



(12) **EUROPEAN PATENT APPLICATION**

(43) Date of publication:
10.05.2023 Bulletin 2023/19

(51) International Patent Classification (IPC):
B65D 17/28 ^(2006.01)

(21) Application number: **21461616.1**

(52) Cooperative Patent Classification (CPC):
B65D 17/4012; B65D 23/0871; B65D 2517/0014;
B65D 2517/0062; B65D 2517/0073;
B65D 2517/0077; B65D 2517/0082

(22) Date of filing: **05.11.2021**

(84) Designated Contracting States:
AL AT BE BG CH CY CZ DE DK EE ES FI FR GB
GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO
PL PT RO RS SE SI SK SM TR
Designated Extension States:
BA ME
Designated Validation States:
KH MA MD TN

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(54) **EASY KEY CONTAINER LID**

(57) A lid for a container, such as a food, beverage, or storage container, may include a laterally extending lid body and a tab. The lid body may have a proximally extending protrusion and a distally extending well. The protrusion and the well may be radially aligned with one another. The tab may be fixed to the lid body. The tab

may include a nose, a handle, and a medial portion that extends between the nose and the handle. The tab may be positionable such that the tab contacts the protrusion causing the handle to be lifted proximally away from the lid body relative to the handle.

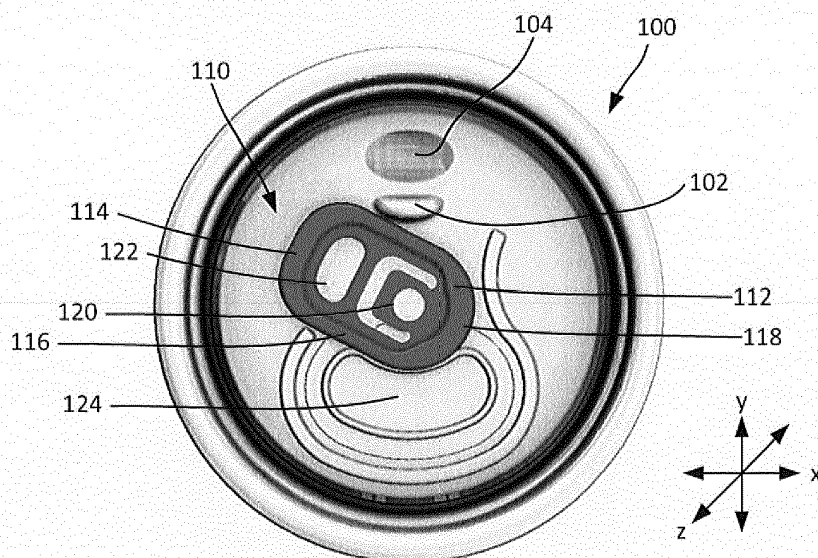


FIG. 1A

Description

FIELD OF THE INVENTION

[0001] The present technology relates to lids for opening containers. More specifically, the present technology relates to lid designs that facilitate easier opening of beverage, food, and storage containers.

BACKGROUND OF THE INVENTION

[0002] Food, beverage, and storage containers often include lids with graspable tabs that enable users to quickly and easily open the cans without the need for a can opener or other tool. Conventional lids include substantially flat surfaces with tabs fixed to the lid. A user may grasp the tab and pull up on the tab to force open a tear panel or to remove the entire lid. The tab is typically flush with the flat lid. As the tab is flush with the flat lid, it may be difficult for a user to reach underneath the tab and fully grasp the tab for an easy open. Therefore, improvements in lids and tabs for food, beverage, and storage cans are desired.

BRIEF SUMMARY OF THE INVENTION

[0003] The present technology relates to lids for containers, such as food, beverage, or storage cans. In some embodiments, the lids include a laterally extending lid body and a tab. The laterally extending lid body may have a proximally extending protrusion and a distally extending well. The protrusion and the well may be radially aligned with one another. The tab may be fixed to the lid body. The tab may include a nose, a handle, and a medial portion that extends between the nose and the handle. The tab may be positionable such that the tab contacts the protrusion causing the handle to be lifted proximally away from the lid body relative to the handle.

[0004] In some embodiments, the lid body may have a circular shape. The well may be disposed radially outward of the protrusion. The lid body may define an opening axially aligned with the protrusion and the well. The protrusion may depress the nose of the tab to the opening in the second radial position. The well may have a well area and the protrusion may have a protrusion area. The well area may be within 20% of the protrusion area. An outer perimeter of the lid body may define a tear panel for removing the lid from the container.

