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(54) **PACKAGE FOR CONSUMER GOODS**

(57) A package for housing an article, the packaging comprising sheet material shaped to form an enclosed cavity for housing the article; wherein an outer surface of the sheet material comprises a first line of weakness along or around which the sheet material is configured to be deformed by a user, and a second line of weakness configured to rupture when the sheet material is deformed along or around the first line of weakness; where-

in the second line of weakness is shaped to define at least one stress concentrating feature; and wherein the at least one stress concentrating feature is configured to be exposed by rupturing of the second line of weakness to enable a tear in the sheet material to be initiated by a user to form an extraction opening for removal of the article housed in the enclosed cavity.

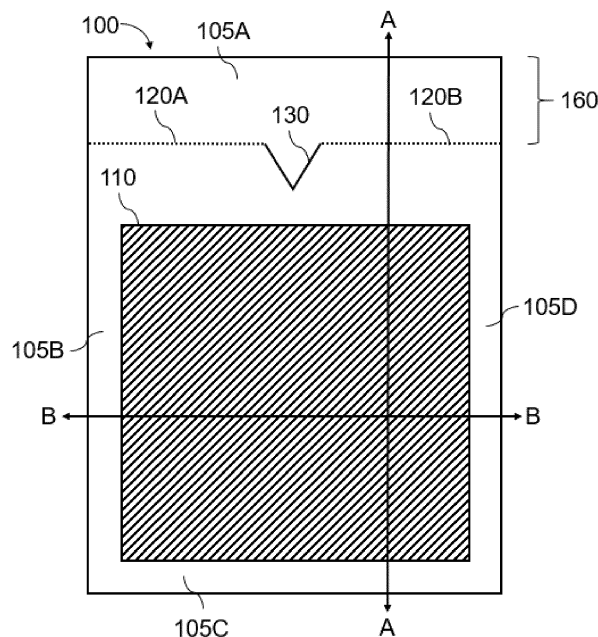


FIG. 1

## Description

### Field

**[0001]** The present disclosure relates to packaging for consumer goods, such as consumer goods relating to aerosol provision systems (including components therefrom, such as a consumable comprising a reservoir containing aerosolisable material which is configured to be aerosolised by the aerosol provision system in use to generate an aerosol for inhalation by the user).

### Background

**[0002]** There currently existing packaging for accommodating consumer goods in a way that allows these consumer goods to be transported and stored (e.g. in a retail outlet) prior to their use/purchase by the end user.

**[0003]** There are a number of potential factors influencing functional aspects of design of packaging for consumer goods. As a first aspect, the means of opening the packaging to access the enclosed consumer goods should ideally be intuitive for a user, and particularly to a first-time user who has not previously opened a packaging of the given design before. As a second aspect, it may in some instances be desirable to make the opening of the packaging intuitive to an adult user, but to provide in the design of the packaging obstacles rendering it challenging for a non-adult user to open the packaging to access the enclosed consumer goods.

**[0004]** Various approaches are described herein which seek to help address or mitigate some of the issues discussed above, by providing packaging providing a method of opening which is intuitive to an adult user while providing some obstacle to opening by a non-adult user.

### Summary

**[0005]** According to a first aspect of certain embodiments there is provided a package for housing an article, the packaging comprising sheet material shaped to form an enclosed cavity for housing the article; wherein an outer surface of the sheet material comprises a first line of weakness along or around which the sheet material is configured to be deformed by a user, and a second line of weakness configured to rupture when the sheet material is deformed along or around the first line of weakness; wherein the second line of weakness is shaped to define at least one stress concentrating feature; and wherein the at least one stress concentrating feature is configured to be exposed by rupturing of the second line of weakness to enable a tear in the sheet material to be initiated by a user to form an extraction opening for removal of the article housed in the enclosed cavity.

**[0006]** According to a second aspect of certain embodiments there is provided a method of forming a package for housing an article, comprising the steps of: shaping sheet material to form an enclosed cavity for housing the

one or more articles; forming a first line of weakness in the sheet material along or around which the sheet material is configured to be deformed by a user, forming a second line of weakness in the sheet material which is configured to rupture when the sheet material is deformed along or around the first line of weakness, wherein the second line of weakness is shaped to define at least one stress concentrating feature, and wherein the at least one stress concentrating feature is configured to be exposed by rupturing of the second line of weakness to enable a tear in the sheet material to be initiated by a user to form an extraction opening for removal of an article housed in the enclosed cavity.

**[0007]** According to a third aspect of certain embodiments there is provided a method of forming an extraction opening for removal of an article housed in an enclosed cavity of a package comprising sheet material shaped to form an enclosed cavity for housing the article; comprising the steps of: deforming the sheet material along or around a first line of weakness comprised in the sheet material to rupture second line of weakness defining at least one stress concentrating feature, thus exposing the at least one stress concentrating feature; initiating a tear in the sheet material at the at least one stress concentrating feature to form an extraction opening for removal of an article housed in the enclosed cavity.

**[0008]** It will be appreciated that features and aspects of the invention described above in relation to the various aspects of the invention are equally applicable to, and may be combined with, embodiments of the invention according to other aspects of the invention as appropriate, and not just in the specific combinations described herein.

### Brief Description of the Drawings

**[0009]** Embodiments of the invention will now be described, by way of example only, with reference to the accompanying drawings, in which:

Figure 1 schematically shows a package comprising an enclosed cavity according to a first set of embodiments of the present disclosure

Figures 2A and 2B schematically show section views of the package shown in Figure 1

Figures 3A and 3B schematically show aspects of forming of a package according to embodiments of the present disclosure

Figure 4 schematically shows the package shown in Figure 1 in a deformed configuration

Figures 5A to 5F schematically show aspects of the manipulation by a user of a package according to the first set of embodiments of the present disclosure to form an extraction opening for removal of an article

from the enclosed cavity

Figure 6 schematically shows a package comprising an enclosed cavity according to a second set of embodiments of the present disclosure

Figure 7 schematically shows the package shown in Figure 6 in a deformed configuration

Figures 8A to 8E schematically show aspects of the manipulation by a user of a package according to the second set of embodiments of the present disclosure to form an extraction opening for removal of an article from the enclosed cavity

Figure 9 schematically shows an alternative configuration of a second line of weakness according to the first set of embodiments of the present disclosure

Figure 10 schematically shows a configuration of a third line of weakness according to the first set of embodiments of the present disclosure

Figure 11 schematically shows a configuration of at least one third line of weakness according to the second set of embodiments of the present disclosure

Figure 12 schematically shows an alternative configuration of a graspable tab defined by a second line of weakness according to the second set of embodiments of the present disclosure

Figure 13 schematically shows a flow diagram setting out steps of a method of forming an extraction opening for removal of an article from an enclosed cavity of a package according to embodiments of the present disclosure

Figure 14 schematically shows a flow diagram setting out steps of a method of opening a package according to embodiments of the present disclosure

## Detailed Description

**[0010]** Aspects and features of certain examples and embodiments are discussed / described herein. Some aspects and features of certain examples and embodiments may be implemented conventionally and these are not discussed / described in detail in the interests of brevity. It will thus be appreciated that aspects and features of apparatus and methods discussed herein which are not described in detail may be implemented in accordance with any conventional techniques for implementing such aspects and features.

**[0011]** The present disclosure relates to packaging for accommodating one or more articles of consumer goods, such as in particular embodiments articles of consumer goods relating to aerosol provision systems and their

components. An example of such packaging is illustrated with reference to those shown in Figures 1 to 12.

**[0012]** Figure 1 shows a package 100 according to embodiments of the present disclosure. The package 100 comprises sheet material shaped to form an enclosed cavity 110 for housing an article of consumer goods. The cavity 110 is surrounded by a border, which is disposed between the edges of the cavity 110 and the edges of the package 100. Figures 2A and 2B show respective section views along lines A-A and B-B shown in Figure 1, illustrating how the cavity 110 is formed by the sheet material between a border 105 which in the example shown schematically in Figure 1 comprises four strip-shaped border regions 105A, 105B, 105C, and 105D. The cavity 110 is sized and shaped for receiving and storing of an article of consumer goods. Each of Figures 2A and 2B shows an indicative position of an article 200 of consumer goods received within the cavity 110. The enclosed cavity 110 comprises a region enclosed by first and second layers (e.g. panels) of sheet material sealed together over to form a border 105. In the example of Figure 1, where the package 100 is substantially rectangular in plan view, with a substantially rectangular cavity 110, the border 105 may comprise border regions 105A, 105B, 105C, and 105D, each of which is strip-shaped, and each of which is parallel to and adjoins one of the four straight outer edges of the package. However, it will be appreciated that in embodiments the package 100 may comprise any outer shape in plan view, such as for example circular, oval, trapezoidal, or any other shape known to the skilled person, and the cavity may comprise any outer shape in plan view. Typically the shapes of cavity 110 and outer edge of the package 100 will correspond (e.g. such that both are rectangular, as in Figure 1, or both are circular), but this is not essential. In all embodiments, the border region extends from the free outer edges of the sheet material of the package 100 to the outer boundary of the cavity 110, thus enclosing the cavity 110 of the package 100, and any article 200 received within the cavity 110.

**[0013]** Figure 3A shows schematically an exemplary process of shaping sheet material to form the enclosed cavity 110 shown in section in Figure 2A. In this approach, as shown in Figure 3A, a first panel 101 and a second panel 102 of sheet material are brought into relation at their major faces, and sealed together around one or more respective areas extending inward from a free edge of the overlaid first panel 101 and second panel 102 (these areas indicated by the regions 's'), forming a sealed border region (105A, 105C, as shown in Figure 2A) in which the first and second panels are joined together over abutting surfaces, to at least partially define an enclosed cavity 110. Likewise, Figure 3B shows a process of forming the cavity shown in section in Figure 2B, in which a first panel 101 and a second panel 102 of sheet material are brought into relation at their major faces, and sealed together around one or more respective edges (indicated by the regions 's') of the first panel

and the second panel to form a border region (105B, 105D, as shown in Figure 2B) at least partially defining an enclosed cavity 110. Whilst Figures 2A to 3B shows separate first and second panels 101 and 102 being brought together at major faces and sealed around a border of an enclosed cavity (in which region the panels are not sealed together), it will be appreciated the package 100 may alternatively be formed of a single panel of sheet material folded over at a line of symmetry to bring major surfaces of two layers of sheet material into relation to one another, with free edges also aligned with one another. In such embodiments, the folded edge of the sheet material (which already forms a seal) may not be sealed to form a border, so that no sealed border region is present along at least one of the four edges of the package 100 (in a rectangular or square package configuration comprising four edges).

**[0014]** In embodiments, an article of consumer goods (such as, for example, an article of an aerosol generating device) is enclosed within the enclosed cavity 110 during the step of shaping the sheet material to form an enclosed cavity for housing the article. Thus where two panels of sheet material are brought together over respective major faces (as shown schematically in Figures 3A and 3B), the article may be placed on a major face of a first one of the first panel 101 and second panel 102, with the second one of the first panel 101 and second panel 102 being placed over the article. This is shown schematically in Figures 3A and 3B, which show in different section views how a first panel 101 of sheet material is brought onto a second panel 102 of sheet material on which an article 200 of consumer goods has been placed. Regions of each respective panel surrounding the article are then sealed according to an approach as described herein to form a border region enclosing the article 200 in an enclosed cavity 110, as shown schematically for the same section views in Figures 2A and 2B. Alternatively, the border 105 may be partially formed by sealing of the sheet material of the package 100, but left discontinuous to provide an opening into which the article of consumer goods can be inserted. Thus, for example, with respect to the package 100 of Figure 1, the border regions 105A, 105B, and 105D may be formed by sealing of a first panel of sheet material to a second panel of sheet material (as described herein), with border region 105C left unsealed. Packages 100 formed in this way may be configured with first, second, and optionally third lines of weakness as described herein. Thus when a package 100 is ready to be filled with an article of consumer goods, this may be introduced to the cavity 110 via the unsealed border region 105C, with the sheet material subsequently sealed to form the border region 105C, and enclose the article fully in the enclosed cavity 110. It will be appreciated that any one or more of the border regions 105A to 105D may be selected to be left unsealed prior to introduction of an article of consumer goods into the cavity 110, and subsequent sealing of the respective border region to fully enclose the cavity 110 and article.

**[0015]** Any flexible sheet material known to the skilled person may be used to form the package 100, such as, for example, papers, flexible cards, plastic films and membranes, metallic foils, and multilayer composites of any two or more of the above sheet materials. In embodiments, the sheet material comprises a thermoplastic material on at least one outer surface, and the sealing together of the one or more panels (e.g. two panels brought into relation at major faces, or a single panel folded to bring major faces into relation) is implemented using a heat sealing process in which the thermoplastic material of sheet regions brought into abutting relation over major surfaces are melted together to form a sealing bond. For example, the edges of the sheet(s) of material may be pressed together between heated plates or rollers to bond regions of major surfaces together in a border region 105 surrounding a cavity 110. In embodiments, the thermoplastic material may comprise polyolefin. Alternatively, the panels (or regions of a single panel) may be sealed together using adhesive introduced between the panels (or regions of a single panel) in the border region 105. The sheet material may comprise a metallic layer such as a layer of metallic foil. Where the sheet material comprises a metallic layer, such a layer (e.g. in the form of a foil) may be sandwiched between layers of thermoplastic polymers to enable heat-sealing of the layers of sheet material to form the border region 105. The incorporation of a metallic layer in the sheet material may be used to occlude light from the cavity 110, preventing or reducing photo-degradation of an article received in the cavity 110. In embodiments, the sheet material is impermeable to liquid and / or gas. This may be an inherent property of metallic foil and / or thermoplastic materials used to form the sheet material, or liquid and / or gas impermeability may be imparted to the sheet material by a treatment, such as a wax impregnation or plasticisation treatment, applied to a paper or card sheet material. Providing a package 100 using liquid-impermeable sheet material may be advantageous in preventing environmental moisture external to the package 100 from penetrating to the cavity 110 and contaminating an article received within, and / or in preventing liquid from a liquid-containing article received in the cavity 110 from escaping from the package 100.

