Oct. 11, 1960 J. DREEBEN 2,955,398

FEED MECHANISM FOR PACKAGE MAKING APPARATUS

Filed May 5, 1958

2 Sheets-Sheet 1

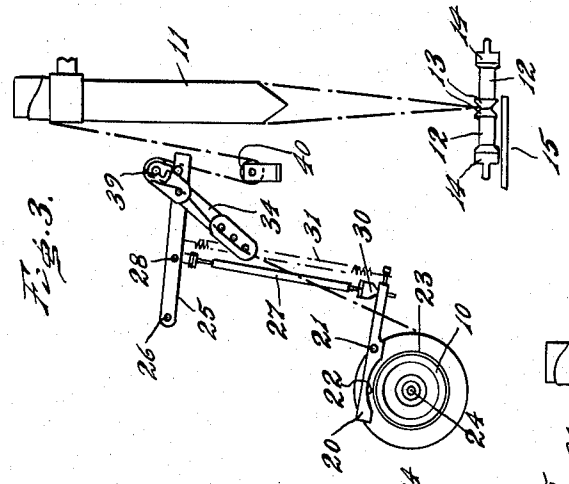


Fig. 3.

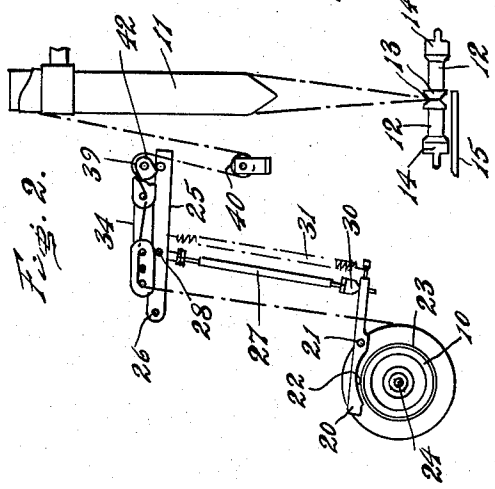


Fig. 2.

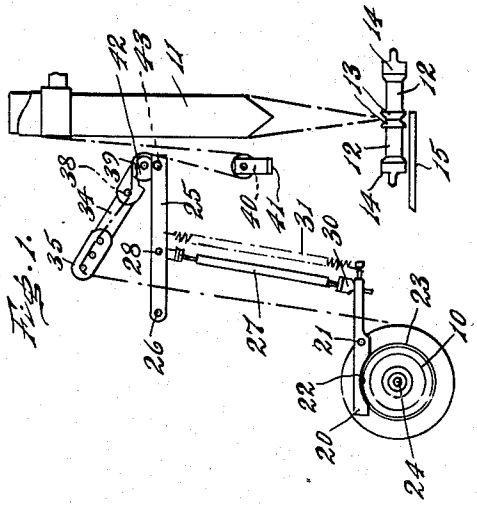


Fig. 1.

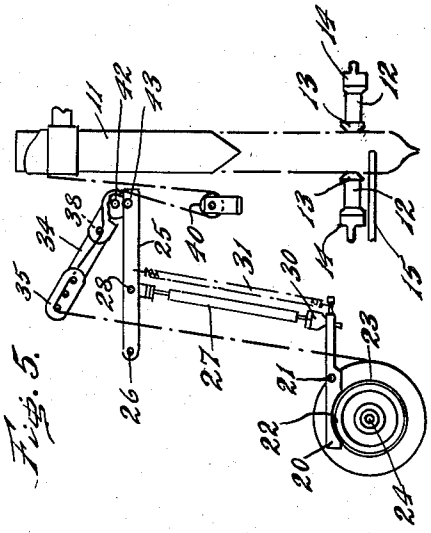


Fig. 5.

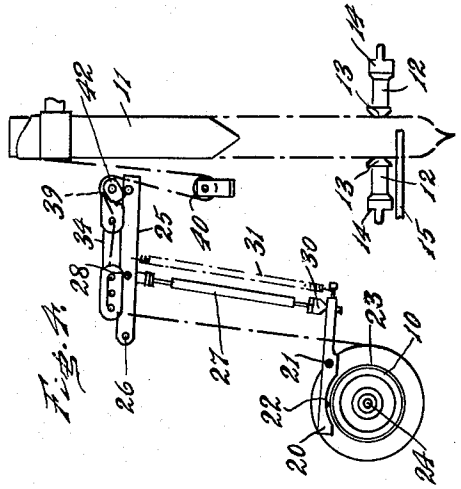


Fig. 4.

