United States Patent [19]

Toss

[11] **3,815,317**

[45] **June 11, 1974**

[54] **METHOD AND MECHANISM FOR MAKING FILLED BAGS**

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[52] **U.S. Cl.** ..... **53/28,** 53/29, 53/182, 53/183, 93/1 F, 93/19, 93/94 R

[51] **Int. Cl.** **B65b 9/08,** B65b 9/10

[58] **Field of Search** ..... 53/28, 29, 180, 182, 183, 53/187; 93/1 F, 19, 20, 35 R, 82, 94 R; 150/3; 229/62, 66

[56] **References Cited**

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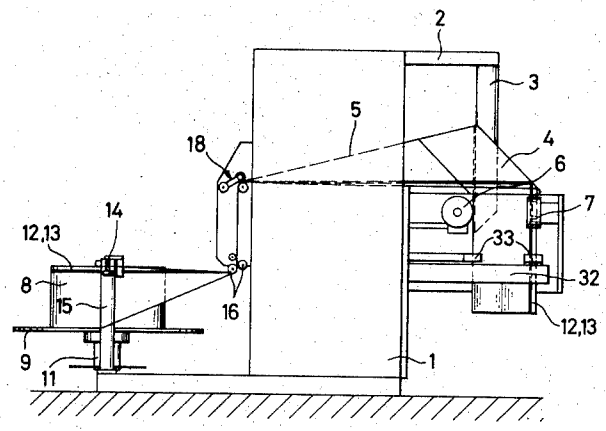
Primary Examiner—Robert L. Spruill

Attorney, Agent, or Firm—Hill, Gross, Simpson, Van Santen, Steadman, Chiara & Simpson

[57] **ABSTRACT**

A method and mechanism for making and filling bags from a continuous film of plastic material having a mating reclosable interlocking profile along the edges wherein material is supplied on a roll with the profiles interlocked, the profiles separated and the film spread, the film folded and the profiles interlocked and the folded film cross-sealed to form a seam along one edge of a bag at a filling station, the bag filled downwardly through the open side at the filling station, and the bag finished by forming the other seam above the filled material.