[0005] Some embodiments of the present technology may encompass methods for opening lids of containers. The methods may include rotating a tab about a laterally extending lid body of the lid from a first radial position to a second radial position. The tab may include a nose, a handle, and a medial portion that extends between and couples the nose and the handle. The laterally extending lid body may include a proximally extending protrusion and a distally extending well in axial alignment. The tab may contact the protrusion causing the handle to be lifted

proximally away from the lid body in the second radial position relative to the handle in the first radial position. The methods may include grasping the handle of the tab proximate the well. The methods may include lifting the handle of the tab proximally to open the container.

[0006] In some embodiments, the first radial position is characterized by the tab being offset from the protrusion by greater than or about 30 degrees. Grasping the handle of the tab may include sliding one or more digits underneath the handle into the well. In the second radial position, the protrusion may lift the handle of the tab proximate the well.

[0007] Some embodiments of the present technology may encompass easy-open (EZO) containers. The EZO containers may include a can body, a laterally extending lid body, and a tab. The laterally extending lid body may be fixed to a proximal end of the can body. The lid may include a proximally extending protrusion and a distally extending well. The protrusion and well may be radially aligned with one another. The tab may be fixed to the lid body. The tab may include a nose, a handle, and a medial portion that extends between and couples the nose and the handle. The tab may contact the protrusion causing the handle to be lifted proximally away from the lid body relative to the handle.

[0008] In some embodiments, the lid may include a center panel. The lid may include a peripheral curl coupled with a rim of the can. The lid may include a chuck wall disposed between the center panel and the peripheral curl. The chuck wall may include a substantially horizontal portion.

BRIEF DESCRIPTION OF THE DRAWINGS

[0009] A further understanding of the nature and advantages of the disclosed technology may be realized by reference to the remaining portions of the specification and the drawings.

FIG. 1A illustrates a top plan view of a lid for a container in a first radial position according to embodiments of the present invention.

FIG. 1B illustrates a partial cross-sectional side elevation view of a lid a container in the first radial position according to embodiments of the present invention.

FIG. 2A illustrates a top plan view of a lid for a container according in a second radial position according to embodiments of the present invention.

FIG. 2B illustrates a partial cross-sectional side elevation view of a lid of a container in a second radial position according to embodiments of the present invention.

FIG. 3 illustrates an isometric view of an easy open

container according to embodiments of the present invention.

FIG. 4 schematically depicts a method of opening a lid of a container according to embodiments of the present invention.

[0010] Several of the figures are included as schematics. It is to be understood that the figures are for illustrative purposes, and are not to be considered of scale unless specifically stated to be of scale. Additionally, as schematics, the figures are provided to aid comprehension and may not include all aspects or information compared to realistic representations, and may include exaggerated material for illustrative purposes.

[0011] In the appended figures, similar components and/or features may have the same reference label. Further, various components of the same type may be distinguished by following the reference label by a letter that distinguishes among the similar components. If only the first reference label is used in the specification, the description is applicable to any one of the similar components having the same first reference label irrespective of the letter.

DETAILED DESCRIPTION OF THE INVENTION

[0012] The ensuing description provides exemplary embodiments only, and is not intended to limit the scope, applicability, or configuration of the disclosure. Rather, the description of the exemplary embodiments will provide those skilled in the art with an enabling description for implementing one or more exemplary embodiments. It being understood that various changes may be made in the function and arrangement of elements without departing from the spirit and scope of the invention as set forth in the appended claims.

[0013] Embodiments of the present invention are directed to lids for containers such as food, beverage, and storage cans. The lids, which may also be referred to as can ends, may include a proximally extending protrusion and a distally extending well, which may allow tabs to be rotated, e.g., laterally rotated between a first radial position and a second radial position. The distinct radial positions may allow for the tabs on the lids to be lifted for easier opening of the containers. Embodiments may include tabs for beverage cans in which a user lifts the handle of the tab to push on a region of a lid having a perforation and/or weakened perimeter to push the region into the inner region of the container to create an opening in the lid through which the beverage may be poured or drank. Embodiments may also be utilized in food and/or beverage cans, such as "easy open" (EZO) cans in which the tab is used to puncture the lid near an outer periphery of the can, with the user then pulling the tab and lid backwards to partially or fully remove the lid from the can. While discussed primarily in the context of food, beverage, and storage cans, it will be appreciated

that the features described herein may be applied to other cans and containers, including racquetball cans, tennis ball cans, and the like.

[0014] Turning now to **FIGS. 1A-1B**, top plan and partial side views of a lid 100 according to one embodiment of the present technology are illustrated. Referring to **FIG. 3**, the longitudinal and lateral/radial directions shown, as well as the proximal and distal portions. Referring again to **FIGS. 1A-1B**, lid 100 includes a laterally extending, e.g. in the XY plane, lid body that is formed of a metallic material, such as or including aluminum, tin, steel, and/or other metal. The lid body may have any shape, such as a circular, square, or another polygonal shape. In some embodiments, such as food or beverage can embodiments, the lid body may have a circular shape. However, it is contemplated that the lid body may take on any shape depending on the container body to which it is to be affixed to.

