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(54) **ZIPPER ASSEMBLY WITH SEPARATE TEAR STRIP AND METHOD OF MANUFACTURING THE SAME**

(57) A zipper assembly (200) for a resealable enclosure (100) may include an elongated flange (202) having a panel side (206) and an opposite facing side (210). The panel side can be coupled with an inner surface of a panel of the resealable enclosure. The zipper assembly also can include an interlocking element (214) protruding from the flange and shaped to mate with another interlocking element of another flange to close the enclosure and shaped to be pulled apart to open the enclosure. The zipper assembly can include a tear strip (106) disposed in the flange and spaced apart from the flange by gaps (218, 220). The tear strip can be pulled to tear through the panel of the resealable enclosure to provide access to the zipper assembly inside the enclosure.

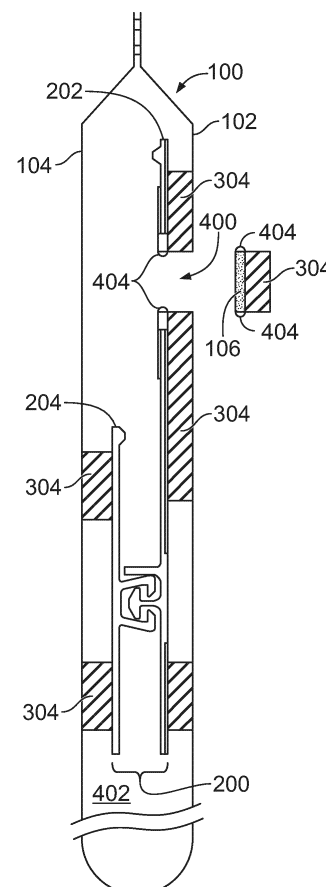


FIG. 4

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Description**CROSS-REFERENCE TO RELATED APPLICATIONS**

[0001] This application claims priority to U.S. Provisional Application No. 63/581,093 (filed 07-September-2023), the entire disclosure of which is incorporated herein by reference.

BACKGROUND**Technical Field.**

[0002] The subject matter described herein relates to zipper assemblies of resealable enclosures having tear strips that tear open the enclosures with the zipper assemblies enabling repeated sealing and opening of the enclosures.

Discussion of Art.

[0003] Many enclosures include recloseable zipper assemblies to allow users to repeatedly open and close the enclosures. For example, plastic bags may have zipper assemblies with opposing profiles formed from intermeshing or interlocking elements. These elements may be bodies having complimentary or matching shapes to allow the profiles to interlock with each other to close the enclosure. A user may pull the profiles away from each other with sufficient force to separate the elements to open the enclosure. The zipper assemblies can be coupled with the enclosures by attaching opposite sides of the profiles with panels of the enclosures.

[0004] Some enclosures have tear strips that extend across front walls or panels of the enclosures. The tear strips may include tabs or other ends that can be gripped and pulled by the user to tear through the front walls or panels and provide openings in these walls or panels to allow the users access to the zipper assemblies. The users can then pull open the zipper assemblies to access contents inside the enclosures. Some known tear strips can be formed to directly contact (e.g., lie upon) the flanges of the zipper assemblies. These tear strips may be co-extruded with the zipper assemblies and without any adhesive, peel seal material, heat seal material, or any other material between the tear strips and flanges of the zipper assemblies (where the flanges can be heat sealed to the walls or panels of the enclosures).

[0005] These tear strips may be in direct contact with the flanges so that, when the tear strips are separated from the flanges, the tear strips may leave no residue, or scum, behind. That is, there is a clean separation between the tear strip and the flange with no adhesive, heat seal material, peel seal material, or any other material between the tear strip and the flange. But these tear strips can be difficult to separate from the flanges, thereby frustrating users who may be unable to easily pull the tear strips and separate the tear strips from the flanges.

[0006] It may be advantageous to have a tear strip and a zipper assembly that differ from those that are currently available.

BRIEF DESCRIPTION

[0007] A zipper assembly for a resealable enclosure may include an elongated flange having a panel side and an opposite facing side. The panel side can be coupled with an inner surface of a panel of the resealable enclosure. The zipper assembly also can include an interlocking element protruding from the flange and shaped to mate with another interlocking element of another flange to close the enclosure and shaped to be pulled apart to open the enclosure. The zipper assembly can include a tear strip disposed in the flange and spaced apart from the flange by gaps. The tear strip can be pulled to tear through the panel of the resealable enclosure to provide access to the zipper assembly inside the enclosure.

[0008] A resealable enclosure may include panels disposed around an interior cavity and a zipper assembly coupled with the panels. The zipper assembly can include elongated flanges having panel sides and opposite facing sides. The panel sides can be coupled with inner surfaces of the panels. The zipper assembly can include interlocking elements protruding from the flanges. The interlocking elements can be shaped to mate with each other to close the enclosure and shaped to be pulled apart to open the enclosure. The zipper assembly also can include tear strip disposed in at least one of the flanges and spaced apart from the at least one of the flanges by gaps. The tear strip can be pulled to tear through at least one of the panels to provide access to the zipper assembly inside the enclosure.

[0009] A zipper assembly for a resealable enclosure can include a first elongated flange configured to be coupled to a first panel of the enclosure. The first elongated flange can include a first interlocking element. The zipper assembly can include a second elongated flange that can be coupled to a second panel of the enclosure. The second elongated flange can include a second interlocking element. The first and second interlocking elements can be shaped to mate with each other. The zipper assembly can include a tear strip disposed within an opening of the first elongated flange such that the tear strip does not contact the first elongated flange.

BRIEF DESCRIPTION OF THE DRAWINGS

[0010] The inventive subject matter may be understood from reading the following description of non-limiting embodiments, with reference to the attached drawings, wherein below:

Figure 1 illustrates a perspective view of one example of a resealable enclosure;

Figure 2 illustrates a cross-sectional view of one

example of a zipper assembly;

Figure 3 illustrates one example of the zipper assembly shown in Figure 2 sealed to inner surfaces of panels of the enclosure;

Figure 4 illustrates one example of a tear strip of the zipper assembly shown in Figure 2 being pulled through a panel of the enclosure;

Figure 5 illustrates a magnified view of a gap between a top edge or side of the tear strip and an edge of a flange of the zipper assembly shown in Figure 2;

Figure 6 illustrates a magnified view of another gap between an opposite bottom edge or side of the tear strip and another edge of the flange of the zipper assembly shown in Figure 2;

Figure 7 illustrates a cross-sectional view of another example of a zipper assembly; and

Figure 8 illustrates one example of a method for forming a zipper assembly and/or resealable enclosure.

DETAILED DESCRIPTION

[0011] Embodiments set forth herein include enclosures having zipper assemblies with tear strips. The enclosure can define an interior cavity where the content is stored. The enclosure may be initially opened by pulling the tear strip and at least partially separating the tear strip from the zipper assembly and the enclosure. The tear strip can tear an access opening through a front wall or panel of the enclosure. This opening can allow a user to access the zipper assembly located between the front panel or wall and an opposing rear panel or wall. The zipper assembly can have first and second zipper segments with interlocking bodies that mate with each other to close the enclosure, separate from each other to allow a user to access the interior of the enclosure, and then mate with each other again to close the enclosure.