14 Claims, 8 Drawing Figures



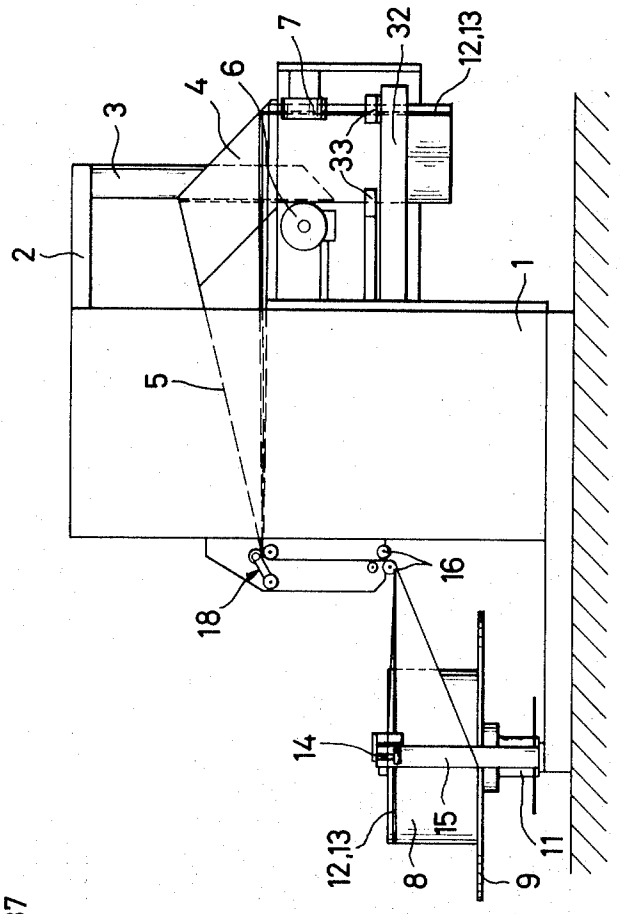


Fig. 1

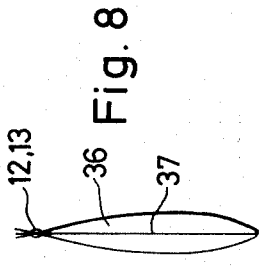


Fig. 8

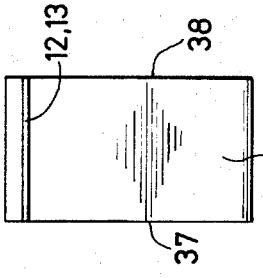


Fig. 7

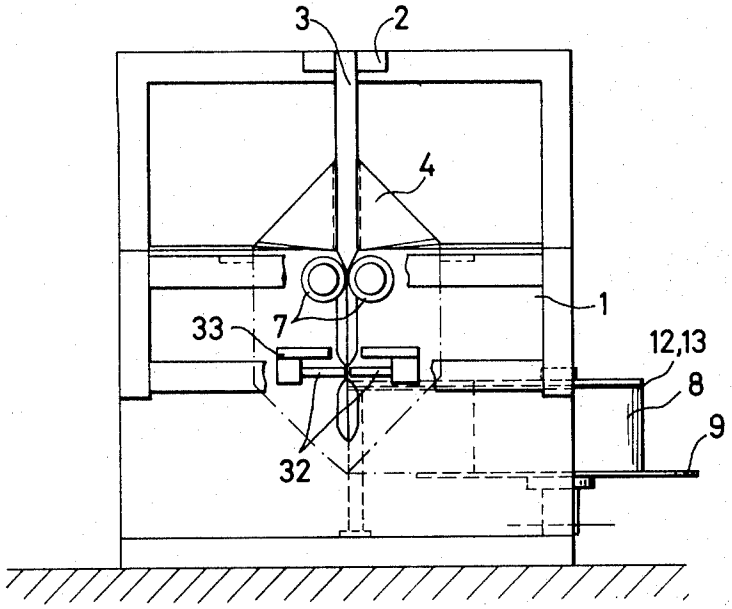

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Fig. 2

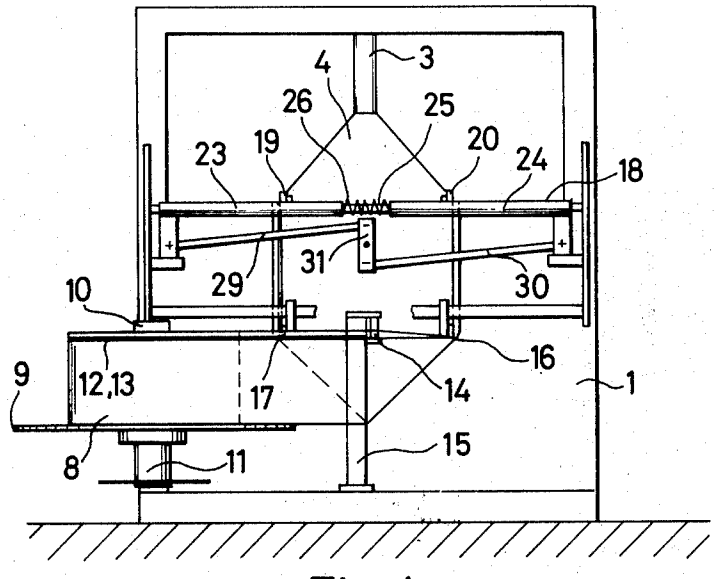

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Fig. 4

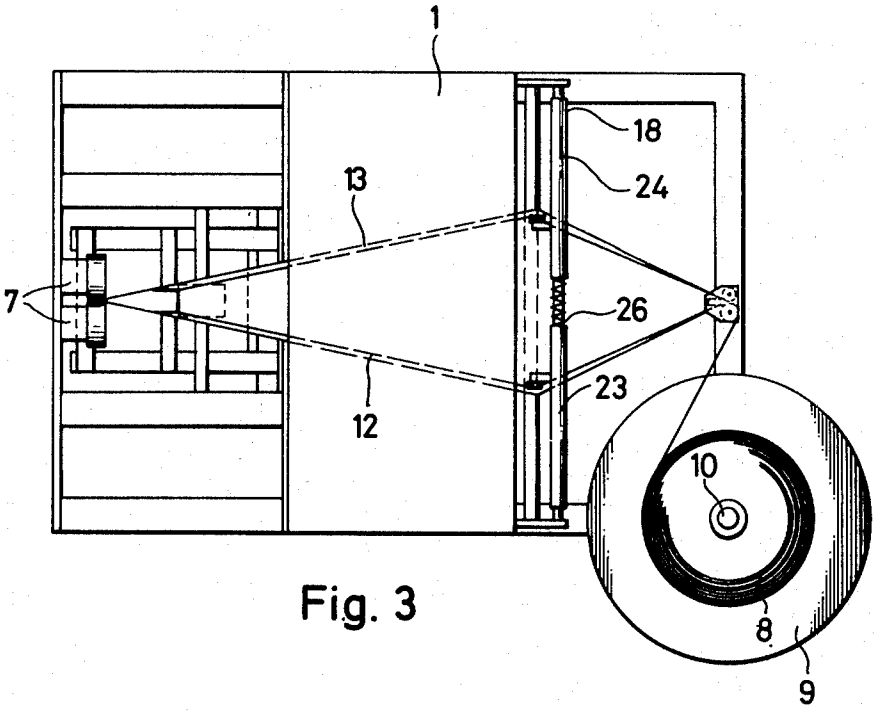


Fig. 3

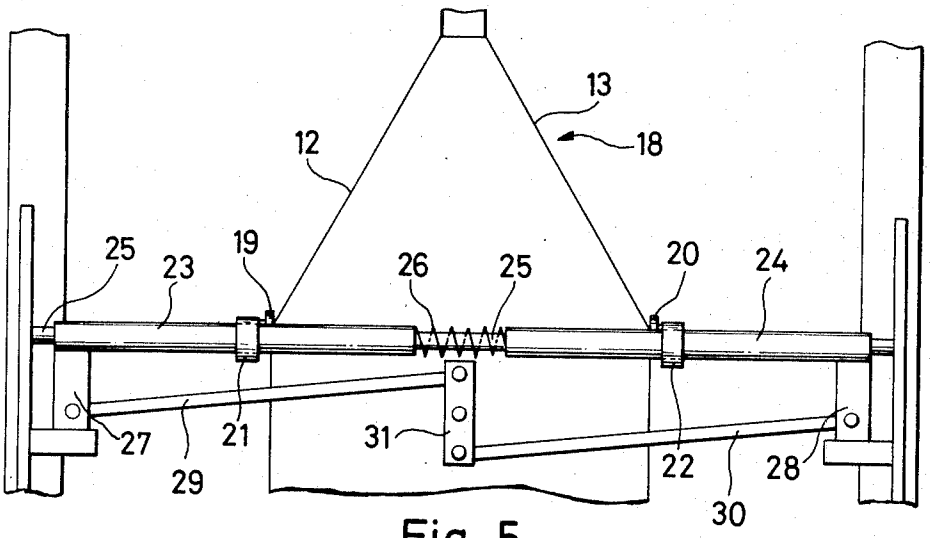


Fig. 5

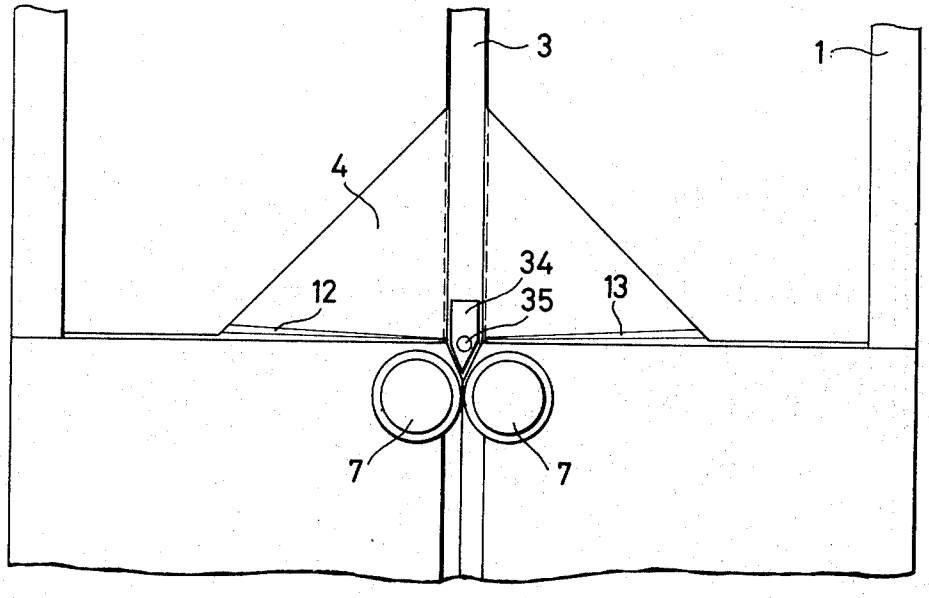


Fig. 6

METHOD AND MECHANISM FOR MAKING FILLED BAGS

BACKGROUND OF THE INVENTION

This invention relates to improvements in methods and mechanism for the production of thin plastic film bags having reclosable interlocking rib and groove profiles at the bag tops.

More particularly, the invention relates to an improved arrangement wherein thin profile film is supplied wound in a roll with the profiles interlocked, and this film is converted into filled completed bags.

