



(51) International Patent Classification:

B65D 85/30 (2006.01) B65D 25/10 (2006.01)

B65D 81/05 (2006.01) B65D 25/54 (2006.01)

B65D 43/16 (2006.01)

(21) International Application Number:

PCT/US2020/039385

(22) International Filing Date:

24 June 2020 (24.06.2020)

(25) Filing Language:

English

(26) Publication Language:

English

(30) Priority Data:

201920961637.5 25 June 2019 (25.06.2019) CN

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(81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM, AO, AT, AU, AZ, BA, BB, BG, BH, BN, BR, BW, BY, BZ, CA, CH, CL, CN, CO, CR, CU, CZ, DE, DJ, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IR, IS, JO, JP, KE, KG, KH, KN, KP, KR, KW, KZ, LA, LC, LK, LR, LS, LU, LY, MA, MD, ME, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PA, PE, PG, PH, PL, PT, QA, RO, RS, RU, RW, SA, SC, SD, SE, SG, SK, SL, ST, SV, SY, TH, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, WS, ZA, ZM, ZW.

(84) Designated States (unless otherwise indicated, for every kind of regional protection available): ARIPO (BW, GH, GM, KE, LR, LS, MW, MZ, NA, RW, SD, SL, ST, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, RU, TJ, TM), European (AL, AT, BE, BG, CH, CY, CZ, DE, DK,

(54) Title: TAMPER-PROOF BOTTLE CASE AND METHODS THEREOF

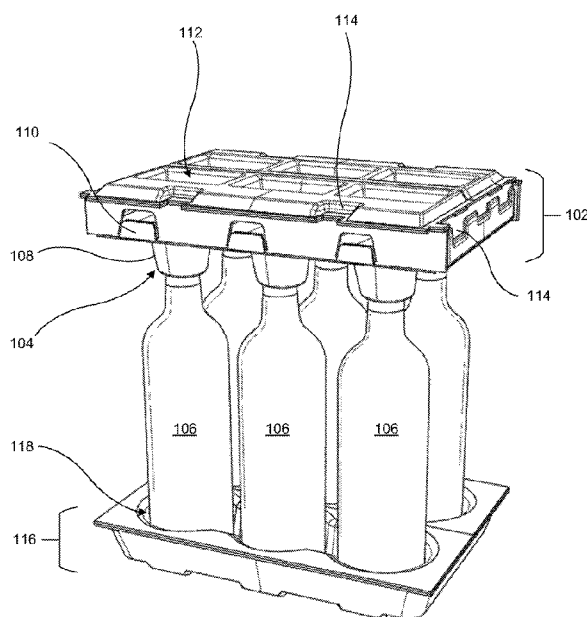


FIG. 1

(57) Abstract: The disclosed systems and methods relate to improved tamper-proof cases for securely storing and shipping products. In one example, a tamper-proof case comprises a top insert for holding and securing the neck of a bottle. The top insert can include one or more elongated bottle holders. The bottle holders can include a tab that attaches to a removable portion of the elongated bottle holder. The tab can act as a security device wherein the bottle may only be removed from the tamper-proof case by tearing the tab from the elongated bottle holder. Other security and packaging features are described for a tamper-proof case.

EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LT, LU, LV,
MC, MK, MT, NL, NO, PL, PT, RO, RS, SE, SI, SK, SM,
TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW,
KM, ML, MR, NE, SN, TD, TG).

Published:

— *with international search report (Art. 21(3))*

TAMPER-PROOF BOTTLE CASE AND METHODS THEREOF

CROSS-REFERENCE TO RELATED APPLICATIONS

[0001] This Application claims priority, and benefit under 35 U.S.C. § 119(a), to Chinese Utility Model Application No. 2019209616375, filed 25 June 2019, the entire contents of which is hereby incorporated by reference as if fully set forth below.

TECHNICAL FIELD

[0002] Aspects of the present disclosure relate to an improved case or portions thereof for shipping and storing various products, including bottled liquids, and, more particularly, for improving the storage, transport, and protection of products such as beverage bottles.

BACKGROUND

[0003] Wine and other beverage producers commonly use rectangular cases made of either wood or cardboard to transport bottles. These cases include internal compartments separated by wood, cardboard, plastic, or foam to provide a certain level of protection for the bottles inside. After the bottles are placed within the cases, the cases are closed and set out for shipment to the wholesaler, retailer, or customer. These closed cases of bottles present several problems due to the inherent flaws of the case designs. For example, a wholesaler, retailer, or customer may have difficulties viewing the contents of the case, determining if someone has tampered with the contents of the case, displaying the contents of the case, or any combination of these limitations.

[0004] Ordinarily, to view the contents within a bottle case, each individual bottle must be removed from the case. The handling of each bottle creates an opportunity to damage the bottle. Additionally, legacy bottle cases do not have individual tamper-resistant mechanisms in place, and since each bottle in the case can be removed, a fraudster can tamper with the contents of the bottle case. For example, someone inspecting the bottles can replace a bottle with a different, less-valuable bottle. Finally, current methods do not provide an aesthetic system for displaying the bottles. A cardboard case, for example, is made to be an inexpensive shipping container that is discarded once opened. The wooden case requires tools to wedge open the lid, which can be easily damaged when being pried apart from the body of the case. What is needed, therefore, is a system that prevents tampering, provides bottle viewability, and maintains an aesthetic form for displaying the bottles.

SUMMARY

[0005] Embodiments of the present disclosure address these concerns as well as other needs that will become apparent upon reading the description below in conjunction with the drawings. Briefly described, aspects of the present disclosure relate to an improved case or portions thereof for shipping and storing various products, including bottled liquids, and, more particularly, for improving the storage, transport, and protection of products such as beverage bottles.

[0006] One aspect of the present disclosure provides a tamper-proof bottle case and method of use. The tamper-proof bottle case can comprise a frame having a top face, a bottom face, and four substantially horizontal side faces. The frame for the case can be a rectangular or a substantially rectangular prism. Each of these faces can be adapted to accept a panel to protect the contents within the frame. At least one of the panels can be transparent and/or provide an opening to both view and manipulate the bottles within the frame.

[0007] The tamper-proof case can include additional features within the case that can support the bottles, protect the bottles, and provide tamper-resistance to ensure security of the bottle. In some aspects, these features can include a top insert for supporting the neck of a bottle. The top insert can be positioned proximate the top face of the frame. The top insert can include a series of elongated bottle holders that are configured to surround and contain the bottle neck. Each elongated bottle holder can have an inner channel accepting the bottle neck and a perimeter surface surrounding the inner channel. In some aspects, each elongated bottle holder can include a tab attached to the perimeter surface of the elongated bottle holder. This tab can create a security feature of the tamper-proof bottle case. For example, this tab can be pulled away from the elongated bottle holder such that the tab pulls with it a removable portion of the perimeter surface. Once the removable portion of the perimeter surface is removed, the bottle neck can be pulled from the elongated bottle holder.

[0008] In some aspects, the top insert can include securing platforms positioned at the top end of the inner channels of the elongated bottle holders. For example, a bottle neck can be placed within the inner channel of an elongated bottle holder, and at the top of the inner channel can be a securing platform that contacts the top of the bottle. The securing platform can be used to constrain the bottle from moving up and down within the tamper-proof bottle case, to apply slight axial pressure to the cork within the bottle, and to further support the bottle.

[0009] In some aspects, the top insert can be manufactured substantially horizontal and can be folded to create the insert that is placed proximate the top face of the frame. For

example, the top insert can have a bottom level comprising the elongated bottle holders and a top level comprising the securing platforms. In a first, horizontal configuration, the securing platforms can be substantially horizontal to the elongated bottle holders. The top insert can then be folded from the first, horizontal position into a second position. In the second position, the securing platforms can be proximate the top end of the inner channels of respective elongated bottle holders.

[0010] In some aspects, the additional features within a frame can include a bottom insert for supporting the heel of a bottle. The bottom insert can be positioned proximate the bottom face of the frame. The bottom insert can include a series of cups that accept the bottle heel. The bottom insert can additionally include raised lips at certain portions around the cups so as to increase the lift required to remove a bottle from the cups.

[0011] In any embodiment described herein, the components of the frame can comprise wood, plastic, and the like or any combination thereof. The top insert and/or bottom insert can comprise pressed paper pulp, cardboard, plastic materials, and the like or any combination thereof. In aspects including panels, the panels can comprise wood, plastic, cardboard, nano crystalline cellulose cardboard, PVC, rubber, metal, cork, and the like or any other suitable material or combination of materials to provide protection for the contents within the tamper-proof case. In the case of a transparent panel, the transparent panel can include glass, clear plastic materials (including but not limited to acrylic glass), and the like.

BRIEF DESCRIPTION OF THE FIGURES

[0012] Reference now will be made to the accompanying figures, which are not necessarily drawn to scale, and wherein:

[0013] **FIGs. 1 and 2** are perspective views of example securing components for a tamper-proof bottle case, according to some embodiments of the present disclosure;

[0014] **FIG. 3** is a perspective view of an unfolded top insert, according to some embodiments of the present disclosure;

[0015] **FIGs. 4 and 5** are perspective views of example top inserts, according to some embodiments of the present disclosure;

[0016] **FIG. 6–8** are front views of a top insert within a frame, according to some embodiments of the present disclosure;

[0017] **FIG. 9** is a perspective view of an example bottom insert, according to some embodiments of the present disclosure;

[0018] **FIG. 10** is a top view of an example bottom insert, according to some embodiments of the present disclosure;

[0019] **FIG. 11** is a side view of an example bottom insert, according to some embodiments of the present disclosure;

[0020] **FIG. 12** is a perspective view of an example frame, according to some embodiments of the present disclosure;

[0021] **FIG. 13** is an example view of a panel being inserted into a face of a frame, according to some embodiments of the present disclosure;

[0022] **FIG. 14** depicts an assembly of a tamper-proof case, according to some embodiments of the present disclosure;

[0023] **FIG. 15** depicts a top panel comprising a security seal and is positioned above a top insert, according to some embodiments of the present disclosure;

[0024] **FIG. 16** depicts a panel with an inspection release button, according to some embodiments of the present disclosure;

[0025] **FIGs. 17A–17D** show an example frame that is foldable from a horizontal, planar configuration into a rectangular configuration, according to some embodiments of the present disclosure;

[0026] **FIGs. 18A–18S** show an example frame that is foldable from a horizontal, planar position to a rectangular configuration and depict a process flow for securing bottles in and removing bottles from a case, according to some embodiments of the present disclosure;

[0027] **FIG. 19** is a flow diagram of an example method for securing bottles, according to some embodiments of the present disclosure; and

[0028] **FIG. 20** is a flow diagram of an example method for removing a bottle from a tamper-proof case, according to some embodiments of the present disclosure.

DETAILED DESCRIPTION

[0029] The present disclosure can be understood more readily by reference to the following detailed description of example embodiments and the examples included herein. Before the exemplary embodiments of the devices and methods according to the present disclosure are disclosed and described, it is to be understood that embodiments are not limited to those described within this disclosure. Numerous modifications and variations therein will be apparent to those skilled in the art and remain within the scope of the disclosure. It is also to be understood that the terminology used herein is for describing specific embodiments only and is not intended to be limiting. Some embodiments of the disclosed technology will be

described more fully hereinafter with reference to the accompanying drawings. This disclosed technology may, however, be embodied in many different forms and should not be construed as limited to the embodiments set forth therein.

[0030] In the following description, numerous specific details are set forth. But it is to be understood that embodiments of the disclosed technology may be practiced without these specific details. In other instances, well-known methods, structures, and techniques have not been shown in detail in order not to obscure an understanding of this description. References to “one embodiment,” “an embodiment,” “example embodiment,” “some embodiments,” “certain embodiments,” “various embodiments,” etc., indicate that the embodiment(s) of the disclosed technology so described may include a particular feature, structure, or characteristic, but not every embodiment necessarily includes the particular feature, structure, or characteristic. Further, repeated use of the phrase “in one embodiment” does not necessarily refer to the same embodiment, although it may.

[0031] Unless otherwise noted, the terms used herein are to be understood according to conventional usage by those of ordinary skill in the relevant art. In addition to any definitions of terms provided below, it is to be understood that as used in the specification and in the claims, “a” or “an” can mean one or more, depending upon the context in which it is used. Throughout the specification and the claims, the following terms take at least the meanings explicitly associated herein, unless the context clearly dictates otherwise. The term “or” is intended to mean an inclusive “or.” Further, the terms “a,” “an,” and “the” are intended to mean one or more unless specified otherwise or clear from the context to be directed to a singular form.

[0032] Unless otherwise specified, the use of the ordinal adjectives “first,” “second,” “third,” etc., to describe a common object, merely indicate that different instances of like objects are being referred to and are not intended to imply that the objects so described must be in a given sequence, either temporally, spatially, in ranking, or in any other manner.

[0033] Also, in describing the exemplary embodiments, terminology will be resorted to for the sake of clarity. It is intended that each term contemplates its broadest meaning as understood by those skilled in the art and includes all technical equivalents that operate in a similar manner to accomplish a similar purpose.

[0034] To facilitate an understanding of the principles and features of the embodiments of the present disclosure, exemplary embodiments are explained hereinafter with reference to their implementation in an illustrative embodiment. Such illustrative embodiments are not, however, intended to be limiting.

[0035] The materials described hereinafter as making up the various elements of the embodiments of the present disclosure are intended to be illustrative and not restrictive. Many suitable materials that would perform the same or a similar function as the materials described herein are intended to be embraced within the scope of the example embodiments. Such other materials not described herein can include, but are not limited to, materials that are developed after the time of the development of the disclosed technology, for example.

[0036] Embodiments of the disclosed technology include a tamper-proof case for storing and transporting bottles of wine. In various embodiments, a tamper-proof wine case can provide improvements to protecting the integrity of bottled wine, as well as features that allow a user to more easily use the wine case. A tamper-proof bottle case according to the present disclosure can be used by wine manufacturers to package bottles of wine and also can be used by consumers to store the wine bottles at home or to transport the bottles.

[0037] Throughout this disclosure, certain embodiments are described in exemplary fashion in relation to storing and transporting bottles of wine. But embodiments of the disclosed technology are not so limited. In some embodiments, the disclosed techniques can be effective in storing and transporting bottles or containers for many other types of liquids. For example, and not limitation, the top inserts and bottom inserts, as described herein, can be configured for spirit bottles, beer bottles, water bottles, and other bottles having different shapes and sizes.

[0038] Various devices and methods are disclosed for providing and using a tamper-proof bottle case, and examples of the devices and methods will now be described with reference to the accompanying figures. FIG. 1 is a perspective view of example securing components for a tamper-proof bottle case, according to some embodiments of the present disclosure. FIG. 1 does not include an outer case or frame for a case. The figure shows example components that can be included within an outer case or frame for securing bottles. Accordingly, the components shown in FIG. 1 can be modular and used in a variety of outer cases or frames.

[0039] In some embodiments, the securing components within a case can include a top insert 102. The top insert 102 can be positioned proximate the top of a tamper-proof bottle case. The top insert 102 can include one or more elongated bottle holders 104. The elongated bottle holders 104 can extend at least partially down the neck of a bottle 106 to constrain the bottle 106 from moving from side to side. Each of the one or more elongated bottle holders 104 can have a perimeter surface 108 along the length of the elongated bottle holder 104. The perimeter surface 108 can include material that surrounds the neck of the bottle 106.

[0040] In some embodiments, a top insert 102 can include a tab 110. The tab 110 can be positioned proximate the perimeter surface 108 and attached to at least a portion of the perimeter surface 108. The tab 110 can be used to remove a removable portion of the perimeter surface 108 such that the bottle 106 can be pulled laterally from the top insert 102. The removable portion is discussed in greater detail with reference to FIGs. 3 and 5, for example.

[0041] In some embodiments, a top insert 102 can include securing platforms 112. The securing platforms 112 can include material that contacts the top of the bottle 106. In FIG. 1, the full securing platforms 112 are not visible as they are placed inside the top insert 102 and proximate the top of the bottle 106. In some embodiments, a top insert 102 can include notches 114. The notches 114 can meet or mate with components of a frame and/or case so as to prevent movement of the top insert 102. For example, the notches 114 can meet with a tab of a frame and/or case to prevent lateral movement of the top insert 102.

[0042] In some embodiments, the securing components within a case can include a bottom insert 116. The bottom insert 116 can include one or more cups 118 that can accept the heel of a bottle 106. The cups 118 can have a depth requiring a certain amount of lift on the bottle 106 to remove the bottle 106 from the cups 118. The cup 118 can be shaped according to the shape of the heel of the bottle 106 in which the cup 118 is holding. For example, if the heel of the bottle 106 is round (as shown), the cup 118 can be round, and if the heel of the bottle 106 is square, the cup 118 can be square. Any other shape of a cup 118 is contemplated and is possible with the presently disclosed systems. In some embodiments, the cup 118 can create a snug fit for the bottle heel. In some embodiments, the cup 118 can be smooth to allow the bottle to be rotated within the cup 118. This embodiment would allow a user to inspect the bottle 106 by rotating the bottle 106 without removing the bottle 106 from the bottom insert 116 or top insert 102. In other embodiments, the cup 118 can comprise a friction-fit surface to prohibit the bottle 106 from rotating. The friction-fit surface also can provide additional padding and protection for the bottle 106. The friction-fit surface can include a rubber pad, rubber grommet, and/or the like.

[0043] It is contemplated that the top insert 102 can be manufactured from a variety of materials. These materials can include but are not limited to, paper pulp, cardboard, foam, plastics, or similar materials. It is also contemplated that the bottom insert 116 can include similar materials as described for the top insert 102. Nothing, however, requires the material composition of the top insert 102 to be the same as the material composition of the bottom insert 116, though it can be the same.

[0044] FIG. 1 depicts an embodiment with six bottles 106, which is in accordance with some embodiments. It is contemplated that three bottles 106 can be along one side of the top insert 102 and bottom insert 116, and another three bottles can be along another side of the inserts 102, 116. However, the present disclosure is not limited to the construct shown in the figure. The systems described herein can equally apply to more or fewer bottles 106 than shown in the figure. It is also contemplated that the present disclosure can be used in a single-bottle construct.

[0045] FIG. 2 is a perspective view of example securing components for a tamper-proof bottle case, according to some embodiments of the present disclosure. FIG. 2 depicts a top insert 102 and a bottom insert 116 configured to hold three bottles 106, which is in accordance with some embodiments. It is contemplated that the systems described herein can be used for a variety of bottle sizes and shapes. For example, a beverage producer may wish to package and ship a magnum (1.5 liter) or larger bottle. In these scenarios, a three or fewer bottle 106 construct can help the producer lower the overall size and weight of the bottle case.

[0046] FIG. 3 is a perspective view of an unfolded top insert 102, according to some embodiments of the present disclosure. In some embodiments, a top insert 102 can include a first configuration and a second configuration. The first configuration can be a substantially horizontal configuration, as shown in FIG. 3. The second configuration can be similar to the configurations shown in FIGs. 1, 2, 4, and 5, for example. These two configurations can allow the top insert to be manufactured as a sheet and then folded into the final protecting insert to be placed atop a bottle 106. For example, by providing a substantially horizontal first configuration, the components of the top insert 102 can be pressed into shape in a single sheet of, for example, cardboard or paper pulp. Once pressed and formed, the top insert 102 can be folded into the final configuration to protect the neck of a bottle 106.

[0047] Referring again to the substantially horizontal configuration shown in FIG. 3, the top insert 102 can include a bottom level 302. The bottom level 302 of the unfolded top insert 102 can include the one or more elongated bottle holders 104. As described herein, the one or more elongated bottle holders 104 can have an inner channel 304 that can contact and accept the neck of a bottle. At one end of the inner channel 304 can be an orifice 306 in which the neck of the bottle is inserted. Each elongated bottle holder 104 can also include a removable portion 308. The removable portion 308 is a portion of the perimeter surface 108 surrounding the inner channel 304 that can be removed upon a pulling of the tab 110. In some embodiments, the bottom level 302 of the unfolded top insert 102 can also include one or more ramps 309 to add additional support for a top level of the unfolded top insert 102.

[0048] In some embodiments, the inner channels 304 can be smooth to allow the bottle to be rotated within the elongated bottle holder 104. This embodiment would allow a user to inspect the bottle 106 by rotating the bottle 106 without removing the bottle 106 from the top insert 102 or bottom insert 116. In other embodiments, the inner channels 304 can include a friction-fit surface to prohibit the bottle 106 from rotating. The friction-fit surface also can provide additional padding and protection for the bottle 106. The friction-fit surface can include a rubber pad, rubber grommet, and/or the like.

[0049] In some embodiments, the top insert 102 can include a top level 310a,b. In some embodiments, the top level can include two separate sides, a first side of the top level 310a and a second side of the top level 310b. In these embodiments, the first side of the top level 310a can fold over from the horizontal position to a position proximate the elongated bottle holders 104, and the second side of the top level 310b can also fold over from the horizontal position to a position proximate the elongated bottle holders 104. In other embodiments, the top level 310a,b is not two separate flanges but is a single flange that folds to a position proximate the elongated bottle holders 104. FIG. 3 provides arrows 350 showing the direction of folding the top insert 102 from the first configuration into the second configuration, e.g., the top level 310a,b can be folded upward and onto the bottom level 302 in the example embodiment.

