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(54) **TAMPER-EVIDENT PACKAGING SYSTEM**

(52) **U.S. Cl. 220/266; 29/428**

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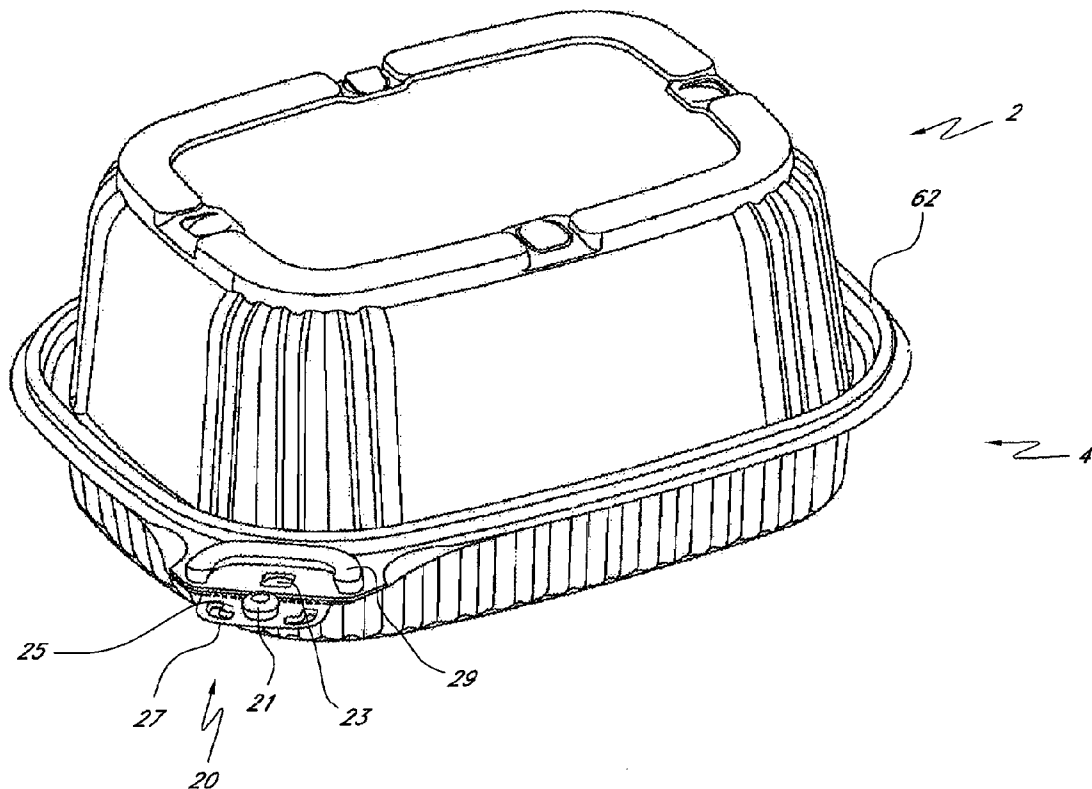
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(57) **ABSTRACT**

A container system suitable for food can comprise a tray, a lid and a locking mechanism. The locking mechanism may comprise locking means, means to impede access to the locking means and a skirt with a skirt edge. A container system can comprise a tray, a lid, an aperture, a flap and an activation member. The activation member of the a first container system can be configured to release heated gases from a second container system by depressing the flap of the second system when the first system is stacked on top the second system. The container system can also comprise a dome surface, at least one stacking rib and an aperture surface. The aperture surface can comprise the aperture and flap. The aperture surface can be at least partially above the dome surface and below the at least one stacking rib. The aperture surface may be sloped.