[0012] In some embodiments, a peel seal material is applied to a surface that interfaces with the walls or panels of the enclosure. The peel seal material may comprise a polymeric material. For example, the peel seal material may comprise at least one of polyethylene (including a polyethylene copolymer), polypropylene, ionomers, amorphous polyester, vinyl acetate, polybutylene, or nylon EVOH. Other examples of peel seal material include polystyrene, polyethylene, polypropylene, poly(lactic acid), poly(vinyl chloride), polyamide-6, poly(ethylene naphthalate), poly(ethylene terephthalate), poly(m-xylylene adipamide), poly(vinyl alcohol), ethylene vinyl alcohol, and poly(vinylidene chloride).

[0013] In some embodiments, the zipper assembly may be at least partially formed from polypropylene

(PP) or high-density polyethylene HDPE. Optionally, the zipper assembly, or parts thereof (e.g., tear strip) may be made from a cyclic olefin copolymer (COC) resin that can provide higher strength and stiffness when compared with PP, HDPE, or other known materials. Providing greater strength and stiffness to the tear strip can enable the use of stronger materials in the layers of the pouch that may not otherwise be used for sealed packaging. Furthermore, the use of COC in the tear strip can allow for more consistent and reliable bag opening by the consumer.

[0014] Figure 1 illustrates a perspective view of one example of a resealable enclosure 100. The enclosure 100 can include a front (or first) panel, wall, or sidewall 102 and an opposing back (or second) panel, wall, or sidewall 104. The first and second panels 102, 104 can be formed by folding a larger panel or wall and sealing other edges to form the enclosure or can be formed by sealing three of the four edges of the panels 102, 104. In Figure 1, a tear strip 106 has been pulled away from the front panel 102, thereby separating or tearing the front panel 102 into a first section 112 (or top front section) and a second section 114 (or bottom front section). With the tear strip 106, the first and second sections 112, 114 can provide an access opening 124 into space between the panels 102, 104 to access a zipper assembly of the enclosure.

[0015] The panels 102, 104 can be discrete sections of a flexible material. In some embodiments, the discrete sections may be provided by different webs (or films) of the flexible material. Discrete sections are not portions of the same piece of flexible material. Discrete sections are typically cut from different webs or cut from the same web at different times. For example, the front panel 102 may be obtained from a first continuous web of flexible material, the back panel 104 may be obtained from a different second continuous web of the same flexible material. Yet in some embodiments, the front and back panels 102, 104 may be formed by folding the same sheet of material onto itself.

[0016] In the illustrated embodiment, the front panel 102 and the back panel 104 are directly attached to each other along a sealed frame 120. The sealed frame 120 can include corresponding edges of the front and back panels 102, 104 being sealed to one another. As shown, the sealed frame 120 can extend along a perimeter of the enclosure 100.

[0017] Figure 2 illustrates a cross-sectional view of one example of a zipper assembly 200. The zipper assembly 200 may be elongated in directions extending into and out of the plane or page of Figure 2. These directions may be oriented along the width of the enclosure 100. The zipper assembly 200 may be coupled with inside or inner surfaces of the front and back panels 102, 104 of the enclosure 100 shown in Figure 1 (e.g., the surfaces that face each other inside the enclosure 100). The zipper assembly 200 may be below the opening formed by the tear strip 106 such that, once the opening is formed by the tear strip

106, the user or consumer can reach into the opening, pull the zipper assembly 200 apart, access the contents of the enclosure 100 that are beneath the zipper assembly 200, and then re-seal the enclosure 100 by pressing the opposing parts of the zipper assembly 200 toward each other and together.

[0018] The zipper assembly 200 includes opposing flanges 202, 204, or base parts, that face each other and that can be sealed to the inner surfaces of the front and back panels 102, 104 of the enclosure 100. Each flange 202, 204 can have a panel side 206, 208 that faces and is sealed to a different one of the panels 102, 104, and a facing side 210, 212 that faces away from the panel 102 or 104 to which the flange 202, 204 is coupled but faces toward the facing side 210 or 212 of the other flange 202 or 204. Optionally, both the flanges 202, 204 may be attached to the same panel 102 or 104. For example, the panel side 206 of the flange 202 and the facing side 212 of the flange 204 may be attached to the panel 102. The flange 204 may be taller than the flange 202 (in the perspective of Figure 2) so that the facing side 212 of a portion of the flange 204 that extends above the flange 202 may be coupled with the panel 102. Alternatively, the facing side 210 of the flange 202 and the panel side 208 of the flange 204 can be attached to the panel 104. The portion of the flange 202 that is located above the gap 218 (described below) and the tear strip 106 can be coupled with the panel 104.

[0019] Each of the flanges 202, 204 includes an interlocking body 214, 216 protruding from the facing side 210, 212 of that flange 202, 204. The interlocking body 214 can be referred to as a male interlocking body and the interlocking body 216 may be referred to as a female interlocking body. The female interlocking body 216 receives the male interlocking body 214 to close the zipper assembly 200 (and the enclosure 100). The male interlocking body 214 may be pulled out of the female interlocking body 216 to open the zipper assembly 200 (and the enclosure 100).

[0020] The flange 202 having the male interlocking body 214 may be wider (or taller in the perspective of Figure 2) than the flange 204 having the female interlocking body 216. Alternatively, the flange 204 having the female interlocking body 216 may be wider (or taller in the perspective of Figure 2) than the flange 202 having the male interlocking body 214. The wider or taller flange 202 or 204 may provide for improved feel or indication to the user or consumer as to which side of the enclosure 100 has the tear strip 106. Alternatively, the flanges 202, 204 may have the same or nearly the same (e.g., within manufacturing tolerances) width or height.

[0021] The flange 202 is shown as including the tear strip 106, but alternatively, the flange 204 may have the tear strip 106. The tear strip 106 can be provided in the flange 202, 204 that is wider or taller than the other flange 204, 202, or can be provided in the flange 202, 204 that is narrower or shorter than the other flange 204, 202. Alternatively, the tear strip 106 can be in either flange 202, 204

having the same width or height as the other flange 204, 202 (e.g., within manufacturing tolerances). The flanges 202, 204 may be formed from PP or HDPE in one example. The tear strip 106 can be formed from PP, HDPE, or COC.

[0022] As shown, the tear strip 106 is disposed or located between the opposite sides 206, 210 of the flange 202. Alternatively, the tear strip 106 can be disposed or located between the opposite sides 208, 212 of the flange 204. Stated differently, the tear strip 106 may have a thickness that does not extend or protrude beyond the facing side or the panel side of the flange 202, 204 in which the tear strip 106 is disposed.