[0050] In some embodiments, a top level 310a,b can include one or more securing platforms 112a,b, as shown in FIGs. 1–2 as securing platforms 112. In embodiments with a first side of the top level 310a and a second side of the top level 310b, one series of securing platforms 112a can be present on one side of the top level 310a, and another series of securing platforms 112b can be on the other side of the top level 310b. In embodiments with a single-piece top level 310a,b, all securing platforms 112a,b can be disposed on the single top level 310a,b. In some embodiments, the securing platforms 112a,b can contact the top of a bottle when the top insert 102 is in a folded, second configuration. As described above, the securing platforms 112a,b can constrain the bottle from moving up the inner channels 304, thereby further securing the bottles in the top insert 102. It is also contemplated that the securing platforms 112a,b can be used to maintain pressure on a cork in the top of a bottle so as to prevent the cork from rising from the bottle during shipping and handling.

[0051] In some embodiments, a securing platform 112a,b can include a recess 312a,b that can be shaped to fit the top of the bottle. For example, the recess 312a,b can be a half-circular recess that is shaped to fit one half of the top of the bottle, as shown in the figure. In other embodiments, the recess 312a,b, can be a full-circular recess to fit the top of the bottle. It is contemplated that the recess 312a,b can be modified according to the dimensions of the

particular bottle being stored in the tamper-proof case since, as will be appreciated by one of skill in the art, bottles can take many different shapes and sizes (e.g., piccolo or split (187.5 ml), demi or half (375 ml), standard (750 ml), magnum (1.5 L), double magnum (3.0 L), etc.).

[0052] In some embodiments, the top insert 102 can include a middle level 314. The middle level 314 can include one or more flanges that, when the top insert 102 is folded from the horizontal configuration to the final configuration, provide side support for the folded top insert 102. For example, the middle level 314 can include end flanges 316 that can be folded to meet with the top level 310a,b when the top level 310a,b is folded over. These end flanges 316 can provide additional support and structural integrity to the top level 310a,b. The middle level 314 can also include side flanges 318 to provide additional support and structural integrity to the top level 310a,b. In some embodiments, the side flanges 318 can be positioned between the bottom level 302 and the top level 310a,b (as shown in FIG. 3) such that a first fold is provided between the side flanges 318 and the bottom level 302, and a second fold is positioned between the side flanges 318 and the top level 310a,b.

[0053] FIG. 4 is a perspective view of an example top insert 102, according to some embodiments of the present disclosure. FIG. 4 shows a top insert 102 in a second, final configuration after folding. For example, the horizontal configuration of FIG. 3 can be folded into the embodiment shown in FIG. 4. A top insert 102 can include securing-platform recesses 402 that extend from one side of the top level 310. These securing-platform recesses 402 can be present to decrease the material used in the top insert 102. For example, in some embodiments, the top insert 102 can be made by pressing a single sheet into the final form of the top level 310. Accordingly, the securing platforms 112 can be created by pressing the top insert 102 into a final form, thereby creating the securing-platform recesses 402. In other embodiments using other manufacturing methods, the securing-platform recesses 402 may not be present.

[0054] It is contemplated that, once folded into a final configuration as shown in FIG. 4, the top level 310 is sealed to the bottom level 302. This sealing can provide security such that a bottle can be removed only by pulling the tab 110 to release a removable portion (e.g., removable portion 308 in FIG. 3) of the elongated bottle holder 104 to release the bottle.

[0055] It is contemplated that the elongated bottle holders 104 can have a variety of shapes. For example, the elongated bottle holders 104 in FIG. 4 have a perimeter surface 108 having a conical frustum shape, which is in accordance with some embodiments of the present disclosure. The removable portion of the perimeter surface 108 can be placed within the conical frustum shape. Other shapes are contemplated, for example, rectangular shapes,

cylindrical shapes, and the like, and these embodiments are contemplated within the scope of this disclosure.

[0056] FIG. 5 is a perspective view of an example top insert 102, according to some embodiments of the present disclosure. The perimeter surface 108 of an elongated bottle holder 104 can include a removable portion 308 that is flat, or planar. For example, the perimeter surface 108 of the elongated bottle holder 104 can be substantially conical, round, cylindrical, and/or the like; the removable portion 308 connected to a tab 110, however, can be substantially planar or flat. It is contemplated that a planar removable portion 308 can facilitate the tab's 110 ability to remove the removable portion 308 so as to create a smooth opening to remove the bottle. In some embodiments, a planar removable portion 308 can comprise the same material as the non-planar part of the perimeter surface 108. For example, as described herein, some embodiments of a top insert 102 can be produced by pressing the top insert 102 into its shape. It is contemplated, therefore, that the planar removable portion 308 is merely formed as a planar part of the geometry of the pressed perimeter surface 108. The removable portion 308 can include perforations that allow the removable portion 308 to be removed from the elongated bottle holder 104 with a clean or straight edge. In some embodiments, a planar removable portion 308 can be a separate material that is connected to the elongated bottle holder 104. For example, some top inserts 102 can include a removable portion 308 that is secured to the elongated bottle holder 104 with adhesive, tamper-evident tape, and/or the like to indicate whether the removable portion 308 has been removed from the top insert 102. Tamper-evident tape can include any tape known in the art used to indicate whether the tape has been removed, broken, or cut. For example, tamper-evident tape can include wording that prohibits the tape from being realigned and reattached once removed. Tamper-evident tape also can include language similar to "check contents if seal is broken" and the like.

[0057] FIG. 6 is a front view of a top insert 102 within a frame 602, according to some embodiments of the present disclosure. The top insert 102 can be inserted into a frame 602 that contains the components described herein and the one or more bottles 106. In some embodiments, the frame 602 can be a substantially rectangular prism, as shown in the figure. The frame 602 can have six planar faces, including a top face 604, four substantially horizontal side faces 606 (one side face is in the foreground and another side face is in the background of this view), and a bottom face (not shown in the figure). The top insert 102 can be proximate the top face 604. Each face can accept a panel to protect the contents within the frame 602. It is contemplated that one or more faces can include tabs 608 that provide an outward force on

a panel so as to prevent the panel from vibrating or excessively moving during handling and transport.

[0058] In some embodiments, the frame 602 can be made to assemble around the components and one or more bottle 106 and thereafter be resistant to disassembly. For example, one aspect of the present disclosure is to provide a tamper-proof case for bottles 106. It is contemplated that once a frame is assembled around the top insert 102 and bottles 106, the frame cannot be disassembled. In these embodiments, a customer wishing to remove the bottle 106 from the frame 602 can be required to pull the tab 110 and remove a removable portion of the elongated bottle holder 104. FIG. 7 depicts an embodiment wherein a removable portion (not shown in FIG. 7 as it has been removed) has been removed by pulling a tab 110. Once the removable portion is removed from the elongated bottle holder 104, an opening 702 can be made in the elongated bottle holder 104. The opening 702 can enable the bottle top 704 to be exposed, and a customer can remove the bottle 106 by pulling the bottle outwardly from the top insert 102. FIG. 8 is a detailed view of the top insert 102 inside a frame 602, according to some embodiments of the present disclosure. In some embodiments, a frame 602 can include latches 802 that can accept a feature of a panel so as to secure the panel to the frame 602.

[0059] FIG. 9 is a perspective view of an example bottom insert 116, according to some embodiments of the present disclosure. As described herein, the components within a frame or case can include a bottom insert 116. The bottom insert 116 can include one or more cups 118 that can accept the heel of a bottle. The cups 118 can have a depth that requires a certain amount of lift on the bottle to remove the bottle from the cups 118. It is contemplated that the cups 118 can have a depth of from about 1.0 cm to about 4.0 cm (e.g., from about 1.0 cm to about 2.0 cm; from about 1.5 cm to about 2.5 cm; from about 2.0 cm to about 3.0 cm; from about 2.5 cm to about 3.5 cm; or from about 3.0 cm to about 4.0 cm). The cups 118 can have varying diameters to accommodate different shapes and sizes, as will be appreciated by one of skill in the art (e.g., piccolo or split (187.5 ml), demi or half (375 ml), standard (750 ml), magnum (1.5 L), double magnum (3.0 L), etc.).

[0060] In some embodiments, the bottom insert 116 can include one or more raised lips 902, 904 at positions around the cups 118 so as to increase the lift required to remove a bottle from the cups 118 at those positions. For example, a bottom insert 116 can include one or more front lips 902 placed at an outside surface face 906 of the bottom insert 116. A front lip 902 can make it so that a higher lift is required to remove the bottle from the frame or case. Referring to FIG. 7 as an example, to remove the bottle 106, the bottle must be pulled out from the top insert 102. Accordingly, if a front lip 902 is provided, the bottle would be lifted over

the front lip 902 to remove the bottle from the opening 702. It is contemplated that the front lip 902 be have a height of from 0.5 cm to about 3.0 cm (e.g., from about 0.5 cm to about 1.5 cm; from about 1.0 cm to about 2.0 cm; from about 1.5 cm to about 2.5 cm; or from about 2.0 cm to about 3.0 cm).

[0061] In some embodiments, a bottom insert 116 can include one or more rear lips 904 placed at the back of a bottle. For example, in an embodiment with a first row of cups 118 parallel to a second roll of cups 118, the rear lips 904 can be placed between the rows, as the bottles may not be expected to be removed from the frame or case in that direction. Accordingly, a rear lip 904 can have a greater height than a front lip 902 as a bottle is not to be removed over a rear lip 904. It is contemplated that the height of the rear lips 904 can have ranges similar to those given for the front lips 902.

[0062] FIG. 10 is a top view of an example bottom insert 116, according to some embodiments of the present disclosure. FIG. 10 shows exemplary topography of an example bottom insert 116. The view also shows how the rear lips 904 can be provided to separate and protect bottles in different rows. As stated herein, however, a bottom insert 116 does not require two rows of cups 118, as a single row of cups 118 can be provided.

[0063] FIG. 11 is a side view of an example bottom insert 116, according to some embodiments of the present disclosure. The figure provides additional detail of an example bottom insert 116 having two rows of cups 118. It also shows an embodiment wherein a front lip 902 can be shorter than a rear lip 904.

[0064] FIG. 12 is a perspective view of an example frame 602, according to some embodiments of the present disclosure. As described herein, a frame 602 can include one or more faces, including a top face 604, a bottom face 1202, and four side faces 606. The frame 602 can include one or more tabs 1204 along the edges of the frame 602 such that a panel (not shown in the figure) can be inserted and held in place at the respective face 604, 606, 1202 of the frame 602. The frame 602 can also include one or more latches 802 (or clips) that hold the respective panel in place against the respective face 604, 606, 1202 of the frame 602. The frame 602 can comprise plastic, PVC, wood, metals, or any other material or combination of materials to provide the desired qualities described herein. The top face 604 can include a panel 1206, which can be similar to panels at other faces 606, 1202 of the frame 602. In some embodiments, the top face 604 can include a top panel 1206, each of the four side faces can include a side panel 1206 (four side panels 1206), and the bottom face 1202 can include a panel 1206 (below the bottom insert 116 in this figure).

[0065] FIG. 13 depicts a panel 1206 being inserted into a face of a frame 602, according to some embodiments of the present disclosure. In some embodiments, a panel 1206 can be attached to the frame 602 about one or more of the faces of the frame 602. In some embodiments, the panel 1206 can include a slot 1304 that accepts the tab 1204 positioned along the edge of a frame 602, wherein the slot 1304 holds the panel 1206 at the respective face of the frame 602.

[0066] It is contemplated that a panel 1206 of the tamper-proof case can include wood, plastic, cardboard, nano crystalline cellulose cardboard, PVC, rubber, metal, cork, or any other suitable material or combination of materials to provide protection for the contents within the tamper-proof case. In some embodiments, one or more panel 1206 can be transparent so as to allow a user to inspect the contents behind the panel 1206 without removing the panel 1206. In the case of a transparent panel 1206, the transparent panel can include glass, clear plastic materials (including but not limited to acrylic glass), and the like. In some embodiments, a panel 1206 can include a cutout or opening for viewing the contents within the case or frame.

[0067] FIG. 14 shows an assembly of a tamper-proof case 1400, in accordance with an example embodiment of the present disclosure. In some embodiments, a tamper-proof case 1400 can include an internal frame 602 (as described herein) with attached panels 1206 at respective side faces 606 of the tamper-proof case 1400. In some embodiments, once a tamper-proof case 1400 is assembled and bottles 106 are placed within the tamper-proof case 1400, a top insert 102 can be placed on the bottles 106. The top insert 102 can be folded prior to placing on the bottles 106, or the top insert 102 can be folded into the second configuration after being placed on the bottles 106. Once the bottles 106 are secured by the top insert 102, a top panel 1206 can be placed on the top face 604 of the tamper-proof case 1400 to close the bottles within the tamper-proof case 1400. In some embodiments, the top insert 102 can be connected to the top panel 1206, for example by an adhesive.

[0068] FIG. 15 depicts a top panel 1206 that comprises security seal 1502 and is positioned above a top insert 102, according to some embodiments of the present disclosure. In some embodiments, the top panel 1206 can provide enclosure of the top face 604 of the tamper-proof case 1400. In some embodiments, and as shown, a top insert 102 can be positioned below of top panel 1206. The top insert 102, top panel 1206, and security seal 1502 can each fit together based on each layer decreasing in size as the layers go from top to bottom. In some embodiments, top panel 1206 has finger grooves 1504 and is positioned above top insert 102. In some embodiments, and as shown, security seal 1502 can be positioned around the perimeter of the top panel 1206. Top panel 1206 can be made of similar material to that used for

construction of a side panel 1206. The security seal 1502 can include additional security features to ensure the case is not opened. For example, the security seal 1502 can include tamper-evident tape, as described herein.

[0069] FIG. 16 depicts a panel 1206 with an inspection release button 1602, according to some embodiments of the present disclosure. In some embodiments, and as shown, panels 1206 can provide enclosure of the tamper-proof case 1400 by sliding downward and onto a respective side face 606 of the frame 602. In some embodiments, when panels 1206 slide completely downward, the inspection release button 1602 can latch onto the frame 602, providing a locking feature. Conversely, in some embodiments, the inspection release button 1602 can be unlocked by pressing the inspection release button 1602 when it is attached to the frame 602. In these embodiments, the panel 1206 can be raised to allow inspection of the bottles 106 within the tamper-proof case 1400 without removing the bottles. For example, a user can rotate the bottles while the bottles remain secured in place to, for example, inspect the label.

[0070] As described above, the tamper-proof case can include a frame 602 to provide support for the components within the frame 602 and provide faces for accepting panels (e.g., side panels 1206). In some embodiments, the frame can be a rectangular prism, as shown in FIG. 12. In some embodiments, the frame 602 can have a first configuration that is substantially horizontal and a second configuration that has the rectangular shape, for example. The frame 602 can, therefore, be folded from the first configuration into the second configuration. FIGs. 17A–17D depict an embodiment with a foldable frame 602.

[0071] FIG. 17A shows an example frame 602 for a tamper-proof case having various living hinges 1702 prior to folding the frame 602 into a final shape, according to some embodiments of the present disclosure. In some embodiments, and as shown, the frame 602 can contain one or more living hinges 1702. In some embodiments, and as will be understood by one of skill in the art, a living hinge 1702 can be a thin piece or portion of the frame 602 designed to allow the frame 602 to fold along the living hinge 1702. According to some embodiments, frame 602 can be positioned so as to allow the frame 602 to be folded into a desired position. In some embodiments, and as shown, frame 602 can contain one or more tabs 1704. As will be appreciated, the tabs 1704 can provide for attachment of the panels 1206 (not shown in figure). In some embodiments, tabs 1704 can be molded projections integrally formed with the frame 602. According to some embodiments, tabs 1704 can be projections affixed to the frame 602. In some embodiments, tabs 1704 can be serrated, and as will be

appreciated such serrated features of the tabs 1704 can further improve the connection at the joint between the panels 1206 and the frame 602.

[0072] As further shown in FIG. 17A, some embodiments can include a bottom insert 116, as previously discussed. According to some embodiments, prior to folding the frame 602, bottom insert 116 can be attached to the frame 602. In some embodiments, bottom insert 116 can snap into place into the frame 602. In some embodiments, bottom insert 116 can be press fit into a face of the frame 602. In alternate embodiments, instead of bottom insert 116, a flat panel can be attached to frame 602 to create a container suitable for storing or transporting, for example, cigars, jewelry, and the like. In other embodiments, bottom insert 116 can be integrally formed with frame 602. Frame 602 also can comprise symmetric top lid frame portions, or edge attachment arms 1706a and 1706b. For example, upon folding frame 602, symmetric top lid frame portions 1706a and 1706b can connect to form the top face 604, as discussed further herein.

[0073] FIG. 17B shows a partially assembled tamper-proof case having a frame 602 comprising various living hinges 1702 (as shown in FIG. 17A), according to some embodiments of the present disclosure. In some embodiments, and as shown, the tamper-proof case can include panels 1206. In some embodiments, slots can be portions of the panel 1206 that are cut out or otherwise configured to receive a portion of the frame 602. According to some embodiments, and as will be appreciated by one of skill in the art, slots can be formed in the fashion of a mortise and tenon joint or any other suitable formation that would allow for connection to be made between the panel 1206 and the frame 602.

[0074] In some embodiments, and as shown, the bottom of the frame 602 can include guiding tabs 1708, which can be molded projections integrally formed with the frame 602 or projections affixed to the frame 602. As will be appreciated, guiding tabs 1708 can provide a locating feature, indicating the location that panels 1206 are to be connected with the frame 602. In some embodiments, and as shown, panels 1206 can be placed within the frame 602 by inserting panels 1206 flush against the guiding tabs 1708. Further, in some embodiments, guiding tabs 1708 can penetrate the bottom slots of panels 1206, allowing attachment of panels 1206 to the bottom of the frame 602.

[0075] Additionally, as shown in FIG. 17B, frame 602 can have living hinges 1702 positioned on both sides of the bottom insert 116. As will be appreciated, such positioning of the living hinges 1702 can allow for the sides of the frame 602 to be folded upwards towards the panels 1206. Side edges of panels 1206 can connect to the frame 602 in a similar manner to the bottom edges of panels 1206 as discussed above. For example, side edges of panels 1206

can have one or more slots (not shown) and the frame 602 can have one or more tabs 1704 corresponding to the one or slots. Accordingly, when the living hinge frame is folded about the living hinges 1702, the one or more tabs on the frame 602 can contact or engage the one or more slots on the side edges of the panels 1206 in a manner similar to how tabs 1704 contact or engage the bottom edge of panels 1206. Accordingly, in such embodiments and as will be appreciated, panels 1206 can be attached to frame 602 both at the bottom portion and side portions without the use of nails, glue, or other adhesives. While the disclosed subject matter has been described in terms of specific positioning of living hinges 1702, it is understood that the positions described and shown herein provide only an exemplary shape for the final tamper-proof case. Accordingly, other positions are contemplated in order to achieve the desired size and shape of the tamper-proof case.

[0076] FIG. 17C shows a tamper-proof case having a frame 602 in a rectangular configuration, according to some embodiments of the present disclosure. The frame 602 can be foldable from a first, substantially planar configuration, as shown in FIG. 17A, to a second, substantially rectangular prism configuration, as shown in FIG. 17C. Once the frame is in a rectangular configuration, a top insert 102, as described herein, can be lowered into the case on top of bottles (not shown in the figure). The symmetric top lid frame portions 1706a and 1706b can remain open to allow the top insert 102 to be lowered into the tamper-proof case. In some embodiments, a top panel 1206 can be lowered on top of the top insert 102. In some embodiments, and as described above, a security seal 1502 can be placed on top of the top panel 1206 to prevent tampering. In other embodiments, and as described below, the symmetric top lid frame portions 1706a and 1706b can close to prevent removal of a top panel 1206, with or without the use of a security seal 1502.

[0077] FIG. 17D shows further assembly of tamper-proof case having a frame 602 comprising various living hinges 1702, in accordance with an example embodiment of the presently disclosed subject matter. As previously discussed, in some embodiments, upon folding the frame 602, symmetric top lid frame portions 1706a and 1706b can connect to form the top face 604 of the frame 602. In such embodiments, top lid frame portions 1706a and 1706b can connect to frame 602 through living hinges 1702 positioned at an end of the top lid frame portions 1706a and 1706b. For example, living hinges 1702 can allow the frame 602 to be folded at the edge of each top lid frame portion 1706a and 1706b such that top lid frame portions 1706a and 1706b can be folded towards each other in order to connect and form the top surface of the frame 602. In some embodiments, the top edges of side panels 1625 can have one or more slots (not shown) and the top lid frame portions 1706a and 1706b can contain

can have one or more tabs 1704 corresponding to the one or slots. According to such an embodiment, for example, when the living hinge frame is folded about the living hinges 1702, the one or more tabs 1704 on the top lid frame portions 1706a and 1706b can contact or be received by the one or more slots on the top edge of the panels 1206 in a manner as previously discussed in regard to FIGS. 17A and 17B.

