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(54) **Reclosable zipper having sealant layer and peel seal; package; method**

(57) A zipper closure (20) having a peel seal (40) and sealant layers for securing the zipper closure to side panels to provide a package (60). The peel seal is po-

sitioned within the interior of the package, such as between the side panels or between the sealing flanges of the zipper closure.

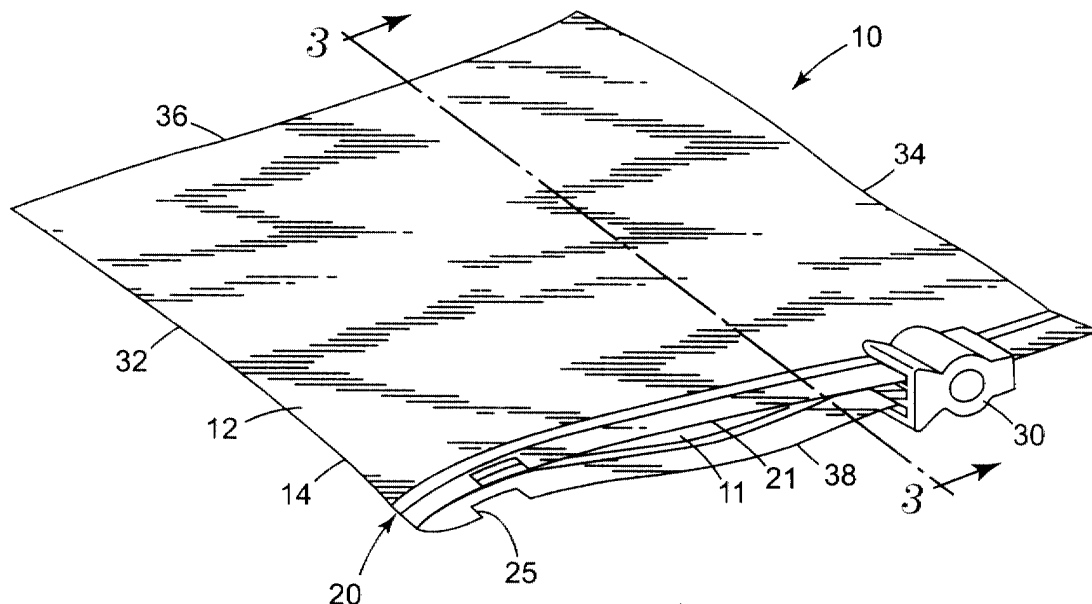


Fig. 1

Description

Field of the Disclosure

[0001] This disclosure concerns reclosable packages and their use. In particular, this disclosure describes reclosable zipper closures having a sealant layer, methods of making the zipper closures, and packages made with the zipper closure.

Background

[0002] Flexible packages, in particular resealable and recloseable packages, are frequently used for packaging of consumable goods. Goods that are not used completely when the package is initially opened rely on a zipper closure to reclose the package and keep the remaining contents fresh. Examples of consumable goods that are often packaged in packages, such as bags, with a zipper closure include potting soil, fertilizer, pet food, dog biscuits, vegetables, cereal, and many different foods edible by humans.

[0003] Often, the opening and closing of the zipper closure is facilitated by a slider device that is mounted on the zipper closure. The slider device is constructed to pry apart the interlocking zipper closure members when the slider device is moved in a first direction along the zipper, and to engage the interlocking zipper closure members when the slider device is moved in a second, opposite direction along the zipper. In some applications, it is desired to include a tamper-evident structure, to notify whether access has been gained to the zipper closure or to the package interior. Improvements in these types of packages are desirable.

Summary of the Disclosure

[0004] The present disclosure relates to a package, such as a flexible bag, having a resealable, reclosable zipper closure mechanism, opening and closing of which is accomplished by a slider device mounted on the zipper mechanism. A tamper-evident structure, such as a peel seal, is provided on the interior of the package between the zipper closure and the product retention volume; preferably this peel seal forms a hermetic seal. The peel seal provides evidence whether access has been gained to the interior of the package. The peel seal may be a peelable film which is attached to the zipper closure after manufacturing of the zipper closure, or the peel seal may be provided on the zipper closure when the closure is manufactured. The package may include a second peel seal positioned, for example, within the zipper closure mechanism or exterior to the zipper closure mechanism, so that the zipper closure mechanism is positioned between the first peel seal and the second peel seal.

[0005] In particular, the present disclosure is directed to a flexible, reclosable package having a package wall

comprising first and second panel sections that define a package interior, access to which is gained through a mouth. A zipper closure, extending along the mouth, includes first and second releasably interlocking closure profiles having first and second sealing flanges which connect the closure profiles to the panel sections. The first and second panel sections define a first portion of an interior surface of the package and the first and second sealing flanges define a second portion of the interior surface. A first sealant layer is positioned between and secures together the first sealing flange and the first panel section, and a second sealant layer is positioned between and secures together the second sealing flange and the second panel section. A peel seal, having first and second opposite outer surfaces, is secured to either the first portion of the interior surface (defined by the panel sections) or the second portion of the interior surface (defined by the sealing flanges) with a first seal strength at the first outer surface and with a second seal strength at the second outer surface. The peel seal has an internal breaking strength which is less than each of the first seal strength and the second seal strength, so that the peel seal preferably breaks within itself. The peel seal can be a peelable film.

[0006] In another embodiment, a slider device is mounted on a zipper closure having a construction including a peel seal. The slider device is constructed and arranged to interlock the first closure profile with the second closure profile when the slider device is moved in a first direction, and to disengage the first closure profile from the second closure profile when the slider device is moved in a second opposite direction. After the closure profiles have been disengaged, the peel seal can be breached to gain access to the package interior.

