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(54) Multi-wall bag including slider actuated reclosable zipper

(57) A multi-wall bag (12) that includes a profile closure (10) extending across the open mouth of the package such that the bag can be reclosed after initial opening. The multi-wall bag (12) includes a top panel (22), a bottom panel (24) 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 (46). The profile closure is attached between the top and bot-

tom panels and preferably includes a slider device (66). The bottom panel of the package includes a closure flap (54) that extends past the top panel edge (56) and is folded to entrap the slider device between the outer layer (52) of the top panel and the inner layer of the closure flap. A tear member (98) is positioned between the profile closure and the bottom panel such that the tear member can be used to initially open the package.

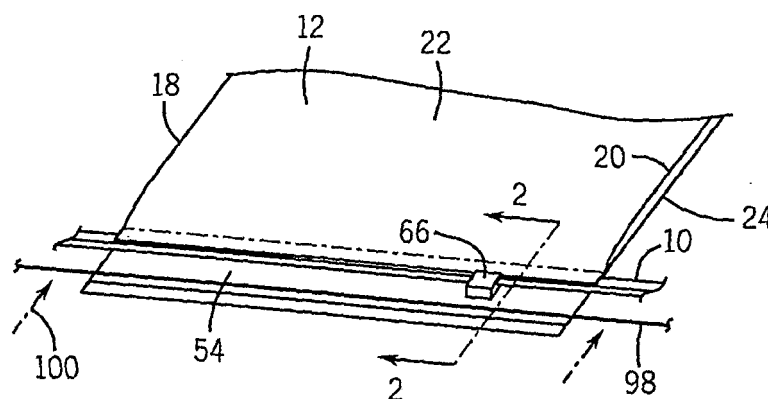


FIG. 1

EP 1 642 839 A1

Description

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 prepackaged 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 bag, 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] According to the present invention, there is pro-

vided 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.

[0009] Preferably, the package further comprises at least one tear member positioned between one or more of the group consisting of: (i) said first profile and said top panel; and (ii) said second profile and said bottom panel.

[0010] Advantageously, the bottom panel includes a closure flap extending past the edge of 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 inside layer of the closure flap when the package is in a sealed condition.

[0011] Conveniently, the sealing flange of the first profile is coupled to the sealing flange of the second profile.

[0012] Preferably, the package further comprises 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.

[0013] Advantageously, the package further comprises 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.

[0014] Conveniently, 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.

[0015] Preferably, 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.

[0016] Advantageously, the top panel, the bottom panel and the pair of side panels are integrally formed with each other.

[0017] Conveniently, the package further comprises

the top panel, the bottom panel (24) and the pair of side panels are integrally formed with each other.

[0018] Preferably, the inner layer of the top panel, the bottom panel and each side panel is plastic.

[0019] Advantageously, the outer layer of the top panel, the bottom panel and each side panel is formed from paper.

[0020] Conveniently, the outer layer of the top panel, the bottom panel and each side panel is formed from paper.

[0021] 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.

[0022] 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.

[0023] 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.

[0024] 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.

[0025] 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.

[0026] 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.

[0027] 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.

[0028] 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.

[0029] So that the invention may be more readily understood, and so that further features thereof may be appreciated, embodiments of the present invention will now described, by way of example, with reference to the accompanying drawings, in which :

Figure 1 is a perspective view of a multi-wall bag of the present invention during the formation process; Figure 2 is a section view taken along line 2-2 of Figure 1; Figure 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; Figure 4 is a section view taken along line 4-4 of Figure 3 illustrating the folding of the closure flap over the reclosable profile; Figure 5 is a section view illustrating the sealing of the closure flap to the front panel of the multi-wall bag; and Figure 6 is a perspective view illustrating the opening of the multi-wall bag through pulling of the tear member.

Detailed Description of Preferred Embodiments

[0030] Referring first to Figure 1, there is shown 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.

[0031] As illustrated in Figure 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 Figure 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.

[0032] Referring now to Figure 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.

[0033] 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 Figure 2. In the preferred embodiment of the invention illustrated in Figure 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.

[0034] In the embodiment of the invention illustrated in Figure 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.

[0035] As illustrated in Figure 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 Figure 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.

[0036] 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.

[0037] Referring back to Figure 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 Figure 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 Figure 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 Figure 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.

[0038] 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.

[0039] 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.

[0040] As clearly illustrated in Figure 2, the tear mem-

ber 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.

[0041] 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.

[0042] As can be seen in Figure 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.

[0043] Referring now to Figures 3 and 4, the closure flap 54 is folded upward as illustrated by arrow 112 in Figures 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 Figure 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 Figure 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.

[0044] 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.

[0045] 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.

[0046] Referring back to Figure 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 Figure 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. 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.

[0047] 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.