Heretofore, reclosable bags with interlocking profiles were made in various ways such as by being made individually, by attaching plastic film fasteners to the tops of bags, by laying sheets of plastic film together and welding all four sides. A substantial number of mechanisms and methods have employed devices for filling the bags through the top and closing the profiles after the bag is filled. Another substantial number of mechanisms have provided a profile bag wherein the profiles are interlocked the bag is open at the bottom to be filled through the open bottom which is thereafter sealed. A disadvantage accompanying this latter method is that the seam formed at the bag bottom is often the weakest part of the bag and yet sustains the greatest stress since the weight of the contents bears directly against the bag bottom when it is held upright.

It is accordingly an object of the present invention to provide an improved method and mechanism for making profile bags wherein the bag bottom is integral or continuous and of one piece so that it is not necessary to form a seam, but the seams are instead formed at the sides of the bag.

A further object of the invention is to provide an improved method and mechanism for making and filling bags which is particularly well adapted to relative high speed continuous operation wherein the bag material is taken off a roll and the completed filled bags are received at the end of the operation.

A further object of the invention is to provide an improved arrangement wherein bags are made from profile film wherein the film is handled in an improved manner to avoid wrinkles and wherein the profiles are brought together and interlocked in an improved manner to avoid inadvertently producing unclosed bags or bags with misaligned or wrinkled sides and edges. A feature of the invention is to utilize thin plastic film having interlocking rib and groove profiles along the edges wherein the film is initially produced by manufacture in folded form with the rib and groove profiles interlocked. This material is readily manufactured in this form and is in a preferred form for handling and shipping inasmuch as the interlocked profiles will help hold the material flat in its wound up roll and will prevent distortion of the interlocking profiles. If the profiles become crushed or crumbled or twisted without being interlocked, or during the time of making them into bags, the bag becomes useless because the contents will be exposed and the bag is unsuitable for reuse.