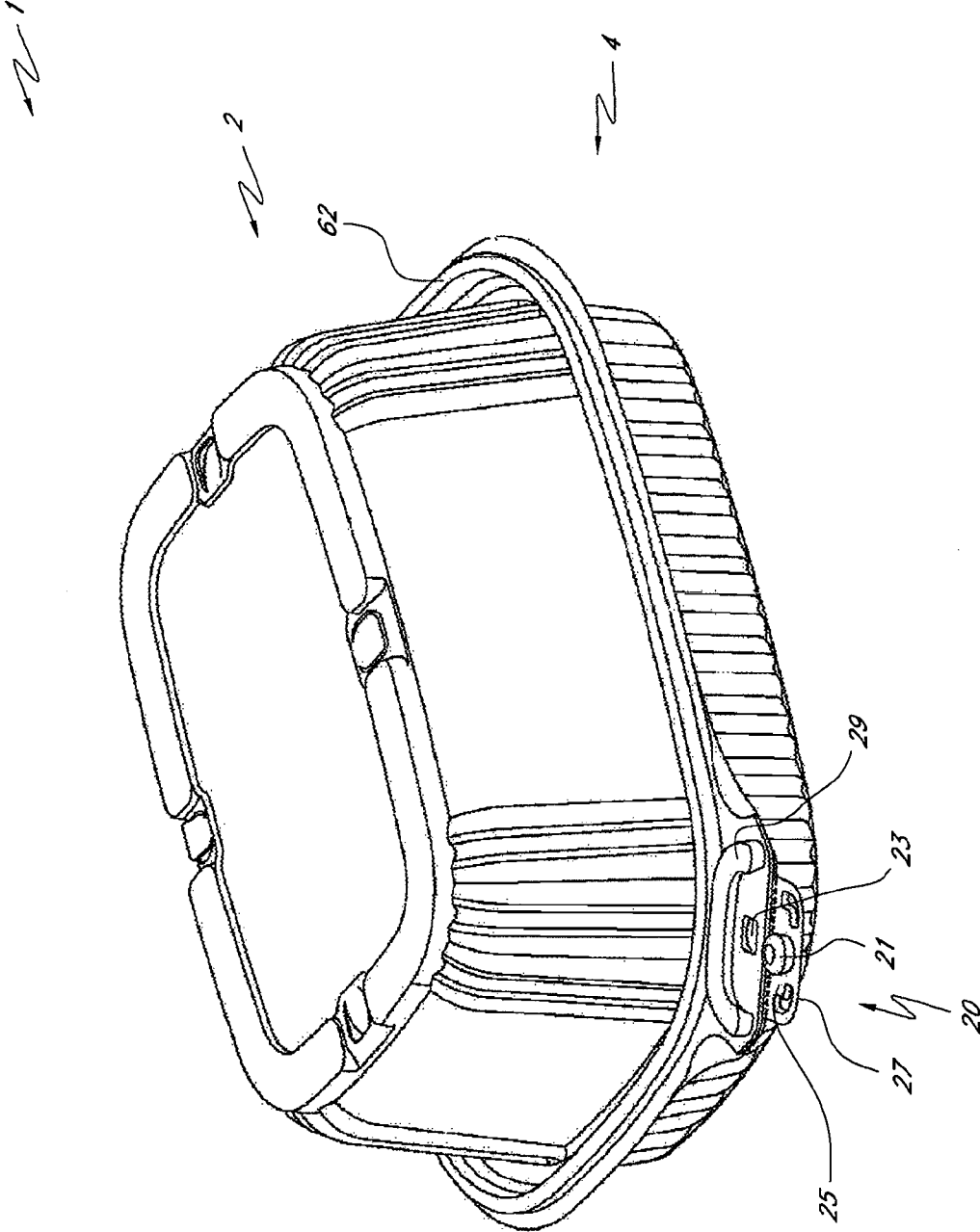


FIG. 1

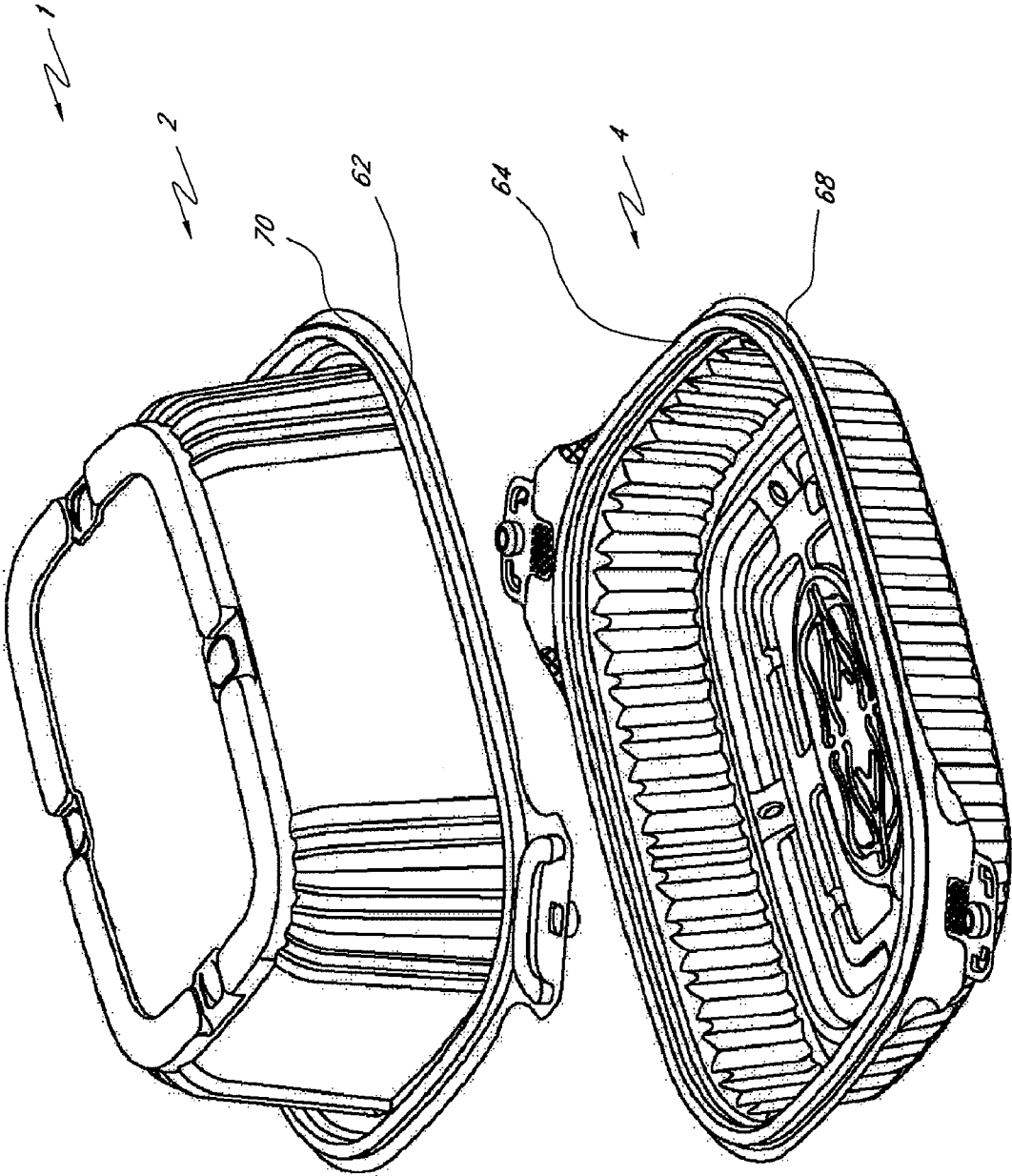


FIG. 2

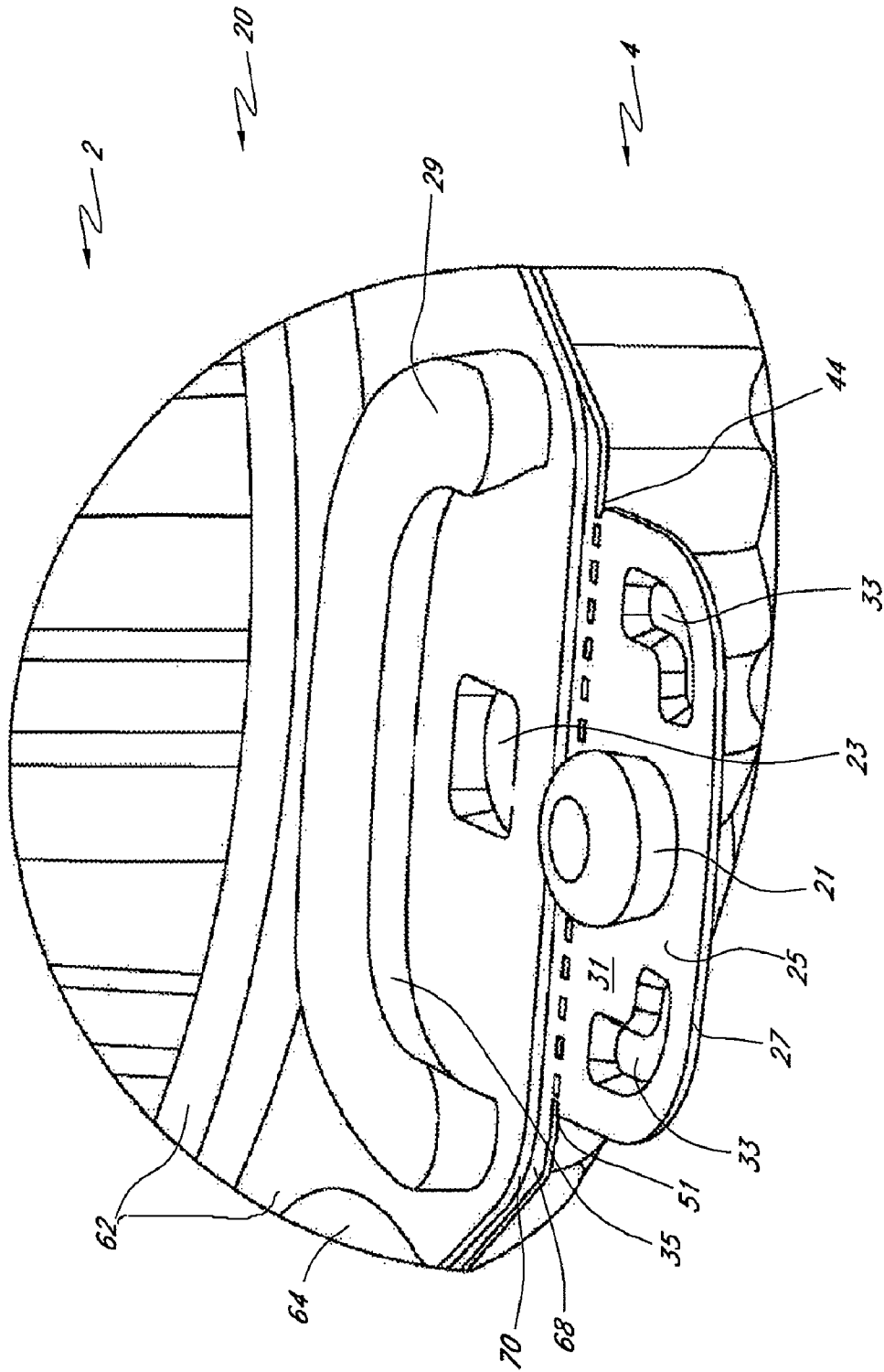


FIG. 3

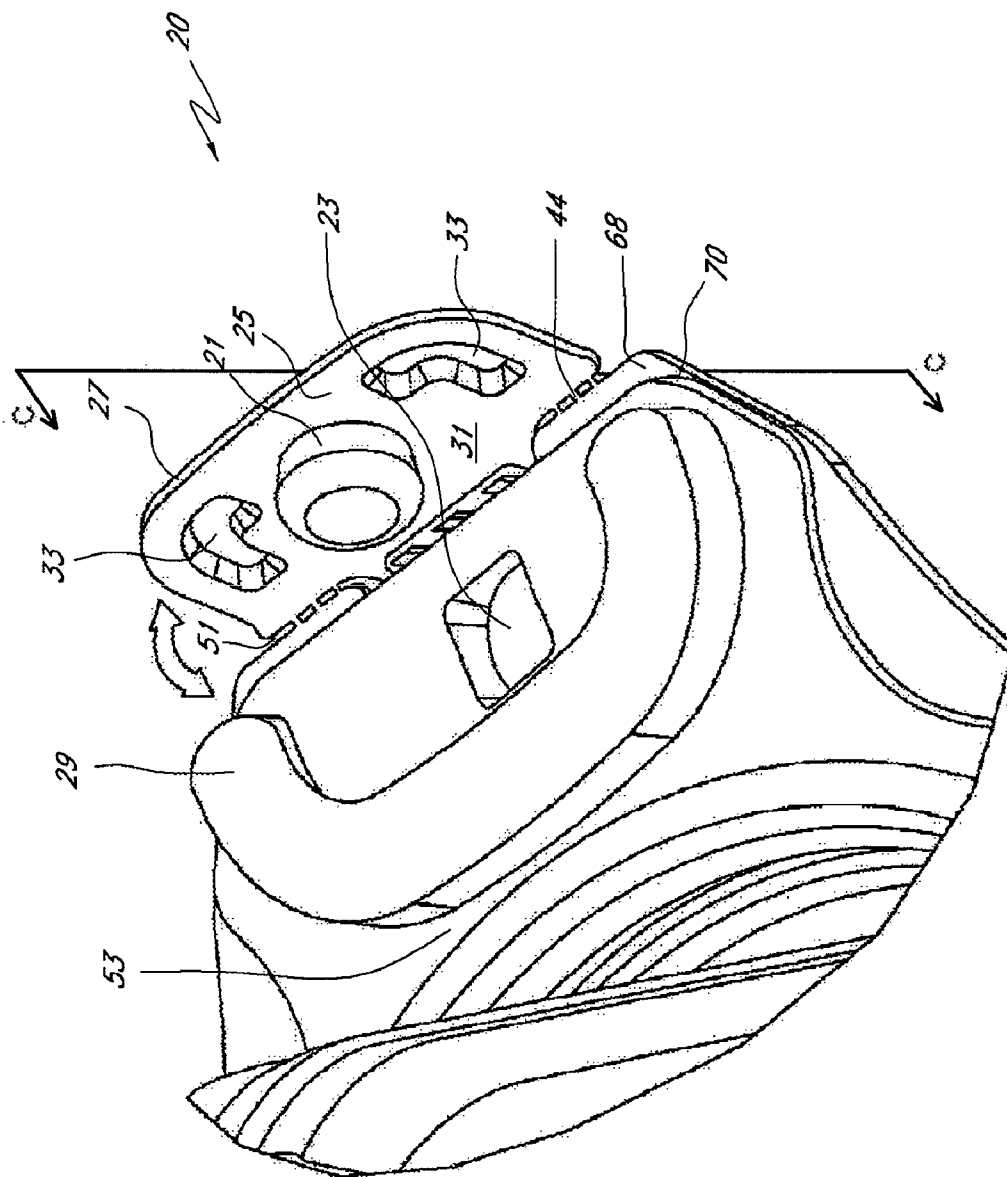


FIG. 4

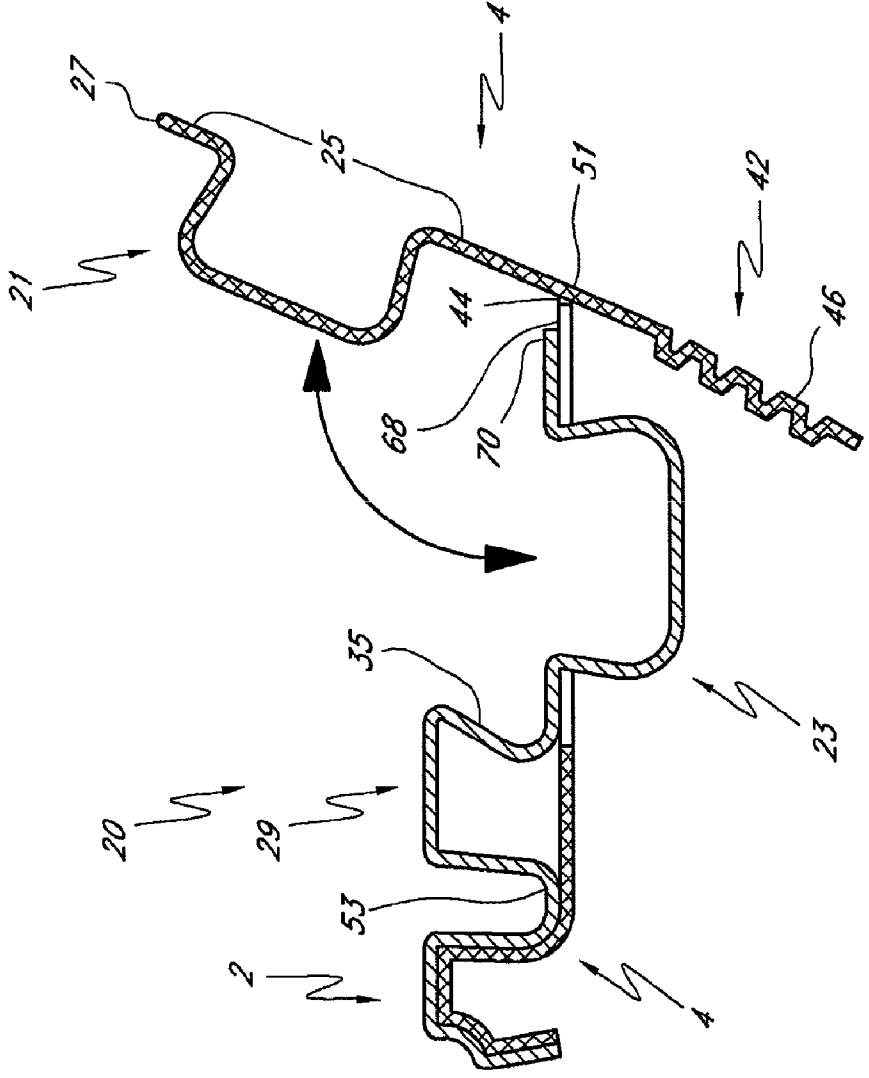