**[0016]** Herein, first and second, and optional third, lines of weakness are described, being defined in an outer surface of sheet material of a package 100 according to embodiments of the present disclosure. It will be appreciated that these first and second, and optional third, lines of weakness may be applied to a package 100 after sealing of layers of sheet material to form a border 105 enclosing a cavity 110, or may be applied to one or more panels of sheet material prior to being sealed to form the border enclosing the cavity.

**[0017]** Returning to Figure 1, an outer surface of the sheet material comprising the package 100 comprises a first line of weakness 120 along or around which the sheet material is configured to be deformed by a user. In

embodiments, the first line of weakness 120 is formed by die-cutting the sheet material. In embodiments, the first line of weakness 120 is formed by laser-cutting the sheet material. Any approach known to the skilled person for forming lines of weakness may be applied to the sheet material of the package 100 to form the first line of weakness 120.

**[0018]** In embodiments, the first line of weakness 120 is configured to be deformed by tearing (i.e. rupturing) of the sheet material along the first line of weakness 120, under manipulation by a user. In such embodiments, as shown in Figure 1, the first line of weakness 120 may extend to at least one edge of the sheet material comprising the package 100, to enable a tear along the first line of weakness 120 to be initiated at the edge of the sheet material by a user. Though not shown in Figure 1, a supplementary stress-concentrating feature may optionally be disposed at one or more junctions of the first line of weakness 120 with the edges of the sheet material of the package 100, to facilitate initiation by a user of tearing of the sheet material along the first line of weakness 120. A supplementary stress concentrating feature may, for example, comprise a 'V' shaped notch formed in the edge of the sheet material, wherein the first line of weakness 120 terminates in the base of the 'V' shaped notch. However, it will be appreciated the provision of a supplementary stress-concentrating feature is optional, and not present in all embodiments. However, in embodiments where the first line of weakness 120 is configured to be deformed by tearing, the use of a supplementary stress-concentrating feature may be advantageous in providing a visual cue to a user that the package 100 is intended to be torn along the first line of weakness 120 (e.g. as opposed to being flexed or folded around the first line of weakness 120, as in other embodiments herein).

**[0019]** In embodiments, the first line of weakness 120 is provided in a plurality of segments (120A, 120B), wherein a second line of weakness 130 as described herein is disposed between at least two of the plurality of segments. In Figure 1, two segments 120A and 120B respectively intersect with first and second edges of the sheet material forming one face of the package. However, in embodiments, the first line of weakness may only intersect with a single edge of the sheet material, such that, in the context of Figure 1, only one of segments 120A and 120B may be provided.

**[0020]** In embodiments where the first line of weakness 120 is configured to be deformed by tearing / rupturing along the first line of weakness 120 under manipulation by a user, the cutting process used to form the first line of weakness 120 may comprise the cutting of a plurality of segments of the line entirely through the thickness of the sheet material (or double-thickness of sheet material where the line is within the border region 105 of the package where two layers of sheet material are sealed together), wherein each cut segment of the line is separated from preceding and subsequent segments by an uncut portion of sheet material. Alternatively, the first line

of weakness 120 may be formed by scoring through a proportion of the through-thickness of the sheet material to reduce the through-thickness without fully perforating the sheet material. This latter approach may be advantageously used in embodiments where the first line of weakness 120 is fully defined within, or extends at least partially into, regions of sheet material overlying cavity 110, where through-thickness perforations of the sheet material would compromise the sealing of the cavity 110 from the exterior of the package 100.

**[0021]** In embodiments where the first line of weakness 120 is configured to be deformed by tearing of the sheet material along the first line of weakness, the first line of weakness may optionally be disposed between the enclosed cavity for housing the one or more articles and an edge of the sheet material, defining a tear-off strip 160 between the first line of weakness and the edge of the sheet material. Where the shape of the package 100 in plan view comprises at least one straight edge (e.g. the package 100 in plan view is rectangular as shown in the example of Figure 1), the first line of weakness 120 may be disposed substantially parallel to a straight edge of the package 100 to form a tear-off strip of substantially uniform width along its length.

**[0022]** In other embodiments of a package 100 as shown schematically in Figure 1, the first line of weakness 120 is not configured for tearing, but is configured to be deformed by flexion or folding of the sheet material by a user around the first line of weakness 120. In such embodiments, the second line of weakness 130 is configured to rupture when the sheet material is deformed along or around the first line of weakness 120. It will be appreciated the required degree of local weakening of the second line of weakness 130 (i.e. in terms of the percentage of the extent of the second line of weakness 130 which comprises through-thickness perforations of the sheet material; or the depth of scoring used to form the second line of weakness 130, relative to the unscored thickness of the sheet material) can be determined by routine experimentation by the skilled person to determine a degree of weakening which permits rupture of the second line of weakness 130 when the sheet material is flexed or folded around the first line of weakness 120. In such embodiments, where the first line of weakness 120 is configured to be deformed by flexion or folding of the sheet material by a user around the first line of weakness 120, the second line of weakness 130 may be configured to present a lower resistance to rupture than the first line of weakness, such that the flexion or folding of the sheet material causes irreversible rupture of the second line of weakness 130 but only non-destructive deformation of the sheet material along the first line of weakness 120.

**[0023]** Thus, in embodiments of the present disclosure, the first line of weakness 120 (comprising first and second segments 120A and 120B in the example of Figure 1) may not be configured to rupture / tear when the sheet material of the package is manipulated by a user, but is instead configured to allow flexion and / or

folding of the sheet material around the first line of weakness 120. For example, the first line of weakness 120 may be configured to allow the strip portion 160 between the first line of weakness 120 and the nearest edge of the package 100 shown in Figure 1 to be folded back by substantially 180 degrees around the first line of weakness 120, causing rupture of the second line of weakness 130 as the strip portion 160 above the first line of weakness 120 pivots with respect to the sheet material below the first line of weakness.

**[0024]** Figure 1 shows schematically a second line of weakness 130 configured to rupture when the sheet material is deformed (i.e. by tearing or by flexion) along or around the first line of weakness 120, wherein the second line of weakness is shaped to define at least one stress concentrating feature, wherein the at least one stress concentrating feature is configured to be exposed by rupturing of the second line of weakness to enable a tear in the sheet material to be initiated by a user to form an extraction opening for removal of the article housed in the enclosed cavity.

**[0025]** In the embodiment of Figure 1, the second line of weakness 130 is shaped to form a notch upon rupturing, wherein a base of the notch forms the at least one stress concentrating feature. In the example of Figure 1, the second line of weakness 130 comprises a 'V' shaped line, wherein the point of the 'V' points towards the cavity 110 of the package 100. As shown in Figure 1, in embodiments the first line of weakness 120 and the second line of weakness 130 are connected together. For example as shown in Figure 1, a first segment 120A of the first line of weakness 120 is disposed between a first edge of the package 100 and a first end of the 'V' shaped second line of weakness 130, and a second segment 120B of the first line of weakness 120 is disposed between a second, opposite edge of the package 100 and a second end of the 'V' shaped second line of weakness 130. Where the first and second lines of weakness are connected in this manner, it will be appreciated that a continuous line of weakness may be considered to be formed, comprising all segments of the first line of weakness 120 and the second line of weakness 130. Though Figure 1 shows two segments 120A and 120B of the first line of weakness 120 connected to respective ends of the second line of weakness 130, it will be appreciated as described further herein that only one end of the second line of weakness 130 may be connected to the first line of weakness 120, and thus with reference to Figure 1, only one of segment 120A or 120B of the first line of weakness 120 may be provided in the sheet material of the package 100. An end of the first line of weakness 120 may be connected to an end of the second line of weakness 130 for the purpose of enabling a tear along the first line of weakness 120 to initiate a rupture of the second line of weakness 130. This is particularly relevant to embodiments in which the first line of weakness 120 is configured to be torn by a user (as opposed to being an axis of flexion / folding). However, it will be appreciated the first line of weakness 120 and the

second line of weakness 130 can also be connected in embodiments where the first line of weakness 120 is configured to be deformed by flexion or folding of the sheet material around the first line of weakness 120.

**[0026]** As will be understood more clearly with reference to Figure 4, the second line of weakness 130 does not intersect with an edge of the package 100, such that the at least one stress concentrating feature defined by the second line of weakness 130 also does not intersect with any edges of the sheet material. Because the at least one stress concentrating feature is disposed to enable a tear in the sheet material to be initiated by a user to form an extraction opening for removal of the article housed in the enclosed cavity, the positioning of the second line of weakness 130 to prevent intersection of the at least one stress concentrating feature with the edges of the package 100 may advantageously render the package 100 more resistant to opening, since a tear in the sheet material used to form an extraction opening for removal of the article housed in the enclosed cavity 110 cannot be directly initiated from the edge of the un-deformed package 100. Instead, a tear in the sheet material used to form an extraction opening for removal of the article housed in the enclosed cavity 110 can only be initiated once the at least one stress concentrating feature is exposed by deformation of the sheet material along or around the first line of weakness 120.

**[0027]** Figure 4 will be recognised from Figure 1, and shows the package 100 of Figure 1 in a configuration in which an outer surface of the sheet material has been deformed by the user along or around the first line of weakness 120 of Figure 1 (e.g. by tearing off strip 160, or folding back strip 160).

**[0028]** In embodiments where the first line of weakness 120 is configured for tearing, Figure 4 will be understood to show the package 100 in a configuration in which the strip 160 shown in Figure 1 has been torn off by the initiation of a tear at an intersection between a first edge of the package 100 and the first line of weakness 120, and the driving of a tear through the first segment 120A of the first line of weakness 120, into the second line of weakness 130, and into the second segment 120B of the first line of weakness 120, to the intersection of the second segment 120B with a second edge of the package 100. This process leaves exposed torn edges 120A' and 120B' corresponding to the previous positions of first and second segments 120A and 120B of the first line of weakness 120. The rupture of the second line of weakness 130, which occurs due to the tearing of the first line of weakness 120, exposes a notch 141, the base of which (i.e. the point of the 'V' of the notch) forms a stress concentrating feature 145 at which a tear in the sheet material of the package 100 can be initiated by a user to form an extraction opening for removal of the article housed in the enclosed cavity 110.

**[0029]** In embodiments where the first line of weakness 120 is configured to be deformed by flexion or folding of the sheet material around the first line of weakness, it will

be appreciated in said embodiments that edges 120A' and 120B' (described as torn edges in relation to packages 100 configured for tearing along the first line of weakness 120) instead comprise folded edges along which the sheet portion 160 above the first line of weakness 120 shown in Figure 1 is folded back at an angle relative to the portion of sheet material disposed below the first line of weakness 120 in Figure 1. This process of folding causes a 'V' shaped tab of sheet material above the second line of weakness 130 to pivot away from the notch 141, exposing the stress concentrating feature 145. Thus whether the first line of weakness 120 is configured for tearing or flexion of the sheet material (or both), the resulting exposing of the stress concentrating feature 145 is the same.

**[0030]** In embodiments, as shown in Figure 4, the stress concentrating feature is shaped to enable tearing of the sheet material to be initiated by a user along a direction oriented away from the first line of weakness 120. In embodiments, the at least one stress concentrating feature may be shaped to enable tearing of the sheet material to be initiated by a user along a direction oriented towards the enclosed cavity 110. The direction of tear initiation in Figure 4 is indicated by the dashed line 150, which in the example of Figure 4 is substantially perpendicular to the first line of weakness 120, though it will be understood this particular range of angles to the first line of weakness is optional.

**[0031]** Figures 5A to 5F show schematically aspects of a method of forming an extraction opening for removal of an article housed in an enclosed cavity of a package comprising sheet material shaped to form an enclosed cavity for housing the article (i.e. a package 100 as shown in Figures 1 to 4), the method comprising the steps of: deforming the sheet material along or around a first line of weakness comprised in the sheet material to rupture second line of weakness defining at least one stress concentrating feature, thus exposing the at least one stress concentrating feature; and initiating a tear in the sheet material at the at least one stress concentrating feature to form an extraction opening for removal of an article housed in the enclosed cavity; wherein the second line of weakness is shaped to form a notch or slit upon rupturing, wherein a base of the notch or slit forms the at least one stress concentrating feature.

**[0032]** Figure 5A shows an embodiment of a package 100 as described in relation to Figures 1 to 4, in which a first line of weakness 120 comprising a first segment 120A and second segment 120B is connected to a second line of weakness 130 shaped to define a stress concentrating feature. In this embodiment, as in Figure 1, the second line of weakness 130 forms a 'V' shape, so as to provide a notch-shaped stress concentrating feature which the second line of weakness is ruptured. However, as described further herein, the second line of weakness may alternatively comprise a line connected to the first line of weakness, and oriented towards the cavity 110, which is shaped to form a slit upon rupturing.

In Figure 5A, the package 100 is in the un-deformed state, and the sheet material has not yet been deformed along or around the first line of weakness 120 so as to rupture the second line of weakness 130.

**[0033]** Figure 5B shows schematically the initiation by a user of a tear into the first segment 120A of the first line of weakness 120 at an intersection between the first segment 120A and an edge of the sheet material of the package 100 shown in Figure 5A.

**[0034]** Figure 5C shows schematically the progression of the tear, which in this view has progressed along the entirety of the first segment 120A of the first line of weakness 120 shown in Figure 5A, ruptured the second line of weakness 130 shown in Figure 5A, and progressed part-way along the second segment 120B of the first line of weakness 120 shown in Figure 5A.