[0007] In yet another embodiment, the present disclosure is directed to a zipper closure and a method of making a zipper closure. The zipper closure has first and second releasably interlocking closure profiles, each of which has a sealing flange extending from the closure profile. Each sealing flange has a first side and an opposite second side. A sealant layer is present on the first side of the sealing flanges and a peelable layer is positioned on the second side of the sealing flanges. When the closure profiles are interlocked, the second sides, having the peelable layer, are facing each other.

[0008] The zipper closure can be made by extruding a first closure profile and a second closure profile, each closure profile having a sealing flange and an interlocking profile, the second interlocking profile interlocking with the first interlocking profile. The closure profiles can be extruded simultaneously, either as a single structure or two individual structures, or can be extruded separately. A sealant layer is provided on each sealing flange and a peel seal is provided on at least one of the interlocking profiles on the sealing flange. In certain embodiments, the sealant layers are co-extruded with the profiles. Further, the peel seal can be simultaneously extruded with the profiles.

Brief Description of the Drawings

[0009]

FIG. 1 is a perspective view of a flexible, reclosable package having a zipper closure and a slider device;

FIG. 2 is an enlarged side view of the zipper closure, without the slider device mounted thereon;

FIG. 3 is a cross-sectional view of a first embodiment of a flexible, reclosable package having a peel seal, as if along line 3-3 of FIG. 1;

FIG. 4 is a cross-sectional view of a second embodiment of a flexible, reclosable package having a peel seal, similar to the view of FIG. 3;

FIG. 5 is a cross-sectional view of a third embodiment of a flexible, reclosable package having a peel seal, similar to the views of FIGS. 3 and 4;

FIG. 6 is a cross-sectional view of one embodiment of first and second mating profiles of a zipper closure;

FIG. 7 is a cross-sectional view of a second embodiment of first and second mating profiles of a zipper closure; and

FIG. 8 is a cross-sectional view of a fourth embodiment of a flexible, reclosable package having a peel seal, similar to the view of FIGS. 3, 4 and 5.

Detailed Description

[0010] Flexible packages having zipper closures are common in today's packaging market. Typically, the zipper closure has first and second interlocking closure profiles. The zipper closure provides easy opening and closing of the package mouth to gain access to the contents within the package interior. The zipper closure also allows resealing the package to keep the contents fresh. The addition of a tamper-evident structure, such as a peel seal, to a flexible package improves the security of the contents within the package, because the tamper-evident structure provides an indication whether the seal has been breached and access has been gained to the interior.

[0011] The addition of a slider device to a flexible package such as a bag is advantageous to aging or arthritic persons not having the physical ability to use just a zipper closure to reseal a bag. Additionally, the addition of a slider device to a flexible package facilitates the use of the bag by users of all ages and abilities.

[0012] A flexible, reclosable package 10 is shown in FIG. 1. Package 10 has a package wall comprising first and second polymeric film side panels 12 and 14 defining an interior 11. Package 10 includes three edges, side edges 32, 34 and bottom edge 36, where side panels 12, 14 are connected to each other to form interior 11 of package 10. First side edge 32 and second side edge 34 are seals created by the application of heat and pressure for a set time period to side panels 12, 14. In an

alternate embodiment, at least one of first side edge 32 and second side edge 34 is a fold line, where a single sheet of film is folded to form the two side panels 12, 14. In FIG. 1, bottom edge 36 is a fold line between side panels 12, 14, which is formed when a single sheet of film is folded to form the two side panels; in another embodiment, bottom edge 36 is a seal created by the application of heat and pressure to side panels 12, 14 for a desired time period. In yet a further embodiment, a tube of material can be used as side panels 12, 14, so that each of first side edge 32 and second side edge 34 are fold lines.

[0013] Bottom edge 36 can include a gusset (not shown). A gusset can be included to provide the package with a stand-up feature or to increase the volume of interior 11. The gusset may be a sealed gusset, where the two sides are sealed together along the length of the gusset or only a portion of the length, or the gusset panels may be non-sealed.

[0014] A zipper closure arrangement 20 having mating closure profiles to open and close (unseal and re-seal) the first and second side panels 12, 14 of package 10 extends between side edge 32 and side edge 34 along top edge 38 of package 10. Zipper closure 20 opens and closes mouth 21 which provides access to interior 11. A slider device 30 is positioned on zipper closure 20 to facilitate opening and closing of zipper closure 20 at mouth 21.

[0015] Referring again to zipper closure 20, zipper closure 20 can include a variety of configurations and structures. In FIG. 2, zipper closure 20 is shown in detail without slider device 30. Zipper closure 20 has a first closure profile 22 and a second closure profile 24. In particular, first closure profile 22 has first interlocking profile 26 and second closure profile 24 has second interlocking profile 28. First and second interlocking profiles 26, 28 interlock to provide a seal across mouth 21 (FIG. 1). First and second closure profiles 22, 24 include first and second sealing flanges 27, 29 respectively, which extend from interlocking profiles 26, 28 and that are provided to secure closure profiles 22, 24 to side panels 12, 14.

[0016] Zipper closure 20 can be configured in any known manner, for example, such as disclosed in U.S. Patent Nos. 4,340,341; 4,346,288; and 4,437,293; each of which is incorporated by reference herein. First closure profile 22 and second closure profile 24 engage and disengage, as appropriate, to open and close package 10.

