Dec. 1, 1970 W. C. LEASURE 3,543,477

APPARATUS FOR PACKAGING WITH HINGED PLATE FOR FORMING FLAT BOTTOM PACKAGE

Filed Dec. 19, 1967 2 Sheets-Sheet 1

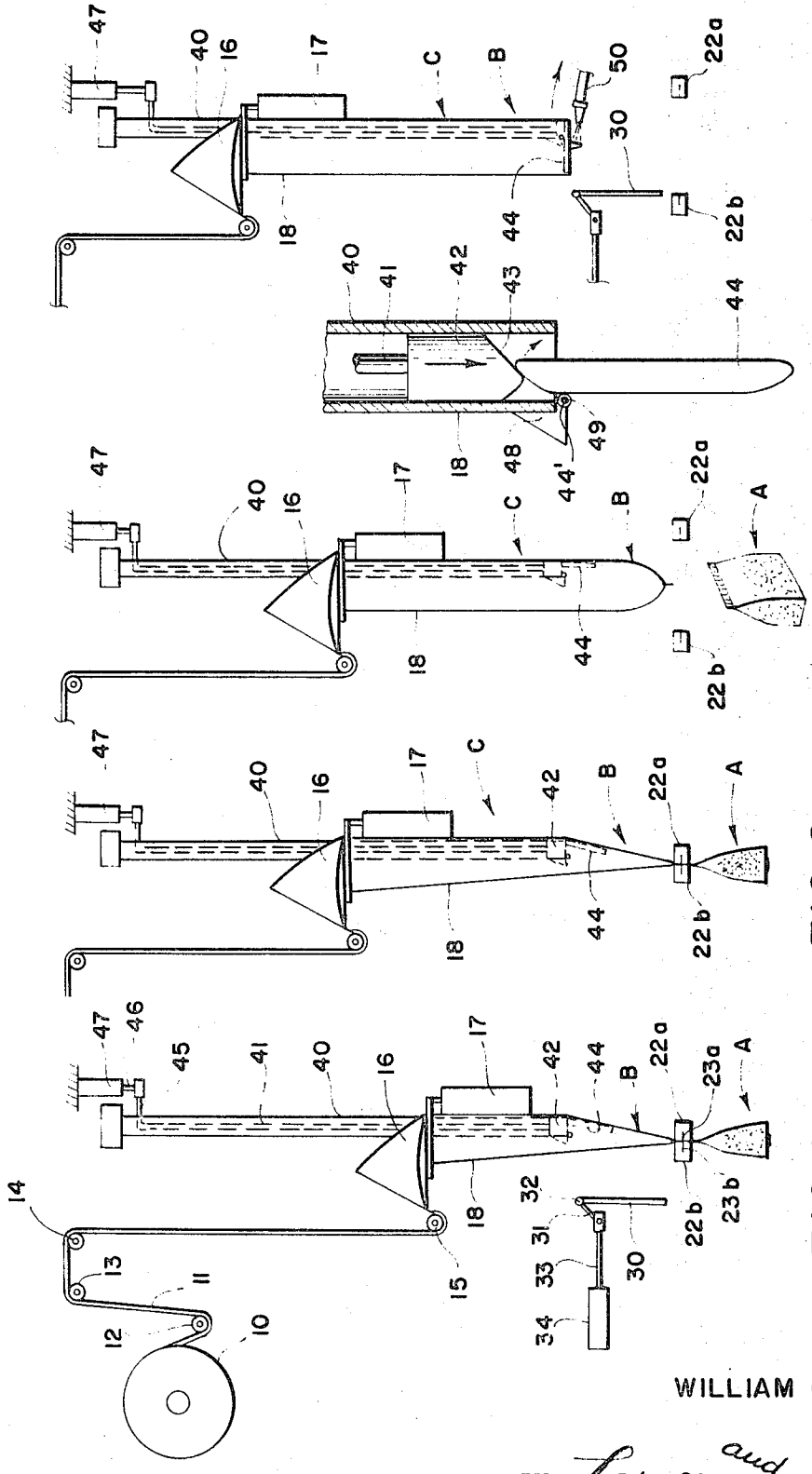


FIG. 4

FIG. 3A

FIG. 3

FIG. 2

FIG. 1

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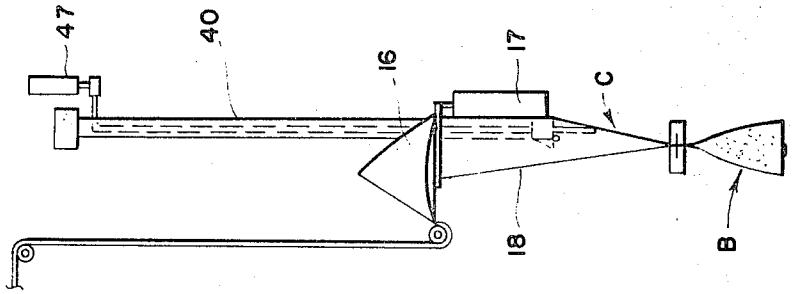


