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(54) **PACKAGING WITH EASY OPENING FEATURE**

LEICHT ZU ÖFFNENDE VERPACKUNG

EMBALLAGE À ÉLÉMENT D'OUVERTURE FACILE

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(56) References cited:
**EP-A1- 0 030 348 EP-A2- 1 749 756
WO-A1-2011/146616 US-A- 3 291 377
US-A1- 2005 276 525 US-A1- 2013 165 887**

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Description

Technical Field of the Invention

[0001] The present invention relates to packaging, and in particular, but not exclusively, to packaging for food and more specifically confectionery products.

Background to the Invention

[0002] It is known to package products, including consumable food products such as chocolate bars and other confectionery or snack type products, in a package which is formed from a length of flexible, film-like material. The material has an inner surface directed to the food product and an outer surface. The outer surface in particular may be printed on or may otherwise be provided with information for the consumer.

[0003] One known packaging arrangement is commonly referred to as a flow-wrap package produced using a flow-wrap method in a substantially continuous process. This method is particularly suitable for wrapping a product that is substantially dimensionally stable and about which the film-like material can be wrapped, the material generally conforming to the shape of the product. The product may comprise a single substantially rigid product piece or it may comprise a number of substantially rigid product pieces arranged in an array. For example, the known flow-wrapped packages are often used to package substantially rigid product pieces such as chocolate or other confectionery or snack type bars and the like. Alternatively, the product may comprise a substantially dimensionally stable inner container which holds a number of product pieces or a flowable product. Often the product will be generally block shaped. However, the known method can be modified to package products of different shapes and types.

[0004] In the flow-wrap method, the film-like material is supplied in a roll and is fed through a machine which folds it about each product in turn so that opposing longitudinal side edges of the material are brought into contact and bonded together to form a longitudinal seal. The side edges can be bonded together inner face to inner face to form a fin seal or one side edge may overlap the other side edge to form a lap seal. The material is crimped to form transverse fin seals at either longitudinal end of the product and the material is cut to separate each package in turn from the remainder of the film. In the known arrangements, the seals may be formed using an adhesive, which may be a heat seal or a cold seal adhesive, to bond opposing surfaces of the material or by fusing the material together to form a welded seal. There are a number of known techniques for producing welded seals including heat sealing and ultra sonic sealing. When used to package a product using this method, the film-like material is often referred to as a wrapper as it is wrapped around the product.

[0005] A variety of materials can be used for forming

flow-wrapped packages including polymeric materials, metallic foil, and paper. Often the film-like material will be a laminate having two or more layers of different materials. For packaging confectionery products, a commonly used laminate comprises an inner layer of paper and an outer layer of a metallic, often aluminium, foil. Polymeric materials are also used in packaging film laminates and these include thermoplastic materials such as polyethylene terephthalate (PET), for example. Depending on the types of materials used, the known packages may be substantially gas and moisture impervious. However, for some food and confectionery applications, a hermitically sealed package is not desirable.

[0006] The known flow-wrap packaging forms a fully sealed container for the product. However, the material used to form such packages is typically quite tough it can be difficult to open as it does not easily tear in a controlled fashion, often requiring multiple tears to get the product out of the wrapper. To overcome this problem, it is known to provide such flow-wrapped packages with an opening feature in which a portion of material in the wrapper can be preferentially folded outwardly to create an opening.

[0007] One known type of opening feature is a tear strip which may comprise a section of the material having one or more lines of weakness along which the material is preferentially torn or separated. The tear strip will often be provided with a tab portion that can be grasped by a user to initiate opening. The tab may be provided on a separate label which is adhesively bonded to the outside of the tear strip or it may be formed integrally with the tear strip as part of the wrapper.

[0008] Where the wrapper material is laminated, it is known to define a tear strip in the material by means of offset lines of weakness formed in inner and outer structures of the laminate. An advantage of this arrangement is that the tear strip can be configured so that it is reclosable. Packaging of this type is disclosed in International patent application WO2011/121337 to Cadbury Holdings Limited.

[0009] In an alternative known arrangement, which can be used to provide a reclosable tear strip in a wrapper made from laminated or non-laminated material, the tear strip is defined in the wrapper between spaced lines of weakness and a label is adhesively bonded to the wrapper over the tear strip. The label has lateral edge regions that extend beyond the tear strip on either side and which are bonded to the wrapper outside of the lines of weakness in a peelable and reclosable manner. The bond strength between the label and the tear strip itself is higher than that between the lateral edge regions of the label and the wrapper outside of the lines of weakness. The label includes a portion which is not fully bonded to the wrapper to form a tab that can be grasped to initiate opening of the package. When a user pulls the tab, the lateral edge regions of the label peel away from the wrapper outside of the lines of weakness whilst the tear strip between the lines of weakness remains affixed to the label and the wrapper is caused to separate along

the lines of weakness. The package is reclosed by pressing the lateral edge regions of the label back into contact with the wrapper.

[0010] A further known type of opening feature comprises a flap defined by one or more lines of weakness that can be folded outwardly to reveal an opening. In some known arrangements, the flap is defined in the wrapper between one or more lines of weakness. The flap will often be provided with a tab that can be grasped to initiate opening. The tab may be provided by means of a label affixed to the outer surface of the flap or it may be integral with the flap. In some known packaging arrangements, the flap is reclosable. WO2010/046623 to Cadbury Holdings Limited discloses flow-wrapped packaging in which the wrapper is made from a laminated material and a reclosable flap is defined in the material by means of offset lines of weakness in inner and outer structures of the laminated material. An opening tab is defined by part of the outer laminate structure in a marginal region between the lines of weakness in the inner and outer laminate structures.

[0011] In the known packaging arrangements, the opening tab is usually provided on a planar face of the package and is arranged to lie flush with the wrapper material, see for example in US 2005/0276525 A1.

[0012] A drawback with the known packaging arrangements is that the tab can be difficult to grasp, requiring a high level of dexterity to open the package, see for example EP 1 749 756 A2. A further drawback is that the tab is often difficult to locate so that users cannot easily see how the package is intended to be opened.

[0013] It is desirable, therefore, to provide an improved or alternative packaging which overcomes, or at least mitigates, some or all of the disadvantages of the known packaging.

Summary of the Invention

[0014] In accordance with a first aspect of the invention, there is provided a packaging assembly comprising a flow-wrapped package containing a product, the package comprising a wrapper formed from a length of flexible, film-like material folded about the product and being closed by means of at least one seal extending longitudinally along a face of the package and by means of a transverse end seal at either longitudinal end of the package, the wrapper having an opening feature comprising a portion of the wrapper material that can be preferentially folded outwardly to produce an opening, the package including a tab attached to the opening feature that can be manually grasped to initiate opening, tab being connected to the opening feature at a base region and having an outer tip portion distal from the opening feature, wherein at least the outer tip portion is not bonded to an underlying portion of the wrapper material and protrudes from the surface of the wrapper material; wherein the at least one product is substantially block shaped having a pair of opposed major faces and a pair of opposed minor

faces, the package defining corresponding pairs of opposed major faces and minor faces, the opening feature being defined in a first one of the major faces of the package and the tab being located so that the outer tip portion protrudes at the intersection between said first one of the major faces and an adjacent one of the minor faces.

[0015] The tab may be embossed, shaped or otherwise treated so as to protrude from the surface of the wrapper in the package. The opening feature may be defined by at least one line of weakness in the wrapper material, the opening feature being preferentially separable from the remainder of the wrapper material along the at least one line of weakness. The at least one line of weakness may comprise a score line and the opening feature may be peelably attached to the remainder of the wrapper material.

[0016] In an embodiment, the opening feature comprises a tear strip.

[0017] In an embodiment the opening feature comprises a flap foldable about an edge. The flap may be foldable about an edge located adjacent and parallel to one of the transverse end seals or about an edge aligned substantially parallel to a side edge of the package and to the longitudinal seal.

[0018] The whole of the tab may not be bonded to an underlying portion of the wrapper material.

[0019] In an alternative embodiment, at least part of the tab is bonded to an underlying portion of the wrapper material, the bond strength between the tab and the underlying portion of the wrapper material decreasing in a direction from the base region to the outer tip region. The adhesive may be applied to the tab so that the amount of adhesive increases in a direction from the outer tip portion towards the base region. The adhesive may be selected and applied or treatment may be applied to the tab or the wrapper so that the bond strength between the tab and the underlying portion of the wrapper material decreases in a direction from the base region to the outer tip region.

[0020] The tab may comprise a part of a label which is bonded to an exterior surface of the opening feature.