[0017] A slider device 30 is mounted on zipper closure 20 to facilitate opening and closing of zipper closure 20. Slider devices and how they function to open and close zipper closures, in general, are taught, for example, in U.S. Patent Nos. 5,063,644; 5,301,394; 5,442,837, and 5,664,329, each of which is incorporated by reference herein. A preferred slider device is taught in U.S. patent applications 09/365,215 and 29/108,657, both filed July 30, 1999, and in provisional patent application

60/222,132, filed July 31, 2000, all which are incorporated herein by reference in their entirety. Although shown schematically in FIGS. 1, 3-5 and 8, slider device 30 is preferably constructed and arranged in accordance with the disclosures of patent applications 09/365,215 and 29/108,657.

[0018] Still referring to FIG. 1, a notch 25 can be disposed within zipper closure 20. Notch 25 is designed to provide a "park place" into which slider device 30 settles when zipper closure 20 is sealed. Such a notch 25 may decrease any tendency for an incomplete interlock between first closure profile 22 and second closure profile 24. Examples of notches are disclosed, for example, in U.S. Patent Nos. 5,067,208 and 5,301,395, each of which is incorporated by reference herein.

[0019] Referring now to FIG. 3, a peel seal 40 is present within package 60; in particular, peel seal 40 in FIG. 3 is positioned on and secured to an interior surface 13 of sealing flanges 27, 29 of zipper closure 20 below first and second interlocking profiles 26, 28. In some embodiments, the entire interior surface 13 of sealing flanges 27, 29 is not covered by peel seal 40; rather, peel seal 40 covers only a portion of surface 13. Although interior surface 13 is shown as the surface of the sealing flanges 27, 29 in FIG. 3, in some embodiments interior surface 13 may include the interior surface of side panels 12, 14 that surrounds interior 11. Peel seal 40 is a tamper-evident structure; by "tamper-evident", it is meant that it provides an indication to the consumer as to whether the package 60 has been previously opened and access gained to the interior 11. Peel seal 40 extends from first side edge 32 (FIG. 1) to second side edge 34 (FIG. 1), providing a barrier between zipper closure 20 and interior 11 of the package. Peel seal 40 is typically a hermetic seal.

[0020] A permanent bond or seal exists between peel seal 40 and sealing flanges 27, 29 at outer surfaces 40a, 40b; the strength of this bond or seal is typically measured by the force needed to break the bond. This seal between peel seal 40 and sealing flanges 27, 29 can be a hermetic seal. In order to access interior 11 of package 60, peel seal 40 needs to be penetrated. Peel seal 40 has an internal strength that is less than the strength of the seals between peel seal 40 and sealing flanges 27, 29 at outer surfaces 40a, 40b. By "internal strength", it is meant that a certain force is needed to rupture, cleave, split, delaminate, or otherwise separate peel seal 40 within its structure between outer surfaces 40a, 40b. Typically, this internal strength is about 1.5 to 2 pounds per inch of peel seal (about 0.27 to about 0.36 kg per cm), although higher strengths are preferred for large packages, and small packages could have a lower internal peel seal strength. Since there is a tendency to break at the weakest point, peel seal 40 will cleave internally, within itself, rather than at the areas where peel seal 40 is secured to interior surface 13, specifically, to sealing flanges 27, 29 in FIG. 3. Thus, upon penetration of peel seal 40, peel seal 40 will split internally, leaving

a portion of peel seal 40 connected to each sealing flange 27, 29 at surfaces 40a, 40b.

[0021] Peel seal 40 is usually about 3 to 5 mm thick incorporated into package 10. Prior to incorporation into the package between sealing flanges 27, 29 or in any other position, peel seal 40 is about 6 mm thick.

[0022] Package 60 also includes sealant layers 52, 54, which provide a permanent seal or bond between side panels 12, 14 and sealing flanges 27, 29, respectively. Sealant layers 52, 54 can be provided on sealing flanges 27, 29 after first and second mating profiles 22, 24 have been manufactured; or, sealant layers 52, 54 can be co-extruded with mating profiles 22, 24. Sealant layers 52, 54 cover at least about 25%, typically at least about 50%, of the sealing flange 27, 29 area and generally are not present on closure profiles 22, 24 at or opposite interlocking profiles 26, 28; rather, sealant layers 52, 54 are generally limited to sealing flanges 27, 29. In some embodiments, sealant layers 52, 54 may be non-continuous or non-contiguous; that is, either or both of sealant layers 52, 54 can include stripes, dots, or other patterns of sealant material having areas without sealant material therebetween.

[0023] Sealant layers 52, 54 are typically activated, to bond sealing flanges 27, 29 to side panels 12, 14, by the application of heat and pressure over time. In order to form the bond between sealing flanges 27, 29 and side panels 12, 14, sealant layers 52, 54 preferably have a melting point that is less than the melting point of both sealing flanges 27, 29 and side panels 12, 14. In one embodiment, the material used for sealant layers 52, 54 has a melting point of no greater than about 130°C, generally about 126°C; in another embodiment, the material used for sealant layers 52, 54 has a melting point of no greater than about 110°C. Examples of materials that can be used as sealant layers include EVA (ethylene-vinyl acetate copolymer), EMMA (ethylene methyl acetic acid), linear low density materials, and ionomers. Additional examples of usable materials are taught in U.S. Patent No. 5,709,915 (Tomic et al.), incorporated herein by reference.

[0024] In particular, peel seal 40 of FIG. 3 is generally a peelable film 41. A "peelable film" generally consists of multiple layers, typically 2 to 5 layers, which, when a force of a predetermined magnitude is applied, delaminates or otherwise splits between at least two of the multiple layers. Generally there are at least 3 layers. This delamination between any two layers is internal to the overall peelable film 41. However, if one of the layers tears within itself, this is also considered an internal split. The various layers of peelable films may be made from different or the same polymeric materials. For example, a peelable film with two layers can have both layers made from the same material; or, the two layers can be made from different materials.

