



US 20070258666A1

(19) **United States**

(12) **Patent Application Publication**
Plourde

(10) **Pub. No.: US 2007/0258666 A1**

(43) **Pub. Date: Nov. 8, 2007**

(54) **EXTERNALLY APPLIED ZIPPER FOR
RECLOSABLE BAG**

Publication Classification

- (51) **Int. Cl.**
B65D 33/00 (2006.01)
B65D 33/16 (2006.01)
- (52) **U.S. Cl.** **383/204; 383/63; 383/64;
383/62**

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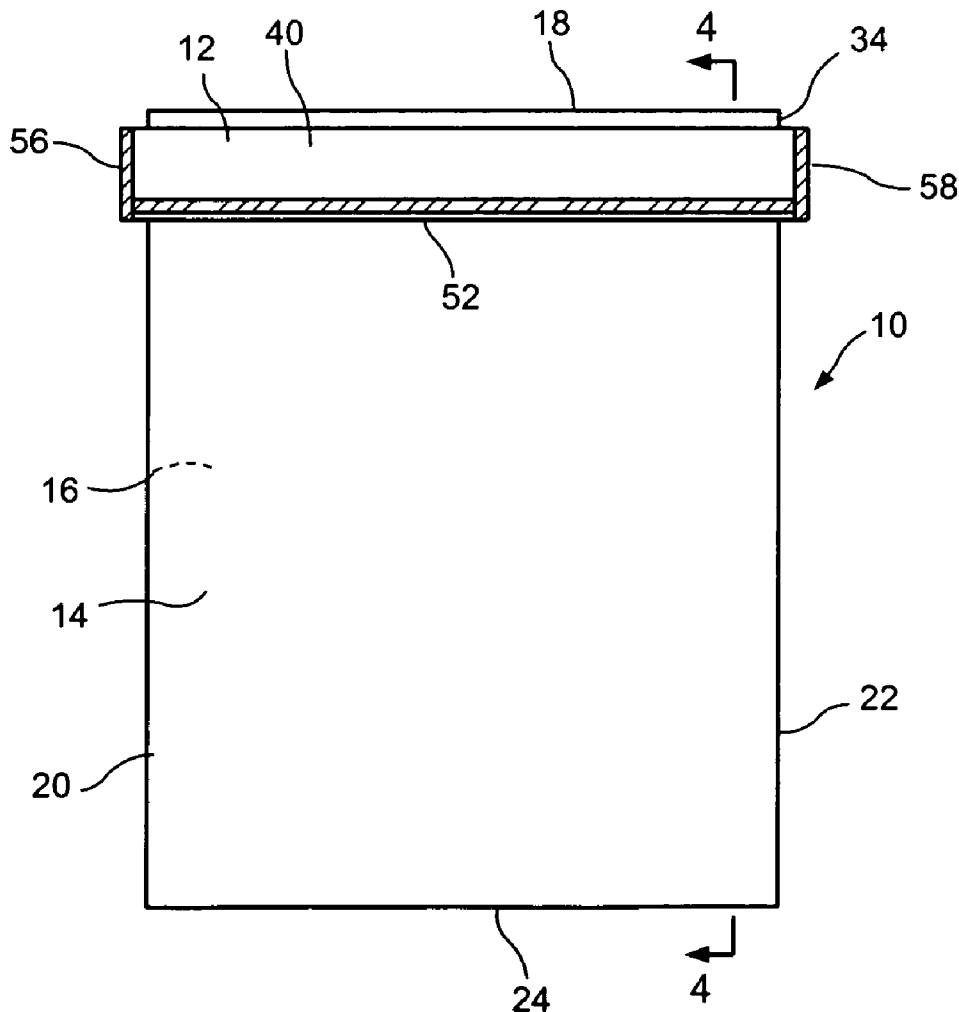
(57) **ABSTRACT**

A reclosable bag is disclosed with a zipper sealed to the exterior surface of front and rear web panels. The interlocking elements of the zipper, prior to initial opening of the reclosable bag, are separated from each other by a removable header formed by lines of weakness immediately above the seal lines between the zipper flanges and the web panels. The initial opening of the bag is performed by tearing the lines of weakness and removing the header. This allows the interlocking elements of the zipper to interlock with each other for the subsequent reclosing of the bag. The zipper can be applied across the top of the bag or along a corner thereof.