[0015] The lid body may include a proximally extending, e.g. in the +Z direction, protrusion 102 and a distally extending, e.g., in the -Z direction, well 104. The protrusion 102 and the well 104 may be radially aligned with one another. It is contemplated that the protrusion 102 and the well 104 may also be radially offset from one another. In embodiments, the well 104 may be disposed radially outward of the protrusion. That is, the well 104 may be closer to an outer periphery of the lid body than the protrusion.

[0016] The protrusion 102 may have a tapered profile where the middle of the protrusion 102 extends in the proximal direction a greater height than the edges of the protrusion 102 extend in the proximal direction. Additionally, the well 104 may have a tapered profile where the middle of the well 104 extends in the distal direction a greater depth than the edges of the well 104 extend in the distal direction. The protrusion 102 may have a protrusion area. The protrusion area may be measured by the area of the outer periphery of the protrusion 102, or the area of the lid 100 that is depressed distally from the lid 100. Similarly, the well 104 may have a well area. The well area may be measured by the area of the outer periphery of the well 104, or the area of the lid 100 that is raised proximally from the lid 100. The well area may be within 20% of the protrusion area, such as within 18%, within 16%, within 14%, within 12%, within 10%, within 8%, within 6%, within 4%, within 2%, or less. For example, the well area may be within about 2% to about 20% of the protrusion area, such as within about 6% to about 20%, within about 10% to about 20%, within about 2% to about 16%, within about 2% to about 14%, or within about 2% to about 10%.

[0017] The protrusion 102 may extend greater than or about 0.1 mm, greater than or about 0.5 mm, greater than or about 1.0 mm, greater than or about 2.0 mm, greater than or about 3.0 mm from the lid body. For example, the protrusion 102 may extend from about 0.1 mm to about 5.0 mm, from about 1.0 mm to about 4.0 mm, or about 2.0 mm to about 3.0 mm. Similarly, the well

104 may recess greater than or about 0.1 mm, greater than or about 0.5 mm, greater than or about 1.0 mm, greater than or about 2.0 mm, greater than or about 3.0 mm into the lid body. For example, the well 104 may recess from about 0.1 mm to about 10.0 mm, from about 1.0 mm to about 7.5 mm, or about 2.0 mm to about 5.0 mm.

[0018] A tab 110 may be fixed to the lid body. In embodiments, the tab 110 may be rotatably fixed to the lid body such that the tab may rotate about the lid body. The tab 110 may include a nose 112 and a handle 114, with a medial portion 116 that extends between and couples the nose 112 and the handle 114. The tab 110 may include a longitudinal axis that extends through the nose 112, handle 114, and medial portion 116. As shown, nose 112 includes an optional apex 118 that is used to puncture and/or otherwise open a lid 100 of a container on which the tab 100 is mounted. Nose 112 may further define an opening 120 that may receive a rivet and/or other fastening mechanism that is used to secure the tab 110 to the lid 100 of a container. The nose 112 and apex 118 may be at a proximal end of tab 100 and handle 114 may be at a distal end of tab 100.

[0019] Handle 114 and/or medial portion 116 may define a central opening 122, which may help a user better grasp the handle 114. Central opening 122 may have a generally circular shape as shown here, or may have any other shape, such as an oval, oblong, or other shape. In some embodiments, such as those in which the tab 110 is installed on an easy-open (EZO) container, the central opening 122 may be sufficiently large that a user may position his or her finger through the central opening 122 to make it easier to apply sufficient force to remove the lid 100 from the container. Some or all of the edge of the material used to form the tab 110 may be bent, folded, and/or otherwise curved onto itself such that some or all of the outer periphery of the central opening 122 may have a rounded edge. For example, the central opening 122 may be formed using a punch or other machining device that forms a hole in a sheet of metallic material.

[0020] Tab 110 may be formed by punching, die cutting, machining and/or otherwise forming the body of tab into a sheet of metal material. This may be performed over several different steps. For example, a general tab shaped periphery may be stamped or punched to the sheet of metal material, opening 120 and/or central opening 122 may be cut into the body, and/or other features may be formed in one or more steps.