[0025] In one embodiment, the multiple layers of peelable film 41 are provided simultaneous during extrusion of the peelable film; that is, the layers of peelable

film 41 are co-extruded. In another embodiment, individual layers are laminated together to provide peelable film 41. The various layers may have the same or different colors. The internal bonding strength between and/or within the multiple layers, whether co-extruded or laminated, is generally less than the bonding strength between the outer surfaces 41a, 41b of peelable film 41 and other polymeric surfaces such as sealing flanges 27, 29 or side panels 12, 14. In package 60, outer surfaces 41a, 41b of peelable film 41 provide a strong seal to sealing flanges 27, 29. When peelable film 41 of package 60 is breached, peelable film 41 delaminates or tears internally, either between two layers or within a single layer, while leaving the seal between outer surfaces 41a, 41b and sealing flanges 27, 29 intact. In some embodiments, a color change may occur when the peelable film 41 delaminates or tears, visually indicating the breach.

[0026] In FIG. 4, package 60' is similar to package 60 of FIG. 3, except that package 60' has peel seal 40 with first and second portions, 42, 44. First portion 42 is sealed to first sealing flange 27, and second portion 44 is sealed to second sealing flange 29; first portion 42 and second portion 44 are also sealed to each other. Typically, first and second portions 42, 44 are the same material; however, in some embodiments, first and second portions 42, 44 are different. When peel seal 40, having first and second portions 42, 44, is breached, first portion 42 and second portion 44 delaminate from each other, leaving the seals to sealing flanges 27, 29 intact. The seal strength between first portion 42 and sealing flange 27, and the seal strength between second portion 44 and sealing flange 27, are greater than the seal strength between first portion 42 and second portion 44.

[0027] Any number of additional peel seals can be included in package 60 or package 60'. For example, a second peel seal can be positioned within closure profiles 22, 24 among first and second interlocking profiles 26, 28, for example, such as taught by U.S. Patent No. 5,605,594 (May). As another example, a peel seal can additionally or alternately be positioned external to first and second interlocking profiles 26, 28 but below the slider device 30, so that the peel seal provides evidence whether access has been gained to the interlocking profiles 26, 28 of closure profiles 22, 24. Generally, any peel seals positioned within or exterior to the zipper closure 20 are tamper-evident structures rather than hermetic seals. In some embodiments, a peel seal can be positioned so that it is broken by the movement of slider device 30.

[0028] Referring now to FIG. 5, package 70 of FIG. 5 is similar to package 60' of FIG. 4, except that package 70 has a partial sealant layer 56 bonding sealing flange 29 to side panel 14; sealant layer 56 can be said to be offset from sealing flange 29. Partial sealant layer 56, in addition to bonding sealing flange 29 to side panel 14, provides a hinge-type structure. The seal at partial sealant layer 56 may be made simultaneously with, or sep-

arate from, the seal at sealant layer 52. The hinge is arranged and configured to increase the holding force of the resealable closure mechanism. Further, the hinge removes a portion of the stress on peel seal 40 when package 70 has items within interior 11. An example of a hinged arrangement is disclosed, for example, in U.S. patent application 09/107,859, filed June 30, 1998, and incorporated herein by reference. A hinge-type structure can be positioned at each of side panels 12, 14. Generally, hinge-type structures are used when packages 70 are filled by their bottoms, that is, the edge of the package 70 opposite zipper closure 20; a hinge-type structure minimizes the stress on peel seal 40 when the items are dropped onto the peel seal 40.

[0029] Although it is sealant layer 56 that is shown offset, it is understood that any layer, such as sealant layer 52 or even peel seal 40 can be offset to not cover all of sealing flange 27, 29.

[0030] FIGS. 6 and 7 show embodiments of zipper closures 20' and 20" prior to being incorporated into a package. Referring to FIG. 6, zipper closure 20' has first mating profile 22 and second mating profile 24 connected together at sealing flanges 27, 29. Zipper closure 20' can be extruded as a single piece, as shown in FIG. 6, and then slit to two separate pieces prior to incorporation into a package. In FIG. 6, sealing flanges 27, 29 have disposed thereon a peel seal layer 40' and a sealant layer 50, each of which extends the length of sealing flanges 27, 29. Peel seal layer 40' and sealant layer 50 can be provided on sealing flanges 27, 29 during extrusion of mating profiles 22, 24; that is, the layers 40', 50 can be co-extruded with the mating profiles 22, 24. Alternately, either peel seal layer 40' or sealing layer 50, or both, can be coated onto formed sealing flanges 27, 29. It is understood that any number of zipper closures 20' can be simultaneously extruded; the die would be adapted to have multiple orifices.

[0031] In FIG. 7, sealing flanges 27, 29 are not contiguous; rather, sealing flanges 27, 29 are connected by a self-supporting peel seal layer 40". Peel seal layer 40" can be attached to sealing flanges 27, 29 after mating profiles 22, 24 are extruded, or, peel seal layer 40" can be co-extruded with mating profiles 22, 24. Peel seal layer 40", one that extends between and connects sealing flanges 27, 29, will generally be a peelable film that will adhere to itself.