[0021] In an embodiment wherein the opening portion comprises a flap foldable about one edge and having a free edge region defined by means of a score line through the wrapper material, the flap having an apex distal from said one edge which apex is located at an intersection between said first one of the major faces of the package and said adjacent minor face, an adhesive label may be bonded to the outer surface of the wrapper extending across the line of weakness so as to be bonded to both the flap inside the line of weakness and a portion of the wrapper outside the line of weakness, the tab being defined by a portion of the label that is not fully bonded to the underlying portion of the wrapper adjacent the apex of the flap at said intersection. The flap may be foldable about an edge located adjacent and parallel to one of the transverse end seals. The label may be bonded to the portion of the wrapper outside the line of weakness in a

peelable and, preferably, reclosable manner. The line of weakness may comprise a score line extending fully through the thickness of the wrapper material. The label may extend over the entire length of the line of weakness.

[0022] The tab may be an integral part of the wrapper material. In an embodiment, the wrapper material is a laminated material having an outer laminate structure bonded to an inner laminate structure, each of the outer and inner laminate structures comprising at least one layer of flexible material; the opening feature being defined by means of at least one outer line of weakness in the outer laminate structure and at least one inner line of weakness in the inner laminate structure, the at least one outer line of weakness delineating an outer opening portion of the outer laminate structure that is separable from the remainder of the outer structure along the at least one outer line of weakness, the at least one inner line of weakness delineating an inner opening portion of the inner laminate structure that is affixed to the outer opening portion and is separable from remainder of the inner structure along the at least one inner line of weakness, wherein the inner and outer lines of weakness are offset from one another and at least part of a marginal region of the outer opening portion between the outer and inner lines of weakness is peelably attached to an underlying surface of the inner laminate structure, the marginal region of the outer opening portion being peelable from the underlying surface of the inner laminate structure so as to cause the inner opening portion to also be peeled back to create an opening in the laminated film; the tab being defined by part of the marginal region of the outer opening portion between the inner and outer lines of weakness. The marginal region of the outer structure may be re-attachable to the underlying surface of the inner structure for re-closing the opening.

Detailed Description of the Invention

[0023] Several embodiments of the invention will now be described, by way of example only, with reference to the accompanying drawings, in which:

Figure 1 is a perspective view of part of a packaging assembly in accordance with a first embodiment of the invention;

Figure 2 is a cross-sectional view on an enlarged scale through a package forming part of the packaging assembly of Figure 1, taken on line X-X;

Figure 3 is a view similar to that of Figure 2 but illustrating an alternative embodiment;

Figure 4 is a perspective schematic view of a length of material in accordance with a first embodiment useful for forming a package comprising part of the packaging assembly of Figure 1;

Figure 5 is an enlarged view of part of the material of Figure 4;

Figure 6 is a plan view of a length of material in accordance with a second embodiment useful for forming a package comprising part of the packaging assembly of Figure 1;

Figure 7 is an enlarged view of part of the material of Figure 4;

Figure 8 is a perspective view of part of a packaging assembly in accordance with a further embodiment of the invention;

Figure 9 is a perspective view of part of the packaging assembly of Figure 8 on an enlarged scale.

[0024] Figure 1 illustrates an embodiment of a packaging assembly 10 in accordance with an embodiment of the present invention. The packaging assembly 10 comprises a flow-wrapped package 12 formed from a wrapper 14 of flexible, film-like material 16 which is folded around a product (not shown) and sealed to fully enclose the product. Overlapping longitudinal edge regions of the wrapper 14 are bonded together to form a longitudinal seam (not shown) which extends along a rear face of the package in a known manner. The longitudinal seam may be a fin seal in which the overlapping longitudinal edge regions are bonded together inner face to inner face or it may be a lap type seal. Opposing end edge regions of the wrapper material are bonded together to form transverse sealed seams (not shown in Fig. 1 but see 170 in Fig. 8 as described below) at either end of the product in a known manner.

[0025] The product may be a food product, including but not limited to: confectionery products such as such chocolate and candy bars, cheese, biscuits, and other snack type food products. However, the invention is not limited to packaging for food products and can be adapted for use in packaging other types of product.

[0026] The product may be a single substantially rigid product piece such as a chocolate bar. Alternatively, the product may include two or more separate substantially rigid product pieces arranged together in an array. For example, the product could comprise two or more chocolate bars arranged side-by-side or end-to-end. Alternatively, the product could comprise at least one substantially rigid inner container which holds two or more product pieces or a flowable material.

[0027] The term "substantially rigid" is used in relation to the product pieces and the inner container to indicate that the product piece or container will generally keep its shape when the wrapper 14 is folded about it to form the package, with the wrapper conforming to the shape of the product piece or container. It will be appreciated however that this does not require that the product piece or inner container is absolutely rigid.

[0028] In an embodiment, the product has at least two generally planar faces or sides so that when the wrapper 14 is folded about the product, the resultant package 12 also has at least two faces, with a corner region or transition where the wrapper changes direction between each pair of adjacent faces. In the embodiment disclosed in Figure 1, the product is a generally block shaped product having a pair of opposed major faces and a pair of opposed minor faces. When formed into the package 12, the wrapper conforms to the shape of the product so that the package 12 has a corresponding block shape with a pair of opposed major faces 18, 20 and a pair of opposed minor faces 22, 24 with a corner or transition 25 between each pair of adjacent faces. In this embodiment the product is a chocolate bar and the major faces 18, 20, are significantly wider than the minor faces 22, 24.

[0029] The term "transition" is used herein to refer to a region of the package where the wrapper 14 changes direction between one face of the package and another. This could comprise a sharp corner or a more rounded transition but generally refers to region where the wrapper transitions from one generally planar face to another. Where the product is very thin, the package may effectively have only two generally planar faces, these being the front and rear major faces 18, 20, with the wrapper being continuously curved about the side edges of the product.

[0030] The wrapper 14 has a flap portion 26 near to one end which forms a sealed and re-closable opening feature for the packaging. The flap 26 is foldably connected with a main body 34 of the wrapper along one edge 28, which in this embodiment is aligned generally parallel with a side edge or minor face 24 of the package. The free outer edge region 30 of the flap overlaps a marginal edge region 32 of the main body portion 34 of the wrapper. The free outer edge 30 of the flap is bonded to the overlapping marginal edge region 32 of the main body portion 34 by means of a peelable and re-closable adhesive 35.

[0031] The flap portion 26 has tab 36 at one end distal from the folding edge 28 and which can be manually grasped by a person to initiate opening of the package. The tab is connected to the flap portion 26 at a base region 38 and has an outer tip portion 40 distal from the flap portion 26. At least the distal outer tip portion 40 of the tab 36 is not bonded to the underlying wrapper 14 material. The wrapper 14 and the flap portion 26 are configured so that in the formed package 12, the tab 36 is located at the transition or corner 25 between one of the major faces 18 and one of the minor faces 22 of the package 12. This results in the tab 36 protruding from the surface of the wrapper 14 so that it can be easily grasped to initiate opening of the package 12 and makes the tab 36 easier to see.

[0032] The packaging assembly 10 can be produced using a flow-wrap method in which a film of material 16 is supplied in a roll to sequentially package a number of products in a substantially continuous process in accord-

ance with the known method as previously described. The material 16 has a number of wrapper sections 14 disposed along its length, each wrapper section 14 having an appropriately positioned flap portion 26. The material is fed through a machine which sequentially folds each wrapper section 14 about a product in turn so that opposing longitudinal edge regions are brought into contact and bonded together to form the longitudinal seam. The material is crimped at either end of the product to form the transverse end seams and the material is cut to separate each package 12 from the remainder of the film 16.

[0033] The packaging assembly 10 is supplied with the flap portion 26 in a closed and sealed condition. A consumer opens the package 10 by grasping the tab 36 and peeling the flap portion 26 away from the main body portion 34 to reveal an opening or aperture through which the product or a part thereof can be removed.

[0034] The peelable seal between the flap portion 26 and the marginal edge region 32 of the main body 34 may be fully re-sealable but in practice it will not usually be expected to form a hermetic seal when the flap is re-closed. In most applications it will be sufficient if the strength of the bond formed when the flap is re-closed is sufficient that the flap is able to hold the remaining contents securely in the package and to provide some protection for the product from the environment. In the case where the packaging is used to package a food product, such as a chocolate bar, it is expected that the flap portion 26 will be fully sealed when the package is formed prior to the first opening. In some cases, the packaging will initially form a hermetically sealed package, though for some foodstuffs a hermetically sealed package is not desirable.

