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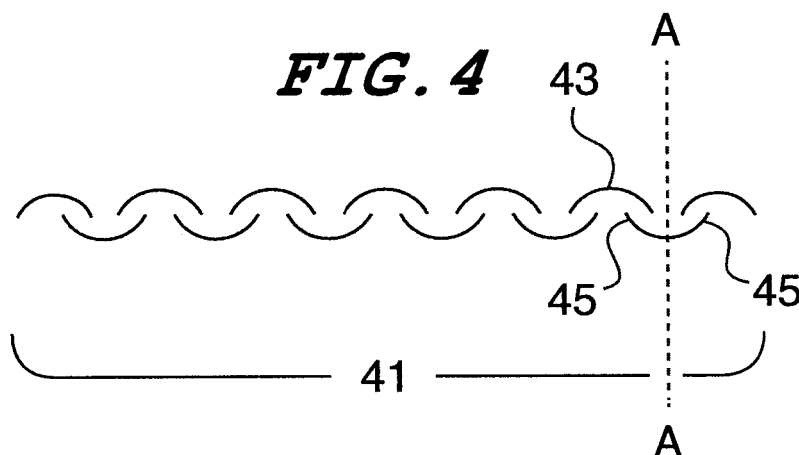
Remarks:

A request for re-establishment of rights in respect of the twelve-month period from the date of filing of the first application has been granted (Art.87(1) and Art.122 EPC).

(54) **TEAR-OPEN RESEALABLE PACKAGE**

(57) A tamper-evident package utilizes a transparent resealable adhesive structure 33 such as a tape or a label to cover the closure opening. Upon a first opening of the package frangible portions of the package front between adjacent disconnected arcuate cuts 41 are torn. This results in a package which is visually tamper-evident after a first opening. A series of disconnected arcuate cuts comprising an apex 43 and two free ends 45 are arranged

in laterally extending opposing top and bottom rows. In one case the cuts have portions of their distal free ends which overlap vertically and are parallel and aligned with the longitudinal axis of the package. The cuts are preferably centered laterally and are flanked on the right and left sides by two continuous wavy slits 37. One row of the cuts can comprise cup shaped cuts with a flat linear portion of each cut lying along its apex.



Description

Related Applications

[0001] This patent application is a continuation-in-part of patent application serial number 15/696,492 filed September 6, 2017 entitled, "Tamper-Evident Tear-Open Reclosable Package", priority from which is hereby claimed, and which is incorporated herein by reference.

Field of the Invention

[0002] The present invention relates to flexible packaging. More specifically it relates to tear-open bags or pouches which have tamper-evident resealable closures.

Background of the Invention

[0003] Most often consumer food packages are made in such a way that for the consumer to access the product a tear strip at the top of the pack above the usual zipper or slider has to be torn off and thrown away. Because of the way these packages are made the bag material often tears unreliably and not straight. Sometimes it only tears part of the way and the leftover edges of film get in the way of the zipper or slider reclosing easily. Furthermore, consumers prefer not to be left holding a part of the package in their hands that requires disposal. The construction of these packages requires a heavier, thicker film material which adds to their cost.

[0004] While these packages have the advantage of being tamper evident because access can only be made after part of the bag has been permanently destroyed, the noted disadvantages are problems that the packaging industry still faces. Tear-open packages provide a solution because the torn material is visible, but when employed with more desirable lighter weight material they are most susceptible to tearing in unwanted directions. This is especially true when the tear force is initiated from the center of the package front downward which is the preferred opening location and direction.

[0005] Recloseable packages that are not the tear-open type are not necessarily tamper evident because the parts of the package which are separated upon opening can be repositioned in registration with their original position when closed so that a prior opening is not evident. An example of this construction is shown in US patent 9,090,383 and is presented here as Figs. 1 and 2. As seen in these figures a transparent tape 11 seals over a straight lateral opening slit 13. As the tape is pulled away, a package opening 17 occurs along the slit. A portion 15 of the tape 11 wraps around the sides of the package. When reclosed the opposing edges of the opening realign so that tampering is not evident.

[0006] One solution that has been offered is to add a second additional label applied to the package for tamper evidence. This additional label is applied over the edge

of the label, and onto the package face, adjacent to the grip area of the label. The label is made of an easily torn brightly colored paper and has a permanent adhesive. When the consumer opens the package using the grip area of the resealable label, the additional label is torn, and remains permanently attached to both the label and the package face. When the resealable label reseals the package, it is visually evident the additional label has been torn. This is an additional expense to have these labels made and applied to the package in register to provide tamper evidence that the package was previously opened.

[0007] Other prior art packaging relevant to the present invention includes the following US patent documents: 3,570,751; 4,787,517; 5,746,369; 3,708,108; 2014/0216969; 2008/0240628; 2015/0266626 and 6,659,644.

[0008] There is therefore a need in the packaging arts for a reclosable tamper-evident package of light weight film that has a central closure which tears open in a controlled, predictable manner and thus avoids the problems of the prior art cited above. It is further desired to devise such a package which is less expensive, easy to manufacture and which functions reliably.

Summary of the Invention

[0009] The inventive packaging described in more detail below has been devised to solve the problems in consumer packaging as discussed above. One embodiment of the invention is a package having a front, a back, and top and bottom edges defining upward and downward longitudinal directions. The direction from one side edge to the other defines a lateral direction.

