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(54) **MULTI-WALL BAG INCLUDING SLIDER ACTUATED RECLOSABLE ZIPPER**

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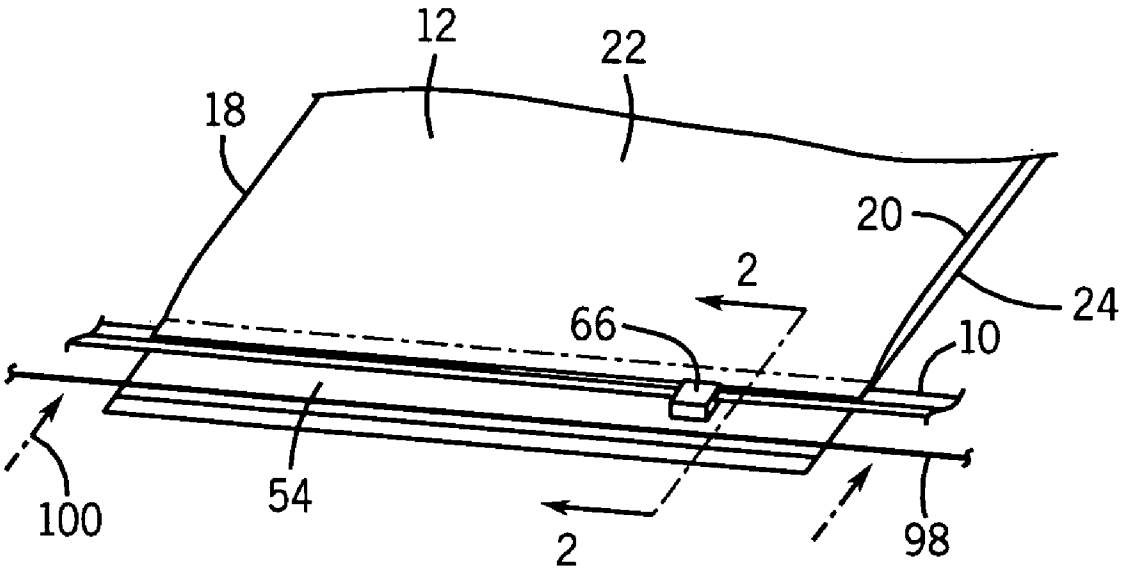
(57) **ABSTRACT**

A multi-wall bag that includes a profile closure extending across the open mouth of the package such that the bag can be reclosed after initial opening. The multi-wall bag includes a top panel, a bottom panel and a pair of side panels joining the top and bottom panels where each of the panels is a multi-wall construction having a plastic inner layer. The profile closure is attached between the top and bottom panels and preferably includes a slider device. The bottom panel of the package includes a closure flap that extends past the top panel and is folded to entrap the slider device between the outer layer of the top panel and the inner layer of the closure flap. A tear member is positioned between the profile closure and the bottom panel such that the tear member can be used to initially open the package.