[0021] The lid body may also define an opening 124. The opening 124 may be axially aligned with the protrusion 102 and the well 104. Again, it is contemplated that the opening 124, protrusion 102, and the well 104, or any combination of the three, may radially offset from one another. As shown in **FIGS. 2A-2B**, the tab 110 may be positionable such that the tab 110 contacts the protrusion 102 causing the handle to be lifted proximally away from the lid body relative to the handle 114. The protrusion 102 may depress the nose 112 of the tab 110 to the open-

ing 124, such as in a second radial position. In embodiments, the tab 110 may be offset from the protrusion 102 and/or well 104 in a first radial position (as shown in **FIGS. 1A-1B**). Simultaneously, in the second radial position, the protrusion 102 may lift the handle 114 proximally away from the lid body, as previously described. Together, the protrusion 102 may increase the distance of the tab 110 from the lid body and the well 104 may provide a portion of the lid body that has an even greater distance from the lid body. The protrusion 102 may lift the tab 110 greater than or about 0.5 mm, greater than or about 0.6 mm, greater than or about 0.7 mm, greater than or about 0.8 mm, greater than or about 0.9 mm, greater than or about 1.0 mm, greater than or about 1.1 mm, greater than or about 1.2 mm, greater than or about 1.3 mm, greater than or about 1.4 mm, greater than or about 1.5 mm, greater than or about 1.6 mm, greater than or about 1.7 mm, greater than or about 1.8 mm, greater than or about 1.9 mm, greater than or about 2.0 mm, greater than or about 2.5 mm, greater than or about 3.0 mm, or more from the lid body. For example, the protrusion may lift the tab 110 between about 0.5 mm and about 3.0 mm, such as between about 0.7 mm and about 3.0 mm, between about 1.0 mm and 3.0 mm, between about 1.5 mm and about 3.0 mm, between about 0.5 mm and 2.5 mm, between about 0.5 mm and 2 mm, or between about 0.5 mm and 1.5 mm. The distance lifted may be measured in a variety of ways. For example, the distance lifted may be measured by a distance between the lid body and an edge of the tab 110, such as at the handle 114 of the tab 110, by a distance between an uppermost point of the protrusion 102 to the handle 114 of the tab 110, or by a distance between a lowermost point of the well 104 to the handle 114 of the tab 110. If the distance between the lid body and the tab 110 is too great, the container may undesirably open or multiple containers may not be able to be stacked upon one another.

[0022] Some embodiments of the present invention may be directed to an EZO container. As shown in **FIG. 3**, the EZO container 300 may include a can body, which may include a cylindrical sidewall 305 and a base 310. The container may define an open interior, which may be used to store food, beverages, and/or other objects. A lid may be positioned over the open interior to seal the contents of container. The lid may be similar to lid 100 described above. The lid may include a tab, which may be used to open the container. The tab may be any tab, such as tab 110 in some embodiments. A user may be able to grasp a handle of tab and pull the handle upward relative to lid to puncture and/or otherwise push a portion of lid downward. For example, the user may lift the handle of the tab to push on a region of a lid having a perforation and/or weakened perimeter to push the region into the inner region of the container to create an opening in the lid through which the beverage may be poured or drank. In some embodiments, such as when container is a drink can, the upward movement of the handle of tab may fully open a drinking/pouring opening of lid. In other embodi-

ments, such as when container has a peel open lid, the user may need to pull tab away from can body to peel all or a portion of lid off of can body to access the contents of container.

[0023] As shown in **FIG. 1B**, lid 100 may include a center panel 200 that is generally flat and is designed to cover a substantial amount of an opening of a can. The protrusion 102, well 104, and tab 110 may be located on the center panel 200. Lid 100 may also include a peripheral curl 202 that is designed to be coupled with a rim of the can to secure lid 100 and can together. Disposed between center panel 200 and peripheral curl 202 may be a chuck wall 204. As used in herein, "chuck wall" is understood to refer to a portion of lid 100 located between a countersink region 206 and peripheral curl 202 and which is contacted by or engaged with a chuck during a seaming operation of a manufacturing process. Chuck wall 204 may include a substantially vertical portion 208 and a substantially horizontal portion 210. Substantially vertical portion 208 may be within 15 degrees of vertical (such as relative to an angle that is generally orthogonal to the center panel 202), within 10 degrees of vertical, within 5 degrees of vertical, or less. In terms of ranges, the angle of substantially vertical portion 208 may range from 0 degrees and 15 degrees of vertical, e.g., from 1 degree to 12 degrees or from 5 degrees to 8 degrees. Substantially vertical portion 208 may be linear and/or may have a contour. Substantially horizontal portion 210 may have an angle θ within 30 degrees of horizontal (such as relative to the center panel 200), within 25 degrees of horizontal, within 20 degrees of horizontal, within 15 degrees of horizontal, within 10 degrees of horizontal, within 5 degrees of horizontal, or less. Substantially horizontal portion 210 may be linear and/or may have a contour.

[0024] Embodiments of the present disclosure may also be directed to methods of opening lids of containers, such as the lid 100 previously described above. As shown in **FIG. 4**, the methods 400 include rotating a tab about a laterally extending lid body of the lid at step 405, such as the lid 100 previously described above, from a first radial position to a second radial position. As previously described above, the tab may include a nose, a handle, and a medial portion that extends between and couples the nose and the handle. The laterally extending lid body may include a proximally extending protrusion and a distally extending well in axial alignment. The tab may contact the protrusion causing the handle to be lifted proximally away from the lid body in the second radial position relative to the handle in the first radial position. The methods include grasping the handle of the tab proximate the well at step 410 and include lifting the handle of the tab proximally to open the container at step 415.