[0010] A tear-open closure having open and closed positions is located along a lateral closure axis for providing access to contents within the package through an opening, said closure comprising two laterally extending longitudinally spaced rows of individual arcuate cuts. Each cut is defined by a continuous arc with an apex and two free ends, a facing direction of each of said cuts is defined by the pointing direction of its apex. The cuts of one row all face in one vertical direction opposite the facing direction of all the cuts of the other row, said rows being laterally staggered thereby defining a series of laterally extending alternating upward pointing and then downward pointing unconnected cuts. In one embodiment the free ends of cuts in one row overlap laterally with the free ends in the other row. The free ends of all the cuts may intercept the lateral closure axis.

[0011] The package of the invention can be made reclosable by using a transparent pressure sensitive adhesive tape or label to cover the closure opening when closed. Upon a first opening of the package, frangible portions of the package front between adjacent arcuate cuts are torn. This tearing distorts the packaging film so that re-registration of the opposing lateral edges upon reclosing is not possible. This results in a package which

is tamper-evident. The tamper-evident condition can be enhanced by graphics or other printing on the front of the package in the area of the closure to make the misalignment of a resealed closure viewed through the tape or label more visually apparent. In one embodiment of the invention the series of cuts are centered laterally and are flanked on the right and left sides by two continuous wavy slits which form side portions of the closure opening. Each of the wavy slits extend laterally to the package side edges along the opening axis from the series of arcuate cuts which occupy the central area of the closure.

[0012] The pressure sensitive adhesive tape or label is comprised of a backing and an adhesive on one side of the backing. Tape structures are commonly wound upon themselves placing the adhesive in contact with the reverse or uncoated side of the tape backing or silicone coated release paper and films to enable unwind and dispensing. Tape structures that do not use release liners commonly use differentials in surface energy and or chemical treatment to enable unwind and dispensing into the application. Examples include but are not limited to differentials in surface energy achieved through either flame or corona energy surface treatment or the application of release coatings such as the Escoat Product line of Mayzo Incorporated (Swanee Georgia, USA) based on Based on polyvinyl octadecyl carbamate (PVODC) and polyvinyl stearyl carbamate (PVSC) chemistries. Labels are typically comprised of a silicone release liner which could be either filmic or paper, a working pressure sensitive adhesive surface which as adhered to a backing substrate, a backing film or paper and optionally a topcoat or surface treatment is applied to the backing on the opposite side of the pressure sensitive adhesive to enable printing and other similar finishing steps.

[0013] The backing material used in accordance with the inventive tamper evident reclosure system comprises any known backing materials that are capable of being blown or cast into a transparent or semi-transparent continuous film.. The backing material is substantially a two-dimensional object having a first and second side. By substantially two-dimensional, it is meant an object having a significantly large size measurement in two dimensions compared to a significantly small size measurement in the third dimension. Some particularly suitable backing materials include polymers, including, but not limited to polyethylene terephthalate, polyethylene, polypropylene; copolymers such as poly ethylene-propylene, polyethylene-octene, olefinic block copolymers and poly styrene films. The thickness of the backing will vary according to the particular application. The polymer backing may have a matte or glossy finish as well as a smooth or irregular (e.g., embossed) surface depending on the package it is being applied to. The film backing materials may be prepared utilizing either a single layer or multiple layer comprised on different polymer compositions of the above backing listed compositions. Examples of multi-layer and compositional blends are disclosed in European Patent Number 2 049 333 B1, US Patent

20120060997 A1 and US5585193 A and are hereby incorporated as reference in their entirety as additional suitable backing substrates. Highlighted in US Patent 9676532 and in these reference patents are the advantages imparted by Machine Direction Oriented films (MDO) which can be utilized as the backing material for the reclosure label structure of this invention. Similarly, as described specifically in the above referenced patent (US Patent 9676532) MDO films could be more advantageous over conventional films in this novel reclose package as the opening feature described below is opened directionally from the reclosure label tab in the same machine direction of the film making it less likely to propagate a film tear upon opening and on repeated use in this novel tamper evident recloseable package.

[0014] The adhesive used in the pressure sensitive coating may comprise any known adhesive. Preferred pressure-sensitive adhesives include formulated hot melt block copolymer adhesives, aqueous acrylic adhesives, solvent acrylic and rubber adhesives, and silicone adhesives. The adhesive can be applied as a continuous layer, or a discontinuous pattern on the backing. When the adhesive is applied as a coating, the coating weight of the adhesive will depend on such factors as the adhesive used, the backing material used, and the end application. Those skilled in the art will readily be able to determine a coating and coat weight. In accordance with the present invention, the adhesive is generally chosen such that after initial opening at the pull tab location a greater force is required to remove the adhesive from the attached objects than is required to separate the fastening system along the tear-open tamper evident novel cut design of this invention to create the opening to the package contents. In addition, the adhesive must reseat onto the package surface multiple times while not leaving any adhesive residues on the surface of the package to which it is separated from and reapplied to the package. Those skilled in the art will readily be able to determine a suitable pressure sensitive adhesive based on the packaging film and package contents in accordance with the end use application. Suitable examples of pressure sensitive adhesives for use in this novel reclose are disclosed in US patent 9676532 and can be used in both dry and moist package contents. The reclosure adhesive does not necessarily have to be resistant to alcohol, but can be depending on the package content.

[0015] To best utilize the novel series of arcuate cuts of the invention, a central pull-tab portion at the top of the recloseable tape or label is adhesively deadened to facilitate manual grasping by the user so that the covering resealable pressure sensitive tape or label can be pulled downward. Although this grasp point creates radial lines of force on the package front away from the central grasp point, the arcuate cuts transfer these forces more directly to the frangible areas between the cuts so that uncontrollable tearing of the package is avoided. This is not the case with a simple series of linear dotted or dashed slits or perforations. Those types of cuts are only useable

when the opening force is applied in the direction of the cuts.