**[0035]** Figure 5D shows schematically the package 100 in a condition wherein the tear has fully progressed through first and second lines of weakness (120, 130) shown in Figure 5A, causing a strip 160 of the package 100 to detach entirely. The rupture of the second line of weakness has exposed a stress concentrating feature 145 comprising the base of a notch exposed by the removal of strip 160.

**[0036]** Figure 5E shows schematically the initiation by a user of a tear from the stress concentrating feature 145 shown in Figure 5D, towards the enclosed cavity 110 as shown in Figure 5A.

**[0037]** Figure 5F shows schematically the progression of the tear 150 initiated in Figure 5E, wherein the tear has at the stage shown progressed into the region of the package corresponding to the enclosed cavity 110 as shown in Figure 5A, forming an extraction opening. It will be appreciated that by this stage, the user will be able to extract an article enclosed within the cavity.

**[0038]** Figure 6 shows another embodiment of a package according to the present disclosure. The package 300 of Figure 6 will be recognised from the package of Figure 1, and it will be appreciated that except where specifically described, features of package 300 of Figure 6 and aspects of its forming are as described in respect of the package 100 of Figure 1. Accordingly, for example, the aspects of sheet material selection, sealing of sheet material to form an enclosed cavity (as described in relation to Figures 2A to 3B), and processes of formation of the first and second lines of weakness, as described in relation to package 100 of Figure 1 apply to package 300 of Figure 6.

**[0039]** As will be described further herein, embodiments according to Figure 6 differ from embodiments according to Figure 1 in that instead of the second line of weakness being shaped to form a notch or slit upon rupturing, wherein a base of the notch or slit forms the at least one stress concentrating feature (as in package 100 of Figure 1), the second line of weakness is shaped to form a tab feature graspable by a user upon rupturing, wherein a junction between the tab feature and the first line of weakness forms the at least one stress concen-

trating feature.

**[0040]** Accordingly, in embodiments according to Figure 6, an outer surface of the sheet material of the package 300 comprises a second line of weakness 330 shaped to form a tab feature upon rupturing, wherein a junction between the tab feature and a first line of weakness 320 forms at least one stress concentrating feature. In the example of Figure 6, the second line of weakness 330 comprises a 'V' shaped line with parallel line sections connecting to the first line of weakness 320, wherein the point of the 'V' points away from the cavity 310 of the package 300. As shown in Figure 6, in embodiments the first line of weakness 320 and the second line of weakness 330 are connected together. In Figure 6, a first segment 320A of the first line of weakness 320 is disposed between a first edge of the package 300 and a first end of the second line of weakness 330, and a second segment 320B of the first line of weakness 320 is disposed between a second, opposite edge of the package 300 and a second end of the second line of weakness 330. Where the first and second lines of weakness are connected in this manner, it will be appreciated that a continuous line of weakness may be considered to be formed comprising all segments of the first line of weakness 320 and the second line of weakness 330. Though Figure 6 shows two segments 320A and 320B of the first line of weakness 320 connected to respective ends of the second line of weakness 330, it will be appreciated as described further herein that only one end of the second line of weakness 330 may be connected to the first line of weakness 320, and thus with reference to Figure 6, only one of segment 320A or 320B of the first line of weakness 320 may be provided in the sheet material of the package 300. An end of the first line of weakness 320 may be connected to an end of the second line of weakness 330 for the purpose of enabling a tear along the first line of weakness 320 to initiate a rupture of the second line of weakness 330, as described in relation to the embodiments of Figures 1 to 5F. This may be considered particularly relevant to embodiments in which the first line of weakness 320 is configured to be torn by a user (as opposed to being an axis of flexion / folding). However, it will be appreciated the first line of weakness 320 and the second line of weakness 330 can also be connected in embodiments where the first line of weakness 320 is configured to be deformed primarily by flexion or folding of the sheet material around the first line of weakness 320. In embodiments where the first line of weakness 320 is configured to be deformed by flexion or folding of the sheet material around the first line of weakness 320 (as opposed to tearing along the first line of weakness 320), the first line of weakness 320 may be continuous from a first edge to a second edge of the sheet material comprising the package 300. In other words, the first segment 320A and second segment 320B shown in Figure 6 may be linked by a third segment (not shown in Figure 6) such that the first line of weakness 320 passes through the tab feature formed by the second line of

weakness 330.

**[0041]** As will be understood more clearly with reference to Figure 7, the second line of weakness 330 does not intersect with an edge of the package 300, such that the at least one stress concentrating feature defined by the second line of weakness 330 also does not intersect with any edges of the sheet material. Because the at least one stress concentrating feature is disposed to enable a tear in the sheet material to be initiated by a user to form an extraction opening for removal of the article housed in the enclosed cavity, the positioning of the second line of weakness 330 to prevent intersection of the at least one stress concentrating feature with the edges of the package 300 may, as for embodiments according to Figure 1, advantageously render the package 300 more resistant to opening, since a tear in the sheet material used to form an extraction opening for removal of an article housed in the enclosed cavity 310 cannot be directly initiated from the edge of the undeformed package 300. Instead, a tear in the sheet material used to form an extraction opening for removal of the article housed in the enclosed cavity 310 can only be initiated once the at least one stress concentrating feature is exposed by prior deformation of the sheet material along or around the first line of weakness 320. Thus, in common with all embodiments of the present disclosure, there is provided a two-stage opening mechanism, whereby two distinct manipulations to the sheet material must be carried out in order to form an extraction opening in the cavity.

**[0042]** Figure 7 will be recognised from Figure 6, and shows the package 300 of Figure 6 in a configuration in which an outer surface of the sheet material has been deformed by the user along or around the first line of weakness 320 of Figure 6.

**[0043]** In embodiments where the first line of weakness 120 is configured for tearing, Figure 7 will be understood to show the package 300 in a configuration in which a strip 360 as shown in Figure 6 has been torn off by the initiation of a tear at an intersection between a first edge of the package 100 and the first line of weakness 320, and the driving of a tear through the first segment 320A of the first line of weakness 320, into the second line of weakness 330, and into the second segment 320B of the first line of weakness 320, to the intersection of the second segment 320B with a second edge of the package 300. This tearing process leaves exposed torn edges 320A' and 320B' corresponding to the previous positions of first and second segments 320A and 320B of the first line of weakness 320. The rupture of the second line of weakness 330 in the course of the tearing of the first line of weakness 320 exposes a graspable tab 340, and the right-angled intersections of the graspable tab 340 with exposed torn edges 320A' and 320B' respectively form stress concentrating features 345A and 345B at which a tears 350A and 350B in the sheet material of the package 300 can be initiated by a user to form an extraction opening for removal of the article housed in the enclosed cavity 310.



**[0044]** In embodiments where the first line of weakness 120 is configured to be deformed by flexion or folding of the sheet material around the first line of weakness, it will be appreciated in said embodiments that the edges 320A' and 320B' (described as torn edges in relation to packages 300 configured for tearing along the first line of weakness 320) instead comprise folded edges along which the sheet portion 360 above the first line of weakness 320 shown in Figure 6 is folded back at an angle relative to the portion of sheet material disposed below the first line of weakness 320 in Figure 6. This process of folding causes the graspable tab portion 340 to pivot away from the material of the strip 360 above the first line of weakness 320, exposing both the plurality of stress concentrating features 345A and 345B, and the edges of the tab 340, enabling the tab to be grasped by a user. Thus whether the first line of weakness 320 is configured for tearing or flexion of the sheet material, the resulting exposing of the one or more stress concentrating features 345 is the same.

**[0045]** As shown in Figure 7, the stress concentrating features 345 comprised by the junctions of the tab 340 and the first line of weakness 320, are shaped to enable tearing of the sheet material to be initiated by a user along a direction oriented away from the first line of weakness 320. Accordingly, the at least one stress concentrating feature 345 may be shaped to enable tearing of the sheet material to be initiated by a user along a direction oriented towards the enclosed cavity 310. The direction of tear initiation in Figure 7 is indicated by the dashed lines 350A and 350B, for tears initiated respectively at stress concentrating features 345A and 345B, with the tears being initiated by a user grasping tab 340 and pulling it towards the direction of cavity 310. In the example of Figure 7, both tear directions 350A and 350B are substantially perpendicular to the first line of weakness 320, though it will be understood this particular range of angles to the first line of weakness is optional.

**[0046]** Figures 8A to 8E show schematically aspects of a method of forming an extraction opening for removal of an article housed in an enclosed cavity of a package comprising sheet material shaped to form an enclosed cavity for housing the article (i.e. a package 300 as shown in Figures 6 and 7), the method comprising the steps of: deforming the sheet material along or around a first line of weakness comprised in the sheet material to rupture second line of weakness defining at least one stress concentrating feature, thus exposing the at least one stress concentrating feature; and initiating a tear in the sheet material at the at least one stress concentrating feature to form an extraction opening for removal of an article housed in the enclosed cavity; wherein the second line of weakness is shaped to form a tab feature graspable by a user upon rupturing, wherein a junction between the tab feature and the first line of weakness forms the at least one stress concentrating feature.

**[0047]** Figure 8A shows an embodiment of a package 300 as described in relation to Figures 6 and 7, in which a

first line of weakness 320 comprising a first segment 320A and second segment 320B is connected to a second line of weakness 330 shaped to form a tab feature graspable by a user upon rupturing, wherein a junction between the tab feature and the first line of weakness forms the at least one stress concentrating feature. In this embodiment, as in Figure 6, the second line of weakness 330 forms a tab shape pointing away from a cavity 310, so as to provide a stress concentrating features at the junctions between the tab feature and the first line of weakness 320 when the second line of weakness 330 is ruptured. In Figure 8A, the package 300 is in the undeformed state, and the sheet material has not yet been deformed along or around the first line of weakness 320 so as to rupture the second line of weakness 330.

**[0048]** Figure 8B shows schematically the flexion or folding of the sheet material around the first line of weakness by a user, initiating rupturing of the second line of weakness.

**[0049]** Figure 8C shows schematically the exposing of tab 340 by rupture of the second line of weakness 330, with stress concentrating features 345A and 345B exposed at first and second junctions between the tab 340 and the first line of weakness, by rupture of the second line of weakness.

**[0050]** Figure 8D shows schematically the grasping of the tab 340 as shown in Figure 8C by the fingers of a user, in preparation to initiate tearing of the sheet material at the stress concentrating features 345A and 345B as shown in Figure 8C. In the embodiment shown, the first line of weakness has not been torn, but the sheet material has been flexed around the first line of weakness, leaving intact the sheet material on the opposing side of the first line of weakness to the cavity. This may advantageously provide a region of sheet material which can be grasped (as by the leftmost hand in Figure 8D) to provide resistance against which to pull the tab towards the cavity (as by the rightmost hand in Figure 8D).

**[0051]** Figure 8E shows schematically the progression of tears 350A and 350B respectively initiated at stress-concentrating features 345A and 345B shown in Figure 8C, wherein the tears 350A and 350B have both progressed into the region of the package corresponding to the enclosed cavity 310 as shown in Figure 8A. It will be appreciated that once the enclosed cavity 310 has been breached in this manner, forming an extraction opening, it is straightforward for the user to continue tearing of the sheet material in order to extract an article contained within the cavity 310.

**[0052]** Certain optional aspects of the embodiments previously described in relation to Figures 1 to 8 will now be described with reference to Figures 9 to 12.

**[0053]** Figure 9 shows a variant of the configuration of first and second lines of weakness comprised in an outer surface of sheet material of a package 100 as otherwise described in relation to Figures 1 to 4. Instead of the second line of weakness 130 being shaped to form a notch, as shown in Figure 1, in this variant the second line

of weakness 130 is shaped to form a slit upon rupturing, wherein a base of the slit forms a stress concentrating feature. The second line of weakness 130 connects to the first line of weakness 120, and extends from it towards the cavity of the package, such that a tear initiated at the slit base can be driven towards the cavity. The dashed line 170 in Figure 9 is used to indicate that the features within the dashed line 170 may be disposed anywhere on an outer surface the sheet material of a package 100 as described herein. Thus whilst the first and second lines of weakness (120, 130) may typically be formed within a border region of the package over which a plurality of layers of sheet material are sealed together, the first and second lines of weakness of any embodiment described herein may be disposed in a single layer of sheet material overlying the cavity configured for housing an article of consumer goods. Furthermore, while a first line of weakness configured to be torn will typically extend to an edge of the sheet material in which it is formed, this is not essential, and first lines of weakness configured to be torn, and first lines of weakness configured to enable flexion or folding of sheet material around a given first line of weakness, may not extend all the way to one or more edges of the sheet material comprising the package.

**[0054]** In embodiments of the present disclosure, one or more third lines of weakness may be comprised in an outer surface of the sheet material to enable easier initiation of a tear in the sheet material at the stress concentrator.

**[0055]** Figure 10 shows a region 170 of sheet material of a package 100 as shown in Figure 1 herein, in which is disposed the second line of weakness 130. The dashed line 170 is used as in Figure 9. In this embodiment, the second line of weakness 130 is shaped to form a notch upon rupturing, wherein a base of the notch forms a stress concentrating feature, as in Figure 1. In this embodiment however, a third line of weakness 180, configured to assist initiation of a tear at the stress concentrating features by a user, is connected to the second line of weakness at the position of the stress concentrating feature. The third line of weakness 180 is oriented away from the first line of weakness 120, and will typically be oriented towards a cavity 110 of the package 100. Thus when a user has exposed the stress concentrating feature comprising the notch formed by the second line of weakness 130, and manipulates the sheet material on either side of the notch (i.e. by pulling material on opposing sides of the notch in opposite directions as shown in Figure 5E), the third line of weakness 130 may assist in guiding the initial tearing of the sheet material in a direction oriented towards the cavity 110, assisting in the successful formation of an extraction opening for removal of the article housed in the enclosed cavity 110.