[0048] When used in this specification and claims, the terms "comprises" and "comprising" and variations thereof mean that the specified features, steps or integers are included. The terms are not to be interpreted to exclude the presence of other features, steps or components.

[0049] The features disclosed in the foregoing description, or the following claims, or the accompanying drawings, expressed in their specific forms or in terms of a means for performing the disclosed function, or a method or process for attaining the disclosed result, as appropriate, may, separately, or in any combination of such features, be utilised for realising the invention in diverse forms thereof.

Claims

1. A multi-wall package, comprising:

- a top panel (22);
- a bottom panel (24);
- a pair of side panels joining the top and bottom panels, wherein the top panel (22), the bottom panel (24) and the side panels include at least an inner layer (46) and an outer layer (48);
- a profile closure (10) having mating first and second profiles, the first profile including a first sealing flange (76) attached to the top panel (22) and the second closure profile including a second sealing flange (78) attached to the bottom panel (24); and
- a slider device (66) operatively mounted on the profile closure (10) and movable to interlock the first profile with the second profile.

2. The package of claim 1 further comprising at least one tear member (98) positioned between one or more of the group consisting of: (i) said first profile and said top panel (22); and (ii) said second profile and said bottom panel (24). 5
3. The package of claim 1 or 2 wherein the bottom panel includes a closure flap (54) extending past the edge of top panel (22), wherein the closure flap is attached to the top panel (22) to entrap the slider device (66) between the outer layer (52) of the top panel (22) and the inside layer (50) of the closure flap when the package is in a sealed condition. 10
4. The package of any preceding claim wherein the sealing flange (76) of the first profile is coupled to the sealing flange (78) of the second profile. 15
5. The package of claim 3 further comprising a tear member (98) positioned between the second profile (74) and the inner layer of the bottom panel (24), wherein the tear member (98) can be used to separate the closure flap (54) from the bottom panel (24). 20
6. The package of claim 3 further comprising a tear member (98) integrally formed with the profile closure, wherein the tear member can be used to separate the closure flap (54) from the bottom panel (24). 25
7. The package of any preceding claim wherein the package further comprises a first side edge (18) and a second side edge (20), wherein the profile closure extends (108) past the first side edge and the second side edge. 30
35
8. The package of claim 7 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 (108) of the closure profile extending past the first side edge (18) of the package and the second stop area is formed on the portion of the closure profile (108) extending past the second side edge of the package (20). 40
9. The package of any preceding claim wherein the top panel (22), the bottom panel (24) and the pair of side panels are integrally formed with each other. 45
10. The package of any preceding claim further comprising a sealing membrane (80) joined between the first sealing flange (76) of the first profile and the second sealing flange (78) of the second profile. 50
11. The package of any preceding claim wherein the inner layer (46) of the top panel (22), the bottom panel (24) and each side panel is plastic. 55
12. The package of any preceding claim wherein the outer layer (52) of the top panel (22), the bottom panel (24) and each side panel is formed from paper.
13. The package of any preceding claim wherein the top panel (22), the bottom panel (24) and each side panels further include at least one intermediate layer (50) formed from paper.