[0016] According to the present invention the pattern of arcuate cuts may vary. In one case the bottom row of disconnected cuts is cup shaped, each cut having a flat linear portion lying along its apex. In this pattern the free ends of the top row of disconnected cuts extends vertically below the free ends of the bottom row of disconnected cuts and distal portions of the free ends of the top row of disconnected cuts are parallel to distal portions of the free ends of the bottom row of disconnected cuts. In a modification of this pattern the two side-most ends of adjacent top row cuts are not free, but bridged by inter-connecting horizontal sections and the bridged ends extend downward to a point where the horizontal sections are substantially in line with the flat linear portions of the cup shaped portions of the bottom row of disconnected cuts.

[0017] By the above described package construction, even a light weight, inexpensive, polypropylene material can be used which has been treated with a pressure sensitive adhesive coating. The reclosable feature can even be supplied by a simple wrap-around covering resealable transparent adhesive tape which makes the manufacture of the package, usually a flexible pouch or bag, very easy and inexpensive. This is one of the main objects of the invention.

[0018] It is therefore an object of the invention to devise a tamper-evident package of light weight material that has a central tear-open closure which tears controllably. Other objects and advantages will be apparent from the following drawings and description of one embodiment of the invention.

Brief Description of the Drawings

[0019]

Figures 1 and 2 are top right front isometric views of prior art packaging.

Figure 3 is a top right front view of a preconstruction layout of one embodiment of the invention.

Figure 4 is a close-up view of the tear-open cut pattern.

Figures 5 and 6 are top right front isometric views showing a package of the invention before and after the first package opening.

Figure 7 and 8 are right side sectional views of the package of the invention in the closed and open positions respectively.

Figures 9 and 10 depict alternate tear-open cut patterns.

Description of the Preferred Embodiment

[0020] Referring now to figure 3, a pre-construction layout of the elements of one embodiment of the invention is shown. Film 31 has a piece of transparent pressure sensitive adhesive reseal structure 33 affixed across it. The adhesive structure includes a pull tab 35 projects upward from the main body of the pressure sensitive reclosure feature. The adhesive on the backside of the pull tab 35 is deadened so that it may be easily grasped by the user. The pressure sensitive adhesive reseal structure 33 extends laterally beyond fold lines 36 which define the sides of the package when constructed so that end portions 34 of the adhesive reseal structure 33 wrap around the sides of the package and the side of the structure which is coated with a pressure sensitive adhesive attach to the back when fully formed for stronger attachment. The structure may be a label or a tape composed of a polymeric backing and a pressure sensitive adhesive on either side of the backing.

[0021] Beneath the adhesive reseal structure in the center of the film between the side fold lines a series of slits and cuts define a package opening through which contents of the package can be removed. The closure comprises right and left side wavy slits 37 and a series of arcuate cuts in the center. For reasons later described, the film preferably has a printed-on graphic such as the word "OPEN" in the area of the arcuate cuts seen in this figure.

[0022] Referring to Figure 4, the pattern of the series of arcuate cuts is shown. The cuts comprise a laterally extending series of longitudinally spaced apart opposite facing individual identical arcuate cuts in two rows. Here we see that each arcuate cut is defined by an apex 43 and two free ends 45. The adjacent cuts alternate in upward and then downward pointing directions of their respective apexes along a vertical axis. One exemplary axis is shown as A-A. The cuts are substantially identical and are geometrically symmetrical about their axis.

[0023] Referring now to Figures 5 and 6, we see depictions of the package of Figure 3 before-and-after it is first opened. When first opened, the user pulls tab 35 tearing the package material 51 apart between the central arcuate cuts. The attachment of the adhesive structure such as a tape or a label is strengthened by portions 34 which wrap around the backsides of the package. The other side portions of the package front are non-destructively separated along the continuous wavy slits 37 on either side of the arcuate cut series. This provides the opening in the package as seen in Figure 8 necessary to access its contents. In Figure 6 we see the package reclosed and resealed. Here, the torn apart package material around and through the printed word "OPEN" distorts its depiction so that the prior package opening is visibly evident through the transparent adhesive structure. Because only a small portion of the opening needs to be forcibly torn, only a relatively small force is needed. This, in combination with the novel shape of the cuts,

permits the desirable use of a lighter gage film material and a package that is easier to open.

[0024] The opening process is further depicted in Figures 7 and 8. As seen in Figure 7 the constructed package forms front and rear panels 75 and 76. Pull tab 35 has deadening material 71 applied to its back surface to allow manual grasping. The main body of the adhesive structure 33 covers the various opening slits and cuts shown here as cut 73. Side portions 34 of the structure 33 wrap around and are adhered to the back of the package 76. As the tab is grasped and pulled downward the adhesive structure starts to peel from the front panel 75. When the separation point of the peel crosses the above described series of arcuate cuts the adherence of the tape or pressure sensitive label to the panel just below the cuts is sufficient to tear the panel material between the cuts to create a package opening through which its contents can be removed. Figure 8 shows the package of Figures 3-7 in its open condition. Here we see the material of the package front panel 75 destructively torn apart at the mouth of the opening.

[0025] Figures 9 and 10 depict alternate tear-open cut patterns located in the same placement as Figure 304, that is, centered about the package front centerline. Like the pattern of Figure 4 these patterns are at the central tear portion between wavy cuts on either side that extend to the sides of the package.