[0023] The tear strip 106 may be spaced apart from the flange 202 by gaps 218, 220. While the description of the tear strip 106 focuses on the tear strip 106 being included in the flange 202, a similar description applies to embodiments where the tear strip 106 is in the other flange 204. These gaps 218, 220 may be intentionally or purposefully formed to ensure that the tear strip 106 can more easily be separated from the flange 202 when compared with tear strips that are in direct contact with the flange or base part. For example, the tear strip 106 can be spaced apart from opposing edges 222, 224 of the flange 202 so that no part of the tear strip 106 directly contacts, abuts, or otherwise engages the flange 202. The flange 202 may include an opening that extends from one edge 222 to the other opposite or opposing edge 224 with the tear strip 106 sized to fit within this opening and leaving the gaps 218, 220.

[0024] At least part of these gaps 218, 220 may be filled with a material that allows the tear strip 106 to be more easily separated from the flange 202 than if the tear strip 106 were in direct contact with the flange 202. For example, peel seal material 226 described above may be applied to the facing side 210 of the flange 202 such that the peel seal material 226 extends over and into the gaps 218, 220. This peel seal material 226 can further separate the tear strip 106 from the flange 202. For example, the peel seal material 226 may be disposed between the tear strip 106 and each of the opposing edges 222, 224 of the flange 202 along the direction in which the width (or height in the perspective of Figure 2) of the flange 202 is measured or extends.

[0025] The peel seal material 226 can allow for the tear strip 106 to remain separate from the flange 202 and for the tear strip 106 to be easily separated from the flange 202. For example, the peel seal material 226 may tear much more easily (e.g., with less pulling force) than if the tear strip 106 were in direct contact with the flange 202. The peel seal material 226 can be a different material from the tear strip 106 and the flange 202 so that the peel seal material 226 is not and cannot be considered part of the tear strip 106 or the flange 202 (so that the tear strip 106 and the flange 202 are clearly separate from each other). For example, the peel seal material 226 can be low density polyethylene resin with a vinyl acetate copolymer (EVA) blended with polybutylene.

[0026] Figure 3 illustrates one example of the zipper assembly 200 sealed to inner surfaces 300, 302 of the panels 102, 104 of the enclosure 100. The panel sides 206, 208 of the flanges 202, 204 can be sealed to the inner surfaces 300, 302 of the panels 102, 104 using an adhesive layer 304, such as a heat seal material (e.g., an adhesive that is activated by and/or applied using heat). The adhesive layer 304 may extend across the gaps 218, 220 between the tear strip 106 and the flange 202 (or the flange 204). Optionally, the adhesive layer 304 may include one or more gaps or interruptions at the gaps 218, 220. The adhesive layer 304 can be a very low density polyethylene plastomer that melts and seals at lower temperatures than low density polyethylene. In one example, the adhesive layer 304 can be formed from a material having a lower density than the peel seal material 226, which can be formed from a material having a lower density than the flange 202, 204 and/or the tear strip 106.

[0027] Figure 4 illustrates one example of the tear strip 106 of the zipper assembly 200 being pulled through the panel 102 of the enclosure 100. One end of the tear strip 106 may be grasped by a user or consumer and pulled away from the panel 104. The tear strip 106 can be stiffer or more resilient to tearing than the peel seal material 226, the adhesive layer 304 and the panel 102. As a result, pulling on the tear strip 106 can tear through and break the continuity of the peel seal material 226 and the panel 102, and optionally the adhesive layer 304. This can provide an opening 400 through the panel 102. The user or consumer can then access the zipper assembly 200 between the panels 102, 104 through the opening 400 to pull the flanges 202, 204 away from each other to access an interior cavity or chamber 402 where a product may be stored.

[0028] As the tear strip 106 is pulled, the tear strip 106 tears through not only the panel 102, but also the peel seal material 226. Remnants or residue (referred to herein as scum 404) of the peel seal material 226 is left behind. That is, pulling the tear strip 106 leaves some of the peel seal material 226 on the tear strip 106 and/or on the edges of the flange 202 as scum 404, as shown in Figure 4. This can be due to the tear strip 106 being sufficiently stiff or resilient and/or the peel seal material 226 being sufficiently soft or weak that the tear strip 106 tears through the peel seal material 226 and leaves some of the peel seal material 226 behind as scum 404. Pulling on the tear strip 106 also can tear through the adhesive layer 304. Remnants or residue (e.g., scum 404) of the adhesive layer 304 optionally can be left behind between the flange 202 and the panel 102.

[0029] Figure 5 illustrates a magnified view of the gap 218 between a top edge or side of the tear strip 106 and the edge 224 of the flange 202. Figure 6 illustrates a magnified view of the gap 220 between an opposite bottom edge or side of the tear strip 106 and the edge 222 of the flange 202. As shown in these Figures, the tear strip 106 is spaced apart from, and does not contact, the

flange 202. The peel seal material 226 is disposed within the gaps 218, 220 between the tear strip 106 and the flange 202. The adhesive layer 304 may include breaks or separations at or over these gaps 218, 220, as shown in Figures 5 and 6. Alternatively, the adhesive layer 304 may continuously extend across the gap 218 and/or the gap 220.

[0030] Figure 7 illustrates a cross-sectional view of another example of a zipper assembly 700. The zipper assembly 700 may be elongated in directions extending into and out of the plane or page of Figure 2. These directions may be oriented along the width of the enclosure 100. The zipper assembly 700 may be coupled with the inside or inner surfaces 300, 302 of the front and back panels 102, 104 of the enclosure 100. The zipper assembly 700 may be below the opening 400 formed by the tear strip 106 such that, once the opening is formed by the tear strip 106, the user or consumer can reach into the opening, pull the zipper assembly 700 apart, access the contents of the enclosure 100 that are beneath the zipper assembly 700, and then re-seal the enclosure 100 by pressing the opposing parts of the zipper assembly 700 toward each other and together.

[0031] The zipper assembly 700 includes opposing flanges 702, 704, or base parts, that face each other and that are sealed to the inner surfaces of the front and back panels 102, 104 of the enclosure 100. Each flange 702, 704 can have a panel side 706, 708 that faces and is sealed to a different one of the panels 102, 104, and a facing side 610, 612 that faces away from the panel 102 or 104 to which the flange 702, 704 is coupled but faces toward the facing side 710 or 712 of the other flange 702 or 704.

[0032] Each of the flanges 202, 204 includes one or more of the interlocking bodies 214, 216 described above. The flange 702 having the male interlocking body 214 may be wider (or taller) than the flange 704 having the female interlocking body 216. Alternatively, the flange 704 having the female interlocking body 216 may be wider (or taller) than the flange 702 having the male interlocking body 214. Alternatively, the flanges 702, 704 may have the same or nearly the same (e.g., within manufacturing tolerances) width or height.