**[0056]** Figure 11 shows a region 370 of sheet material of a package 300 as shown in Figure 6 herein, in which is disposed the second line of weakness 330. The dashed line 170 is used as in Figures 9 and 10. In this embodiment, the second line of weakness 130 is shaped to form

a tab feature graspable by a user upon rupturing, wherein a junction between the tab feature and the first line of weakness forms the at least one stress concentrating feature, as described in relation to Figures 6 and 7. In this embodiment, a third line of weakness 180, configured to assist initiation of a tear at the stress concentrating features by a user, is connected to the second line of weakness at the position of each of the two stress concentrating features comprising the junctions of the second line of weakness 330 with each of first segment 120A and second segment 120B of the first line of weakness. Each third line of weakness (380A and 380B) is oriented away from the first line of weakness 120, and will typically be oriented towards a cavity 110 of the package 100. Thus when a user has exposed the tab formed by the second line of weakness 130, and exposed the stress concentrating features comprising the junctions of the tab and the first line of weakness, the third lines of weakness 330A and 330B assist in guiding the initial tearing of the sheet material in a direction oriented towards the cavity 310 as the user grasps and pulls the tab (i.e. as shown in Figures 8D and 8E), assisting in the successful formation of an extraction opening for removal of the article housed in the enclosed cavity 310.

**[0057]** It will be appreciated in embodiments where one or more third lines of weakness are formed in the sheet material of a package, these can be formed using approaches set out herein in respect of the second line of weakness (e.g. die-cutting or laser cutting).

**[0058]** In embodiments where the second line of weakness is shaped to form a tab feature graspable by a user upon rupturing (as in Figures 6 to 8), it will be appreciated the tab can be provided in any of a plurality of shapes, provided that the tab is disposed on an opposite side of the first line of weakness to at least a portion of the cavity enclosed by the sheet material of the package. Figure 12 shows a region 370 of sheet material of a package 300 as shown in Figure 6 herein, in which is disposed a second line of weakness 330 forming a tab feature 330 of an alternative geometry to that shown in Figures 6, 7, and 11. In Figure 12 the second line of weakness 330 is shaped to form a rectangular tab feature. The dashed line 170 is used as in Figures 9 to 11.

**[0059]** While the foregoing disclosure has tended to describe embodiments in terms of whether the first line of weakness is configured to be deformed by flexion or folding of the sheet material around the first line of weakness, or the first line of weakness is configured to be deformed by tearing of the sheet material along the first line of weakness, it will be appreciated these may not be mutually exclusive, and a first line of weakness which will flex or fold without tearing under a certain form of manipulation by a user may be configured to tear under another, different form of manipulation by a user. Thus while certain approaches used to form the first line of weakness (i.e. partial-thickness scoring, or through-thickness perforation at intervals) may respectively be used to preferentially configure the first line of weakness either for

tearing or flexion, a user may determine to manipulate the sheet material to cause one or other form of deformation depending on preference.

**[0060]** In any of the embodiments herein, in terms of the overall shape described by the edges of the package, and the geometry of the enclosed cavity, it may be realised that these may have any required geometry, depending on what article the cavity is configured to retain, in use. In principle, any article of consumer goods, or more broadly speaking any object, could be located in the cavity, as required. Though the present packages herein described may have particular application for use in accommodating articles of consumer goods relating to aerosol provision systems, such as cartridges or single-part devices containing liquid comprising an active substance, or consumables containing plant material such as tobacco, this is not essential. Thus in accordance with some more particular embodiments, the enclosed cavity may receive any of:

- i) an article of consumer goods;
- ii) an accessory for such an article of consumer goods; and/or
- iii) labelling/instructions for such an article of consumer goods.

**[0061]** For example, one application might comprise the cavity receiving an article such as an aerosol delivery system, and / or one or more consumables for such an aerosol provision system, wherein each consumable comprises a reservoir containing aerosolisable material. Packages according to embodiments described herein may be particularly suited to receiving for storage and / or sale articles comprising an active substance (for example, a cartridge or other consumable for an aerosol delivery system), due to a desire to render such packages more difficult for children to open.

**[0062]** Other articles of consumer goods could be received in the cavity of any package as described herein, which do not necessarily relate to aerosol provision / generation systems, such as a wearable consumer good, such as earrings, or some other form of jewellery, for example, or an article of cosmetics or medication.

**[0063]** Appreciating the foregoing, there has accordingly been described a package for housing an article, the packaging comprising sheet material shaped to form an enclosed cavity for housing the article; wherein an outer surface of the sheet material comprises a first line of weakness along or around which the sheet material is configured to be deformed by a user, and a second line of weakness configured to rupture when the sheet material is deformed along or around the first line of weakness; wherein the second line of weakness is shaped to define at least one stress concentrating feature; and wherein the at least one stress concentrating feature is configured to be exposed by rupturing of the second line of weakness to enable a tear in the sheet material to be initiated by a user to form an extraction opening for removal of the

article housed in the enclosed cavity.

**[0064]** There has also been described a package as described above, further comprising a third line of weakness connected to the second line of weakness at the position of a stress concentrating feature, the third line of weakness being oriented towards the enclosed cavity of the package.

**[0065]** There has also been described a package as described above, further comprising the article (e.g. an article of consumer goods) in the cavity.

**[0066]** This may alternatively be described as a package for housing an article, the packaging comprising sheet material shaped to form an enclosed cavity for housing the article; wherein an outer surface of the sheet material comprises a first line of weakness along or around which the sheet material is configured to be deformed by a user, and a second line of weakness configured to rupture when the sheet material is deformed along or around the first line of weakness; wherein the second line of weakness is shaped to define at least one user interactable element; and wherein the at least one user interactable element is configured to be exposed by rupturing of the second line of weakness to enable a tear in the sheet material to be initiated by a user to form an extraction opening for removal of the article housed in the enclosed cavity.

**[0067]** There has also been described a sheet of material which is configured to be shaped to form a package comprising an enclosed cavity for housing the article packaging, such as the package described above, wherein a surface of the sheet of material comprises a first line of weakness along or around which the sheet material is configured to be deformed by a user, and a second line of weakness configured to rupture when the sheet material is deformed along or around the first line of weakness; wherein the second line of weakness is shaped to define at least one stress concentrating feature; and wherein the at least one stress concentrating feature is configured to be exposed by rupturing of the second line of weakness to enable a tear in the sheet material to be initiated by a user.

**[0068]** The sheet of material may be shaped into a package comprising an enclosed cavity, according to approaches set out further herein.

**[0069]** There has also been described a method of forming a package for housing an article as shown schematically in Figure 13, comprising a step S1 of shaping sheet material to form an enclosed cavity for housing an article; a step S2 of forming a first line of weakness in the sheet material along or around which the sheet material is configured to be deformed by a user; and a step S3 of forming a second line of weakness in the sheet material which is configured to rupture when the sheet material is deformed along or around the first line of weakness, wherein the second line of weakness is shaped to define at least one stress concentrating feature, and wherein the at least one stress concentrating feature is configured to be exposed by rupturing of the second line of weakness

to enable a tear in the sheet material to be initiated by a user to form an extraction opening for removal of an article housed in the enclosed cavity.

**[0070]** There has also been described a method of forming an extraction opening for removal of an article housed in an enclosed cavity of a package comprising sheet material shaped to form an enclosed cavity for housing the article, as shown schematically in Figure 14, comprising a step T1 of deforming the sheet material along or around a first line of weakness comprised in the sheet material to rupture second line of weakness defining at least one stress concentrating feature, thus exposing the at least one stress concentrating feature; and a step T2 of initiating a tear in the sheet material at the at least one stress concentrating feature to form an extraction opening for removal of an article housed in the enclosed cavity.

**[0071]** In order to address various issues and advance the art, this disclosure shows by way of illustration various embodiments in which the claimed invention(s) may be practiced. The advantages and features of the disclosure are of a representative sample of embodiments only, and are not exhaustive and/or exclusive. They are presented only to assist in understanding and to teach the claimed invention(s). It is to be understood that advantages, embodiments, examples, functions, features, structures, and/or other aspects of the disclosure are not to be considered limitations on the disclosure as defined by the claims or limitations on equivalents to the claims, and that other embodiments may be utilised and modifications may be made without departing from the scope of the claims. Various embodiments may suitably comprise, consist of, or consist essentially of, various combinations of the disclosed elements, components, features, parts, steps, means, etc. other than those specifically described herein, and it will thus be appreciated that features of the dependent claims may be combined with features of the independent claims in combinations other than those explicitly set out in the claims. For instance, any of the dependent claims relating to independent claim 1 (or other independent claims) may correspondingly be employed as corresponding features in any of the related independent claims listed in the claims, as required. Appreciably as well, the disclosure may include other inventions not presently claimed, but which may be claimed in future.

**[0072]** Purely for completeness, it will be appreciated that in some embodiments as well, any of the provided cavities may, in some embodiments, comprise a viewing portion for allowing visibility into the cavity when the packaging is in unopened configuration. In terms of what this viewing portion might be, in some embodiments the viewing portion could appreciably comprise a portion of sheet material overlying the cavity which is at least partially transparent or at least partially translucent, such as a portion which is made of a transparent plastic. With the provision of this viewing portion, a user may be enabled to verify that the cavity contains the particular article of

consumer goods which they are expecting.

**[0073]** Certain aspects of the disclosure are set out in the following numbered paragraphs:

Paragraph 1. A package for housing an article, the packaging comprising sheet material shaped to form an enclosed cavity for housing the article; wherein an outer surface of the sheet material comprises a first line of weakness along or around which the sheet material is configured to be deformed by a user, and a second line of weakness configured to rupture when the sheet material is deformed along or around the first line of weakness; wherein the second line of weakness is shaped to define at least one stress concentrating feature; and wherein the at least one stress concentrating feature is configured to be exposed by rupturing of the second line of weakness to enable a tear in the sheet material to be initiated by a user to form an extraction opening for removal of the article housed in the enclosed cavity.

Paragraph 2. The package of paragraph 1, wherein the at least one stress concentrating feature does not intersect with the an edge of the sheet material.

Paragraph 3. The package of any preceding paragraph, wherein the at least one stress concentrating feature is shaped to enable tearing of the sheet material to be initiated by a user along a direction oriented away from the first line of weakness.

Paragraph 4. The package of any preceding paragraph, wherein the second line of weakness is shaped to form a tab feature graspable by a user upon rupturing, wherein a junction between the tab feature and the first line of weakness forms the at least one stress concentrating feature.

Paragraph 5. The package of any of paragraphs 1 to 3, wherein the second line of weakness is shaped to form a notch or slit upon rupturing, wherein a base of the notch or slit forms the at least one stress concentrating feature.

Paragraph 6. The package of any preceding paragraph, wherein the first line of weakness is configured to be deformed by flexion or folding of the sheet material around the first line of weakness.

Paragraph 7. The package of any preceding paragraph, wherein the second line of weakness is configured to present a lower resistance to rupture than the first line of weakness.

Paragraph 8. The package of any preceding paragraph, wherein the first line of weakness extends to a first edge of the sheet material.

Paragraph 9. The package of paragraph 8, wherein the first line of weakness is configured to be deformed by tearing of the sheet material along the first line of weakness.

Paragraph 10. The package of paragraph 9, wherein a supplementary stress concentrating feature is disposed at the junction of the first line of weakness with the edge of the sheet material, to enable tearing of the sheet material along the first line of weakness to be initiated by a user.

Paragraph 11. The package of any of paragraphs 8 to 10, wherein the first line of weakness is disposed between the enclosed cavity for housing the one or more articles and a second edge of the sheet material, defining a tear-off strip between the first line of weakness and the second edge of the sheet material.

Paragraph 12. The package of any preceding paragraph, wherein the first line of weakness and the second line of weakness are connected.

Paragraph 13. The package of paragraph 12, wherein an end of the first line of weakness is connected to an end of the second line of weakness to enable a tear along the first line of weakness to initiate a rupture of the second line of weakness.

Paragraph 14. The package of any preceding paragraph, the sheet material comprising a first panel and a second panel brought into relation at their major faces, and sealed together around one or more respective edges of the first panel and the second panel to form a border region at least partially defining the enclosed cavity.

Paragraph 15. The package of paragraph 14, wherein the first and second lines of weakness are formed within the border region

Paragraph 16. The package of paragraph 15, wherein the at least one stress concentrating feature is shaped to enable tearing of the sheet material to be initiated by a user along a direction oriented towards the enclosed cavity.

Paragraph 17. The package of any preceding paragraph, wherein the one or more articles comprise an active substance.

Paragraph 18. The package of any preceding paragraph, wherein the one or more articles comprise one or more components of an aerosol delivery system.

Paragraph 19. The package of any of paragraphs 14

to 18, wherein the sheet material comprises a thermoplastic material, and the border is formed by heat sealing.

Paragraph 20. The package of any preceding paragraph, wherein the sheet material comprises a metallic layer.

Paragraph 21. The package of any preceding paragraph, wherein the sheet material is impermeable to liquid.

Paragraph 22. A method of forming a package for housing an article, comprising the steps of: shaping sheet material to form an enclosed cavity for housing the one or more articles; forming a first line of weakness in the sheet material along or around which the sheet material is configured to be deformed by a user, forming a second line of weakness in the sheet material which is configured to rupture when the sheet material is deformed along or around the first line of weakness, wherein the second line of weakness is shaped to define at least one stress concentrating feature, and wherein the at least one stress concentrating feature is configured to be exposed by rupturing of the second line of weakness to enable a tear in the sheet material to be initiated by a user to form an extraction opening for removal of an article housed in the enclosed cavity.

Paragraph 23. The method of paragraph 22, wherein the article is enclosed within the enclosed cavity during the step of shaping the sheet material to form an enclosed cavity for housing the article.

Paragraph 24. A method of forming an extraction opening for removal of an article housed in an enclosed cavity of a package comprising sheet material shaped to form an enclosed cavity for housing the article; comprising the steps of: deforming the sheet material along or around a first line of weakness comprised in the sheet material to rupture second line of weakness defining at least one stress concentrating feature, thus exposing the at least one stress concentrating feature; and initiating a tear in the sheet material at the at least one stress concentrating feature to form an extraction opening for removal of an article housed in the enclosed cavity.