[0026] In Figure 9, the two opposing rows of disconnected cuts 81 and 83 are not identical and the free ends of the top row extend into the wells of a cup-shaped bottom row cuts. As seen in the close-up view associated with Figure 9, the free ends 87 of the top row cuts 81 extend vertically below the upstanding free ends 85 of the bottom row cuts 83 as illustrated by imaginary horizontal line D-D. Furthermore, the bottom row of cuts each have a flat linear portion 82 lying along their apex. While this Figure depicts three tear cuts along the top row and four cuts along the bottom row the invention may include a greater or lesser number of cuts similarly arranged. Furthermore the top and bottom rows may be interchanged in position.

[0027] Referring now to Figure 10, this cut pattern is identical to that seen in Figure 9 except that the ends of the two side-most cuts are not free. They extend downward to the lowest point of the bottom row, bridged by interconnecting horizontal sections 91 and 93. The horizontal portions are therefore substantially in line with the flat linear portions 82 of the cup shaped bottom row of disconnected cuts.

[0028] From the above description of the invention it can readily be seen that the objects of the invention have been achieved. While only one embodiment of the invention is depicted in the drawings and described above there can be variations in dimension and proportionality. Furthermore the means of production can be any suitable means available to the art at that time. Many modifications to the preferred embodiment may be possible without departing from the scope and spirit of the invention

which shall be defined only by the following claims and their legal equivalents.

5 Claims

1. A package, comprising;

a package having a front, a back, and top and bottom edges defining upward and downward longitudinal directions, said package also having opposing left and right side edges (36) defining a lateral direction;

characterized as having

a tear-open closure having open and closed positions located along a lateral closure axis for providing access to contents within the package through an opening, said closure comprising two laterally extending longitudinally spaced top and bottom rows of individual disconnected arcuate cuts (41), each cut defining a continuous arc with an apex (43) and two free ends (45).

2. The package of claim 1 wherein a facing direction of each of said cuts (41) is defined by the pointing direction of its apex (43) and wherein the cuts of one row all face in one vertical direction opposite the facing direction of all the cuts of the other row, said rows being laterally staggered thereby defining a series of laterally extending alternating upward pointing and then downward pointing disconnected cuts (41).

3. The package of claim 2 wherein the ends (45) of laterally adjacent cuts overlap.

4. The package of claim 2 wherein the ends (45) of the cuts (41) intercept the lateral closure axis, optionally wherein a prior opening of the package closure is evident after it is closed and resealed by an adhesive structure, in particular wherein a central longitudinally extending tab portion of the adhesive structure is adhesively deadened to facilitate its manual grasping by a user.

5. The package of one of the preceding claims wherein the closure is covered by a resealable transparent adhesive structure (33) that holds the closure in the closed position, especially wherein the adhesive structure (33) is either a tape or a label comprised of:

- a. a polymeric backing; and
- b. a pressure sensitive adhesive on either side of the polymeric backing, in particular

wherein the adhesive structure (33) is adapted to function equally well with either moist or dry package

contents.

6. The package of one of the preceding claims having manually frangible portions of the package front (51) located between adjacent cuts (41) which rupture when the package is first opened. 5
7. The package of claim 6 wherein the series of cuts (41) are centered between opposite sides of the package. 10
8. The package of one of the preceding claims wherein the closure further includes wavy slits (37) through the package front (51) on either lateral side of the series of arcuate cuts (41). 15
9. The package of claim 5 wherein the adhesive structure (33) is located across the package front (51), wraps around the sides of the package, and is adhered to a back side (76). 20
10. The package of claim 9 further having graphics printed on the package front (51) in the area of the series of arcuate cuts (41) to enhance the visual evidence of a prior closure opening. 25
11. The package of one of the preceding claims wherein the bottom row of disconnected cuts (83) is cup shaped, each cut having a flat linear portion (82) lying along its apex. 30
12. The package of claim 11 wherein the free ends of the top row (81) of disconnected cuts extends vertically below the free ends (85) of the bottom row of disconnected cuts. 35
13. The package of claim 12 wherein the portions of the free ends of the top row (87) of disconnected cuts are parallel to portions of the free ends (85) of the bottom row of disconnected cuts. 40
14. The package of claim 13 wherein the two side-most ends of adjacent top row cuts (81) are not free but bridged by interconnecting horizontal sections (91, 93). 45
15. The package of claim 14 wherein the horizontal sections (91, 93) are substantially in line with the flat linear portions of the cup shaped cuts (83) of the bottom row of disconnected cuts. 50

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FIG. 1
(PRIOR ART)