FIG. 7

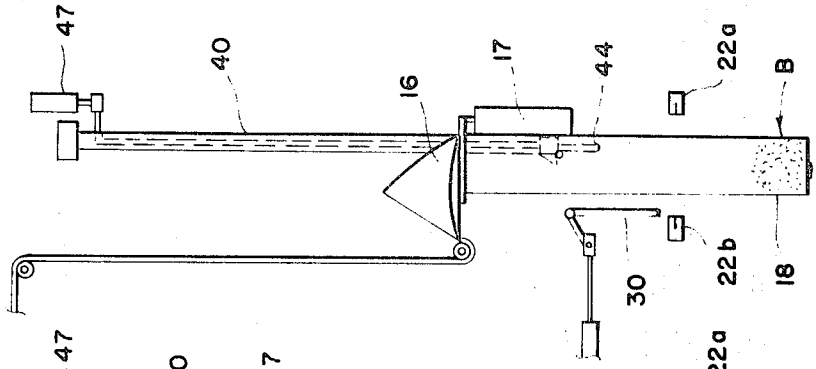


FIG. 6

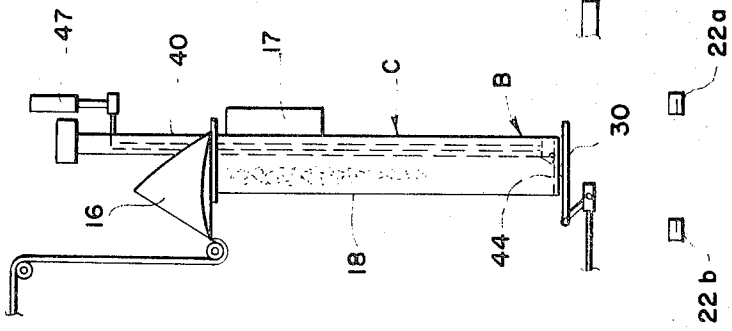


FIG. 5

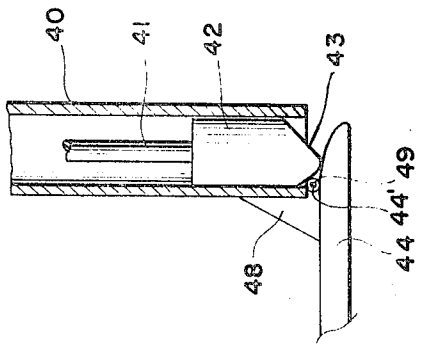


FIG. 4A

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United States Patent Office 3,543,477 Patented Dec. 1, 1970

3,543,477

APPARATUS FOR PACKAGING WITH HINGED PLATE FOR FORMING FLAT BOTTOM PACKAGE

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Filed Dec. 19, 1967, Ser. No. 691,869
Int. Cl. B65b 51/30
U.S. Cl. 53—180 7 Claims

ABSTRACT OF THE DISCLOSURE

A packaging apparatus for forming a flat bottom package on form, fill and seal packaging machinery including a movable former adapted to form a tubular length of material from a continuous web of material and including an actuating plate positioned within the tubular length of material for cooperating with the former and with a flat exterior platen surface to flatten the end of the tubular length of material remote from the former.

BACKGROUND—FIELD OF THE INVENTION

This invention relates to packaging and more particularly to a method and apparatus for forming a flat bottom package on a form, fill and seal type packaging machine having a former which reciprocates with respect to stationary sealing jaws to draw film over the former.

BACKGROUND—DESCRIPTION OF THE PRIOR ART

In my prior Pat. 2,969,627 there is described a method and apparatus for packaging wherein the former which shapes the strip packaging film into tubular form reciprocates with respect to sealing jaws which move into and out of engagement with the packaging film in a horizontal plane. When the sealing jaws move into engagement with the film to form a package end seal the former is moved away from the jaws to draw additional film over the former. The sealing jaws are released and the former is moved towards the jaws to pass the film between the jaws. The jaws are then brought together to form the other package end seal.

A package formed as above described is a "pillow" type package which has the disadvantage of not being able to stand upright. Thus in the prior art there has been a need for a method and apparatus for forming a flat bottom bag on form, fill and seal packaging machinery.