[0033] The flange 702 is shown as including the tear strip 106, but alternatively, the flange 704 may have the tear strip 106. The tear strip 106 can be provided in the flange 702, 704 that is wider or taller than the other flange 704, 702, or can be provided in the flange 702, 704 that is narrower or shorter than the other flange 704, 702. Alternatively, the tear strip 106 can be in either flange 702, 704 having the same width or height as the other flange 704, 702 (e.g., within manufacturing tolerances). The flanges 702, 704 may be formed from PP or HDPE in one example.

[0034] As shown, the tear strip 106 is disposed or located between the opposite sides 706, 710 of the flange 702. Alternatively, the tear strip 106 can be disposed or located between the opposite sides 708, 712 of the flange

704. Stated differently, the tear strip 106 may have a thickness that does not extend or protrude beyond the facing side or the panel side of the flange 702, 704 in which the tear strip 106 is disposed.

[0035] As described above, the tear strip 106 may be spaced apart from the flange 702 by the gaps 218, 220. While the description of the tear strip 106 focuses on the tear strip 106 being included in the flange 702, a similar description applies to embodiments where the tear strip 106 is in the other flange 704. Also as described above, at least part of these gaps 218, 220 may be filled with the peel seal material 226 that allows the tear strip 106 to be more easily separated from the flange 702 than if the tear strip 106 were in direct contact with the flange 702.

[0036] One difference between the flange 202 shown in Figures 2 through 5 and the flange 702 shown in Figure 7 is the presence of lines of weakness 714, 716 extending through the thickness of the flange 702. The lines of weakness 714, 716 may be a line of perforations, thinner portions of the flange 702, or the like, that allow for the flange 702 to be more easily torn along the lines of weakness 714, 716 when compared to the flange 702 without the lines of weakness 714, 716. For example, even though the flange 702 and the tear strip 106 are different components formed from different materials having different stiffnesses with the tear strip 106 and the flange 702 not contacting each other, the lines of weakness 714, 716 can allow for the flange 702 to be torn along one or both the lines of weakness 714, 716 if a consumer or user pulls the tear strip 106 in such a way (e.g., toward one line of weakness 714 or 716).

[0037] Figure 8 illustrates one example of a method 800 for forming a zipper assembly and/or resealable enclosure. The method 800 can be used to manufacture or otherwise provide one or more of the zipper assemblies and/or resealable enclosures described herein. At 802, the flanges and the tear strip of the zipper assembly are extruded. The flanges and tear strip can be co-extruded together or at the same time with the gaps between the outer edges of the tear strip and the inner edges of the flanges. This can ensure that the tear strip and the flanges are spaced apart from each other and do not contact each other. At 804, a peel seal material can be applied to the facing sides of the flanges. With respect to the tear strip, the peel seal material may extend over the tear strip and also extend into and partially (or entirely) fill the gaps on either side of the tear strip between the tear strip and the flange. At 806, a heat seal material may be applied to the opposite sides of the flanges and tear strip. At 808, flanges and tear strip may then be adhered to the inner surface of the panels of the enclosure using the heat seal material as an adhesive. The zipper assembly is thereby adhered to the enclosure and the enclosure optionally may be sealed (along the top edge of the panels if the top edges are separate from each other) to enclose the zipper assembly within the panels of the enclosure. At 810, a hole or other opening can be provided in the front panel of the enclosure to allow a user to

grasp the tear strip and pull the tear strip through the front panel of the enclosure. This also can tear through the peel seal material in the gaps. Scum or residue of the peel seal material and/or heat seal material may be left on the flanges and/or tear strip. The user can then access the zipper assembly through an opening created by tearing the front panel using the tear strip.

[0038] The singular forms "a," "an," and "the" include plural references unless the context clearly dictates otherwise. "Optional" or "optionally" means that the subsequently described event or circumstance may or may not occur, and that the description may include instances where the event occurs and instances where it does not. Approximating language, as used herein throughout the specification and claims, may be applied to modify any quantitative representation that could permissibly vary without resulting in a change in the basic function to which it may be related. Accordingly, a value modified by a term or terms, such as "about," "substantially," and "approximately," may not be limited to the precise value specified. In at least some instances, the approximating language may correspond to the precision of an instrument for measuring the value. Here and throughout the specification and claims, range limitations may be combined and/or interchanged, such ranges may be identified and include all the sub-ranges contained therein unless context or language indicates otherwise.

[0039] This written description uses examples to disclose the embodiments, including the best mode, and to enable a person of ordinary skill in the art to practice the embodiments, including making and using any devices or systems and performing any incorporated methods. The claims define the patentable scope of the disclosure, and include other examples that occur to those of ordinary skill in the art. Such other examples are intended to be within the scope of the claims if they have structural elements that do not differ from the literal language of the claims, or if they include equivalent structural elements with insubstantial differences from the literal language of the claims.

Certain embodiments of the invention are described in the following clauses:

Clause 1. A zipper assembly for a resealable enclosure, the zipper assembly comprising:

an elongated flange having a panel side and an opposite facing side, the panel side configured to be coupled with an inner surface of a panel of the resealable enclosure;

an interlocking element protruding from the flange, the interlocking element shaped to mate with another interlocking element of another flange to close the enclosure and shaped to be pulled apart to open the enclosure; and

a tear strip disposed in the flange and spaced

apart from the flange by gaps, the tear strip configured to be pulled to tear through the panel of the resealable enclosure to provide access to the zipper assembly inside the enclosure.

Clause 2. The zipper assembly of clause 1, wherein the tear strip does not contact the flange.

Clause 3. The zipper assembly of clause 1, further comprising a peel seal material disposed in the gaps between the tear strip and the flange.

Clause 4. The zipper assembly of clause 3, wherein the peel seal material is disposed in the gaps such that pulling on the tear strip tears both the panel and the peel seal material in the gaps.

Clause 5. The zipper assembly of clause 3, wherein the peel seal material is disposed in the gaps in contact with both the flange and the tear strip such that pulling on the tear strip to tear open the panel of the enclosure leaves residue scum of the peel seal material on the flange, on the tear strip, or on both the flange and the tear strip.

Clause 6. The zipper assembly of clause 1, wherein the tear strip is disposed between the panel side and the facing side of the flange.

Clause 7. The zipper assembly of clause 1, wherein the flange includes one or more lines of weakness spaced apart from and separated from the tear strip.

Clause 8. The zipper assembly of clause 7, wherein at least one of the gaps is between the one or more lines of weakness and the tear strip.

Clause 9. A resealable enclosure comprising:

panels disposed around an interior cavity; and

a zipper assembly coupled with the panels, the zipper assembly including elongated flanges having panel sides and opposite facing sides, the panel sides configured to be coupled with inner surfaces of the panels, the zipper assembly including interlocking elements protruding from the flanges, the interlocking elements shaped to mate with each other to close the enclosure and shaped to be pulled apart to open the enclosure, the zipper assembly also including tear strip disposed in at least one of the flanges and spaced apart from the at least one of the flanges by gaps, the tear strip configured to be pulled to tear through at least one of the panels to provide access to the zipper assembly inside the enclosure.

Clause 10. The resealable enclosure of clause 9, wherein the tear strip does not contact the at least one of the flanges.