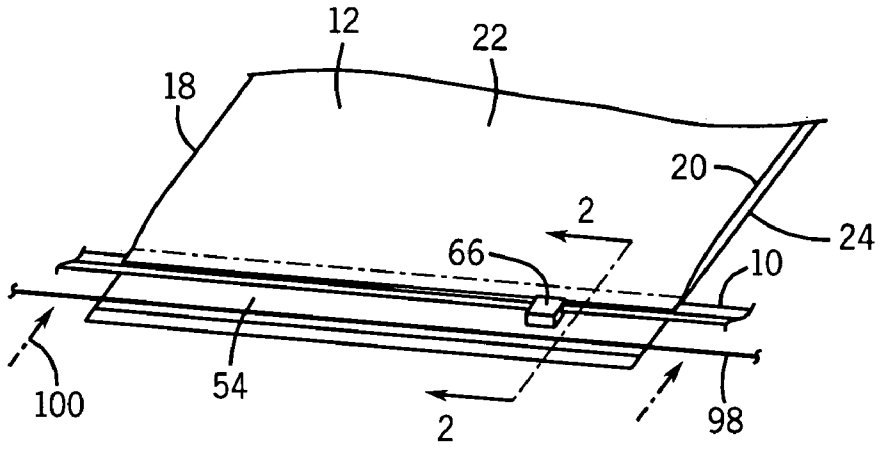
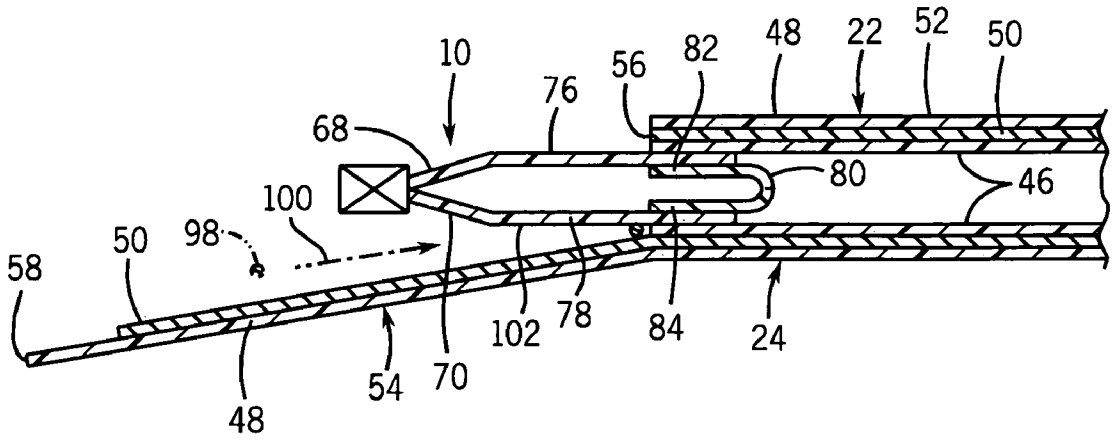

12
22
18
20
2
24
66
10
100
54
2
98

FIG. 1


10
76
56
82
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22
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48