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(21) Appl. No.: **11/429,870**

(22) Filed: **May 8, 2006**



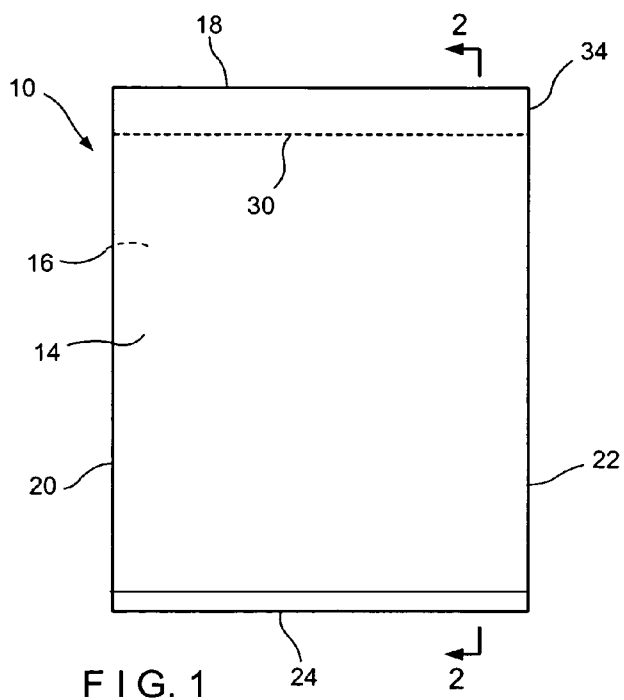


FIG. 1

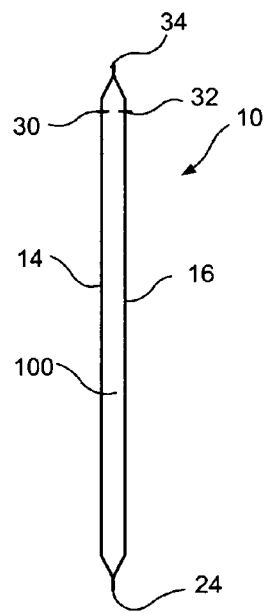


FIG. 2

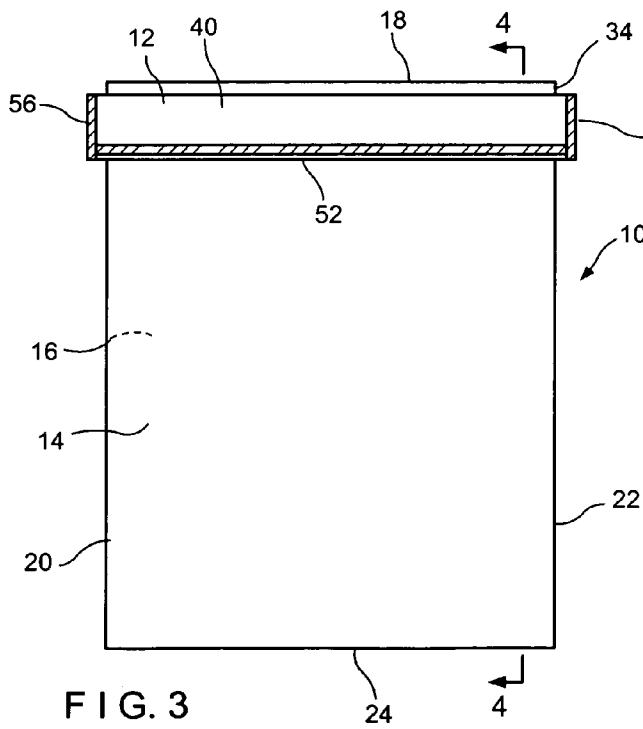


FIG. 3

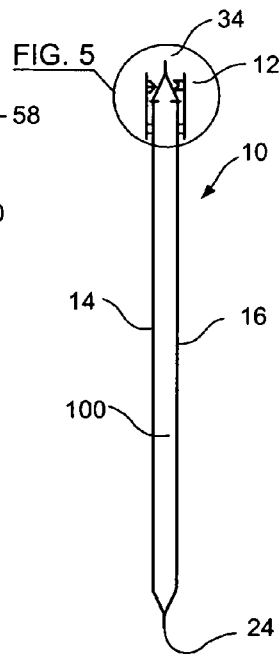


FIG. 4

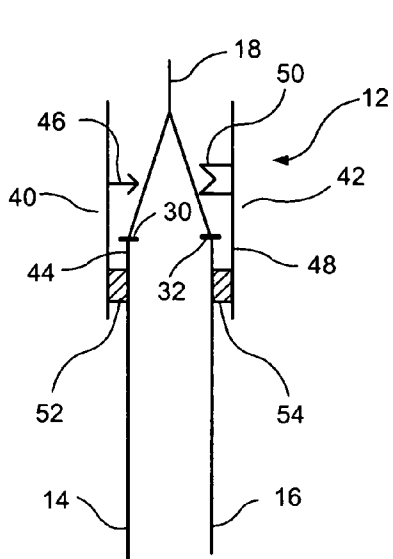


FIG. 5