Clause 11. The resealable enclosure of clause 9, further comprising a peel seal material disposed in the gaps between the tear strip and the at least one of the flanges.

Clause 12. The resealable enclosure of clause 11, wherein the peel seal material is disposed in the gaps and is configured to be torn while the tear strip is pulled open tear the panel.

Clause 13. The resealable enclosure of clause 11, wherein the peel seal material is disposed in the gaps in contact with both the at least one of the flanges and the tear strip, the peel seal material configured to leave residue scum of the peel seal material on the at least one of the flanges, on the tear strip, or on both the at least one of the flanges and the tear strip from pulling on the tear strip to tear open the panel.

Clause 14. The resealable enclosure of clause 9, wherein the tear strip is disposed between the panel side and the facing side of the at least one of the flanges.

Clause 15. The resealable enclosure of clause 9, wherein the at least one of the flanges includes one or more lines of weakness spaced apart from and separated from the tear strip.

Clause 16. The resealable enclosure of clause 15, wherein at least one of the gaps is between the one or more lines of weakness and the tear strip.

Clause 17. A zipper assembly for a resealable enclosure, the zipper assembly comprising:

a first elongated flange configured to be coupled to a first panel of the enclosure, the first elongated flange including a first interlocking element;

a second elongated flange configured to be coupled to a second panel of the enclosure, the second elongated flange including a second interlocking element, the first and second interlocking elements shaped to mate with each other; and

a tear strip disposed within an opening of the first elongated flange, the tear strip separated from and not contacting the first elongated flange.

Clause 18. The zipper assembly of clause 17, further comprising peel seal material disposed in gaps on

both sides of the tear strip between the tear strip and the first elongated flange.

Clause 19. The zipper assembly of clause 17, wherein the first elongated flange includes lines of weakness on both sides of the tear strip.

Clause 20. The zipper assembly of clause 17, wherein the first elongated flange includes a panel side that couples with the first panel of the enclosure and an opposite facing side from which the first interlocking element protrudes, the tear strip disposed between the panel side and the facing side.

Claims

1. A zipper assembly for a resealable enclosure, the zipper assembly comprising:

an elongated flange having a panel side and an opposite facing side, the panel side configured to be coupled with an inner surface of a panel of the resealable enclosure;

an interlocking element protruding from the flange, the interlocking element shaped to mate with another interlocking element of another flange to close the enclosure and shaped to be pulled apart to open the enclosure; and
a tear strip disposed in the flange and spaced apart from the flange by gaps, the tear strip configured to be pulled to tear through the panel of the resealable enclosure to provide access to the zipper assembly inside the enclosure.

2. The zipper assembly of claim 1, wherein the tear strip does not contact the flange.
3. The zipper assembly of claim 1, further comprising a peel seal material disposed in the gaps between the tear strip and the flange.
4. The zipper assembly of claim 3, wherein the peel seal material is disposed in the gaps such that pulling on the tear strip tears both the panel and the peel seal material in the gaps, or
wherein the peel seal material is disposed in the gaps in contact with both the flange and the tear strip such that pulling on the tear strip to tear open the panel of the enclosure leaves residue scum of the peel seal material on the flange, on the tear strip, or on both the flange and the tear strip.
5. The zipper assembly of claim 1, wherein the tear strip is disposed between the panel side and the facing side of the flange.
6. The zipper assembly of claim 1, wherein the flange

includes one or more lines of weakness spaced apart from and separated from the tear strip, and optionally wherein at least one of the gaps is between the one or more lines of weakness and the tear strip.

7. A resealable enclosure comprising:

panels disposed around an interior cavity; and
a zipper assembly coupled with the panels, the zipper assembly including elongated flanges having panel sides and opposite facing sides, the panel sides configured to be coupled with inner surfaces of the panels, the zipper assembly including interlocking elements protruding from the flanges, the interlocking elements shaped to mate with each other to close the enclosure and shaped to be pulled apart to open the enclosure, the zipper assembly also including tear strip disposed in at least one of the flanges and spaced apart from the at least one of the flanges by gaps, the tear strip configured to be pulled to tear through at least one of the panels to provide access to the zipper assembly inside the enclosure.

8. The resealable enclosure of claim 7, wherein the tear strip does not contact the at least one of the flanges.
9. The resealable enclosure of claim 7, further comprising a peel seal material disposed in the gaps between the tear strip and the at least one of the flanges.
10. The resealable enclosure of claim 9, wherein the peel seal material is disposed in the gaps and is configured to be torn while the tear strip is pulled open tear the panel, or
wherein the peel seal material is disposed in the gaps in contact with both the at least one of the flanges and the tear strip, the peel seal material configured to leave residue scum of the peel seal material on the at least one of the flanges, on the tear strip, or on both the at least one of the flanges and the tear strip from pulling on the tear strip to tear open the panel.
11. The resealable enclosure of claim 7, wherein the tear strip is disposed between the panel side and the facing side of the at least one of the flanges.
12. The resealable enclosure of claim 7, wherein the at least one of the flanges includes one or more lines of weakness spaced apart from and separated from the tear strip, and optionally
wherein at least one of the gaps is between the one or more lines of weakness and the tear strip.
13. A zipper assembly for a resealable enclosure, the zipper assembly comprising:

a first elongated flange configured to be coupled to a first panel of the enclosure, the first elongated flange including a first interlocking element;

a second elongated flange configured to be coupled to a second panel of the enclosure, the second elongated flange including a second interlocking element, the first and second interlocking elements shaped to mate with each other; and

a tear strip disposed within an opening of the first elongated flange, the tear strip separated from and not contacting the first elongated flange.

14. The zipper assembly of claim 13, further comprising peel seal material disposed in gaps on both sides of the tear strip between the tear strip and the first elongated flange, or wherein the first elongated flange includes lines of weakness on both sides of the tear strip.

15. The zipper assembly of claim 13, wherein the first elongated flange includes a panel side that couples with the first panel of the enclosure and an opposite facing side from which the first interlocking element protrudes, the tear strip disposed between the panel side and the facing side.