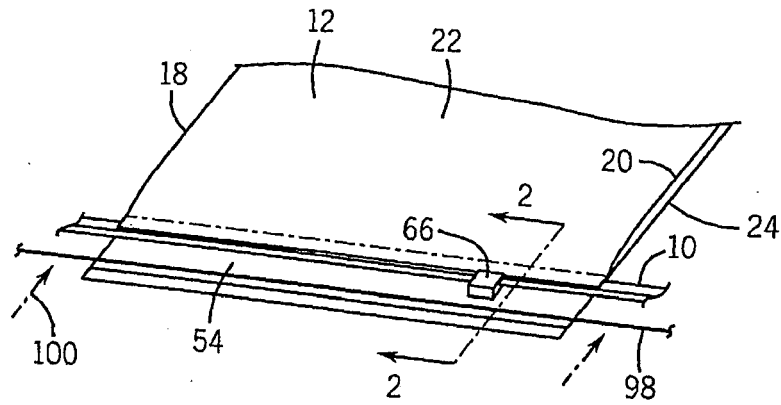


FIG. 1

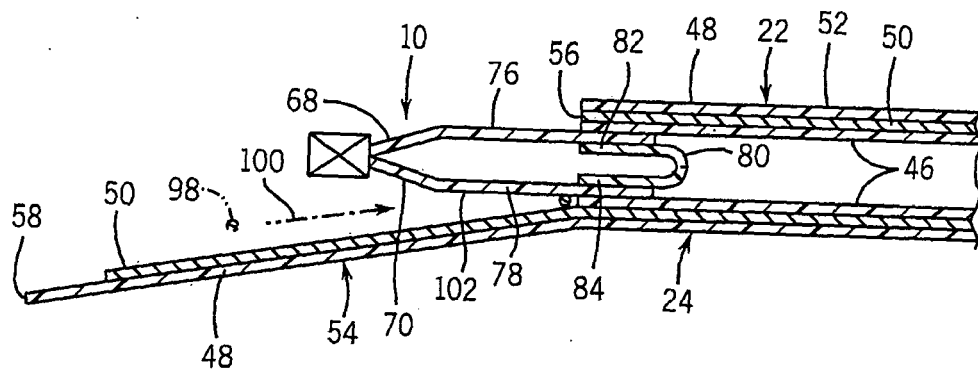


FIG. 2

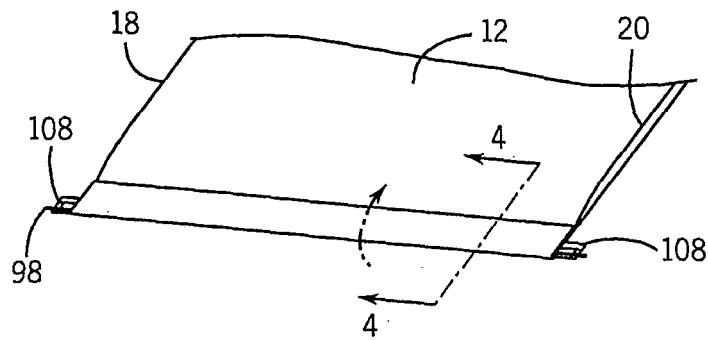


FIG. 3

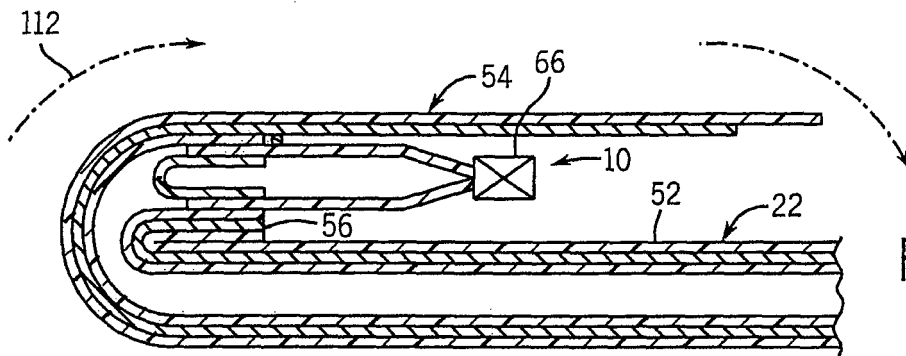


FIG. 4

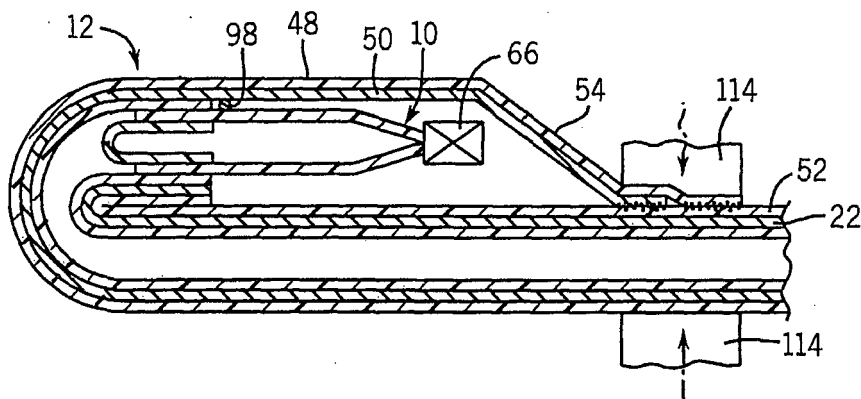


FIG. 5

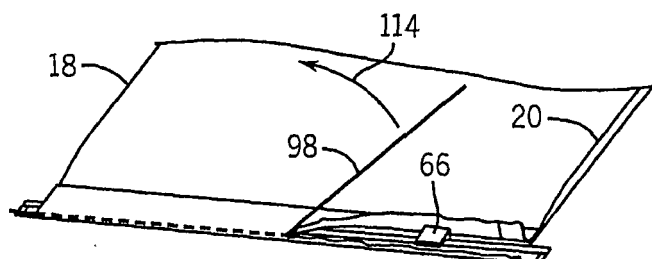


FIG. 6



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EUROPEAN SEARCH REPORT

Application Number
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Place of search The Hague		Date of completion of the search 1 December 2005	Examiner Leijten, M
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			

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EPO FORM 1503 03.82 (P04C01)

**ANNEX TO THE EUROPEAN SEARCH REPORT
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This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
The members are as contained in the European Patent Office EDP file on
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