## Claims

1. A package for housing an article, the packaging comprising sheet material shaped to form an enclosed cavity for housing the article;

wherein an outer surface of the sheet material comprises a first line of weakness along or

- around which the sheet material is configured to be deformed by a user, and a second line of weakness configured to rupture when the sheet material is deformed along or around the first line of weakness;  
 wherein the second line of weakness is shaped to define at least one stress concentrating feature; and  
 wherein the at least one stress concentrating feature is configured to be exposed by rupturing of the second line of weakness to enable a tear in the sheet material to be initiated by a user to form an extraction opening for removal of the article housed in the enclosed cavity.
2. The package of claim 1, wherein the at least one stress concentrating feature does not intersect with the an edge of the sheet material.
  3. The package of any preceding claim, wherein the at least one stress concentrating feature is shaped to enable tearing of the sheet material to be initiated by a user along a direction oriented away from the first line of weakness.
  4. The package of any preceding claim, wherein the second line of weakness is shaped to form a tab feature graspable by a user upon rupturing, wherein a junction between the tab feature and the first line of weakness forms the at least one stress concentrating feature.
  5. The package of any of claims 1 to 3, wherein the second line of weakness is shaped to form a notch or slit upon rupturing, wherein a base of the notch or slit forms the at least one stress concentrating feature.
  6. The package of any preceding claim, wherein the first line of weakness is configured to be deformed by flexion or folding of the sheet material around the first line of weakness.
  7. The package of any preceding claim, wherein the first line of weakness extends to a first edge of the sheet material.
  8. The package of claim 7, wherein the first line of weakness is disposed between the enclosed cavity for housing the one or more articles and a second edge of the sheet material, defining a tear-off strip between the first line of weakness and the second edge of the sheet material.
  9. The package of any preceding claim, wherein the first line of weakness and the second line of weakness are connected.
  10. The package of any preceding claim, the sheet material comprising a first panel and a second panel brought into relation at their major faces, and sealed together around one or more respective edges of the first panel and the second panel to form a border region at least partially defining the enclosed cavity.
  11. The package of claim 10, wherein the first and second lines of weakness are formed within the border region.
  12. The package of any preceding claim, wherein the one or more articles comprise one or more components of an aerosol delivery system.
  13. The package of any preceding claim, wherein the sheet material is impermeable to liquid.
  14. A method of forming a package for housing an article, comprising the steps of:  
 shaping sheet material to form an enclosed cavity for housing the one or more articles;  
 forming a first line of weakness in the sheet material along or around which the sheet material is configured to be deformed by a user,  
 forming a second line of weakness in the sheet material which is configured to rupture when the sheet material is deformed along or around the first line of weakness, wherein the second line of weakness is shaped to define at least one stress concentrating feature, and  
 wherein the at least one stress concentrating feature is configured to be exposed by rupturing of the second line of weakness to enable a tear in the sheet material to be initiated by a user to form an extraction opening for removal of an article housed in the enclosed cavity.
  15. A method of forming an extraction opening for removal of an article housed in an enclosed cavity of a package comprising sheet material shaped to form an enclosed cavity for housing the article; comprising the steps of:  
 deforming the sheet material along or around a first line of weakness comprised in the sheet material to rupture second line of weakness defining at least one stress concentrating feature, thus exposing the at least one stress concentrating feature; and  
 initiating a tear in the sheet material at the at least one stress concentrating feature to form an extraction opening for removal of an article housed in the enclosed cavity.

