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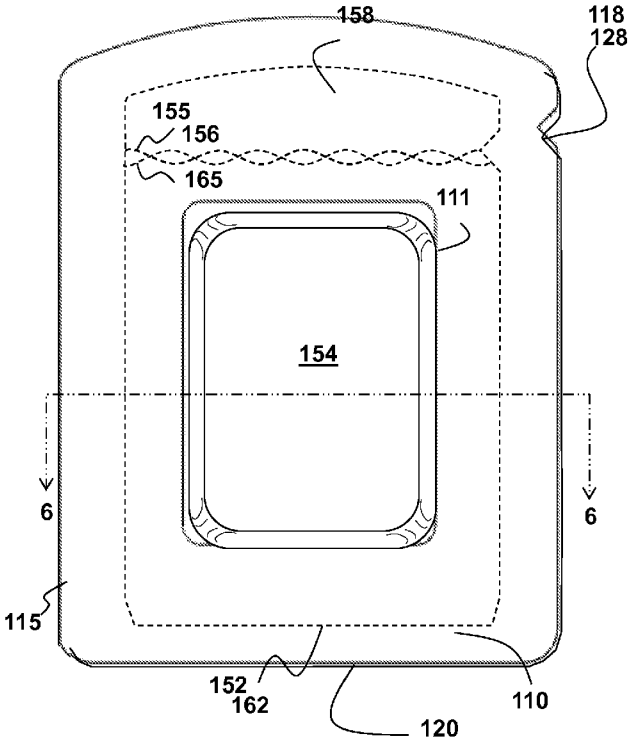
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[Continued on next page]

(54) **Title**: BLISTER CARD WITH BEND-RESISTING FEATURE

FIG. 5



(57) **Abstract**: A package is disclosed which includes first panel (110) and second panel (120) having an attached blister (150, 160). The blister has a flange sandwiched between the panels (110, 120). A portion of the blister flange has a nonlinear or scalloped edge (155, 165) to minimize bending along the nonlinear edge.

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BLISTER CARD WITH BEND-RESISTING FEATURE

REFERENCE TO RELATED APPLICATION

[0001] This application claims the benefit of priority under 35 U.S.C. §119(e) of United States provisional application serial number 61/739,055 filed on December 19, 2012, which is hereby incorporated by reference in its entirety.

BACKGROUND

[0002] This disclosure is directed to blister card packages and, more particularly, to blister packages with a non-linear edge to the blister which helps prevent bending the card along that edge of the blister.

[0003] Manufacturers and retailers of consumer goods, such as pharmaceuticals, software, electronics, health and beauty products and the like, typically package their products in tamper resistant security packages. For example, many consumer goods are packaged in blister or clamshell packages formed by positioning a consumer good in a flanged blister made from various polymeric and/or paperboard materials and sealing the flanged blister between two paperboard substrates. Consumers have voiced disapproval of such packages because of the difficulty of opening the same and the potential for being cut on a rough edge especially of plastic blisters. Packages may therefore be made based largely on paperboard, for example, NATRALOCK packages. Packaging made primarily of paperboard is more sustainable than packaging made from petroleum-based plastics. The paperboard used in such packages may be tear-resistant as described in commonly assigned US Patent No. 7,144,635.

[0004] Some packages may comprise a paperboard card and a polymeric blister. Often the paperboard card may be a planar or flat construction. If the card is tear resistant, a notch may be provided which, after purchase, the consumer may cut or tear to start opening the package. Often this notch may be proximate to the edge of a blister flange sandwiched in the package between two cards.

[0005] The thickness change of the package at the edge of the blister flange may provide a stress raiser so that in handling the package, it may tend to flex or bend along the edge of the blister flange. The shape of the package then becomes less attractive, and the associated printed graphics may become creased. A consumer may then be less willing to purchase the package, possibly thinking its contents may be damaged, or that it is unsuitable if the purchased item is to be given as a gift.

[0006] It would, therefore, be advantageous to have a package whose blister is constructed with a flange that mitigates the potential bending in normal handling along the edge of the blister flange.

SUMMARY

[0007] In one aspect a package is disclosed which includes a blister attached to a card. The card may have at least a first and second panel. The blister may have a flange, and at least one edge of the flange may have a non-linear shape. The blister may have multiple parts, with certain non-linear flanges overlapping.

[0008] Other aspects of the disclosed package will become apparent from the following description and the accompanying drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

[0009] Fig. 1 is a plan view of a blank to form a double-blister package;

[0010] Fig. 2 is a plan view of the blisters for use with the double-blister package;

[0011] Fig. 3 is a plan view of the blank with blisters installed during assembly of the package, before folding the blank;

[0012] Fig. 4 is a cross section view through the assembly of Fig. 3;

[0013] Fig. 5 is a plan view of the package after folding the blank to enclose the blister flanges;

[0014] Fig. 6 is a cross section view through the assembly of Fig. 5;

[0015] Fig. 7 is an example sealing pattern for adhesively joining the parts of the package;

[0016] Fig. 8 is a view of the package after opening;

[0017] Fig. 9 is a plan view of an alternative blank to form a double-blister package;

[0018] Fig. 10 is a plan view of an alternative form of blisters for use with the double-blister package;

[0019] Fig. 11 is a plan view of a blank to form a single-blister package;

[0020] Fig. 12 is a plan view of a blister for use with the single-blister package;

[0021] Fig. 13 is a plan view of the blank with the blister installed during assembly of the package, before folding the blank;

[0022] Fig. 14 is a cross section view of the assembly of Fig. 13;

[0023] Fig. 15 is a plan view of the package after folding the blank to enclose the blister flange;

[0024] Fig. 16 is a cross section view of the assembly of Fig. 15;

[0025] Fig. 17 is an example sealing pattern for adhesively joining the parts of the package;

[0026] Fig. 18 is a view of the package after opening; and

[0027] Fig. 19 is a plan view of an alternative blank to form a single-blister package.

DETAILED DESCRIPTION

[0028] As various embodiments of the package are described, reference will be made to Figures 1-19. Certain parts of the packages are denoted by reference numerals. Where there is more than one of the same feature, generally only one will be denoted by a reference numeral. Typically in these Figures, where a front plan view is shown for a blank of material, solid lines usually indicate periphery or cuts, and dashed lines usually indicate crease, score, or fold lines. In perspective views, solid lines typically show edges or folds, while dashed lines typically show hidden or partially obscured features. Where assembly steps are described, these steps are exemplary and are not to be limiting as to the sequence of operations used to arrive at the final package. Also, directions such as up, down, top, bottom, front, back, etc. are used for convenience in describing the package and are not meant to be limiting. The packages described here may be made from one blank (that is, the cut sheet parts from which the package components are made by folding and other steps) or from more than one blank. The word "card" or "panel" will often be used to describe a piece of sheet material such as paperboard, particularly with respect to a blank from which the package is made. Since panels are sometimes superimposed, for example, creating a two-layer or multi-layer structure, like features or panels will sometime coincide, in which cases, descriptions may call out the number identifying the feature closer to the viewer, that is, the feature visible in a particular Figure.

[0029] Figs. 1-10 show a package utilizing two blisters. Fig. 1 shows a front plan view of a blank 100 for forming package. Blank 100 may include a first or front panel 110 and a second or back panel 120, which may be joined by a fold line 115 therebetween. A front cutout 111 may be provided in front panel 110 and back cutout 121 may be provided in back panel 120. These cutouts may receive a blister or blisters 150, 160 as described below, and may be shaped and sized to receive the blister(s). Therefore cutouts 111, 121 may have identical, similar, or different shapes and sizes.

[0030] Fig. 2 shows a back blister 160 and front blister 150. The blisters may have each have a cavity or blister body 154, 164 to hold merchandise. The blisters may also

each have a peripheral flange 152, 162. These flanges may extend partially or completely around the blisters. The edges of the flanges may be straight or linear. However, at least one of the edges may be non-linear, for example blister flange scalloped edge 155, 165. A portion of the flange for one or both blisters may extend beyond the blister flange scalloped edge, for example blister flange extension 158 which is show to extend beyond the blister flange scalloped edge 155.

[0031] The front blister 150 and back blister 160 may be separate as shown in Fig. 2, or they may be joined together, for example along an edge. If the blisters are joined together along an edge, it may be advantageous to have them joined along the edge opposite from the scalloped edge (see Fig. 10) particularly if the package is to be opened along the scalloped edge. In such a case the blisters upon opening may 'hinge' apart along the joined edge. On the other hand the blisters may also be joined along an edge adjacent the scalloped edge. Finally as noted the blisters may be separate.