[0025] The first radial position may be characterized by the tab being offset from the protrusion by greater than or about 30 degrees, such as greater than or about 35 degrees, greater than or about 40, greater than or about 45 degrees, or more. For example, the first radial position may be characterized by the tab being offset from the

protrusion by between about 30 degrees and about 50 degrees, such as between about 30 degrees and about 45 degrees, between about 35 degrees and about 45 degrees, between about 35 degrees and about 40 degrees, or between about 40 degrees and about 45 degrees. Grasping the handle of the tab may include sliding one or more digits underneath the handle into the well. Alternatively, a key or other utensil may be slid underneath the handle into the well. As previously described above, in the second radial position, the protrusion lifts the handle of the tab proximate the well.

[0026] Embodiments of the present disclosure may allow for easier opening of containers having sealable lids with tabs. In conventional designs, the tabs are flush with the lids and it becomes difficult for users to grasp the tabs to open to lids. In embodiments of the present disclosure, the protrusions and wells on the lids may allow for the tab to be lifted when the tab is laterally rotated about the lid. Once rotated, the protrusion lift the tab and the well may provide a recess for easier grasping of the tabs by providing an increased gap that allows a user's finger to more easily insert under the handle for easier opening.

[0027] The methods, systems, and devices discussed herein are examples. Various configurations may omit, substitute, or add various procedures or components as appropriate. For instance, in alternative configurations, the methods may be performed in an order different from that described, and/or various stages may be added, omitted, and/or combined. Also, features described with respect to certain configurations may be combined in various other configurations. Different aspects and elements of the configurations may be combined in a similar manner. Also, technology evolves and, thus, many of the elements are examples and do not limit the scope of the disclosure or claims. Additionally, the techniques discussed herein may provide differing results with different types of context awareness classifiers.

[0028] While illustrative and presently preferred embodiments of the disclosed systems, methods, and machine-readable media have been described in detail herein, it is to be understood that the inventive concepts may be otherwise variously embodied and employed, and that the appended claims are intended to be construed to include such variations, except as limited by the prior art.

[0029] Unless defined otherwise, all technical and scientific terms used herein have the same meaning as commonly or conventionally understood. As used herein, the articles "a" and "an" refer to one or to more than one (i.e., to at least one) of the grammatical object of the article. By way of example, "an element" means one element or more than one element. "About" and/or "approximately" as used herein when referring to a measurable value such as an amount, a temporal duration, and the like, encompasses variations of $\pm 20\%$ or $\pm 10\%$, $\pm 5\%$, or $\pm 0.1\%$ from the specified value, as such variations are appropriate to in the context of the systems, devices, circuits, methods, and other implementations described

herein. "Substantially" as used herein when referring to a measurable value such as an amount, a temporal duration, a physical attribute (such as frequency), and the like, also encompasses variations of $\pm 20\%$ or $\pm 10\%$, $\pm 5\%$, or $+0.1\%$ from the specified value, as such variations are appropriate to in the context of the systems, devices, circuits, methods, and other implementations described herein.

[0030] Where a range of values is provided, it is understood that each intervening value, to the smallest fraction of the unit of the lower limit, unless the context clearly dictates otherwise, between the upper and lower limits of that range is also specifically disclosed. Any narrower range between any stated values or unstated intervening values in a stated range and any other stated or intervening value in that stated range is encompassed. The upper and lower limits of those smaller ranges may independently be included or excluded in the range, and each range where either, neither, or both limits are included in the smaller ranges is also encompassed within the technology, subject to any specifically excluded limit in the stated range. Where the stated range includes one or both of the limits, ranges excluding either or both of those included limits are also included.

Claims

1. A lid for a container, comprising:

a laterally extending lid body having a proximally extending protrusion and a distally extending well, wherein the protrusion and the well are radially aligned with one another; and
a tab fixed to the lid body, the tab comprising a nose, a handle, and a medial portion that extends between the nose and the handle;
wherein the tab is positionable such that the tab contacts the protrusion causing the handle to be lifted proximally away from the lid body relative to the handle.

2. The lid for a container of claim 1, wherein the lid body has a circular shape.

3. The lid for a container of claim 2, wherein the well is disposed radially outward of the protrusion.

4. The lid for a container of claim 1, wherein the lid body further defines an opening axially aligned with the protrusion and the well.

5. The lid for a container of claim 1, wherein the lid body further comprises an openable tear panel axially aligned with the protrusion and the well.

6. The lid for a container of claim 4, wherein the protrusion depresses the nose of the tab to the opening.

7. The lid for a container of claim 1, wherein the well has a well area and the protrusion has a protrusion area, and wherein the well area is within 20% of the protrusion area.