With the provision of material received from the manufacturer in a folded or doubled over and interlocked form, it is advantageous to carefully spread the material flat into a planar relationship to remove the wrinkles therefrom and to permit refolding and

forming into a bag free from distortions and wrinkles and capable of being welded with uniform leak free seams.

A further feature of the invention is the provision of an improved arrangement for bringing the interlocking profiles together uniformly and pressing them together in a manner to assure that they are positively joined. In handling film difficulties are encountered in that the spacing of the closure profiles from each other is subject to fluctuation both within one type of material and within material of different prescribed widths. The pressing arrangement provides a guide device for holding the profiles at the same spacing. This device includes resiliently positioned guides which are interconnected so that they assume the same spacing relative to the center of the film.

Other objects, advantages and features will become more apparent as will equivalent methods and structures which are intended to be covered herein, in the teaching of the principles of the invention in the disclosure of the specification, claims and drawings, in which:

DRAWINGS

FIG. **1** is an elevational view in somewhat schematic form of a bag forming machine constructed and operating in accordance with the principles of the present invention;

FIG. **2** is a front view of the mechanism of FIG. **1**;

FIG. **3** is a plan view of the mechanism;

FIG. **4** is a rear elevational view of the mechanism;

FIG. **5** is an enlarged view of the guide mechanism for the film, also shown in FIG. **4**;

FIG. **6** is an enlarged fragmentary front view of a portion of the mechanism;

FIG. **7** is a front elevational view of a bag of the type formed by the mechanism of the present invention; and

FIG. **8** is an end elevational view of the bag of FIG. **7**.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

An example of the type of film handled by the present mechanism is U.S. Pat. No. 3,506,517. The film may initially be formed by the manufacturer in tubular form and then slit between the profiles so that a flat sheet results, doubled over with the profiles interlocked. The manufacturer supplies the film in a rolled up form and because the profiles are interlocked, they are prevented from being distorted or flattened during storage and handling.

FIG. **1** shows a supply roll of film at **8** which has been folded or doubled over so as to have two layers, supported on a rotatable bearing mounted disk shaped plate or table **9**. The table **9** is connected with a shaft **11** which is rotatably journalled in a bearing. The mechanism includes a stand **1** providing a frame with a forming member **3** carrying a forming shoulder **4**. Over the forming shoulder and on the forming member **3** is drawn the endless plastic foil web **5**. The web is supported and carried forward on a transport roll **6** and a pair of transport rolls **7**.

The plastic film on the roll **8** is folded with the interlocking profiles joined in order to prevent the profiles from being deformed during storage and transportation. The bag is shown in FIGS. **7** and **8** at **36** with the top profiles at **12** and **13**.

The separation of the profiles as the material is wound off of the roll **8**, as shown in FIG. **1**, is performed by a pin **14** which is fixed to a support **15**. Reversing rolls **16** and **17**, FIG. **4**, engage the edges of the film and it is turned by 90° to be spread out into a flat planar web. A guide device **18** which is connected to the reversing rolls functions to hold the profiles at equal spacing with reference to the profile closing rolls **7**, as will be observed in FIG. **3**. In other words, the film must be fed uniformly in its flattened out condition to the mechanism which again joins the profiles. Because it is brought in sideways or in a cocked arrangement, the profiles will not interlock properly.