[0032] By "scalloped" is meant an edge that undulates, for example having a shape similar to a sinusoidal, saw-tooth, or square wave, or similar wave form. Such a wave form may have an amplitude "A" and a period "P" as denoted in Fig. 2. The wave form may be uniform or substantially uniform, that is, with a generally constant amplitude and period, or it may be non-uniform or random, that is, with the amplitude and/or period varying along the scalloped edge. If the amplitude or period is non-uniform, the scallop may still be characterized by an average amplitude and/or an average period. The amplitude and period may be chosen according to manufacturing preference. By way of example only, the amplitude may range from 0.05 to 2 inches, or from 0.1 to 0.5 inches, or from 0.15 to 0.25 inches. By way of example only, the period may range from 0.5 to 3 inches, or from 1 to 2 inches, or from 1.25 to 1.5 inches. The period and/or amplitude may be chosen relative to the size of the package or blister, for example being determined by ratio to the package dimensions. The period and/or amplitude may be chosen according to a ratio between the period and amplitude. The scalloped edge may have a certain number of peaks and valleys (i.e. cycles of the wave form) which may be chosen according to manufacturing preference. A minimum (or

maximum) number of peaks and valleys may be determined according to manufacturing preference.

[0033] While various shapes of "scallop" may be used, a smooth waveform such as a sinusoid wave may have advantages over "non-smooth" waveforms such as saw tooth and square waves. For example, if the joint formed in blister 150 between scallops 155, 156 is only partially cut through during manufacturing, during the opening process (see Fig. 8) it may be easier for a user to tear apart sinusoidal scalloped joint than a saw tooth or square wave scalloped joint. A smooth form like a sinusoidal wave may also present fewer sharp corners than a saw tooth or square wave.

[0034] Instead of having a single cavity or blister body 154, 164, the blisters 150, 160 may have multiple cavities, and the front panel 110 and back panel 120 may have one or multiple cutouts 111, 121 to receive the blister cavities. The back (or front) 'blister' may even lack a cavity, for example by using a third panel having only a flat sheet-like aspect, which could be useful for stiffening or strengthening the package, and providing intercalation of the blister flange scalloped edges as described below. In the event the back (or front) 'blister' lacks a cavity, the associated cutout may be omitted. However, if the stiffening third panel used in its place is transparent, the associated back (or front) panel may still have a cutout as a 'window' for viewing the product.

[0035] One or more notches 118, 128 may be provided in one or both of the front panel 110 and back panel 120. Such notches may be used to facilitate opening the package.

[0036] For illustration purposes, blank 100 in Fig. 1 may be considered as having its outer surface facing the viewer, and blisters 150, 160 in Fig. 2 may be considered as having their outward (e.g. protruding) surfaces facing the viewer. As an example step in the assembly of the package, Fig. 3 shows the blank as in Fig. 1, with the blisters now placed behind the blank so that back blister body 164 protrudes up through cutout 121 in back panel 120, and front blister body 154 protrudes up through cutout 111 in front panel 110. The blister flanges 152, 162 are hidden from view but shown with dashed lines. A cross section view 4 through the blank and blisters is shown in Fig. 4.

[0037] From the view on Figs. 3 and 4, the back panel 120 with associated back blister may be pivoted backward and to the right along fold line 115 to reach the structure shown in plan view in Fig. 5. A cross section view 6 is shown in Fig. 6. The front panel 110 may thus be seen to be superimposed over the back panel 120. The front blister body 154 and back blister body 164 (hidden from view) may also be generally aligned. The blister flange scalloped edges 155, 156, 165 which will eventually be separated during opening of the package, are seen to be generally aligned with notches 118, 128. However, the blister flange scalloped edges 155, 156, 165 have been formed so that in this assembled package as shown in Fig.4, the scalloped edges are overlapped and intercalated. The "intercalated" scalloped edges may be offset from one another, for example by approximately one half the period P, or approximately one third the period, or approximately one quarter the period. The non-linear (scalloped) edges, and their intercalated overlap, result in a reduced tendency of the assembled package to flex or bend the scalloped line, since there is no well-defined line where bending stresses might be focused.

[0038] Although the blister flange scalloped edges 155, 156, 165 may have various shapes as described earlier, it may be advantageous for resisting bending that when two scalloped parts overlap (as in Fig. 5) that the scalloped wave forms have approximately the same period, and are aligned so that the peaks of one scalloped flange correspond to the valleys of the flange which it overlaps.

[0039] Figs. 5 and 6 thus show the assembled package with the front panel 110 overlaid on the back panel 120 to form a two-ply (two-panel) structure with the blister bodies 154 protruding through front cutout 111, blister body 164 protruding through back cutout 121, and the blister flanges 152, 162, and 158 sandwiched between the front panel 110 and back panel 120.

[0040] Fig. 7 shows an example sealing pattern for the package. The inside-facing surfaces of the front and back panels may be coated locally or overall with a sealing material such as a heat sealable material, or adhesive made by otherwise applied before or during assembly of the package. As shown in the example sealing pattern, a card perimeter seal 172 may be provided around the outer perimeter of the front panel 110

and back panel 120. The perimeter seal 172 may be a panel to panel seal. This card perimeter seal 172 may be omitted at or near the tear notches 118, 128. Also as shown in the example sealing pattern, a blister perimeter seal 174 may be formed on the blister flanges 152, 162 at least partly around the blister bodies 154, 164. This blister perimeter seal may be one or more of a seal between the front panel and front blister flange, a seal between the back panel and back blister flange, a seal between the two blister flanges, and/or a seal between all of the front panel, front blister flange, back blister flange, and back panel.

[0041] Also, a blister flange extension seal 176 may be provided between blister flange extension 158 and one or both of the front panel 110 (at its upper region 110a as denoted on Fig. 1) and the back panel 120 (at its upper region 120a as denoted on Fig. 1).

[0042] In order to open the package, a customer may initiate a tear at notches 118, 128 either by hand or using a cutting tool such as a scissors. The tear may then be propagated across front panel 110 and back panel 120 and along the joint between scallops 155, 156 (tearing this joint if it is left only partly severed during the manufacturing process). The upper part of the package structure, that is, the panel upper regions 110a, 120a and the flange extension 158 sandwiched within, may then be separated from the main body of the package. Using their fingers, the user may separate the blister flanges at scalloped edges 155, 165 and gain access to the blister body or bodies.

[0043] Fig. 9 shows a front plan view of an alternative blank 102 for forming a package. Blank 102 is in many respects similar to blank 100 shown in Fig. 1. However, with blank 102, the front panel 110 and back panel 120 are hingedly connected along a fold line 116 along the lower edge of the cards, instead of fold line 115 along a side edge of the cards. As another option, separate blanks may be used to form the front panel 110 and back panel 120.

[0044] Fig. 10 shows the front blister 150 and back blister 160 formed as a single unit 151 with the front and back blisters connected through a fold line 153 at the lower edge

of the associated flanges 152, 162. The blisters are otherwise quite similar to the blisters shown in Fig. 2. Depending on the specific design of the package, fold lines 116 and 153 may not coincide in the finished package, so it may be necessary to fold the blisters and load their contents before folding the panels 110, 120 around the blisters.

[0045] Figs. 11 to 19 show a package with a single blister. Many of the parts have already been described in reference to the double-blister package of Figs. 1-10.

[0046] Fig. 11 shows a front plan view of a blank 104 for forming a single blister package. Blank 104 may include a first or front panel 110 and a second or back panel 120, which may be joined by a fold line 115 therebetween. A front cutout 111 may be provided in the front panel 110. The cutout may receive a front blister 150, and may be shaped and sized to receive the blister(s).

[0047] Fig. 12 shows a front blister 150. The blister may have a blister body 154 to hold merchandise. The blister may also have a peripheral flange 152. The flange may extend partially or completely around the blister. The edges of the flange may be straight or linear. However, at least one of the edges may be non-linear, for example blister flange scalloped edge 155. A portion of the flange for the blister may extend beyond the blister flange scalloped edge, for example flange extension 158 which is shown to extend beyond the blister flange scalloped edge 155.

[0048] Instead of having a single blister body 154, the blister 150 may have multiple cavities, and the front panel 110 may have one or multiple cutouts 111 to receive the blister cavities. Although a back blister is not used in this single-blister example, a third panel of material (paperboard, plastic, or other suitable material) could be placed behind the front blister for stiffening or strengthening the package, and providing intercalation of the scalloped flange edges as described below. If this additional third panel of material is used and is transparent, a back panel cutout (cutout 121 as shown in Figs. 1-10) may be provided as a window to see the package contents.

[0049] One or more notches 118, 128 may be provided in one or both of the front panel 110 and back panel 120. Such notches may be used to facilitate opening the package.

[0050] For illustration purposes, blank 104 in Fig. 11 may be considered as having its outer surface facing the viewer, and blister 150 in Fig. 12 may be considered as having its outward (e.g. protruding) surface facing the viewer. As an example step in the assembly of the package, Fig. 13 shows the blank as in Fig. 11, with the blister 150 now placed behind the blank so that front blister body 154 protrudes up through cutout 111 in front panel 110. The flange 152 is hidden from view but shown with dashed lines. A cross section view 14 through the blank and blister is shown in Fig. 14.

[0051] From the view on Figs. 13 and 14, the back panel 120 may be pivoted backward and to the right along fold line 115 to reach the structure shown in plan view in Fig. 15. A cross section view 16 is shown in Fig. 16. The front panel 110 may thus be seen to be superimposed over the back panel 120. The blister flange scalloped edge 155, 156 that may later be torn during opening of the package is seen to be generally aligned with notches 118, 128. Although only a first or front blister 150 is used in this assembly, the scalloped edges are 155, 156 will reduce the tendency of the assembled package to flex or bend at the scalloped line, since there is no well-defined line where bending stresses might be focused.