[0078] Additionally, in some embodiments, top lid frame portions 1706a and 1706b can each contain male fastener or locking mechanism 1710a and a female fastener or locking mechanism 1710b. Thus, after the frame 602 has been folded, the male fastener 1710a can latch with the female fastener 1710b, forming the top surface of the frame 602 and locking the frame 602 in place. As will be appreciated, the locking feature provided by the male fastener 1710a and the female fastener 1710b allow the frame to lock without compromising the frame 602. In some embodiments, the male fastener 1710a and female fastener 1710b are inaccessible once the frame 602 is fully assembled. According to some embodiments, the male fastener 1710a and female fastener 1710b can be snap tap fasteners, but other types of suitable fasteners can be used. According to some embodiments, once the male fastener 1710a and female fastener 1710b have closed the top lid frame portions 1706a and 1706b, the top of the frame 602 is permanently sealed. In these embodiments, a bottle within the tamper-proof case may only be removed by the methods described above, which include pulling the tabs and removing the removable portion of the elongated channel holders.

[0079] FIGS. 18A–18S show an example frame 602 that is foldable from a horizontal, planar position to a rectangular configuration and depict a process flow for securing bottles in and removing bottles from a case, according to some embodiments of the present disclosure. The example frame 602 shown in FIGS. 18A–18S is similar to the frame 602 shown in FIGS. 17A–17D, but in this case the frame 602 includes a unibody top portion 1808, instead of the two top lid frame portions, or edge attachment arms 1706a and 1706b, shown in FIGS. 17A–17D. As shown in FIG. 18A, the frame 602 can be a unibody frame have a substantially planar configuration comprising a plurality of living hinges 1702 that allow portions of the frame 602 to fold into a rectangular configuration. The frame portions can include a front portion 1802, a bottom portion 1804, a back portion 1806, and a top portion 1808. In some example, one or more bolts 1810 can be added to any of the portions to enable opening and closing of one of the portions. This example is shown in greater detail with reference to FIG. 18P.

[0080] In FIG. 18B, the one or more bolts 1810 can be added to corresponding opening holes 1812 in one of the frame portions. In the present example, the bolts 1810 are added into the top portion 1808 so that the front portion 1802 can be hinged open from the top portion

1808, which is again discussed in greater detail with reference to FIG. 18P below. FIG. 18C is a detailed view of a bolt 1010 inserted into a corresponding opening hole 1812.

[0081] In FIG. 18D, panels 1206 for the front portion 1802 and/or back portion 1806 can be prepared to be inserted into their respective frame portion. Panel clips 1814 can be added into clip recesses 1815 in the panel 1206 to ensure the panel(s) 1206 is/are attached to the respective frame portion. In FIG. 18E, the panels 1206 are inserted into the front portion 1802 and/or back portion 1806. In FIG. 18F, additional panels 1206 can be inserted into the top portion 1808 and/or bottom portion 1804 to fully enclose the top, bottom, front, and back of the frame 602.

[0082] In FIG. 18G, a bottom insert 116, as described throughout this disclosure, can be added to the bottom portion 1804 of the frame 602. In FIG. 18H, two additional panels 1206 can be added to the construct to create the six sides of the final frame 602. After the side panels 1206 are added to the frame 602, the front portion 1802 and back portion 1806 can be hinged inwardly, at the living hinges 1702, to create the rectangular prism configuration, as shown in FIGs. 18I and 18J. As shown in FIG. 18K, once the frame 602 is in the rectangular configuration, one or more bottles 106 can be loaded into the frame 602, wherein the bottom (or heel) of the bottle 106 is inserted into the bottom insert 116. In FIG. 18L, the bottles 106 are fully loaded in the frame 602, and the top portion 1808 remains open, like a lid for the frame 602.

[0083] In FIG. 18M, a top insert 102, as described throughout this disclosure, can be lowered onto the top (or neck) of the bottle(s) 106. The elongated bottle holder(s) 104 of the top insert 102 can be slid over the neck of the bottle(s) 106 to protect the bottle(s) from lateral movement. FIG. 18N shows the top insert 102 fully seated on the bottles 106 within the frame 602. At this point, the top portion 1808 can be hinged, e.g., along a living hinge 1702, to close the frame 602, as shown in FIG. 18O. At this point, with all portions in place, and all panels 1206 inserted, the frame 602 is enclosed, thereby creating the case as described herein.

[0084] Once the top portion 1808 is hinged to close the frame 602, the bolts 1810 (shown in FIGs. 18B and 18C) can latch onto the material of the front portion 1802 of the frame 602 to secure the case into its closed configuration. The opening holes 1812 described above can provide access to the bolts 1810, such that they can be bent slightly to disengage the bolts 1810 from the front portion 1802 of the frame 602. This can be completed, for example, by inserting one or more pins 1816 into an opening hole 1812 to engage the bolts 1810, bend the bolts 1810, and release the front portion 1802 of the frame 602. If more than one bolt 1810 (and

corresponding opening hole 1812) is present, then each bolt 1810 can be bent simultaneously with more than one pin 1816 to open the front portion 1802 of the frame 602.

[0085] In FIG. 18Q, once the bolts 1810 are bent slightly, the front portion 1802 of the frame 602 can be opened to reveal the bottles 106 stored within the frame 602. At this point, a tab 110 on the top insert 102, as described above, can be pulled to create an opening 702 in an elongated bottle holders 104 from which a bottle 106 can be removed. In FIG. 18R, the tab 110 is removed to create the opening 702, and in FIG. 18S, the bottle 106 is removed from the top insert 102.

[0086] As described above, one aspect of the present disclosure is the ability to remove a single bottle 106 without tampering with adjacent bottles stored in the case. To this end, after the single bottle 106 is removed, the front portion 1802 of the frame 602 can be hinged back into place to close the frame 602. Since the bolts 1810 remain in place, the case can be resealed for storage of the remaining bottles 106.

[0087] FIG. 19 is a flow diagram of an example method 1900 for securing one or more bottles, according to some embodiments of the present disclosure. Method 1900 can be performed, for example, with the example tamper-proof cases described herein. Method 1900 can begin at step 1905, which includes providing a top insert of a bottle case. The top insert can include a bottom level having a plurality of elongated bottle holders. Each of the bottle holders can include an inner channel having a first end and a second end, the first end being configured to accept a neck of a bottle. The bottle holders can include a perimeter surface surrounding the inner channel. The bottle holders can include a tab connected to a removable portion the perimeter surface. The removable portion can be removed upon the pulling of a tab. The top insert can also include a top level that has a plurality of securing platforms configured to contact a top of the bottle. The top level can be configured to fold from a first position to a second position, wherein the first position is substantially horizontal to the bottom level, and wherein the second position is proximate the second end of the inner channels.

[0088] At step 1910, method 1900 can include inserting the neck of the bottle into the first end of the inner channel of at least one elongated bottle holder. At step 1915, the top level of the top insert can be folded from its first position to its second position. In the second position, at least one securing platform can contact the top of the bottle to secure the bottle. Method 1900 can end after step 1915. In other examples, additional steps can be performed according to the examples described herein, including but not limiting to securing the bottles within a bottom insert.

[0089] FIG. 20 is a flow diagram of an example method 2000 of removing a bottle from a tamper-proof case, according to some embodiments of the present disclosure. The method steps shown in method 2000 can be used, for example, to remove a bottle that was secured using the steps shown in method 1900 of FIG. 19. Method 2000 can begin at step 2005, which includes receiving a case. The case can include a top insert having an elongated bottle holder. A neck of a bottle can be held and secured by the elongated bottle holder.

[0090] At step 2010, method 2000 can include pulling a tab on the elongated bottle holder to remove a removable portion of the elongated bottle holder. Removal of the portion can create an opening in the elongated bottle holder so as to enable removal of the bottle. At step 2015, method 2000 can include pulling the bottle neck from the opening created by pulling the tab. Method 2000 can end after step 2015. In other examples, additional steps can be performed according to the examples described herein.

[0091] Aspects of the invention are also provided by the following numbered clauses:

[0092] Clause 1: A method for securing bottles comprising: providing a top insert comprising: a bottom level comprising a plurality of elongated bottle holders, each elongated bottle holder comprising: an inner channel having a first end and a second end, the first end being configured to accept a neck of a bottle; a perimeter surface surrounding the inner channel; a tab connected to a removable portion the perimeter surface, wherein the removable portion of the perimeter surface is configured to be removed upon a pulling of the tab; and a top level comprising a plurality of securing platforms configured to contact a top of the bottle, wherein the top level is configured to fold from a first position to a second position, wherein the first position is substantially horizontal to the bottom level, and wherein the second position is proximate the second end of the inner channels; inserting the neck of the bottle into the first end of the inner channel of at least one elongated bottle holder; folding the top level from the first position to the second position such that at least one of the plurality of securing platforms contacts the top of the bottle.

[0093] Clause 2: The method for securing bottles of clause 1, further comprising: providing a bottom insert comprising a plurality of cups configured to accept a heel of the bottle; and inserting the heel of the bottle into at least one cup of the plurality of cups.

[0094] Clause 3: The method for securing bottles of clause 2, further comprising: providing a frame having a top face, a bottom face, and four substantially horizontal side faces; placing the bottom insert proximate the bottom face; and placing the top insert proximate the top face.

[0095] Clause 4: The method for securing bottles of clause 3, further comprising: placing a top panel proximate the top face; and securing the bottle, the top insert, and the bottom insert within the frame.

[0096] Clause 5: The method for securing bottles of clause 4, further comprising: pulling the tab; removing the removable portion of the perimeter surface to create an opening in the perimeter surface; pulling the neck of the bottle from the opening in the perimeter surface; and removing the bottle from the frame.

[0097] Clause 6: The method for securing bottles of any of clauses 1–5, wherein the perimeter surface has a conical frustum shape, and wherein the tab is configured to remove the removable portion of the conical frustum shape.

[0098] Clause 7: The method for securing bottles of any of clauses 1–5, wherein the removable portion the perimeter surface is planar.

[0099] Clause 8: The method for securing bottles of any of clauses 1–5, wherein at least a portion of the perimeter surface has a conical frustum shape, and wherein the removable portion of the perimeter surface is planar.

[0100] Clause 9: A method for removing bottle from a tamper-proof case comprising: receiving a case, the case comprising: a top insert comprising an elongated bottle holder comprising: an inner channel configured to accept a neck of a bottle; a perimeter surface surrounding the inner channel; and a tab connected to a removable portion the perimeter surface, wherein the removable portion of the perimeter surface is configured to be removed upon a pulling of the tab; and a bottle comprising a bottle neck, wherein the bottle neck is disposed within the inner channel of the top insert; pulling the tab; removing the removable portion of the perimeter surface to create an opening in the perimeter surface; pulling the bottle neck from the opening in the perimeter surface; and removing the bottle from the frame.

[0101] Certain examples and implementations of the disclosed technology are described above with reference to block and flow diagrams according to examples of the disclosed technology. It will be understood that one or more blocks of the block diagrams and flow diagrams, and combinations of blocks in the block diagrams and flow diagrams, respectively, can be implemented by computer-executable program instructions. Likewise, some blocks of the block diagrams and flow diagrams do not necessarily need to be performed in the order presented, can be repeated, or do not necessarily need to be performed at all, according to some examples or implementations of the disclosed technology. It is also to be understood that the mention of one or more method steps does not preclude the presence of additional method steps or intervening method steps between those steps expressly identified. Additionally, method

steps from one process flow diagram or block diagram can be combined with method steps from another process diagram or block diagram. These combinations and/or modifications are contemplated herein.

[0102] It is to be understood that the embodiments and claims disclosed herein are not limited in their application to the details of construction and arrangement of the components set forth in the description and illustrated in the drawings. Rather, the description and the drawings provide examples of the embodiments envisioned. The embodiments and claims disclosed herein are further capable of other embodiments and of being practiced and carried out in various ways. Also, it is to be understood that the phraseology and terminology employed herein are for the purposes of description and should not be regarded as limiting the claims.

[0103] Accordingly, those skilled in the art will appreciate that the conception upon which the application and claims are based may be readily utilized as a basis for the design of other structures, methods, and systems for carrying out the several purposes of the embodiments and claims presented in this application. It is important, therefore, that the claims be regarded as including such equivalent constructions.

[0104] Furthermore, the purpose of the foregoing Abstract is to enable the United States Patent and Trademark Office and the public generally, and especially including the practitioners in the art who are not familiar with patent and legal terms or phraseology, to determine quickly from a cursory inspection the nature and essence of the technical disclosure of the application. The Abstract is neither intended to define the claims of the application, nor is it intended to be limiting to the scope of the claims in any way. Instead, it is intended that the invention is defined by the claims appended hereto.

CLAIMS

What is claimed is:

1. A tamper-proof bottle case comprising:
 - a frame having a top face, a bottom face, and four substantially horizontal side faces;
 - a top insert disposed proximate the top face, the top insert comprising:
 - a plurality of elongated bottle holders, each elongated bottle holder comprising:
 - an inner channel configured to accept a neck of a bottle;
 - a perimeter surface surrounding the inner channel; and
 - a tab connected to a removable portion the perimeter surface, wherein the removable portion of the perimeter surface is configured to be removed upon a pulling of the tab; and
 - a bottom insert disposed proximate the bottom face, the bottom insert comprising a plurality of cups configured to accept a heel of the bottle.
2. The tamper-proof bottle case of Claim 1, wherein the perimeter surface has a conical frustum shape, and wherein the tab is configured to remove the removable portion of the conical frustum shape.
3. The tamper-proof bottle case of Claim 1, wherein the removable portion the perimeter surface is planar.
4. The tamper-proof bottle case of Claim 1, wherein at least a portion of the perimeter surface has a conical frustum shape, and wherein the removable portion of the perimeter surface is planar.
5. The tamper-proof bottle case of Claim 1, wherein the inner channel of each elongated bottle holder comprises a first end and a second end, wherein the first end is configured to accept the neck of the bottle, and wherein the second end comprises a securing platform configured to contact a top of the bottle.

6. The tamper-proof bottle case of Claim 1, wherein:
- the top face is adapted to receive a top panel;
 - the bottom face is adapted to receive a bottom panel;
 - each of the four substantially horizontal side faces is adapted to receive a side panel;
- and
- the tamper-proof bottle case further comprising:
 - a top panel;
 - a bottom panel; and
 - four side panels.
7. The tamper-proof bottle case of Claim 6, wherein at least one of the four side panels is transparent.
8. The tamper-proof bottle case of Claim 1, wherein the top insert and the bottom insert comprise at least one of paper pulp or cardboard.
9. The tamper-proof bottle case of Claim 1, wherein the top insert and the bottom insert comprise a plastic material.
10. The tamper-proof bottle case of Claim 1, wherein the frame comprises a plurality of living hinges such that the frame is foldable from a first substantially planar configuration to a second substantially rectangular prism configuration.
11. A tamper-proof bottle case comprising:
- a frame having a top face, a bottom face, and four substantially horizontal side faces;
 - a top insert configured such that the top insert can be folded from a first configuration into a second configuration, the first configuration being a substantially horizontal configuration, and the second configuration configured to be disposed proximate the top face, wherein the top insert comprises:
 - a plurality of elongated bottle holders, each elongated bottle holder comprising:
 - an inner channel configured to accept a neck of a bottle;
 - a perimeter surface surrounding the inner channel; and

a tab connected to a removable portion the perimeter surface, wherein the removable portion of the perimeter surface is configured to be removed upon a pulling of the tab; and

a bottom insert disposed proximate the bottom face, the bottom insert comprising a plurality of cups configured to accept a heel of a bottle.

12. The tamper-proof bottle case of Claim 11, wherein the perimeter surface has a conical frustum shape, and wherein the tab is configured to remove the removable portion of the conical frustum shape.

13. The tamper-proof bottle case of Claim 11, wherein the removable portion the perimeter surface is planar.

14. The tamper-proof bottle case of Claim 11, wherein at least a portion of the perimeter surface has a conical frustum shape, and wherein the removable portion of the perimeter surface is planar.

15. The tamper-proof bottle case of Claim 11, wherein the inner channel of each elongated bottle holder comprises a first end and a second end, wherein the first end is configured to accept the neck of the bottle, and wherein the second end comprises a securing platform configured to contact a top of the bottle.

16. The tamper-proof bottle case of Claim 11, wherein:

the top face is adapted to receive a top panel;

the bottom face is adapted to receive a bottom panel;

each of the four substantially horizontal side faces is adapted to receive a side panel;

and

the tamper-proof bottle case further comprising:

a top panel;

a bottom panel; and

four side panels.

17. The tamper-proof bottle case of Claim 16, wherein at least one of the four side panels is transparent.

18. The tamper-proof bottle case of Claim 11, wherein:

the inner channel of each elongated bottle holder of the plurality of elongated bottle holders comprises a first end and a second end;

the first end is configured to accept the neck of the bottle;

the top insert further comprises a flange comprising a plurality of securing platforms;

the plurality of securing platforms, when in the first configuration, are substantially horizontal to the plurality of elongated bottle holders; and

the plurality of securing platforms when in the second configuration, are proximate the second end of the plurality of elongated bottle holders.

19. The tamper-proof bottle case of Claim 11, wherein the frame comprises a plurality of living hinges such that the frame is foldable from a first substantially planar configuration to a second substantially rectangular prism configuration.

20. A tamper-proof insert for a bottle case comprising:

a bottom level comprising a plurality of elongated bottle holders, each elongated bottle holder comprising:

an inner channel having a first end and a second end, the first end being configured to accept a neck of a bottle;

a perimeter surface surrounding the inner channel; and

a tab connected to a removable portion the perimeter surface, wherein the removable portion of the perimeter surface is configured to be removed upon a pulling of the tab; and

a top level comprising a plurality of securing platforms configured to contact a top of the bottle,

wherein the tamper-proof insert is configured such that the insert can be folded from a first configuration into a second configuration,

wherein, in the first configuration, the bottom level is substantially horizontal to the top level, and

wherein, in the second configuration, the plurality of securing platforms is proximate the second end of the inner channels of the plurality of elongated bottle holders.

21. The tamper-proof insert of Claim 20, wherein the perimeter surface has a conical frustum shape, and wherein the tab is configured to remove the removable portion of the conical frustum shape.

22. The tamper-proof insert of Claim 20, wherein the removable portion the perimeter surface is planar.

23. A method for securing bottles comprising:

providing a top insert comprising:

a bottom level comprising a plurality of elongated bottle holders, each

elongated bottle holder comprising:

an inner channel having a first end and a second end, the first end being configured to accept a neck of a bottle;

a perimeter surface surrounding the inner channel; and

a tab connected to a removable portion the perimeter surface, wherein the removable portion of the perimeter surface is configured to be removed upon a pulling of the tab; and

a top level comprising a plurality of securing platforms configured to contact a top of the bottle, wherein the top level is configured to fold from a first position to a second position, wherein the first position is substantially horizontal to the bottom level, and wherein the second position is proximate the second end of the inner channels;

inserting the neck of the bottle into the first end of the inner channel of at least one elongated bottle holder; and

folding the top level from the first position to the second position such that at least one of the plurality of securing platforms contacts the top of the bottle.

24. The method for securing bottles of Claim 23, further comprising:

providing a bottom insert comprising a plurality of cups configured to accept a heel of the bottle; and

inserting the heel of the bottle into at least one cup of the plurality of cups.

25. The method for securing bottles of Claim 24, further comprising:
providing a frame having a top face, a bottom face, and four substantially horizontal side faces;
placing the bottom insert proximate the bottom face; and
placing the top insert proximate the top face.
26. The method for securing bottles of Claim 25, further comprising:
placing a top panel proximate the top face; and
securing the bottle, the top insert, and the bottom insert within the frame.
27. The method for securing bottles of Claim 26, further comprising:
pulling the tab;
removing the removable portion of the perimeter surface to create an opening in the perimeter surface;
pulling the neck of the bottle from the opening in the perimeter surface; and
removing the bottle from the frame.
28. The method for securing bottles of Claim 23, wherein the perimeter surface has a conical frustum shape, and wherein the tab is configured to remove the removable portion of the conical frustum shape.
29. The method for securing bottles of Claim 23, wherein the removable portion the perimeter surface is planar.
30. The method for securing bottles of Claim 23, wherein at least a portion of the perimeter surface has a conical frustum shape, and wherein the removable portion of the perimeter surface is planar.
31. A method for removing bottle from a tamper-proof case comprising:
receiving a case, the case comprising:
a top insert comprising an elongated bottle holder comprising:
an inner channel configured to accept a neck of a bottle;
a perimeter surface surrounding the inner channel; and

a tab connected to a removable portion the perimeter surface, wherein the removable portion of the perimeter surface is configured to be removed upon a pulling of the tab; and

a bottle comprising a bottle neck, wherein the bottle neck is disposed within the inner channel of the top insert;

pulling the tab;

removing the removable portion of the perimeter surface to create an opening in the perimeter surface;

pulling the bottle neck from the opening in the perimeter surface; and

removing the bottle from the case.