FIG. 2

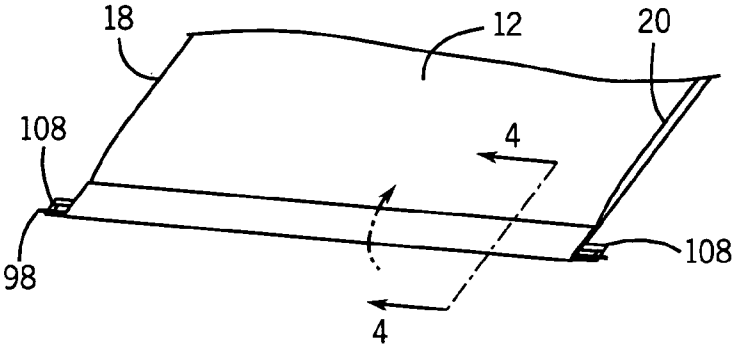

FIG. 3

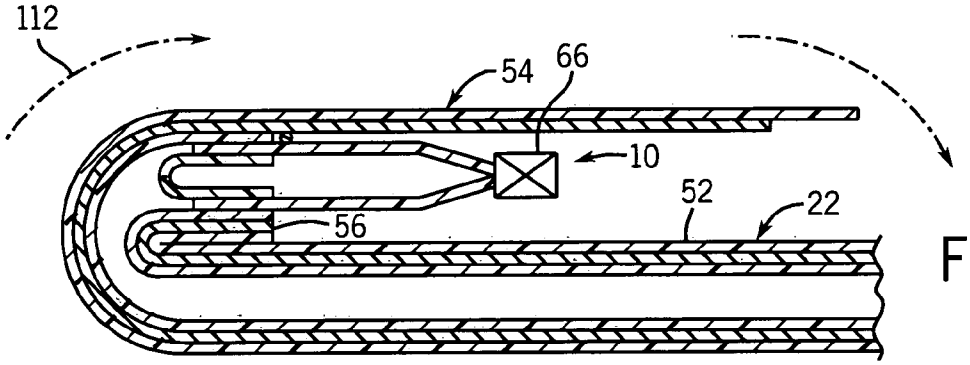

FIG. 4

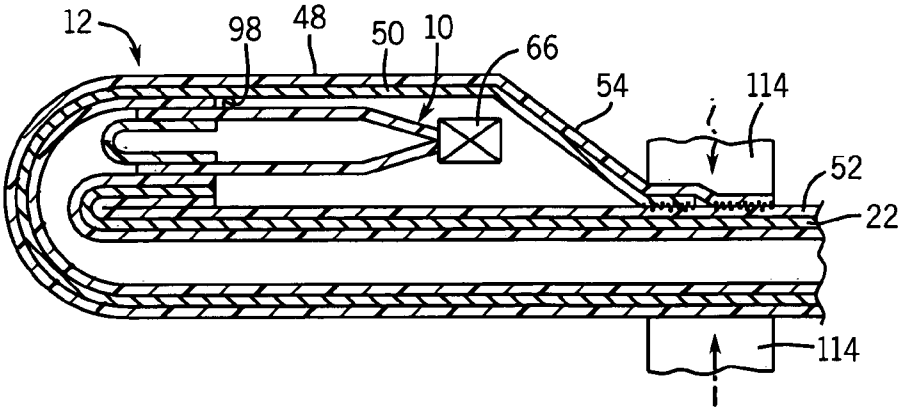

FIG. 5

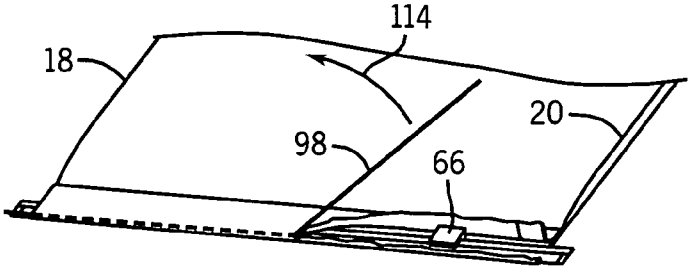

FIG. 6

MULTI-WALL BAG INCLUDING SLIDER ACTUATED RECLOSABLE ZIPPER

FIELD OF THE INVENTION

[0001] The present invention relates to a multi-wall bag or sack. More specifically, the present invention relates to a multi-wall bag that includes a reclosable profile across the open mouth of the bag such that the profile can be used to reclose the bag after initial opening.

BACKGROUND OF THE INVENTION

[0002] Presently, multi-wall bags or sacks are used in many packaging applications, often for containing a large supply of food product. One common example of a multi-wall bag application is in the storage and packaging of pet foods, and specifically dog food. A multi-wall sack is often used for storing large quantities of pet food, such as pre-packaged bags that include seventeen pounds and greater of dog food.

[0003] Most currently available multi-wall bags are formed from a laminated stock of material. Typically, the stock of material includes an inner plastic liner, one or more layers of craft paper and an outer face sheet that typically includes product information. The multi-layer stock sheet is processed into a tubular shape such that the inner plastic layer lines the internal area of the tube that will become the bag interior. During the formation of the tube, gussets are formed along each side of the bag to allow the bag to expand upon filling. After the gussets have been formed, a bottom or top seal is formed and the food product is filled into the bag through the unsealed end.

[0004] Once the bag has been filled with product, a closure flap is used to seal the contents of the bag. Typically, a tear string is inserted behind the closure flap such that the tear string can be used to initially open the bag.

[0005] Once the multi-wall bag has been opened for the first time, the open mouth of the bag cannot be resealed other than by folding the bag over on top of itself as is conventionally known.

[0006] Although it is desirable to include some type of reclosure mechanism across the open mouth of the multi-wall bat, methods and apparatus are currently not available to insert a reclosable member across the open mouth of the bag such that the bag can be resealed upon initial opening. Thus, the introduction of a reclosable mechanism across the open mouth of the bag would provide an improvement over the types of packages currently available.

SUMMARY OF THE INVENTION

[0007] The present invention relates to a multi-wall bag that includes a reclosable profile closure extending across the open mouth of the package such that the bag can be reclosed after initial opening.

[0008] The multi-wall bag includes a top panel, a bottom panel and a pair of side panels that joins the top and bottom panels. Preferably, the multi-wall bag is formed using conventional bag forming techniques. Preferably, the top panel, bottom panel and side panels are each formed from a multi-layer structure that includes at least an inner layer and at least an outer layer. Preferably, the multi-wall structure includes one or more intermediate layers formed from a paper material, while the inner layer is formed from a plastic material.