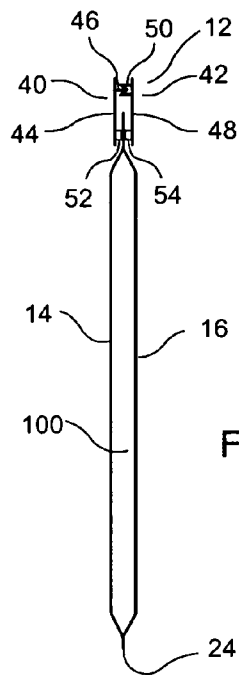


FIG. 8

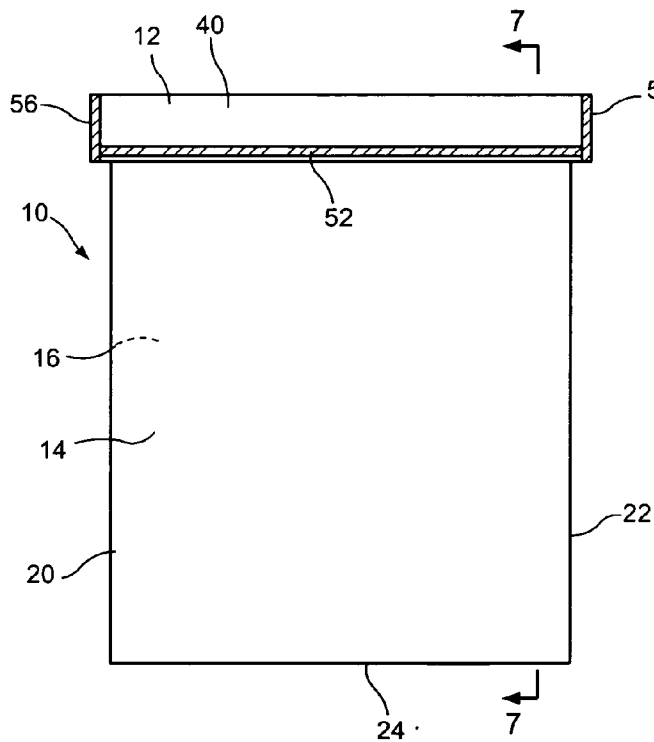


FIG. 6

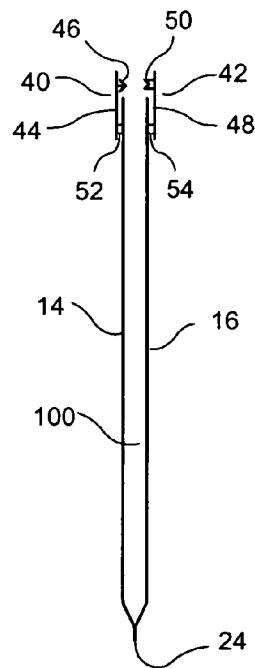


FIG. 7

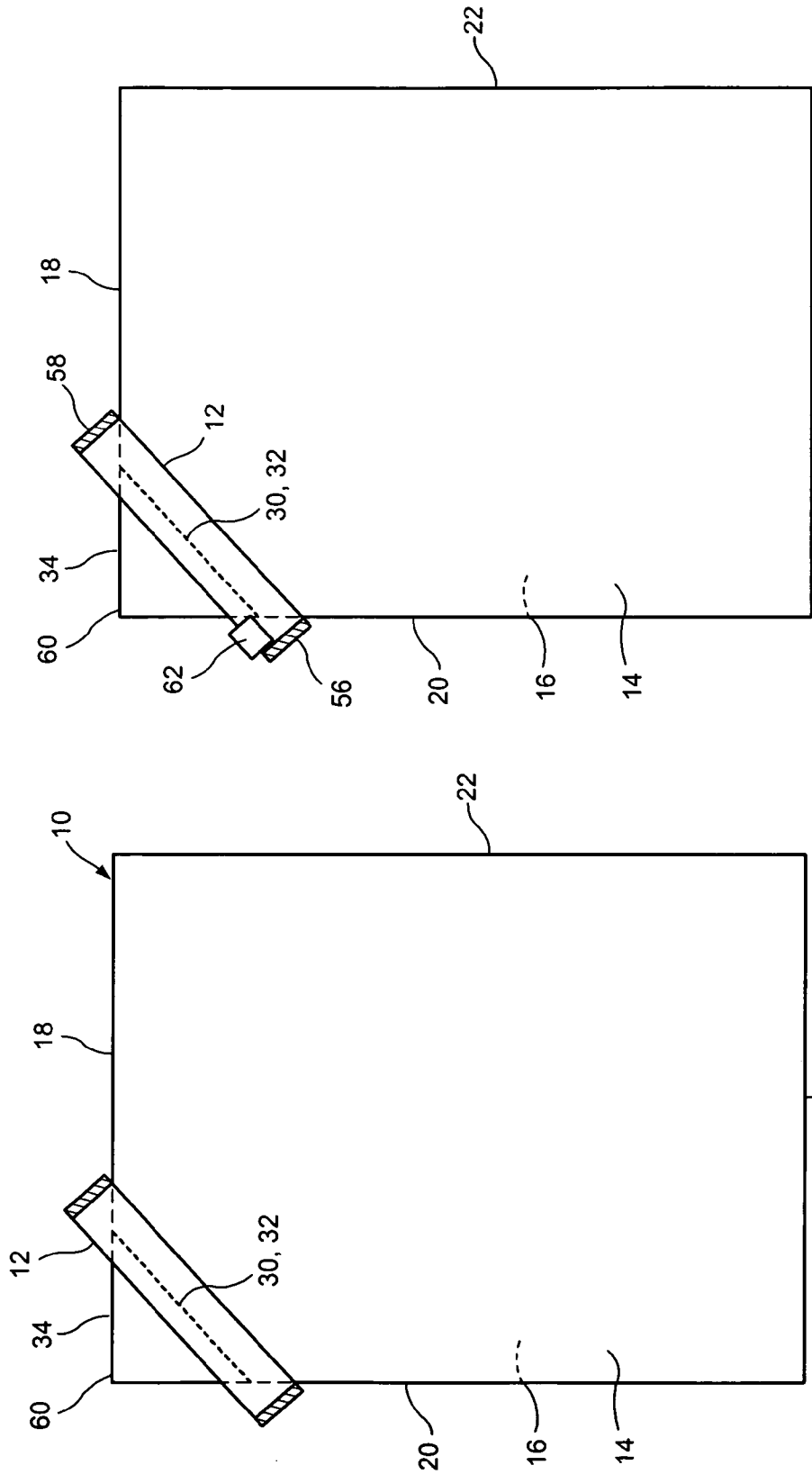


FIG. 9

FIG. 10

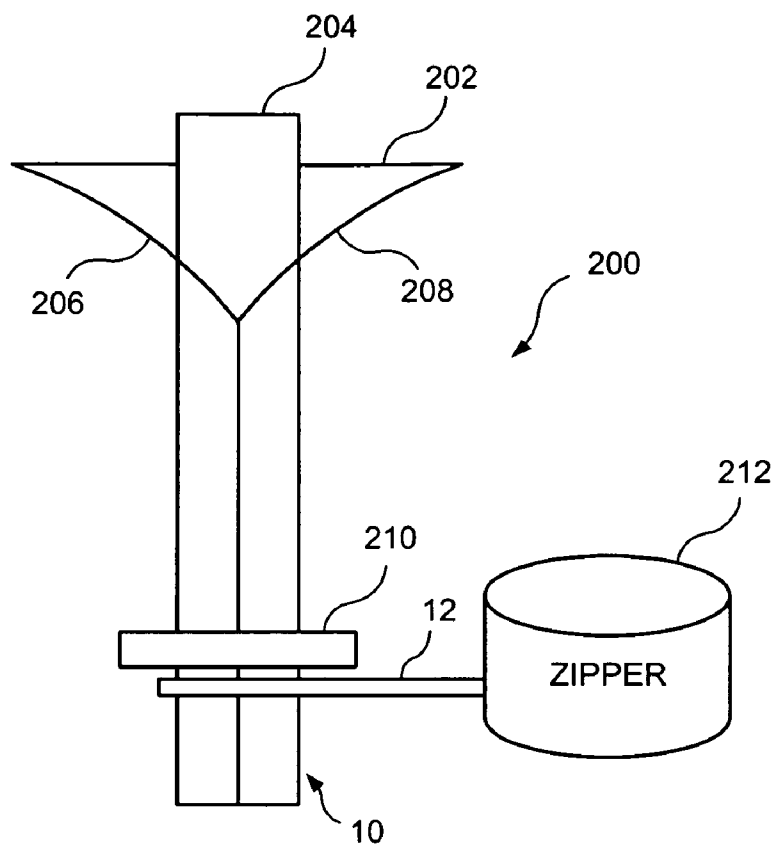


FIG. 12

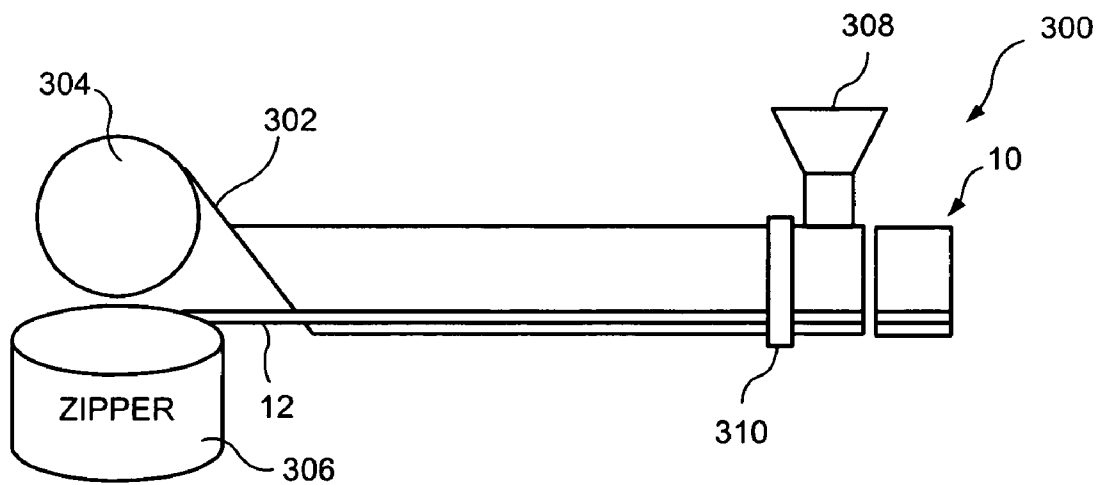


FIG. 13

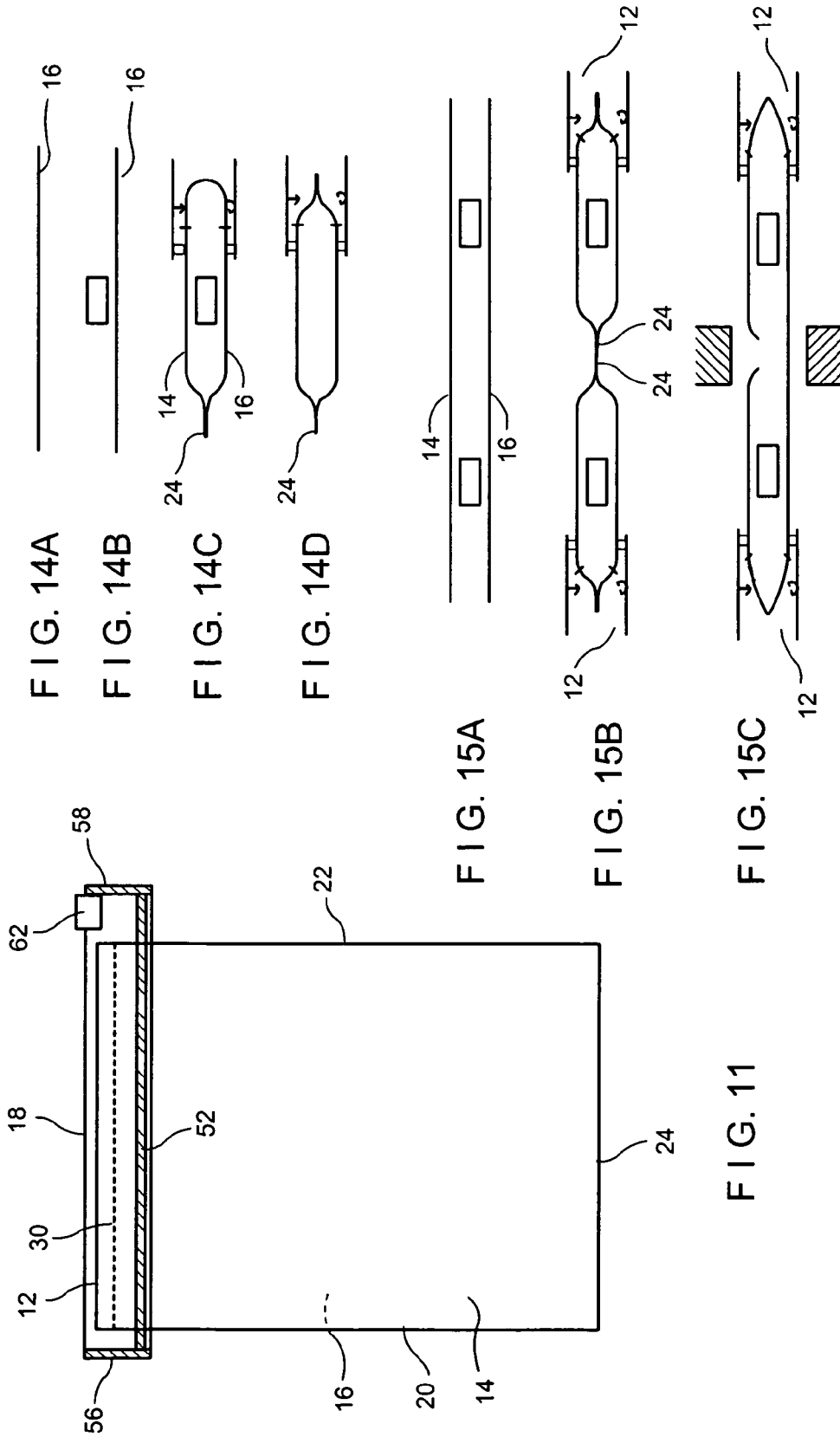


FIG. 14A

FIG. 14B

FIG. 14C

FIG. 14D

FIG. 15A

FIG. 15B

FIG. 15C

FIG. 11

EXTERNALLY APPLIED ZIPPER FOR RECLOSABLE BAG

BACKGROUND OF THE INVENTION

[0001] 1. Field of the Invention

[0002] The present invention relates to a reclosable bag with an externally applied zipper. Prior to the initial opening of the bag, the profiles of the zipper are separated by the bag walls and are not engaged with each other. However, perforations or other lines of weakness in the bag walls, between the zipper flange to bag seal lines and the zipper profile, allow the user to remove a header portion of the bag, thereby providing an initial opening and allowing the profiles of the zipper to engage with each other for subsequent reclosing of the bag.