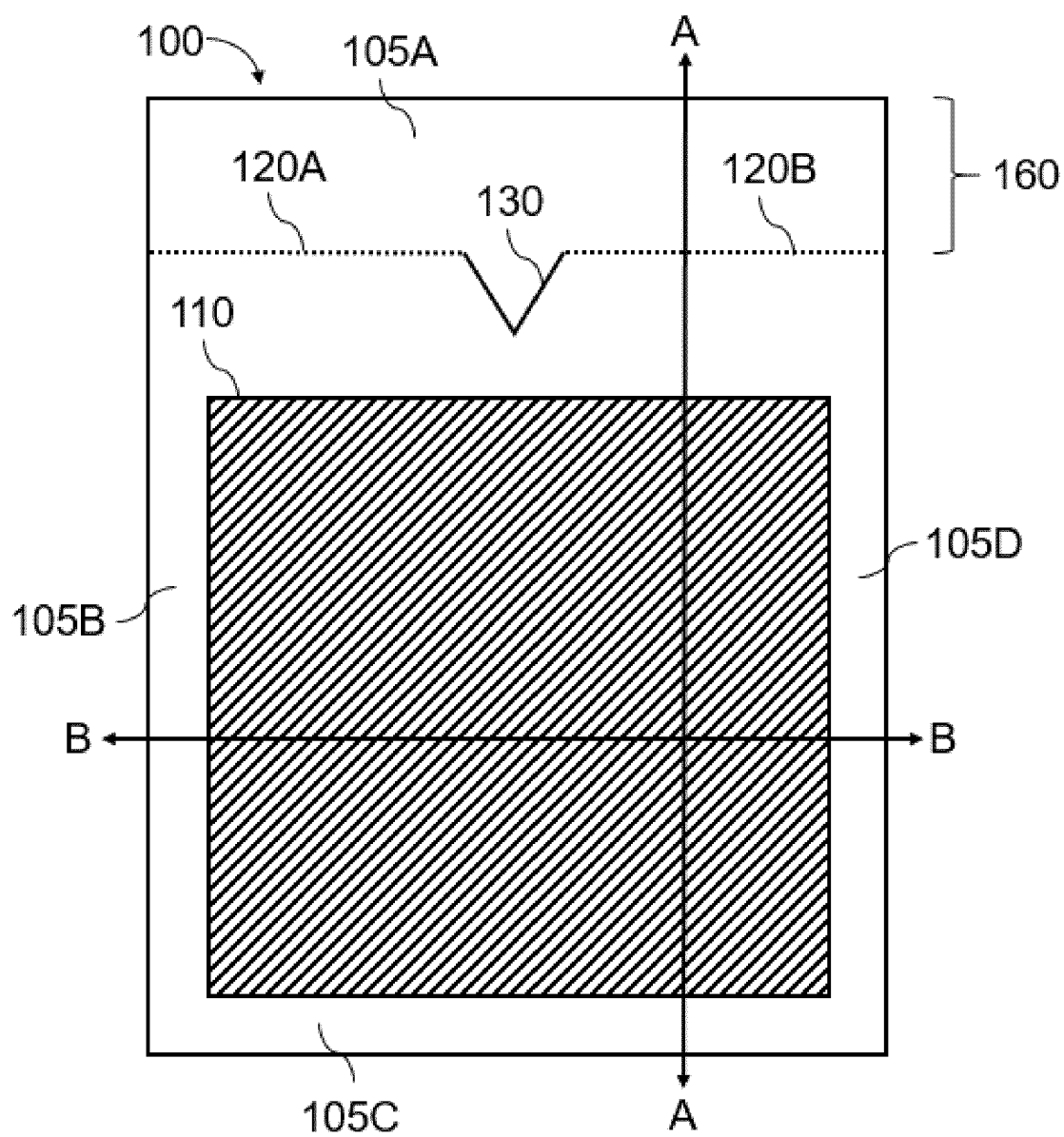


FIG. 1

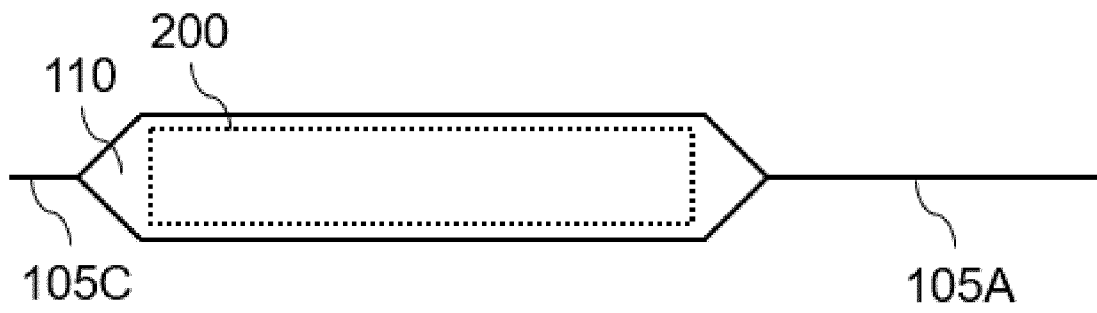


FIG. 2A

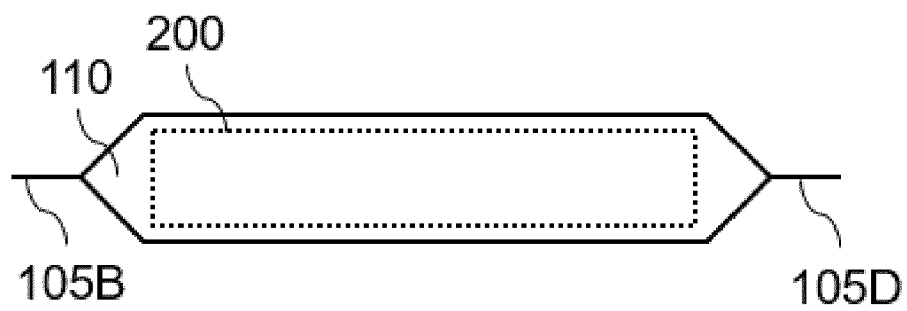


FIG. 2B



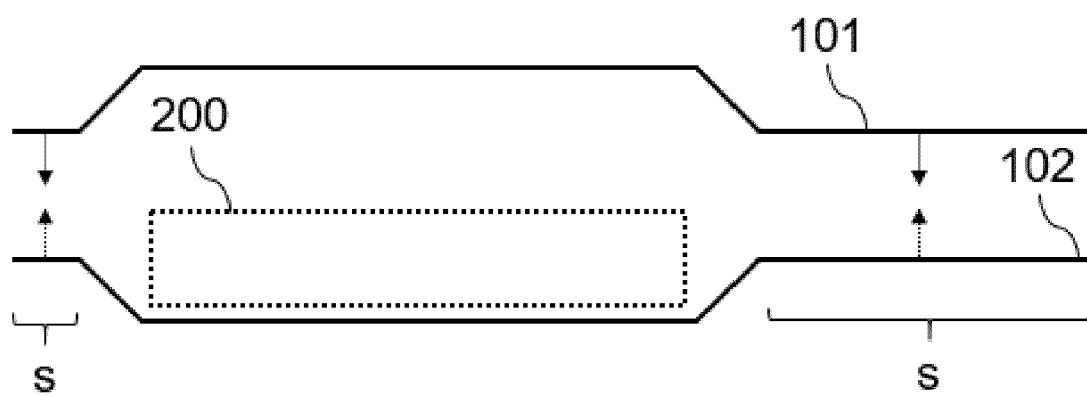


FIG. 3A

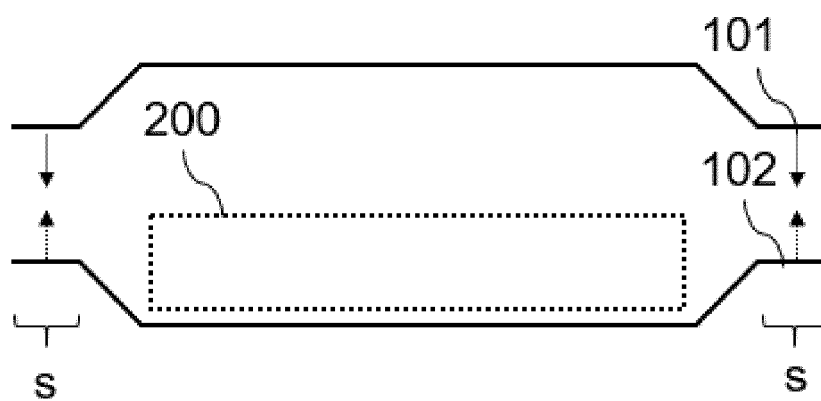


FIG. 3B

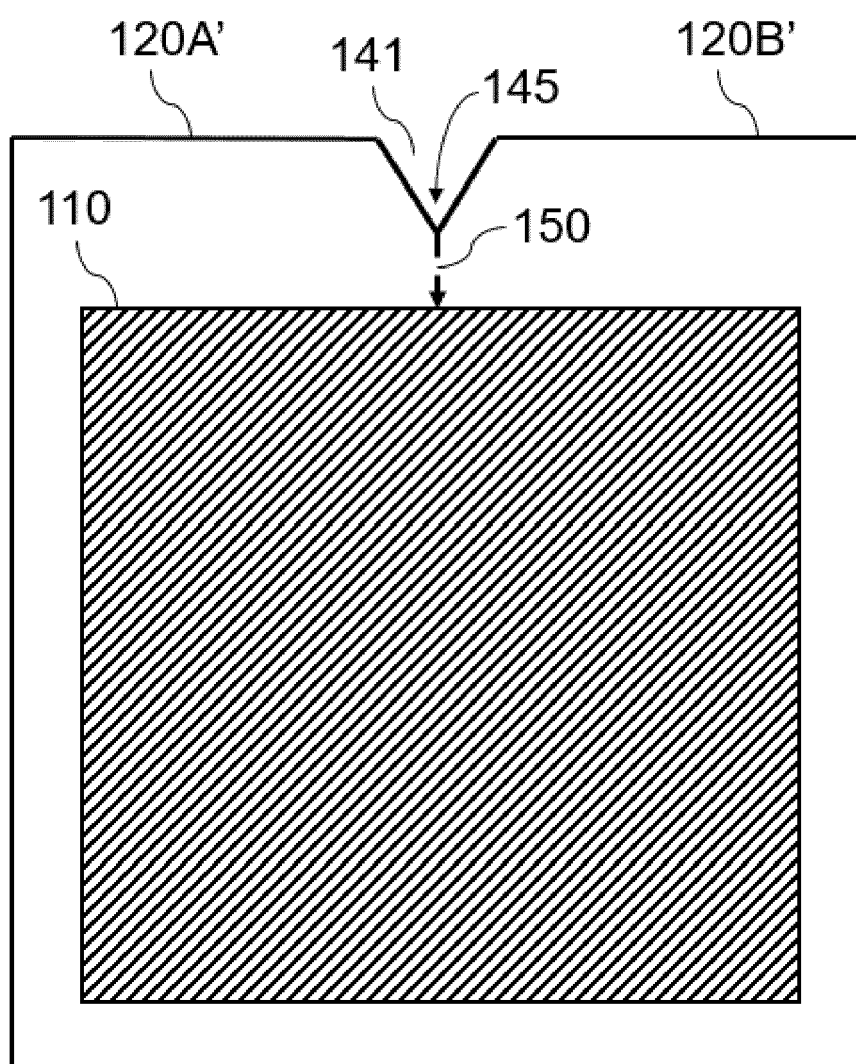


FIG. 4

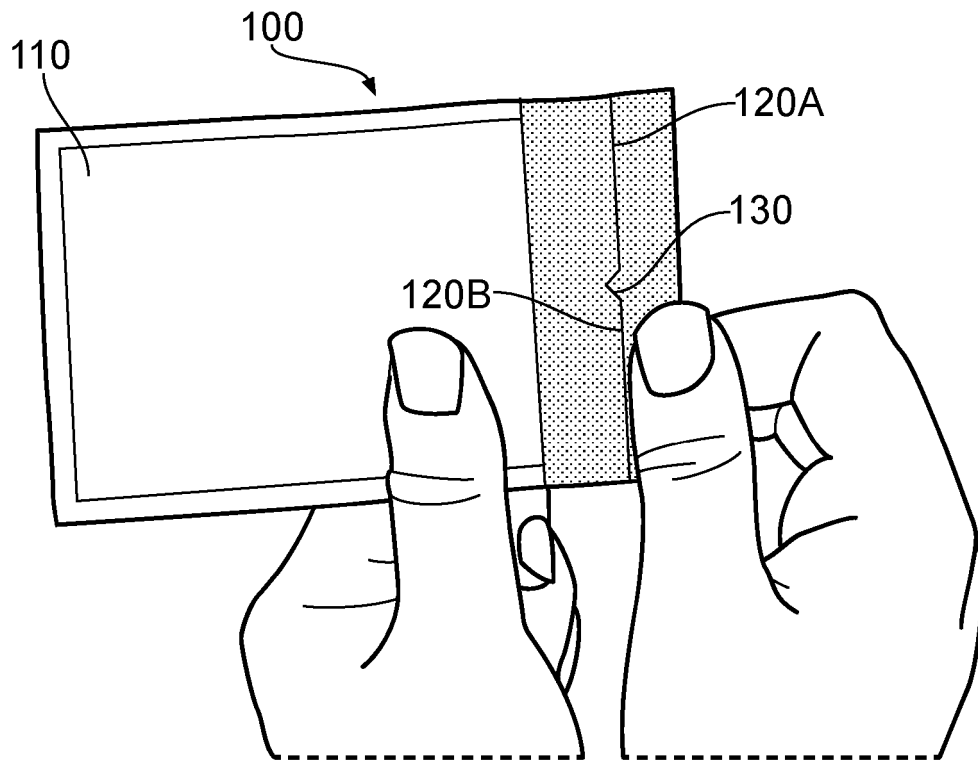


FIG. 5A

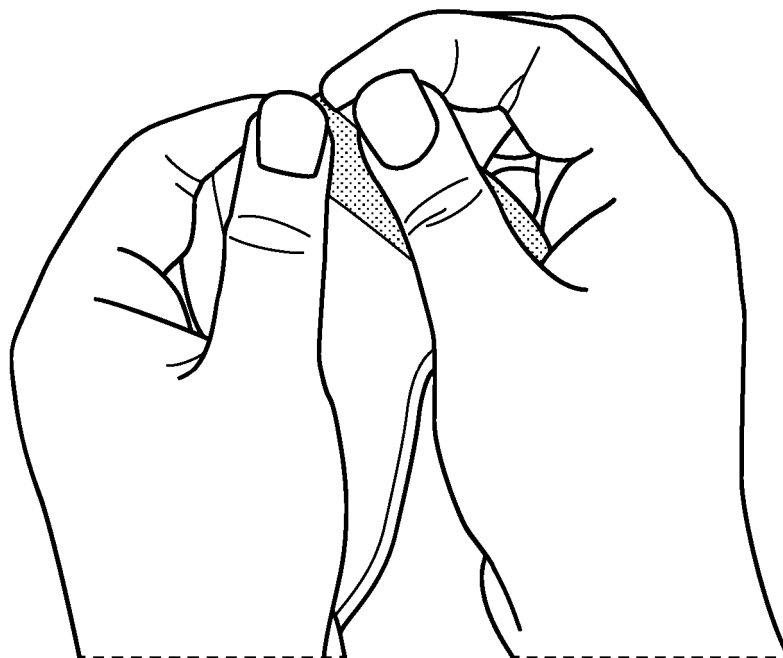


FIG. 5B

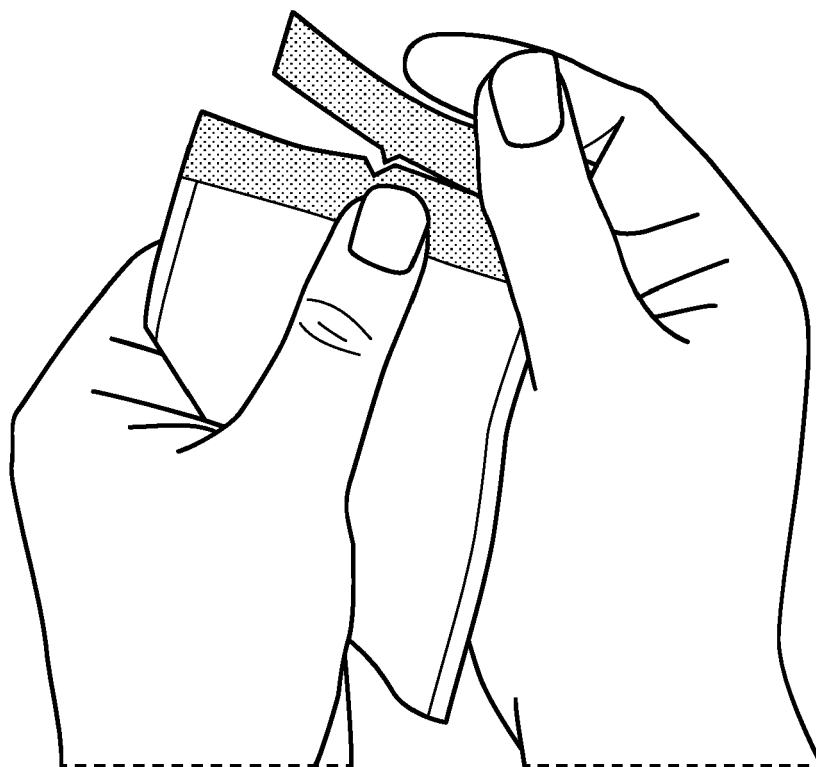


FIG. 5C

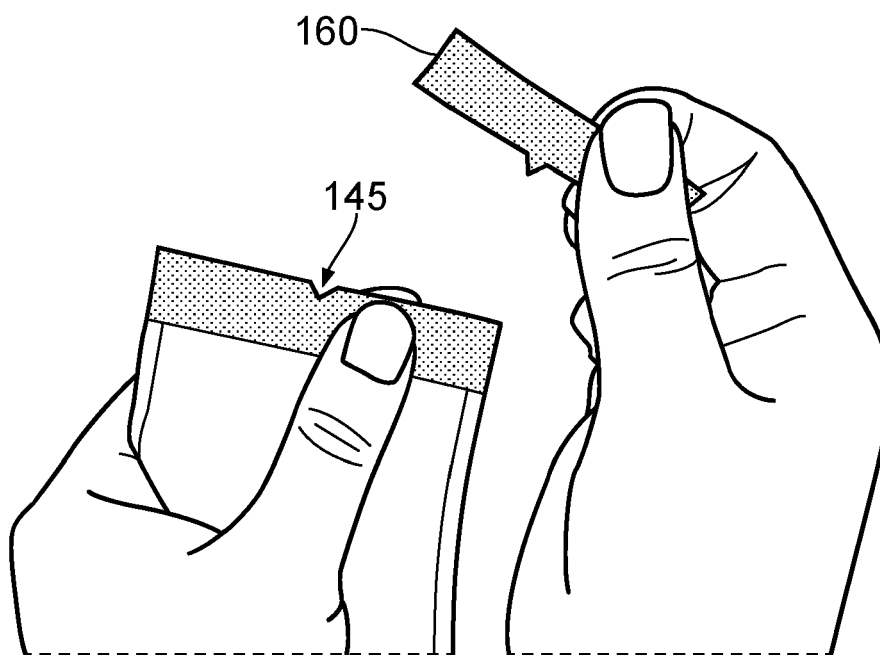


FIG. 5D