[0009] A profile closure is positioned along the open mouth of the bag between the top panel and the bottom panel. Preferably, the profile closure extends through each of the side panels that join the top and bottom panels such that the profile closure extends past both a first side edge of the package and a second side edge of the package. The profile closure is a conventional item that includes a pair of mating profiles that can be selectively engaged and disengaged.

[0010] The profile closure includes a slider device that is mounted to the profile closure in a conventional manner. The slider device is operatively movable along the profile closure to selectively engage and disengage the first and second profiles.

[0011] Each of the first and second profiles includes a sealing flange. The sealing flange of the first profile is attached to the top panel of the bag while the sealing flange of the second profile is attached to the bottom panel of the bag. In this manner, the profile closure is attached across the open mouth of the multi-wall bag.

[0012] After the profile closure has been attached across the open mouth of the bag, a closure flap formed on the bottom panel of the package is folded over the open mouth of the package and attached to the top panel. Preferably, the closure flap is a portion of the bottom panel that extends past the outermost edge of the top panel such that the closure flap can be folded over the open mouth and attached to the top panel. When the closure flap is attached to the top panel, the closure flap entraps the slider device between the outer layer of the top panel and the inner layer of the closure flap. When the slider device is entrapped between the top panel and the closure flap, the slide device is protected from both damage and separation from the profile closure.

[0013] In the preferred embodiment of the invention, the multi-wall bag includes a tear member that is positioned between the profile closure and one of the top and bottom panels. Preferably, the tear member is positioned between the sealing flange of a second profile and the bottom panel of the multi-wall bag. In a contemplated alternate embodiment of the invention, the tear member can be integrally extruded with the profile closure. Once the bag is in its closed, sealed condition, the tear member can be used to initially open the bag by tearing the portion of the closure flap positioned above the tear member.

[0014] During formation of the multi-wall bag, the first and second profiles are sealed to each other at each end of the bag to define a first stop area and a second stop area. The first and second stop areas prevent the slider from traveling past the outer ends of the profile closure and becoming separated from the profile closure. In the preferred embodiment of the invention, both the first stop area and the second stop area are formed on the portions of the closure profile that extend past the first and second side edges of the bag, respectively.

[0015] During the initial formation of the multi-wall bag, the bottom end of the package is left open for filling of product into the open interior of the bag. Once the package has been filled with material, the bottom end of the package is sealed and the filled package can be sold.

BRIEF DESCRIPTION OF THE DRAWINGS

[0016] **FIG. 1** is a perspective view of a multi-wall bag of the present invention during the formation process;

[0017] **FIG. 2** is a section view taken along line **2-2** of **FIG. 1**;

[0018] **FIG. 3** is a perspective view illustrating the folding of the extended closure flap of the bottom panel of the bag to close the bag after filling;

[0019] **FIG. 4** is a section view taken along line **4-4** of **FIG. 3** illustrating the folding of the closure flap over the reclosable profile;

[0020] **FIG. 5** is a section view illustrating the sealing of the closure flap to the front panel of the multi-wall bag; and

[0021] **FIG. 6** is a perspective view illustrating the opening of the multi-wall bag through pulling of the tear member.

DETAILED DESCRIPTION OF PREFERRED EMBODIMENTS

[0022] Referring first to **FIG. 1**, thereshown is a multi-wall bag that includes a profile closure that allows the multi-wall bag to be reclosed after initial opening. The multi-wall bag **12** is formed using an upstream bag formation process that results in the bag **12** having an open bottom end and an open mouth. The bag **12** is formed from a tube of material and processed to include a first side edge **18** and an opposite, second side edge **20**. Typically, the bags **12** are formed at a bag forming facility and the individual bags stacked onto a pallet and shipped onto a second location for filling and sealing. Once the bag **12** has been filled with a product, the open bottom end is sealed and the product is ready for shipment and sale to a customer.