FIG. 4A

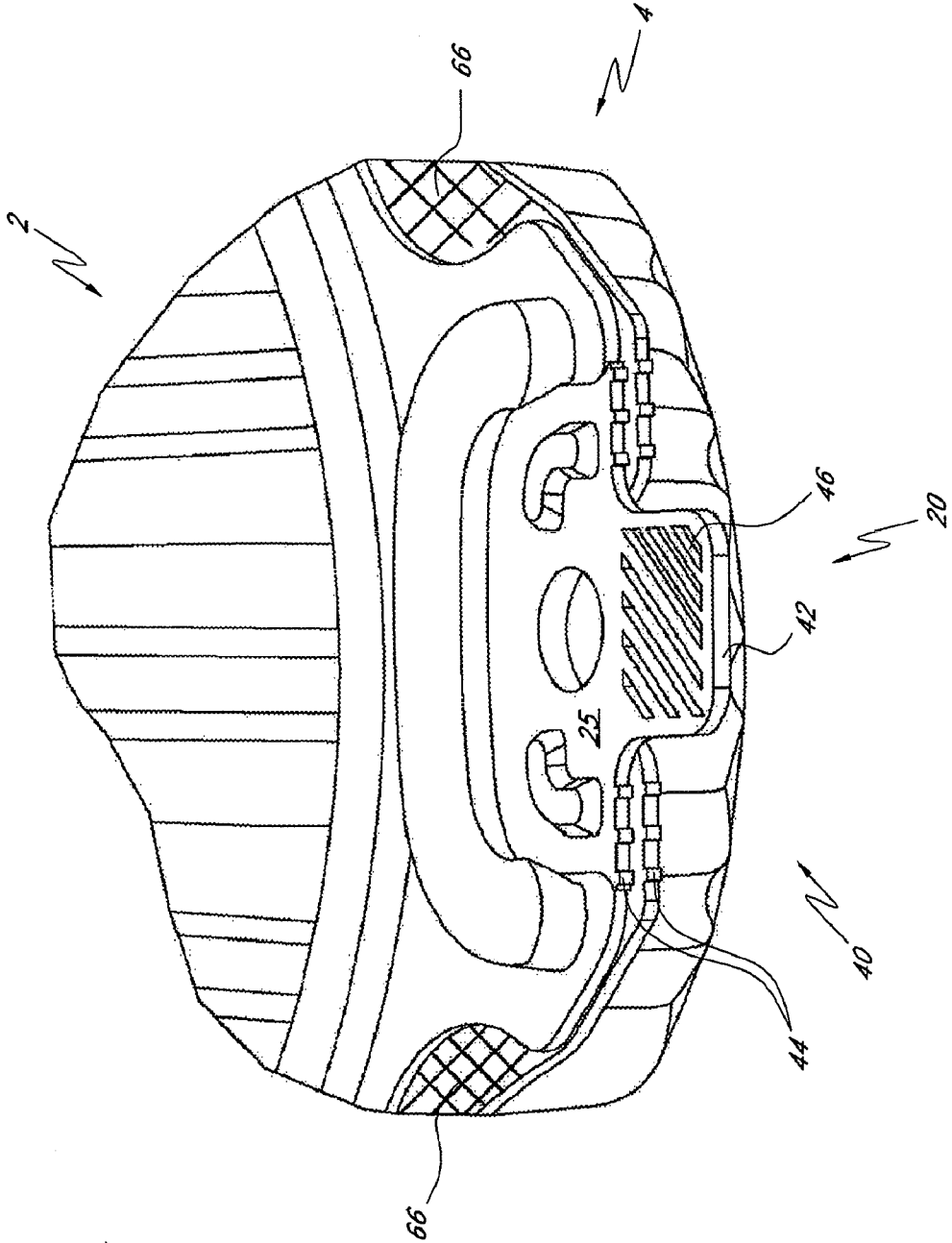


FIG. 6

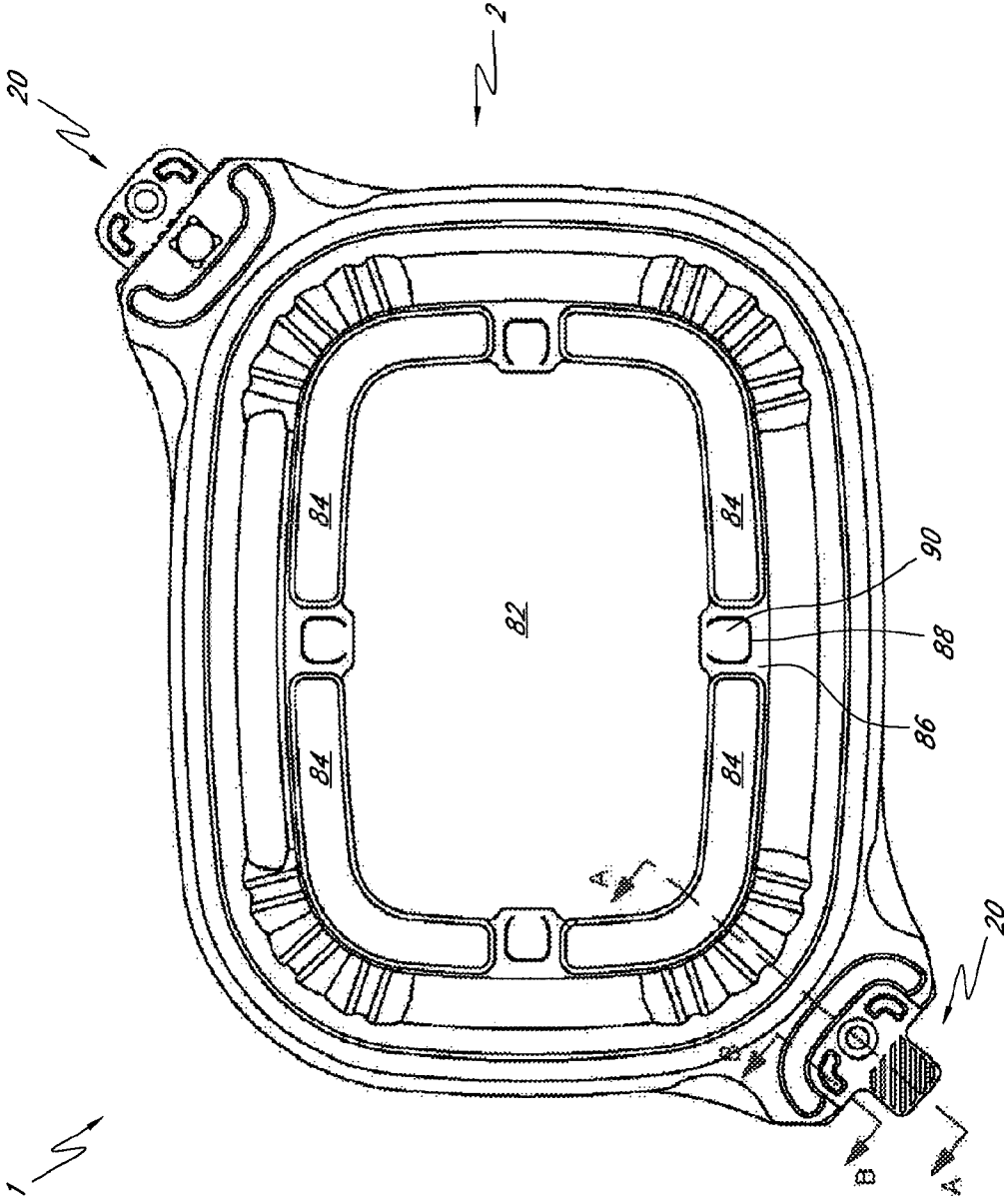


FIG. 7

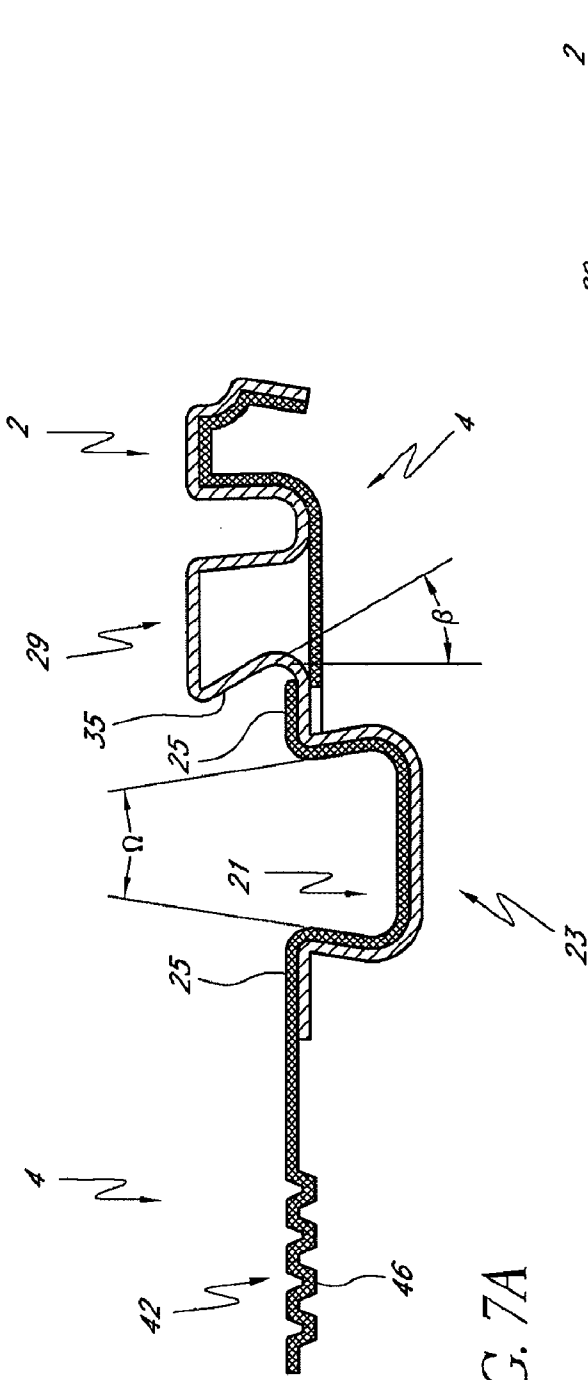


FIG. 7A

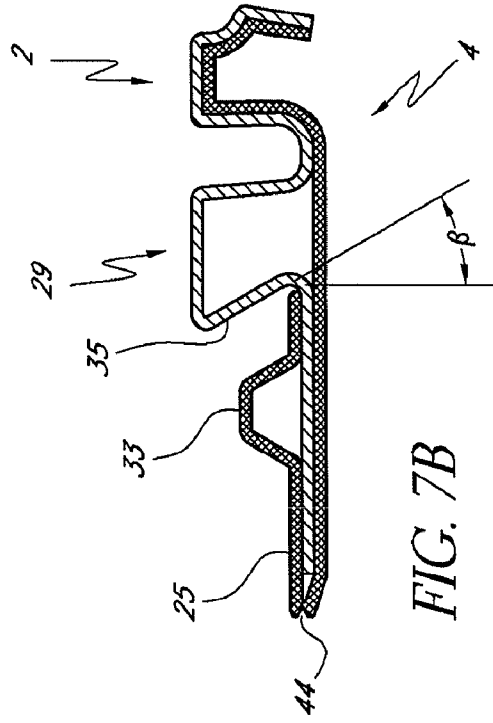


FIG. 7B

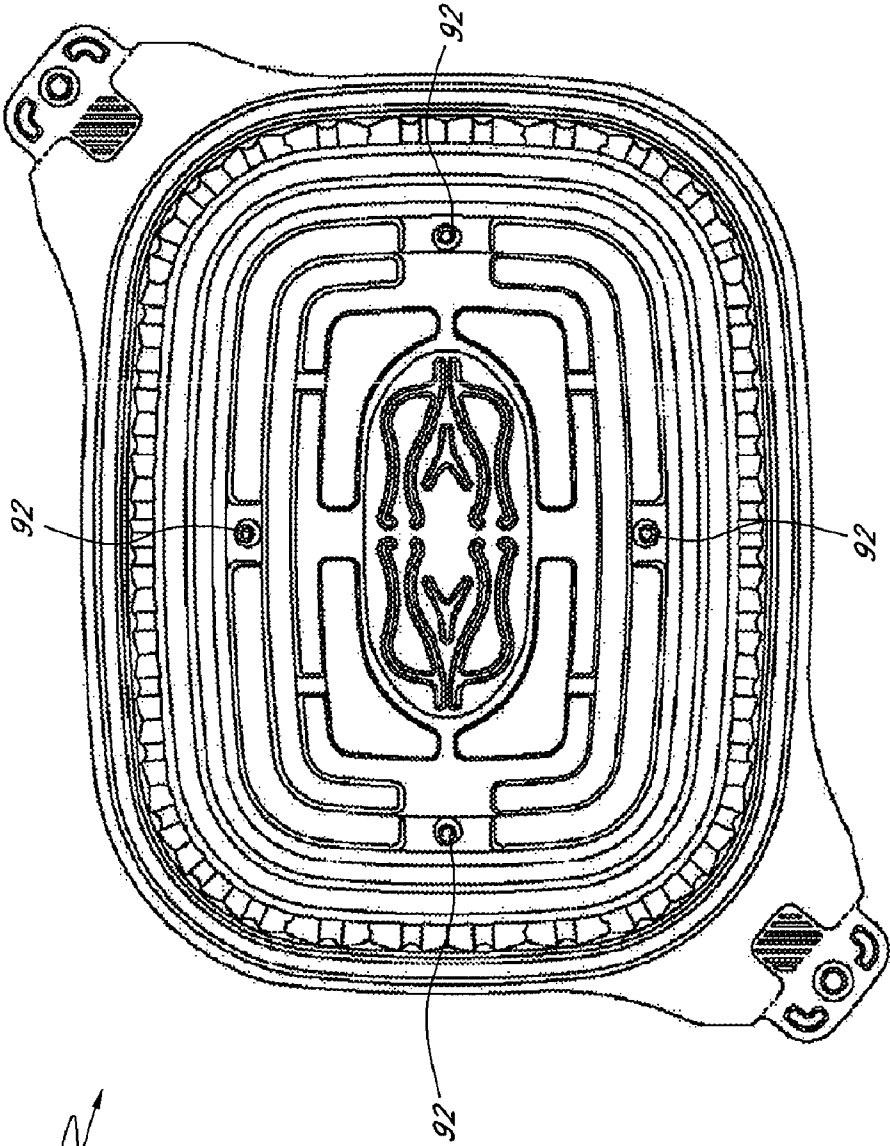