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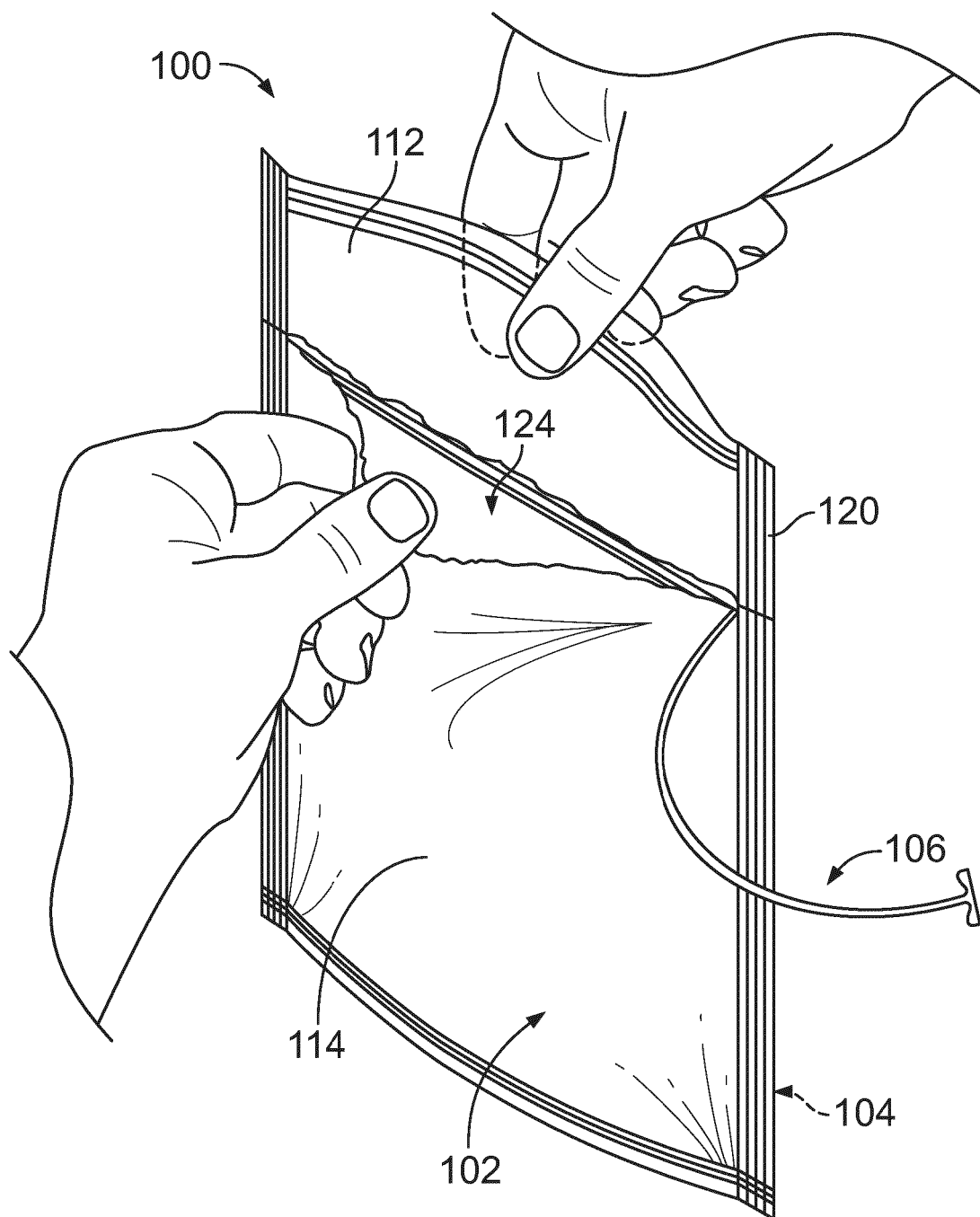