[0032] The zipper closures 20, 20', 20" of the present disclosure are designed to be interchangeable among various types and sizes of packages. For example, the same zipper closure 20, 20', 20" can be used for packages that are hermetically sealed, packages that have a tamper-evident structure, and for packages that do not include a tamper-evident structure. In some embodiments, a tamper-evident pocket may be provided over slider device 30 to provide evidence whether slider device 30 has been moved. For packages where no peel seal is desired, the same zipper closure 20, 20', 20" can be used, simply without the peel seal being activated in

the final package. Zipper closures 20, 20', 20" can be incorporated into packages which have the zipper closure positioned in a side panel of the package rather than at an edge; in these packages, zipper closure 20, 20', 20" may extend the entire length or width of the package or only partially.

[0033] Prior to being incorporated into a package, such as package 10, 60, 60', 70, zipper closure 20, 20', 20" is preferably provided on a core, spool or otherwise retained and stored. Mating profiles 22, 24 can be interlocked for storage, can be not interlocked, or can be provided on separate cores or spools. In yet a further embodiment, zipper closure 20, 20', 20" can be extruded immediately prior to incorporation into a package, eliminating the need to store or otherwise handle the zipper closure.

[0034] Yet another embodiment of a flexible, reclosable package is shown in FIG. 8. Package 80 of FIG. 8 has first and second side panels 12, 14 that define an interior 11. A zipper closure 20, having first and second mating profiles 22, 24, is sealed to side panels 12, 14 by sealant layers 52, 54; sealant layers 52, 54 are disposed between sealing flanges 27, 29 of mating profiles 22, 24 and side panels 12, 14. A slider device 30 is mounted on zipper closure 20.

[0035] Package 80 has a peel seal 40 disposed between zipper closure 20 and package interior 11; peel seal 40, in particular, is shown as peel seal 45. Peel seal 45 is sealed to interior surface 13, specifically, to first and second side panels 12, 14. Peel seal 45 of package 80 is similar to peel seal 40 of FIG. 3 except that in FIG. 3, peel seal 40 is sealed to sealing flanges 27, 29. Peel seal 45 is sealed to side panels 12, 14 at outer surfaces 45a, 45b. This bond at outer surfaces 45a, 45b is greater than the internal strength of peel seal 45; thus, failure of peel seal 45 occurs within peel seal 45.

[0036] The above specification is believed to provide a complete description of the manufacture and use of particular embodiments of the invention. Many embodiments of the invention can be made without departing from the spirit and scope of the invention.

Claims

1. A zipper closure (20) comprising:

- (a) first and second releasably interlocking closure profiles (22, 24); and
- (b) a first sealing flange (27) extending from the first closure profile (22), and a second sealing flange (29) extending from the second closure profile (24);

- (i) the first sealing flange (27) and the second sealing flange (29) each having a first side and an opposite second side;

characterized by:

- (a) a first sealant layer (52) positioned on the first side of the first sealing flange (27) and a second sealant layer (54) positioned on the first side of the second sealing flange (29); and
- (b) a peelable layer (40, 42) positioned on the second side of the first sealing flange (27).

2. The zipper closure (20) according to claim 1, further comprising:

- (a) a second peelable (44) layer positioned on the second side of the second sealing flange (29).

3. The zipper closure (20) according to any of claims 1-2, wherein the first sealing flange (27) is connected to the second sealing flange (29).

4. The zipper closure (20) according to any of claims 1-3, wherein the peelable layer (40, 42) is a multi-layered film (41).

5. The zipper closure (20) according to claim 4, wherein the multi-layered film (41) has at least 3 layers.

6. The zipper closure (20) according to any of claims 1-5, further comprising:

- (a) a slider device (30) operably mounted on the zipper closure (20); the slider device (30) constructed and arranged to interlock the first closure profile (22) with the second closure profile (24) when the slider device (30) is moved in a first direction, and to disengage the first closure profile (22) from the second closure profile (24) when the slider device (30) is moved in a second opposite direction.

7. The zipper closure (20) according to any of claims 1-6, further comprising a notch (25) in the first and second closure profiles (22, 24).