[0035] In one embodiment, the film-like material 16 is a laminate having an inner laminate structure 41 and an outer laminate structure 42 as illustrated in Figure 2. The inner laminate structure 41 may be a metallic foil or another metallised material and the outer laminate structure 42 may be a plastics material. However, the inner and outer laminate structures 41, 42 can be made from any flexible materials suitable for packaging the product concerned. Examples of typical materials include: paper based materials, one or more polymeric materials, and metallic foils. Each of the inner and outer laminate structures 41, 42 could itself be a lamination of two or more layers of materials. Where the product is a food product, the laminated material 16 may be substantially moisture and gas impervious so that when the wrapper 14 is fully sealed, the packaging 10 provides a hermetically sealed container for the product. However, this is not essential.

[0036] The flap portions 26 are formed as an integral part of the film 16 by producing offset lines of weakness, which may be through cuts or score lines, in the inner and outer laminate structures 41, 42 of the laminated material. A first or outer line of weakness 44 is formed though the outer laminate structure 42 and delineates an outer edge of an outer opening portion 46 in the outer

laminate structure which is separable from the remainder of the outer laminate structure 42 along the outer line of weakness. A second or inner line of weakness 48, spaced inwardly (in terms of the flap portion 26) from the outer line of weakness 44, is formed through the inner laminate structure 41 and delineates an inner opening portion 50 in the inner laminate structure which is affixed to the outer opening portion 46 and is separable from the remainder of the inner laminate structure 41 along the inner line or weakness 48. The distance between the inner and outer lines of weakness 44, 48 defines the marginal region 32 where the edge of the outer opening portion 46 of the outer structure 42 overlies the remainder of inner laminate structure 41 to form the free edge 30 of the flap portion 26.

[0037] In the present embodiment, the inner and outer laminate structures 41, 42 are bonded together by a permanent adhesive 52 over the majority of their areas. However, in at least part of the marginal region 32 between the inner and outer lines of weakness 44, 48, the laminate structures 41, 42 are bonded together by means of a peelable and re-sealable adhesive 52. The peelable and re-sealable adhesive 52 may be a cold seal or pressure sensitive adhesive, for example. In an alternative embodiment the inner and outer laminate structures 41, 42 are bonded together using only a single peelable adhesive both in the marginal region 32 and in the remaining lamination area of the structures but the arrangement is configured so that the bond strength in the marginal edge region 32 is lower than over the remainder of the lamination so that the marginal edge region 32 will preferentially delaminate when the flap 26 is opened.

[0038] The lines of weakness 44, 48 can be produced using laser cutters 54, 56 as illustrated or they could be die cut, for example by means of opposed die cylinders having cutting blades which engage opposites sides of the material 16 or using any suitable method and apparatus. The lines of weakness 44, 48 are shaped to also define the tab 36 which is formed by a part of the outer laminate structure 42 between the inner and outer lines of weakness which is not fully bonded to the underlying part of the inner laminate structure 41.

[0039] Figure 3 illustrates an alternative arrangement for producing a reclosable flap portion 26 which can be used with a non-laminated material. In this embodiment, the free edge 30 of the flap is produced by laser treatment (e.g. laser cutting/etching) of the wrapper material 16 to produce overlapping regions 60 along the free edge 30 of the flap portion 26 and the main body 34. As illustrated in Figure 3, a cut 62 is made through the material following a stretched or elongate "S" shaped path to create an overlapping region 60 between the free edge 30 of the flap portion and the marginal edge region 32 main body portion 34. A peelable and preferably resealable adhesive is applied to one or both of the overlapping free edge 30 of the flap portion and the marginal edge region 32 of main body portion. The cut also defines the tab 36 at a distal end of the flap which is not fully bonded to the un-

derlying material in the main body 34 of the wrapper.

[0040] To further ensure that the tab 36 protrudes from the surface of the wrapper 14, the tab 36 may be embossed or otherwise shaped so that it tends to stick out from the wrapper, at least when formed into a package 12. Figures 4 and 5 illustrate a length film 16 comprising a wrapper section 14 in which a flap portion 26 is produced using either of the methods discussed above. The inner extent of the marginal edge region 30 of the flap portion 26 is indicated schematically by the line 64. The tab 36 is not fully bonded to the underlying wrapper material and is embossed to form a number of ridges 66 which are configured to cause the outer tip region 40 of the tab 26 to protrude from the plane of the wrapper 14. It will be appreciated that other patterns of embossing could be used to cause the outer tip region 40 of the tab 36 to protrude.

[0041] At least the outer tip region of 36 is not bonded to the underlying wrapper material. In an embodiment, the whole of the tab 36 is not bonded to the underlying wrapper material. In an alternative embodiment, the tab 36 is partially bonded to the underlying material but the arrangement is configured so that the bond strength reduces in a direction from the base region 38 towards the outer tip 40 so that at least the outer tip 40 of the tab 36 protrudes from the surface of the wrapper material. For example, this could comprise vignetting the adhesive 35 so there is little or no adhesive at the tip 40 of the tab 36 and the amount of adhesive gets heavier nearer the aperture at the base region 38. The amount of adhesive may be measured as a density in grams per square meter. Alternatively or additionally, the strength of the adhesive may be varied to adjust the bond strength as required. This is illustrated schematically in Figures 6 and 7 which shows a length of film 16 having a wrapper section 14 in which a flap portion 26 is produced using either of the methods discussed above, similar to Figures 4 and 5 discussed above. In Figures 6 and 7, the adhesive 35 used to bond the marginal edge region 30 of the flap portion 26 to the marginal edge region 32 of the main body 34 is shown by the dark colour. As can be seen best in the detail in Figure 7, the adhesive 35 is applied in a pattern to the tab 36 so that the amount (density) of adhesive reduces from the base region 38 towards the outer tip 40.

[0042] Figures 8 and 9 illustrate a second embodiment of a packaging assembly 110 in accordance with the invention. The packaging assembly 110 of the second embodiment is similar to the packaging assembly 10 of the first embodiment and the same reference numerals but increased by one hundred in each case will be used to identify features that are the same or which perform the same function as in the previously described embodiment.

[0043] The package assembly 110 comprises a flow-wrapped package 112 formed from a wrapper 114 of flexible, film-like material 116 which is folded around a product (not shown) and sealed to fully enclose the product.

The flow-wrapped package 112 is similar to the package 12 as described above in relation to the first embodiment and can be manufactured in a similar manner. Accordingly, only those features that differ from the first embodiment will be described in detail.

[0044] The package 112 comprises an openable flap portion 126, which in this embodiment is foldably connected with the remainder of the wrapper 114 along one edge 128 which is adjacent to and parallel with one of the transverse end seals 170. The flap portion 126 is defined in the wrapper material by a simple line of weakness, indicated by dashed line 172, to define the "free" outer edge 130 of the flap portion 126. The flap portion 126 is shaped so that it has an apex 174 distal from the folding edge 128 and which is laterally offset from a centre line of the front major face 118 so that it is positioned at the transition or corner 125 between the front major face 118 and one of the minor side faces 122 of the package.

[0045] Because the flap portion 126 is defined by a simple straight line of weakness 172, the flap portion 126 does not overlap a marginal edge region of the main body 134 of the wrapper 114. In order that the flap can be opened and reclosed, a label 176 is bonded to the outside of the wrapper, overlapping the free outer edge 130 of the flap portion 126 and a marginal edge region 132 of the main body 134 outside of the line of weakness 172. The label 176 is shaped so as to follow the contour of the free edge 130 of the flap portion 126. The label has a main body 178 which is bonded to the wrapper 114 and a tab portion 136 of which at least an outer tip 140 is not bonded to the wrapper 114. The whole of the tab portion 136 may not be bonded or the tab portion may only be partially bonded in a manner similar to that described above in relation to Figures 6 and 7. The main body 178 may be transparent so that any printing on the outside of the wrapper 114 is visible through the main body and the tab 136 may be printed on so that the tab can be easily seen.

[0046] The tab 136 is located at the apex 174 of the flap portion at the transition or corner 125 between the front major face 118 and the minor side face 122 so that it tends to protrude from the wrapper making it easy to find and grasp.

[0047] The main body 178 of the label 176 is bonded to the marginal region of the main body 134 of the wrapper outside the line of weakness 172 in a peelable and, preferably, a reclosable manner but is bonded to the marginal edge region 130 of the flap portion 126 inside the line of weakness 172 so that the label will remain attached to the flap portion on opening. The label 176 may be bonded to the flap portion 126 using a permanent adhesive and to the main body using a peelable and re-sealable adhesive such as a cold seal. Alternatively, the label 176 may be bonded to both the flap portion 126 and the main body 134 using the same adhesive but the arrangement configured so that the bond strength between the label 176 and the flap portion 126 is higher than that between the label and the main body 134.