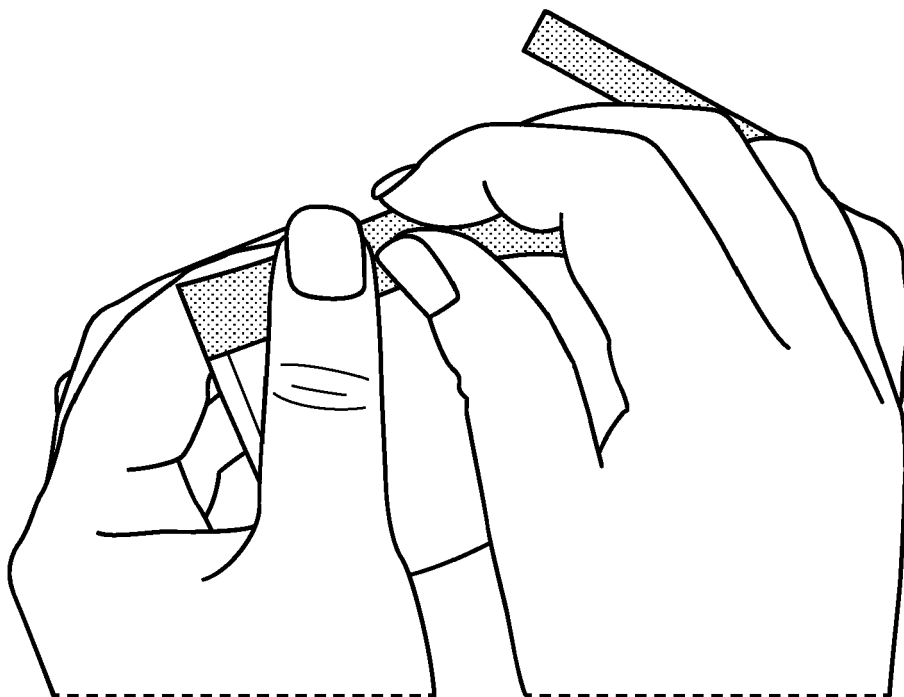


FIG. 5E

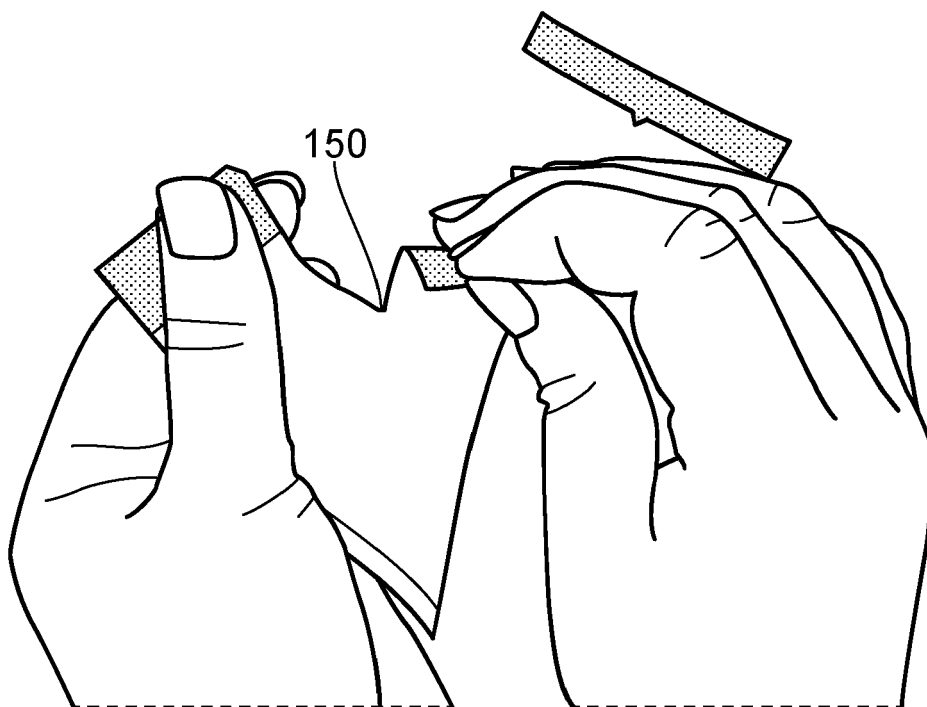


FIG. 5F

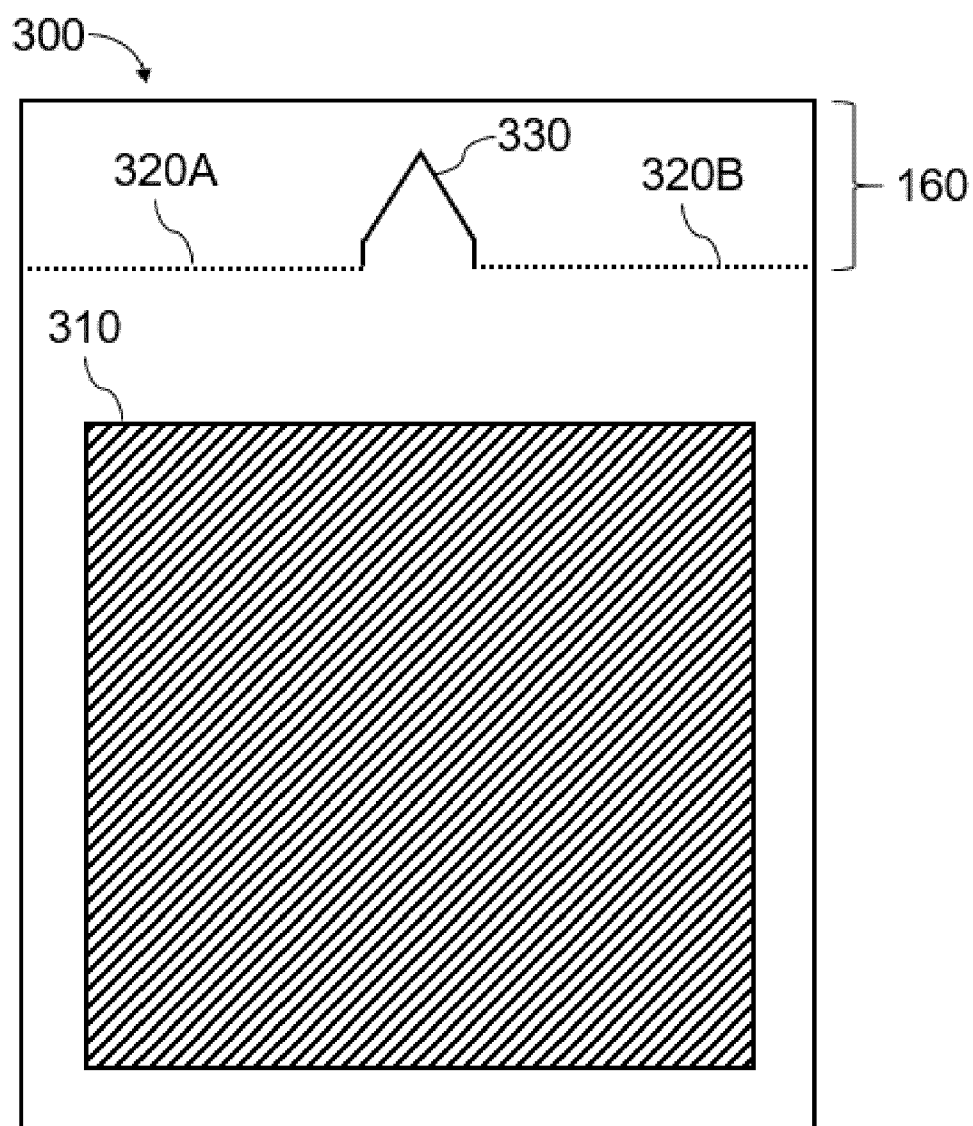


FIG. 6

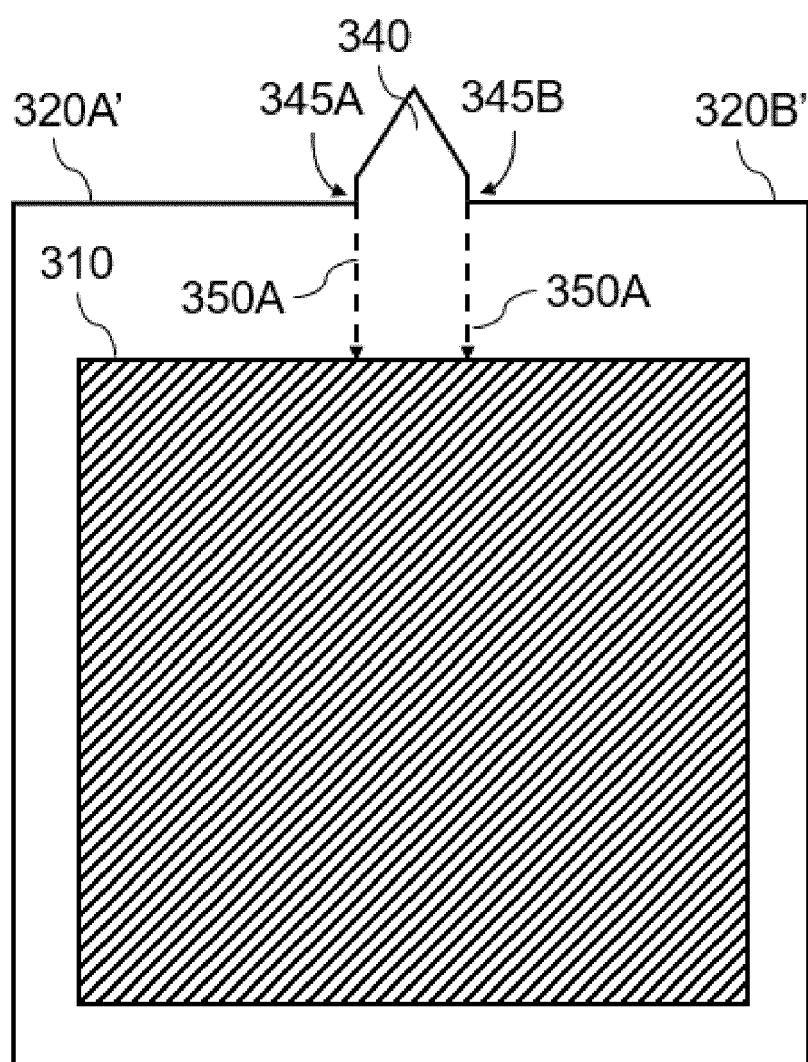


FIG. 7

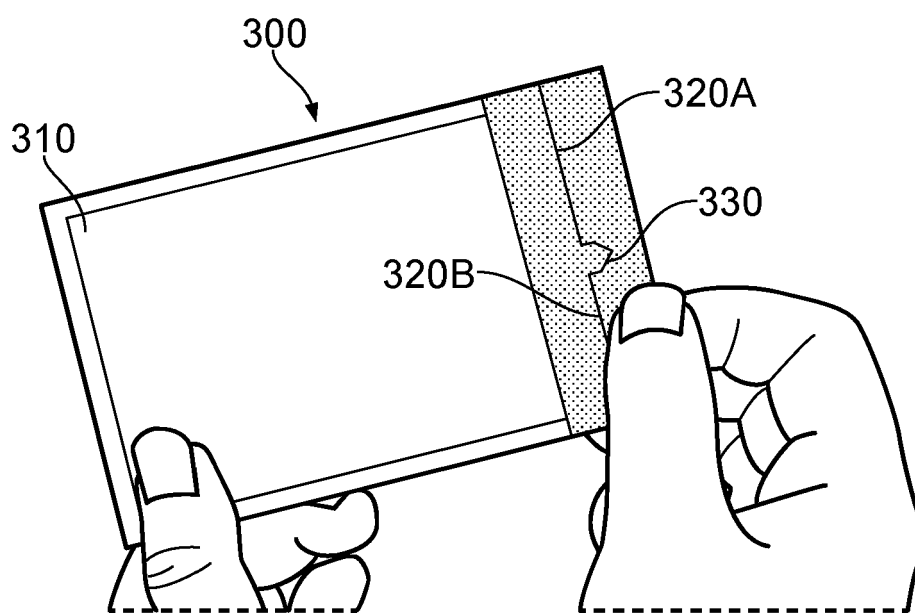


FIG. 8A

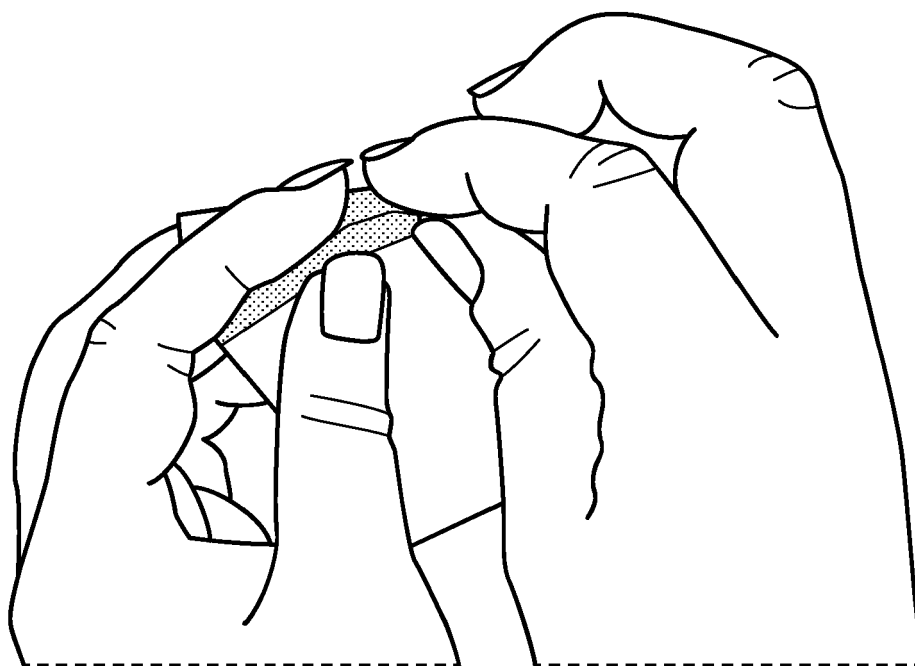


FIG. 8B



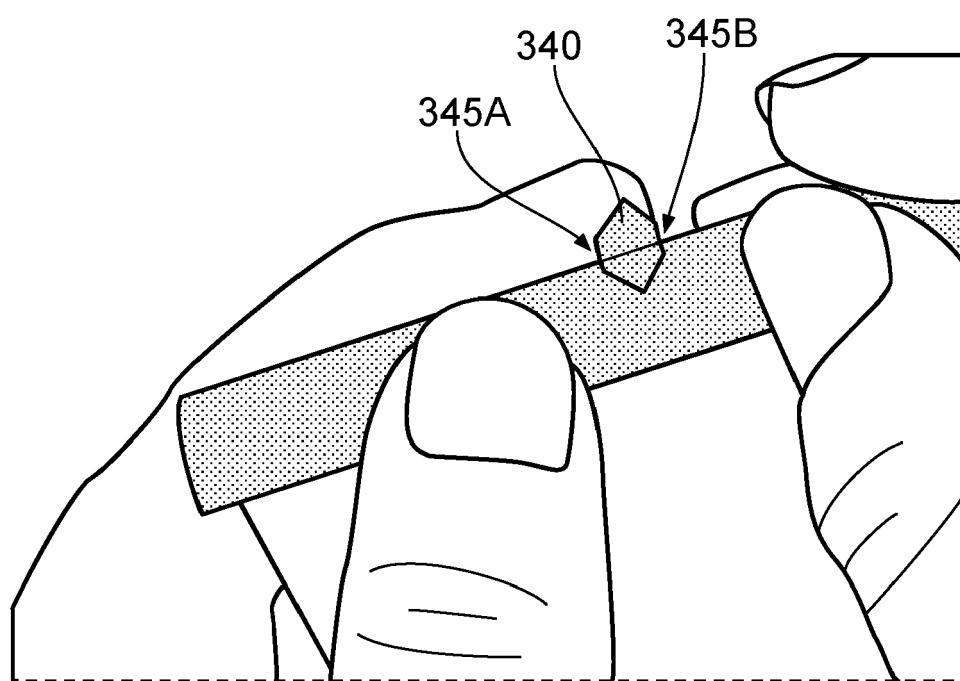


FIG. 8C

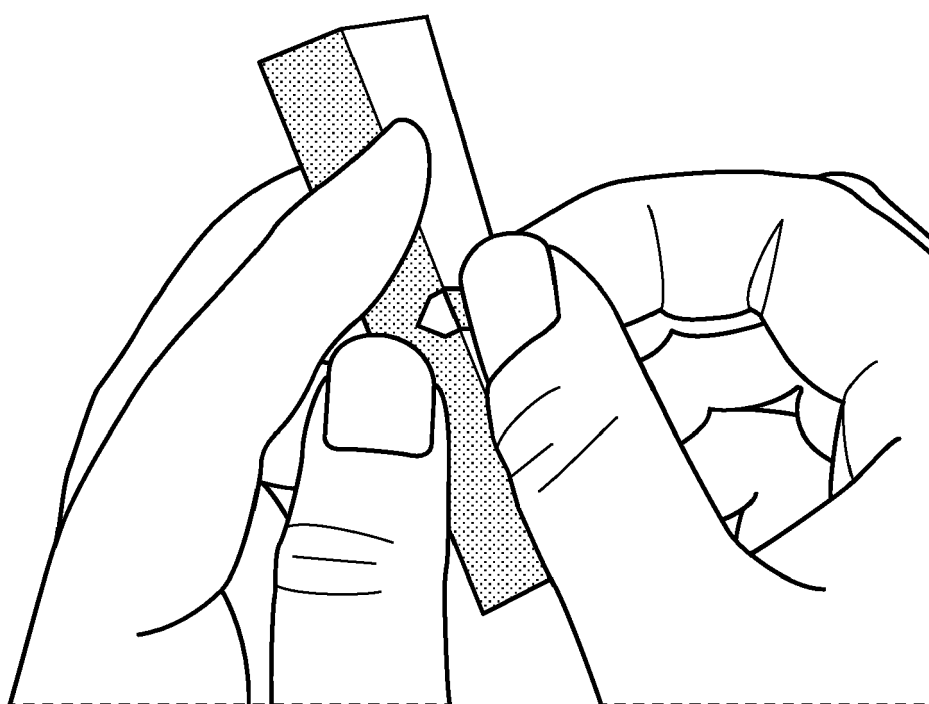


FIG. 8D

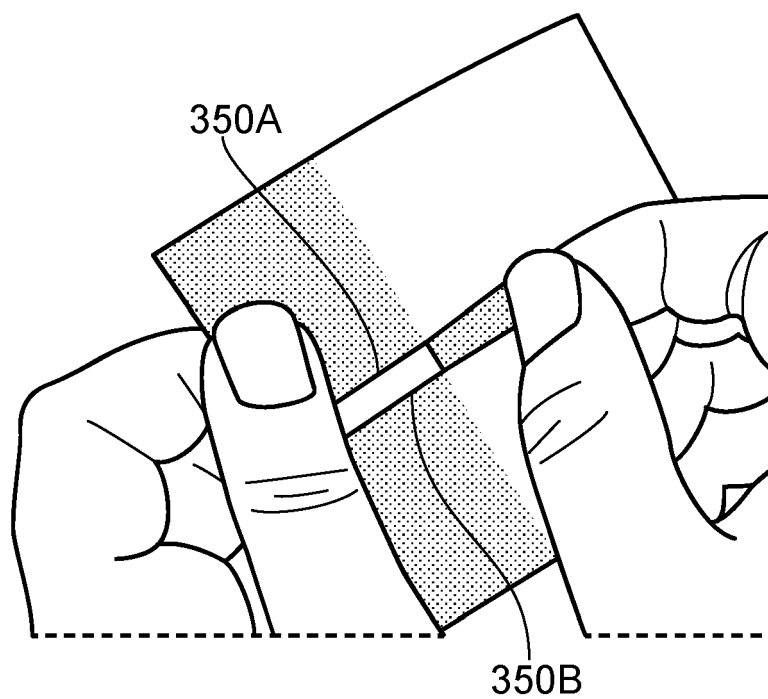


FIG. 8E

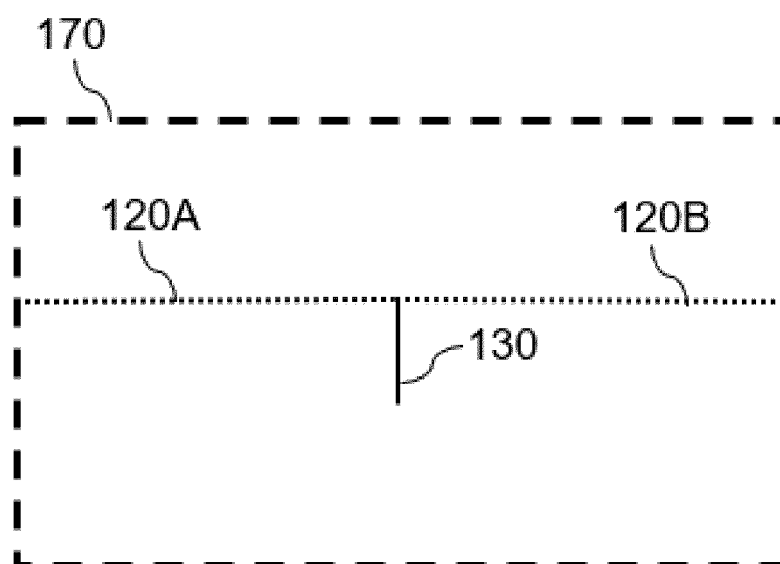


FIG. 9