8. The lid for a container of claim 1, wherein an outer perimeter of the lid body defines a tear panel for removing the lid from the container.

9. The lid for a container of claim 1, wherein:

the tab is rotatably fixed to the lid body; and
the tab has a first radial position in which the tab does not contact the protrusion, and a second radial position in which the tab contacts the protrusion causing the handle to be lifted proximally away from the lid body relative to the handle in the first radial position.

10. A method of opening a lid of a container comprising:

rotating a tab about a laterally extending lid body of the lid from a first radial position to a second radial position, wherein:

the tab comprises a nose, a handle, and a medial portion that extends between and couples the nose and the handle;
the laterally extending lid body comprises a proximally extending protrusion and a distally extending well in axial alignment; and
the tab contacts the protrusion causing the handle to be lifted proximally away from the lid body in the second radial position relative to the handle in the first radial position;

grasping the handle of the tab proximate the well; and
lifting the handle of the tab proximally to open the container.

91. The method of claim 10, wherein the first radial position is **characterized by** the tab being offset from the protrusion by greater than or about 30 degrees.

12. The method of claim 10, wherein grasping the handle of the tab comprises sliding one or more digits underneath the handle into the well.

13. The method of claim 10, wherein, in the second radial position, the protrusion lifts the handle of the tab proximate the well.

14. An easy-open (EZO) container, comprising:

a can body;

a laterally extending lid body fixed to a proximal end of the can body, wherein the lid comprises a proximally extending protrusion and a distally extending well, wherein the protrusion and well are radially aligned with one another; 5
 a tab fixed to the lid body, the tab comprising a nose, a handle, and a medial portion that extends between and couples the nose and the handle, and wherein the tab is positionable such that the tab contacts the protrusion causing the handle to be lifted proximally away from the lid body relative to the handle. 10

15. The EZO container of claim 14, wherein:

the lid comprises:

a center panel;
 a peripheral curl coupled with a rim of the can; and 20
 a chuck wall disposed between the center panel and the peripheral curl; and

the chuck wall comprises a substantially horizontal portion. 25

16. The EZO container of claim 14, wherein:

the tab is rotatably fixed to the lid body; and
 the tab has a first radial position in which the tab does not contact the protrusion, and a second radial position in which the tab contacts the protrusion causing the handle to be lifted proximally away from the lid body relative to the handle in the first radial position. 30
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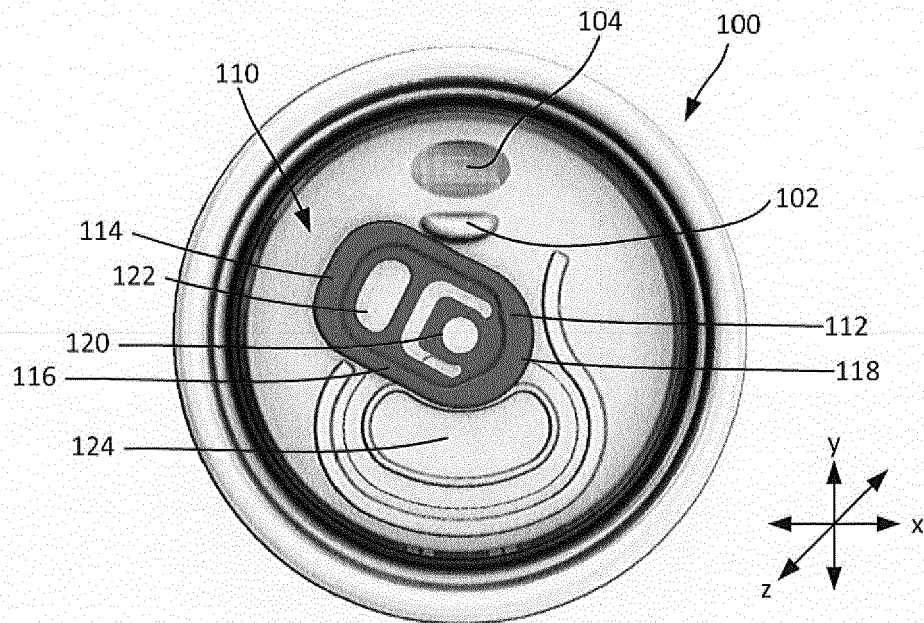