[0003] 2. Description of the Prior Art

[0004] The prior art of reclosable bags is well-developed in many aspects, and has generally been suitable for its intended purposes.

[0005] While corner openings of reclosable bags have been known in order to create a spout-like opening, such as disclosed in U.S. Pat. No. 6,007,246 entitled "Reclosable Container Arrangement", issued on Dec. 28, 1999 to Kini-gakis et al., the manufacturing and other characteristics of this reclosable bag have been open to improvement.

[0006] Likewise, reclosable bags, such as those disclosed in U.S. Pat. Nos. 4,787,755 and 4,892,512, both to Branson, entitled "Reclosable Flexible Container Having Fastener Profiles Sealed at Their Ends to the Outside of the Bag" and issued on Nov. 29, 1988 and "Method of Making Reclosable Flexible Containers Having Fastener Profiles Affixed to Exterior of Bag Walls" and issued on Jan. 9, 1990, respectively, have been disadvantageous in that the bag walls have been pinched between the zipper profiles when the zipper was closed. Additional prior art includes U.S. Pat. No. 4,691,373 entitled "Zipper Closure with Unitary Adhesive Cover Sheet" issued on Sep. 1, 1987 to Ausnit.

OBJECTS AND SUMMARY OF THE INVENTION

[0007] It is therefore an object of the present invention to provide a reclosable bag wherein the product is contained by the package film prior to initial opening, rather than relying on the internal strength of the zipper profile.

[0008] It is therefore a further object of the present invention to provide a reclosable bag wherein the film is not engaged between the zipper profiles upon reclosing of the bag subsequent to initial opening.

[0009] It is therefore a still further object of the present invention to provide a zipper configuration which can be adapted to a wide range of package styles and package manufacturing processes.

[0010] These and other advantages are attained by providing a reclosable plastic bag wherein the zipper profiles are attached to the outside of bag with the interlocking elements facing inwardly. Perforations or other lines of weakness are formed in the bag walls immediately upward of the seal lines between the zipper flange and the bag walls. In this configuration, the interlocking elements are separated

from each other by a removable portion of the bag walls prior to the initial opening of the reclosable bag. However, after the removable portion of the bag walls is removed during the initial opening of the bag, the interlocking portions of the zippers may contact and interlock with each other to reclose the bag. This configuration may be formed along the entire top of a reclosable bag or may be formed at a top corner of a reclosable bag, particularly if a spout-like configuration is desired.

BRIEF DESCRIPTION OF THE DRAWINGS

[0011] Further objects and advantages of the invention will become apparent from the following description and from the accompanying drawings, wherein:

[0012] FIG. 1 is a plan view of the first embodiment of the reclosable bag of present invention, prior to the sealing of the zipper profiles along the top thereof.

[0013] FIG. 2 is a cross-sectional view along plane 2-2 of FIG. 1.

[0014] FIG. 3 is a plan view of the first embodiment of the reclosable bag of the present invention, after the sealing of the zipper profile along the top thereof, but prior to the initial opening of the reclosable bag.

[0015] FIG. 4 is a cross-sectional view along plane 4-4 of FIG. 3.

[0016] FIG. 5 is a detailed section of FIG. 4.

[0017] FIG. 6 is a plan view of the first embodiment of the reclosable bag of the present invention, subsequent to the initial opening of the bag by the removal of the header by the consumer.

[0018] FIG. 7 is a cross-sectional view along plane 7-7 of FIG. 6 with the zipper profiles separated.

[0019] FIG. 8 is a cross-sectional view along plane 7-7 of FIG. 6 with the zipper profiles engaged with each other.

[0020] FIG. 9 is a front plan view of the second embodiment of the reclosable bag of the present invention, with the zipper and removable header (the perforated lines shown in phantom) diagonally across a top corner of the reclosable bag.

[0021] FIG. 10 is a front plan view of an alternative second embodiment of the reclosable bag, including a slider, of the present invention.

[0022] FIG. 11 is a front plan view of an alternative third embodiment of the reclosable bag, including a slider, of the present invention.

[0023] FIG. 12 is a schematic of a vertical form fill and seal apparatus for forming the reclosable bag of the present invention.

[0024] FIG. 13 is a schematic of a horizontal form vertical fill and seal apparatus for forming the reclosable bag of the present invention.

[0025] FIGS. 14A-14D are schematics of a first horizontal form horizontal fill manufacturing process for forming the reclosable bag of the present invention.