[0048] As with the first embodiment, the tab 136 could be embossed or otherwise shaped or treated so as to encourage it to protrude from the wrapper 114.

[0049] The flap portion 126 is located adjacent one end of the package so that once opened the product can be slid out of the main body portion 134 of the package in a longitudinal direction through the opening. Where the product is a portioned bar of chocolate for example, it need be slid out only far enough to enable the consumer to break off one or more portions as required. The remaining product can then be slid back into the package and the flap portion 126 re-sealed to keep it secure.

[0050] In an embodiment, the line of weakness 172 is a through-cut or score line that extends fully through the thickness of the wrapper material. In this embodiment, the line of weakness 172 may be formed after the label 176 has been applied to the wrapper material. This embodiment is advantageous in that the wrapper material does not have to be torn when opening the package. To ensure an adequate seal, in this embodiment the label will usually extend along the entire length of the line of weakness 172. However, in an alternative embodiment, the line of weakness 172 may only extend partially through the thickness of the wrapper material to maintain the integrity of the package without the need for the label to cover the whole length of the line of weakness.

[0051] In the embodiments described, the tab 136 is located at the transition or corner 125 between two adjacent faces of the package to encourage the tab to protrude from the wrapper.

[0052] The foregoing embodiments are not intended to limit the scope of protection afforded by the claims, but rather to describe examples how the invention may be put into practice.

Claims

1. A packaging assembly (10; 110) comprising a flow-wrapped package (12; 112) containing a product, the package comprising a wrapper (14; 114) formed from a length of flexible, film-like material (16; 116) folded about the product and being closed by means of at least one seal extending longitudinally along a face of the package and by means of a transverse end seal (170) at either longitudinal end of the package, the wrapper having an opening feature (26; 126) comprising a portion of the wrapper material that can be preferentially folded outwardly to produce an opening, the package including a tab (36; 136) attached to the opening feature that can be manually grasped to initiate opening, the tab being connected to the opening feature at a base region (38) and having an outer tip portion (40; 140) distal from the opening feature, wherein at least the outer tip portion is not bonded to an underlying portion of the wrapper material and protrudes from the surface of the wrapper material; wherein the at least one product is sub-

- stantially block shaped having a pair of opposed major faces and a pair of opposed minor faces, the package (12; 112) defining corresponding pairs of opposed major faces (18, 20; 118, 120) and minor faces (22, 24; 122), the opening feature being defined in a first one of the major faces (18; 118) of the package (12; 112), **characterized in** the tab (36; 136) being located so that the outer tip portion (40; 140) protrudes at the intersection (25; 125) between said first one of the major faces (18; 118) and an adjacent one of the minor faces (22; 122).
2. A packaging assembly (10; 110) as claimed in claim 1, wherein the tab (36; 136) is embossed (66), shaped or otherwise treated so as to protrude from the surface of the wrapper (14; 114) in the package (12; 112).
 3. A packaging assembly (10; 110) as claimed in any one of the preceding claims, wherein the opening feature (26; 126) is defined by at least one line of weakness (44, 48; 62; 172) in the wrapper material, the opening feature (26; 126) being preferably separable from the remainder of the wrapper material along the at least one line of weakness (44, 48; 62; 172).
 4. A packaging assembly (10; 110) as claimed in claim 3, wherein the at least one line of weakness (44, 48; 62; 172) comprises a score line and the opening feature (26; 126) is peelably attached to the remainder of the wrapper material.
 5. A packaging assembly as claimed in any one of the preceding claims, wherein the opening feature (26; 126) comprises a tear strip.
 6. A packaging assembly (10; 110) as claimed in any one of claims 1 to 4, wherein the opening feature (26; 126) comprises a flap (26; 126) foldable about an edge.
 7. A packaging assembly (10; 110) as claimed in any one of the preceding claims, wherein at least part of the tab (36; 136) is bonded to an underlying portion of the wrapper material and wherein the bond strength between the tab (36; 136) and the underlying portion of the wrapper material decreases in a direction from the base region (38) to the outer tip portion (40; 140).
 8. A packaging assembly (10; 110) as claimed in claim 7, wherein the adhesive (35) is applied to the tab (36; 136) so that the amount of adhesive increases in a direction from the outer tip portion (40; 140) towards the base region (38).
 9. A packaging assembly (110) as claimed in any one of the preceding claims, wherein the tab (136) comprises a part of a label (176) which is bonded to an exterior surface of the opening feature (126).
 10. A packaging assembly (110) as claimed in claim 9, wherein the opening feature (126) comprises a flap (126) foldable about one edge (128) and having a free edge region (130) defined by means of a score line (172) through the wrapper material, the flap having an apex (174) distal from said one edge which apex is located at the intersection (125) between said first one of the major faces (118) and said adjacent minor face (122), an adhesive label (176) bonded to the outer surface of the wrapper (114) extending across the line of weakness (172) so as to be bonded to both the flap (126) inside the line of weakness and a portion of the wrapper outside the line of weakness, the tab (136) being defined by a portion of the label that is not fully bonded to the underlying portion of the wrapper adjacent the apex of the flap at said intersection.
 11. A packaging assembly (110) as claimed in claim 10, wherein the flap (126) is foldable about an edge (130) located adjacent and parallel to one of the transverse end seals (172).
 12. A packaging assembly (10) as claimed in any one of claims 1 to 8, wherein the tab (36) is an integral part of the wrapper material (16), the wrapper material being a laminated material having an outer laminate structure (42) bonded to an inner laminate structure (41), each of the outer and inner laminate structures comprising at least one layer of flexible material; the opening feature (26) being defined by means of at least one outer line of weakness (44) in the outer laminate structure and at least one inner line of weakness (48) in the inner laminate structure, the at least one outer line of weakness (44) delineating an outer opening portion (46) of the outer laminate structure that is separable from the remainder of the outer structure along the at least one outer line of weakness, the at least one inner line of weakness (48) delineating an inner opening portion (50) of the inner laminate structure that is affixed to the outer opening portion (46) and is separable from remainder of the inner structure along the at least one inner line of weakness, wherein the inner and outer lines of weakness (44, 48) are offset from one another and at least part of a marginal region (32) of the outer opening portion (46) between the outer and inner lines of weakness is peelably attached to an underlying surface of the inner laminate structure, the marginal region (32) of the outer opening portion being peelable from the underlying surface of the inner laminate structure (41) so as to cause the inner opening portion (50) to also be peeled back to create an opening in the laminated film; the tab (36) being de-

finied by part of the marginal region (32) of the outer opening portion (46) between the inner and outer lines of weakness.

13. A packaging assembly (10) as claimed in claim 12, wherein the marginal region (32) of the outer structure (42) is re-attachable to the underlying surface of the inner structure (41) for re-closing the opening.

Patentansprüche

1. Verpackungsanordnung (10; 110), die eine ein Produkt umfassende Schlauchbeutelpackung (12; 112) umfasst, die eine aus einer Länge von flexiblem, folienartigen Material (16; 116) ausgebildete Umhüllung (14; 114) umfasst, die um das Produkt herum gefaltet und mittels mindestens einer sich entlang einer Fläche der Verpackung in Längsrichtung erstreckenden Versiegelung und mittels einer querverlaufenden Endversiegelung (170) an einem der Längsenden der Verpackung verschlossen ist, wobei die Umhüllung ein Öffnungsmerkmal (26; 126) aufweist, das einen Abschnitt des Umhüllungsmaterials umfasst, der vorzugsweise nach außen gefaltet werden kann, um eine Öffnung zu erzeugen, wobei die Verpackung eine an dem Öffnungsmerkmal befestigte Zunge (36; 136) aufweist, die manuell ergriffen werden kann, um das Öffnen zu initiieren, wobei die Zunge an einem Basisbereich (38) mit dem Öffnungsmerkmal verbunden ist und distal von dem Öffnungsmerkmal einen äußeren Spitzenabschnitt (40; 140) aufweist, wobei mindestens der äußere Spitzenabschnitt nicht mit einem darunterliegenden Abschnitt des Umhüllungsmaterials verklebt ist und von der Oberfläche des Umhüllungsmaterials absteht; wobei das mindestens eine Produkt im Wesentlichen eine Blockform mit einem Paar von gegenüberliegenden Hauptflächen und einem Paar von gegenüberliegenden Nebenflächen aufweist, wobei die Verpackung (12; 112) entsprechende Paare von gegenüberliegenden Hauptflächen (18, 20; 118; 120) und Nebenflächen (22, 24; 122) definiert, wobei das Öffnungsmerkmal in einer ersten der Hauptflächen (18; 118) der Verpackung (12; 112) definiert ist, **dadurch gekennzeichnet, dass** die Zunge (36; 136) so angeordnet ist, dass der äußere Spitzenabschnitt (40; 140) an der Schnittstelle (25; 125) zwischen der ersten der Hauptflächen (18; 118) und einer angrenzenden der Nebenflächen (22; 122) absteht.
2. Verpackungsanordnung (10; 110) nach Anspruch 1, wobei die Zunge (36; 136) geprägt (66), geformt oder anderweitig so behandelt ist, dass sie von der Oberfläche der Umhüllung (14; 114) in der Verpackung (12; 112) absteht.