FIG. 8

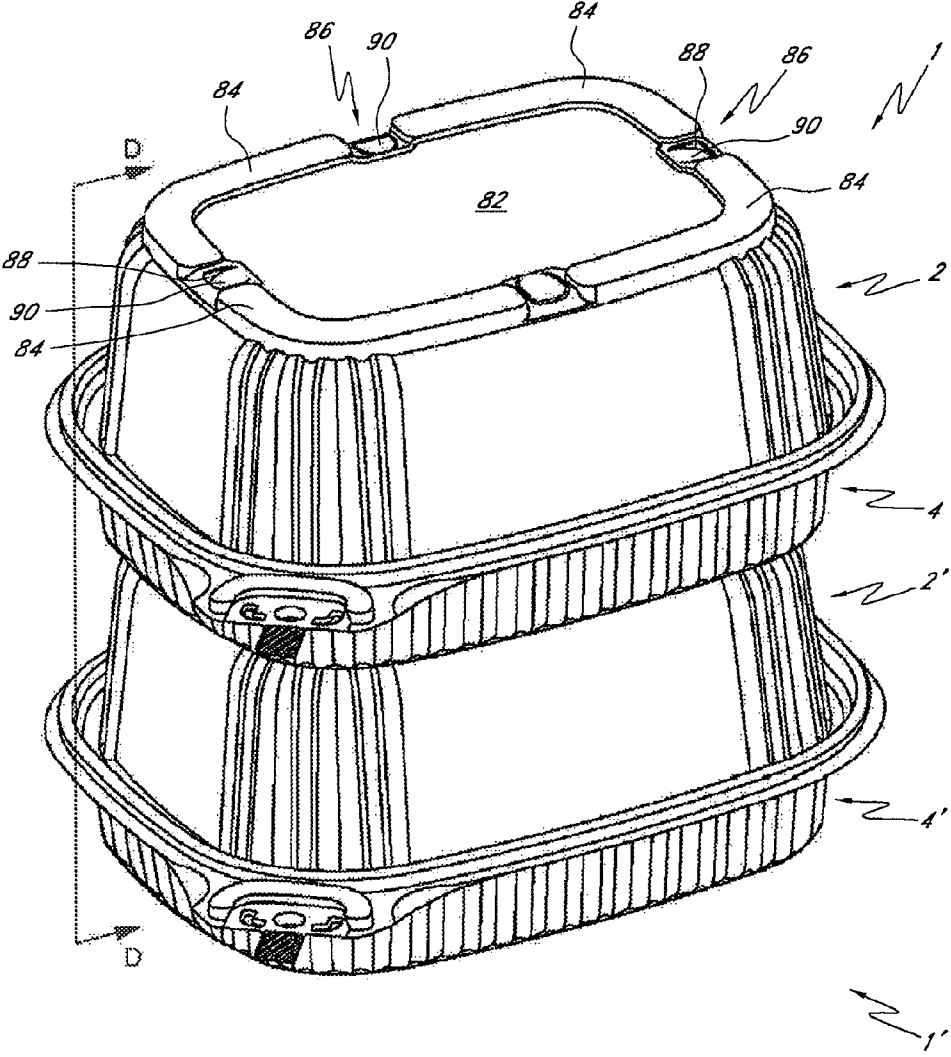


FIG. 9

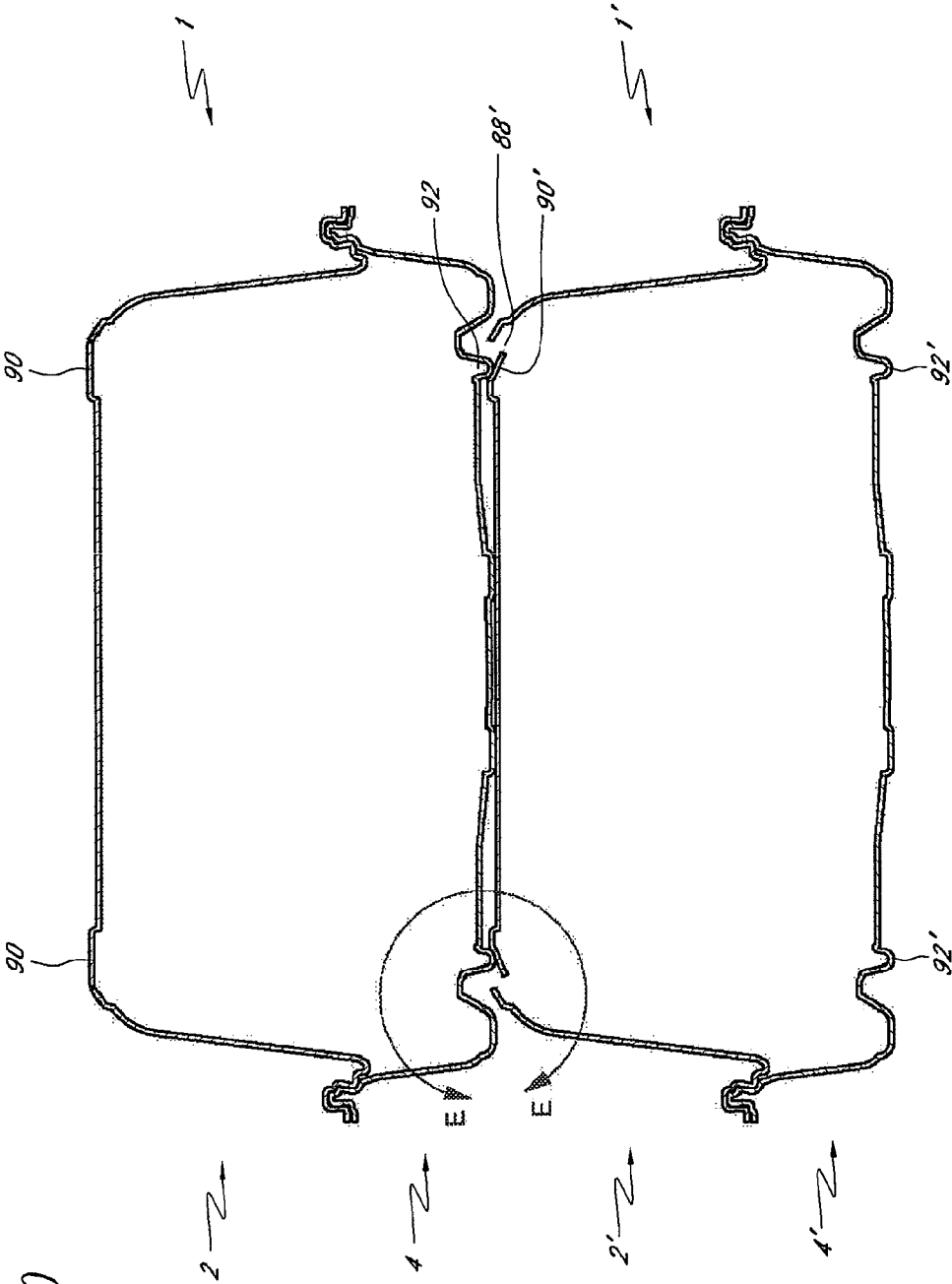


FIG. 10

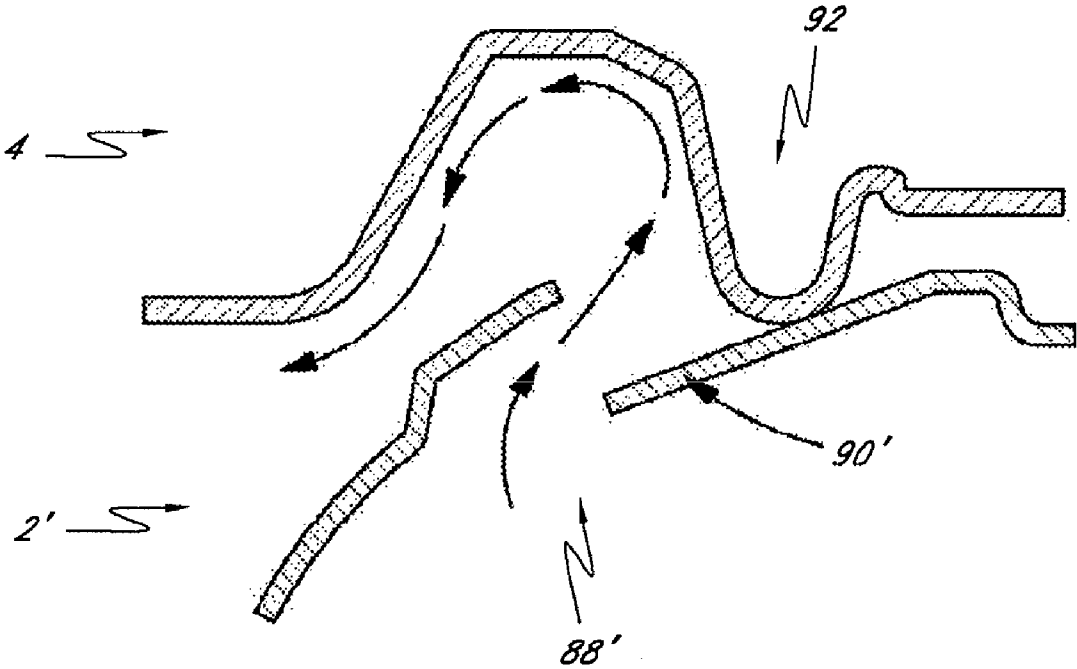


FIG. 10A

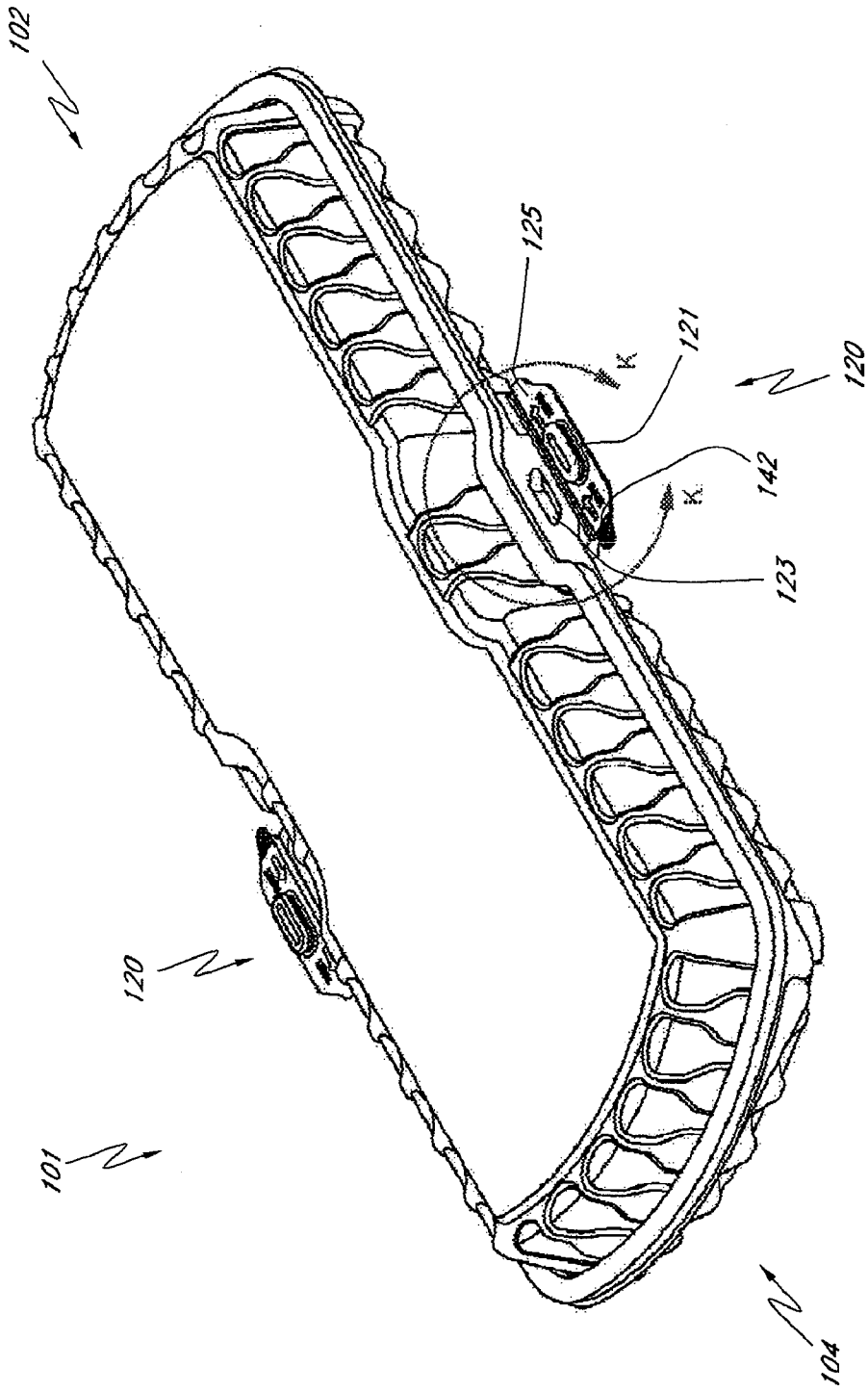
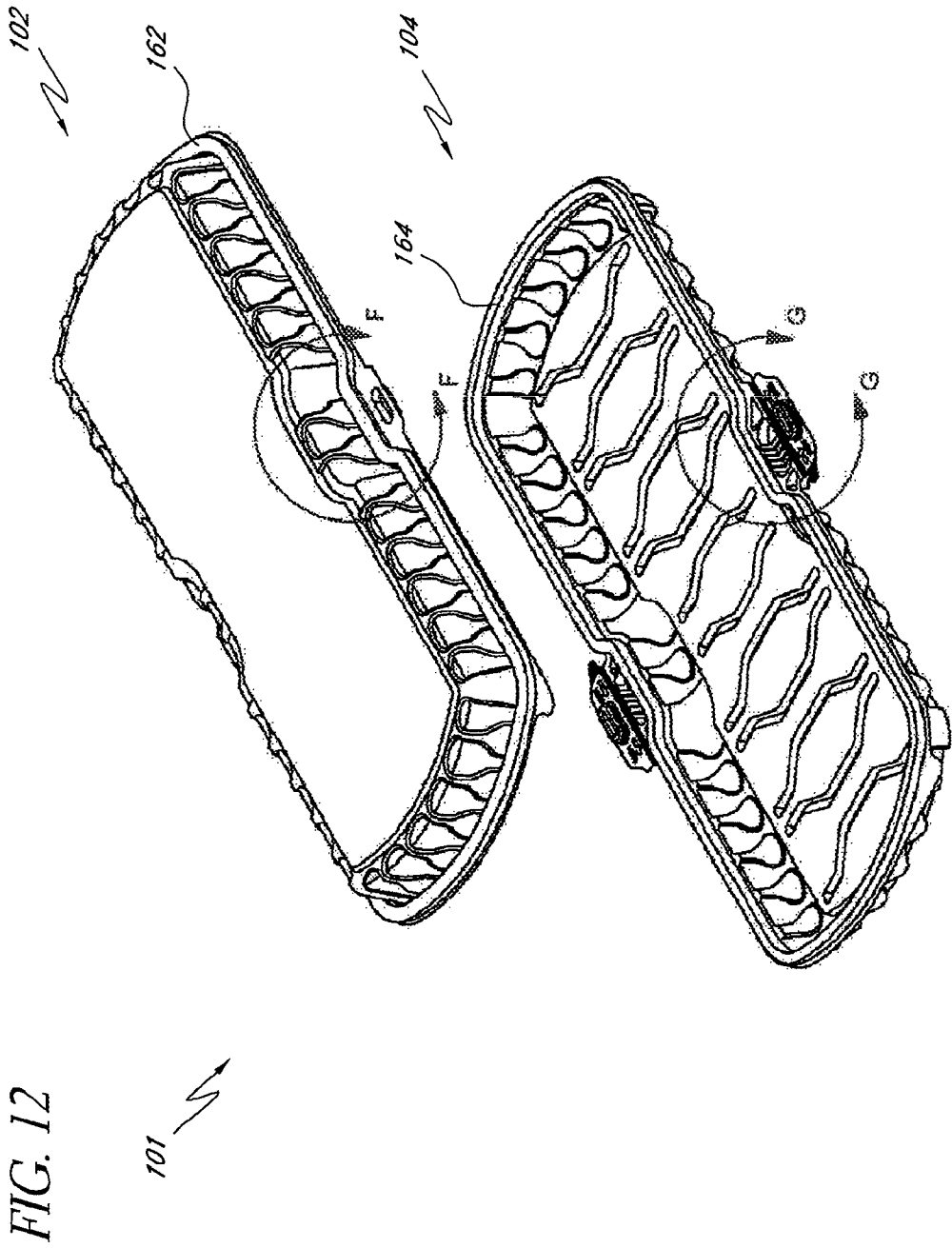


