ZIPPER FOR TRANSVERSE DIRECTION FRONT PANEL POUCH

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ABSTRACT
The disclosure relates to a zipper design, with or without a leading flange, to improve front panel zipper fabrication and end use applications. The profiles of the zipper include a plurality of interlocking elements, which may include C-shaped, J-shaped or repeating male interlocking elements. In the unflanged version, a portion of the interlocking elements of one of the profiles is sealed directly to the interior of a bag on a first side of the front panel bag opening, while the base of the other profile is sealed on a second side of the front panel bag opening, aligned so that interlocking elements of one profile can interlock with interlocking elements of the other profile.
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BACKGROUND OF THE INVENTION

[0001] 1. Field of the Invention

[0002] This invention pertains to a zipper design, with or without a leading flange, to improve front panel zipper fabrication and end use applications.

[0003] 2. Description of the Prior Art

[0004] In the prior art of re closable bags, front panel pouches are well-known. Examples include U.S. Pat. No. 5,951,453 entitled “Re closable Bag Assembly and Method of Making Same”, issued on Sep. 14, 1999 to Yeager and U.S. Pat. No. 6,270,257 entitled “Re closable Bag with Profile Strip Fastener Assembly Having Improved Opening Feature”, issued on Aug. 7, 2001 to Yeager.


[0006] While these references disclose devices which have been satisfactory in certain respects, it is desired to obtain further improvements in front panel zipper fabrication and end use applications.

OBJECTS AND SUMMARY OF THE INVENTION

[0007] It is therefore an object of the present invention to provide a zipper for a re closable bag which provides improvements in front panel zipper fabrication.

[0008] It is therefore a further object of the present invention to provide a zipper for a re closable bag which provides improvements in end use applications.

[0009] These and other objects are attained by providing a zipper which can have a flanged or unflanged (otherwise known as webless or motoneter) embodiment. The interlocking profiles of the zipper include a series of interlocking elements, such as C-shaped elements terminating at both ends in an inwardly pointing hook configuration, J-shaped elements or multiple male elements. This allows the profiles to engage each other easily and form a strong interlocking configuration.

[0010] For use in a front panel opening bag, typically a portion of the interlocking elements of a first profile are sealed to the interior of the web of the bag on a first side of the opening so that the remaining interlocking elements face outwardly while the base of a second profile is attached to the interior of the web of the bag via a sealant layer on a second side of the opening so that the interlocking elements face inwardly toward similar elements of the first profile. In the flanged configuration, it is the flange of the first profile which is bonded to the web of the bag. In the unflanged configuration, as a portion of the interlocking elements of the first profile is bonded to the film, material with a very high melting index is required for the profiles.

[0011] In one configuration, a peel seal is added between the profiles.

BRIEF DESCRIPTION OF THE DRAWINGS

[0012] Further objects and advantages of the invention will become apparent from the following description and from the accompanying drawings, wherein:

[0013] FIG. 1 is a front view of the re closable bag with an unflanged embodiment of the zipper, of the present invention.

[0014] FIG. 2 is a cross-sectional view of plane 2-2 of FIG. 1.

[0015] FIGS. 2a and 2b are alternative cross-sectional views of plane 2-2 of FIG. 1.

[0016] FIG. 3 is a cross-sectional view of the profiles, immediately prior to interlocking, of the unflanged embodiment of the zipper, including C-shaped interlocking elements.

[0017] FIG. 4 is a cross-sectional view of the profiles, after interlocking, of the unflanged embodiment of the zipper, including C-shaped interlocking elements.

[0018] FIG. 5 is a cross-sectional view of the profiles, after interlocking, of the unflanged embodiment of the zipper, including C-shaped interlocking elements.

[0019] FIG. 6 is a cross-sectional view of the profiles, after interlocking, of a further embodiment with a single flange on each profile, including C-shaped interlocking elements.

[0020] FIG. 7 is a cross-sectional view of the profiles, after interlocking, of a still further embodiment wherein one profile includes one flange and the other profile includes two flanges, including C-shaped interlocking elements.