32. A tamper proof bottle case comprising:

a unibody frame comprising a front portion, a bottom portion, a back portion, and a top portion, the front portion being connected to the bottom portion via a first living hinge, the bottom portion being connected to the back portion via a second living hinge, and the back portion being connected to the top portion via a third living hinge such that the front portion, the bottom portion, the back portion, and the top portion are hingeable from a planar configuration to a substantially rectangular configuration;

a plurality of panels configured to engage with one of the front portion, the bottom portion, the back portion, or the top portion; and

a top insert disposed proximate the top portion, the top insert comprising:

a plurality of elongated bottle holders, each elongated bottle holder comprising:

an inner channel configured to accept a neck of a bottle;

a perimeter surface surrounding the inner channel; and

a tab connected to a removable portion the perimeter surface,

wherein the removable portion of the perimeter surface is configured to be removed upon a pulling of the tab.

33. The tamper proof bottle case of Claim 32, further comprising a bolt positionable within an opening hole disposed on one of the front portion, the bottom portion, the back portion, or the top portion, the bolt being configured to connect one of the front portion, the bottom

portion, the back portion, or the top portion to another of the front portion, the bottom portion, the back portion, or the top portion.

34. The tamper proof bottle case of Claim 33, wherein the bolt is releasable by a pin inserted into the opening hole.

1 / 21

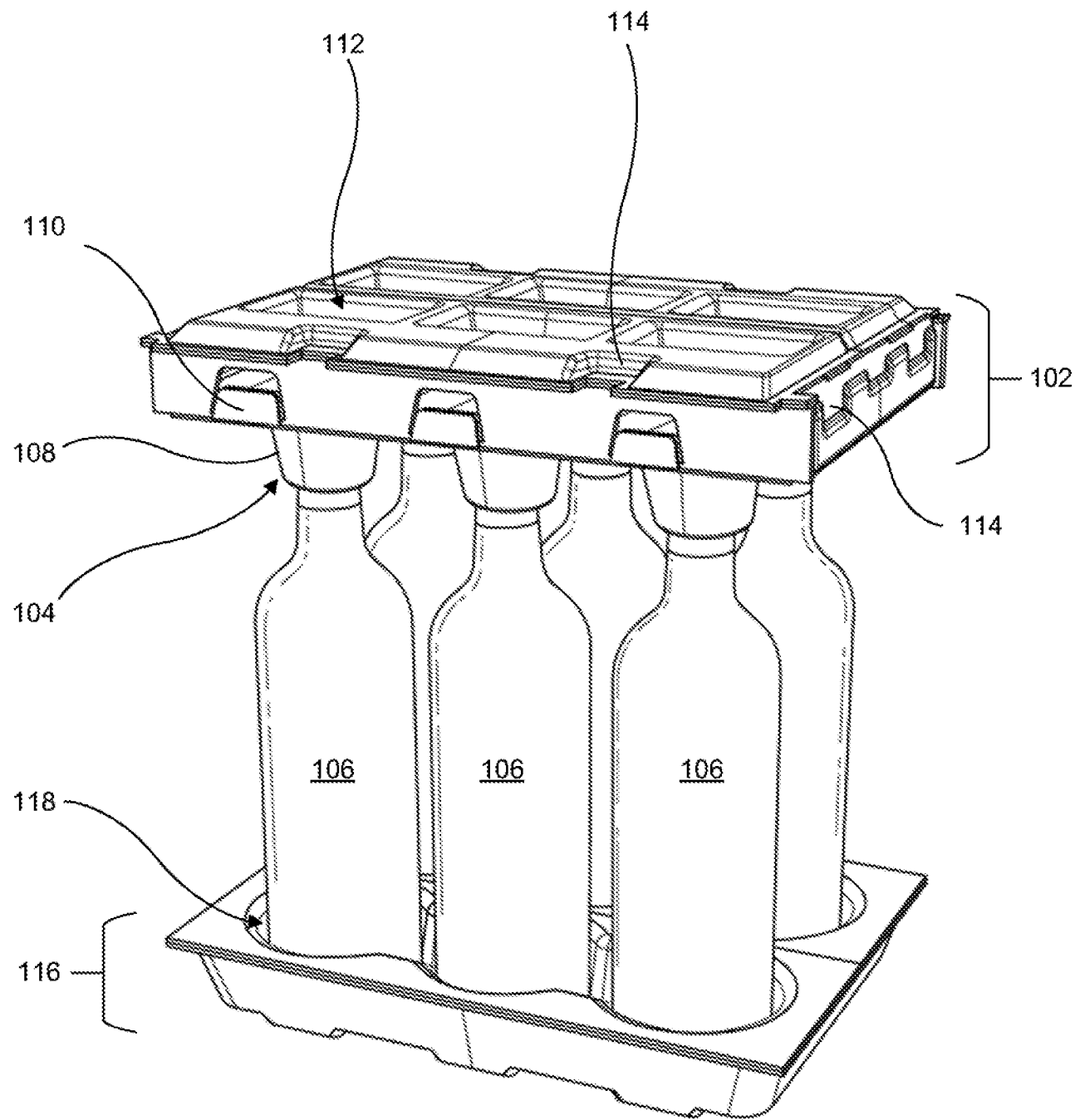


FIG. 1

2 / 21

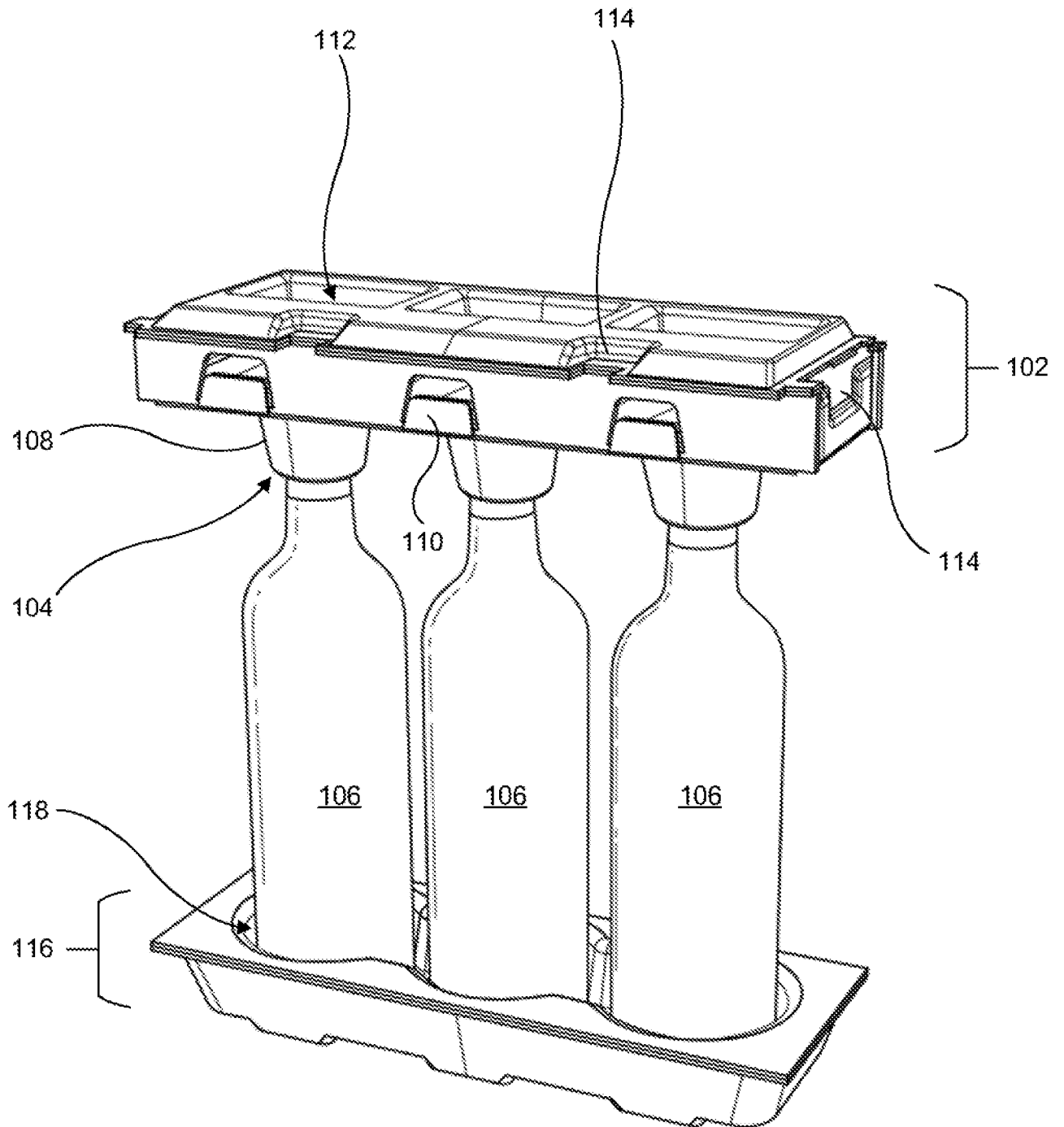
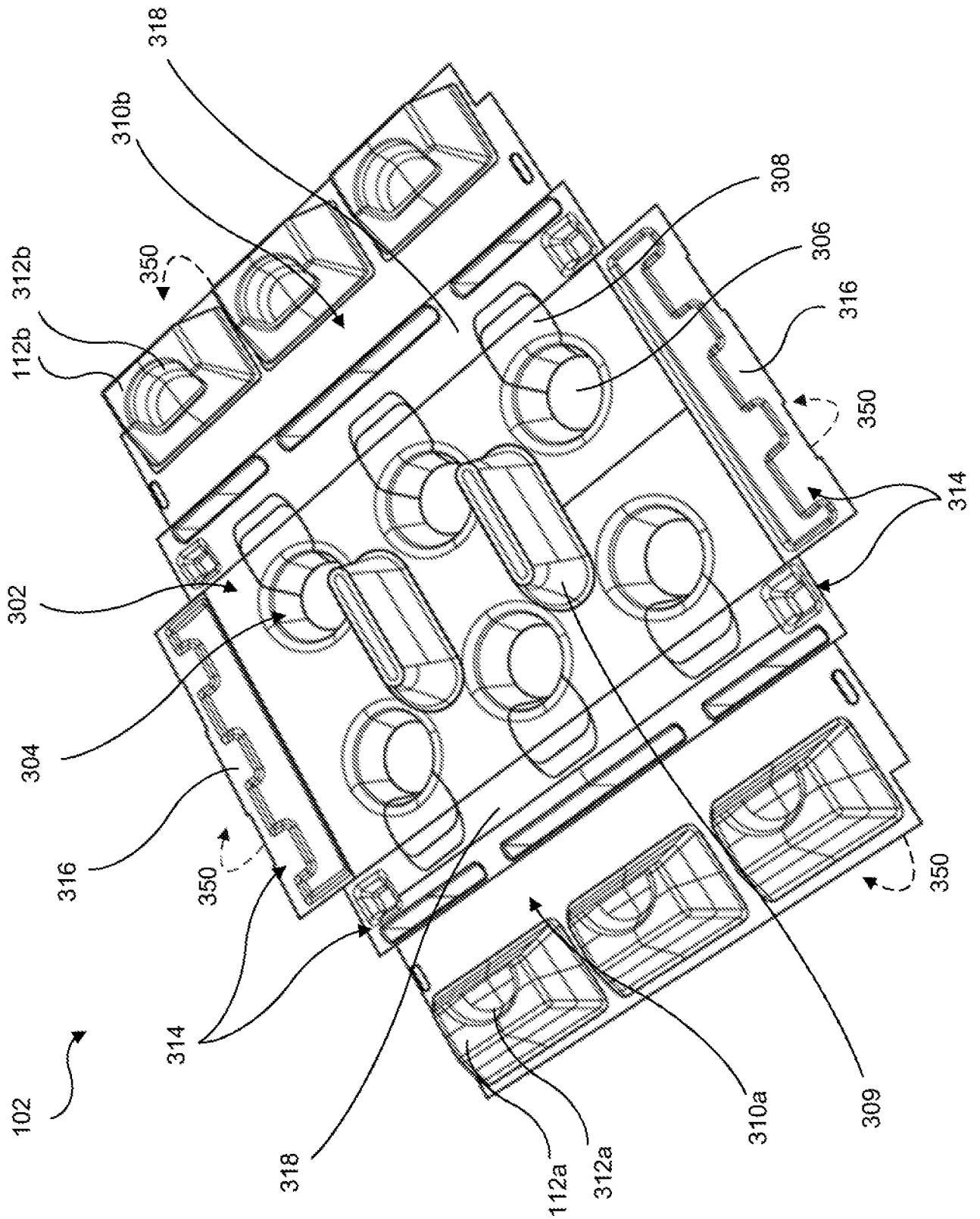