[0052] Figs. 15 and 16 thus show the assembled package with the front panel 110 overlaid on the back panel 120 to form a two-ply (card) structure with the blister body 154 protruding outward from the front panel 110, and the blister flanges 152, 158 sandwiched between the front panel 110 and back panel 120 and the blister body 154 protruding through the front cutout 111.

[0053] Fig. 17 shows an example sealing pattern for the package. The inside-facing surfaces of the front and back panels may be coated locally or overall with a sealing material such as a heat sealable material, or adhesive made by otherwise applied before or during assembly of the package. As shown in the example sealing pattern, a card perimeter seal 172 may be provided around the outer perimeter of the front panel 110

and back panel 120. The perimeter seal 172 may be a panel to panel seal. This card perimeter seal 172 may be omitted at or near the tear notches 118, 128. Also as shown in the example sealing pattern, a blister perimeter seal 174 may be formed on the blister flange 152 at least partly around the blister body 154. This blister perimeter seal may be one or more of a seal between the front panel and front blister flange, a seal between the back panel and front blister flange, and/or a seal between all of the front panel, front blister flange, and back panel.

[0054] Also, a flange extension seal 176 may be provided between flange extension 158 and one or both of the front panel 110 (at its upper region 110a as denoted on Fig. 11) and the back panel 120 (at its upper region 120a as denoted on Fig. 11).

[0055] As shown in Fig. 18, to open the package a customer may initiate a tear at notches 118, 128 either by hand or using a cutting tool such as a scissors. The tear may then be propagated across front panel 110 and back panel 120 and along the joint between scallops 155, 156 (tearing this joint if it is left only partly severed during the manufacturing process). The upper part of the package structure, that is, the panel upper regions 110a, 120a and the flange extension 158 sandwiched within, may then be separated from the main body of the package. Using their fingers, the user may separate the blister flange scalloped edges 155 away from back panel 120 and gain access to the blister body 154.

[0056] Fig. 19 shows a front plan view of an alternative blank 106 for forming a package. Blank 106 is in many respects similar to blank 104 shown in Fig. 11. However, with blank 106, the front panel 110 and back panel 120 are hingedly connected along a fold line 116 along the lower edge of the cards, instead of fold line 115 along a side edge of the cards. As another option, separate blanks may be used to form the front panel 110 and back panel 120.

[0057] Although the blister constructions shown here generally are for a blister that completely encloses a product, it is also contemplated that portions of the blisters may be left open, for example to allow a customer to handle the product such as feeling the

texture, observing the product directly (without looking through the blister material), testing a fit (e.g. for an electrical connection), and for other purposes.

[0058] The packages as described herein may be closed and sealed once the contents are placed inside the blister. The panels and flange(s) may then be joined together by heat sealing, adhesive, staples, or other suitable method.

[0059] The blanks 100, 102, 104, 106 may be formed of a sheet material such as paperboard, which may be made of or coated with materials to increase its strength. An example of such a sheet material is EASYSEAL paperboard made by MeadWestvaco Corporation. The sheet material may have a heat sealable coating, for example to allow a heat seal to be created between the front panel 110 and back panel 120. Alternately, other forms of adhesive may be used to seal these parts together. It should be noted that the use of tear resistant materials, and/or in more than one layer, help to improve the tamper- and theft-resistance of the package. The panels may be joined together by heat sealing, RF (radio frequency) sealing, ultrasonic sealing, adhesive, or other means. Such sealing may be done on most of the facing surfaces of the front and back panels or sealing may be done to less than the entire facing surfaces, for example only around the outer perimeter of the package, and along or upon part or all of flanges 152, 158, 162.

[0060] Blisters 150, 151, 160 may be made with common thermoform plastics such as PVC or APET but may also include a recycled material such as RPET or a biodegradable material such as PLA. However other materials including other plastics or paperboard may also be used. Besides thermoforming, the case or blister may be formed by injection molding or other manufacturing methods. The blisters may be formed in one or more pieces.

[0061] It should be understood that additional panels or fold-over panels may be included in the package for further reinforcing the package, providing additional advertising space, and so on.

CLAIMS

1. A package comprising:

a first panel comprised of sheet material and having an opening therein;

a second panel comprised of sheet material; and

a first blister comprising:

a first blister body received in the opening; and

a first blister flange having a perimeter comprising a scalloped portion;

wherein first and second panel are joined together in facing relationship and the first blister flange is received between the first and second panel.

2. The package of claim 1, further comprising a notch formed in the perimeter of at least one of the first and second panels, the notch being aligned with the first scalloped portion.

3. The package of claim 1, further comprising a second blister positioned between the first blister and the second panel, wherein the second blister has a second blister flange comprising a second scalloped portion.

4. The package of claim 3, wherein the first scalloped portion and the second scalloped portion generally overlap and are intercalated.

5. The package of claim 4, wherein the first scalloped portion and the second scalloped portion have a period P, and are intercalated by from about one quarter of the period P to about one half of the period P.