[0021] FIG. 8 is a cross-sectional view of the profiles, after interlocking, of yet a further embodiment with a single flange on each profile and a peel seal between the profiles, including C-shaped interlocking elements.

[0022] FIG. 9 shows the zipper placed on the web in the transverse direction during manufacture.

[0023] FIGS. 3a-8a correspond to FIGS. 3-8, respectively, with multiple male interlocking elements in place of C-shaped interlocking elements.

[0024] FIGS. 3b-8b correspond to FIGS. 3-8, respectively, with J-shaped interlocking elements in place of C-shaped interlocking elements.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

[0025] Referring now to the drawings in detail wherein like numerals refer to like elements throughout the several views, one sees that FIG. 1 is a front view of a re closable bag 10 and that FIG. 2 is a cross-sectional view of the bag 10. Re closable bag 10 is formed from front panel 12 and rear panel 14 of film or web which are sealed together by a top seal 16, a bottom seal 18 and side seals 20, 22. A front opening, such as a perforated line 30 is formed on an upper...
portion of front panel 12 of film or web. The user would, of course, tear the perforated line 30 to gain initial access to the contents of reclosable bag 10. Perforated line 30 could be replaced by two closely spaced perforated parallel lines (not shown) in a oval-like configuration so that the opening is formed by the user removing a tear-strip of film formed between the two closely spaced perforated parallel lines. Additionally, the front opening may include a thumb tab (not shown) to facilitate opening by the user. Zipper 32 is formed from upper and lower interlocking profiles 34, 36 (see FIG. 2) and provides the reclosability feature of the front opening formed by perforated line 30. As shown in FIG. 2, a portion of upper interlocking profile 34 is sealed to the interior of front panel 12 of film or web which is immediately above the front opening formed by perforated line 30. A portion of the locking arms (described hereinafter) of interlocking profile 34 is sealed to the film. This requires that the profiles be made of very high melting index material to facilitate bonding of the upper profile 34 to the film. Typically, upper and lower interlocking profiles 34, 36 are extruded with standard low density polyethylene resins. The remaining portion of upper interlocking profile 34 extends beyond the edge of film abutting the opening formed by perforated line 30. This configuration results in the locking arms of upper interlocking profile 34 pointing outward toward the exterior of reclosable bag 10.

[0026] The lower interlocking profile 36 includes a base (described hereinafter) which is sealed to the interior of front panel 12 of film or web via a sealant panel on lower interlocking profile 36. Typically, the entire base is sealed to the interior of front panel 12 of film or web. This configuration results in the locking arms of lower interlocking profile 36 pointing inward toward the interior of reclosable bag 10. As shown in FIG. 4, this configuration likewise results in the locking arms 44, 46 of upper interlocking profile 34 being in position to engage the locking arms 56, 58 of lower interlocking profile 36.

[0027] Alternatively, as shown in FIGS. 2a and 2b, the upper interlocking profile 34 can be sealed into top seal 16, either with a flange (FIG. 2a) or without a flange (FIG. 2b). Typically, upper interlocking profile 34 is sealed to front panel 12 first, and then rear panel 14 is subsequently sealed thereto.

[0028] As shown in FIGS. 3 and 4, upper interlocking profile 34 includes upper base 40 and upper C-shaped interlocking elements 42. Each C-shaped interlocking element 42 includes two locking arms 44, 46 forming a C-shape. Further, locking arms 44, 46 include respective distal inwardly extending detent hooks 48, 50 (numerals shown in FIG. 3 only).

[0029] Lower interlocking profile 36 includes lower base 52 and lower C-shaped interlocking elements 54. Each C-shaped interlocking element 54 includes two locking arms 56, 58 forming a C-shape. Further, locking arms 56, 58 include respective distal inwardly extending detent hooks 60, 62 (numerals shown in FIG. 3 only).