The guide device **18** has guide wheels **19** and **20** which engage the film at the inner edges of the closure profiles **12** and **13**. The guide wheels are affixed to hubs or bosses **21** and **22**. These hubs are slidably fixed on sleeves **23** and **24** to be able to adapt the spacing of the rolls to different film widths. The sleeves **23** and **24** are slidably arranged on a shaft **25** held apart by a spring **26** between them. On the sleeves **23** and **24** are arms **27** and **28** which are connected to rods **29** and **30** secured at their ends to a rocker arm **31**. The rods function to insure equal spacing of the sleeves **23** and **24**. In operation the guide wheels **19** and **20** are arranged at a predetermined spacing and engage the inner edge of the interlocking profiles. The spring **26** causes the rolls to engage the edges of the profiles at a predetermined pressure and the foil is spread out relatively tightly to remove wrinkles and folds. If the spacing between the profiles is changed, then the spacing between the wheels **19** and **20** is also automatically altered. Upon a decrease in spacing, the wheels are pushed against the force of the spring and an increase in spacing permits the spring **26** to cause the wheels to follow up. Because the guide wheels are fixedly connected to the rods **29** and **30** in the manner above described, it is assured that the wheels will maintain the film centered.

From the guide device **18** the film travels over the forming shoulder **4** and the forming member **3**. The interlocking rolls **7** also function as transport rolls and are preferably driven in rotation for that purpose. These rolls press the interlocking profiles together, thus forming a tube. The tube is cross welded by a welding device **32**. In the operation, a weld is formed to weld one side of the bag, the bag is filled through the other side and then a weld is formed after the contents to complete the bag as it is severed from the tube. The bags formed are separated from one another preferably in the same operative step, but they can be welded as above described and separated in a subsequent operation.

In order to obtain welded seams which are free from folds, there is provided in the vicinity of the welder spreading devices **33** which engage the tube at the ends and spread the tube apart in the direction of the seam. The filling pipe **3** extends down with its end in a filling zone, and the material to be filled into the bag feeds gravitationally downwardly into the bag side which is welded transversely on its lower side. After the bag is filled, the tube is pulled downwardly and the sealing operation again occurs to form a second seam for the bag behind the filled material and to simultaneously form a new seam for the next succeeding bag.

In FIG. **6** the closure device for the interlocking of the profiles **12** and **13** is shown. The transport and closure roll **7** include opposed pressure rolls having a shaped outer surface with grooves to receive and apply pressure at the proper locations for interlocking the profiles and for holding them in alignment. The closure rolls **7** may be rubber or plastic covered to increase the traction on the film and help in maintaining the profiles in alignment.

To improve the guidance of the profiles into absolute interlocking alignment, a guide wedge **34** is positioned immediately in advance of the pressure roll **7**. This wedge has channels down the sides to receive the profiles which project from the film. The wedge is freely journalled on a horizontal axis or shaft **35** so that the wedge depends downwardly and is pivotal for aiding in guiding the profiles into their position between the roll **7**. The wedge can slide axially so that it maintains it alignment with the profiles. The wedge has a lower tip which extends down between the guide rolls and its freedom of motion on its shaft insures the equalization of possible nonuniform travel of the opposing sides of the film.

FIGS. **6** and **7** show the finished filled bag **36** with the side seams **37** and **38**. It will be noted that the bottom of the bag is of continuous integral material for optimum strength.

In summary, the material is drawn off the drum **8** and the interlocking profiles are separated and the material spread out to a flat web. As shown at **18** in FIG. **1**, guide wheels **19** and **20** are carried on arms supported on sleeves **23** and **24** and the wheels ride on the top surface of the film guidingly and spreadingly engaging the inner edge of the profiles so as to spread the film on the roll **17a** over which is passes. The flattened film is again folded over the form **4**, and the interlocking elements press together by the rolls **7**. The tube is spread by the members **33** and cross seamed at **32** to form the bottom edge of the bag while the bag is filled through its upper edge through a tube **3**. The bag is then pulled downwardly to form another seam with the seaming mechanisms **32** for the other edge of the bag above the contents. Suitable mechanism is provided to control the intermittent operation of the rolls **7** in timed sequence with the weld mechanism **32**. Suitable interconnecting and operating mechanism such as time switches or contact microswitches operated by the welders **32** and by the advancing material may be employed in an operational connection.

