STAY OPEN BAG MOUTH AND METHODS OF MANUFACTURE

Applicant: ILLINOIS TOOL WORKS INC., Glenview, IL (US)

Inventors: David ANZINI, Middletown, NY (US); Eric PLOURDE, Frankfort, IL (US)

Assignee: ILLINOIS TOOL WORKS INC., Glenview, IL (US)

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Abstract

The present disclosure relates to a stay-open configuration or structure at the mouth of a polymeric or similar package or bag, wherein the configuration or structure has sufficient stiffness or tenacity to be able to maintain the mouth of the package or bag in an open position after being placed into this position. The semi-rigid material which implements the stay-open configuration can be incorporated into zipper components, such as, but not limited to, the flanges. The semi-rigid material may further be a separate element which is attached proximate to the zipper. The semi-rigid material typically goes through processes of extrusion and orientation.
BACKGROUND OF THE DISCLOSURE

1. Field of the Disclosure

The present disclosure relates to a stay-open configuration or structure at the mouth of a polymeric or similar package or bag, wherein the configuration or structure has sufficient stiffness or tenacity to be able to maintain the mouth of the package or bag in an open position after being placed into this position.

2. Description of the Prior Art

In the prior art, reclosures are a common feature on many flexible packages or bags used in the food industry. While the reclosure gives the end user the freedom to use or consume a portion of the contents of the package and store the remainder for future use, simple access to the package contents is not always guaranteed. Because the reclosures on the package are flexible, they do not tend to stay in an open position when opened, thereby typically requiring two-handed operation and raising the possibility that the food item will touch the sides of the package as it is being removed from or placed into the package. For items that are dusty, granular, sticky, greasy, wet, or otherwise unstable or unpleasant to handle, not having a bag or pouch that has the ability to stay open while filling or emptying can be disadvantageous.

U.S. Pat. No. 7,011,879 entitled “Composite Polymeric Twist Tie” issued on Mar. 14, 2006 to Contreras et al. describes a configuration with a twist tie that is made from plastic materials and which exhibits dead fold/twist characteristics. This reference further describes methods of orienting plastics such that they are able to maintain a dead fold.

OBJECTS AND SUMMARY OF THE DISCLOSURE

It is therefore an object of the present disclosure to provide a configuration or structure for a reclosable package or bag, wherein configuration or structure can maintain the mouth of the package or bag in an open position after being placed into this position.

This and other objects are attained by providing a stiff polyethylene member proximate to the mouth of a bag. The member can be produced in various cross sections, such as, but not limited to, round or square. The member is produced by stretching through a forming mandrel, with the stretching step having the impact of significantly raising the modulus of the polyethylene material, making it capable of taking a fold or bend and remaining bent or folded. The high modulus polyethylene structure is then placed on to a zipper pouch, typically by sealing it into the pouch behind the zipper. This disclosure therefore incorporates zipper extrusion and orientation. This is intended to preferentially hold the mouth of the pouch open whenever the pouch is placed into an open configuration.

This typically results in the additional advantages that no metal wire is required, that secondary manufacturing steps are eliminated or reduced, and that a relatively inexpensive method and process is utilized.

BRIEF DESCRIPTION OF THE DRAWINGS

Further objects and advantages of the disclosure will become apparent from the following description and from the accompanying drawings, wherein:

FIG. 1 is a perspective view of a typical pouch, such as a plastic bag, with the stay-open structure of the present disclosure.

FIG. 2 is a cross-sectional view along plane 2-2 of FIG. 1.

FIG. 3 is an alternative cross-sectional view along plane 2-2 of FIG. 1.

FIG. 4A is a schematic of the stretching of the polyethylene material by a forming mandrel.

FIG. 4B is a schematic of placing the stretched polyethylene material onto bag wall material for formation into a plastic bag or pouch.

FIGS. 5A and 5B show a comparison of a bag or pouch without the stay-open characteristic of the present disclosure versus a bag or pouch with the stay-open characteristic of the present disclosure.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

Referring now to the drawings in detail wherein like numerals indicate like elements throughout the several views, one sees that FIG. 1 illustrates a typical example of plastic bag or pouch 100 is illustrated. Front and rear walls 102, 104 are typically formed from the polymeric material such as, but not limited to, polyethylene. Front and rear walls 102, 104, which are coextensive with each other, are sealed together along bottom seal 106 and side seals 108, 110. Bottom seal 106 may be replaced with a fold if front and rear walls 102, 104 are formed from a single piece of bag wall material. A mouth 112 is formed at the top of the bag or pouch 100. This mouth 112 is made reclosable by zipper 114 which is comprised of first and second profiles 116, 118, a typical example of which is illustrated in the cross-sectional view of FIG. 2. As shown in the FIG. 2, semi-rigid member 10 is typically placed near or behind the first and second profiles 116, 118 in order to achieve the stay-open characteristics of the plastic bag or pouch 100. Alternatively, as will be described with respect to FIG. 3, the semi-rigid material may be incorporated into the flanges of zipper 114, thereby eliminating the need for a separate semi-rigid member 10.