8. The zipper closure (20) according to any of claims 1-7, further including:

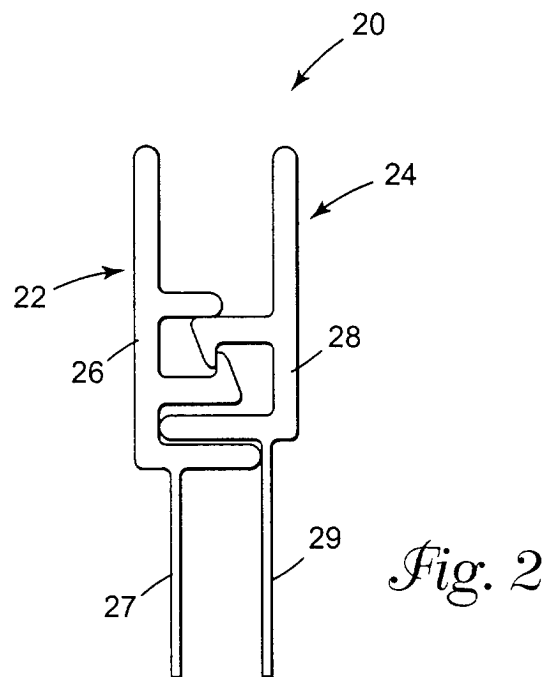
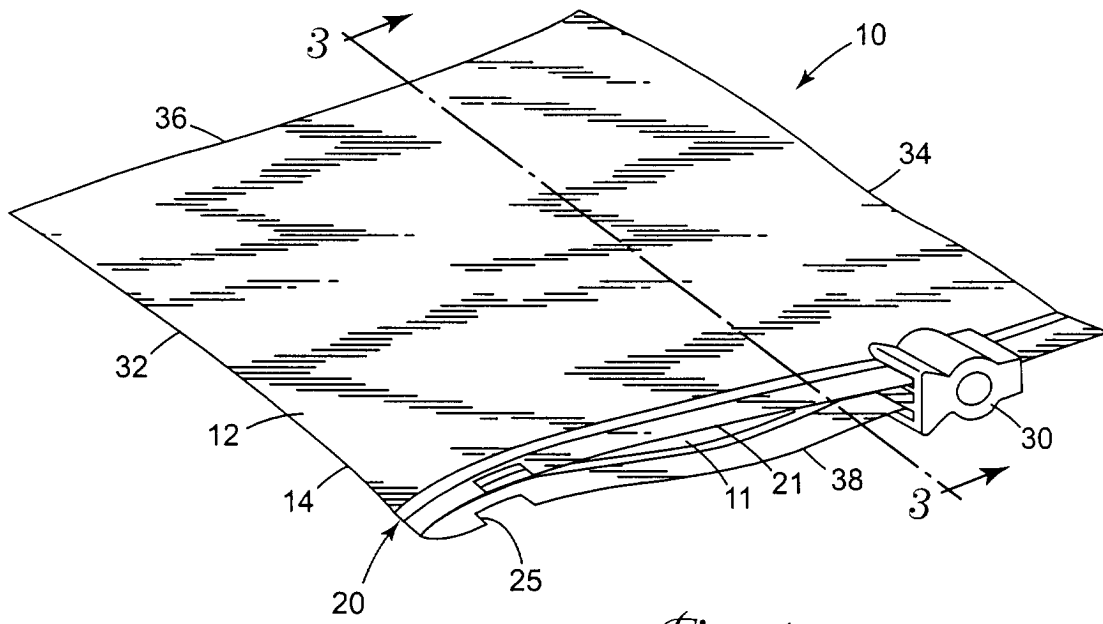
- (a) a core; the zipper closure (20) being stored on the core.

9. A flexible, reclosable package (10) comprising:

- (a) first and second panel sections (12, 14), the first and second panel sections (12, 14) defining a package interior (11);
- (b) the zipper closure (20) according to any of claims 1-5 at a mouth (21) of the package (10), wherein, the peelable layer (40) has first and second opposite outer surfaces (40a, 40b);

- (i) the first outer surface (40a) of the peelable layer (40) being secured to the second surface (13) of the first sealing flange (27) with a first seal strength;
- (ii) the second outer surface (40b) of the

- peelable layer (40) being secured to the second surface (13) of the second sealing flange (29) with a second seal strength; and
- (iii) the peelable layer (40) having an internal breaking strength that is less than each of the first seal strength and the second seal strength.
10. The flexible, reclosable package according to claim 9, wherein the first sealant layer (52) provides a hinge between the first closure profile (22) and the first panel section (12).
11. The flexible, reclosable package according to any of claims 9-10, further comprising:
- (a) a slider device (30) operably mounted on the zipper closure (20); the slider device (30) constructed and arranged to interlock the first closure profile (22) with the second closure profile (24) when the slider device (30) is moved in a first direction, and to disengage the first closure profile (22) from the second closure profile (24) when the slider device (30) is moved in a second opposite direction.
12. The flexible, reclosable package according to claim 11, further comprising a notch (25) in the zipper closure (20).
13. A method of making the zipper closure (20) of any of claims 1-5, the method comprising:
- (a) extruding the first closure profile (22), the first closure profile (22) comprising:
- (i) the first sealing flange (27); and
- (ii) the first interlocking profile (26);
- (b) extruding the second closure profile (24), the second closure profile (24) comprising:
- (i) the second sealing flange (29);
- (ii) the second interlocking profile (28);
- (iii) the second interlocking profile (28) constructed and arranged to interlock with the first interlocking profile (26);
- (c) providing the first sealant layer (52) on the first sealing flange (27);
- (d) providing the second sealant layer (54) on the second sealing flange (29); and
- (e) providing the peelable layer (40) on the first sealing flange (27) opposite the first sealant layer (52).
14. The method according to claim 13, wherein the step of extruding a first closure profile (22) is done simultaneously with the step of extruding a second closure profile (24).
15. The method according to claim 13, wherein the step of extruding the first closure profile (22) is done simultaneously with the step of providing a first sealant layer (52) on the first sealing flange (27).
16. The method according to claim 15, further comprising:
- (a) co-extruding the first sealant layer (52) with the first interlocking profile (26).
17. The method according to claim 16, further comprising:
- (a) simultaneously providing the peelable layer (40) on the first interlocking profile (26).
18. The method according to claim 16, wherein the step of co-extruding the first sealant layer (52) with the first interlocking profile (26) comprises:
- (a) extruding the first interlocking profile (26) from a material having a first melting point; and
- (b) extruding the sealant layer (52) from a material having a second melting point, the second melting point being lower than the first melting point.