FIG. 11



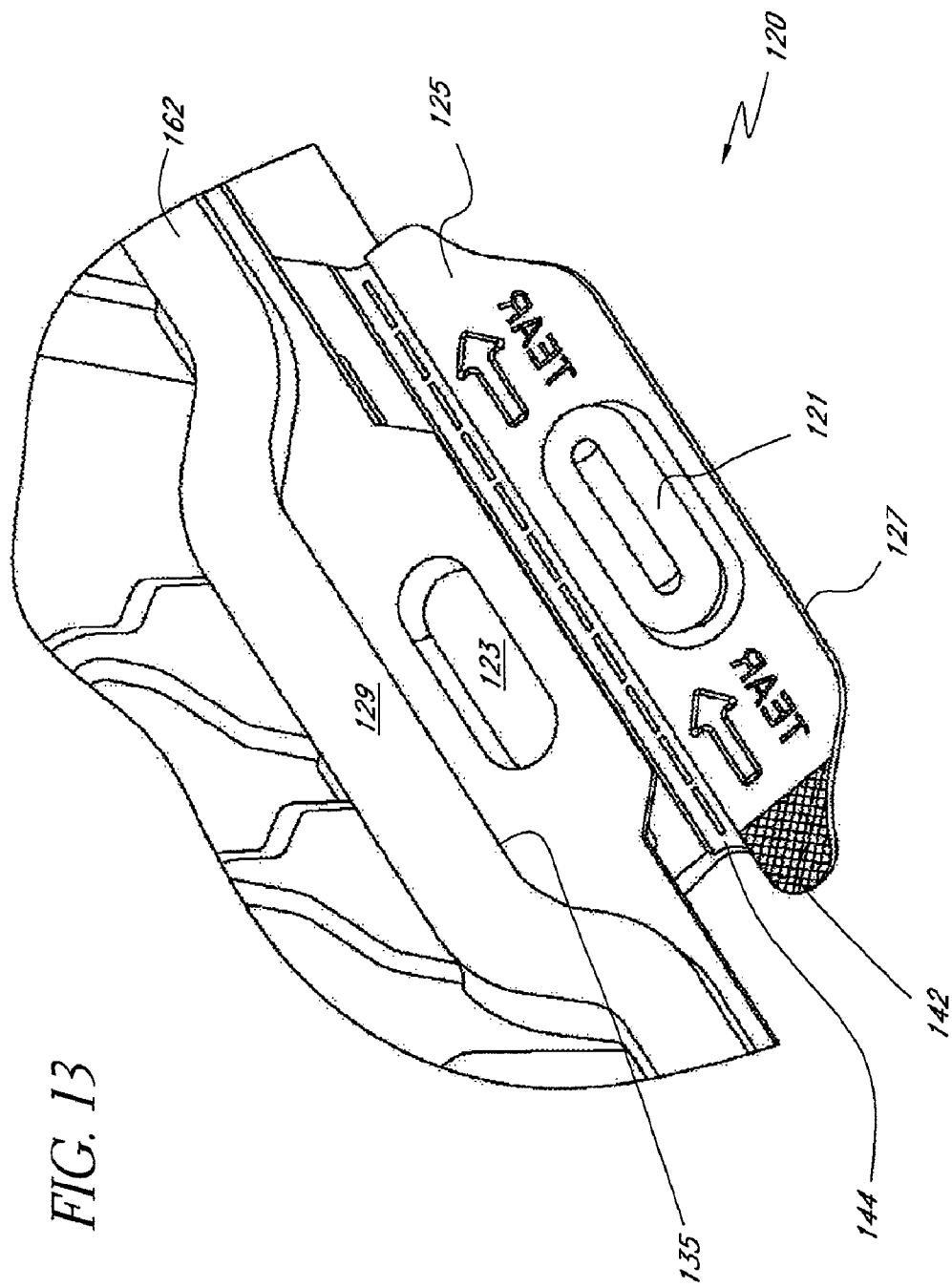


FIG. 13

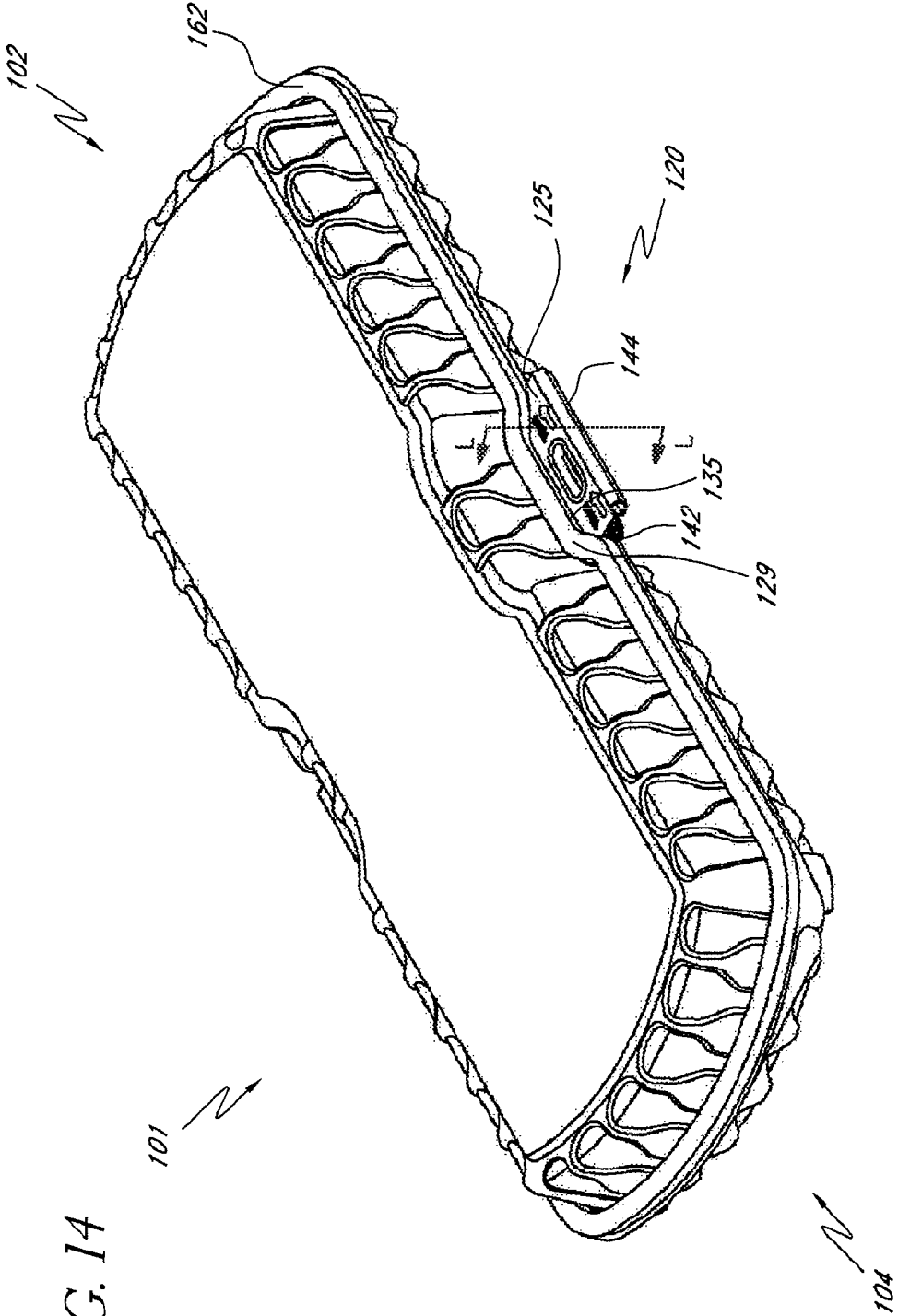


FIG. 14

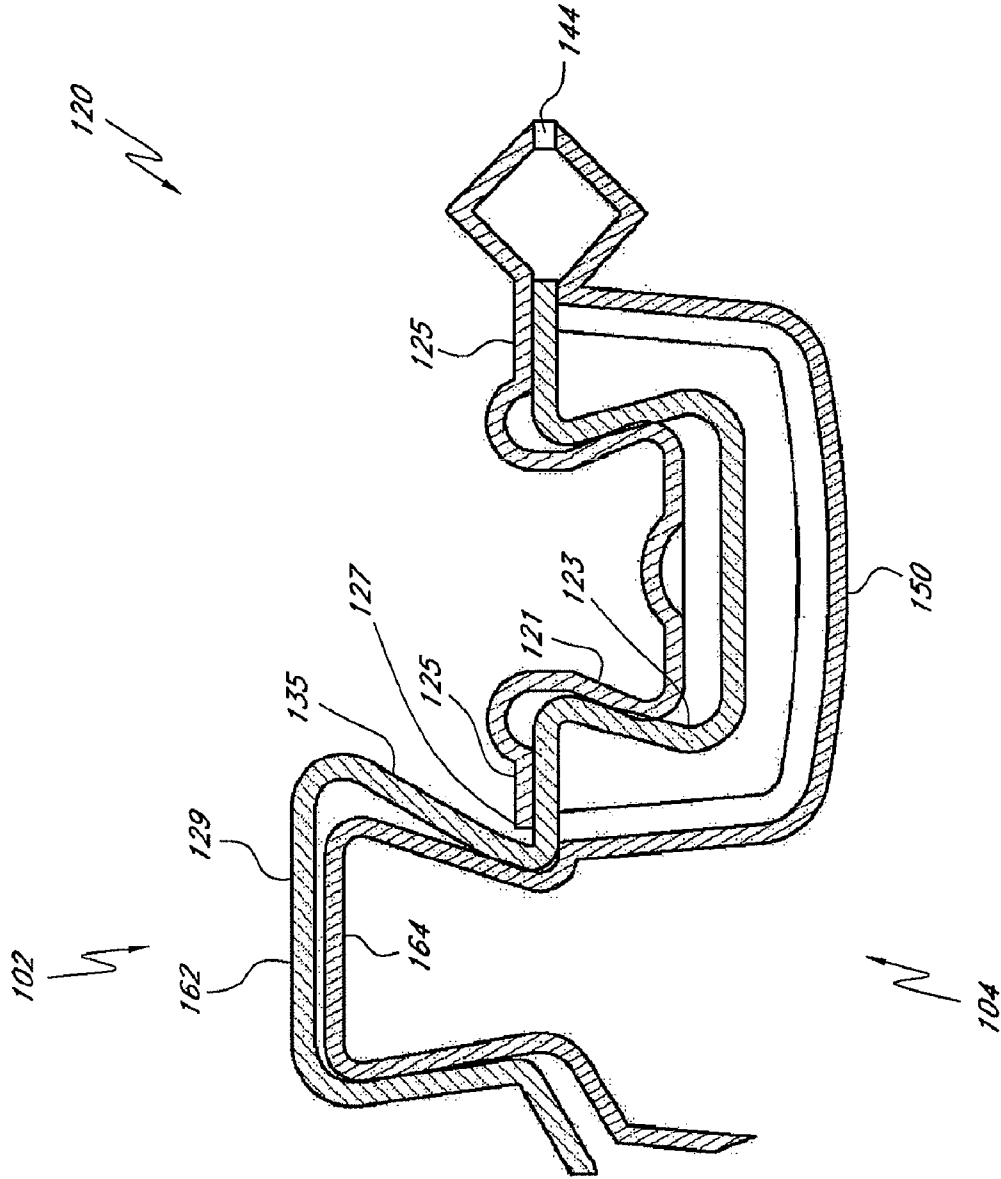


FIG. 14A

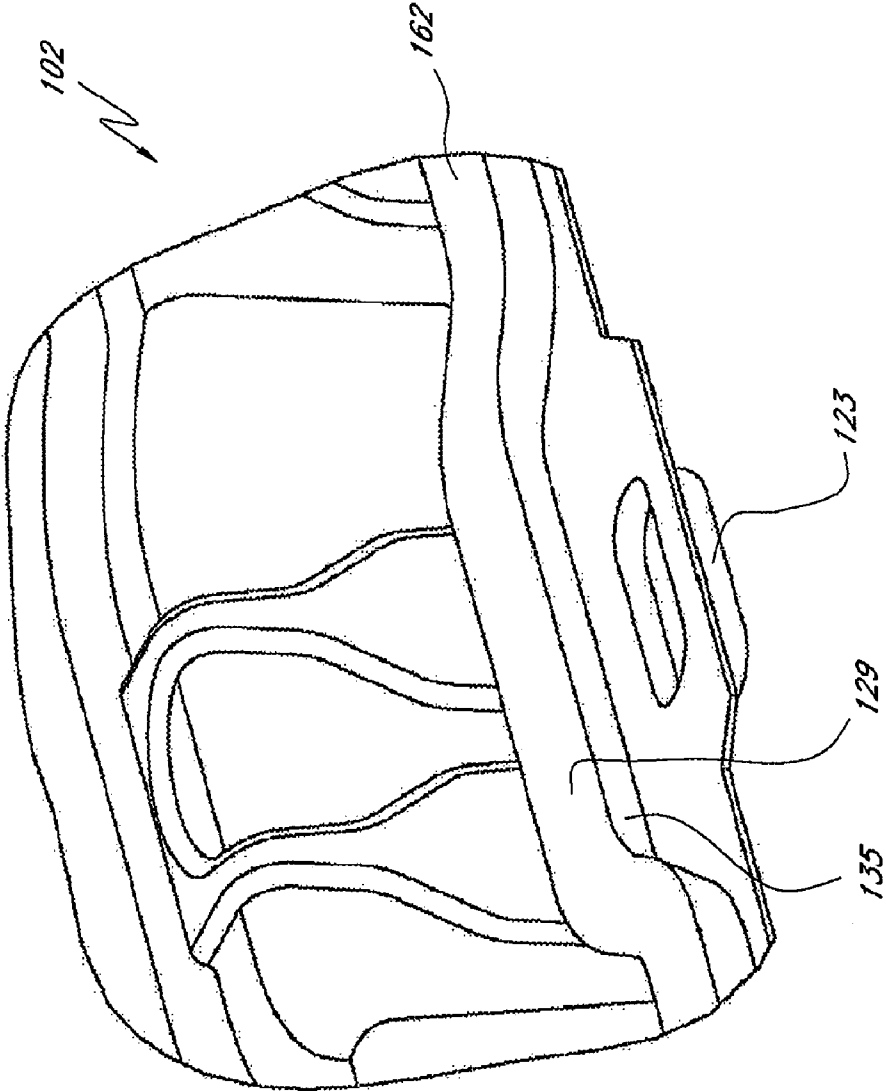


FIG. 15

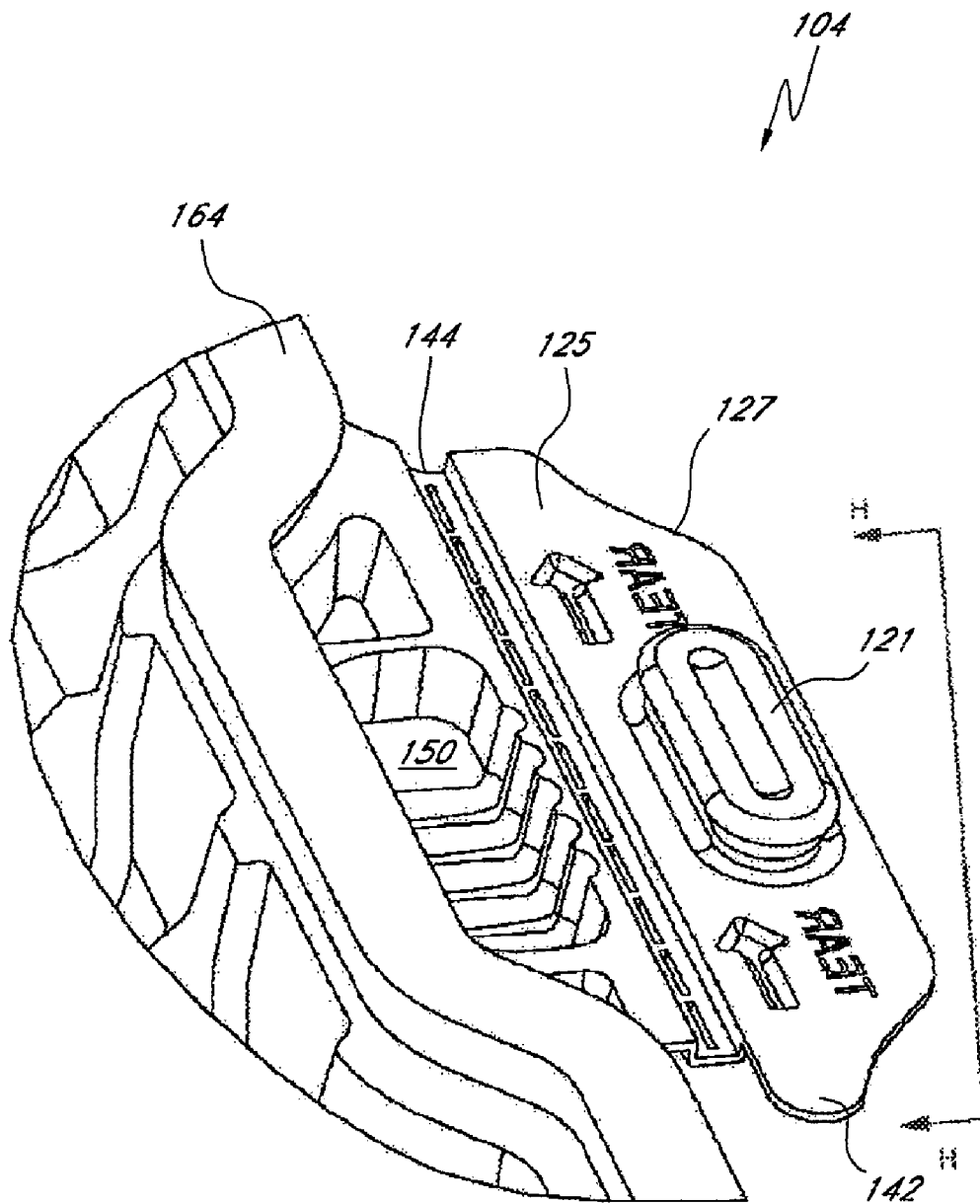


FIG. 16

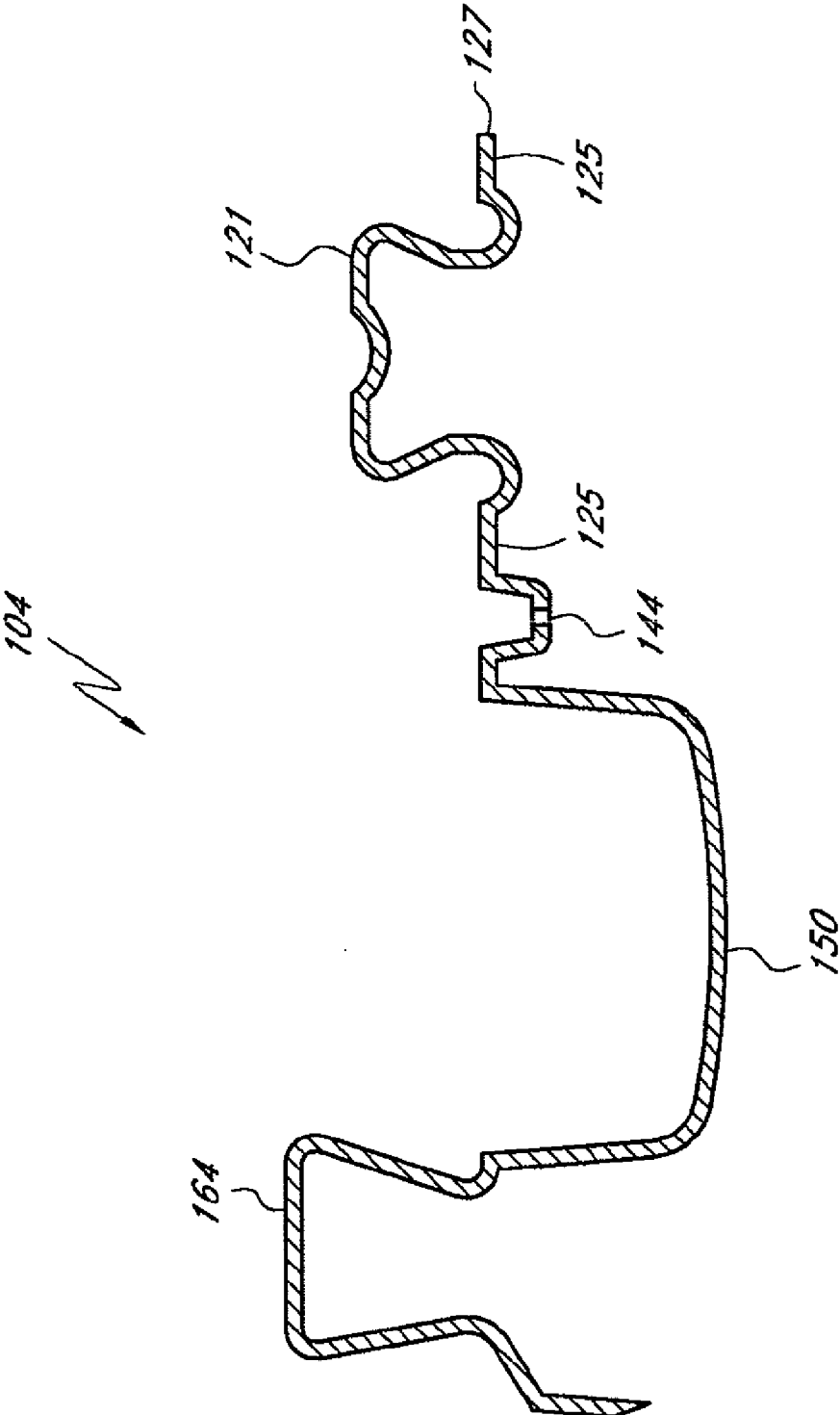


FIG. 16A

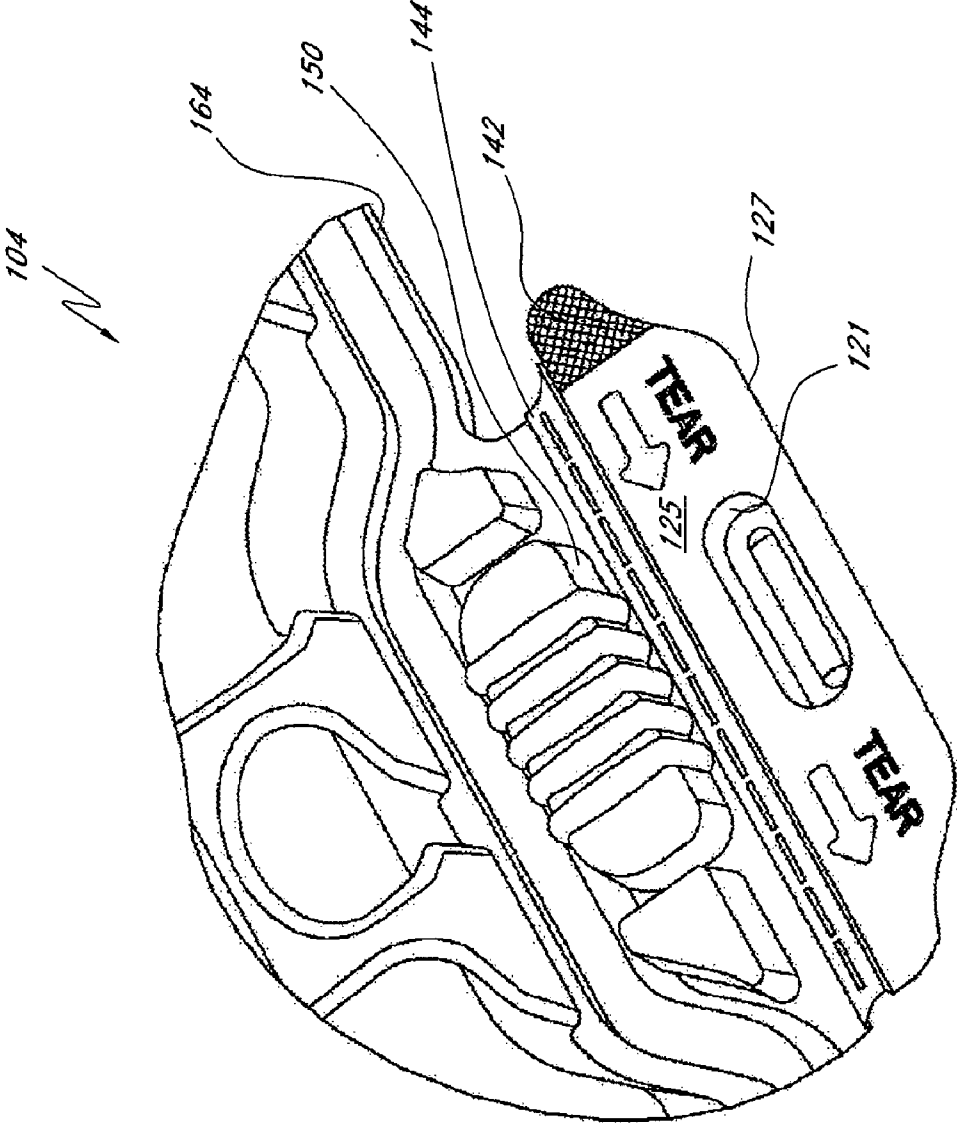


FIG. 17

TAMPER-EVIDENT PACKAGING SYSTEM

BACKGROUND

[0001] 1. Field

[0002] Disclosed are container systems for foodstuffs. This disclosure relates to a food packaging containment system that is suitable for heated food items such as rotisserie chicken and the like. The system can include a tray compartment, a lid member and a tamper-evident locking mechanism. The disclosure also relates to a food containment system that can include a tray compartment, a lid member and structures for release of heated gases.

[0003] 2. Description of the Related Art

[0004] Packaging for food (e.g., packaging for roasted chickens) has various drawbacks. For example, many chicken roaster packages lack a means whereby a consumer can know whether the packaging has been tampered with. Release of heated gases has also been a problem. Packages can sometimes be too hot to carry conveniently.

SUMMARY

[0005] In some embodiments, a container system suitable for food comprises a tray member with a first connection lip, a lid member with a second connection lip configured to connect with the first connection lip of the tray member and a locking mechanism. The first and second connection lips are configured to form a seal between the lid member and the tray member. The connection lips may form a ridge and groove configured to receive the ridge. The locking mechanism can be configured to engage when the tray member and lid member are positioned to connect. The locking mechanism may comprise locking means, a skirt with a skirt edge and means for impeding access to the skirt edge.

[0006] In some embodiments the locking means may comprise a male member and a female member configured to receive the male member. The means for impeding access to the skirt edge may comprise a finger guard that impedes access to the skirt edge when the male member is received into the female member. The finger guard may be a raised rib with a side surface configured to overhang and impede access to the skirt edge. The skirt may further comprise a flat portion and a rib portion configured to impede access to the skirt edge. The container system may be stackable.

[0007] In some embodiments, the container system further comprises a tamper-evident separation mechanism. The tamper-evident separation mechanism may comprise a pull tab and a break-locus at which the skirt is configured to break in order to allow the user to open the container system at the seal between the lid member and the tray member. The break-locus can allow a single piece of material to separate into two pieces when the pull tab is pulled. The break-locus can take many forms, for example, it may be a perforated section or a thin section. The break-locus may also be an area around which the skirt folds along to allow the male and female members to engage with each other.

[0008] In addition, the system may be configured such that pulling on the pull tab after the male member has engaged with the female member can cause the skirt to break at the break-locus, allowing the pull tab and the separated portion of the skirt to separate and indicating that the tray member and the lid member have been closed and subsequently opened. This provides a consumer with evidence of potential tampering.

[0009] Some embodiments comprise a container system suitable for heated food. A first container system may comprise a tray with an activation member and a lid. The lid can

have an aperture partially covered by a flap. The aperture and flap are configured to enable the release of heated gases when the flap is depressed. The activation member is configured to depress a flap in a second container system. The activation member may optionally protrude downward in the bottom of the tray member.

[0010] The container system of some embodiments comprise a dome surface, at least one stacking rib and an aperture surface. The aperture surface may comprise the aperture and the flap and the aperture surface is configured such that it is at least partially above the dome surface and below the at least one stacking rib. The aperture surface may also be sloped.

[0011] Some embodiments encompass a method of making a tamper-evident food container system. The method may comprise providing a first container portion of a lid formed from a single piece of material, the lid having an outward lid extension substantially surrounding the perimeter thereof. Providing a second container portion comprising a tray formed from a single piece of material, the tray having an outward tray extension substantially surrounding the perimeter thereof. Establishing an enclosed space by positioning the lid and the tray together with the outward lid extension and the outward tray extension abutting each other around substantially the full perimeter of the enclosed space and securing the lid to the tray by inserting a male portion of a locking mechanism of one container portion into a female portion of a locking mechanism in the other container portion at a securement complex. Further securing the lid to the tray at the securement complex by folding a portion of the long outward extension of one container portion over a sandwiched section of the outward extension of the other container portion and preventing future undetected tampering by causing a pull tab to protrude from the side of the food-container system, the pull tab configured to permanently separate from the container portion when the tab is pulled with sufficient force to separate the lid from the tray.