6. The package of claim 1, wherein the scalloped portion has a period between 0.5 to 3 inches.

7. The package of claim 6, wherein the scalloped portion has a period between 1 to 2 inches.

8. The package of claim 6, wherein the scalloped portion has a period between 1.25 to 1.5 inches.

9. The package of claim 1, wherein the scalloped portion has an amplitude between 0.05 to 2 inches.

10. The package of claim 9, wherein the scalloped portion has an amplitude between 0.1 to 0.5 inches.

11. The package of claim 10, wherein the scalloped portion has an amplitude between 0.15 to 0.25 inches.

12. The package of claim 1, wherein the scalloped portion has substantially the shape of a sinusoidal wave.

FIG. 1

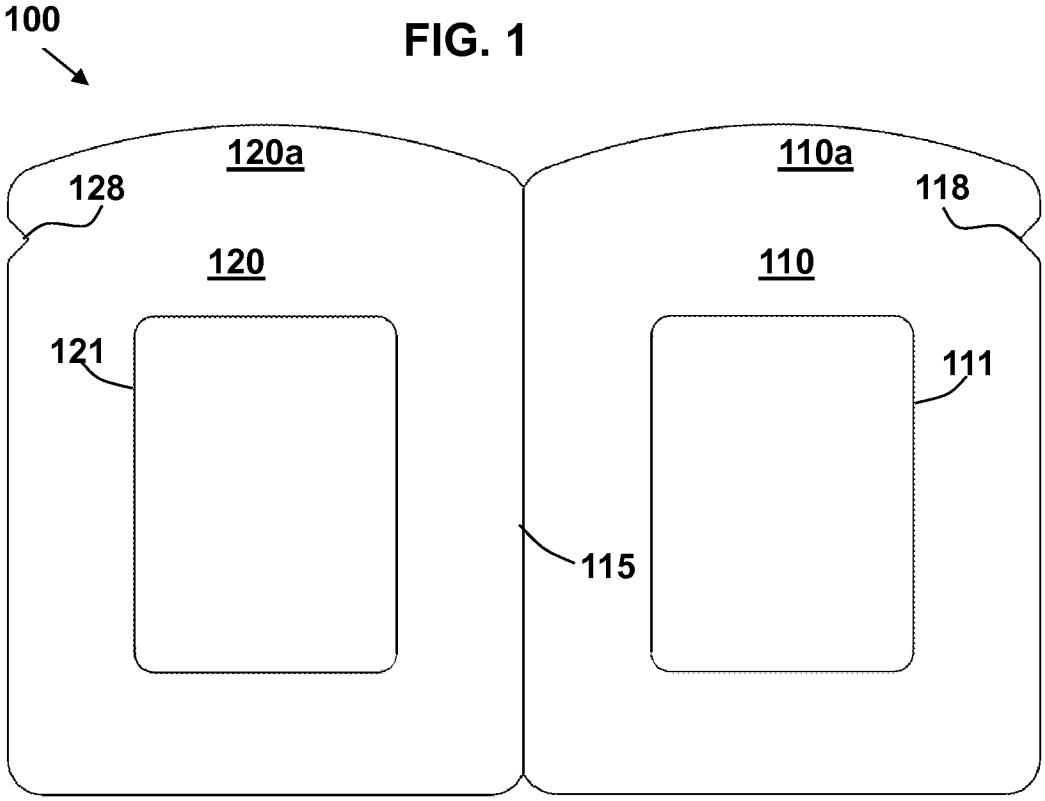

100
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FIG. 2

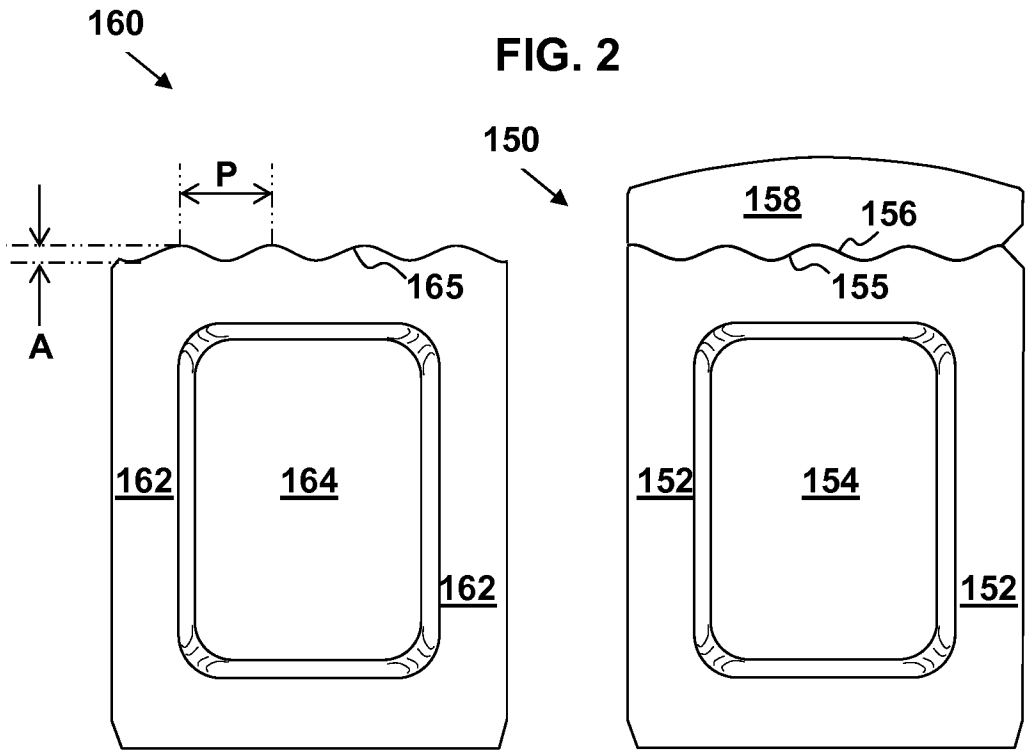

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FIG. 3

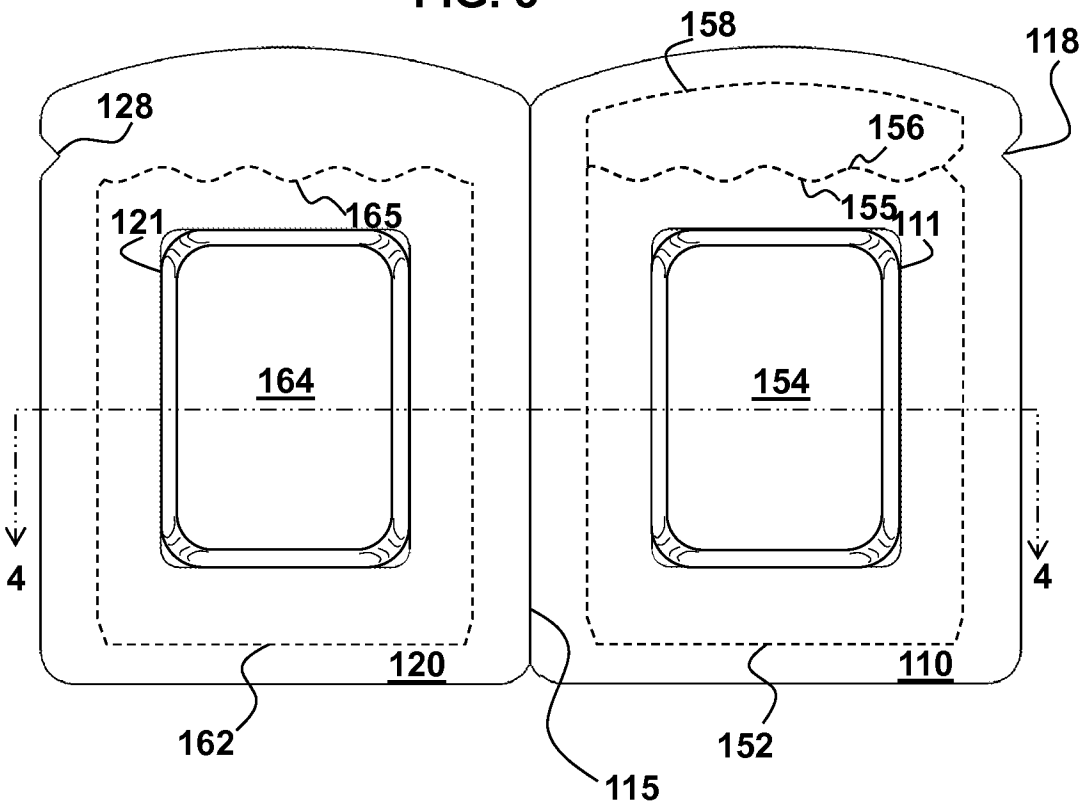

158
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FIG. 4

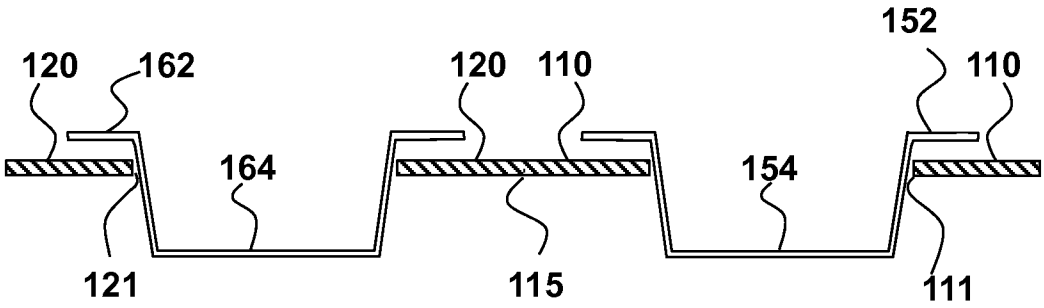

152
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FIG. 5

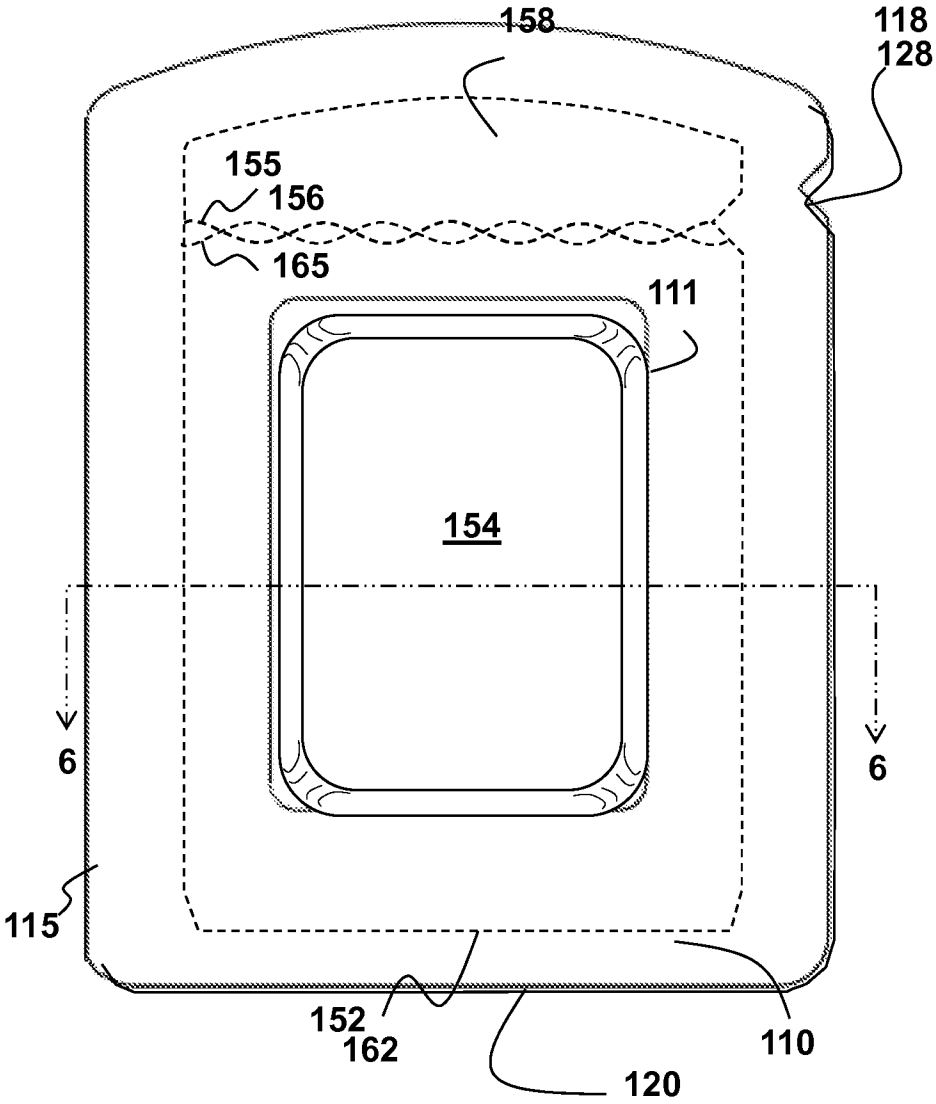

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152
162
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120