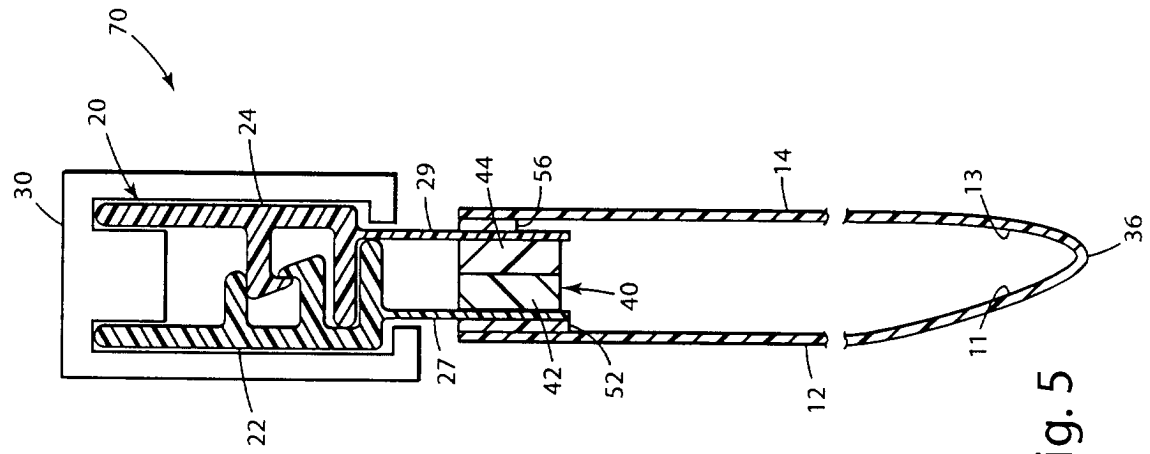


Fig. 5

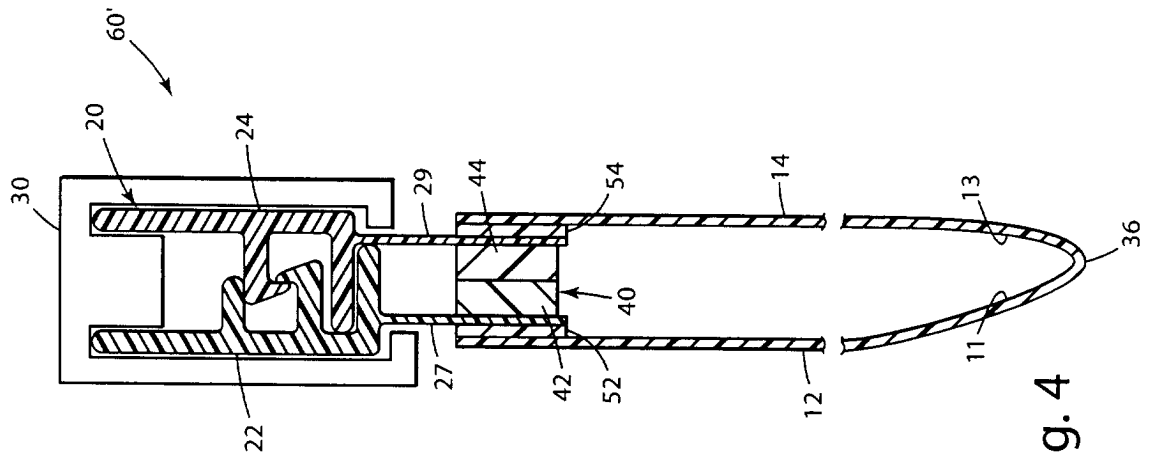


Fig. 4

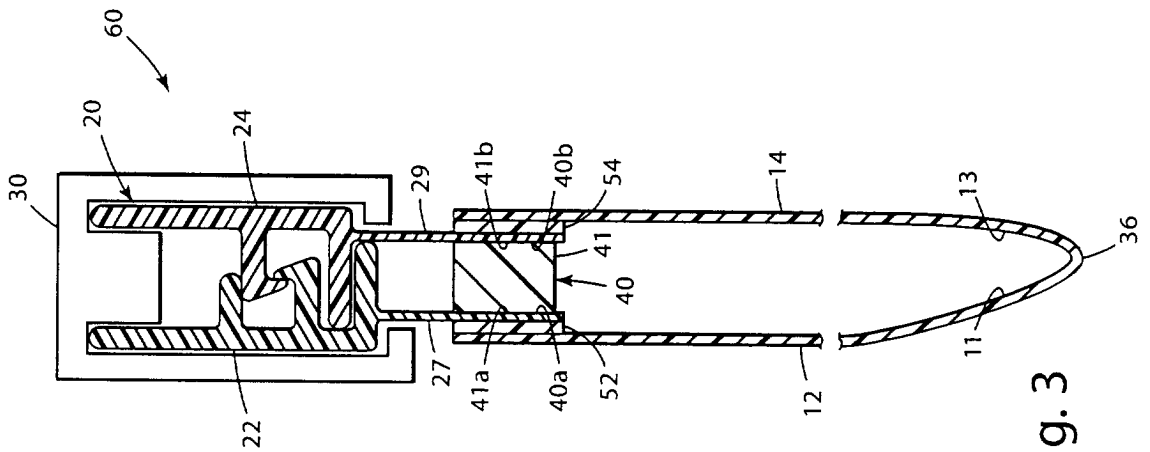


Fig. 3