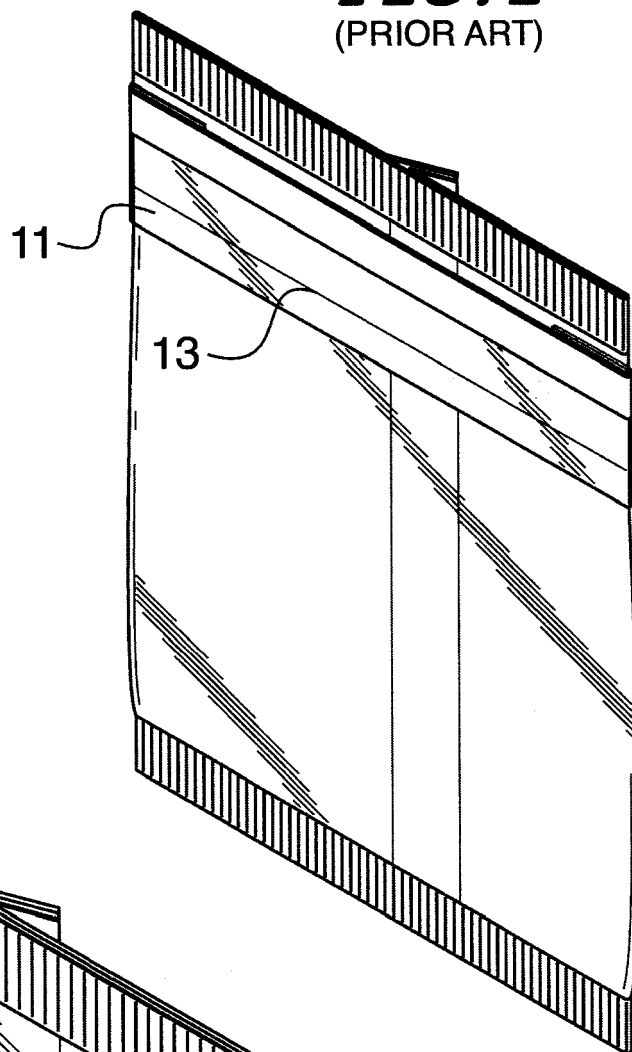
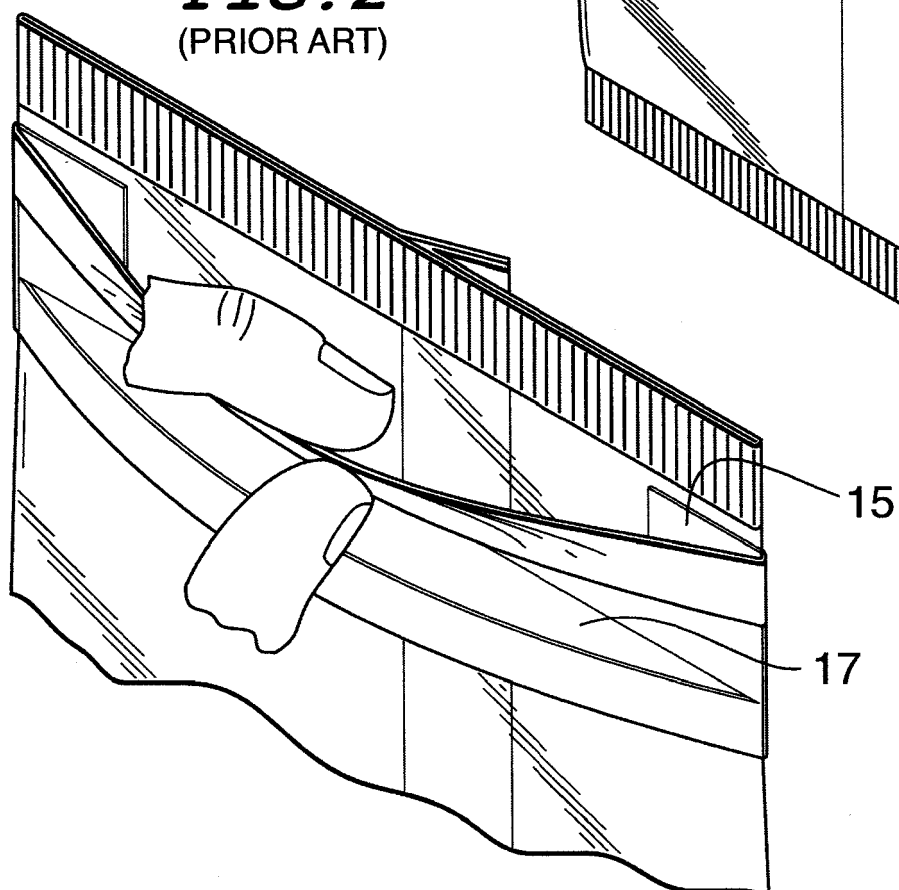


FIG. 2
(PRIOR ART)