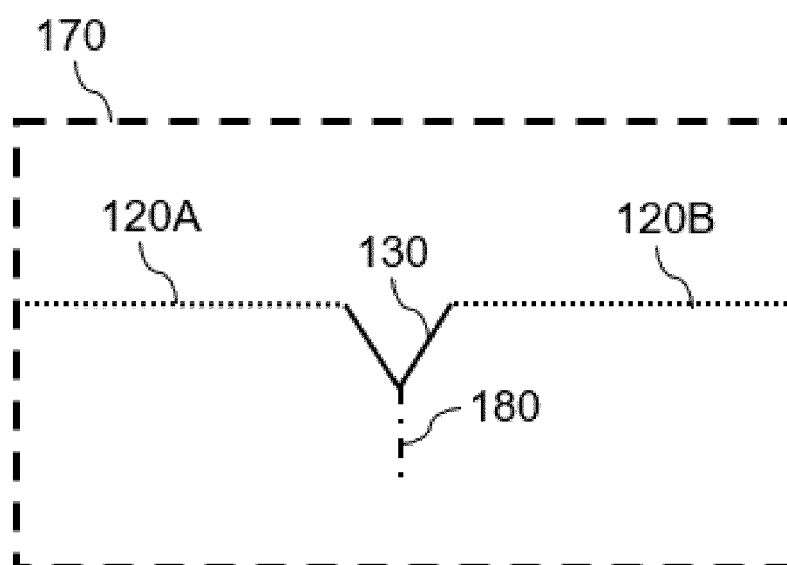


FIG. 10

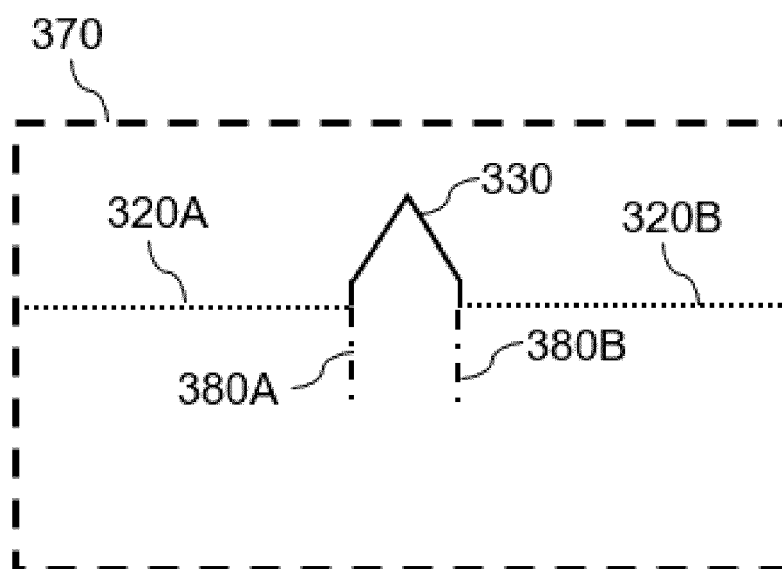


FIG. 11

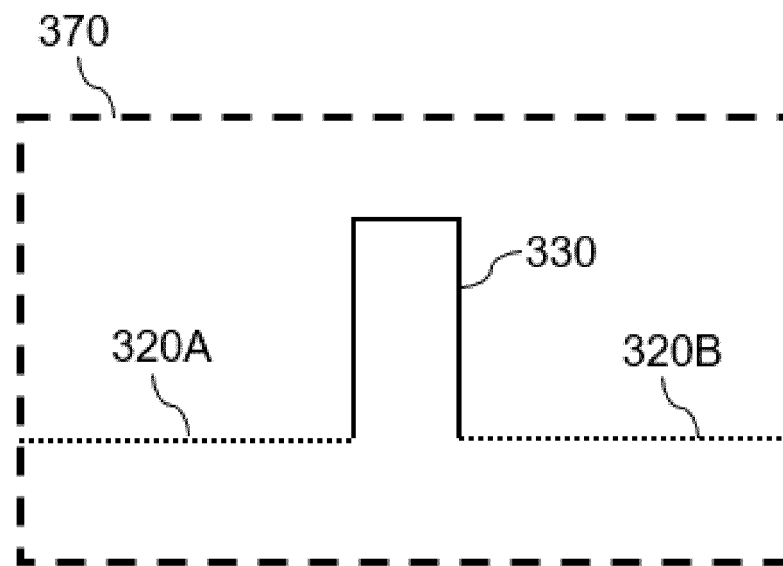


FIG. 12

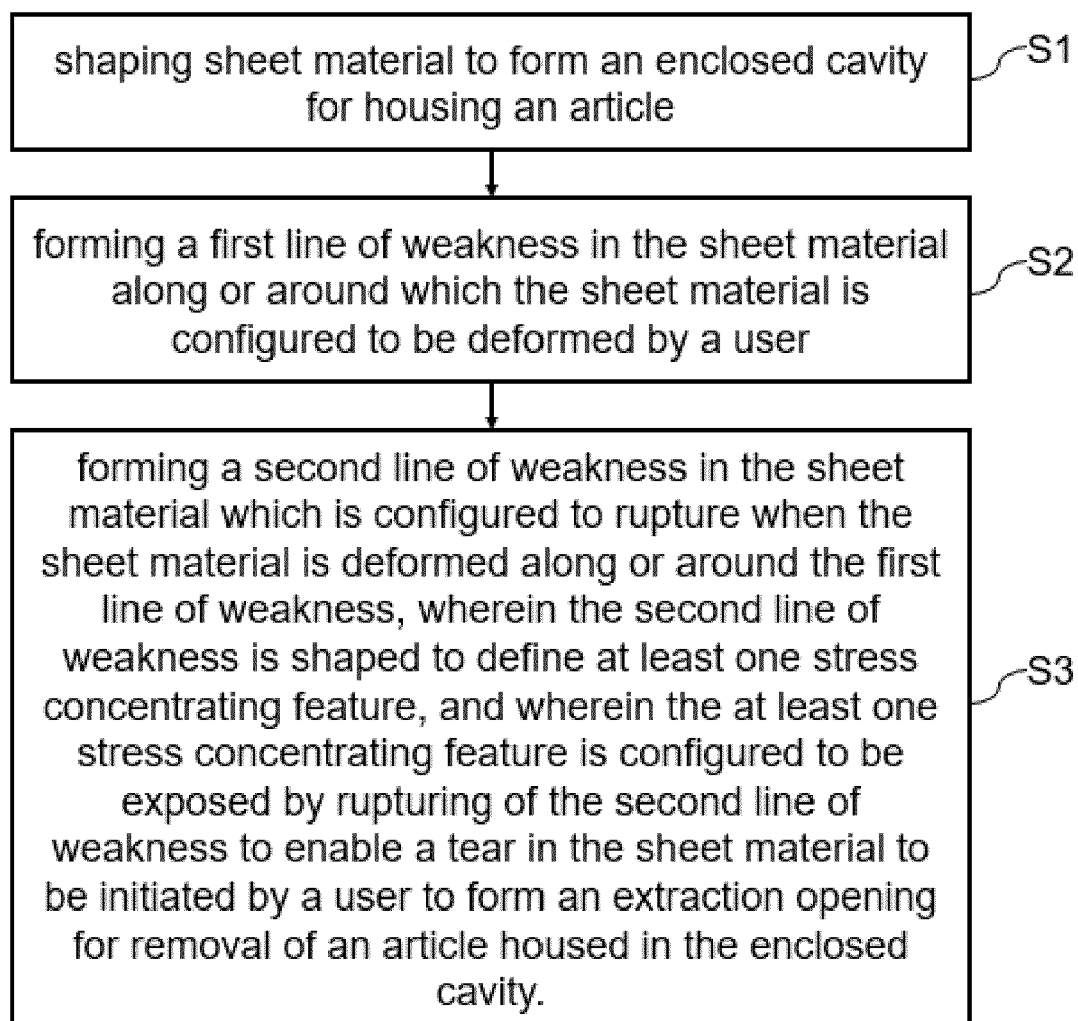


FIG. 13

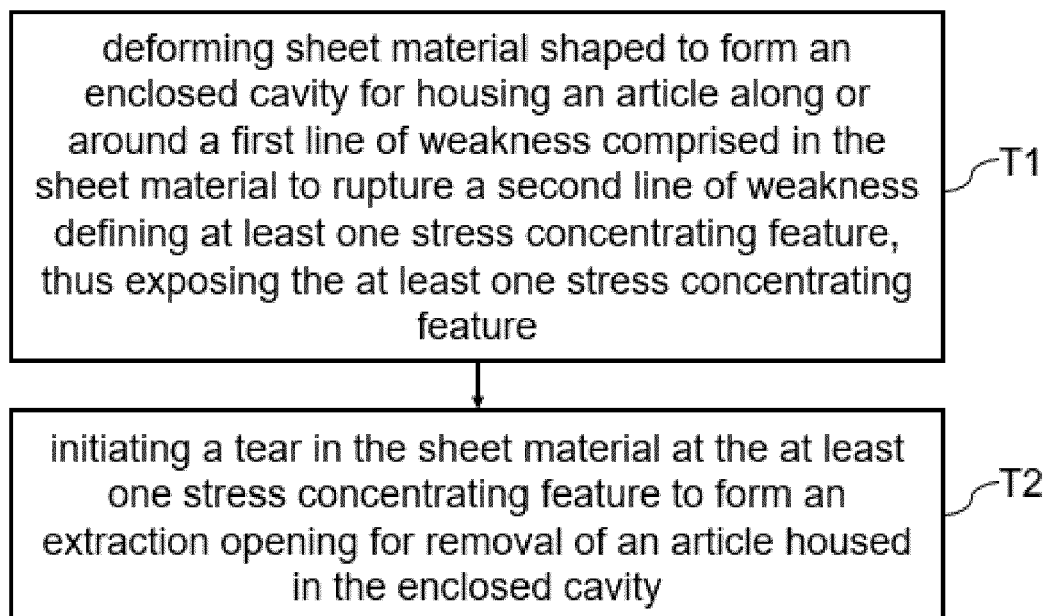


FIG. 14



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The present search report has been drawn up for all claims			
Place of search		Date of completion of the search	Examiner
Munich		9 August 2024	Jervelund, Niels
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