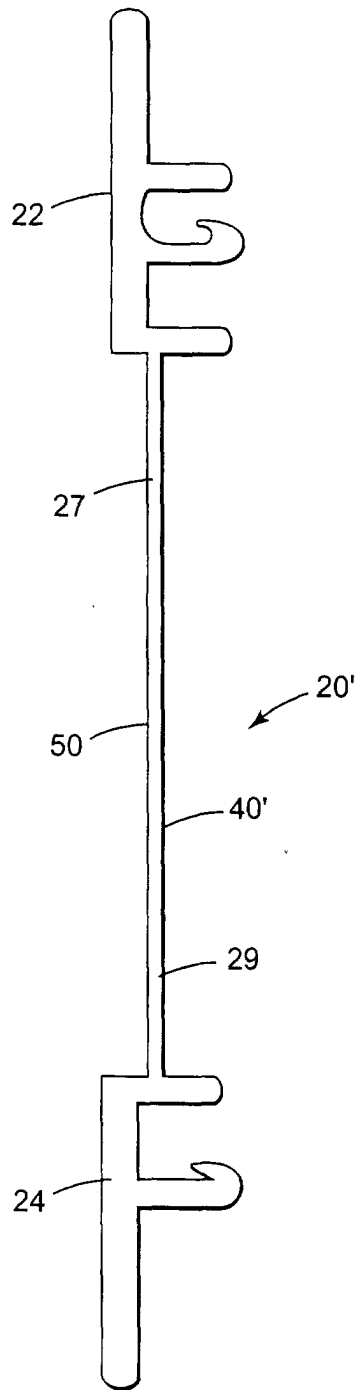


Fig. 6

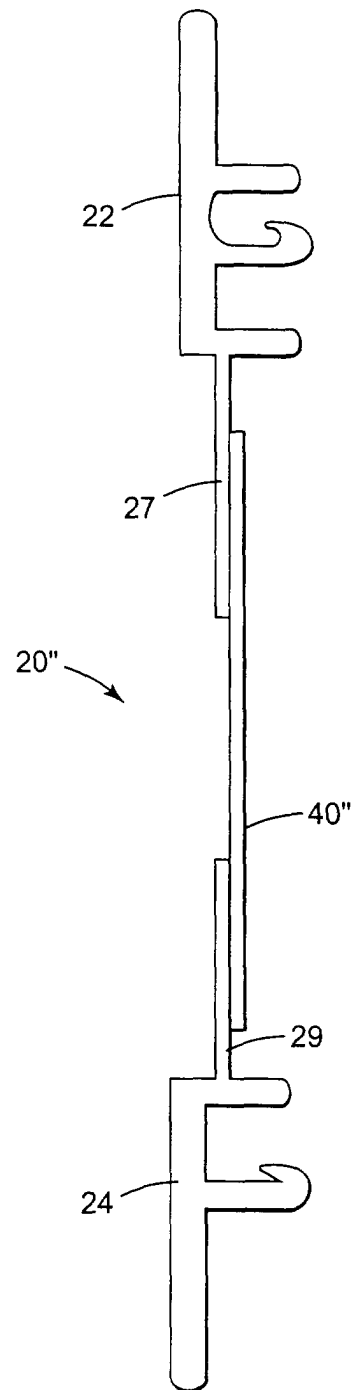


Fig. 7

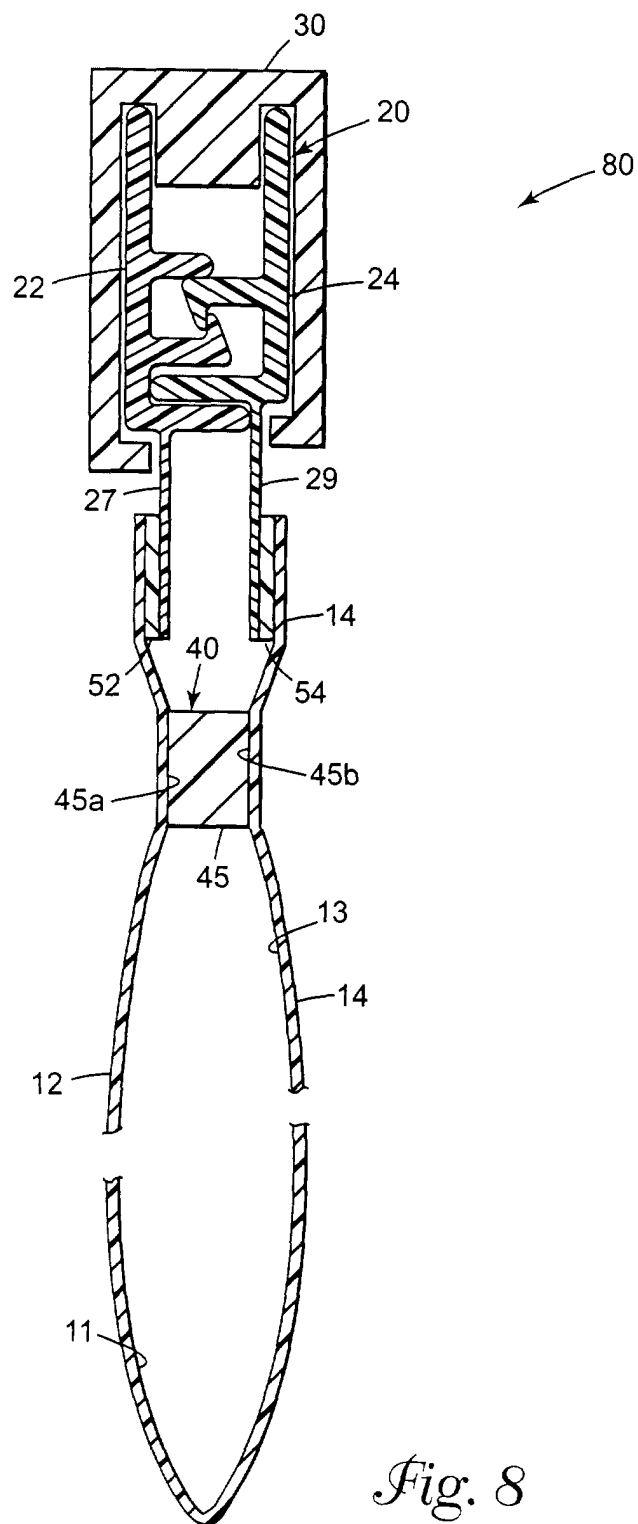


Fig. 8