FIG. 2

3 / 21



3
G
L

4 / 21

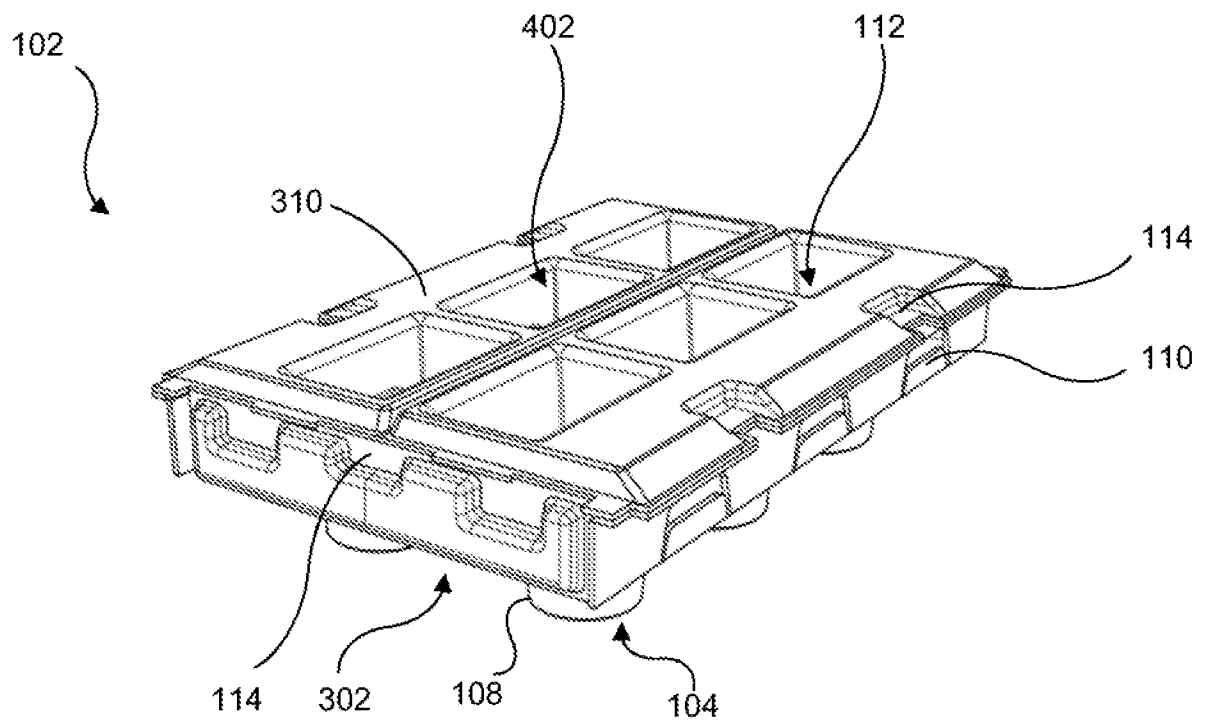


FIG. 4

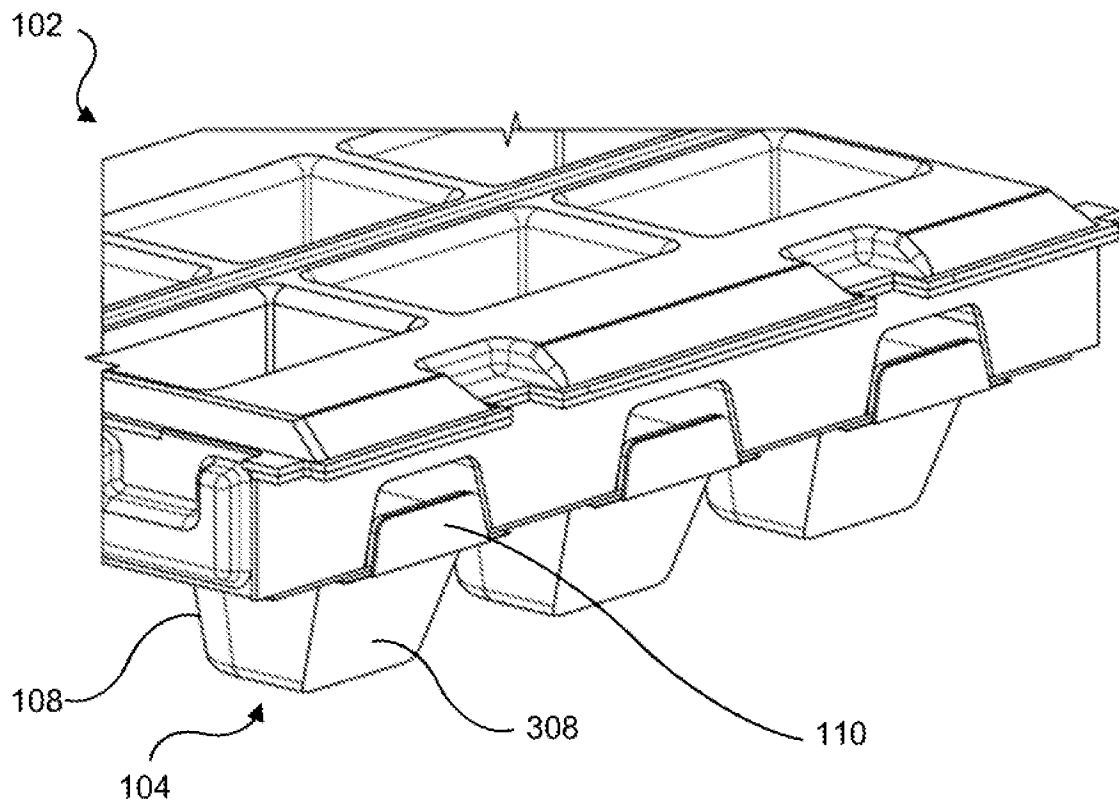


FIG. 5

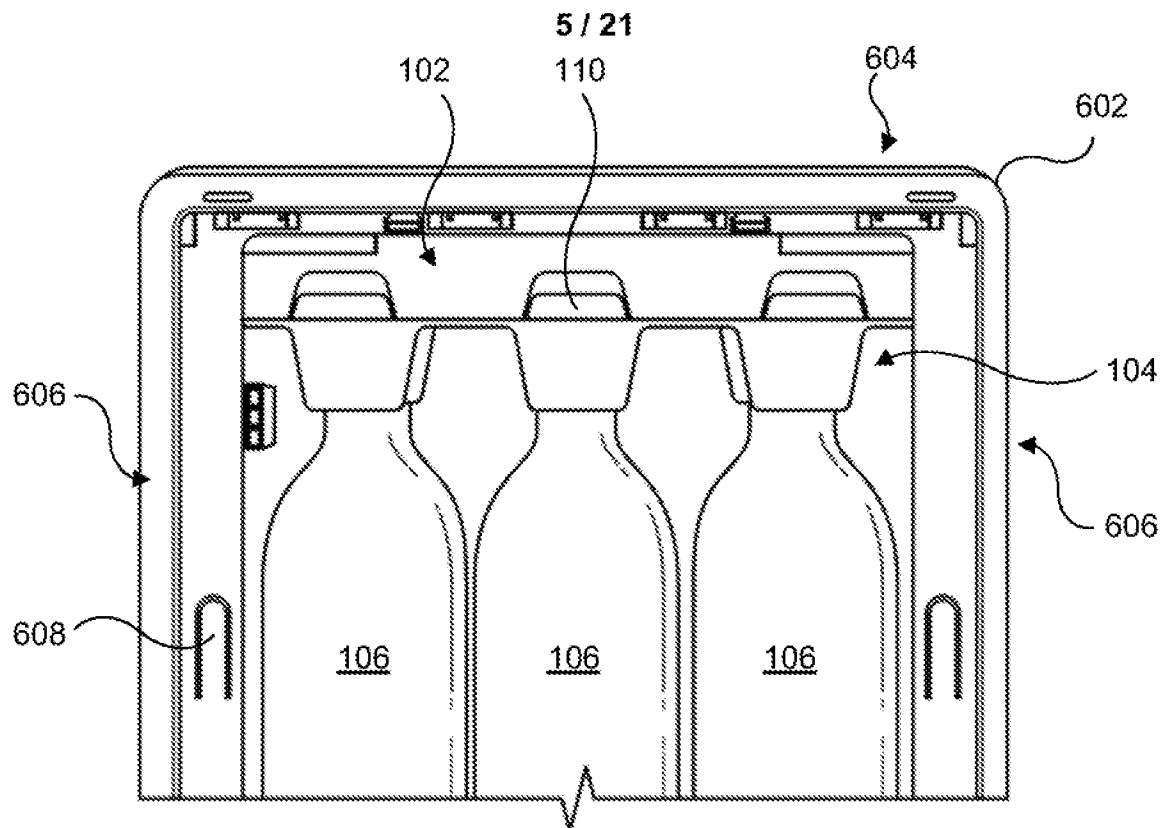


FIG. 6

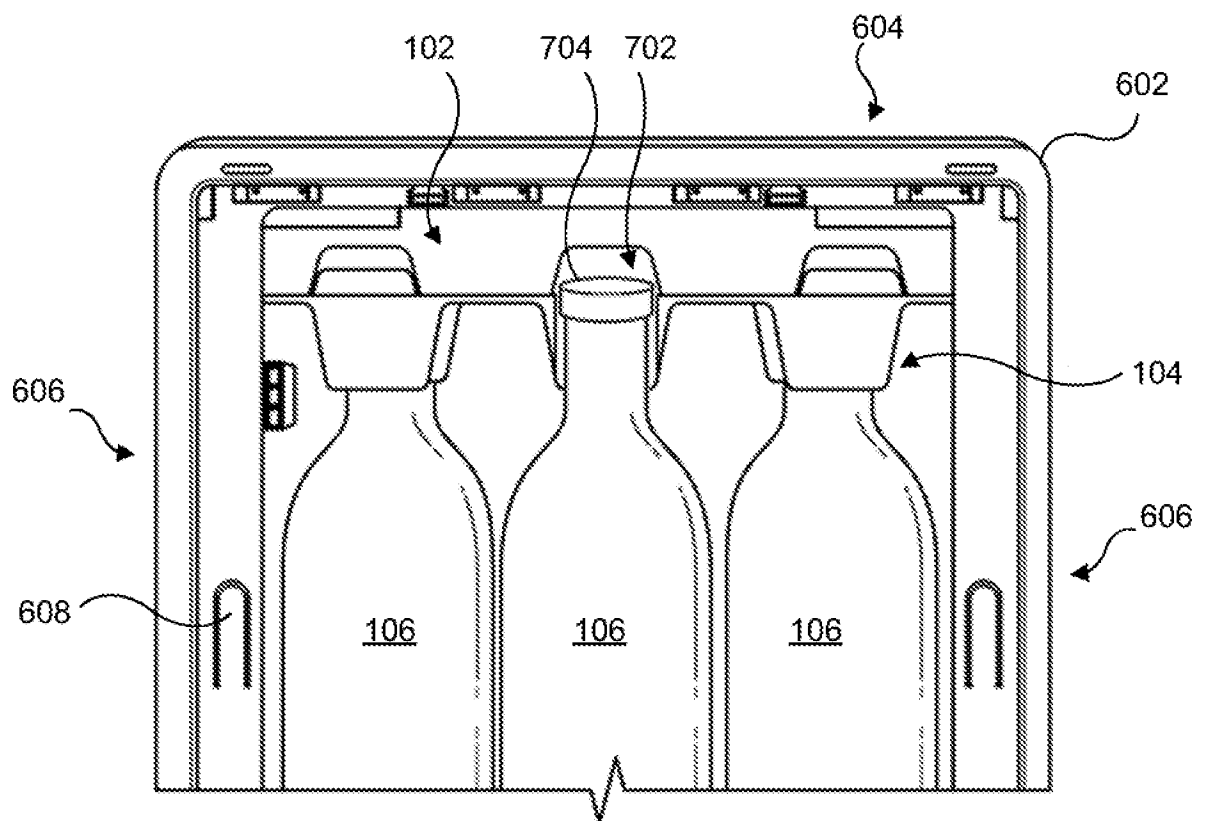


FIG. 7

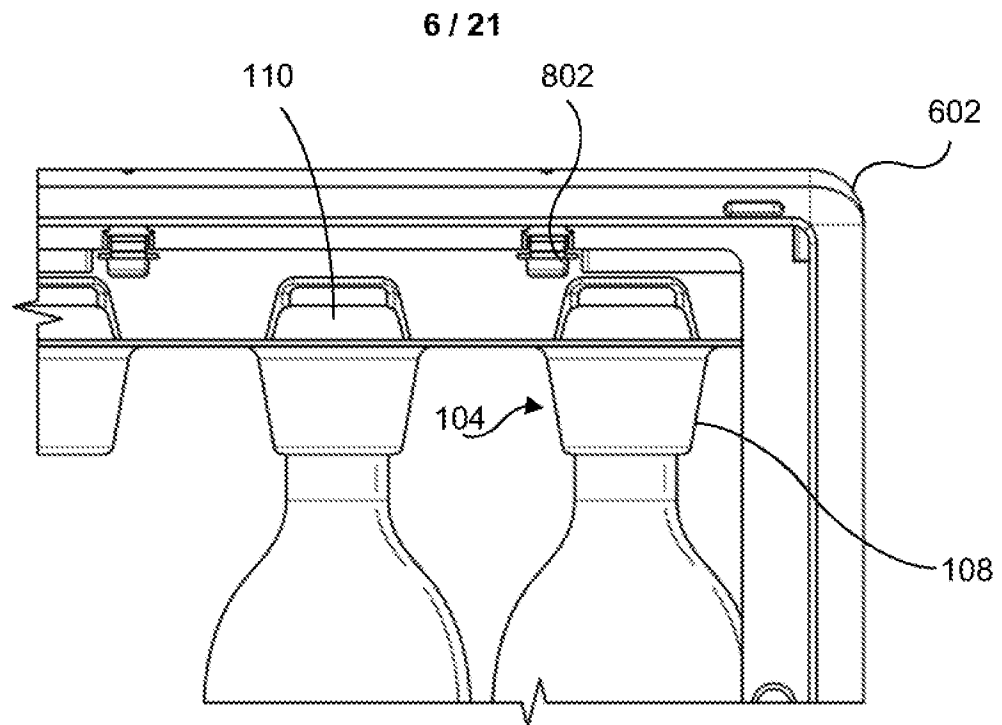


FIG. 8

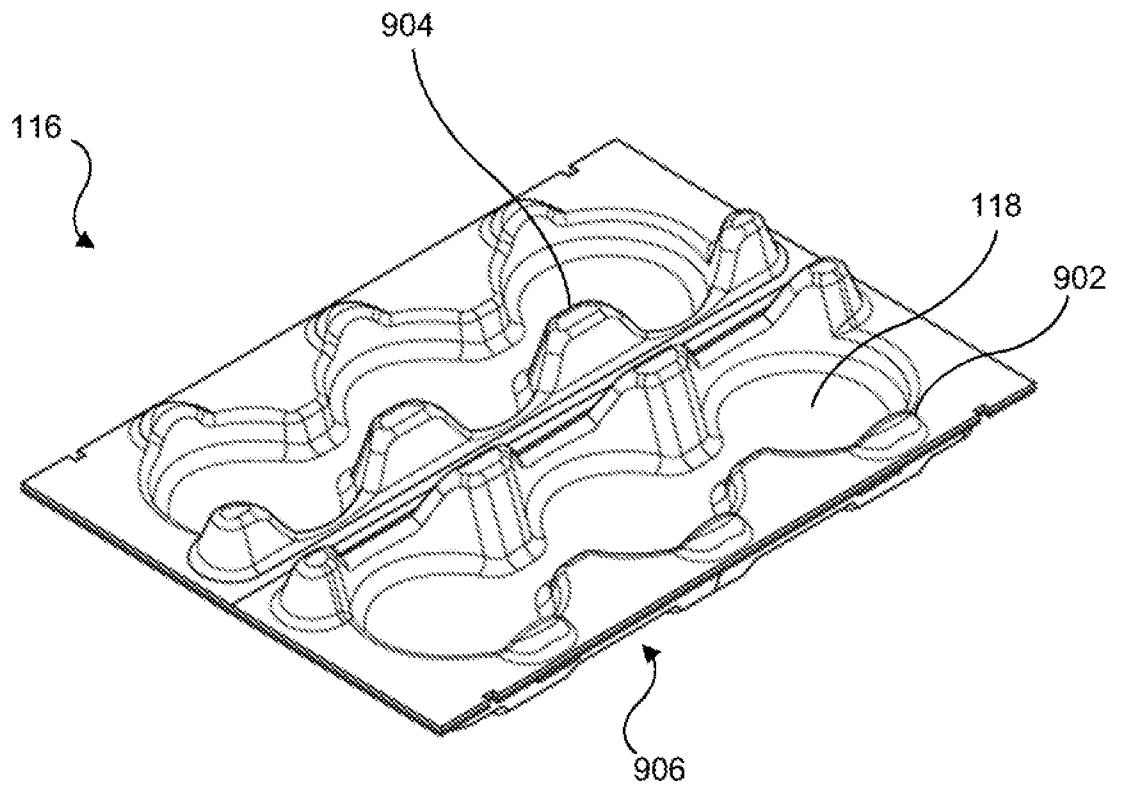


FIG. 9

7 / 21

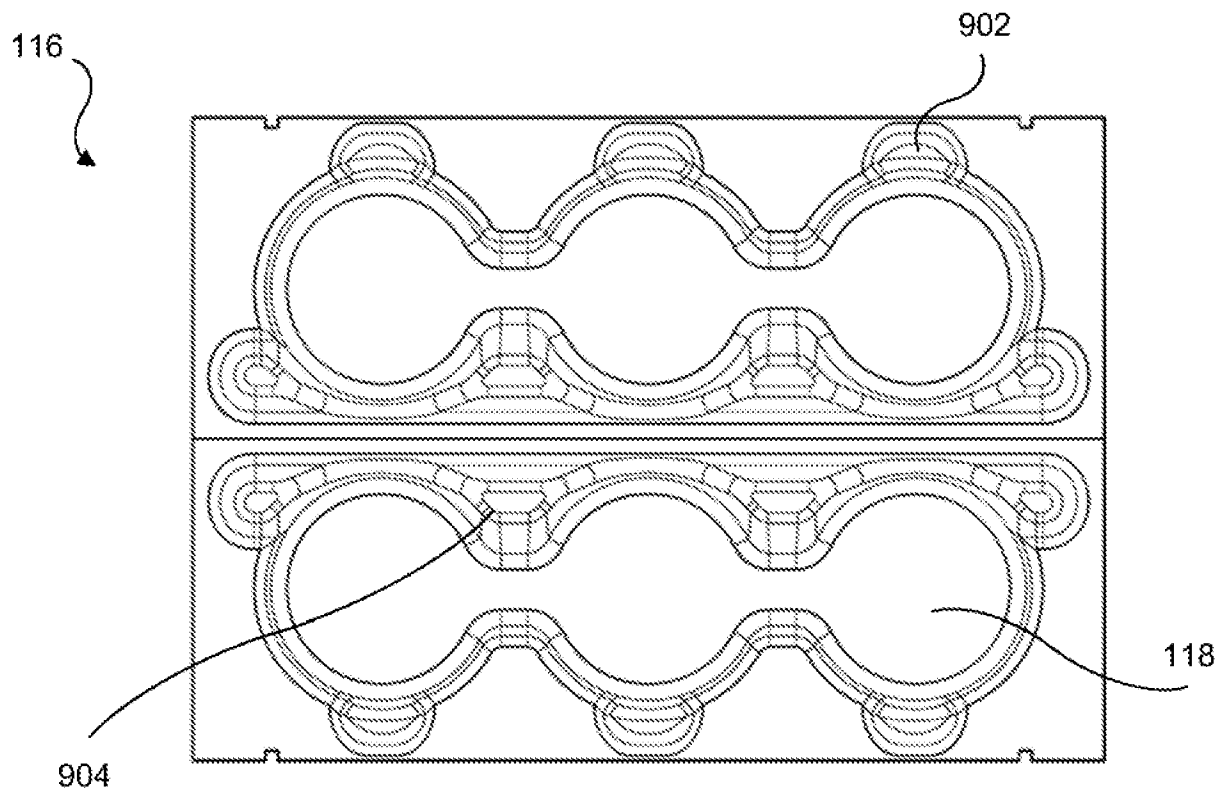


FIG. 10

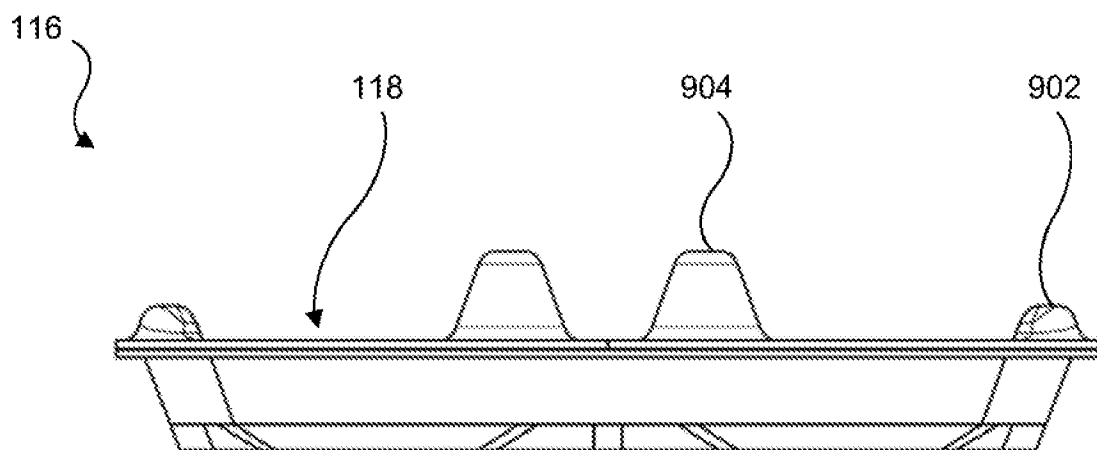


FIG. 11

8 / 21

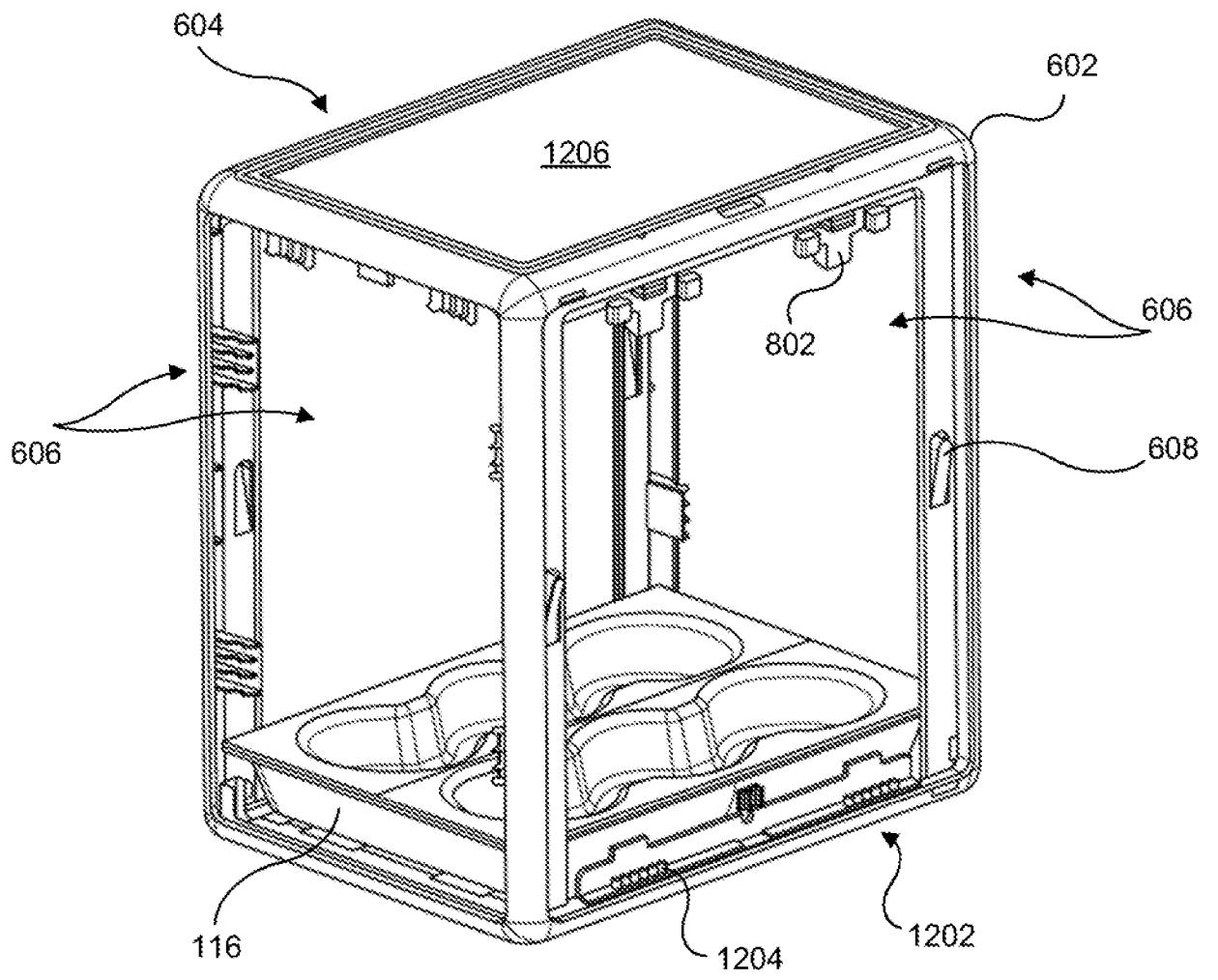


FIG. 12

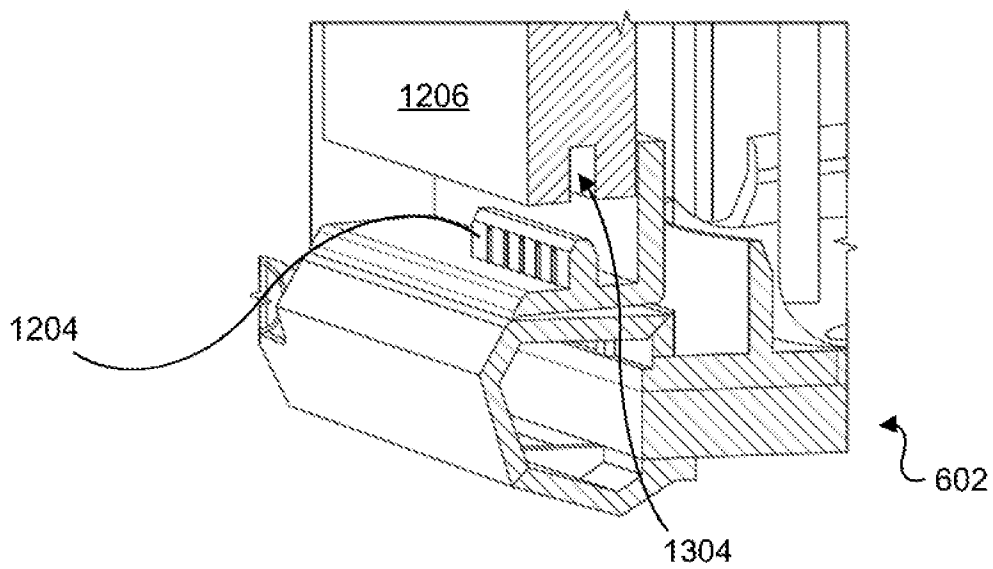


FIG. 13

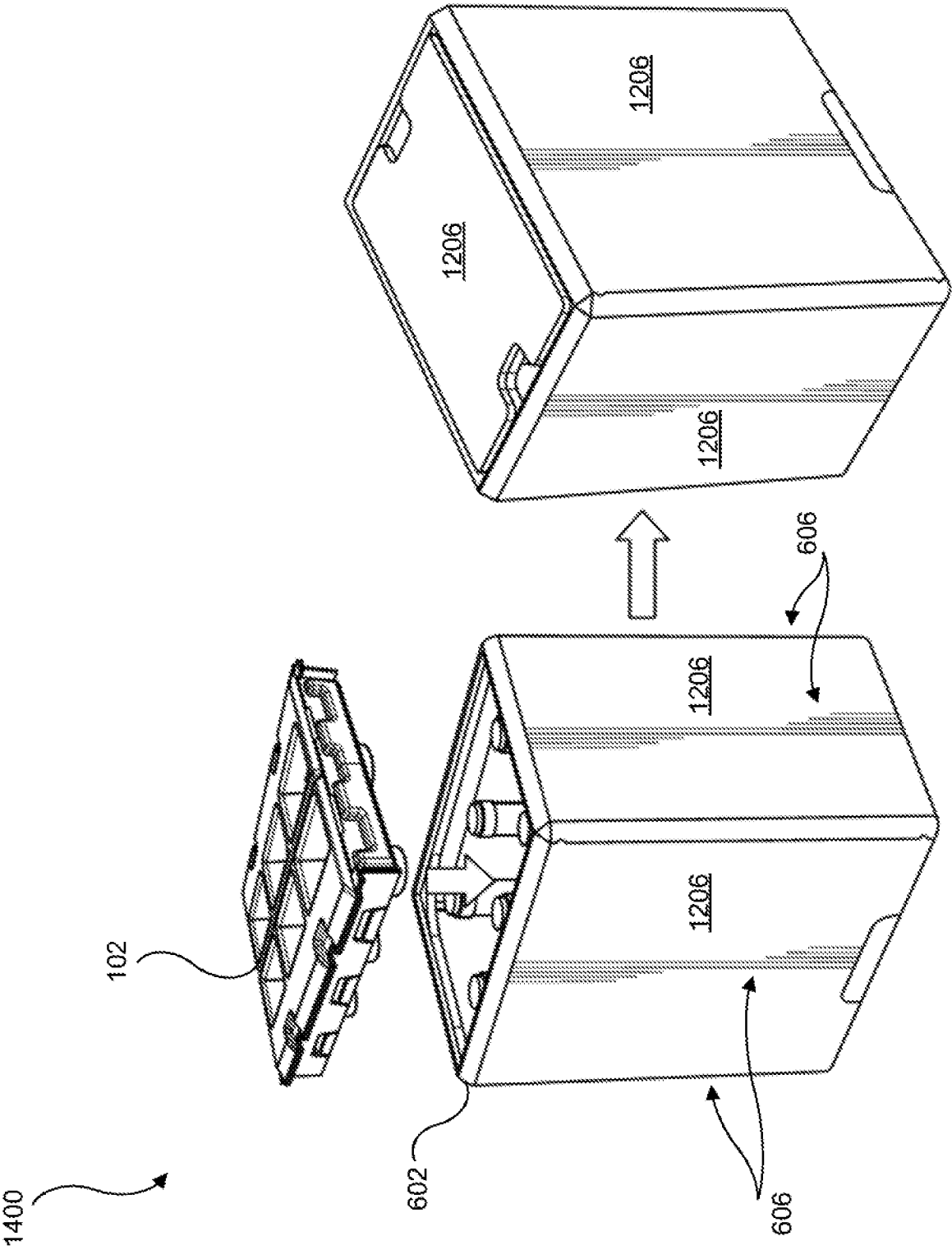


FIG. 14

10 / 21

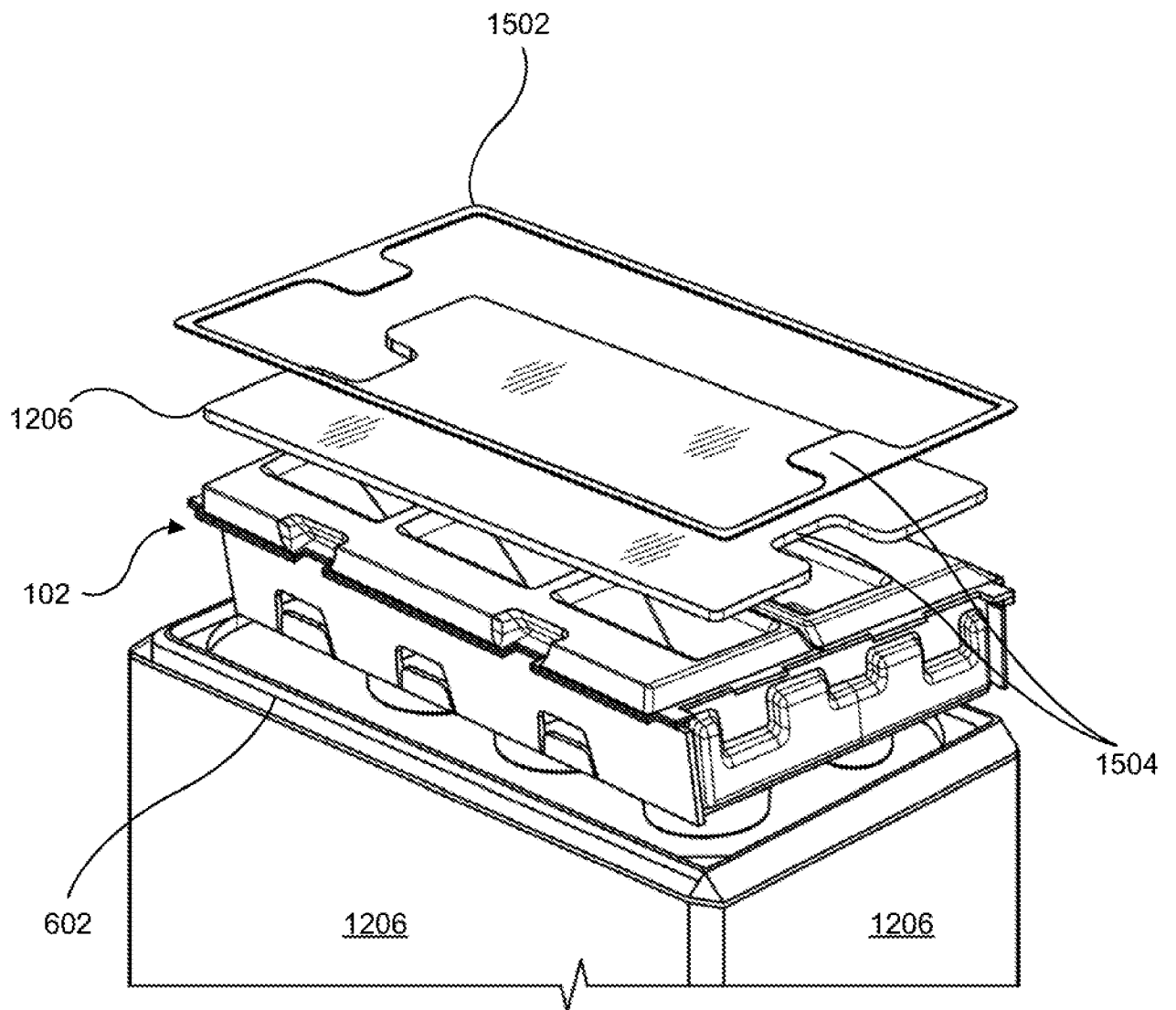


FIG. 15

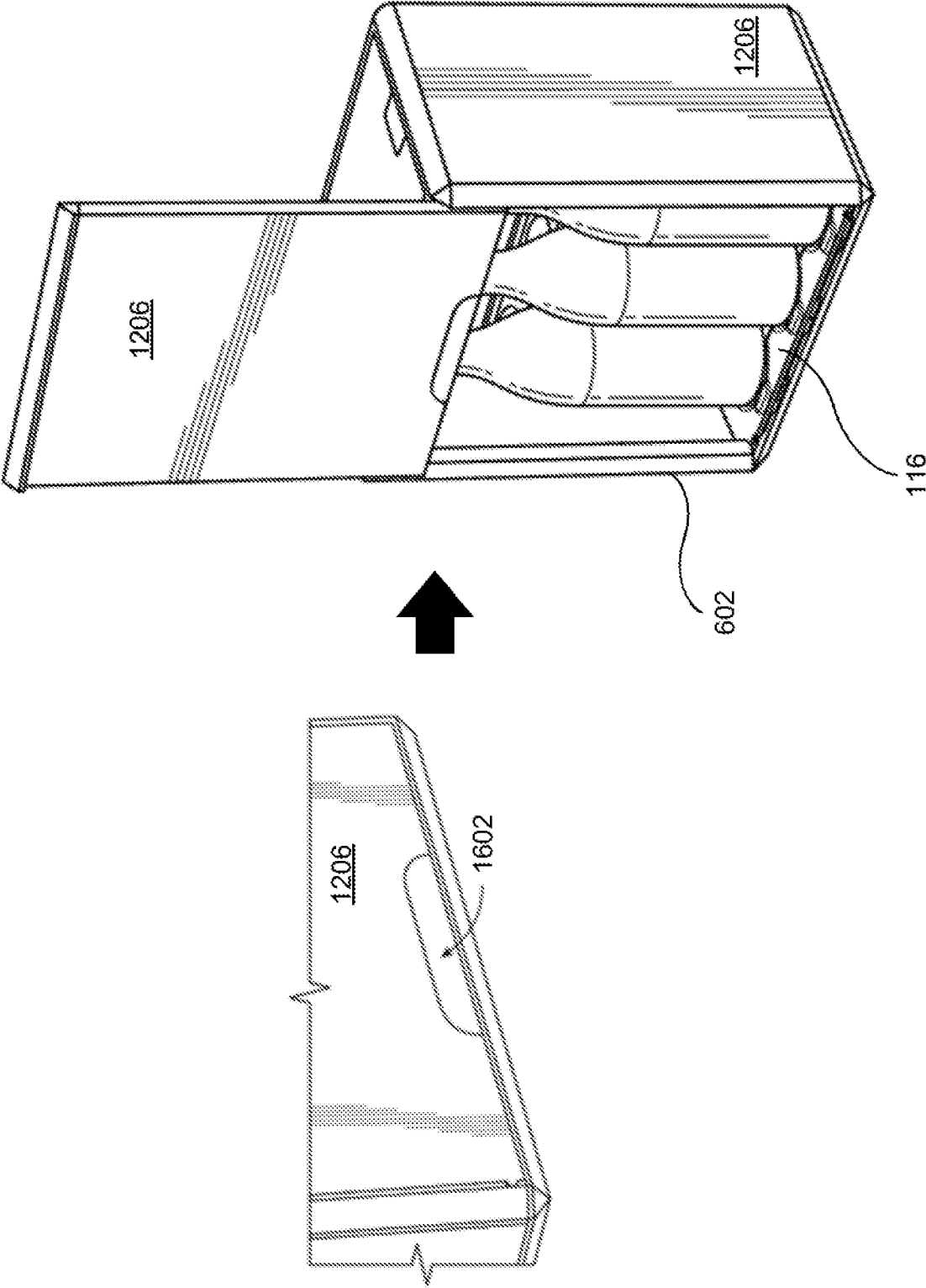


FIG. 16

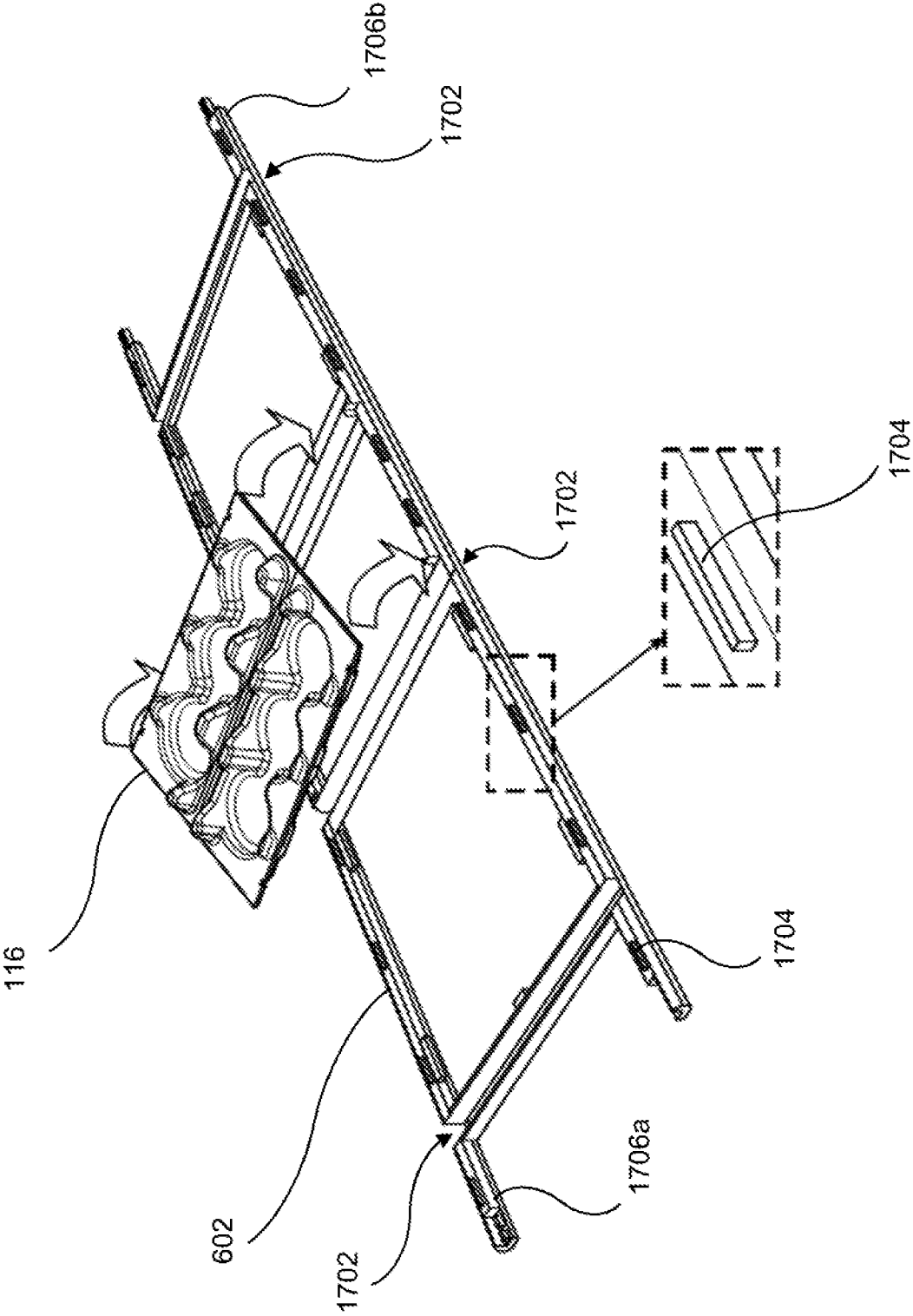


FIG. 17A

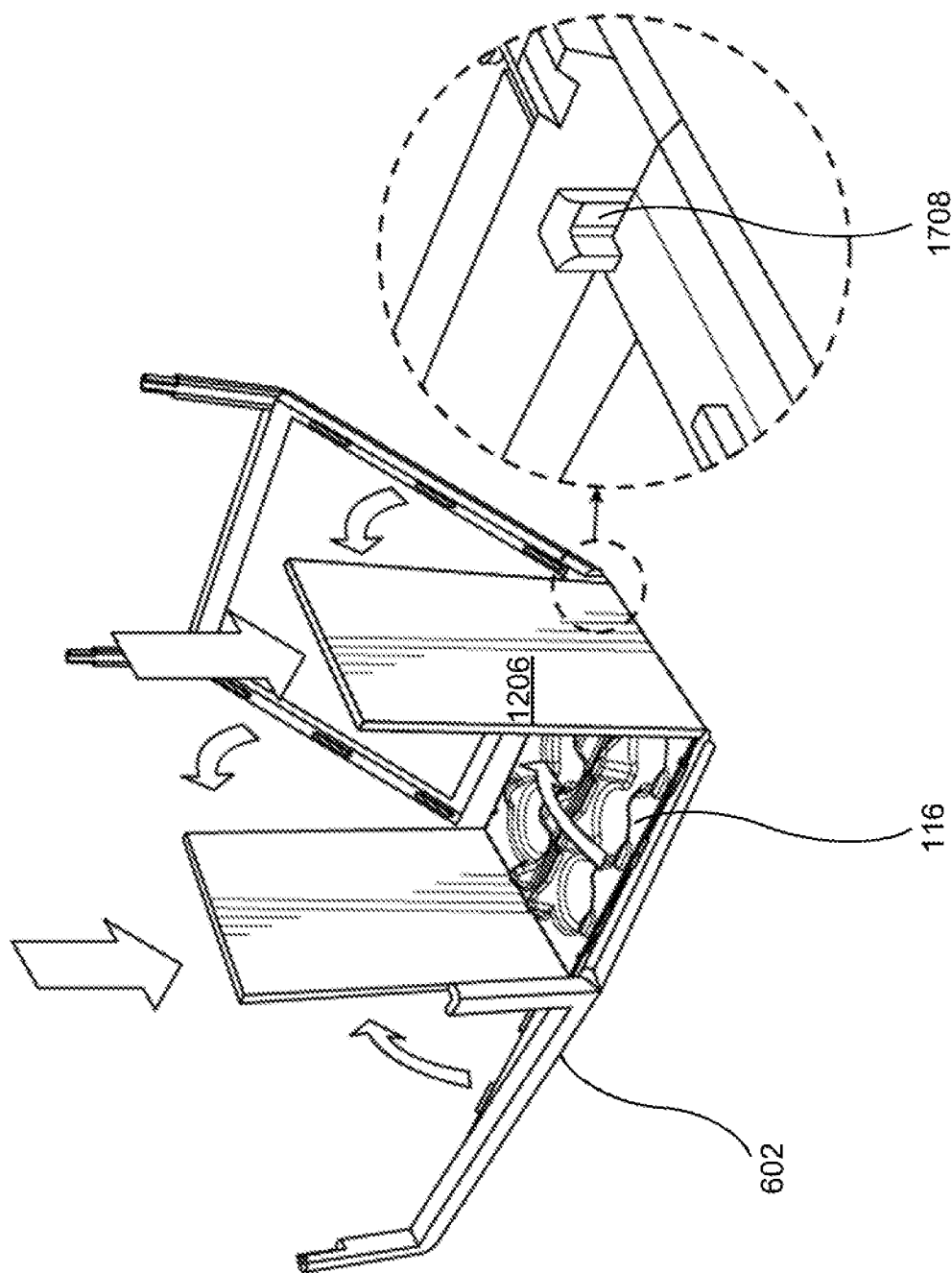


FIG. 17B

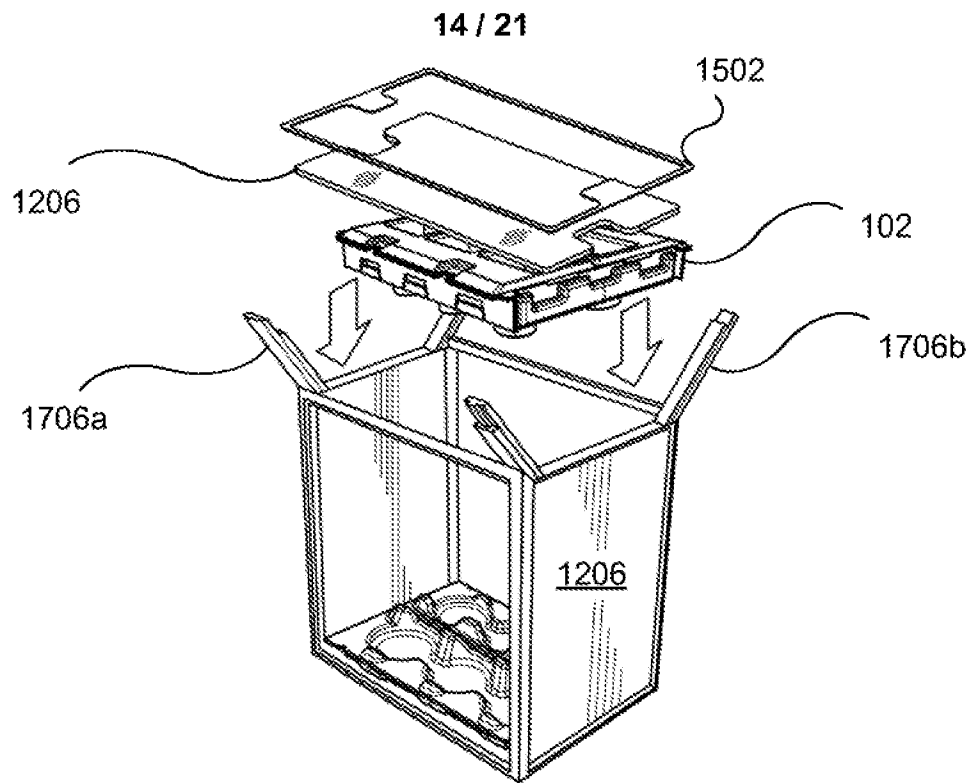


FIG. 17C

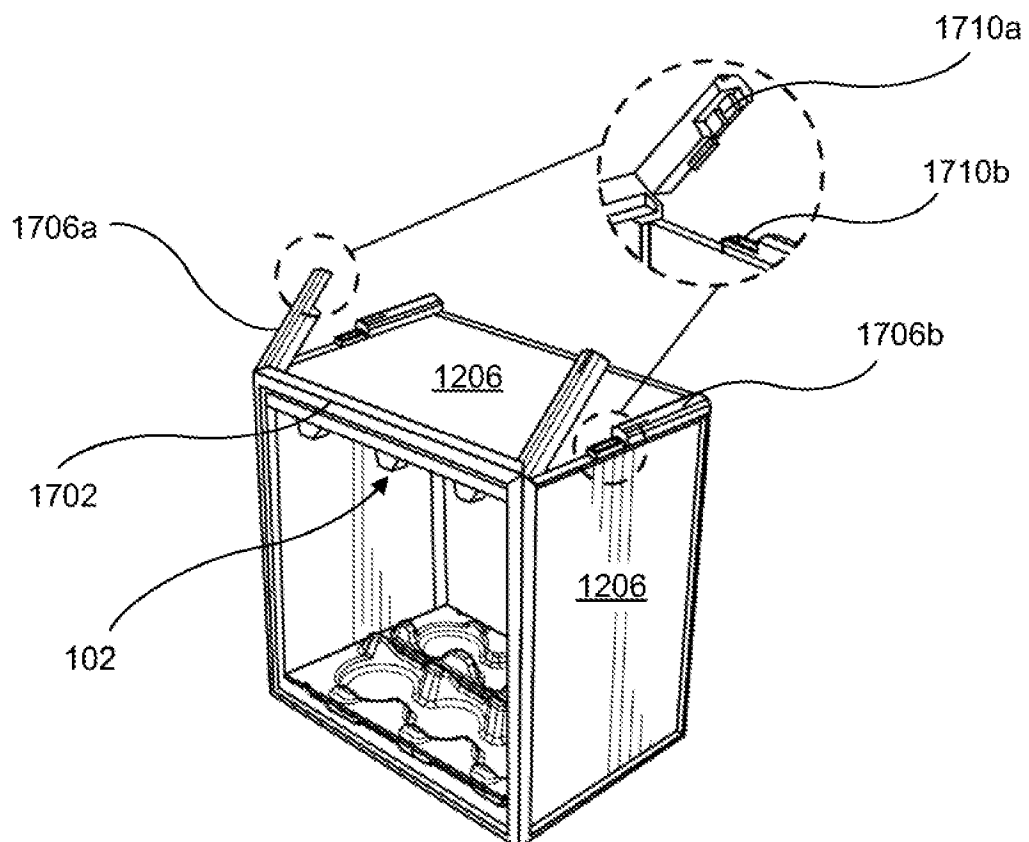


FIG. 17D

15 / 21

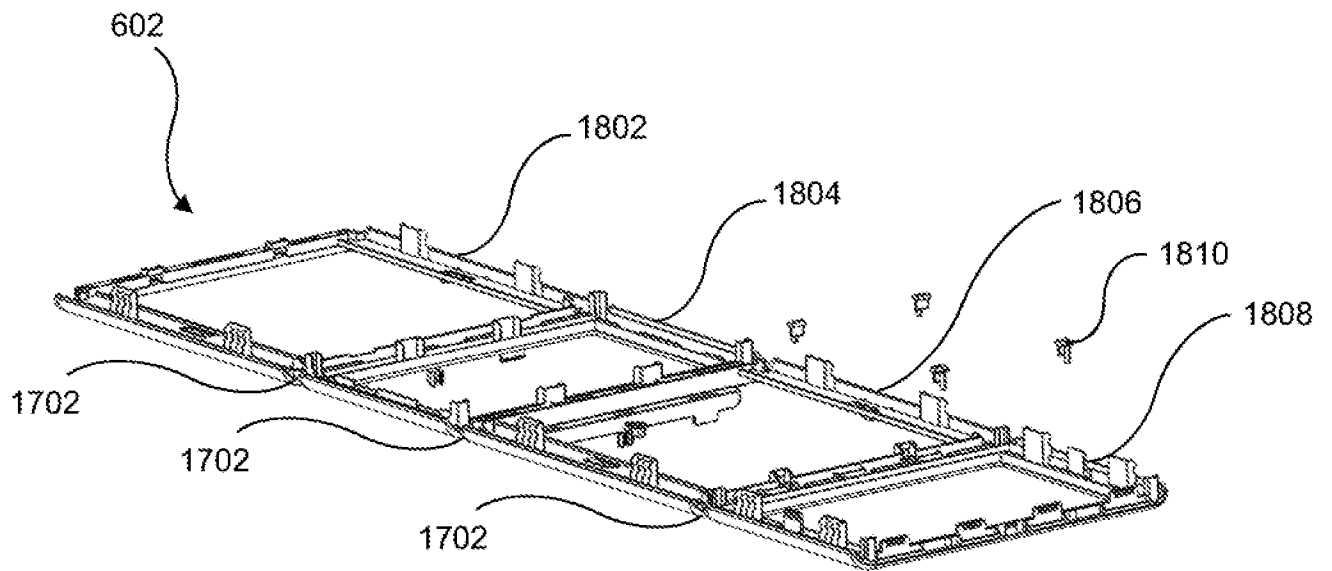


FIG. 18A

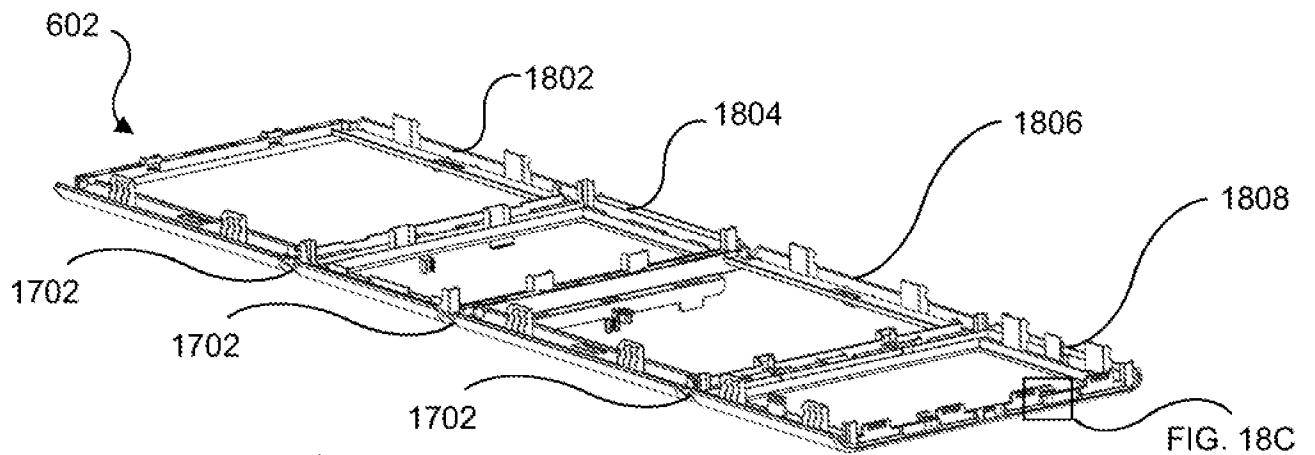


FIG. 18B

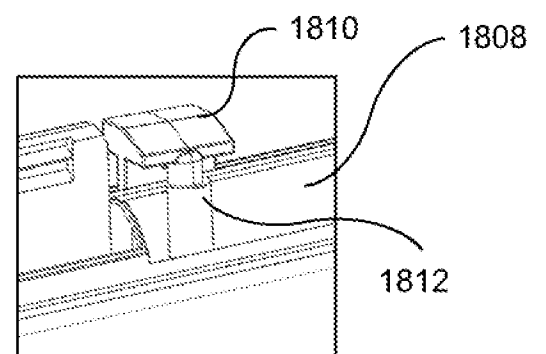


FIG. 18C

16 / 21

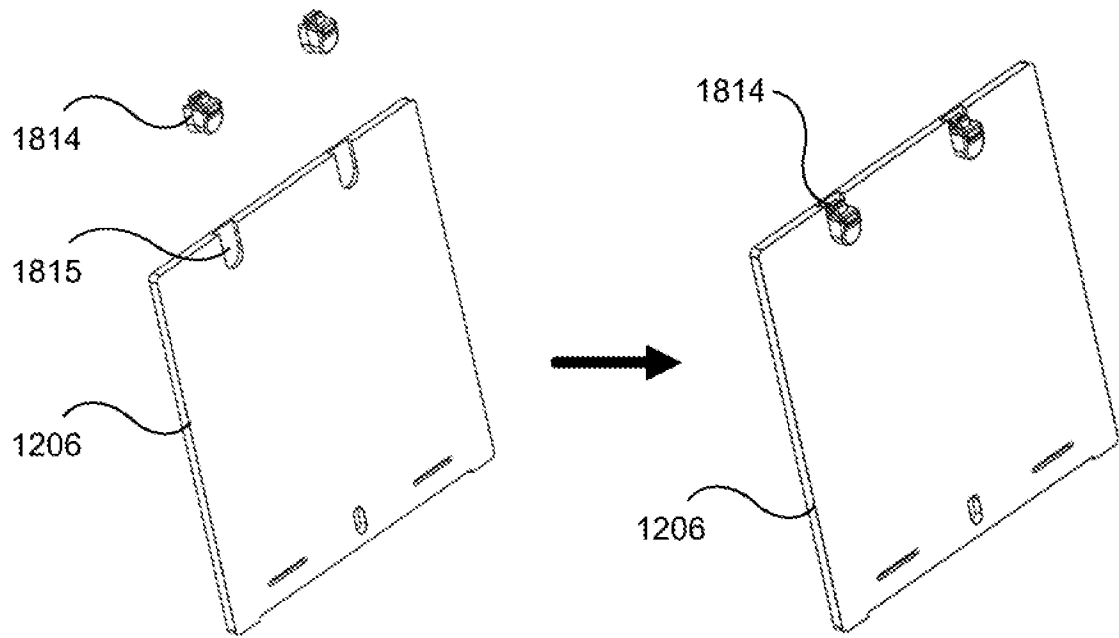


FIG. 18D

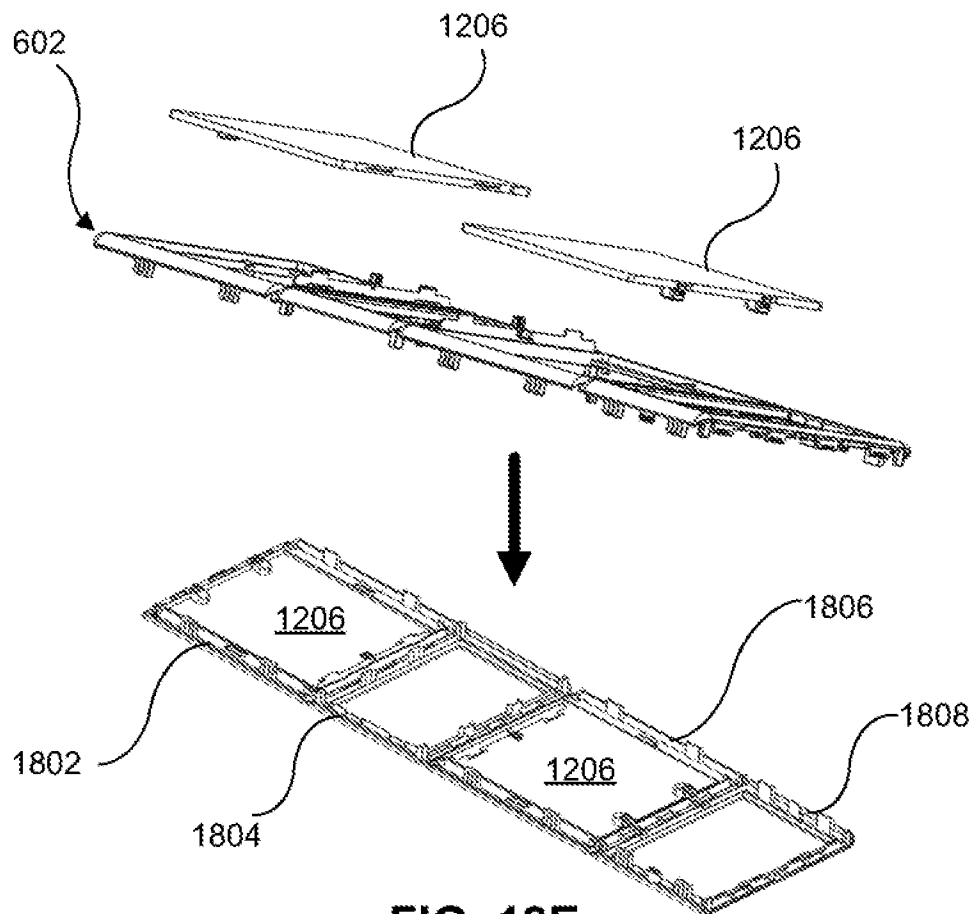


FIG. 18E

17 / 21