3. Verpackungsanordnung (10; 110) nach einem der vorstehenden Ansprüche, wobei das Öffnungsmerkmal (26; 126) durch mindestens eine Schwachstellenlinie (44, 48; 62; 172) in dem Umhüllungsmaterial definiert ist, wobei das Öffnungsmerkmal (26; 126) vorzugsweise von dem Rest des Umhüllungsmaterials entlang der mindestens einen Schwachstellenlinie (44, 48; 62; 172) trennbar ist.
4. Verpackungsanordnung (10, 110) nach Anspruch 3, wobei die mindestens eine Schwachstellenlinie (44, 48; 62; 172) eine Bruchlinie umfasst und das Öffnungsmerkmal (26; 126) abziehbar mit dem Rest des Umhüllungsmaterials verbunden ist.
5. Verpackungsanordnung nach einem der vorstehenden Ansprüche, wobei das Öffnungsmerkmal (26; 126;) einen Aufreißstreifen umfasst.
6. Verpackungsanordnung (10; 110) nach einem der Ansprüche 1 bis 4, wobei das Öffnungsmerkmal (26; 126) eine um eine Kante faltbare Lasche (26; 126) umfasst.
7. Verpackungsanordnung (10; 110) nach einem der vorstehenden Ansprüche, wobei mindestens ein Teil der Zunge (36; 136) mit dem darunterliegenden Abschnitt des Umhüllungsmaterials verklebt ist, und wobei die Haftfestigkeit zwischen der Zunge (36; 136) und dem darunterliegenden Abschnitt des Umhüllungsmaterials in einer Richtung von dem Basisbereich (38) zum äußeren Spitzenabschnitt (40; 140) abnimmt.
8. Verpackungsanordnung (10; 110) nach Anspruch 7, wobei der Klebstoff (35) so auf die Zunge (36; 136) aufgetragen wird, dass die Menge an Klebstoff in einer Richtung von dem äußeren Spitzenabschnitt (40; 140) zur Basisregion (38) zunimmt.
9. Verpackungsanordnung (110) nach einem der vorstehenden Ansprüche, wobei die Zunge (136) einen Teil eines Etiketts (176) umfasst, welches mit einer Außenfläche des Öffnungsmerkmals (126) verklebt ist.
10. Verpackungsanordnung (110) nach Anspruch 9, wobei das Öffnungsmerkmal (126) eine um eine Kante (128) faltbare Lasche (126) umfasst und einen freien Kantenbereich (130) aufweist, der mittels einer Bruchlinie (172) durch das Umhüllungsmaterial definiert ist, wobei die Lasche distal von der Kante eine Spitze (174) aufweist, wobei sich die Spitze an der Schnittstelle (125) zwischen der ersten der Hauptflächen (118) und der angrenzenden Nebenfläche (122) befindet, wobei ein Klebeetikett (176) auf die Außenfläche der Umhüllung (114) geklebt ist, das sich über die Schwachstellenlinie (172) erstreckt, so-

dass es sowohl mit der Lasche (126) innerhalb der Schwachstellenlinie als auch mit einem Abschnitt der Umhüllung außerhalb der Schwachstellenlinie verklebt ist, wobei die Zunge (136) durch einen Abschnitt des Etiketts definiert ist, der nicht vollständig mit dem darunterliegenden Abschnitt der Umhüllung, der an die Spitze der Lasche an der Schnittstelle angrenzt, verklebt ist.

11. Verpackungsanordnung (110) nach Anspruch 10, wobei die Lasche (126) um eine Kante (130) faltbar ist, die sich angrenzend und parallel zu einer der querverlaufenden Endversiegelungen (172) befindet.
12. Verpackungsanordnung (10) nach einem der Ansprüche 1 bis 8, wobei die Zunge (36) ein fester Bestandteil des Umhüllungsmaterials (16) ist, wobei das Umhüllungsmaterial ein Schichtmaterial ist, das eine mit einer inneren Schichtstoffstruktur (41) verklebte äußere Schichtstoffstruktur (42) aufweist, wobei jede der äußeren und inneren Schichtstoffstrukturen mindestens eine Lage aus flexiblem Material umfasst; wobei das Öffnungsmerkmal (26) mittels mindestens einer äußeren Schwachstellenlinie (44) in der äußeren Schichtstoffstruktur und mindestens einer inneren Schwachstellenlinie (48) in der inneren Schichtstoffstruktur definiert ist, wobei die mindestens eine äußere Schwachstellenlinie (44) einen äußeren Öffnungsabschnitt (46) der äußeren Schichtstoffstruktur abgrenzt, der von dem Rest der äußeren Struktur entlang mindestens einer äußeren Schwachstellenlinie trennbar ist, wobei die mindestens eine innere Schwachstellenlinie (48) einen inneren Öffnungsabschnitt (50) der inneren Schichtstoffstruktur abgrenzt, der an dem äußeren Öffnungsabschnitt (46) befestigt ist und von dem Rest der inneren Struktur entlang der mindestens einen inneren Schwachstellenlinie trennbar ist, wobei die inneren und äußeren Schwachstellenlinien (44, 48) voneinander versetzt sind und mindestens ein Teil des Randbereichs (32) des äußeren Öffnungsabschnitts (46) zwischen den äußeren und inneren Schwachstellenlinien abziehbar an der darunterliegenden Oberfläche der inneren Schichtstoffstruktur befestigt ist, wobei der Randbereich (32) des äußeren Öffnungsabschnitts derart von der darunterliegenden Oberfläche der inneren Schichtstoffstruktur (41) abziehbar ist, dass verursacht wird, dass der innere Öffnungsabschnitt (50) ebenfalls abgezogen wird, um eine Öffnung in der laminierten Folie zu erzeugen; wobei die Zunge (36) durch einen Teil des Randbereichs (32) des äußeren Öffnungsabschnitts (46) zwischen den inneren und äußeren Schwachstellenlinien definiert ist.
13. Verpackungsanordnung (10) nach Anspruch 12, wobei der Randbereich (32) der äußeren Struktur (42)

an der darunterliegenden Oberfläche der inneren Struktur (41) zum Wiederverschließen der Öffnung wiederbefestigbar ist.