SUMMARY OF THE INVENTION

The purpose of the present invention is to provide a packaging method and apparatus for a form, fill and seal packaging machine using a movable former as shown in Pat. No. 2,969,627 including an actuating plate located within a tubular length of packaging material for forming a flat bottom package.

A main feature of the present invention includes the use of an actuating plate to form a flat bottom package. For this purpose an actuating plate is located within the tubular length of material, held by support means extending from above, and is movable about a pivot axis between a raised position whereat it extends horizontally and engages the tubular length of material in a transverse plane and a lowered position whereat it extends vertically, generally perpendicular to said transverse plane.

In forming a flat bottom package according to the present invention the packaging film is formed into a tube by passing the film over a former and sealing the longitudinal edges of the film together. The transverse seal is formed across the tubular shaped film by the sealing jaws in the conventional manner. The former moves upwardly as disclosed in my prior Pat. No. 2,969,627 and, since the stationary sealing jaws are gripping the packaging film, additional film is drawn over the former to form further tubular lengths of film. The jaws are then separated and the actuating plate is moved from its vertical to its horizontal position. The former continues to move the tubular length of material upwardly until the bottom of the tubular length at the transverse seal engages the actuating plate. The effect of this movement will be to cause a flattening of the closed end of the tubular length. To complete the formation of the flat bottom it may be desirable to fold the lower transverse seal upwardly against the flat bottom of the package. For this purpose the present invention includes a suitable means such as an interior actuating plate. The package may be filled upon completion of the formation of the flat bottom for the package.

It is an object of this invention to provide a new method and apparatus for forming a flat bottom package on form, fill and seal packaging machinery.

It is another object of this invention to provide a packaging method and apparatus of the type wherein a continuous web of material is formed into a tubular length of material employing a movable former with an actuating plate for assisting in the formation of a flat bottom package.

Other objects and the attendant advantages of the present invention will become apparent from the detailed description to follow together with the accompanying drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

There follows a detailed description of the preferred embodiment of the present invention together with accompanying drawings. However, it is to be understood that the invention is capable of numerous modifications and variations apparent to those skilled in the art without departing from the spirit and scope of the invention.

In the drawings:

FIGS. 1, 2, 3, 4, 5, 6, and 7 inclusive, are diagrammatic drawings showing the sequence of operation of the present invention in connection with the packaging of a product.

FIGS. 3A and 4A are enlarged views of portions of FIGS. 3 and 4, respectively.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

In the accompanying drawings like numerals are employed to designate like parts throughout.

Referring to FIG. 1, a continuous web of material **11** is fed from a supply roll **10** over rollers **12**, **13**, and **14** and over roller **15** which is connected to a former **16** for movement therewith. The former **16** then forms the continuous web of material **11** into a tubular length of material **18**, the opposing edges of the web being connected together by a longitudinal sealing means **17**. The roller **15**, the former **16** and the longitudinal sealing means **17** are reciprocated vertically by the apparatus shown in the Leasure Pat. No. 2,969,627. Also, the former **16** may be of the type shown in FIGS. 13 and 14 of the said Leasure patent. A pair of sealing jaws **22***a* and **22***b* are provided for forming a transverse seal across the tubular lengths **18**. These sealing jaws further include cooperating knife and slot means **23***a* and **23***b* for severing a completed package after its top seal has been formed. The sealing jaws may also include stripper plates as shown in the Leasure Pat. No. 3,027,695.

At the lower end of the apparatus there is provided an exterior platen **30** including a connecting rod **31** rigidly connected thereto, the combination of platen **30** and con-

necting rod **31** being mounted for pivotal movement about a stationary pivot axis **32**. Connecting rod **31** is in turn pivotally connected to a piston rod **33** which is in turn connected to a double acting piston in the cylinder **34**. Thus, by moving the piston to the right or the left, the platen **30** can be raised or lowered, respectively.

The apparatus further includes an actuating plate supported by means extending through the former and into the tubular length **18** for movement between a lowered position as shown in FIG. 3A and a raised position as shown in FIG. 4A. A hollow member **40** extends downwardly through the former and includes an actuating rod **41** extending from its forward end down to a cam member **42** having a lower guide surface **43**. The hollow member forms a back plate for the longitudinal seam sealer **17**. When the cam **42** is in the raised position, its lower cam surface **43** permits the actuating plate **44** to fall under its own weight to the lowered position about a pivot axis **44'**. When the cam **42** is lowered, the guide surface **43** causes the actuating plate **44** to pivot in a clockwise direction about its axis **44'** to the raised position shown in FIG. 4A. In the raised position the actuating plate is supported by a rigid plate **48** and a roller **49**.

The cam **42** is operated through actuating rod **41** by a double acting piston and cylinder **47** which is connected to rod **41** through a piston rod **46** and a connecting rod **45**.