INVENTOR.
Jack Dreeben

BY J. T. Wilensmith

ATTORNEY.

Oct. 11, 1960 J. DREEBEN 2,955,398

FEED MECHANISM FOR PACKAGE MAKING APPARATUS

Filed May 5, 1958 2 Sheets-Sheet 2

Fig. 6.

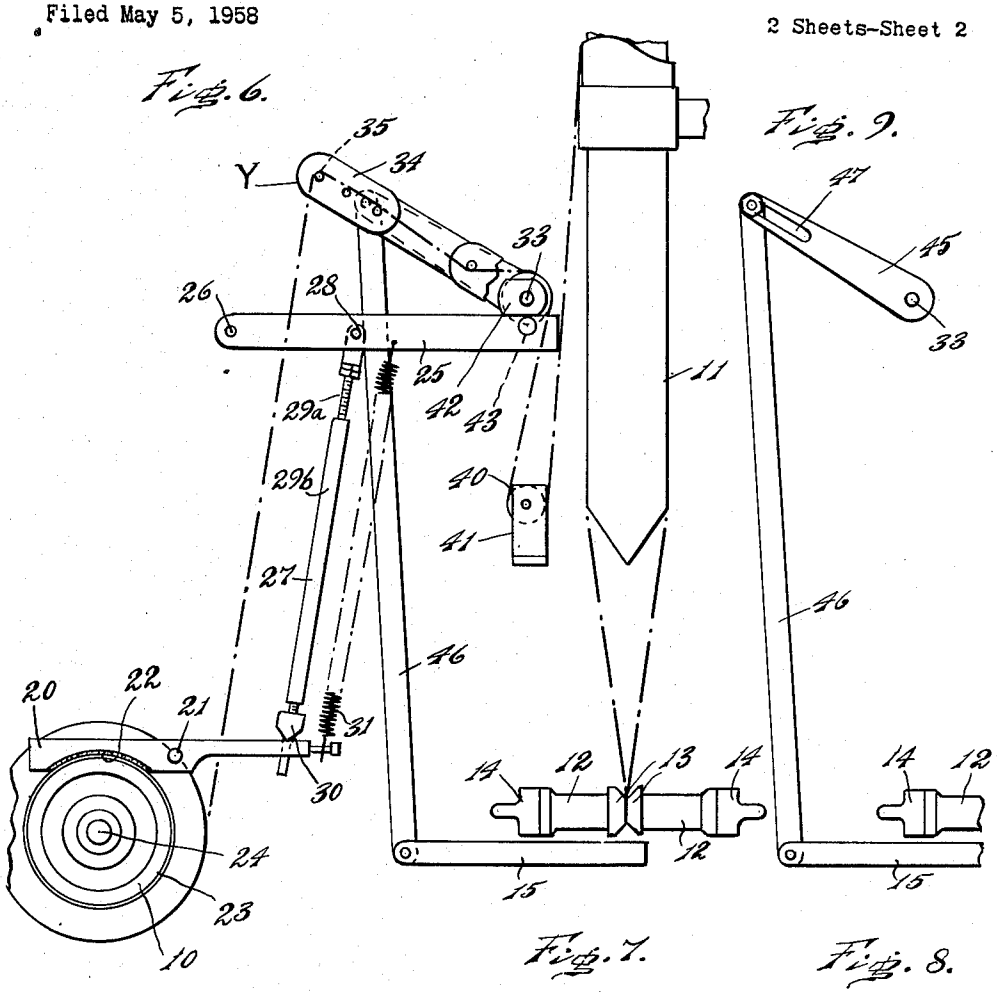


Fig. 9.

Fig. 7.