[0023] As illustrated in **FIG. 1**, the multi-wall bag **12** includes a top panel **22** and a bottom panel **24**. The top and bottom panels **22**, **24** are joined to each other by a first side panel and a second side panel. In the embodiment of the invention illustrated, the top panel **22**, bottom panel **24** and pair of side panels are formed from a continuous sheet of base material that is folded and cut into the configuration shown in **FIG. 1**. The first and second side panels form a folded gusset such that the sides of the open bag interior can expand as product is loaded into the bag interior.

[0024] Referring now to **FIG. 2**, both the top panel **22** and the bottom panel **24** are formed from a supply of material that includes a multi-wall cross-section, as illustrated. In the embodiment of the invention illustrated, the top and bottom panels **22**, **24** include three distinct layers. However, it is contemplated that the top and bottom panels **22**, **24** could have only two layers or have many more layers, such as four or five. Since the top panel **22** and the bottom panel **24** are formed from the same material, the two elements have a common cross-sectional appearance, as illustrated.

[0025] As illustrated, the top panel **22** includes an inner layer **46** and an outer layer **48**. In the preferred embodiment of the invention, the inner layer **46** is a plastic liner that is typically formed from conventional plastic material, such as polyethylene or polypropylene. The plastic inner layer **46** is either directly joined to the outer layer **48** or is joined to another intermediate layer **50**, as shown in **FIG. 2**. In the preferred embodiment of the invention illustrated in **FIG. 2**, the intermediate layer **50** is formed from craft paper, which is typically inexpensive and formed from recycled fiber. The outer layer **48** is a face sheet also formed from a paper material that has a glossy or smooth outer surface **52**. The outer surface **52** allows graphics and other information to be printed onto the outer surface **52**.

[0026] In the embodiment of the invention illustrated in **FIG. 2**, the intermediate layer **50** is a single layer of craft paper. However, it is contemplated by the inventors that the intermediate layer **50** could have multiple layers of craft paper, depending upon the thickness and strength required for the multi-wall bag.

[0027] As illustrated in **FIG. 2**, the bottom panel **24** includes a closure flap **54** that extends past the top edge **56** of the top panel **22**. The closure flap **54** extends to an outer edge **58** and may include less than all of the layers of the stock material used to form the multi-wall bag. In the embodiment illustrated in **FIG. 2**, the closure flap **54** includes only the outer layer **48** and the intermediate layer **50**. The plastic inner layer **46** terminates at a location generally in line with the top edge **56** of the top panel **22**.

[0028] As illustrated in **FIG. 2**, the open mouth of the multi-wall bag **12** receives a profile closure **10** that allows the bag to be repeatedly opened and closed as desired. As illustrated in **FIG. 2**, the profile closure **10** includes a first profile **68** and a second profile **70**. The first and second profiles **68**, **70** are configured to releasably mate with each other in a conventional manner. In the embodiment of the invention illustrated, the first profile **68** includes a male closure element while the second profile **70** includes a female closure element. As illustrated in **FIG. 1**, the profile closure **10** includes a slider **66** such that movement of the slider **66** along the length of the profile closure separates the male and female profiles when the slider is moved in a first direction and re-engage the male and female profiles when the slider is moved in a second, opposite direction.

[0029] Referring back to **FIG. 2**, the first profile **68** includes a first sealing flange **76** while the second profile **70** includes a second sealing flange **78**. In the embodiment of the invention illustrated in **FIG. 2**, a tamper evident membrane **80** extends between the first and second sealing flanges **76**, **78**. The tamper evident membrane includes a line of weakness such that upon initial opening of the profile closure **10**, the tamper evident membrane **80** ruptures along the line of weakness. In the embodiment illustrated in **FIG. 2**, a first end **82** of the tamper evident membrane **80** is attached to the first sealing flange **76**, while a second end **84** is attached to the second sealing flange **78**. Although a separate tamper evident membrane **80** is shown in **FIG. 2**, it is contemplated that the first and second sealing flanges **76**, **78** could be co-extruded with each other and include a line of weakness. Alternatively, the sealing flange of one of the profiles **68**, **70** could be extended and attached to the other of the profiles **68**, **70**. In each of the contemplated embodiments of the invention, the tamper evident membrane **80** prevents food products contained within the bag interior from passing between the first and second sealing flanges **76**, **78** and contacting the closure elements.