The operation of the invention is as follows. Packaging film is passed over the former **16** so as to shape the film into tubular form and the sealer **17** seals the longitudinal edges of the film together. In FIG. 1 the sealing jaws **22***a* and **22***b* form a transverse seal which will constitute the top of package A and the bottom of package B. In FIG. 2, while sealing jaws are still in engagement with the tubular length **18**, the former **16** is moved upwardly to provide an additional length of tubular material which will subsequently form package C. Between FIGS. 3 and 4 the double acting piston and cylinder **47** is operated to move the cam **42** downwardly thereby raising the actuating plate **44**. Also between FIGS. 3 and 4 the former has been moved upwardly an additional length so that the lower end of package B engages the actuating plate **44**. This action will tend to flatten the bottom of package B. It may be desirable to fold the lower transverse seal against the flat bottom of package B. For this purpose a suitable adhesive may be applied by nozzle **50** to the transverse seal after which the piston in cylinder **34** is moved to the right to raise exterior platen **30** thereby pressing the lower end of package B against the actuating plate **44** as shown in FIG. 5. After the bottom of package B has been completely formed, the platen **30** is lowered. The former then commences its downward movement and, since actuating rod **41** has been raised, the actuating plate **44** is free to move to a vertical position. Just prior to this time product may be introduced through the upper end of the former and tubular formed packaging film. The former **16** then continues to move the tubular length of material downwardly to place the length of material constituting package B to a point below the sealing jaws **22***a* and **22***b*. The former may move downwardly a distance greater than one package length to permit a stripping operation as described in my prior Pat. 3,027,695. The sealing jaws are then operated to close the package B and form the bottom of package C thereby attaining the position of FIG. 1 after which the cycle is repeated.

The method and apparatus of the present invention may be employed in the production of either a pillow type flat bottom package or a gussetted type flat bottom package. In the production of a pillow type flat bottom package the two ends of the lower seal would project laterally. Suitable means (not shown) may be employed for folding these ends up to and attaching them against the sides of the formed package. Alternatively, means (not shown) my be employed for folding these ends under the package before the package engages the flat surface of platen **30**.

To form a gussetted type flat bottom package suitable

means would be employed for folding the opposing portions of the package to be gussetted inwardly. The sealing jaws **22***a* and **22***b* would then form the transverse seal between the packages and thus permanently form the gussets in the transverse seals.

As illustrated, the longitudinal seal would be located on the front or back of the package. However, it is possible to rotate the gussetting means and the transverse sealing jaws 90° in a horizontal plane relative to the former so that the longitudinal seal would be located on the side of the package and formed into one of the gussets. One advantage of this would be to leave the front and back of the package free for advertising material.

Although the preferred embodiments of the invention have been illustrated and described in consideral detail, it should be understood that the invention is capable of numerous modifications and variations apparent to those skilled in the art without departing from the spirit and scope of the invention as defined in the claims.

I claim:

1. A packaging apparatus including a former means for forming a web of sheet material into a length of tubular material and sealing means for forming package closing end seals across the tubular length of material, the improvement comprising a flattening means for flattening the end of the tubular length of material remote from the former means including an actuating plate mounted inside of the tubular length of material between the former and the remote end of the tubular length of material, and said actuating plate being movable between an operative position at which it extends across the interior of the tubular length of material and an inoperative position whereat it extends generally longitudinally of the tubular length of material to permit product to pass thereby to the remote end of the tubular length of material, and wherein said former means is movable for moving said remote end of the tubular length of material against said actuating plate to form said flat bottom on the tubular length of material.

2. The apparatus of claim **1** wherein the tubular length of material extends vertically and wherein the operative position is a raised position whereas the plate extends in a plane traverse to the axis of the tubular length of material, and the inoperative position is a lowered position whereat the plate extends vertically generally parallel to said axis.

3. The apparatus of claim **2** including a cam member having a cam surface engaging the actuating plate, and actuating means for moving the said cam to move the actuating plate between said raised and lowered positions.

4. The apparatus of claim **3** including a rod connected to the cam and extending through the former, and wherein the actuating means comprises a double acting piston operatively connected to said rod.

5. The apparatus of claim **2** wherein said actuating plate is mounted for pivotal movement between said raised and lowered positions, and including a cam member operatively engaging the actuating plate for pivoting it about the axis of pivotal movement.

6. The apparatus of claim **2** including an exterior platen having a flat surface movable into the path of movement of the remote end when the actuating plate is in the raised position and engages the said remote end.

7. The apparatus of claim **2** wherein the said sealing means are prevented from moving in the direction of movement of the former.

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