[0030] As shown in FIG. 4, in the interlocked configuration of interlocking elements 34, 36, one of inwardly extending detent hooks 48, 50 engages with one of inwardly extending detent hooks 60, 62. Furthermore, the identity of configuration of the successive C-shaped interlocking elements 42 or 54, along with the regular or even spacing thereof, on upper or lower interlocking profiles 34, 36 allows the interlocking profiles to engage with different alignments. For instance, in FIG. 4, upper interlocking profile 34 could be moved to the right by the distance separating the centers of two adjacent C-shaped interlocking elements 42 resulting in the engagement of all eight C-shaped interlocking elements 54 of lower interlocking profile 36 with the eight rightmost C-shaped interlocking elements 42 of upper interlocking profile 34.

[0031] FIG. 5 discloses an embodiment wherein upper interlocking element 34 includes flange 64. With this embodiment, flange 64 would be sealed to the interior of front panel 12 of film or web which is immediately above the front opening formed by perforated line 30 thereby exposing all of upper C-shaped interlocking elements 42 for engagement with lower C-shaped interlocking elements 54.

[0032] FIG. 6 discloses an embodiment with flange 64 on upper interlocking element and flange 70 formed by an extension of lower base 52.

[0033] FIG. 7 discloses an embodiment with flanges 64 and 70 as disclosed in FIG. 6 and further including flange 80 formed on an end of lower base 52 opposite to that of flange 70.

[0034] Typically, the width of any of flanges 64, 70, 80 would be less than the width of the body of the zipper, which is defined as the total width of the zipper which includes the C-shaped interlocking elements 42, 54.

[0035] FIG. 8 discloses an embodiment with a seal 90 between upper and lower interlocking profiles 34, 36. Seal 90 is typically configured to be immediately inwardly adjacent to the perforated line 30 of FIG. 1.

[0036] FIGS. 3a-3e correspond to FIGS. 3-8, respectively, with multiple male interlocking elements 142, formed from post 144 and enlarged detent head 146 at a distal end of post 144 (numerals shown on FIG. 3a only), in place of C-shaped interlocking elements 42.

[0037] FIGS. 3b-3f correspond to FIGS. 3-8, respectively, with J-shaped interlocking elements 242, formed from post 244 and locking hook 246 at a distal end of post 244 (numerals shown on FIG. 3b only), in place of C-shaped interlocking elements 42.

[0038] In all of these embodiments, during manufacture, typically, the zippers 32 are placed in the transverse direction on the web 100 as shown in FIG. 9.

[0039] 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 zipper for reclosable bags, comprising:
   a first interlocking profile, including a first base and first interlocking elements extending therefrom;
   a second interlocking profile, including a second base and second interlocking elements extending therefrom;
   wherein said first and second bases are free of flanges;
a portion of said interlocking elements of said first interlocking element are intended to be sealed to an interior of the reclosable bag on a first side of an opening of the reclosable bag; and

wherein said base of said second interlocking element is intended to be sealed to an interior of the reclosable bag on a second side of an opening of the reclosable bag, said second side being opposite to said first side.

2. The zipper of claim 1 wherein said first and second interlocking elements are C-shaped and comprised of two locking arms, distal ends of said locking arms including inwardly extending detent hooks.

3. The zipper of claim 1 wherein said first and second interlocking elements are male locking elements with a post and an enlarged head at the distal end of said post.

4. The zipper of claim 1 wherein said first and second interlocking elements are J-shaped and comprised of a post and a hook at a distal end of said post.

5. The zipper of claim 1 wherein said first and second interlocking profiles are made from very high melting index material to facilitate bonding to the film of the reclosable bag.

6. The zipper of claim 1 wherein said first and second interlocking profiles are made from low density polyethylene.

7. The zipper of claim 1 wherein said interlocking elements are regularly spaced along said bases to allow for variations in alignment of said first and second profiles in an interlocked configuration.

8. A reclosable bag, comprising:

front and rear walls formed from a web;

a line of weakness in said front wall which can be torn in order to provide an opening;

a zipper which can reclose said opening;

said zipper including a first interlocking profile, including a first base and first interlocking elements extending therefrom and a second interlocking profile, including a second base and second interlocking elements extending therefrom;

wherein said first and second bases are free of flanges;

wherein a portion of said interlocking elements of said first interlocking element are sealed to an interior of the reclosable bag on a first side of said line of weakness; and

wherein said base of said second interlocking element is sealed to an interior of the reclosable bag on a second side of said line of weakness, said second side being opposite to said first side.