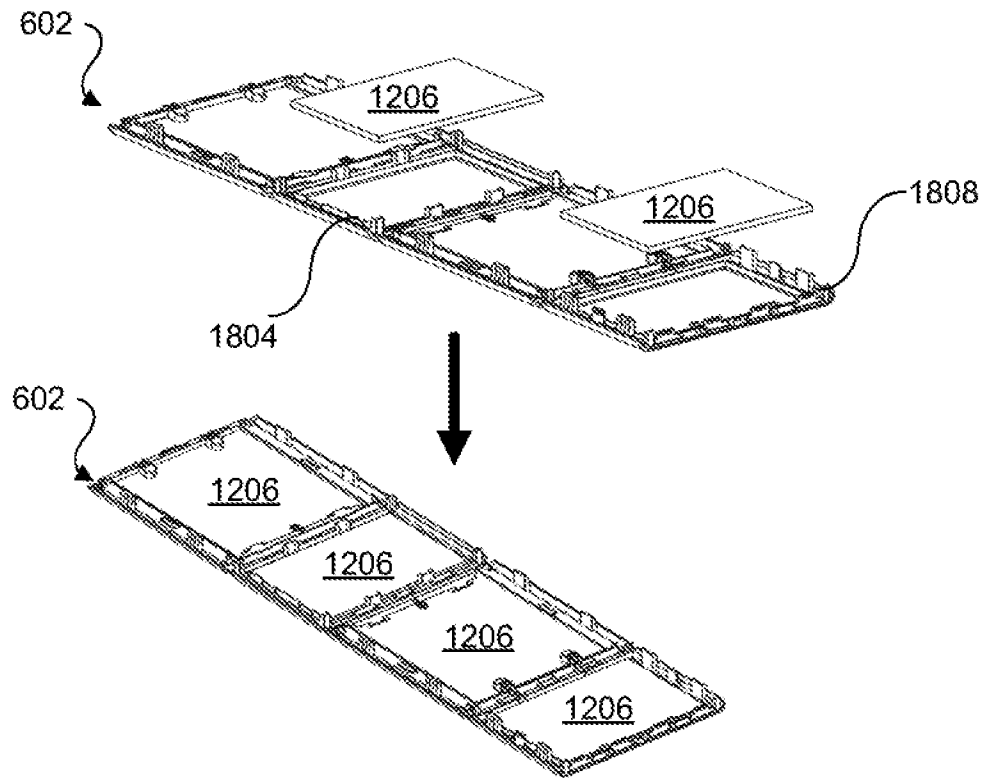


FIG. 18F

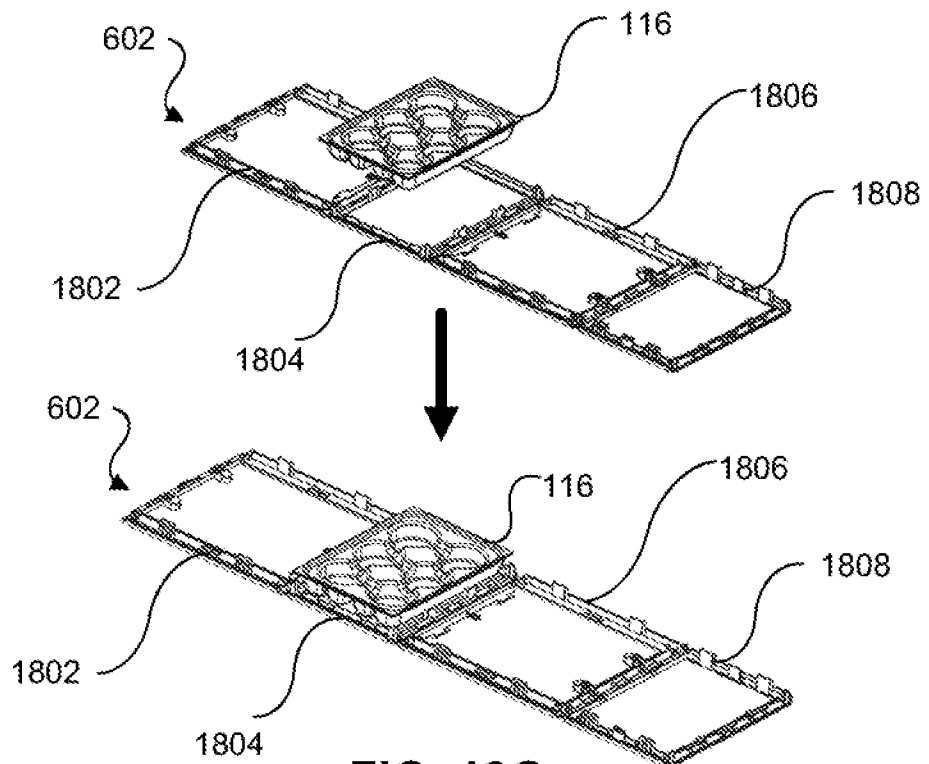


FIG. 18G

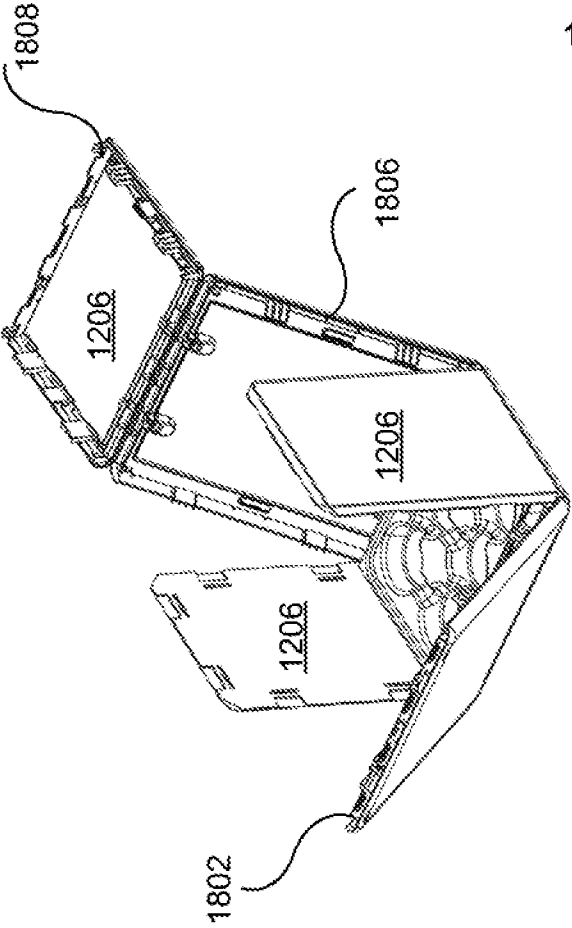


FIG. 18I

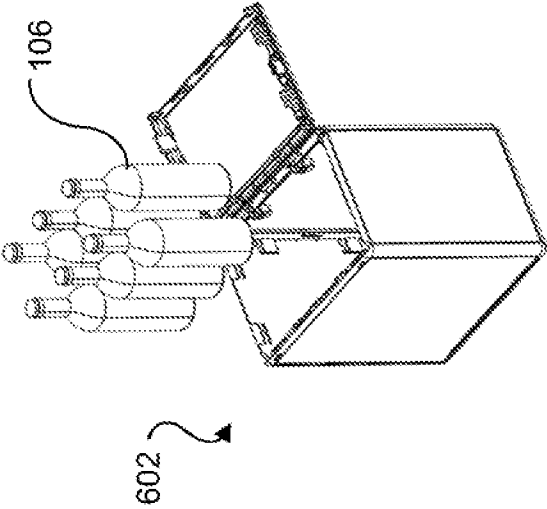


FIG. 18K

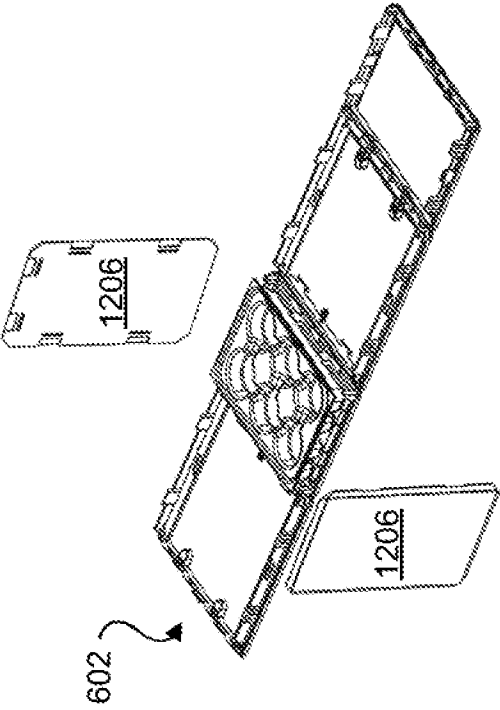


FIG. 18H

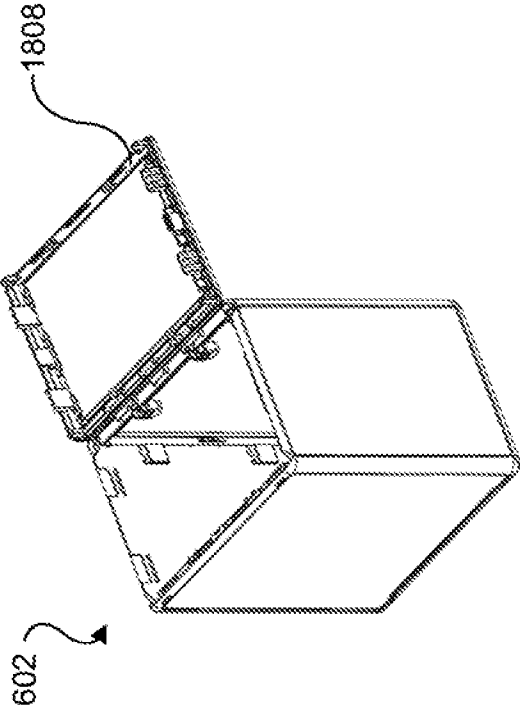


FIG. 18J

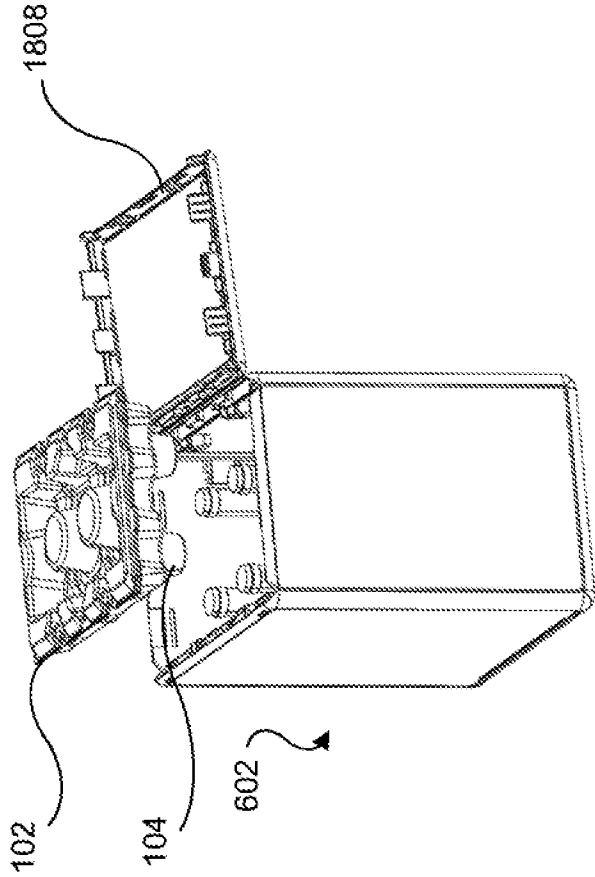


FIG. 18M

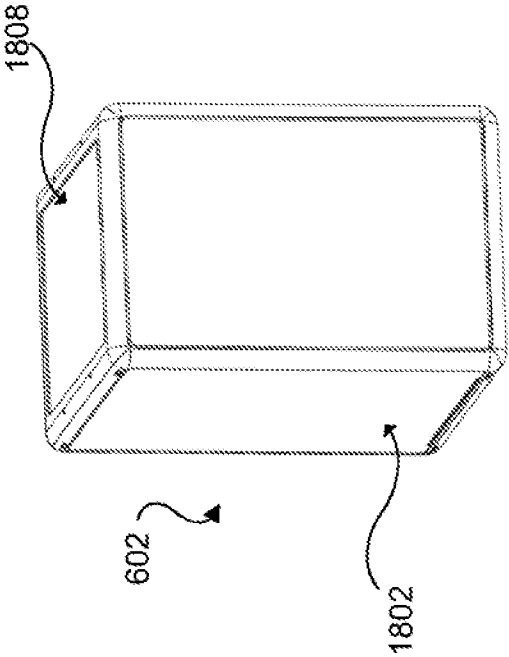


FIG. 18O

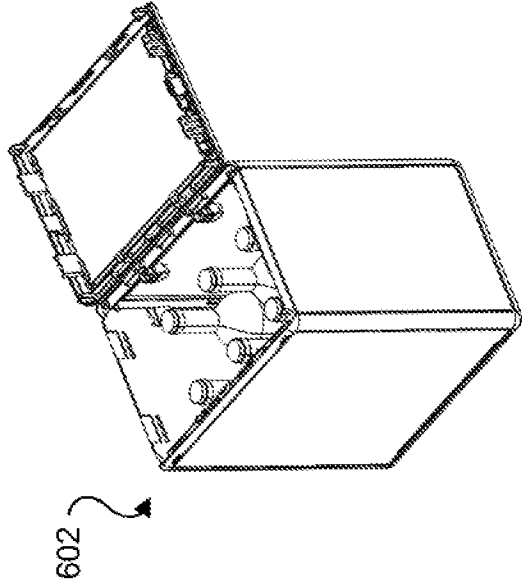


FIG. 18L

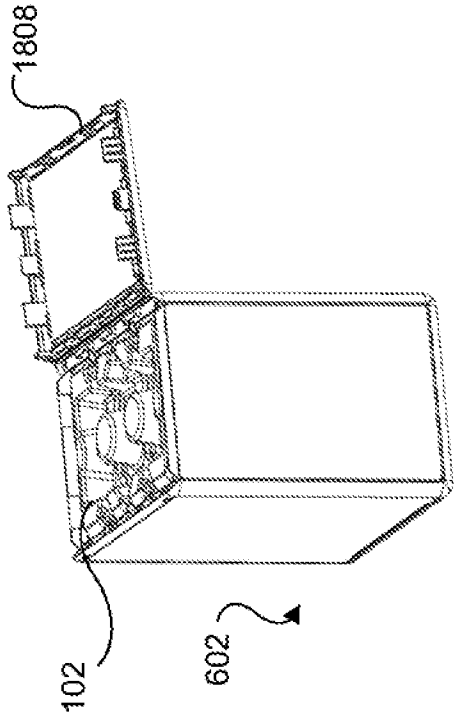


FIG. 18N

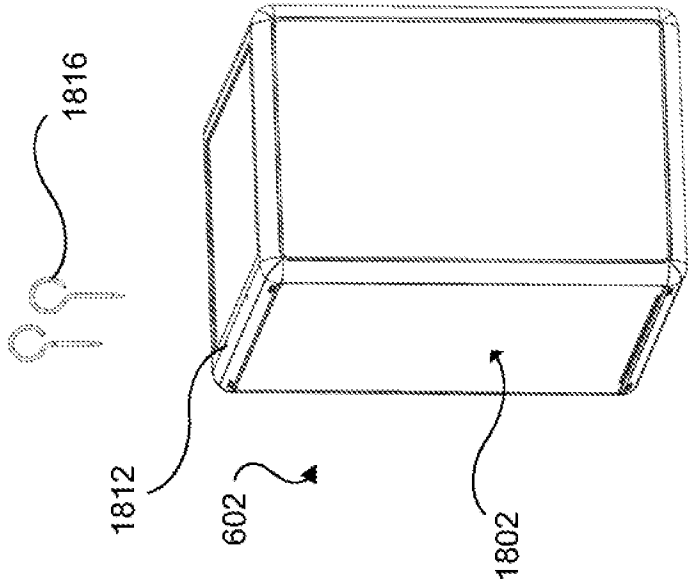


FIG. 18P

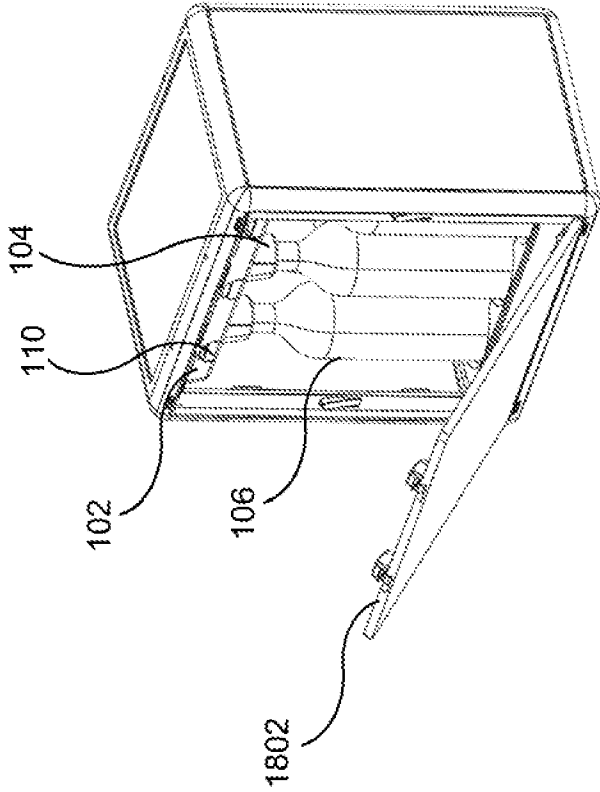


FIG. 18Q

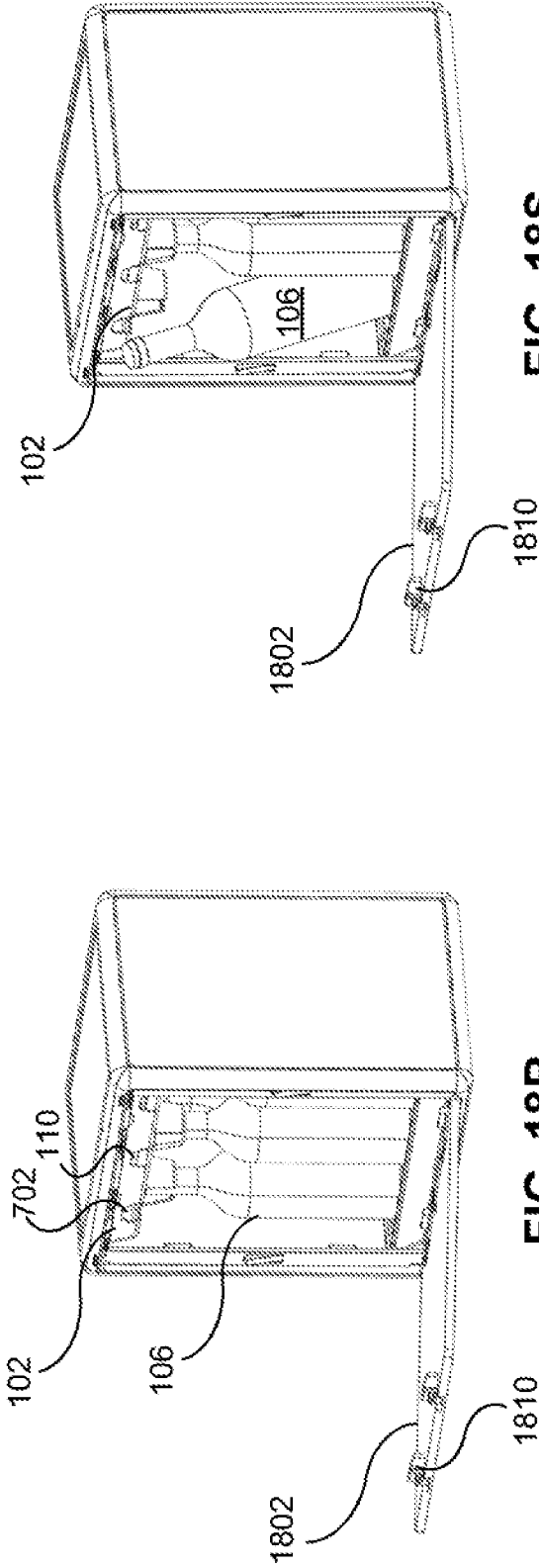


FIG. 18R

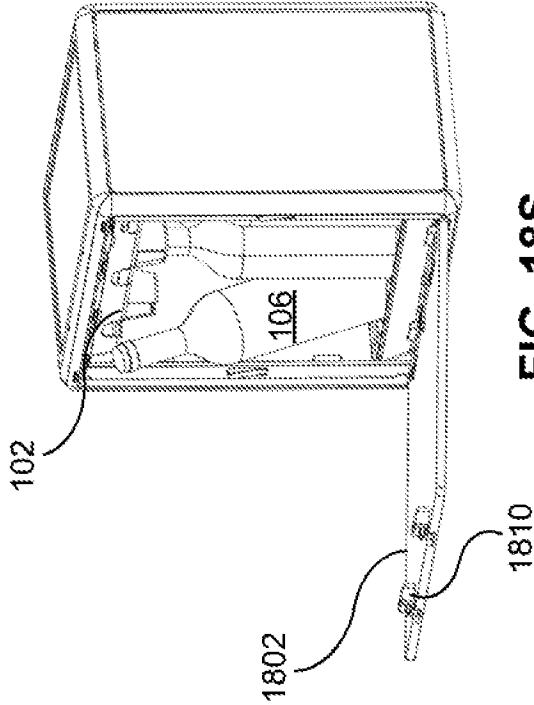


FIG. 18S

21 / 21

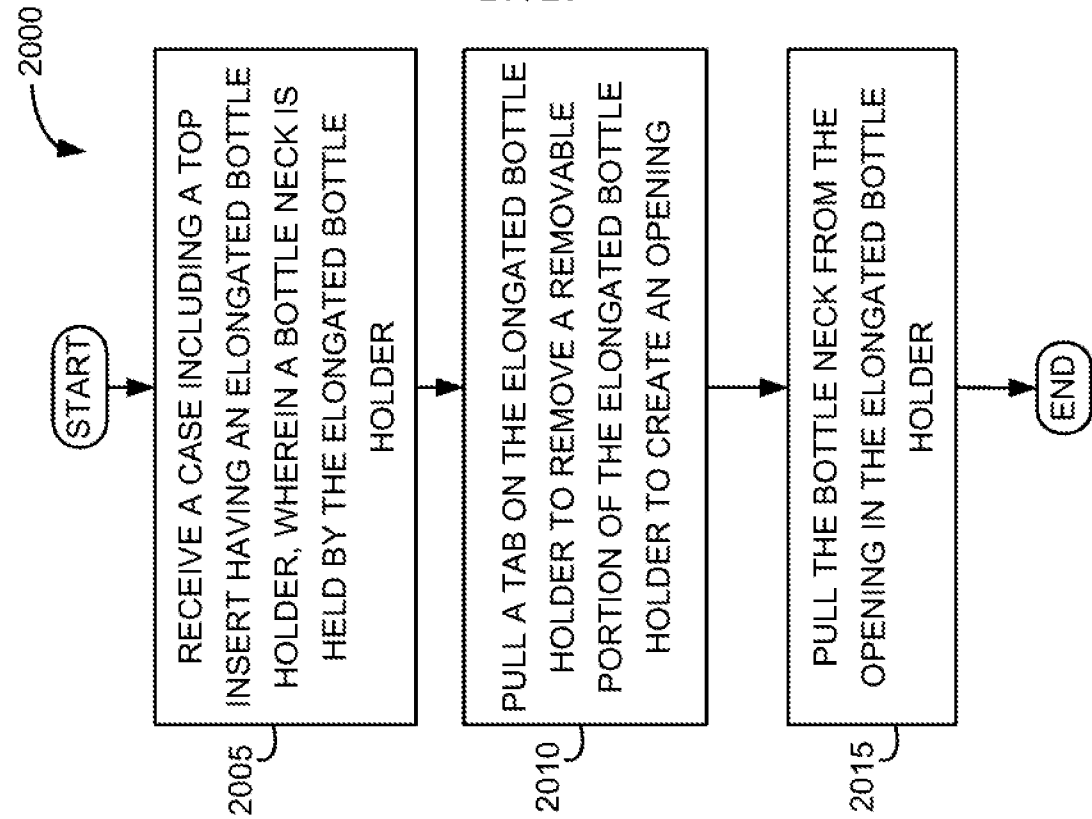


FIG. 20

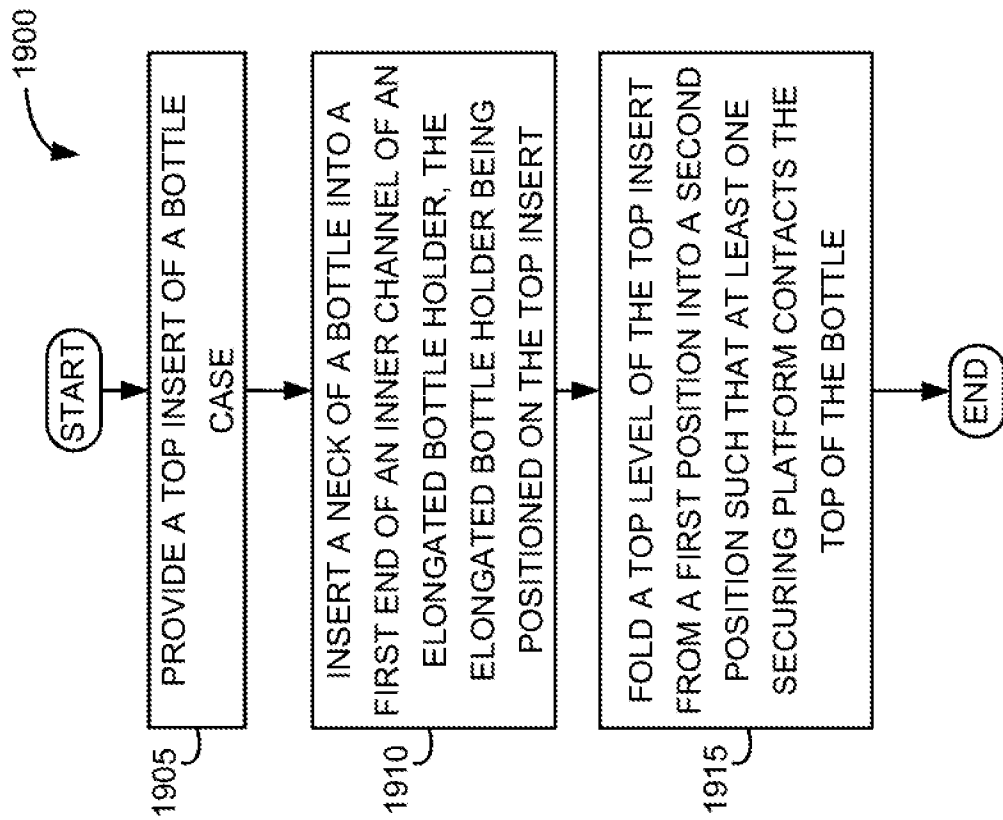


FIG. 19

INTERNATIONAL SEARCH REPORT

International application No.

PCT/US 20/39385

A. CLASSIFICATION OF SUBJECT MATTER

IPC - B65D 85/30, B65D 81/05, B65D 43/16, B65D 25/10, B65D 25/54 (2020.01)

CPC - B65D 85/305, B65D 11/1873, B65D 11/1893, B65D 21/0202, B65D 25/10, B65D 25/54, B65D 43/16, B65D 81/052, B65D 81/107, B65D 9/06, B65D 9/18, B65D 2211/00, B65D 2401/05