I claim:

1. A mechanism for making and filling bags from a continuous film of plastic material having mating reclosable interlocking profiles along the edges comprising in combination:

means for feeding the film forwardly through a filling station;

means for pressing the interlocking elements together to interlocking relationship with the material folded;

means forming a first cross seam across the material to form one side seam of a bag;

means filling the folded material with contents at said filling station through the other side of the bag; and

means for forming a second cross seam across the film behind the filled material to complete the bag.

2. A mechanism for making and filling bags from a continuous film of plastic material having mating re-

closable interlocking profiles along the confronting edges constructed in accordance with claim 1:

wherein the material is fed vertically downwardly at the filling station and the contents are fed gravitationally into the bag.

3. A mechanism for making and filling bags from a continuous film of plastic material having mating reclosable interlocking profiles along the confronting edges constructed in accordance with claim 1:

wherein said film is open and flat in advance of said filling station and means are provided for folding the film to bring the interlocking elements into a confronting relationship in advance of the filling station.

4. A mechanism for making and filling bags from a continuous film of plastic material having mating reclosable interlocking profiles along the confronting edges constructed in accordance with claim 3:

wherein the film is initially received from a roll wherein the profiles are interlocked and means are provided for first separating the interlocked profiles and flattening the film.

5. A mechanism for making and filling bags from a continuous film of plastic material having mating reclosable interlocking profiles along the confronting edges constructed in accordance with claim 4:

wherein means are provided for flattening the material after the profiles are separated and the flattened material is arranged to be planar with an absence of folds and wrinkles.

6. A mechanism for making and filling bags from a continuous film of plastic material having mating reclosable interlocking profiles along the confronting edges constructed in accordance with claim 5:

wherein said flattening means includes a roll means over which the material is passed and the roll means has axially separable guide wheels engaging the edges of the interlocking profiles for spreading the film.

7. A mechanism for making and filling bags from a continuous film of plastic material having mating reclosable interlocking profiles along the confronting edges constructed in accordance with claim 1:

including a guide wedge means engaging the profiles in advance of the means for pressing the profiles to interlocking relation.

8. A mechanism for making and filling bags from a continuous film of plastic material having mating reclosable interlocking profiles along the confronting edges constructed in accordance with claim 1:

wherein the pressing means includes a pair of opposed rollers arranged to engage the outer surface of the film for pressing the profiles together.

9. A mechanism for making and filling bags from a continuous film of plastic material having mating reclosable interlocking profiles along the confronting edges constructed in accordance with claim 8:

wherein said rollers are driven in rotation for drawing the film forwardly.

10. A method for making and filling bags from a continuous film of plastic material having mating reclosable interlocking profiles along the edges comprising the steps:

feeding the film forwardly through a filling station;

pressing the profile elements together to interlocking relation;

forming a first cross seam across the material to form one side edge seam of a bag;

filling the material through the other edge; and

forming a second cross seam behind the filled material to complete the bag.

11. A method for making and filling bags from a continuous film of plastic material having mating reclosable interlocking profiles along the edges in accordance with the steps of claim 10:

werein the film is fed vertically downwardly through the filling station and the bag contents are fed gravitationally downwardly.

12. A method for making and filling bags from a continuous film of plastic material having mating reclosable interlocking profiles along the edges in accordance with the steps of claim 10:

including the step of folding the film material to bring the interlocking profiles into confronting relationship and to fold the base of the bag in advance of the filling station.

13. A method for making and filling bags from a continuous film of plastic material having mating reclosable interlocking profiles along the edges in accordance with the steps of claim 10:

including first separating interlocked rib and groove elements of the film in advance of the filling station.

14. A method for making and filling bags from a continuous film of plastic material having mating reclosable interlocking profiles along the edges in accordance with the steps of claim 10:

including first flattening and spreading the film material into a flat sheet in advance of the filling station prior to folding the material and pressing the interlocking elements together.

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