[0026] FIGS. 15A-15C are schematics of a second horizontal form horizontal fill manufacturing process for forming the reclosable bag of the present invention.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

[0027] Referring now to the drawings in detail wherein like numerals indicate like elements throughout the several views, one sees that FIG. 1 is a plan view of a first embodiment of the reclosable bag 10 of the present invention, prior to the sealing of the zipper 12 thereto. FIG. 2 is a cross-sectional view thereof. Reclosable bag 10 includes front web panel 14 and rear web panel 16, co-extensive with each other, sealed to each other around the periphery thereof—top seal 18, side seals 20, 22 and bottom seal 24—thereby forming product containment area 100 therein. Bag 10 can be initially provided empty or filled with product. Some seals 18, 20, 22, 24 may be replaced by folds in some variations of these embodiments. Front and rear web panels 14, 16 are formed from polymeric film or similar material, including monolayer, co-extruded or laminate films, coated paper or multi-wall paper webs, as would be known to those skilled in the art. Lines of weakness 30, 32, such as perforated lines or score lines, are formed opposite to each other, across the width of front and rear web panels 14, 16, respectively, immediately downwardly adjacent from, and parallel to, top seal 18. The portions of front and rear web panels 14, 16 above lines of weakness 30, 32 form removable header 34. Removable header 34 may include a hang aperture (not shown).

[0028] As shown in FIGS. 3, 4 and 5, zipper 12 is formed from first profile 40 and second profile 42. First profile 40 includes first flange 44 and male interlocking element 46. Likewise, second profile 42 includes second flange 48 and female interlocking element 50. First and second flanges 44, 48 are sealed to the exterior of front and rear web panels 14, 16, respectively, immediately downwardly adjacent to, and parallel to, lines of weakness 30, 32, respectively, along first and second seal (or joinder) lines 52, 54 so that the male and female interlocking elements 46, 50 face inwardly toward each other. First and second seal lines 52, 54 are typically formed by heat sealing (in which case sealant resin may be placed on the interior of first and second flanges 44, 48) or by hot glue or other adhesive. Likewise, first and second seal lines 52, 54 typically intersect with side seals 20, 22. Those skilled in the art will recognize further variations after review of this disclosure.

[0029] Zipper 12, which is applied to the bag 10 shown in FIGS. 1 and 2 in order to form the bag 10 as shown in FIGS. 3, 4 and 5, is fed over the web panels 14, 16 of bag 10. In these figures, the zipper 12 has been pre-cut to a segment with the ends fused, or pre-stomped together along respective ends of the profiles along profile end seal lines 56, 58, but the zipper 12 could likewise be supplied as unattached zipper half segments or could be fed from a continuous supply of zipper halves or mated zipper could be supplied and unmated prior to attachment.

[0030] As shown in FIGS. 4 and 5, with removable header 34 in place extending above zipper 12 and protruding between first and zipper profiles 40, 42, male interlocking element 46 is separated from female interlocking element 50 by removable header 34.

[0031] However, as shown in FIGS. 6, 7 and 8, after removable header 34 is removed, typically by the consumer, by tearing along lines of weakness 30, 32, male interlocking element 46 has access to female interlocking element 50. As shown in FIG. 7, interlocking elements 46, 50 may be separated to allow access by the consumer to product containment area 100. Likewise, as shown in FIG. 8, interlocking elements 46, 50 may be interlocked by the consumer in order to reclose bag 10.

[0032] A second embodiment of reclosable bag 10 is shown in FIG. 9. Zipper 12 and lines of weakness 30, 32 (shown in phantom) are diagonally across top corner 60 of bag 10, typically at a forty-five degree angle, thereby causing removable header 34 to be triangular. This second embodiment operates similarly to the first embodiment except that a spout-like opening is formed in place of top corner 60 by the removal of header 34.

[0033] A variation of the second embodiment of reclosable bag 10 is shown in FIG. 10 wherein slider 62 is parked or stabilized on a portion of zipper 12 which extends beyond side seal 18. In this configuration, typically no flanges would be formed above the interlocking elements 46, 50. Upon the removal of header 34, slider 62 is free to move in the conventional manner as known to those skilled in the art, separating first and second profiles 40, 42 when moved in a first direction and interlocking first and second profiles 40, 42 when moved in a second direction.

[0034] FIG. 11 illustrates the embodiment of the reclosable bag 10, similar to that of FIG. 10, but with zipper 12 extending along the top edge of the reclosable bag 10 and extending beyond side 22 and including slider 62 parked at the extended portion of zipper 12.

[0035] FIG. 12 illustrates vertical form fill and seal apparatus 200 for the formation of reclosable bag 10. Film 202 is wrapped around fill tube 204 and lateral edges 206, 208 are sealed to each other to form front and rear web panels 14, 16. Cross-seal bar 210 typically forms top seal 18 and bottom seal 24 (typically one operation of cross-seal bar forming one seal for a first bag and another seal for a subsequent bag) as well as lines of weakness 30, 32. Zipper 12 is thereafter supplied from spool 212, and pulled, driven or guided into place and sealed to film 202.