[0012] Some methods may comprise the further step wherein securing the lid to the tray comprises positioning the folded portion of the outward extension of one container portion underneath an overhanging feature on the other container portion to impede unfolding of the long outward extension.

[0013] Some methods of making a tamper-evident food container system may involve the following steps. Forming a lid and tray, each from a single piece of material. Forming a securement mechanism on the food container system with a secured section, a skirt with a separable portion, a pull tab forming part of the separable portion, and a skirt edge. The skirt configured to fold along a separation locus around the secured section. The securement mechanism also has a male snap in either the secured section or the skirt, a female snap receptacle in either the secured section or the skirt, the female snap receptacle configured to receive the male snap when the skirt is folded, and a skirt overhang configured to impede access to the skirt edge when the skirt is folded.

[0014] Some methods may further comprise forming at least one ridge in the skirt, the ridge configured to impede access to the skirt edge when the skirt is folded and the skirt overhang overhangs the skirt edge. Some methods may even further comprise securing the securement mechanism by inserting the male snap into the female snap receptacle; positioning the skirt edge underneath the skirt overhang; and subsequently, configuring the tab to protrude such that when a user pulls the tab to open the container system, the tab irreversibly separates to provide evidence that the container has previously been opened.

BRIEF DESCRIPTION OF THE DRAWINGS

[0015] FIG. 1 is an isometric view of an assembled container system with a locking mechanism in the opened and unlocked position and means for the release of heated gases.

[0016] FIG. 2 is an exploded isometric view of the container system.

[0017] FIG. 3 is an isometric detail view of the locking mechanism in the opened, unlocked position.

[0018] FIG. 4 is an isometric detail view of the locking mechanism in the opened, unlocked position as a skirt rotates around a break locus.

[0019] FIG. 4A is a single-plane cross sectional view of the locking mechanism taken in the plane of the line C-C of FIG. 4.

[0020] FIG. 5 is an isometric detail view of the locking mechanism in the closed, locked position.

[0021] FIG. 6 is an isometric detail view of the locking mechanism wherein the break locus has been broken.

[0022] FIG. 7 is a top view of the container system.

[0023] FIG. 7A is a single-plane cross sectional view of the closed and locked locking mechanism taken in the plane of the line A-A of FIG. 7.

[0024] FIG. 7B is a single-plane cross sectional view of the closed and locked locking mechanism taken in the plane of the line B-B of FIG. 7.

[0025] FIG. 8 is a top view of the tray member.

[0026] FIG. 9 is an isometric view of two assembled container systems in a stacked configuration.

[0027] FIG. 10 is a single-plane cross sectional view of two assembled container systems in a stacked configuration showing the interaction between the steam vent and the activation member, the section taken in the plane of the line D-D of FIG. 9.

[0028] FIG. 10A is a detail view of the interaction between the steam vent and the activation member taken along line E-E of FIG. 10.

[0029] FIG. 11 is an isometric view of another embodiment of an assembled container system with a locking mechanism in the open and unlocked position.

[0030] FIG. 12 is an exploded isometric view of the container system with locking mechanism.

[0031] FIG. 13 is an isometric detail view of the locking mechanism in the opened, unlocked position taken along line K-K of FIG. 11.

[0032] FIG. 14 is an isometric view of the locking mechanism in the closed, locked position.

[0033] FIG. 14A is a single-plane cross sectional view of the closed and locked locking mechanism taken in the plane of the line L-L of FIG. 14.

[0034] FIG. 15 is an isometric detail view of parts of the locking mechanism associated with the lid member taken along line F-F of FIG. 12.

[0035] FIG. 16 is an isometric detail view of parts of the locking mechanism associated with the tray member taken along line G-G of FIG. 12.

[0036] FIG. 16A is a single-plane cross sectional view of parts of the locking mechanism associated with the tray member taken in the plane of the line H-H of FIG. 16.

[0037] FIG. 17 is an isometric detail bottom view of parts of the locking mechanism associated with the tray member viewed from the bottom of the tray member.