Revendications

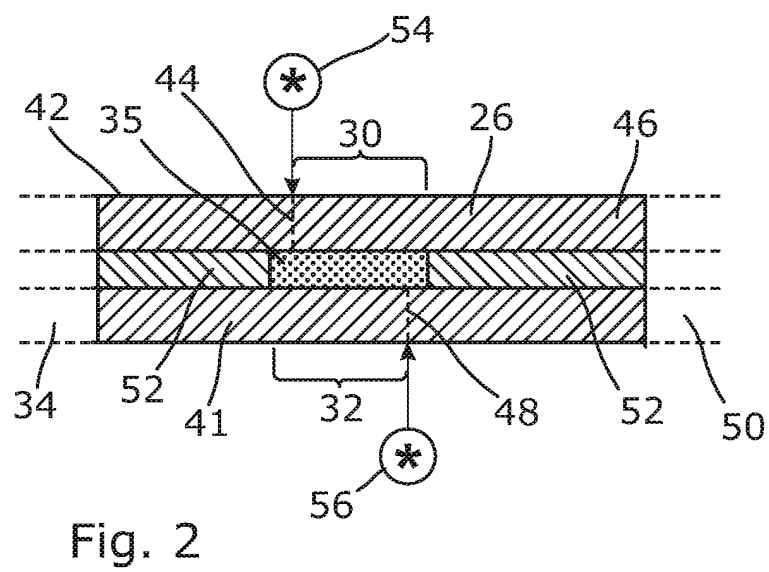
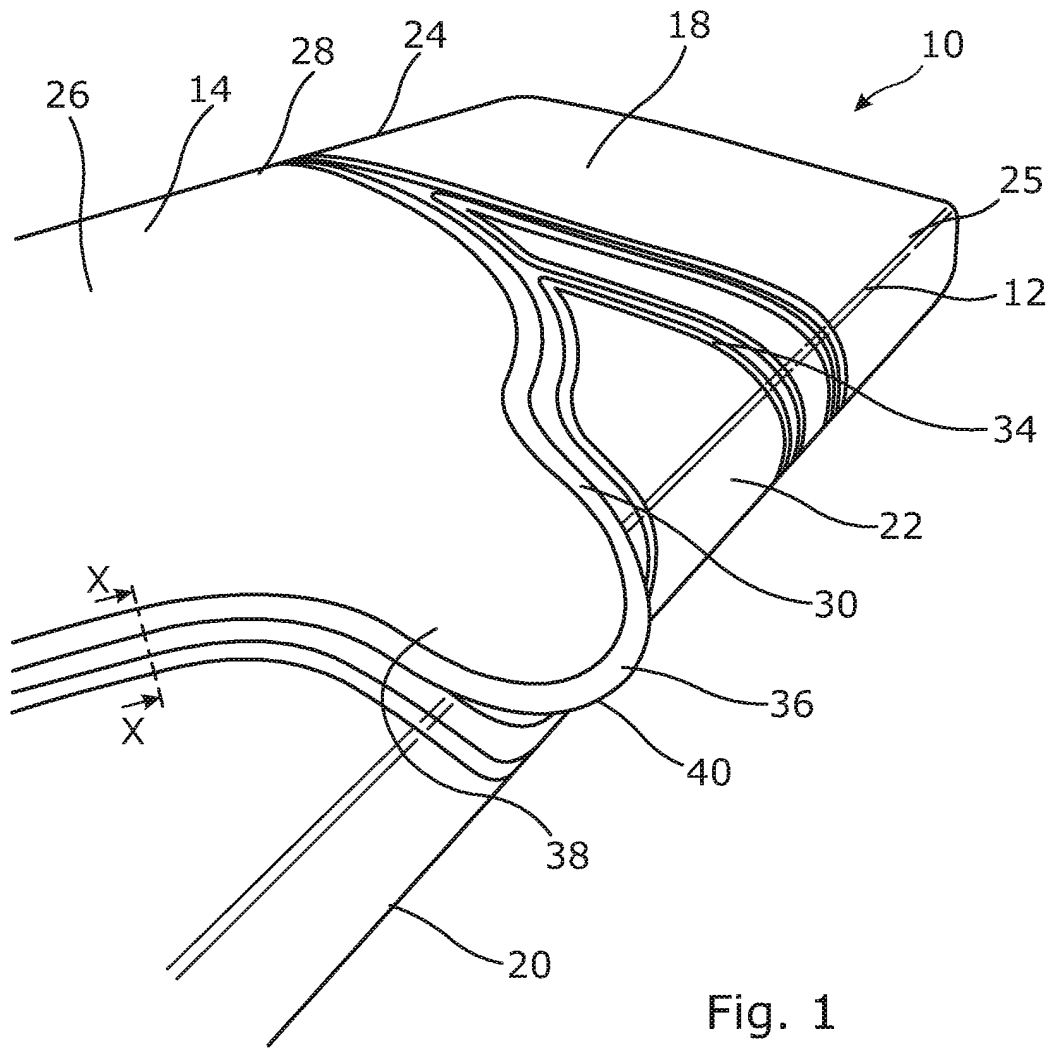
1. Ensemble d'emballage (10 ; 110) comprenant un emballage tubulaire (12 ; 112) contenant un produit, l'emballage comprenant une enveloppe (14 ; 114) formée à partir d'une longueur de matériau souple, de type film (16 ; 116) pliée autour du produit et étant fermée au moyen d'au moins un joint s'étendant longitudinalement le long d'une face de l'emballage et au moyen d'un joint d'extrémité transversal (170) au niveau de l'une ou l'autre extrémité longitudinale de l'emballage, l'enveloppe ayant une caractéristique d'ouverture (26 ; 126) comprenant une partie du matériau d'enveloppe qui peut être préférentiellement pliée vers l'extérieur pour produire une ouverture, l'emballage incluant une languette (36 : 136) fixée à la caractéristique d'ouverture, laquelle peut être saisie manuellement pour amorcer l'ouverture, la languette étant reliée à la caractéristique d'ouverture au niveau d'une région de base (38) et ayant une partie d'extrémité externe (40 ; 140) distale par rapport à la caractéristique d'ouverture, dans lequel au moins la partie d'extrémité externe n'est pas liée à une partie sous-jacente du matériau d'enveloppe et dépasse de la surface du matériau d'enveloppe ; dans lequel ledit au moins un produit est essentiellement en forme de bloc, ayant une paire de faces principales opposées et une paire de faces secondaires opposées, l'emballage (12 ; 112) définissant des paires correspondantes de faces principales (18, 20 ; 118, 120) et faces secondaires (22, 24 ; 122) opposées, la caractéristique d'ouverture étant définie dans une première des faces principales (18 ; 118) de l'emballage (12 ; 112), **caractérisé en ce que** la languette (36 ; 136) est située de sorte que la partie d'extrémité externe (40 ; 140) dépasse au niveau de l'intersection (25 ; 125) entre ladite première des faces principales (18 ; 118) et une face adjacente parmi les faces secondaires (22 ; 122).
2. Ensemble d'emballage (10 ; 110) selon la revendication 1, dans lequel la languette (36 ; 136) est gaufrée (66), profilée ou autrement traitée de façon à dépasser de la surface de l'enveloppe (14 ; 114) dans l'emballage (12 ; 112).
3. Ensemble d'emballage (10 ; 110) selon l'une quelconque des revendications précédentes, dans lequel la caractéristique d'ouverture (26 ; 126) est définie par au moins une ligne d'affaiblissement (44, 48 ; 62 ; 172) dans le matériau d'enveloppe, la caractéristique d'ouverture (26 ; 126) étant de préférence séparable du reste du matériau d'enveloppe

le long de ladite au moins une ligne d'affaiblissement (44, 48 ; 62 ; 172).

4. Ensemble d'emballage (10 ; 110) selon la revendication 3, dans lequel ladite au moins une ligne d'affaiblissement (44, 48 ; 62 ; 172) comprend une ligne d'entaille et la caractéristique d'ouverture (26 ; 126) est fixée de façon décollable au reste du matériau d'enveloppe. 5
5. Ensemble d'emballage selon l'une quelconque des revendications précédentes, dans lequel la caractéristique d'ouverture (26 ; 126) comprend une bande de déchirure. 10
6. Ensemble d'emballage (10 ; 110) selon l'une quelconque des revendications 1 à 4, dans lequel la caractéristique d'ouverture (26 ; 126) comprend un rabat (26 ; 126) pliable autour d'un bord. 15
7. Ensemble d'emballage (10 ; 110) selon l'une quelconque des revendications précédentes, dans lequel au moins une partie de la languette (36 ; 136) est liée à une partie sous-jacente du matériau d'enveloppe et dans lequel la résistance de liaison entre la languette (36 ; 136) et la partie sous-jacente du matériau d'enveloppe diminue dans une direction allant de la région de base (38) à la partie d'extrémité externe (40 ; 140). 20
8. Ensemble d'emballage (10 ; 110) selon la revendication 7, dans lequel l'adhésif (35) est appliqué à la languette (36 ; 136) de sorte que la quantité d'adhésif augmente dans une direction allant de la partie d'extrémité externe (40 ; 140) en direction de la région de base (38). 25
9. Ensemble d'emballage (110) selon l'une quelconque des revendications précédentes, dans lequel la languette (136) comprend une partie d'une étiquette (176) qui est liée à une surface extérieure de la caractéristique d'ouverture (126). 30
10. Ensemble d'emballage (110) selon la revendication 9, dans lequel la caractéristique d'ouverture (126) comprend un rabat (126) pliable autour d'un bord (128) et ayant une région de bord libre (130) définie au moyen d'une ligne d'entaille (172) à travers le matériau d'enveloppe, le rabat ayant un point culminant (174) distal dudit bord précité, lequel point culminant est situé au niveau de l'intersection (125) entre ladite première des faces principales (118) et ladite face secondaire adjacente (122), une étiquette adhésive (176) liée à la surface externe de l'enveloppe (114) s'étendant à travers la ligne d'affaiblissement (172) de façon à être liée à la fois au rabat (126) à l'intérieur de la ligne d'affaiblissement et à une partie de l'enveloppe à l'extérieur de la ligne 35

d'affaiblissement, la languette (136) étant définie par une partie de l'étiquette qui n'est pas complètement liée à la partie sous-jacente de l'enveloppe à côté du point culminant du rabat au niveau de ladite intersection. 40