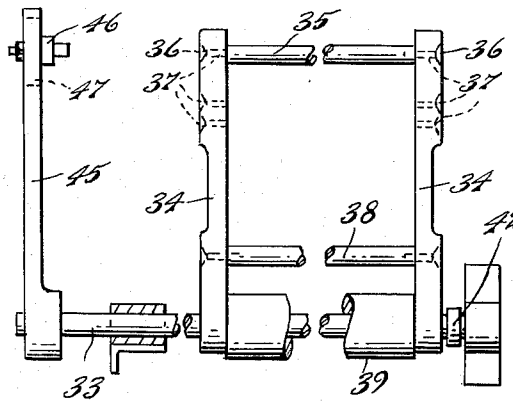
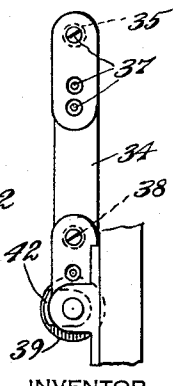


Fig. 8.



INVENTOR
Jack Dreeben
BY
ATTORNEY

United States Patent Office 2,955,398
Patented Oct. 11, 1960

2,955,398

FEED MECHANISM FOR PACKAGE MAKING APPARATUS

Jack Dreeben, % Mercury Heat Sealing Equipment Co., 2601 N. Howard St., Philadelphia 33, Pa.

Filed May 5, 1958, Ser. No. 733,211

4 Claims. (Cl. 53—180)

This invention relates to feed mechanism for package making apparatus and more particularly to mechanism for controlling the delivery of sheet material from the web roll.

It has heretofore been proposed to draw transparent synthetic plastic sheet material from a web roll, form the same into a bag or envelope with a longitudinal seal, fill the bag or envelope, seal the top of one package with simultaneous sealing of the bottom of the succeeding package, and sever the seal intermediate its top and bottom edges to separate the packages, this all being repetitively effected in a timed sequence.

One of the materials heretofore commonly employed has been regenerated cellulose in sheet form, available as cellophane, and this has a very low elongation rate.

Upon attempting to form packages in a similar manner from polyethylene, considerable difficulty has been encountered because of the high elongation rate which, for polyethylene up to five mils (0.005 inch) in thickness, is of the order of 300 to 800%, with recoil of approximately 65%.

Because of the elongation characteristics of the polyethylene, the equipment heretofore available has not functioned satisfactorily.

It is the principal object of the present invention, therefore, to provide an improved character of feeding of sheet material of high elongation rate in a package forming machine.

It is a further object of the present invention to provide a simple but effective attachment for package forming machines by which high elongation rate sheet material can be controlled between the web roll from which it is taken and the transverse gripping jaws beyond the forming tube at which the flat material is formed into a tube for longitudinal sealing, filling, and transverse sealing.

It is a further object of the present invention to provide a controlled and timed slack providing mechanism for package forming and filling machines.

Other objects and advantageous features of the invention will be apparent from the description and claims.

The nature and characteristic features of the invention will be more readily understood from the following description, taken in connection with the accompanying drawings forming part thereof, in which:

Figure 1 is a diagrammatic view of a package forming and filling machine having the web control mechanism of the present invention applied thereto, and shown in a beginning position at the top of the stroke;

Fig. 2 is a view similar to Fig. 1, showing a subsequent operating position, and intermediate the top and bottom of the downward portion of the stroke;

Fig. 3 is a view similar to Fig. 1, showing a subsequent operating position, and at the bottom of the stroke;

Fig. 4 is a view similar to Fig. 1, showing a subsequent operating position, and intermediate the bottom and top of the upward portion of the stroke;

Fig. 5 is a view similar to Fig. 1, showing a subsequent operating position, and immediately below the top of the upward portion of the stroke;

Fig. 6 is a side elevational view, enlarged, of the structure shown in Figs. 1 to 5, inclusive;

Fig. 7 is a front elevational view, enlarged, of the slack controller and its operating mechanism;

Fig. 8 is an end elevational view of a portion of the slack controller, as seen from the right of Fig. 7; and

Fig. 9 is a fragmentary side elevational view showing the operating connections between the slack controller shaft and the vertically movable platform.

It should, of course, be understood that the description and drawings herein are illustrative merely, and that various modifications and changes can be made in the structure disclosed without departing from the spirit of the invention.

Like numerals refer to like parts throughout the several views.

It has heretofore been proposed to provide package making machines which include a web roll **10** having thereon a supply of sheet material to be made into a package. The prior package making machines also included a forming tube **11** to which the sheet material was advanced from the supply on the web roll, the advancing being effected by the downward movement of closed but horizontally separable gripping jaws **12**.

The gripping jaws **12**, customarily provided with heating portions **13** for heat sealing, were reciprocated in a vertical path by their supports **14**, which supports were carried on a platform **15** vertically oscillated in a predetermined stroke, the length of which determined the length of the package.