FIG. 2 is a typical cross-sectional view along plane 2-2 of FIG. 1. Although a specific structural, first and second profiles 116, 118 of reclosable zipper 114 is illustrated, it should be understood that this disclosure is envisioned to be applicable to a wide range of reclosable zippers. First profile 116 may have first upper and lower flanges 122, 124, extending from a male interlocking element 126 which includes a post 128 terminating in an arrowhead-shaped detent element 130. Second profile 118 may have second upper and lower flanges 132, 134, extending from a female interlocking element 136 which is formed from first and second extending arms 138, 140 terminating in respective first and second detent hooks 142, 144 which, in the interlocked position, detent engage the arrowhead-shaped detent element 130 of first profile 116. First upper and lower flanges 122, 124 are sealed or otherwise attached to front wall 102 while second upper and lower flanges 132, 134 are sealed or otherwise attached to rear wall 104. Semi-rigid member 10 is shown sealed between the first profile 116 and the front wall 102 and
between the second profile 118 and rear wall 104. The position of the semi-rigid member 10 is shown directly aligned and outwardly adjacent from the male and female interlocking elements 126, 136. However, variation in this alignment is envisioned to be within the scope of this disclosure. It is envisioned that that the semi-rigid member 10 could be separate from the zipper 114 (see element 10 in phantom on FIG. 2). Furthermore, a wide range of cross-sectional shapes of semi-rigid member 10 is envisioned, such as, but not limited to, square or round. It is also further envisioned that the zippers 114 may be eliminated from some embodiments of the present disclosure.

[0019] FIG. 3 is an alternative cross-sectional view along plane 2-2 of FIG. 1. In this embodiment, the flanges 122, 124, 132, 134 could incorporate the semi-rigid material, thereby eliminating the semi-rigid member 10. Again, it is envisioned that a wide range of zipper designs implemented as various embodiments of the present disclosure.

[0020] FIG. 4A is a simplified schematic of the production of the semi-rigid member 10 of the present disclosure, while FIG. 4B is a simplified schematic of the placement of the polyethylene material onto the bag wall material for subsequent formation of a bag or package. Polyethylene material 12 is extruded into a pre-determined profile shape (e.g., round, square or rectangular cross section), using draw ratios, temperatures and similar parameters as would be known to one skilled in the art, and allowed to cool and therefore solidify, and then pulled by opposed driven rollers 201, 202 (or a similar device) through an aperture 204 (of decreasing diameter) in forming mandrel 200 which has been heated to a temperature below the melting point of the polyethylene material 12. The polyethylene material 12 (which typically includes at least a portion of high density polyethylene and which ultimately forms semi-rigid member 10) is drawn through the mandrel 200 thereby reducing the cross-sectional area of the profile, resulting in stretching which causes the polymer molecules to align thereby creating a high modulus semi-rigid element 10 to a degree necessary to maintain an open (or closed) position of the bag 100 as shown in FIG. 5B. The material of semi-rigid member 10 may be coiled onto a reel or similar device for later use and/or joined to a resealable element. Alternately, as shown in FIG. 4B, the semi-rigid member 10 is then placed and sealed, glued or otherwise adhered to bag wall material 206 (typically of polymeric material) for subsequent formation into the front and rear walls 102, 104 of plastic bag or pouch 100, a typical example of which is shown in FIG. 1. Alternately, as indicated above, the semi-rigid member is then placed and sealed or glued or otherwise attached to the base of the zipper behind the interlocking elements or to the zipper flanges. The semi-rigid material may also be co-extruded at the same time as the zipper material, formed and then attached to the zipper material.

[0021] As a further separate alternative, in order to incorporate the semi-rigid elements into the flanges 122, 124, 132, 134 or other elements of the zipper 114 as illustrated in FIG. 3, the following is taken into account with respect to the process of FIGS. 4A and 4B. It is typically undesirable for the interlocking elements (e.g., male and female interlocking elements 126, 136 of FIG. 2) to take a dead fold, therefore these elements could be co-extruded from a material such as low density polyethylene that tends to exhibit less of a dead fold characteristic when oriented and the reseal elements, such as, but not limited to, the flanges 122, 124, 132, 134 (in place of semi-rigid member 10 in FIGS. 4A and 4B), could be extruded from polymers which include at least a portion of high density polyethylene or other material, which does tend to acquire the dead fold characteristic when properly oriented. A further alternative would be to use a process wherein the flanges are extruded separately, then oriented, and then the profile extruded onto the flange. A still further possibility would be to make an oriented flange material and heat seal a pre-made closure element onto it, wherein the closure could be zipper, hook-and-eye (i.e., Velcro®), mushroom shaped interlocking elements, etc. It is noted that the terms low density polyethylene and high density polyethylene are well-defined within the art.