[0030] In the embodiment of the invention illustrated, both the first sealing flange **76** and the second sealing flange **78** include a sealant layer that aid in bonding the first and second sealing flanges **78**, **80** to the respective inner layers **46** of the top panel **22** and the bottom panel **24**.

[0031] Once the profile closure **10** has been securely attached between the top panel **22** and the bottom panel **24**, a tear member **98** is moved into position between the second sealing flange **78** and the bottom panel **24**, as illustrated by arrow **100**. In the embodiment of the invention illustrated, the tear member **98** is an extruded plastic bead. However, it is contemplated that the tear member **98** could be a string, plastic tape or any other structure having sufficient strength to open the bag after it is closed. In addition, it is contemplated by the inventors that the tear member **98** could be integrally formed with the profile closure **10**. Specifically, it is contemplated that the tear member **98** could be extruded with one of the first and second sealing flanges **76**, **78**.

[0032] As clearly illustrated in **FIG. 2**, the tear member **98** is positioned between an outer surface **102** of the second sealing flange **78** and the intermediate layer **50** of the closure flap **54**. The movement of the tear member **98** in the direction illustrated by arrow **100** is limited by the seal between the second sealing flange **78** and the plastic inner layer **46** of the bottom panel **24**.

[0033] In the preferred embodiment of the invention shown in **FIG. 3**, the first closure profile **68** is bonded to the second closure profile **70** to prevent the slider device **66** from traveling past the outer edges of the profile closure **10**. The seal between the first profile **68** and the second profile **70** provides end stops for the movement of the slider **66**.

[0034] As can be seen in **FIG. 3**, a profile tab **108** extends past each of the side edges **18**, **20** of the multi-wall bag **12**. The profile tabs **108** provide a visual indication that the profile closure **10** is included in the bag **12** and include the stop areas for the slider. In addition to the pair of closure tabs **108**, the tear member **98** also extends past the side edges **18**, **20** to provide a location for the user to grasp the tear member and open the bag in the manner to be discussed below.

[0035] Referring now to **FIGS. 3 and 4**, the closure flap **54** is folded upward as illustrated by arrow **112** in **FIGS. 3 and 4**. As the closure flap **54** is folded upward, the top edge **56** of the top panel **22** is folded over such that the slider **66** is positioned between the closure flap **54** and the outer surface **52** of the top panel **22**. Once the closure flap **54** has been folded over as shown in **FIG. 4**, the closure flap **54** is sealed to the outer surface **52** of the top panel by a pair of sealing members **114**, as best shown in **FIG. 5**. The sealing members apply pressure to an adhesive layer between the closure flap **54** and the top panel **22** to create a bond between the closure flap **54** and the top panel **22**. In this manner, the profile closure **10**, including the slider **66** is enclosed and entrapped between the closure flap **54** and the top panel **22**. Thus, the slider **66** is completely enclosed and protected from damage during handling of the multi-wall bag **12**.

[0036] Since the slider device **66** is enclosed and protected by the closure flap **54**, the slider device **66** will not be damaged or knocked off of the profile closure **10** during handling of the multi-wall bag **12** after the bag has been filled with product. For example, in a typical application in which the bag is filled with 50-60 pounds of dog food, the stacking and unstacking of a supply of bags would otherwise result in the slider device **66** being dislodged from the profile closure during handling of the bags after the bags are filled with product. In accordance with the present invention, the slider device **66** is enclosed and protected.

[0037] After the closure flap **54** has been sealed to the top wall of the bag **12**, the bag is transferred for downstream processing, which typically includes stacking and shipment. In a typical application for the bag **12**, the bottom end **14** of each bag **12** remains open while the top end of the bag includes the profile closure **10** and is sealed by the closure flap **54**. Thus, after the bags are shipped to a filling facility, the bags are loaded through the open bottom end **14**. Once the bag has been loaded, the bottom end **14** is sealed and the product can be shipped to a consumer.