DETAILED DESCRIPTION OF PREFERRED EMBODIMENTS

[0038] Rigid and flexible plastic containers can be used to protect and display both perishable and fragile food items such as sandwiches, salads and bakery items. The roles of plastic packaging can be expanded to meet additional demands. Presentation, brand presence, consumer desires, added value to enhance commercial competitiveness, differentiation, imagery and psychology can all be factors in pack-

age design and application. Convenience and versatility continue to shape the future of packaging, with consumers gravitating toward packaged convenience items. Thus, social and environmental considerations can be advantageously included in the development process of plastic packaging. The provision of multiple compartments in a variety of shapes and utilities in rigid plastic containers is an example of a useful advantage.

[0039] Plastic food containers can be manufactured, for example, from Polystyrene, Polypropylene, Polyethylene Terephthalate (PET), Polylactide, Polyvinyl Chloride (PVC), or other rigid polymers. Materials that can be used include thermoformable plastics such as: Oriented Polystyrene (OPS); Talc-Filled Polypropylene (TFPP); High Impact Polystyrene (HIPS); Polypropylene (PP); Polyethylene Terephthalate (PET); Amorphous PET (APET); Crystallized Polyethylene (CPET); polylactide or polylactic acid (PLA); Polystyrene; Styrene Block Copolymer blends; and the like. Plastic food containers can comprise multiple parts—e.g., a tray and lid—or they may be a one-piece construction with a hinge that allows one portion of the container to act as the tray and the other connected portion to act as a lid. Plastic packages can be manufactured in a variety of shapes and cross-sections: circular, rectangular, square, elliptical, etc.

[0040] The use of such plastics for holding heated food has many advantages, especially with rotisserie chicken applications. However, many currently available food packages have not been designed to cater to the consumer's needs as related to the risk of tampering or the handling of container systems for heated foods. Many of the currently available container systems have no way of indicating whether the container has been prematurely opened or tampered with. In addition, heating of the container contents can result in high temperature fluids and gases, increased pressure build-up, and so forth. A hot container can thus be painful to touch. Such constraints also place limitations on the logistical elements such as containerization of large quantities of heated food product. This disclosure provides for a unique approach that achieves these objectives, among others.

[0041] Embodiments will be described more fully hereinafter with reference to the accompanying drawings. Inventions disclosed herein may be embodied in many different forms and should not be construed as limited to the embodiments set forth herein; rather, example embodiments are provided so that this disclosure will be thorough and complete and will convey the scope of the invention to those skilled in the art.

[0042] Referring to the drawings and in particular to FIGS. 1 and 2, there is shown a dome-shaped, rigid polymer construct food container system 1. The food container system 1 can include a lid member 2 and tray member 4 which forms the primary recess into which heated foodstuff, such as a rotisserie chicken, is placed.

[0043] The lid member 2 and tray member 4 of the container system 1 can be molded, through thermoforming manufacturing means, from a single sheetline of polymer material work piece into a predetermined shape and thickness as required. The lid member 2 and tray member 4 of the container system 1 may also be formed, through thermoforming manufacturing means, into a curvilinear geometry to thereby provide the end user with a variety of polygonal shapes. In the container system 1, the lid member 2 has geometry that permits even mating with the tray member 4 at their peripheral edge, where even mating can imply that two structures mate evenly. Additionally, mating between lid member 2 and tray member 4 can be releaseably-sealable and achieved using a snap-fit grip, shown here as components 62,

64. The releaseably-sealable mechanism can be a slotable mechanical interface wherein the tray member snap-fit grip component 64 is the male element and the lid member snap-fit grip component 62 is the female element.

[0044] FIG. 1 shows the container system 1 with a locking mechanism 20 configured to engage when the tray member 4 and lid member 2 are positioned to permit even mating. The locking mechanism 20 may comprise locking means and impediment means, wherein the locking means and impediment means can be the same structure.

[0045] Locking means, as used herein, is a broad term and is used in its ordinary meaning. Locking means can include but are not limited to any of the following: anything that attaches two pieces of material together, male and female locking parts, a button and button receiver (e.g., button hole), a hook, an interference fit, a tongue and groove, a tongue and slot, a rivet, a snap, mating portions of plastic containers, etc. Locking means can also include the locking mechanisms disclosed in the Figures.

[0046] Impediment means, as used herein, is a broad term and is used in its ordinary meaning. Impediment means can include but are not limited to any of the following: structures or voids (lack of structure) that make access to another structure more difficult, that prevent easy access to another structure, that prohibit access to another structure, that block or partially block access to another structure, that prevent access to a structure in normal use, etc.

[0047] The locking means can be configured to lock the locking mechanism and the impediment means can be configured to deny access to at least a part of the locking means. The locking means may be a male member 21, and a female member 23 configured to receive the male member 21. The locking means can have an interference fit. The locking mechanism 20 may further comprise a skirt 25 with a skirt edge 27. The locking means can be separate from the sealing mechanism. The impediment means may be a finger guard 29 configured to impede access to the skirt edge 27 after the male 21 and female 23 members are joined.

[0048] The locking mechanism can take on many different configurations. For example, the Figures show the male member 21 associated with the tray member 4 and the female member 23 with the lid member 2; this association can be reversed with the male member 21 formed as part of the lid and the female part formed as part of the tray. In addition, the locking mechanism 20 can be integrated into the releaseably-sealable mechanism. The principles of the locking mechanism 20 can be applied using different configurations from those displayed in the Figures. In addition, a container system 1 can have one or more locking mechanisms 20.

[0049] Now turning to FIG. 3, the locking mechanism 20 of some embodiments will be discussed in more detail. The skirt 25 of the locking mechanism 20 may comprise a flat portion 31 and at least one rib portion 33. The at least one rib portion 33 can increase the structural rigidity of the skirt 25. The at least one rib portion 33 may be configured to impede access to the skirt edge 27 when the locking mechanism 20 is in the locked position, as will be explained in more detail below. The finger guard 29 also works to impede access to the skirt edge 27. The finger guard 29 may comprise a raised rib. The raised rib may have a side surface 35 configured to overhang and impede access to the skirt edge 27 when the locking mechanism 20 is in the locked position.

[0050] Reference is now made to FIGS. 3-5, in discussing the locking function of the locking mechanism 20. With the lid member 2 placed on the tray member 4, and whether or not the snap-fit components 62, 64 are in a sealed configuration, a user can initiate locking of the locking mechanism 20. To do

this, a user may bend the skirt 25 to engage the male 21 and female 23 members. Once the male 21 and female 23 members are engaged, the locking mechanism 20 is in an initial locked configuration (FIG. 5). While the male 21 and female 23 members are engaging each other, the skirt edge 27 can also abut, be adjacent to, or lie under the side surface 35 of the finger guard 29. The side surface 35 may be sloped or undercut so as to create an overhang. In this way, as the skirt 25 and skirt edge 27 engage or come into close proximity with the finger guard 29 and the side surface 35, the skirt 25 and skirt edge 27 become more enclosed by the finger guard 29 and side surface 35 (FIG. 7A-B). This can have the advantage of impeding access to the skirt edge. For example, after the male member 21 and the female member 23 are in a locked position, the finger guard can prevent a finger from easily accessing the skirt edge. There are various ways to impede access to the skirt edge 27. The illustrated finger guard 29 is one such way. Other ways may include the use of different shaped ridges or slots to impede access to or to completely enclose the skirt edge 27.

[0051] The finger guard 29 or other structures that are designed to impede access to the skirt edge 27 provide many benefits. Impeding access to the skirt edge 27 is one way of helping to ensure that the locking mechanism 20 stays in a locked configuration. Impeding access to the skirt edge 27 helps to prevent tampering and helps to ensure that the tamper-evident mechanism works as designed, as explained below.

[0052] In addition to the finger guard 29, the at least one rib portion 33 may also impede access to the skirt edge 27. The at least one rib portion 33 can provide many benefits including strengthening the skirt 25 and thereby increasing the rigidity of the skirt. This can help maintain the skirt 25 in the locked configuration, keeping the system securely closed. This is because as the rigidity of the skirt 25 increases, the skirt 25 in a locked configuration is more difficult to bend or flex in a manner that can enable the skirt's 25 removal from the locked configuration. A raised rib portion close to the skirt edge can also decrease access to the skirt edge 27 thus further impeding access to the skirt edge 27 when used in conjunction with the finger guard 29 or other impediment means.

[0053] Turning to FIGS. 5 and 6, other embodiments of the container system 1 may further comprise a tamper-evident separation mechanism 40. The tamper-evident separation mechanism 40 may comprise a pull tab 42 and a break-locus 44 at which the skirt 25 is configured to break. When a user attempts to open the lock mechanism 20, the break-locus 44 is configured to break. This action serves two purposes, first a user can quickly and easily identify if or when the container system 1 has already been opened or otherwise tampered with. Second, it allows a user to unseal the lid member 2 and tray member 4 and to open the container system 1.

[0054] While the locking mechanism 20 is locked and the break-locus 44 is unbroken, a user can be prevented from separating the lid member 2 and tray member 4. This should be true when, for example, there are two locking mechanisms 20 on opposite sides of the container system 1, or when the lid member and tray member are connected at a hinge and the container system has a locking mechanism on the opposite side of the container system away from the hinge.

[0055] The break-locus 44 can comprise a weak section of material configured to allow a single piece of material to separate into two pieces (see FIG. 6) when the pull tab 42 is pulled or when a user attempts to unlock the locking mechanism 20. The pull tab 42 may comprise grip features 46 wherein the grip features 46 may comprise ridges. The weak section can, for example, comprise a perforated section or a

thin section. The perforated section can be an area defined by perforations in the material. The thin section can be defined by the relative thickness of material along one area compared to adjoining areas. The thin section can, for example, comprise a thickness of less than 0.007 inches.

[0056] The pull tab 42 may be configured such that pulling on the pull tab 42 causes more force to be exerted at the break-locus 44 than at the locking means. This tends to cause separation at the break-locus 44 rather than, for example, separating the male member 21 from the female member 23 of the locking mechanism 20. In this way, the skirt 25 breaks at the break-locus 44 when the pull tab 42 is pulled.

[0057] The pull tab 42 may be used in concert with a gripping area 66 to break the break-locus 44. A user can hold the pull tab 42 with one hand and a gripping area 66 with another hand and apply force in opposite directions so as to separate the break-locus 44.

[0058] In some embodiments, as illustrated in FIG. 9, the container system 1 may be stackable. This provides additional benefits especially to the grocer as it allows for easy display and requires less shelf space.

[0059] Returning now to FIG. 5, in some embodiments, the pull tab 42 of the tamper-evident mechanism 40 is mechanically linked to the skirt 25 such that when the skirt 25 folds and the male 21 and female 23 members engage, and the pull tab 42 protrudes.

[0060] Additional features in some embodiments deal with the sealing engagement of the lid member 2 and the tray member 4. Referencing FIGS. 2 and 3, the container system 1, comprises a first connection lip 62 with an outwardly-extending flange 70 that extends substantially around the perimeter of the lid 2, and a second connection lip 64 also with an outwardly-extending flange 68 that extends substantially around the perimeter of the tray 4. The first and second connection lips 62, 64 are configured to abut substantially along the full perimeter of the container system 1 when the system 1 is in the closed configuration. The skirt 25 can comprise a portion of second connection lip 64, and the skirt 25 can be configured to extend beyond lip 64 such that when the skirt 25 is folded along the break locus 44, the extended portion of the skirt 25 secures to the first connection lip 62. In the figures, the skirt 25 is shown as part of second connection lip 64 but the disclosure also embodies the configuration where the skirt 25 is part of the first connection lip 62. In the later configuration, when the skirt 25 is folded it secures to the second connection lip 64.

[0061] The container system 1 may have the configuration depicted in FIG. 3, where the break locus 44 (along which the skirt 25 folds) is located along an outer edge 68 of a connection lip 64. The outer edge 68 of the connection lip 64 can extend beyond the outer edge 70 of the abutting connection lip 62, as shown. This configuration can allow the skirt 25 room to fold around the outer edge 70 of the connection lip 62.

[0062] In some embodiments, a container system 1 suitable for food can comprise a tray member 4 and a lid member 2 wherein the tray 4 and lid 2 members have a connecting portion and a locking mechanism 20. The locking mechanism 20 may comprise a rotating section 25, a pre-formed connection 44 around which the rotating section 25 is configured to rotate and a closure assembly. When the closure assembly is in a closed state, the closure assembly can be closed together more strongly than the pre-formed connection 44 so that attempts to open the closure assembly will disconnect the preformed connection 44, thus unlocking the locking mechanism 20.

[0063] In some embodiments (e.g., those illustrated in FIG. 3 and FIG. 4), the container system 1 may be configured such

that the rotating section 25 is configured to pivot at a first fulcrum 51 when the locking mechanism 20 is in an initial unlocked configuration, where the first fulcrum 51 can comprise a pre-formed connection 44. The rotating section 25 pivots at a second fulcrum 53 when the locking mechanism 20 is in a subsequent locked configuration and the preformed connection 44 has disconnected. In addition, where the connecting portion can comprise a seal around the perimeter of the container system 1 where the lid member 2 and the tray member 4 seal together, and the locking mechanism 20 can be located outside the connecting portion.

[0064] With reference now to FIGS. 7-10A, some embodiments can comprise a first container system 1 suitable for heated food. The first container system 1 can comprise a tray member 4 with an activation member 92 and a lid member 2. The lid member 2 can have an aperture 88 partially covered by a flap 90. The aperture 88 and flap 90 can enable the release of heated gases.

[0065] FIG. 10 shows an embodiment in which the container system is stackable. Here, the activation member 92 is configured to depress a flap 90' in a second container system 1'. This can enable the release of heated gases through the aperture 88' of the second container system 1'.

[0066] Also in FIG. 10, in some embodiments of the container system 1, the activation member 92 protrudes downward from the bottom of the tray member 4.

[0067] FIG. 10A demonstrates how the activation member 92 of the first container system 1 works with the aperture 88' and flap 90' of the second container system 1' to release heated gases from the second container system 1'. As the first container system 1 is placed on top of the second container system 1', the activation member 92 of the first container system 1 interacts with the flap 90' of the second container system 1'. The interaction is such that the activation member 92 depresses the flap 90'. The depressed flap 90' allows for an increase in the release of heated gases from the second container system 1'.