FIG. 1

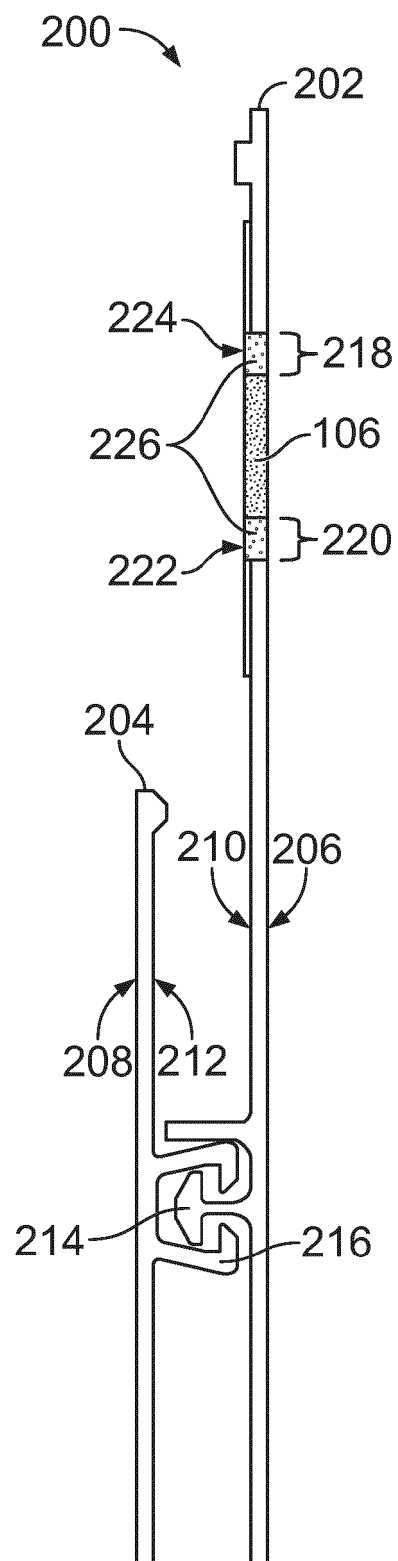


FIG. 2

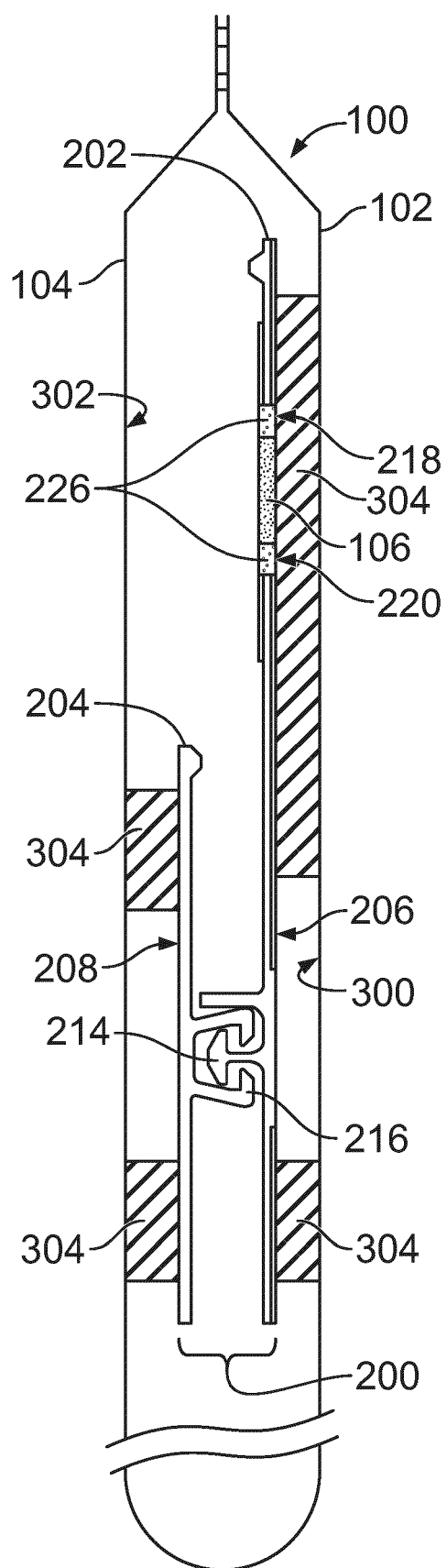


FIG. 3

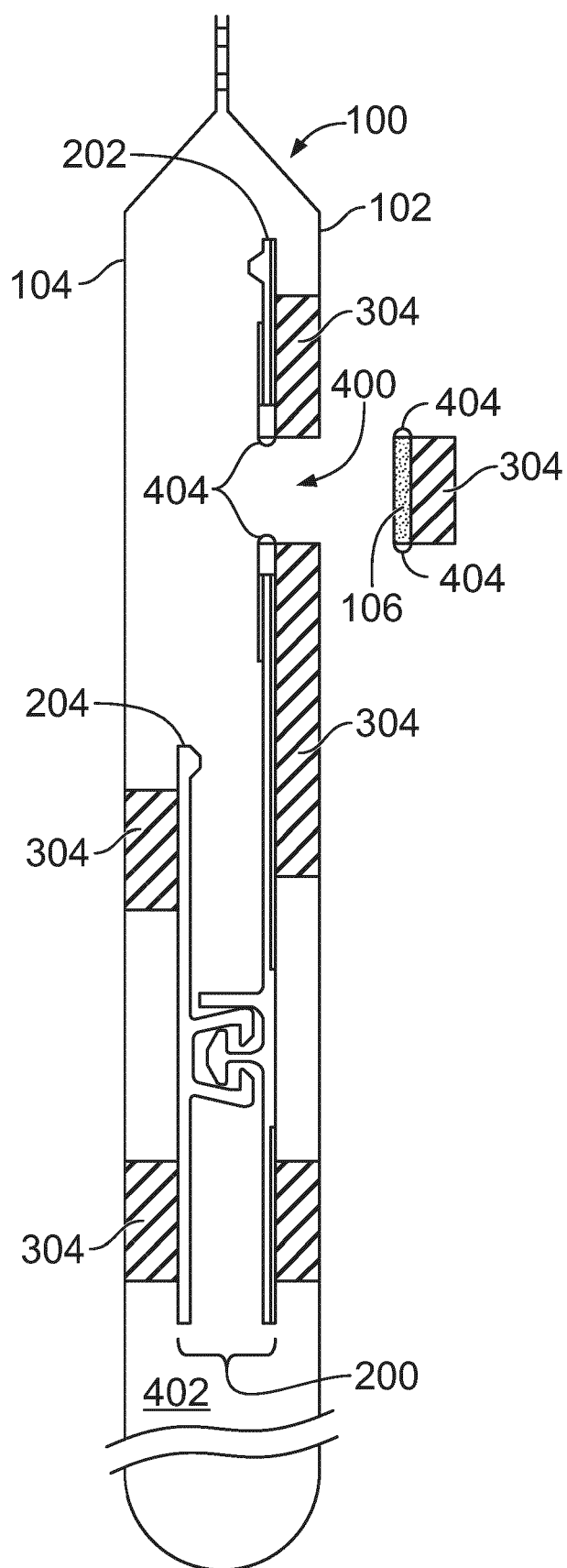


FIG. 4

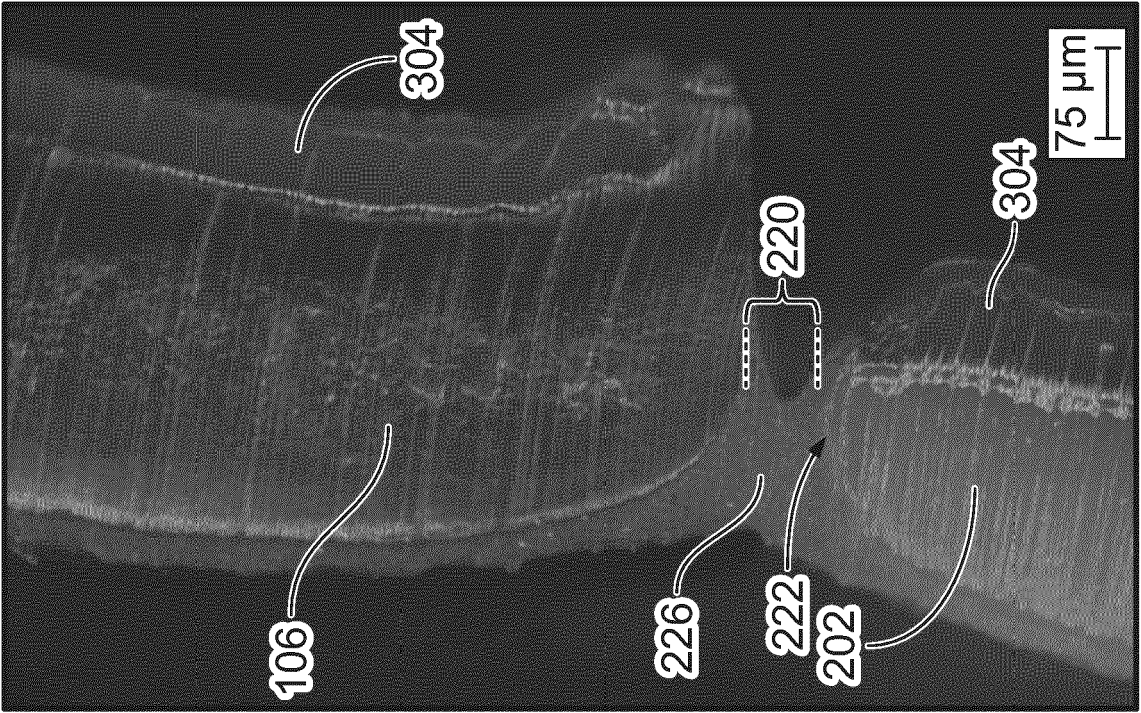


FIG. 6

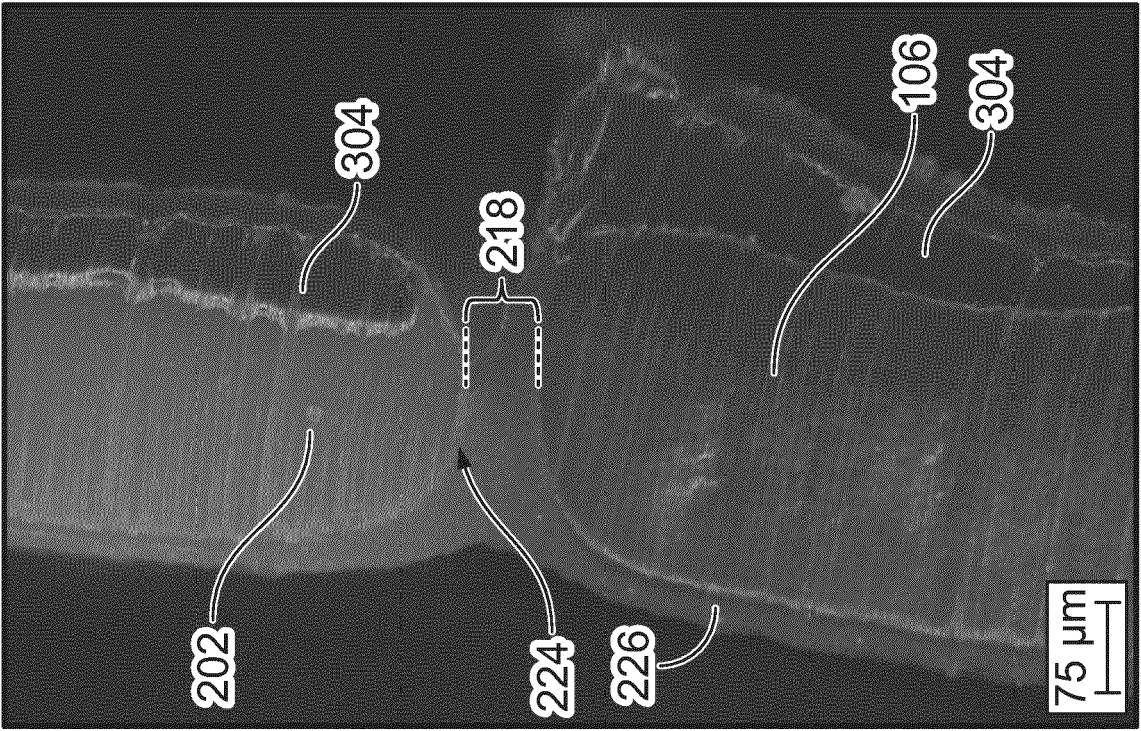


FIG. 5

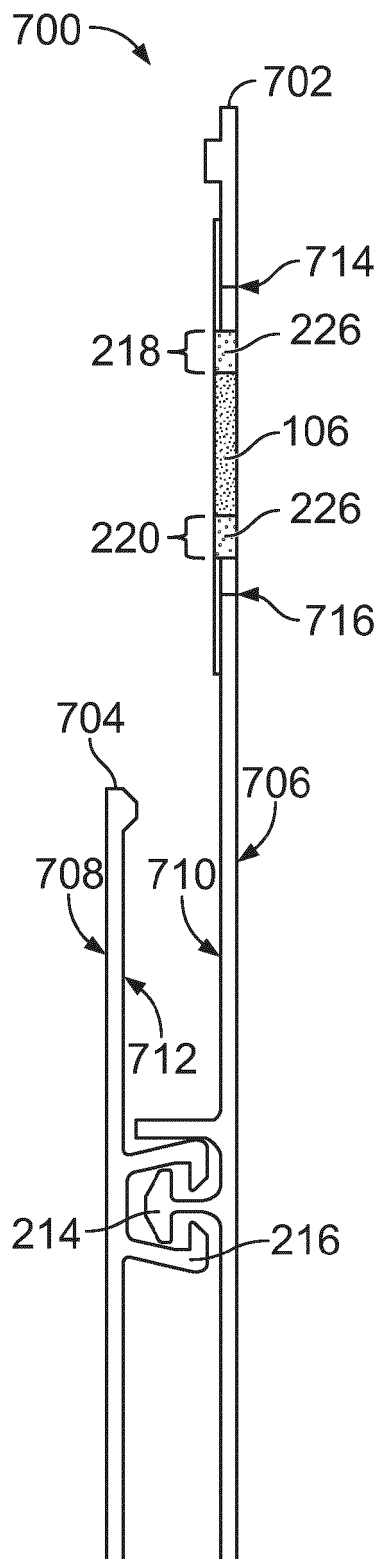


FIG. 7