The supports **14** were separated at the bottom of the stroke and moved upwardly in open position, then closed at the top of their stroke to bring the sealing portions **13** of the jaws **12** in transverse gripping relation to the tubular conformation of the sheet material provided by the forming tube **11**.

During the downward movement of the web of tubular sheet material, a longitudinal seal was provided by a longitudinal heat sealer (not shown), and the articles to be packaged were delivered into the tubular formed web through the forming tube **11**.

During the downward movement of the jaws **12** also, a transverse seal was applied to the tubular sheet material, usually by the sealing portions **13** during their downward gripping movement, and the transverse seal was severed intermediate its top and bottom margins so that the transverse seal thus formed provided a sealed transverse top margin of the filled package, and a sealed transverse bottom margin of the next package to be filled. Repetition of the operations just referred to produced a succession of filled and separated packages. The packages were severed in various ways to separate the same.

With relatively non-elongatable sheet material no serious difficulties have been encountered, but upon attempting to use highly elongatable materials such as polyethylene, in the equipment heretofore available failure resulted.

Polyethylene, because of its chemical and physical properties, is an advantageous material to employ for packaging.

In accordance with the present invention and to accommodate highly elongatable packaging material, a web supply controller or slack controller is interposed between the web roll **10** and the forming tube **11**, and is operated in timed relation to the vertical movement of the jaws **12**.

The slack controller preferably includes a pivotally mounted brake arm **20** carried on a pivot pin **21** supported by the frame (not shown) of the machine and

having a brake face 22 for engagement with a brake rim 23 carried on the shaft 24 to which the web roll 10 is secured. A brake operating lever 25 is pivotally mounted on a pivot 26 supported by the frame (not shown) of the machine. The lever 25 has an actuating link 27 connected thereto by a pivot 28. The link 27 can be adjustable in length and for this purpose can have telescoped threaded portions 29*a* and 29*b*. The link 27 at its lower end has a V-shaped block 30 for engagement with the brake arm 20. A helical tension spring 31 is provided between the outer end of the brake arm 20 and the brake operating lever 25 for urging the brake operating lever 25 and the brake arm 20 towards each other and retaining the block 30 in engagement with the brake arm 20.

The slack controller preferably also includes an idler yoke assembly Y carried by a shaft 33 and a pair of side rails 34 with a guide bar 35 capable of adjustment along the side rails 34. The bar 35 can be mounted by pins 36 in a selected pair of aligned holes 37 in the side rails 34.

The idler yoke assembly Y also includes a guide bar 38 intermediate the ends of the side rails 34 and a guide roll 39 concentric with the shaft 33.

Below the idler yoke assembly Y, a guide roller 40 is provided mounted on a carriage 41 carried by the frame (not shown) of the machine.

A brake cam 42 is secured to the shaft 33 which upon change of position of the rails 34 is adapted to engage a follower 43 on the brake operating lever 25 for moving the brake operating lever 25 to a release position and for permitting the movement of the brake operating lever 25 to a position for brake application.

On the shaft 33 also, a slotted actuating lever 45 is provided from which a link 46 extends, pivotally adjustable along the slot 47 for imparting the desired movement to the lever 45. The link 46 is preferably pivotally connected to the platform 15 for movement therewith.

Referring now to Figs. 1 to 5, it will be seen that the sheet material extends from the web roll 10 over the support bar 35, under the guide bar 38, around the roll 39, down around the roller 40 and upwardly to the forming tube 11, and then downwardly to the jaws 12.

The condition at the top of the stroke of the platform 15 and jaws 12 is shown in Fig. 1. The jaws 12 are closed and in gripping engagement with the tubular formed web of sheet material and the web control frame or idler yoke assembly Y is upwardly inclined at an angle and is at its uppermost position.

The web roll 10 is stationary and is held by the engagement of the brake face 22 with the brake rim 23.

As the platform 15 and the jaws 12 move downwardly from the position shown in Fig. 1 towards the position shown in Fig. 2, which is indicative of the mid-part of the downward portion of the stroke, the engagement of the cam 42 with the follower 43 urges the brake operating lever 25 in a counterclockwise direction; and through the link 27 the brake arm 20 is moved to a brake releasing position with the brake face 22 out of engagement with the brake rim 23. Free withdrawal of material from the web roll 10 is thus permitted.