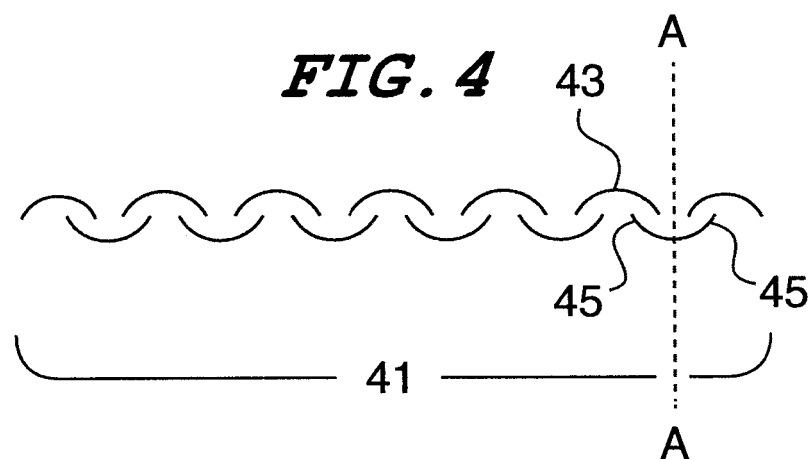
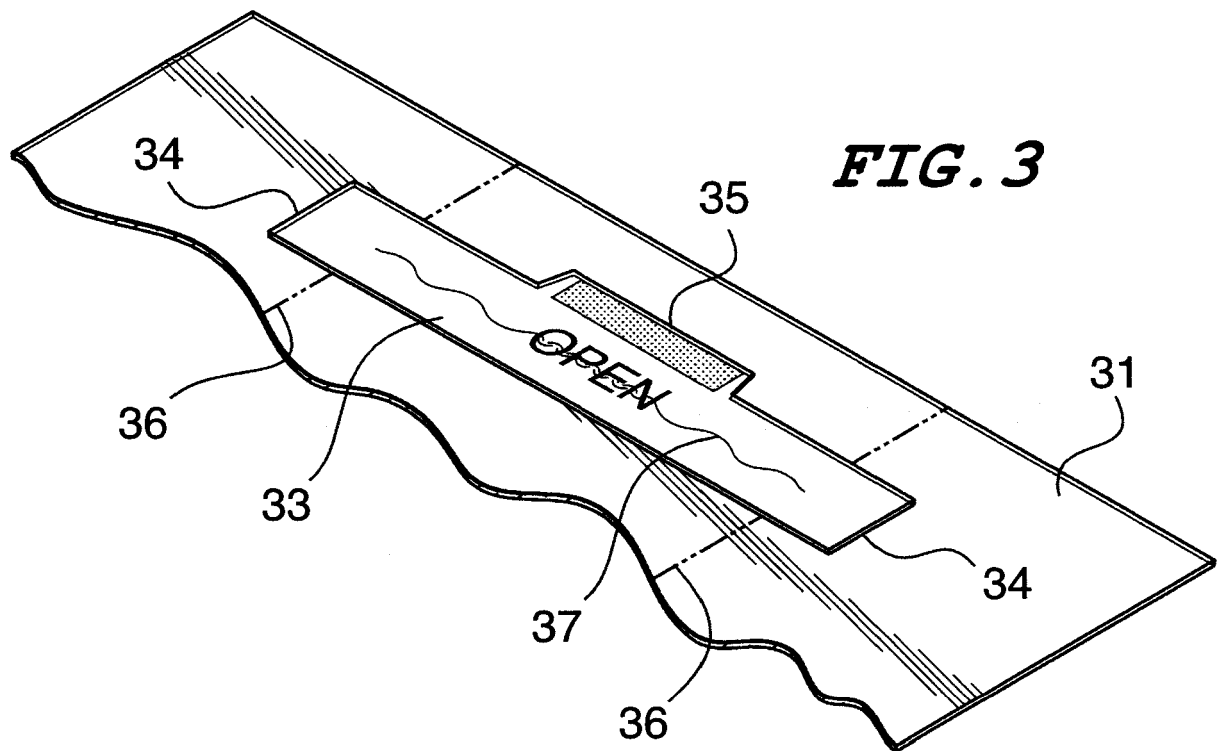