[0022] FIG. 5A illustrates a prior art bag which does not have the ability to maintain an open configuration whereas FIG. 5B illustrates a typical bag 100 of the present disclosure wherein the user can position the mouth in an open position and the increased modulus of the semi-rigid element 10 (not specifically shown in FIG. 5B) maintains the mouth 112 in an open position. Likewise, semi-rigid element 10 can be used to maintain the bag 100 in a closed position.

[0023] Thus the several aforementioned objects and advantages are most effectively attained. Although preferred embodiments of the invention have been disclosed and described in detail herein, it should be understood that this invention is in no sense limited thereby and its scope is to be determined by that of the appended claims.

What is claimed is:

1. A polymeric bag or container, including:
   a. a front wall and a rear wall, sealed together at edges thereof thereby forming a mouth;
   b. a resealable element around the mouth, thereby making the mouth resealable;
   c. a semi-rigid element extending around and attached to the mouth with a sufficient modulus for the mouth of the bag to maintain an open position after being placed in an open position.

2. The polymeric bag or container of claim 1 wherein the semi-rigid element is made of polyethylene which has undergone steps of extruding and stretching.

3. The polymeric bag or container of claim 1 wherein the semi-rigid element includes at least a portion of high density polyethylene.

4. The polymeric bag or container of claim 2 wherein the step of stretching increases the modulus of the semi-rigid element in order for the semi-rigid element to maintain an open or a closed position of the bag.

5. The polymeric bag of claim 2 wherein the semi-rigid element is positioned between the reseal and the front wall and between the reseal and the rear wall.

6. The polymeric bag of claim 2 wherein the reseal is a zipper including a first profile and a second profile, wherein the first profile includes at least one first flange and the second profile includes at least one second flange, and wherein the semi-rigid element forms at least the one first flange and the at least one second flange.

7. The polymeric bag of claim 2 wherein the first profile includes a first interlocking element and the second profile includes a second interlocking element.

8. The polymeric bag of claim 7 wherein the first and second interlocking elements are at least partially formed from low density polyethylene and the at least one first flange and the at least one second flange are at least partially formed from high density polyethylene.
9. The polymeric bag of claim 8 wherein the first and second interlocking elements are co-extruded with the at least one first flange and the at least one second flange.

10. The polymeric bag of claim 2 wherein the semi-rigid element is separate from the reclosure.

11. The polymeric bag of claim 2 wherein the semi-rigid element is attached in a position chosen from the group consisting of behind the bag wall, behind the interlocking elements and attached to the flanges.

12. A reclosure for a bag or container, including:
   a first interlocking profile and a second interlocking profile;
   the first and second interlocking profiles including a semi-rigid element with a sufficient modulus for the reclosure to maintain an open position after being placed in an open position.

13. The reclosure of claim 12 wherein the semi-rigid element is made of polyethylene which has undergone steps of extruding and stretching.

14. The reclosure of claim 12 wherein the semi-rigid element includes at least a portion of high density polyethylene.

15. The reclosure of claim 13 wherein the step of stretching increases the modulus of the semi-rigid element in order for the semi-rigid element to maintain an open or a closed position of the bag.

16. The reclosure of claim 13 wherein the reclosure is a zipper including a first profile and a second profile, wherein the semi-rigid element is attached to outwardly facing portions of the first and second profiles.

17. The reclosure of claim 13 wherein the reclosure is a zipper including a first profile and a second profile, wherein the first profile includes at least one first flange and the second profile includes at least one second flange, and wherein the semi-rigid element forms at least one first flange and the at least one second flange.

18. The reclosure of claim 13 wherein the first profile includes a first interlocking element and the second profile includes a second interlocking element.

19. The reclosure of claim 18 wherein the first and second interlocking elements are at least partially formed from low density polyethylene and the at least one first flange and the at least one second flange are at least partially formed from high density polyethylene.

20. The reclosure of claim 19 wherein the first and second interlocking elements are co-extruded with the at least one first flange and the at least one second flange.

21. The reclosure of claim 13 wherein the semi-rigid element is attached in a position chosen from the group consisting of behind the bag wall, behind the interlocking elements and attached to the flanges.

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