11. Ensemble d'emballage (110) selon la revendication 10, dans lequel le rabat (126) est pliable autour d'un bord (130) situé adjacent et parallèle à un des joints d'extrémité transversaux (172). 45
12. Ensemble d'emballage (10) selon l'une quelconque des revendications 1 à 8, dans lequel la languette (36) est une partie intégrante du matériau d'enveloppe (16), le matériau d'enveloppe étant un matériau stratifié ayant une structure stratifiée externe (42) liée à une structure stratifiée interne (41), chacune des structures stratifiées externe et interne comprenant au moins une couche de matériau souple ; la caractéristique d'ouverture (26) étant définie au moyen d'au moins une ligne d'affaiblissement externe (44) dans la structure stratifiée externe et au moins une ligne d'affaiblissement interne (48) dans la structure stratifiée interne, ladite au moins une ligne d'affaiblissement externe (44) délimitant une partie d'ouverture externe (46) de la structure stratifiée externe qui est séparable du reste de la structure externe le long de ladite au moins une ligne d'affaiblissement externe, ladite au moins une ligne d'affaiblissement interne (48) délimitant une partie d'ouverture interne (50) de la structure stratifiée interne qui est attachée à la partie d'ouverture externe (46) et est séparable du reste de la structure interne le long de ladite au moins une ligne d'affaiblissement interne, dans laquelle les lignes d'affaiblissement interne et externe (44, 48) sont décalées l'une de l'autre et au moins une partie d'une région périphérique (32) de la partie d'ouverture externe (46) entre les lignes d'affaiblissement externe et interne est fixée de façon décollable à une surface sous-jacente de la structure stratifiée interne, la région périphérique (32) de la partie d'ouverture externe étant décollable de la surface sous-jacente de la structure stratifiée interne (41) afin d'amener la partie d'ouverture interne (50) à être également décollée de façon à créer une ouverture dans le film stratifié ; la languette (36) étant définie par une partie de la région périphérique (32) de la partie d'ouverture externe (46) entre les lignes d'affaiblissement interne et externe. 50
13. Ensemble d'emballage (10) selon la revendication 12, dans lequel la région périphérique (32) de la structure externe (42) peut être rattachée à la surface sous-jacente de la structure interne (41) pour refermer l'ouverture. 55