FIG. 6

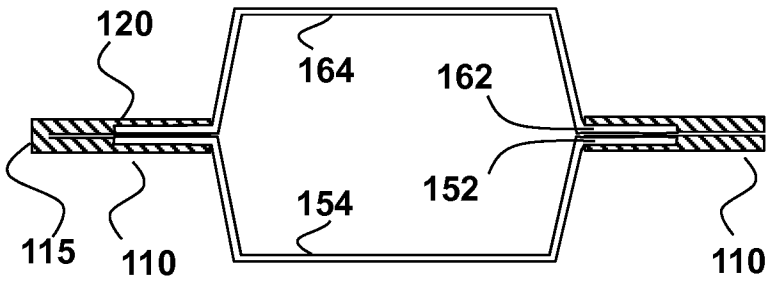

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FIG. 7

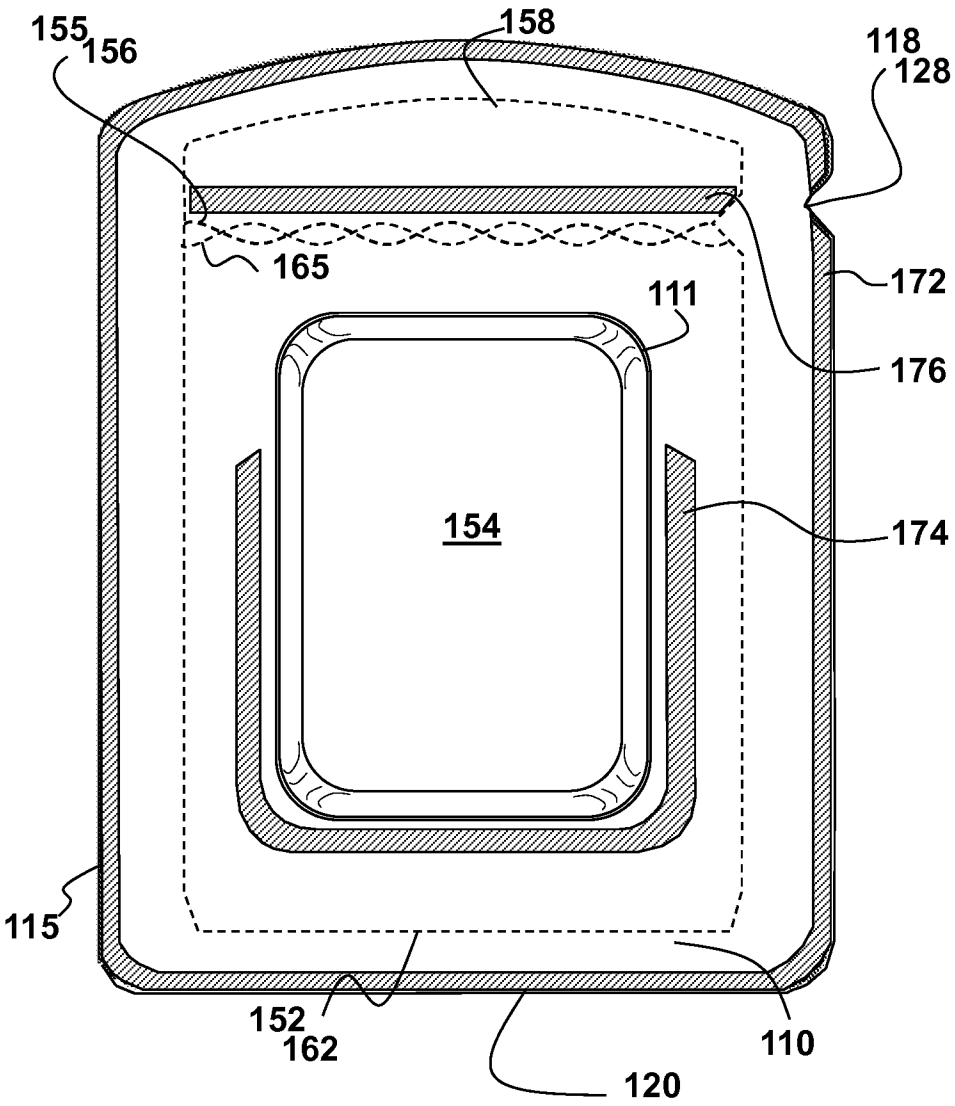


FIG. 8

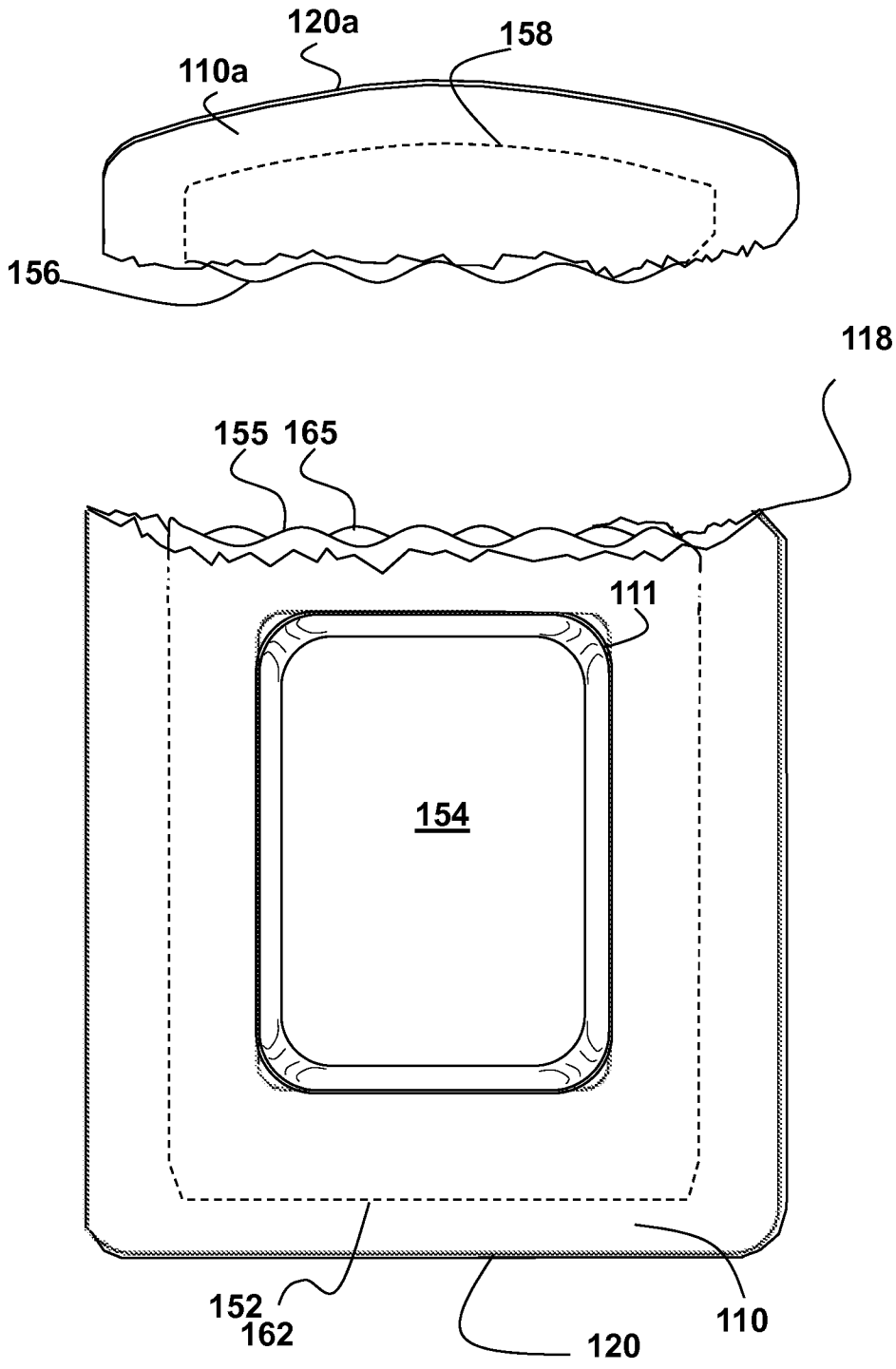


FIG. 9

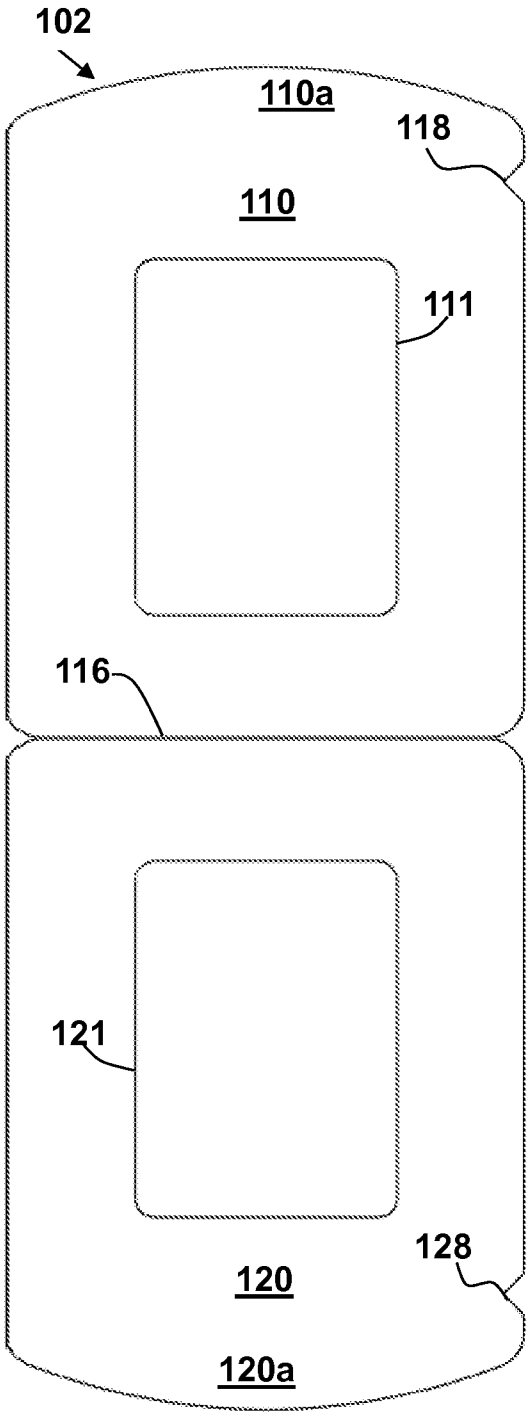

102
110a
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128