FIG. 1A

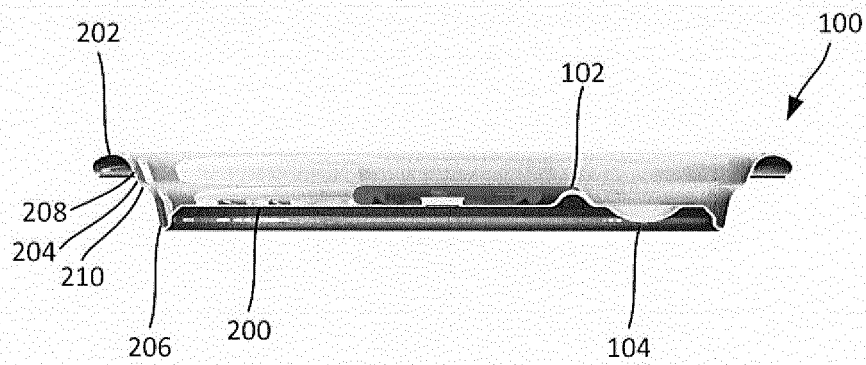


FIG. 1B

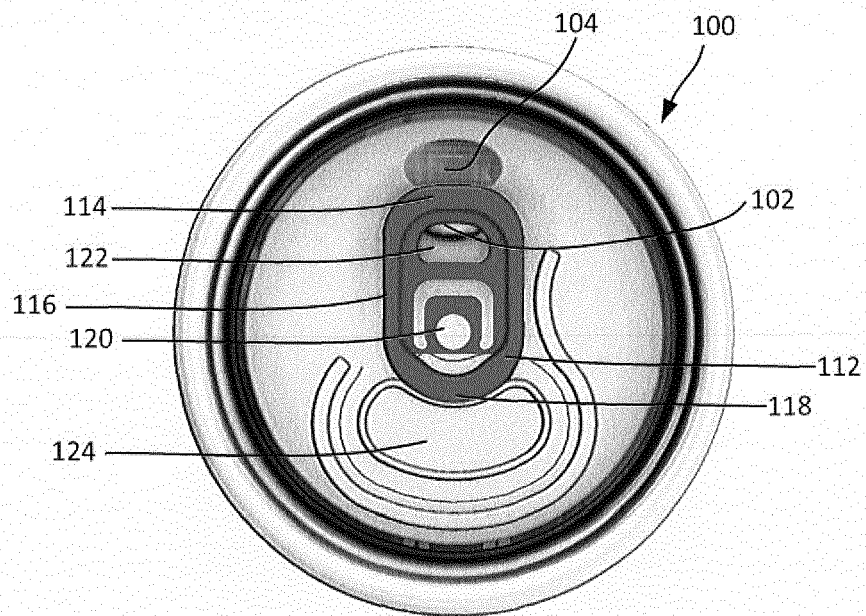


FIG. 2A

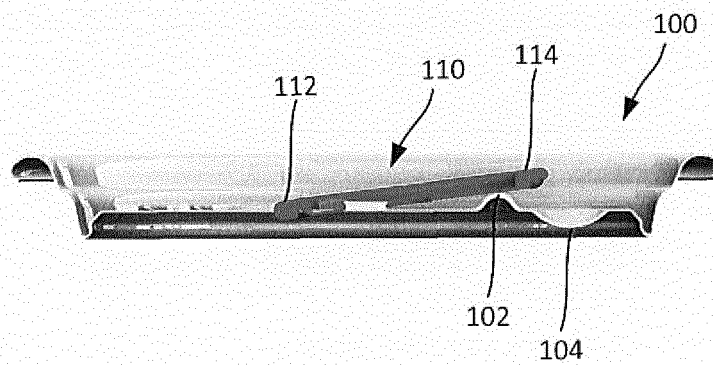
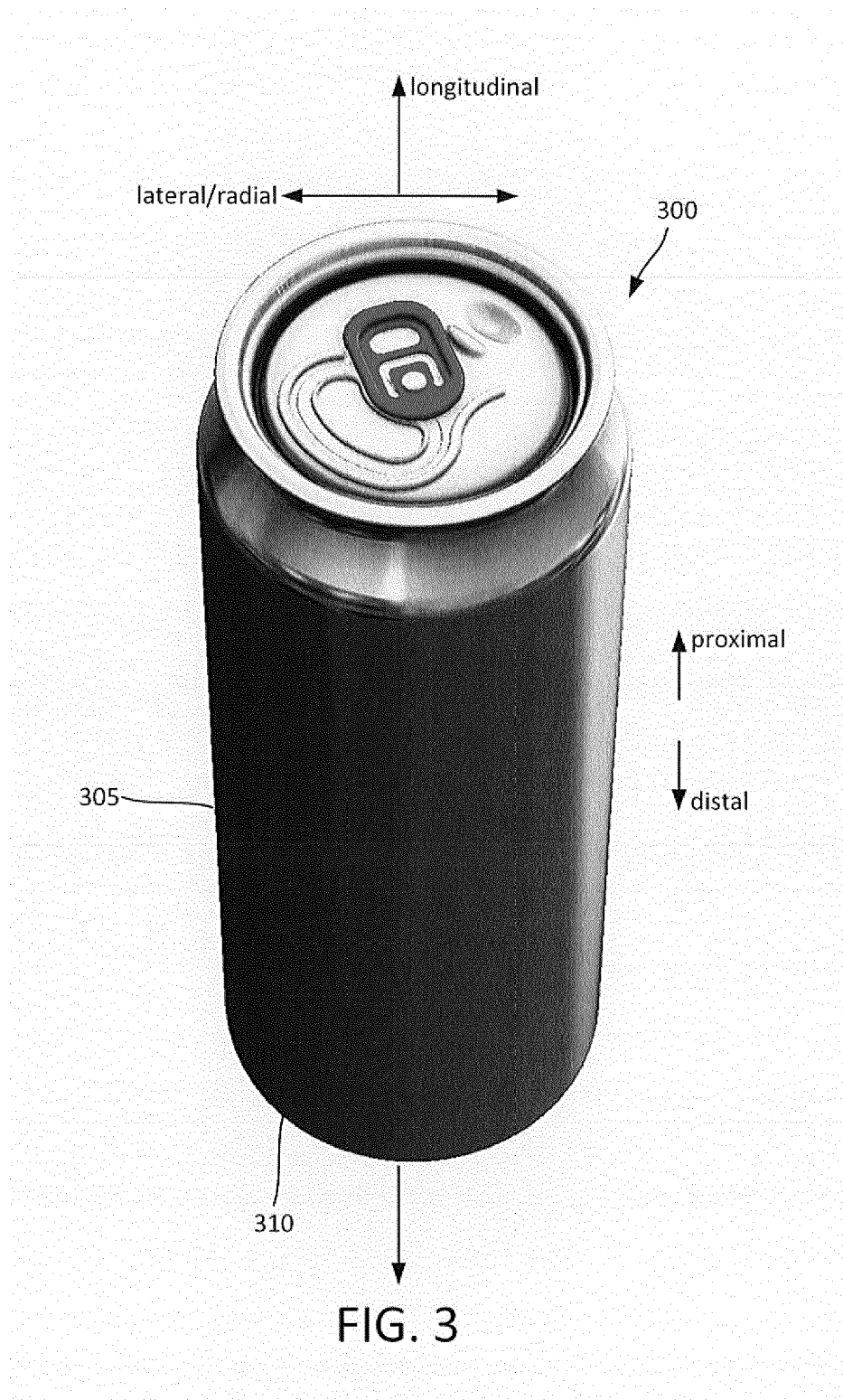


FIG. 2B



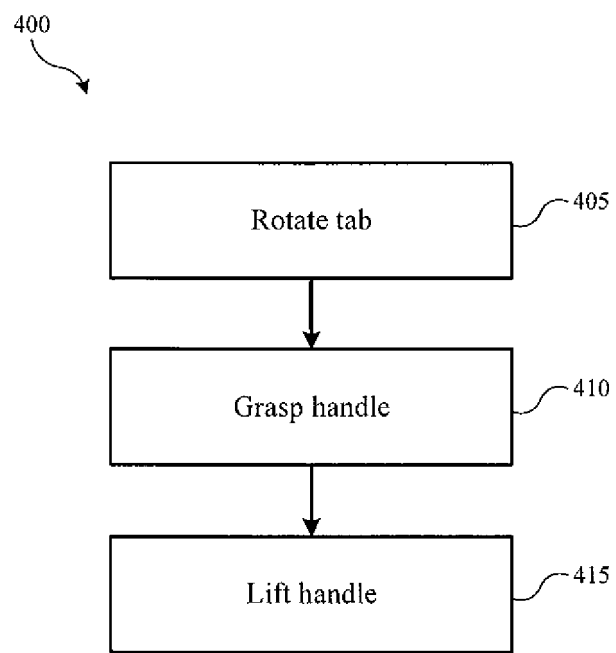


FIG. 4



EUROPEAN SEARCH REPORT

Application Number

EP 21 46 1616

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	KR 2018 0066777 A (YUN SOUNG HUN [KR]) 19 June 2018 (2018-06-19) * figures 3-7 * -----	1-16	INV. B65D17/28
A	US 5 224 618 A (GARBISO MICHAEL J [US]) 6 July 1993 (1993-07-06) * figures 1-10 * -----	1-16	
			TECHNICAL FIELDS SEARCHED (IPC)
			B65D
The present search report has been drawn up for all claims			
Place of search		Date of completion of the search	Examiner
The Hague		30 March 2022	Sacepe, Nicolas
CATEGORY OF CITED DOCUMENTS		T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document	
X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document			

1
EPO FORM 1503 03.82 (P04C01)

**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

EP 21 46 1616

5 This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
The members are as contained in the European Patent Office EDP file on
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30-03-2022

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
KR 20180066777 A	19-06-2018	NONE	

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