As the jaws 12 move downwardly and pull the web downwardly therewith, the yoke frame Y is swung downwardly by the downward movement of the platform 15 through the link 46, the lever 45 and the shaft 33 to relieve the stress on the web and provide additional material, dependent on the extent of stretching applied to the sheet material.

At the bottom of the stroke, as illustrated in Fig. 3, the frame Y and the support bar 35 have moved to their lowermost position, the jaws 12 are ready to, and immediately thereafter, open, the web roll 10 still being in unrestrained condition with the brake arm 20 released.

Upon further upward movement of the jaws 12 in open condition, as illustrated in Fig. 4 at the mid-part of the upper portion of the stroke the yoke assembly Y is moved upwardly and the brake arm 20 is still in released condition.

As the jaws 12 reach a position close to the top of the stroke, as illustrated in Fig. 5 a few degrees below the top of the stroke, and with the jaws 12 still open, the idler yoke Y continues to move in a clockwise direction to withdraw additional sheet material from the web roll 10 and the cam 42 carried on the shaft 33 moves to a position to apply the brake face 22 against the brake rim 23 to retain the feed roll 10 locked against further feeding. At the top of the stroke, the jaws 12 close into engagement with the tubular web and the cycle is repeated.

The withdrawal of the web from the web roll 10 is accordingly effected in a controlled manner, so that the length of web required for the package is made freely available during downward movement of the jaws 12 by reason of either storage upon prior upward movement of the yoke Y or by elongation of a portion of the web, or both.

The movement of the idler yoke Y applies a variable tension and variation in the feed during the downward stroke, with resetting during the upward stroke so as to accommodate the high stretchability of the material. Back feed of the web is prevented by the frictional engagement of the web with the forming shoe at the upper end of the forming tube 11 and also by engagement of the longitudinal sealer (not shown). The continuous production of packages having consistent longitudinal and transverse seals is thus made possible.

I claim:

1. Package making apparatus comprising a web supply roll, a forming tube for the web, a pair of separable jaws engaging the web for advancing it with respect to the forming tube and movable in a predetermined linear path, and means for controlling the withdrawal of the web from the web roll comprising a brake member for holding the web roll against rotation, a pivotally mounted frame having a bar in engagement with the web and a roller on the pivotal axis of the frame in engagement with the web, actuating connections between the frame and the jaw members for moving the bar member to form a loop in the web during one part of said path and for releasing the withdrawn web portion during another part of said path, and operating connections between said frame and said brake member for releasing said brake member for web withdrawal from the web roll.

2. Package making apparatus comprising a web supply roll, a forming tube for the web, a pair of separable jaws engaging the web for advancing it with respect to the forming tube and movable in a predetermined linear path, and means for controlling the withdrawal of the web from the web roll comprising a pivotally mounted brake member for holding the web roll against rotation, a pivotally mounted shaft, a frame on said shaft and swingable about the axis of the shaft, said frame having a bar in engagement with the web and a roller on the pivotal axis of the frame in engagement with the web, actuating connections between the frame and the jaw members for moving the bar member to form a loop in the web during one part of said path and for releasing the withdrawn web portion during another part of said path, a cam mounted on said shaft, an operating lever having a cam follower for engagement by said cam, and an actuating link connecting said lever and said brake member.

3. Package making apparatus as defined in claim 2 in which said link is adjustable in length.

4. Package making apparatus comprising a web supply roll, a forming tube for the web, a pair of separable jaws engaging the web for advancing it with respect to the forming tube and movable in a predetermined linear path, and means for controlling the withdrawal of the web from the web roll comprising a pivotally mounted

brake member releasably holding the web roll against rotation, a pivotally mounted frame having a bar portion in engagement with the web, a web engaging roller on the pivotal axis of said frame, actuating connections between the frame and the jaw members for moving the bar member to form a loop in the web during one part of said path and for releasing the withdrawn web portion during another part of said path, and brake actuating members for releasing said brake member during loop forming movement of said bar member.

References Cited in the file of this patent

UNITED STATES PATENTS

1,941,597	Cavagnaro	Jan. 2, 1934
2,237,119	Smith	Apr. 1, 1941
2,636,732	Howard	Apr. 28, 1953
2,894,362	Cargill et al.	July 14, 1959