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

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

See Search History document

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

See Search History document

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

See Search History document

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 2018/0354711 A1 (CITADEL CASING LTD) 13 December 2018 (13.12.2018), entire document, especially figures 14A, 14B, 20A-20F, 23A	1, 3, 6-10, 31-34
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Y		2, 4-5
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A		11-30
Y	US 4,911,300 A (Colonna) 27 March 1990 (27.03.1990), entire document, especially Fig. 3, 4, 6, 7, 8; col 3, ln 67 to col 4, ln 7; col 4, ln 31-45;	2, 4-5
A	WO 95/23745 A1 (RIVERWOOD INTERNATIONAL CORPORATION) 08 September 1995 (08.09.1995), entire document, especially figures 1-3	11-30
A	US 7,252,196 B1 (Koefelda et al) 07 August 2007 (07.08.2007), entire document	1-34
A	US 2,287,731 A (Franks et al) 20 October 1941 (20.10.1941), entire document	1-34
A	US 2008/0135445 A1 (Juliano) 12 June 2008 (12.06.2008), entire document	1-34
A	US 6,213,297 B1 (Gale) 10 April 2001 (10.04.2001), entire document	1-34
A	US 5,975,300 A (Gale) 02 November 1999 (02.11.1999), entire document	1-34
A	US 6,325,210 B1 (Henry, Jr.) 04 December 2001 (04.12.2001), entire document	1-34



Further documents are listed in the continuation of Box C.



See patent family annex.

- * Special categories of cited documents:
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- "D" document cited by the applicant in the international application
- "E" earlier application or patent but published on or after the international filing date
- "L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
- "O" document referring to an oral disclosure, use, exhibition or other means
- "P" document published prior to the international filing date but later than the priority date claimed

- "T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
- "X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
- "Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
- "&" document member of the same patent family

Date of the actual completion of the international search

12 August 2020

Date of mailing of the international search report

25 SEP 2020

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Authorized officer

Lee Young

Telephone No. PCT Helpdesk: 571-272-4300