9. The reclosable bag of claim 8 wherein said first and second interlocking elements are C-shaped and comprised of two locking arms, distal ends of said locking arms including inwardly extending detent hooks.

10. The reclosable bag of claim 8 wherein said first and second interlocking elements are male locking elements with a post and an enlarged head at the distal end of said post.

11. The reclosable bag of claim 8 wherein said first and second interlocking elements are J-shaped and comprised of a post and a hook at a distal end of said post.

12. The reclosable bag of claim 8 wherein said first and second interlocking profiles are made from very high melting index material to facilitate bonding to the film of the reclosable bag.

13. The reclosable bag of claim 8 wherein said first and second interlocking profiles are made from low density polyethylene.

14. The reclosable bag of claim 8 wherein said interlocking elements are regularly spaced along said bases to allow for variations in alignment of said first and second profiles in an interlocked configuration.

15. The reclosable bag of claim 8 wherein said first interlocking profile is sealed to said rear wall.

16. A zipper for reclosable bags, comprising:

a first interlocking profile, including a first base and first interlocking elements extending therefrom;

a second interlocking profile, including a second base and second interlocking elements extending therefrom;

said first interlocking profile including a flange;

wherein said interlocking elements are regularly spaced along said bases to allow for variations in alignment of said first and second profiles in an interlocked configuration;

wherein said flange is intended to be sealed to an interior of the reclosable bag on a first side of an opening of the reclosable bag;

wherein said base of said second interlocking element is intended to be sealed to an interior of the reclosable bag on a second side of an opening of the reclosable bag, said second side being opposite to said first side; and

wherein a width of said at least one flange is less than a width of said interlocking profiles wherein said interlocking elements are formed.

17. The zipper of claim 16 wherein said first and second interlocking elements are C-shaped and comprised of two locking arms, distal ends of said locking arms including inwardly extending detent hooks.

18. The zipper of claim 16 wherein said first and second interlocking elements are male locking elements with a post and an enlarged head at the distal end of said post.

19. The zipper of claim 16 wherein said first and second interlocking elements are J-shaped and comprised of a post and a hook at a distal end of said post.

20. The zipper of claim 16 wherein said first and second interlocking profiles are made from low density polyethylene.

21. The zipper of claim 16 wherein said second interlocking profile includes at least one flange.

22. The zipper of claim 16 further including a peel seal between said first and second interlocking profiles.

23. A reclosable bag, comprising:

front and rear walls formed from a web;

a line of weakness in said front wall which can be torn in order to provide an opening;

a zipper which can reclose said opening;

said zipper including a first interlocking profile, including a first base and first interlocking elements extending
therefrom and a second interlocking profile, including a second base and second interlocking elements extending therefrom;

said first interlocking profile including a flange;

wherein said interlocking elements are regularly spaced along said bases to allow for variations in alignment of said first and second profiles in an interlocked configuration;

wherein said flange is sealed to an interior of the reclosable bag on a first side of an opening of the reclosable bag;

wherein said base of said second interlocking element is sealed to an interior of the reclosable bag on a second side of an opening of the reclosable bag, said second side being opposite to said first side; and

wherein a width of said at least one flange is less than a width of said interlocking profiles wherein said interlocking elements are formed.

24. The reclosable bag of claim 23 wherein said first and second interlocking elements are C-shaped and comprised of two locking arms, distal ends of said locking arms including inwardly extending detent hooks.

25. The reclosable bag of claim 23 wherein said first and second interlocking elements are male locking elements with a post and an enlarged head at the distal end of said post.

26. The reclosable bag of claim 23 wherein said first and second interlocking elements are J-shaped and comprised of a post and a hook at a distal end of said post.

27. The reclosable bag of claim 23 wherein said first and second interlocking profiles are made from low density polyethylene.

28. The reclosable bag of claim 23 wherein said second interlocking profile includes at least one flange.

29. The reclosable bag of claim 23 further including a peel seal between said first and second interlocking profiles.

30. The reclosable bag of claim 23 wherein said first profile is sealed to said rear wall.

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