[0038] Referring back to **FIG. 6**, once the bag has been filled, the tear member **98** can be used to initially open the bag by pulling the tear member **98** as shown by arrow **114**. As can be understood in **FIG. 5**, when the tear member **98** is grasped, the tear member **98** tears through both the intermediate layer **50** and the outer layer **48** of the closure flap **54**. Once the tear member **98** has been pulled across the entire width of the bag from the side edge **20** to the side edge **18**, the profile closure **10**, including the slider **66**, can be removed from between the portion of the closure flap **54** that remains attached to the top panel **22** and the top panel **22**. Once removed, the profile closure **10** extends past the top edge of the bag and allows the slider **66** to separate and reengage the first and second profiles **76**, **78**.

[0039] Having described the presently preferred embodiments, it is to be understood that the invention may be otherwise embodied within the scope of the appended claims.

What is claimed is:

1. A multi-wall package, comprising:

a top panel;

a bottom panel;

a pair of side panels joining the top and bottom panels, wherein the top panel, the bottom panel and the side panels include at least an inner layer and an outer layer;

a profile closure having mating first and second profiles, the first profile including a first sealing flange attached to the top panel and the second closure profile including a second sealing flange attached to the bottom panel; and

a slider device operatively mounted on the profile closure and movable to interlock the first profile with the second profile.

2. The package of claim 1 wherein the bottom panel includes a closure flap extending past the top panel, wherein the closure flap is attached to the top panel to entrap the slider device between the outer layer of the top panel and the inner layer of the closure flap when the package is in a sealed condition.

3. The package of claim 1 wherein the sealing flange of the first profile is coupled to the sealing flange of the second profile.

4. The package of claim 3 further comprising a sealing membrane joined between the first sealing flange of the first profile and the second sealing flange of the second profile.

5. The package of claim 2 further comprising a tear member positioned between the second profile and the inner layer of the bottom panel, wherein the tear member can be used to separate the closure flap from the bottom panel.

6. The package of claim 2 further comprising a tear member integrally formed with the profile closure, wherein the tear member can be used to separate the closure flap from the bottom panel.

7. The package of claim 1 wherein the top panel, the bottom panel and the pair of side panels are integrally formed with each other.

8. The package of claim 7 wherein the inner layer of the top panel, the bottom panel and the side panel is plastic.

9. The package of claim 8 wherein the outer layer of the top panel, the bottom panel and the side panel is formed from paper.

10. The package of claim 9 wherein the top panel, the bottom panel and the side panels further include at least one intermediate layer formed from paper.

11. The package of claim 1 wherein the package further comprises a first side edge and a second side edge, wherein the profile closure extends past the first side edge and the second side edge.

12. The package of claim 11 wherein the first profile is joined to the second profile to define a first stop area and a second stop area, wherein the first stop area is formed on the portion of the closure profile extending past the first side edge of the package and the second stop area is formed on the portion of the closure profile extending past the second side edge of the package.

13. A multi-wall package, comprising:

a top panel;

a bottom panel;

a pair of side panels joining the top and bottom panels, wherein the top panel, the bottom panel, and the side panels each include at least an inner layer and an outer layer;

a profile closure having mating first and second profiles, the first profile including a first sealing flange attached to the top panel and the second profile including a second sealing flange attached to the bottom panel, wherein the profile closure extends past a first side edge and a second side edge of the package;

a slider device operatively mounted on the profile closure and movable to interlock the first profile with the second profile; and

a tear member positioned between one of the first and second profiles and one of the top and bottom panels.

14. The package of claim 13 wherein the first profile is bonded to the second profile to define a first stop area and a second stop area, wherein the first stop area is formed on the portion of the closure profile extending past the first side edge of the package and the second stop area is formed on the portion of the closure profile extending past the second side edge of the package.

15. The package of claim 13 wherein the tear member extends past the first side edge of the package and the second side edge of the package.

16. The package of claim 13 wherein the inner layer of the top panel, the bottom panel and the side panel is plastic.

17. The package of claim 13 wherein the bottom panel includes a closure flap extending past the top panel, wherein the closure flap is attached to the top panel to entrap the slider device between the outer layer of the top panel and the inner layer of closure flap when the package is in a sealed condition.

18. The package of claim 13 further comprising a seal member joined between the first sealing flange of the first profile and the second sealing flange of a second profile.

* * * * *