[0068] In some embodiments, with reference to FIG. 9, a container system 1 can comprise a dome surface 82, at least one stacking rib 84, and an aperture surface 86. The aperture surface 86 can comprise an aperture 88 and a flap 90. The aperture surface 86 can be at least partially above the dome surface 82 and below the at least one stacking rib 84. This configuration of the aperture surface 86 is beneficial in that the activation member 92 need not protrude below other points or areas in the bottom of the tray member 4. Thus when the container system 1 is in an unstacked configuration, the system 1 will sit properly, in a stable manner, on a flat surface.

[0069] The aperture surface 86 may optionally be sloped. The slope may be between approximately 0 and 60 degrees. The slope may also be between approximately 15 and 45 degrees. The slope may be between 25 and 35 degrees. The sloped aperture surface 86 advantageously provides clearance for the heated gases to escape the container system 1. This is especially true when the container systems are in a stacked configuration.

[0070] The ability to release heated gases is a useful characteristic in the design of container systems for heated food. The presence of heated gases, such as steam, can decrease visibility within the container system. This can be a problem as consumers are less likely to purchase certain food stuffs when they cannot see the actual food item inside the container system.

[0071] Now with reference to FIGS. 11-17, additional characteristics will be discussed in the context of an example embodiment. A container system 101 may comprise a tray 104 and a lid 102. The lid 102 and tray 104 can be sealably

connected, thus forming a sealed enclosure. The illustrated sealed enclosure may be especially suited for food storage, and in particular, fish storage. The sealing connection may be formed by a tongue 164 and a groove 162. The tongue 164 may fit snugly into the groove 162 forming a sealed connection. The sealing connection can also be performed in other ways. The container system 101 may also optionally have a hinge between the tray 104 and the lid 102.

[0072] The container system 101 may have at least one locking mechanism 120. The container system 101 preferably has two locking mechanisms 120, one on either side of the container system 101. The locking mechanism 120 can have a means for locking the tray 104 and the lid 102 in place. The locking means can be separate from the sealing connection.

[0073] Now with particular reference to FIG. 13, the locking means of the locking mechanism 120 can be a male member 121 and a female member 123. The locking mechanism 120 may also have a skirt 125 with a skirt edge 127. The locking mechanism 120 may also have a break-locus 144. The break-locus 144 can be configured to allow the male member 121 and the female member 123 to engage into a locked position, as shown in FIG. 14. The locking mechanism 120 may also have a pull tab 142. The pull tab 142 may protrude from the rest of the locking mechanism 120.

[0074] The break-locus 144 can comprise a weak section of material configured to allow a single piece of material to separate into two pieces when the pull tab 142 is pulled or when a user attempts to unlock the locking mechanism 120. The pull tab 142 may comprise grip features 146 wherein the grip features 146 may comprise ridges. The weak section can, for example, comprise a perforated section or a thin section. The perforated section can be an area defined by perforations in the material. The thin section can be defined by the relative thickness of material along one area compared to adjoining areas. The thin section can, for example, comprise a thickness of less than 0.007 inches.

[0075] The pull tab 142 can be attached to the skirt 125 and can provide a means for opening the locking mechanism, thus allowing the container system 101 to be opened. A user can hold the pull tab 142 and with a pulling motion break the skirt at the break-locus 144 so as to separate the lid member 102 from the tray member 104. Pulling the pull tab 142 may also remove the pull tab 143 from the container system 101. By so doing the male 121 and female 123 members may also become disengaged.

[0076] Breaking the skirt 125 at the break-locus 144 both allows a user to open the container system 101 and provides notice that the container system 101 has been opened. This is especially useful to the consumer buying food stored in container systems, as a locked container system 101 can provide the consumer with assurances that the food purchased is safe to consume and that it has not been tampered with. The unbroken locking mechanism 120 provides the consumer with this information.

[0077] Similarly to the previously disclosed embodiments, the container system 101 may have a skirt edge 127 and a means for impeding access to the skirt edge 127. When the locking mechanism 120 is engaged, the means for impeding access to the skirt edge 127 helps to maintain the locking mechanism 120 in the locked position. The means for impeding access to the skirt edge 127 may comprise a raised rib 129. The raised rib 129 may be formed integrally with or make up a part of the sealing connection. For example, the raised rib 129 can be a part of the groove 162. The raised rib 129 can have a side surface 135 configured such that a part of or all of the skirt edge 127 is received into the side surface 135. The side surface 135 may be sloped in such a way as to create an

overhang at a top portion so that access to the skirt edge 127 is impeded by the overhang of the side surface 135.

[0078] The means for impeding access to the skirt edge 127 may take other forms as well. For example, the means for impeding access can be a receiving slit configured to receive all or substantially all of a skirt edge 127. The skirt edge 127 can also be angled in such a way to make access difficult because of the manner in which the skirt edge engages another surface. Impeding access to the skirt edge 127 is one way of helping to ensure that the locking mechanism 120 stays in a locked configuration. Impeding access to the skirt edge 127 helps to prevent tampering and it helps to ensure that the tamper-evident mechanism works as designed.

[0079] Now referring to FIG. 14A, the locking mechanism 120 may also have a cover 150. The cover 150 may enclose all or a part of the locking means. The cover 150 may have ribs to increase the structural rigidity of the cover 150. In one configuration, the cover 150 can enclose the unreceiving end of the female member 123. This is beneficial because it protects the locking means from tampering in that a person is not able to apply pressure on the unreceiving end of the female member 123 to separate the male 121 and female 123 members.

[0080] Although the disclosures presented herein are in the context of certain preferred embodiments and examples, it will be understood by those skilled in the art that the disclosures extend beyond the specifically described embodiments to other alternative embodiments and/or uses of the disclosures and obvious modifications and equivalents thereof. Thus, it is intended that the scope of the disclosures herein described should not be limited by the particular embodiments described above.

What is claimed is:

1. A container system suitable for food, the system comprising:
 - a tray member with a first connection lip;
 - a lid member with a second connection lip configured to connect with the first connection lip of the tray member; and
 - a locking mechanism configured to engage when the tray member and lid member are positioned to connect to each other, the locking mechanism comprising:
 - a snaplock;
 - a skirt with a skirt edge; and
 - an undercut rib to conceal the skirt edge when the snaplock is closed.
2. A container system suitable for food, the system comprising:
 - a tray member with a first connection lip;
 - a lid member with a second connection lip configured to be secured to the first connection lip of the tray member; and
 - a locking mechanism configured to engage when the tray member and lid member are positioned to be secured to each other, the locking mechanism comprising:
 - locking means;
 - a skirt with a skirt edge; and
 - impediment means configured to impede access to the skirt edge when the locking means is secured.
3. The container system of claim 2, the locking means comprising a male member and a female member configured to receive the male member.
4. The container system of claim 2, the impediment means comprising a finger guard.
5. The container system of claim 2, wherein the first and second connection lips are configured to form a seal between the lid member and the tray member.

6. The container system of claim 2, wherein the first connection lip comprises a ridge and the second connection lip comprises a groove configured to receive the ridge.

7. The container system of claim 2, wherein the skirt further comprises:

a flat portion; and

a rib portion configured to impede access to the skirt edge.

8. The container system of claim 2, wherein the finger guard is a raised rib with a side surface configured to overhang and impede access to the skirt edge.

9. The container system of claim 2, further comprising a tamper-evident separation mechanism.

10. The container system of claim 9, wherein the tamper-evident separation mechanism comprises:

a pull tab; and

a break-locus at which the skirt is configured to break in order to allow the user to open the container system at the seal between the lid member and the tray member.

11. The container system of claim 10, wherein the break-locus comprises a weak section configured to allow a single piece of material to separate into two pieces when the pull tab is pulled.

12. The container system of claim 11, wherein the weak section comprises a perforated section.

13. The container system of claim 11, wherein the weak section comprises a thin section that is less than 0.007 inch thick.

14. The container system of claim 10, wherein the pull tab comprises grip features.

15. The container system of claim 14, wherein the grip features comprise ridges.

16. The container system of claim 2, wherein the container system is stackable.

17. The container system of claim 10, wherein the skirt folds along the break-locus to allow the male and female members to engage with each other.

18. The container system of claim 17, wherein the pull tab is mechanically linked to the skirt such that when the skirt folds and the male and female members engage, the pull tab protrudes.

19. The container system of claim 18, wherein all of the system structures are comprised by and molded as a unitary piece with either the lid member or the tray member, further comprising a gripping area on the same unitary piece as the pull tab such that pulling on the gripping area in a contrary direction from the pull tab tends to separate the pull tab along the break locus.

20. The container system of claim 19, wherein the gripping area is located on the tray member and the pull tab is molded as a unitary piece with the tray member.

21. The container system of claim 18, wherein the system is configured such that the pull tab and skirt are both attached to either the tray member or the lid member before the tray member and lid member have been secured together by the locking mechanism and the pull tab and skirt are both attached to the other of the lid member or tray member after the locking mechanism has been opened.

22. The container system of claim 18, wherein the system is configured such that pulling on the pull tab after the male member has engaged with the female member can cause the skirt to break at the break locus, allowing the pull tab and the separated portion of the skirt to separate and indicate that the tray member and the lid member have been closed and subsequently opened, providing evidence of potential tampering.

23. The container system of claim 22, wherein the pull tab is configured such that pulling up on the pull tab causes more force to be exerted tending to cause separation at the break locus than is exerted tending to remove the male member from the female member of the locking mechanism.

24. The container system of claim 17, wherein:

the first connection lip comprises an outwardly-extending flange that extends substantially around the perimeter of the lid portion;

the second connection lip comprises an outwardly-extending flange that extends substantially around the perimeter of the tray portion;

the first and second connection lips are configured to abut substantially along the full perimeter of the container system when the system is in the closed configuration; and

the skirt comprises a portion of one connection lip, and the skirt is configured to extend beyond that lip such that when the skirt is folded along the break-locus, the extended portion of the skirt secures the abutting lip.

25. The container system of claim 24, wherein the break-locus is located along an outer edge of a connection lip that extends farther out than the outer edge of the abutting connection lip.

26. The container system of claim 25, wherein the tray member comprises the skirt and break locus and the second connection lip extends beyond the first connection lip when the tray member and lid member are connected.

27. The container system of claim 24, wherein the lid member comprises the female member and the finger guard, and the tray member comprises the male member, the skirt, and the pull tab.

28. The container system of claim 27, wherein the female member is formed as a depression in the first connection lip, the finger guard is formed as a protrusion from the first connection lip, and the male member is formed as a protrusion from the second connection lip.

29. The container system of claim 27, wherein the male member fits into the female member with an interference fit.

30. A method of making a tamper-evident food container system, the method comprising:

providing a first container portion comprising a lid formed from a single piece of material, the lid having an outward lid extension substantially surrounding the perimeter thereof;

providing a second container portion comprising a tray formed from a single piece of material, the tray having an outward tray extension substantially surrounding the perimeter thereof;

establishing an enclosed space by positioning the lid and the tray together with the outward lid extension and the outward tray extension abutting each other around substantially the full perimeter of the enclosed space;

securing the lid to the tray by inserting a male portion of a locking mechanism of one container portion into a female portion of a locking mechanism in the other container portion at a securement complex;

further securing the lid to the tray at the securement complex by folding a portion of the long outward extension of one container portion over a sandwiched section of the outward extension of the other container portion; and preventing future undetected tampering by causing a pull tab to protrude from the food-container system, the pull tab configured to permanently separate from the con-

tainer portion to which it was previously attached when the tab is pulled with sufficient force to separate the lid from the tray.

31. The method of claim 30, wherein further securing the lid to the tray comprises positioning the folded portion of the outward extension of one container portion underneath an overhanging feature on the other container portion to impede unfolding of the long outward extension.

32. A method of making a tamper-evident food container system, the method comprising:

- forming a lid from a single piece of material;
- forming a tray from a single piece of material;
- forming a securement mechanism on the food container system, the securement mechanism comprising:
 - a secured section;
 - a skirt comprising a separable portion, a pull tab forming part of the separable portion, and a skirt edge, the skirt foldable along a separation locus such that the skirt is configured to fold around the secured section;
 - a male snap in either the secured section or the skirt;
 - a female snap receptacle in either the secured section or the skirt, the female snap receptacle configured to receive the male snap when the skirt is folded; and
 - a skirt overhang configured to impede access to the skirt edge when the skirt is folded.

33. The method of claim 32, further comprising forming at least one ridge in the skirt, the ridge configured to impede access to the skirt edge when the skirt is folded and the skirt overhang overhangs the skirt edge.

- 34. The method of claim 32, further comprising:
 - securing the securement mechanism by inserting the male snap into the female snap receptacle;
 - positioning the skirt edge underneath the skirt overhang; and
 - subsequently, configuring the tab to protrude such that when a user pulls the tab to open the container system, the tab irreversibly separates to provide evidence that the container has previously been opened.

35. A container system suitable for food, the system comprising:

- a tray member;
- a lid member, wherein the tray and lid members have a connecting portion; and
- a locking mechanism, wherein the locking mechanism comprises:
 - a rotating section;
 - a pre-formed connection around which the rotating section is configured to rotate; and

a closure assembly configured such that, when the closure assembly is in a closed state, the closure assembly is closed together more strongly than the preformed connection so that attempts to open the closure assembly will disconnect the preformed connection, thus unlocking the locking mechanism.

36. The container system of claim 35, wherein: the rotating section is configured to pivot at a first fulcrum when the locking mechanism is in an initial unlocked configuration, the first fulcrum comprising the preformed connection;

the rotating section pivots at a second fulcrum when the locking mechanism is in a subsequent locked configuration and the preformed connection has disconnected; and

the connecting portion comprises a seal around the perimeter of the container system where the lid member and the tray member seal together, and the locking mechanism is located outside the connecting portion.

37. A container system suitable for heated food, the system comprising:

- a tray member comprising an activation member; and
- a lid member comprising an aperture partially covered by a flap, the aperture and flap configured to enable the release of heated gases when the flap is depressed; wherein the activation member is configured to depress a flap in a second container system.

38. The container system of claim 37, wherein the container system is stackable.

39. The container system of claim 37, wherein the activation member protrudes downward in the bottom of the tray member.

- 40. The container system of claim 37 further comprising:
 - a dome surface;
 - at least one stacking rib; and
 - an aperture surface comprising:
 - the aperture; and
 - the flap; and

wherein the aperture surface is at least partially above the dome surface and below the at least one stacking rib.

41. The container system of claim 40, wherein the aperture surface is sloped.

42. The container system of claim 41, wherein the slope is between approximately 0 and approximately 60 degrees.

43. The container system of claim 41, wherein the slope is between approximately 15 and approximately 45 degrees.

44. The container system of claim 41, wherein the slope is between 25 and 35 degrees.

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