[0036] FIG. 13 illustrates a horizontal form vertical fill and seal apparatus 300 for the formation of reclosable bag 10. Film 302 is supplied from spool 304 and folded along the bottom to form front and rear web panels 14, 16 (alternatively, separate spools could provide the film for front and rear web panels 14, 16). Film 302 may be supplied with lines of weakness 30, 32 pre-formed or formed shortly after the dispensing from spool 304. Zipper 12 is supplied from spool 306 and sealed to film 302. While FIG. 12 illustrates zipper 12 being sealed along the bottom of the resulting folded film structure, zipper 12 could likewise be sealed along the top edges of the folded film structure forming front and rear web panels 14, 16. Product is supplied by vertical filling station 308 and cross-seal bar 310 forms side seals 20, 22 and separates adjacent bags one from another (typically one operation of cross-seal bar 310 forming one side seal for a first bag and another side seal for a subsequent bag and separating one bag from another).

[0037] A first horizontal form, horizontal fill manufacturing process is illustrated in FIGS. 14A-14D. A first single

sheet of web, illustrated as rear sheet 16, is provided as illustrated in FIG. 14A. Product 102 is placed thereon as illustrated in FIG. 14B. The first single sheet of web is then folded as shown in FIG. 14C to form front and rear sheets 14, 16, or a second sheet of web, illustrated as front sheet 14, is provided as shown in FIG. 14D. The appropriate seals are formed and zipper 12 is attached.

[0038] Similarly, in FIG. 15A, two products 102 are provided between sheets of web 14, 16 and the appropriate seals are formed and the zippers 12 attached as shown in FIG. 15B. Alternatively, the ends of a single sheet can be folded over the products 100 so that the middle half of sheet of web forms the rear panel of two adjacent reclosable packages and the end quarters of the sheet of web form the front panels of two adjacent reclosable packages as shown in FIG. 15C.

[0039] Those skilled in the art will find many variations of the apparatus disclosed in FIGS. 12, 13, 14A-D and 15A-C after review of the present disclosure.

[0040] 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 reclosable bag, including:
 - a first web panel;
 - a second web panel joined to said first web panel;
 - a zipper including a first profile and a second profile, said first profile including a first interlocking element and said second profile including a second interlocking element;
 - said first profile being joined to an exterior of said first web panel with said first interlocking element facing said first web panel and said second profile being joined to an exterior of said second web panel with said second interlocking element facing said second web panel; and
 - said first and second web panels including a removable portion, wherein said removable portion, prior to removal, separates said first interlocking element from said second interlocking element and wherein, after said removable portion has been removed, said first interlocking element and said second interlocking element can interlock with each other thereby reclosing said bag.
- 2. The reclosable bag of claim 1 wherein removal of said removable portion provides an initial opening of said bag and subsequent interlocking of said first and second interlocking elements with each other provides a subsequent reclosing of said bag.
- 3. The reclosable bag of claim 2 wherein said removable portion is formed by at least one line of weakness in said first and second web panels.
- 4. The reclosable bag of claim 2 wherein said removable portion is formed by a first line of weakness in said first web panel and a second line of weakness in said second web panel.

5. The reclosable bag of claim 4 wherein said first and second lines of weakness are first and second perforated lines.

6. The reclosable bag of claim 4 wherein said first and second lines of weakness are first and second scored lines.

7. The reclosable bag of claim 1 wherein said first and second web panels are co-extensive with each other and are joined to each other around a periphery thereof.

8. The reclosable bag of claim 7 wherein at least a portion of the periphery of said first and second web panels are joined to each other by sealing.

9. The reclosable bag of claim 1 wherein said first and second web panels are formed from a single sheet of web and at least a portion of the periphery of said first and second web panels is formed by a fold therebetween.

10. The reclosable bag of claim 1 wherein said first zipper profile includes a first flange and said second zipper profile includes a second flange.

11. The reclosable bag of claim 10 wherein said first flange is joined to said first web panel along a first joiner line immediately adjacent to said first line of weakness and said second flange is joined to said second web panel immediately adjacent to said second line of weakness along a second joiner line.

12. The reclosable bag of claim 10 wherein said first line of weakness is between said first joiner line and said first interlocking element and said second line of weakness is between said second joiner line and said second interlocking element.

13. The reclosable bag of claim 11 wherein said first and second lines of weakness are formed opposite to each other and immediately adjacent and parallel to a side of said periphery of said first and second web panels.

14. The reclosable bag of claim 1 wherein said first and second lines of weakness are formed opposite to each other and diagonally across a corner of said first and second web panels.

15. The reclosable bag of claim 14 wherein said first and second lines of weakness form a forty-five degree angle with a portion of the periphery of said first and second web panels.

16. The reclosable bag of claim 14 wherein said zipper includes a slider which, when moved in a first direction, separates said first and second interlocking elements and, when moved in a second direction, interlocks said first and second interlocking elements.

17. The reclosable bag of claim 16 wherein, prior to removal of said removable portion, said slider is stabilized in a location beyond said periphery of said first and second web panels.

18. The reclosable bag of claim 1 wherein said first interlocking element is male element and said second interlocking element is a female element.

19. The reclosable bag of claim 1 wherein said removable portion, prior to removal, protrudes between said first and second profiles of said zipper.

20. The reclosable bag of claim 1 wherein said zipper includes a portion extending beyond said first and second web panels, and wherein a slider is mounted on said portion.