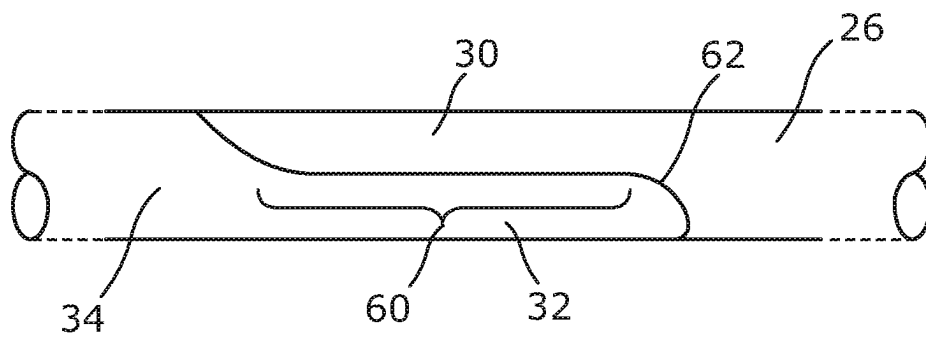


Fig. 3

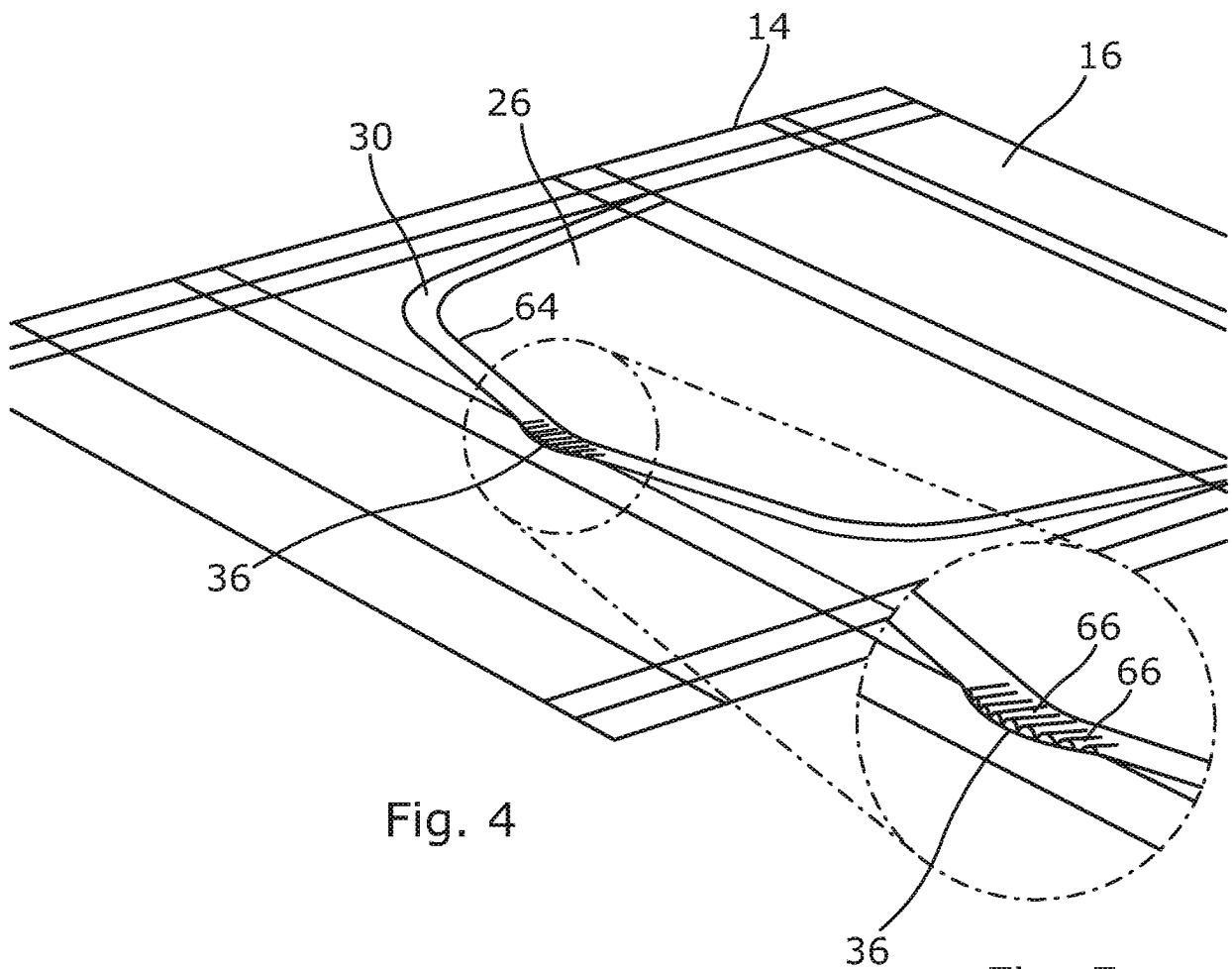


Fig. 4

Fig. 5

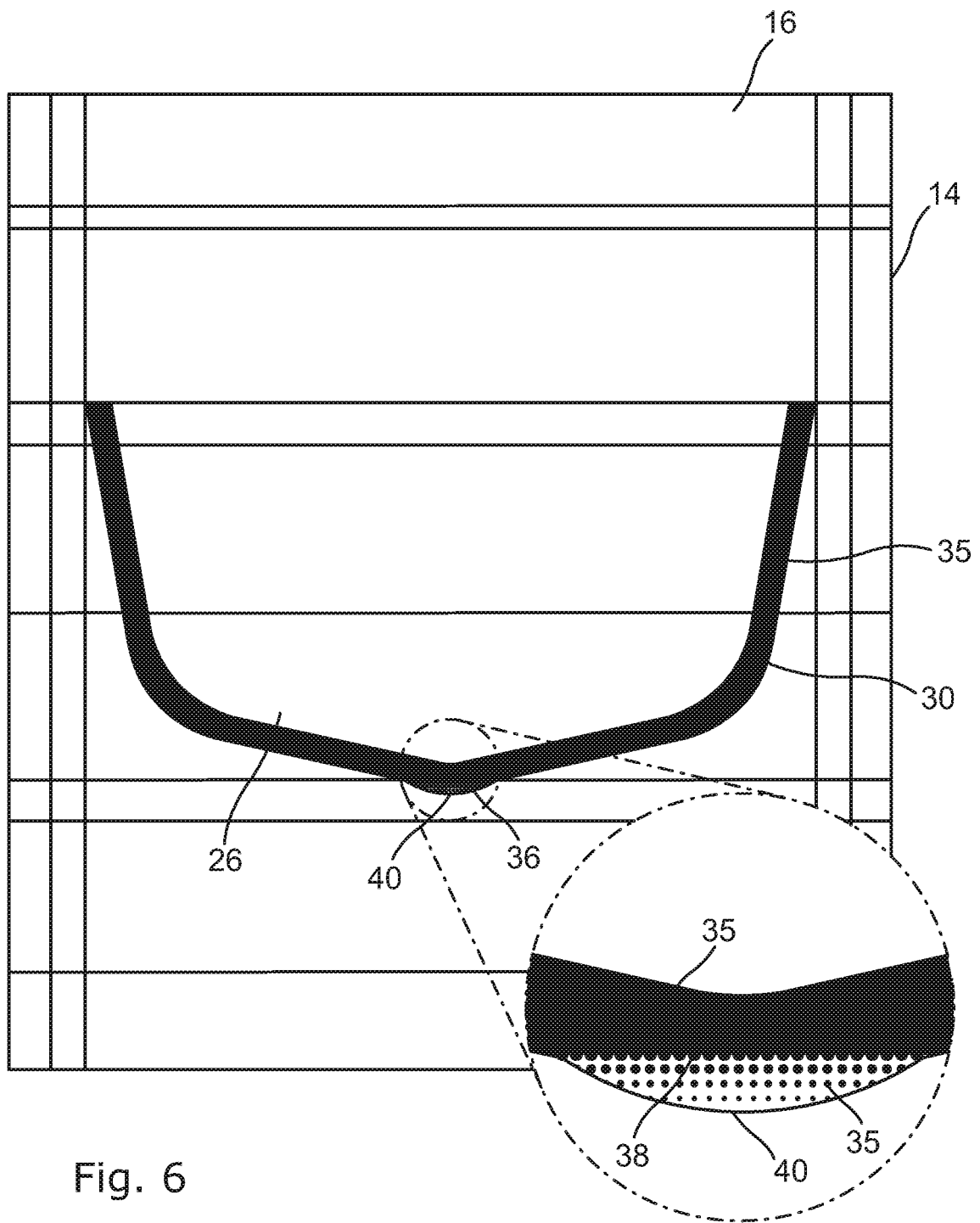


Fig. 6

Fig. 7

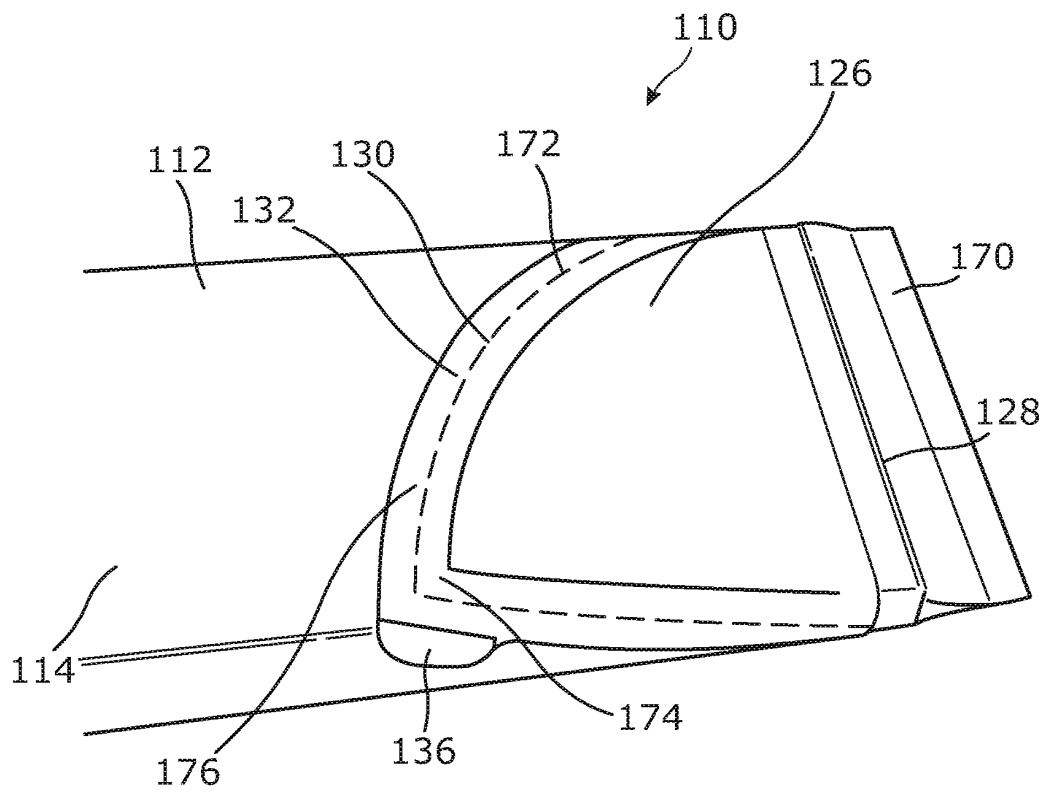


Fig. 8

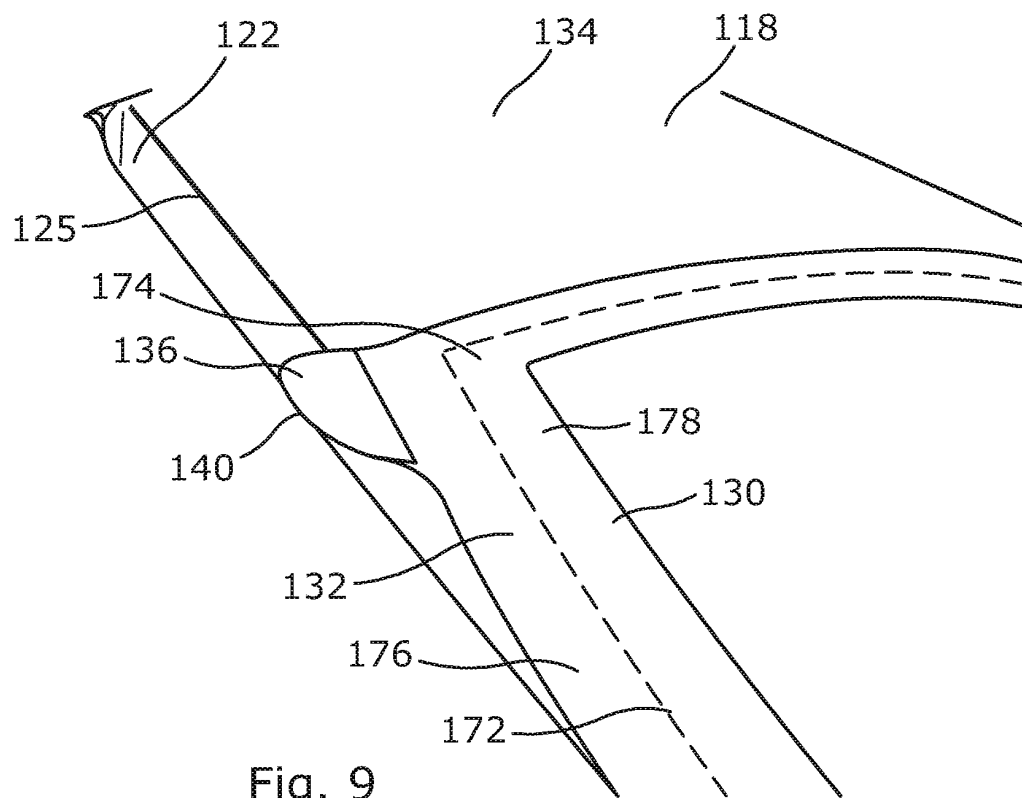


Fig. 9

REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

- WO 2011121337 A [0008]
- WO 2010046623 A [0010]
- US 20050276525 A1 [0011]
- EP 1749756 A2 [0012]