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120a

FIG. 10

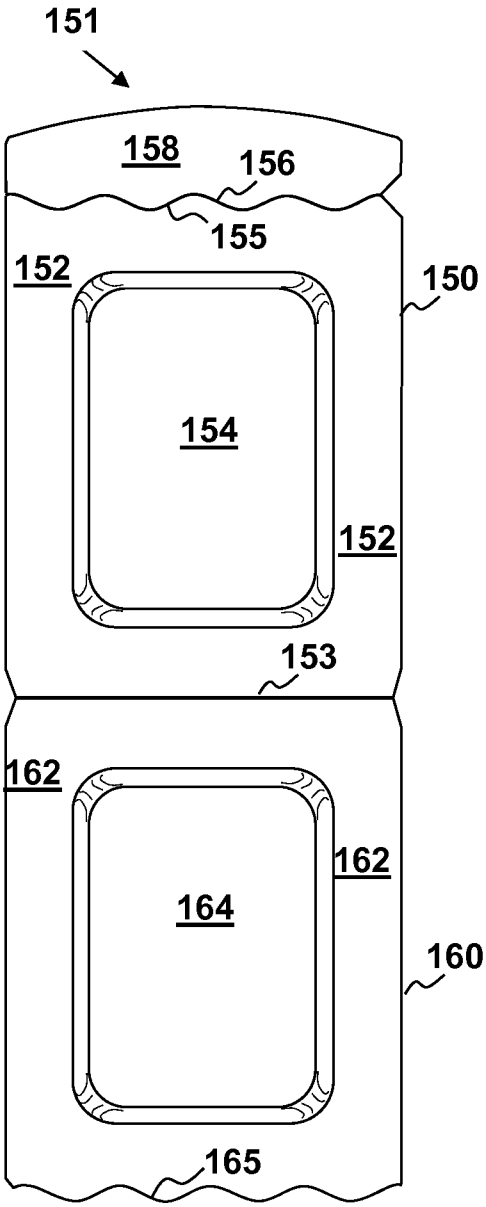

151
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FIG. 11

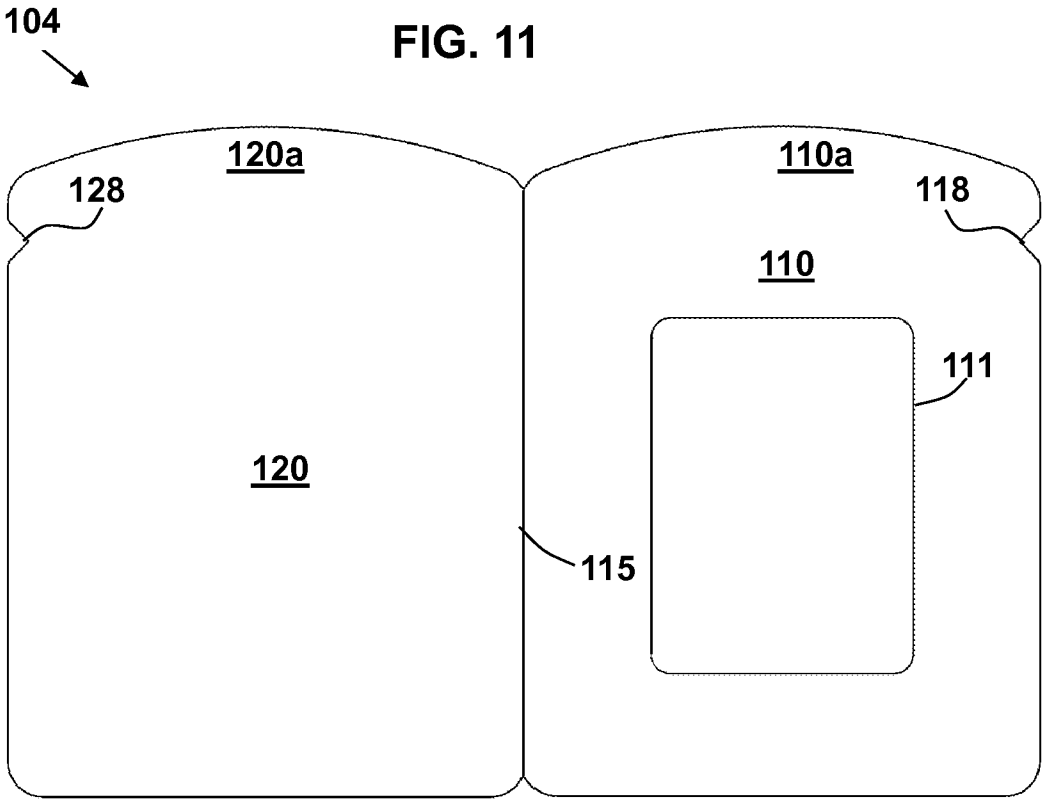

104
120a
128
110a
118
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FIG. 12

