may be either a single, a single folded, or a double roll of film. If film **20** is in the form of a roll of single film, then it is folded as illustrated in the figures and passes between sealing and cutting jaws **22** where the edge **23** is sealed to form an envelope.

In the embodiment of FIGS. 1–3 after the sealing and cutting operation of jaws **22**, picker arm **18** hooks onto an edge of film **20** and pulls this edge back so as to clear the path of entry of forming bars **15** and **15'** as shown at position A in FIG. 1. In this position the jaws **16** of forming bars **15**, **15'** are in a closed or almost closed position.

Forming bars **15** and **15'** continue their circular clockwise rotation until forming bar **15'** encounters edge **23** which has been sealed. The forming bars **15**, **15'** then continue past sealing and cutting jaws **22** at the same time advancing film **20** along with the jaw elements **16**. At a time after forming bar **15** has passed between sealing and cutting jaws **22**, these jaws are clamped together to cut the film and seal another edge so that bars **15**, **15'** continue with a bag **25** which has just been formed to position B shown in FIG. 2. In timed sequence with the rotation of forming bars **15** and **15'** the picker arm **18** returns to the position shown in FIG. 2 so that the film **20** is positioned in this manner for the sealing and cutting jaws **22** which have been activated so as to form the trailing edge seal of bag **25** and at the same time form the leading edge seal on film **20** for the next bag which will be formed.

By the time forming bars **15** and **15'** have reached position C, the jaw elements **16** have been opening and at the same time stretching the bag toward an open position. By the time the bag has reached position D, it is opened to its fullest extent with jaw elements **16** in their widest position. At this point, the bag is ready to have a product inserted therein. Either the product may be inserted in a horizontal position and the bag removed from jaws **15** and **15'** whereupon its open end will be sealed on another machine, or in this open position bag **25** may be transferred onto a secondary means for product insertion and final sealing. Forming bars **15**, **15'** then continue their clockwise rotation at the same time closing the jaw elements **16** preparatory to encountering film **20** and repeating the procedure.

In the embodiment of FIGS. 4–6 the procedure is somewhat similar to that shown in the previous figures. In this form of the machine, with forming bars **15, 15'** at an angle of approximately 135° with arms **11** and **11'**, the need for picker arm **18** is eliminated since due to the angle, forming bars **15** and **15'** may enter the folds of film **20** without the necessity of pulling one side of that film out of position. In addition, FIGS. 4–6 have illustrated a variation in the positioning of film supply **21** with the roll now in the horizontal position which necessitates a rotation of all positions illustrated in FIGS. 1–3 of approximately 90°. Therefore, the final loading position is in a different location from that illustrated in FIG. 2 but the loading in this position would still consist of horizontal loading of the products to be inserted. In all other respects the sequence of operation of the forming bars **15, 15'** in relation to film **20** and sealing and cutting jaws **22** is the same as previously described.

In order that jaw elements **16** of forming bars **15, 15'** may open and close as required and act in conjunction with picker arm **18** in one of the embodiments shown, and with the sealing and cutting jaws **22** both embodiments, during their rotation about shaft **12**, one of the configurations of cams, gears and linkages is shown in FIGS. 7–8. These are merely schematic drawings and do not show construction details of the machine such as stabilizing linkages that would be required to limit the motion of cam rollers to an oscillating radial movement.

As shown in FIGS. 7 and 8 the movement of forming bars **15** and **15'** are coordinated by means of their connection to meshed gears **30, 31** which are placed for counter-rotation to each other. Though suitable linkage **32** each pair of meshed gears **30, 31** connected to forming bars **15, 15'**, are both connected to a single cam roller **33** which rotates on the stationary cam **34**. As the arms **11, 11'** are rotated, the cam rollers **33** move over high and low points on stationary cam **34** thereby moving the linkages **32** as shown in FIG. 7 so as to rotate gears **31** and thereby cause the rotation of the respective gears **30** meshed therewith. This rotation causes the opening and closing of jaw elements **16.**

Shaft **12** upon which are mounted arms **11** and **11'** for rotation therewith passes through an opening in stationary cam **34** without any connection thereto. Mounted on shaft **12** for rotation therewith is gear **35**. Gear **36** is meshed with gear **35** as illustrated in FIG. 9 and has lever **37** which rotates therewith. Projection **38** on the opposite end of lever **37** from its attachment with gear **36** and shaft **40**, moves through an arc shown in dashed line to pass into grooves **41** of gear **35**. Gears **35** and **36** with lever **37** and projection **38** form a Geneva drive allowing intermittent motion of shaft **40** which rotates once per bag cycle. Mounted on shaft **40** are cams which are a cut and seal cam **41** and a picker arm cam **42** which operate through suitable linkage and cam follower arrangement (not shown). The picker arm cam will operate picker arm **18** in the embodiment of the machine shown in FIS. 1–3. Through linkage as shown in FIG. 8 with a cam follower riding on cut and seal cam **41**, cutting and sealing jaws of a pivoted type may be operated while other linkage (not shown) operating off of cut and seal cam **41** alternatively can operate sealing and cutting jaws **22** which are a clamping type of mechanism.

It should be apparent that the apparatus described hereing can automatically handle the forming and filling of plastic bags which may be of a clinging type of plastic usually difficult to handle, with a minimum of difficulty and transfer of the plastic film.

It will be obvious to those skilled in the art that various changes may be made without departing from the scope of the invention and the invention is not to be considered limited to what is shown in the drawings and described in this specification.

What is claimed is:

1. A machine for forming and opening bags made of plastic film comprising

a shaft,

at least one pair of forming bars mounted for rotation about said shaft,

sealing and cutting means connected to operate in conjunction with the rotation of said forming bars,

supply means to feed the plastic film to said sealing and cutting means in a double layer of the film,

said forming bars positioned to enter between the double layer of plastic film at a position adjacent to said sealing and cutting means,

said sealing and cutting means operating to cut and seal the plastic film after passage of a pair of said forming bars in the plastic film past said sealing and cutting means.

2. The machine of claim **1** further characterized by

a picker means to grip and separate the double layer of plastic film to enable the movement of said forming bars therebetween.

3. The machine of claim **1** further characterized by

arms extending from said shaft and mounted on said shaft for rotation therewith,

said forming bars mounted on said extending arms so as to form an obtuse angle with said arms.

4. The machine of claim **1** further characterized by

said forming bars each including jaw member elements,

said jaw member elements of a pair of said forming bars forming jaws opening in positions facing each other and operating in unison with each other.

5. The machine of claim **4** further characterized by

a gear mounted on each said jaw member element, said gears intermeshing to operate the jaw members elements on each forming bar in counter-rotating relationship to each other,

a stationary cam mounted within the circle of rotation of said forming bars,

cam follower means positioned to ride on said stationary cam,

linkage connecting each of said cam follower means to at least one of said gears of one of said jaw member elements of each of said forming bars.

6. The machine of claim **5** further characterized by

said linkage connecting each of said cam follower means to at least one of said gears of both of a said pair of forming bars.

7. The machine of claim **5** further characterized by

a second shaft parallel to said first-mentioned shaft,

cam means to operate said sealing and cutting means mounted for rotation on said second shaft,

and intermittent motion gear means mounted on said shafts in operative relation to rotate said second shaft intermittently in relation to the rotation of said first-mentionted shaft.

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U.S. Cl. X.R.

53—183