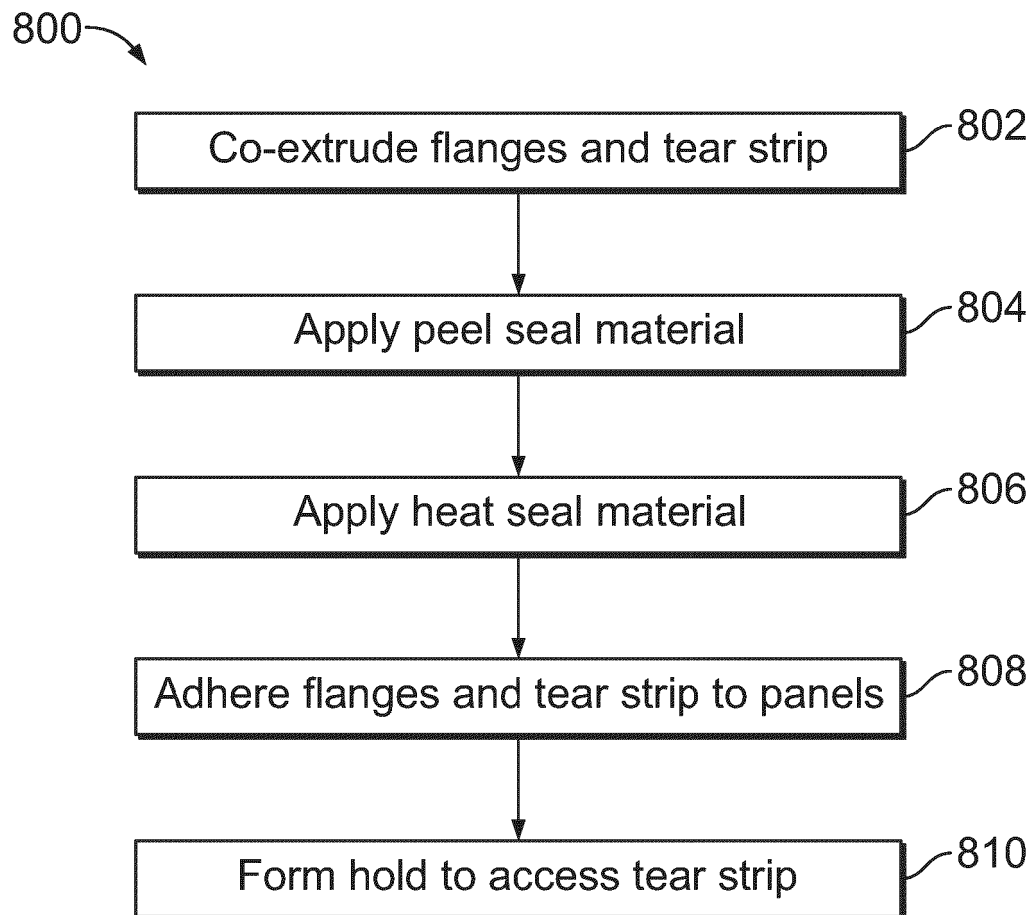


FIG. 8



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Application Number

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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		20 January 2025	Leijten, René
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