FIG. 5

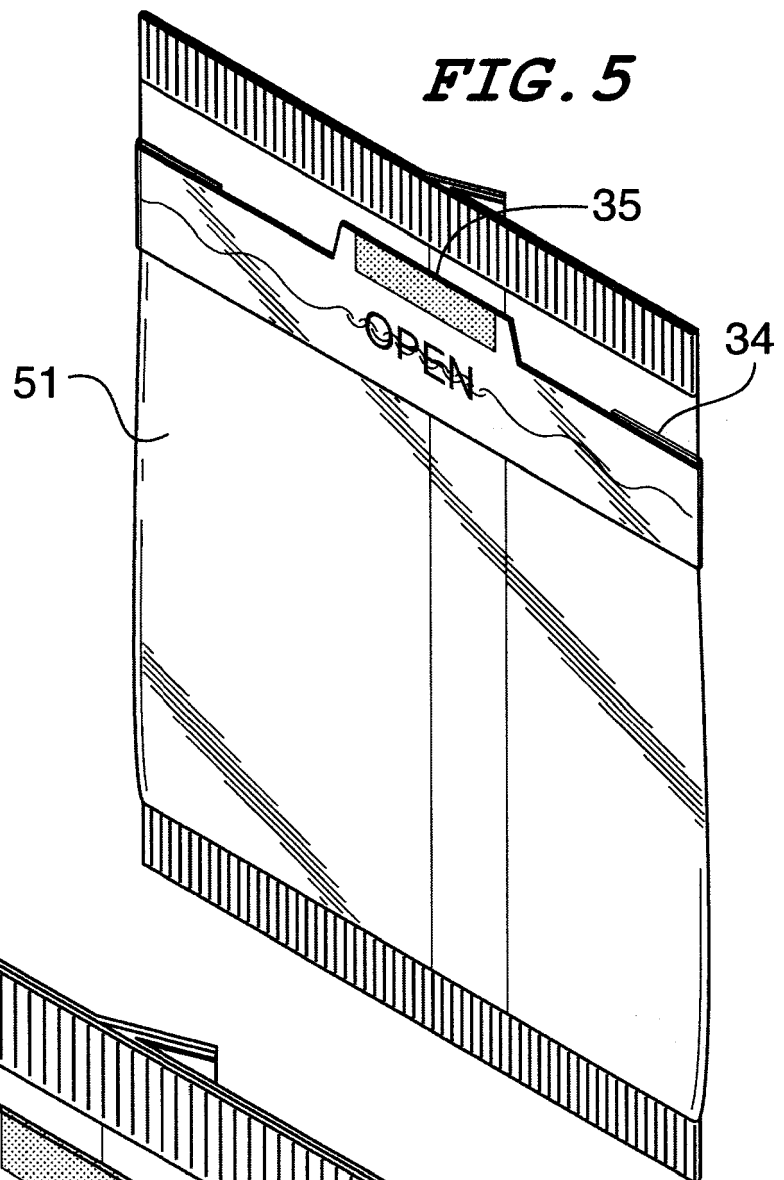


FIG. 6

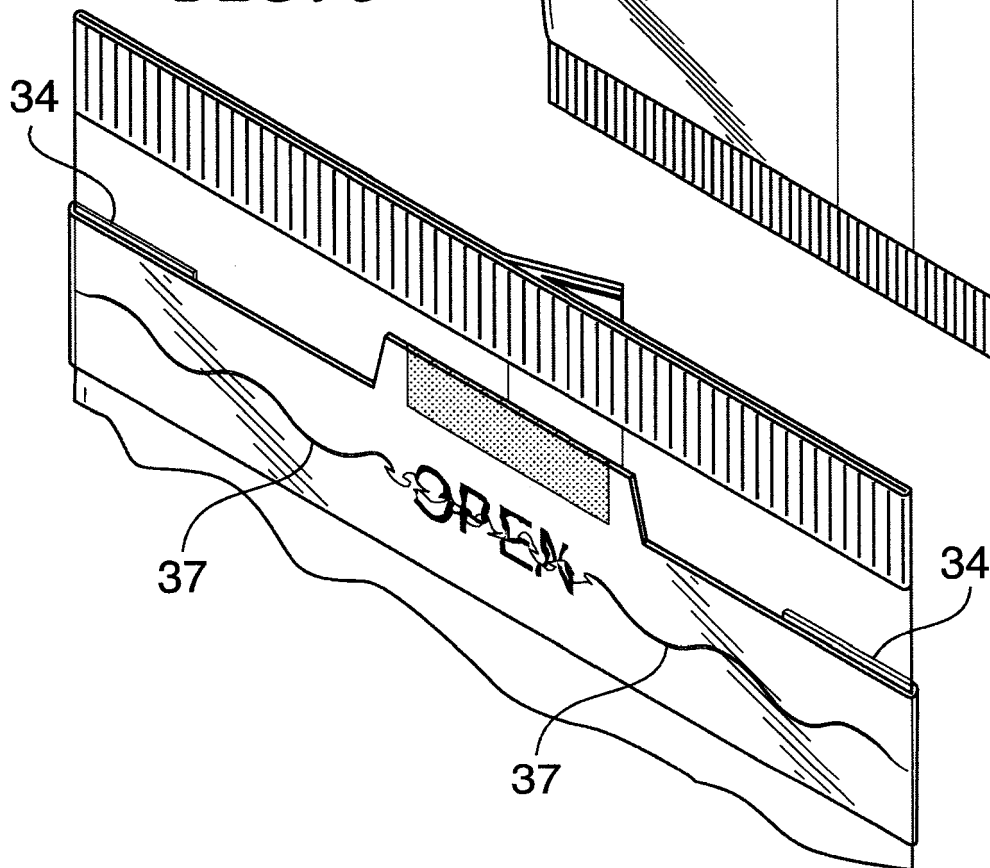


FIG. 7

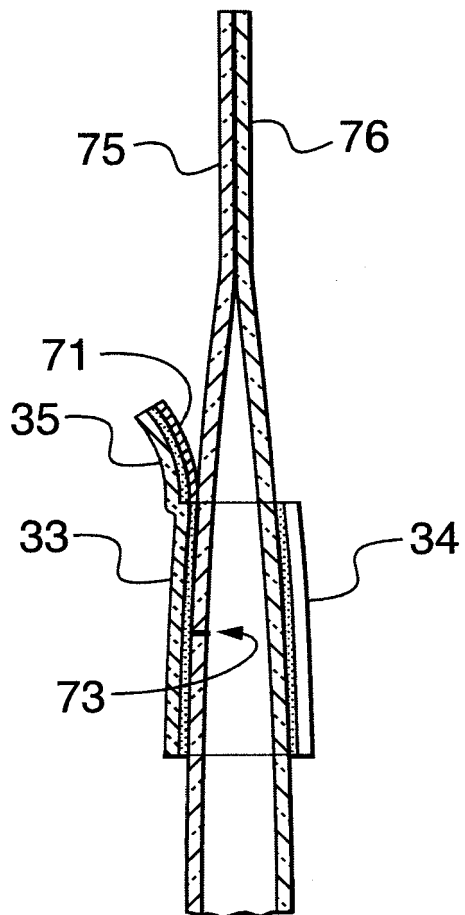


FIG. 8

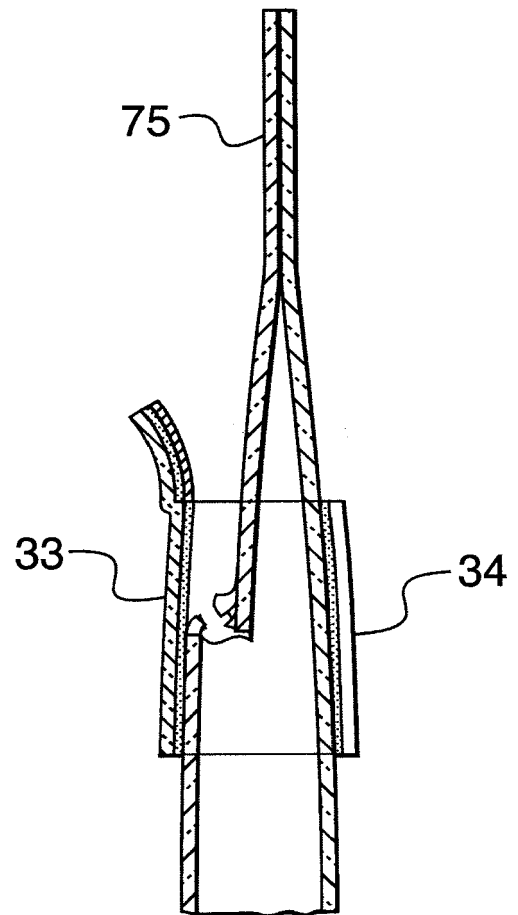


FIG. 9

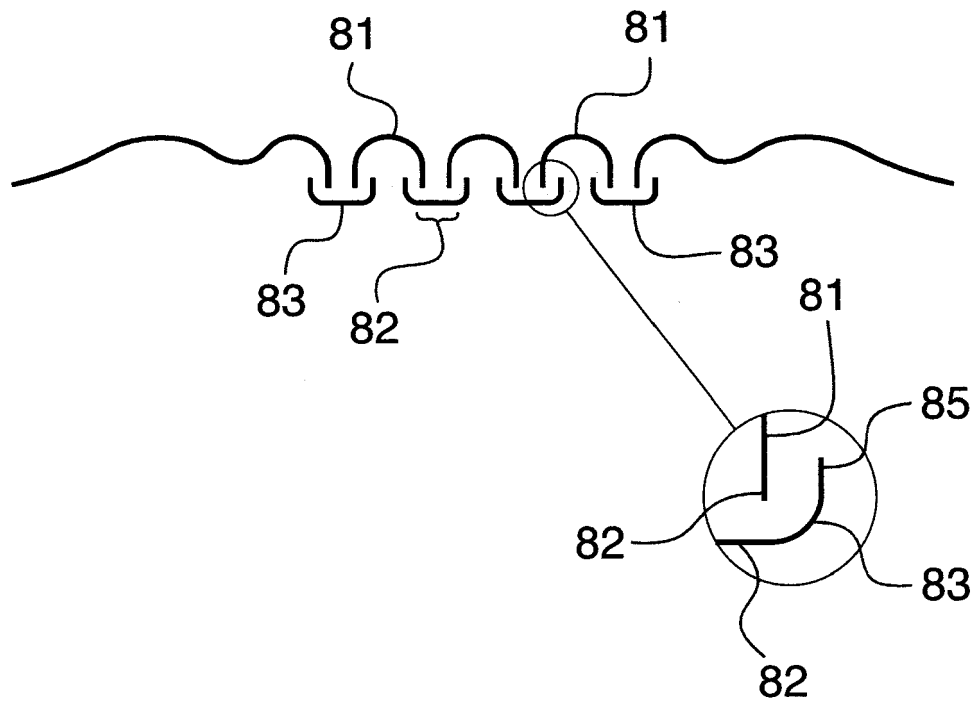
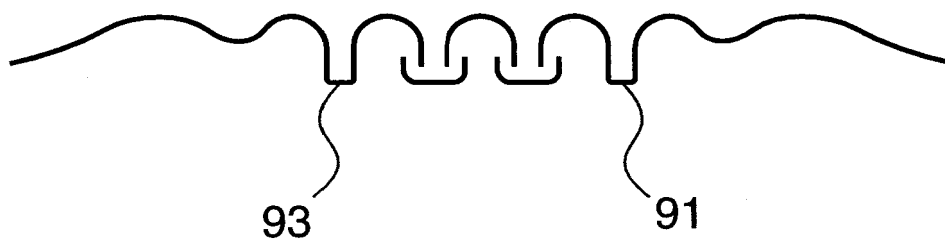


FIG. 10





EUROPEAN SEARCH REPORT

Application Number
EP 18 19 9433

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DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
Y	US 2015/266626 A1 (FORMAN JOSEPHINE ANNE [US] ET AL) 24 September 2015 (2015-09-24) * the whole document *	1-15	INV. B65D75/40 B65D75/58
Y	US 2 285 542 A (TASKER HOMER G) 9 June 1942 (1942-06-09) * page 1, left-hand column, lines 39-41; figures 4,7 * * page 1, right-hand column, lines 38-45 *	1-15	
A	US 4 572 377 A (BECKETT DONALD E [CA]) 25 February 1986 (1986-02-25) * abstract; figures *	1-15	
A	US 2 967 010 A (CUFFEY JR WILLIAM H ET AL) 3 January 1961 (1961-01-03) * claims; figures 1-8 *	1	
			TECHNICAL FIELDS SEARCHED (IPC)
			B65D
The present search report has been drawn up for all claims			
Place of search The Hague		Date of completion of the search 8 May 2019	Examiner Serrano Galarraga, J
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EP 18 19 9433

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08-05-2019

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Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 2015266626 A1	24-09-2015	NONE	
US 2285542 A	09-06-1942	NONE	
US 4572377 A	25-02-1986	NONE	
US 2967010 A	03-01-1961	NONE	

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For more details about this annex : see Official Journal of the European Patent Office, No. 12/82

REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

- WO 15696492 A [0001]
- US 9090383 B [0005]
- US 3570751 A [0007]
- US 4787517 A [0007]
- US 5746369 A [0007]
- US 3708108 A [0007]
- US 20140216969 A [0007]
- US 20080240628 A [0007]
- US 20150266626 A [0007]
- US 6659644 B [0007]
- EP 2049333 B1 [0013]
- US 20120060997 A1 [0013]
- US 5585193 A [0013]
- US 9676532 B [0013] [0014]