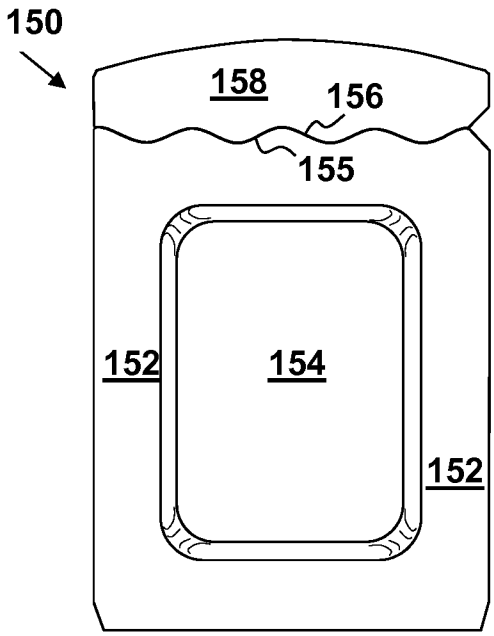

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152

FIG. 13

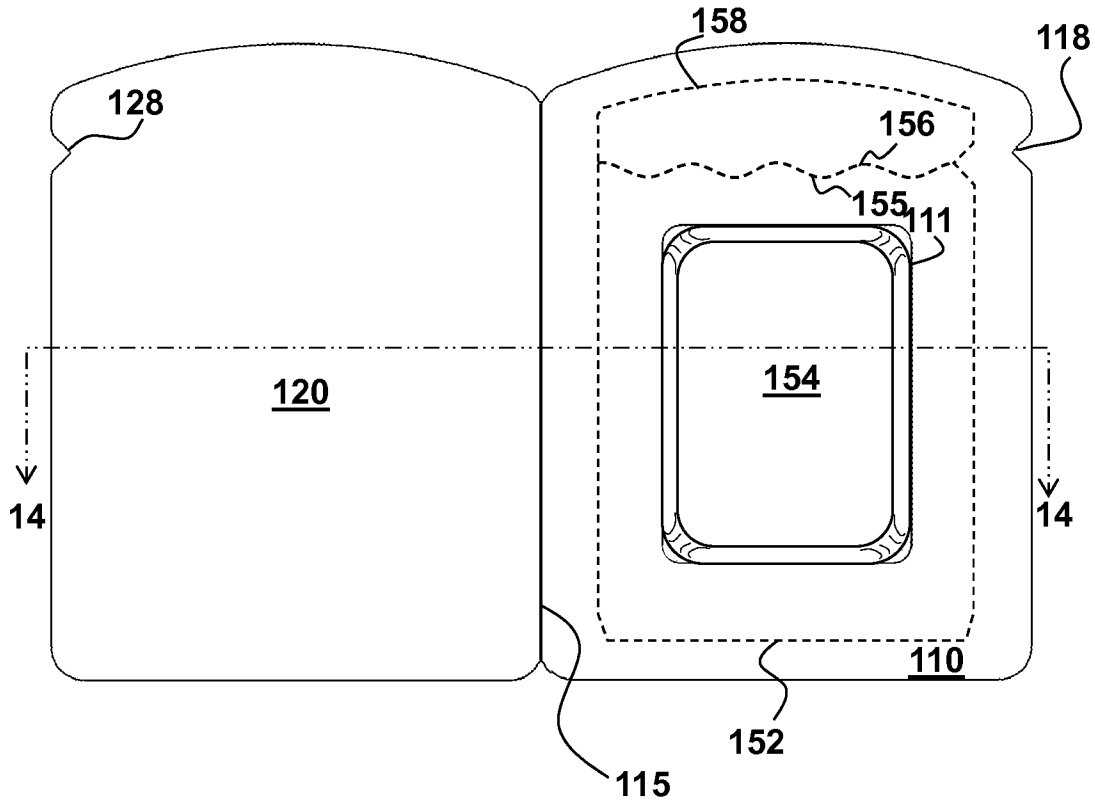

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FIG. 14

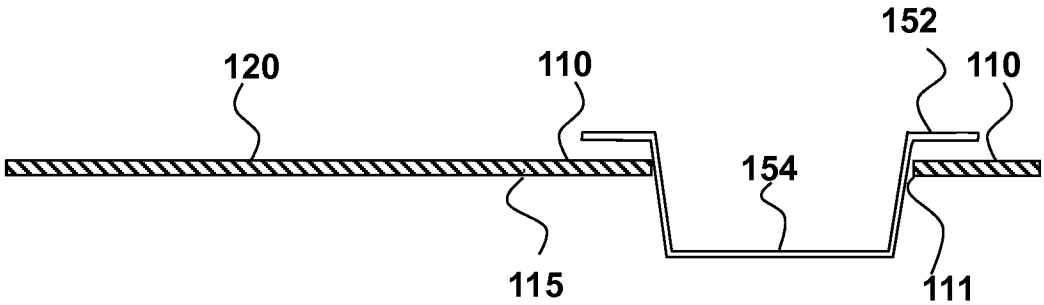

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FIG. 15

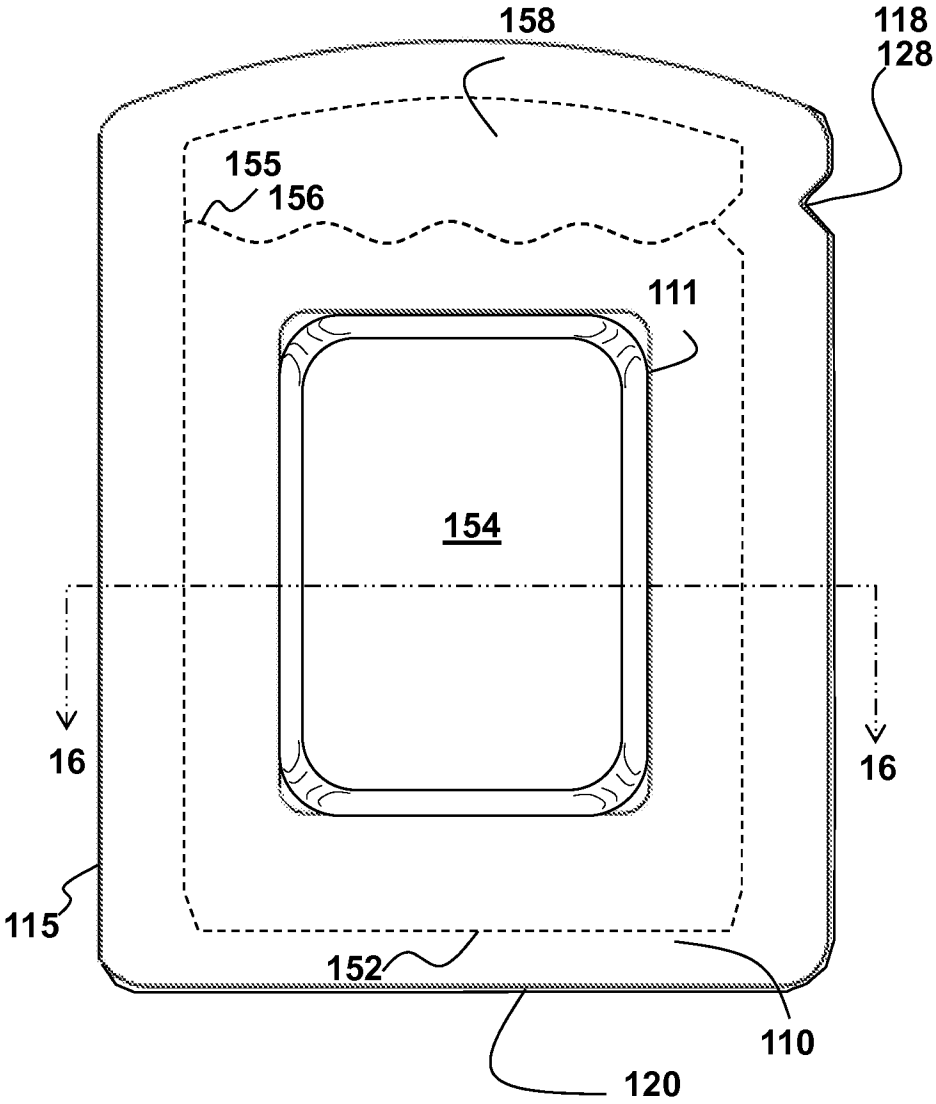

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FIG. 16

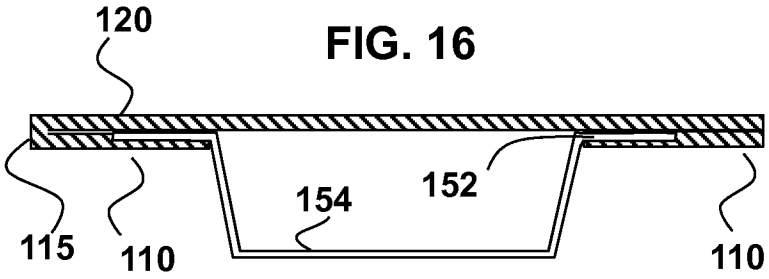

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FIG. 17

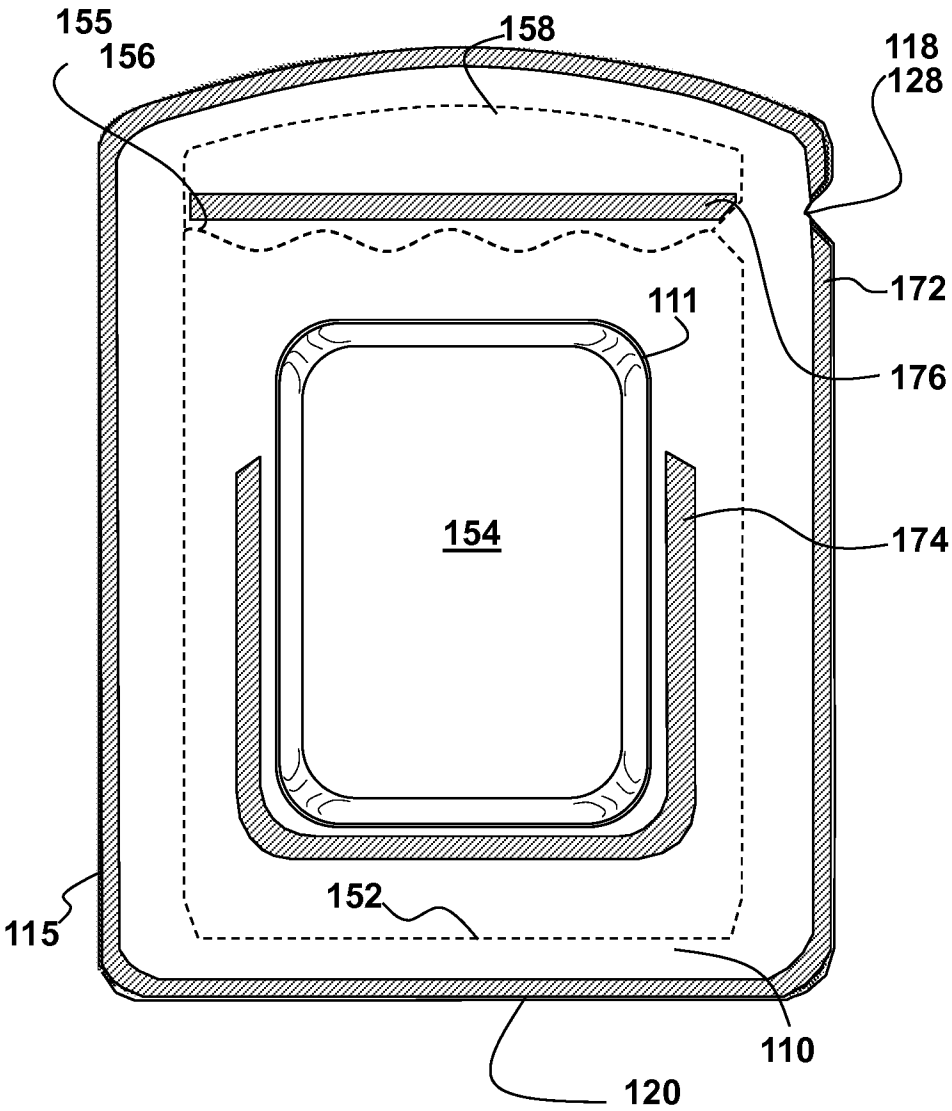


FIG. 18

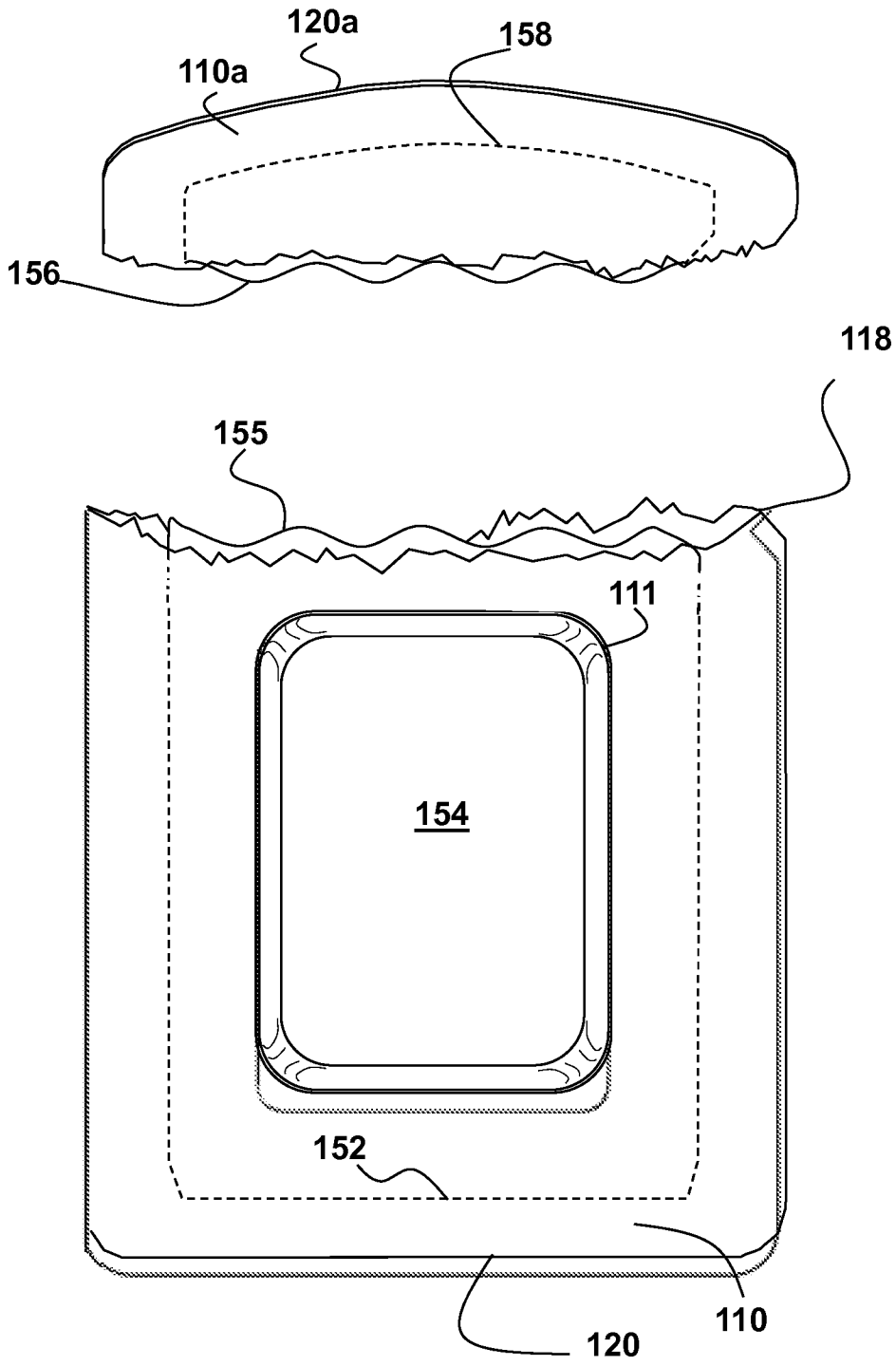
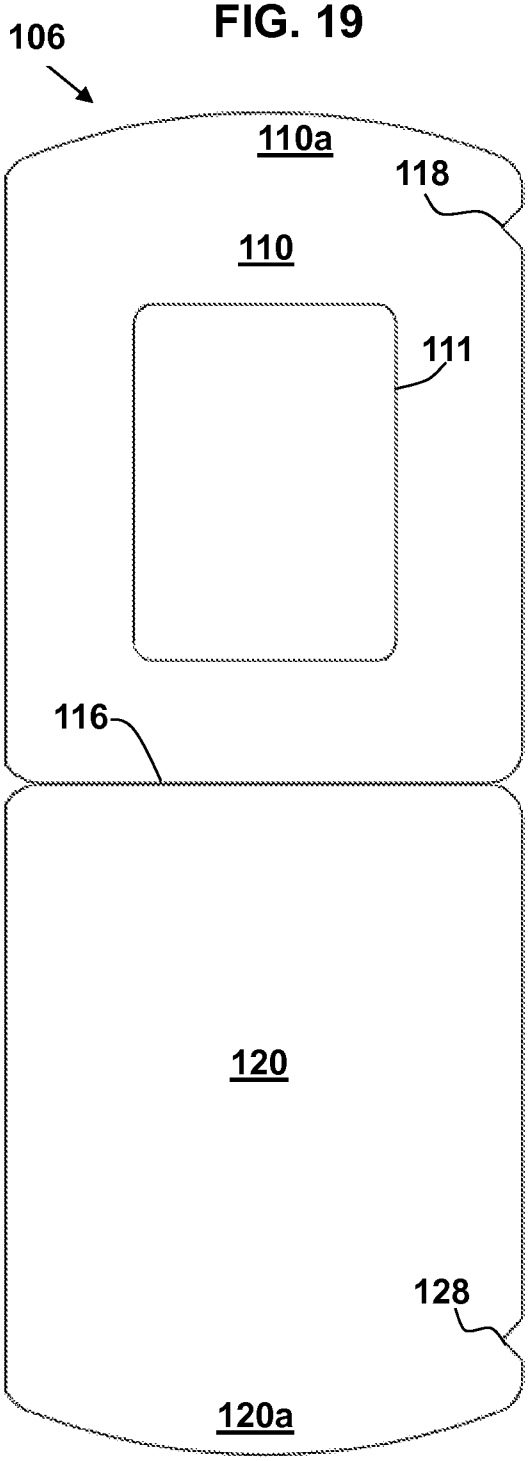


FIG. 19



INTERNATIONAL SEARCH REPORT

International application No
PCT/US2013/073999

A. CLASSIFICATION OF SUBJECT MATTER
INV. B65D73/00
ADD.

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
B65D

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)
EPO-Internal, WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	DE 32 23 732 A1 (KNAUER KARL GMBH & CO KG [DE]) 29 December 1983 (1983-12-29) abstract; claims 1,2,8; figure 1 page 5, paragraph 6 - page 6, paragraph 1	1-12
A	US 2012/012491 A1 (WADE MICHAEL P [US]) 19 January 2012 (2012-01-19) abstract; claims 1,6,8-10 paragraph [0027] - paragraph [0033]; figures 3A-3C paragraph [0034] - paragraph [0041]; figures 4A-4C	1-12
A	FR 2 448 324 A1 (JOUETS ARTICLES MOULES STE IND) 5 September 1980 (1980-09-05) claim 1; figures 1,2	1-12

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[X] Further documents are listed in the continuation of Box C.

[X] See patent family annex.

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"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

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"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
11 March 2014	19/03/2014

Name and mailing address of the ISA/	Authorized officer
European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Fax: (+31-70) 340-3016	Segerer, Heiko

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C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 7 144 635 B2 (HAWES DAVID H [US] ET AL) 5 December 2006 (2006-12-05) cited in the application abstract; figures 1,3 column 2, line 36 - line 45 -----	1-12

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No
PCT/US2013/073999

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
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		EP 2595595 A1	29-05-2013
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		WO 2012012015 A1	26-01-2012
FR 2448324 A1	05-09-1980	NONE	
US 7144635 B2	05-12-2006	NONE	