US 20140091103A1

(19) **United States**

(12) **Patent Application Publication**

Neitzel

(10) **Pub. No.: US 2014/0091103 A1**

(43) **Pub. Date: Apr. 3, 2014**

(54) **LID**

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(21) Appl. No.: **14/043,484**

(22) Filed: **Oct. 1, 2013**

Related U.S. Application Data

(60) Provisional application No. 61/708,957, filed on Oct. 2, 2012.

Publication Classification

(51) **Int. Cl.**

B65D 43/22 (2006.01)
B65B 5/06 (2006.01)
B65D 21/02 (2006.01)

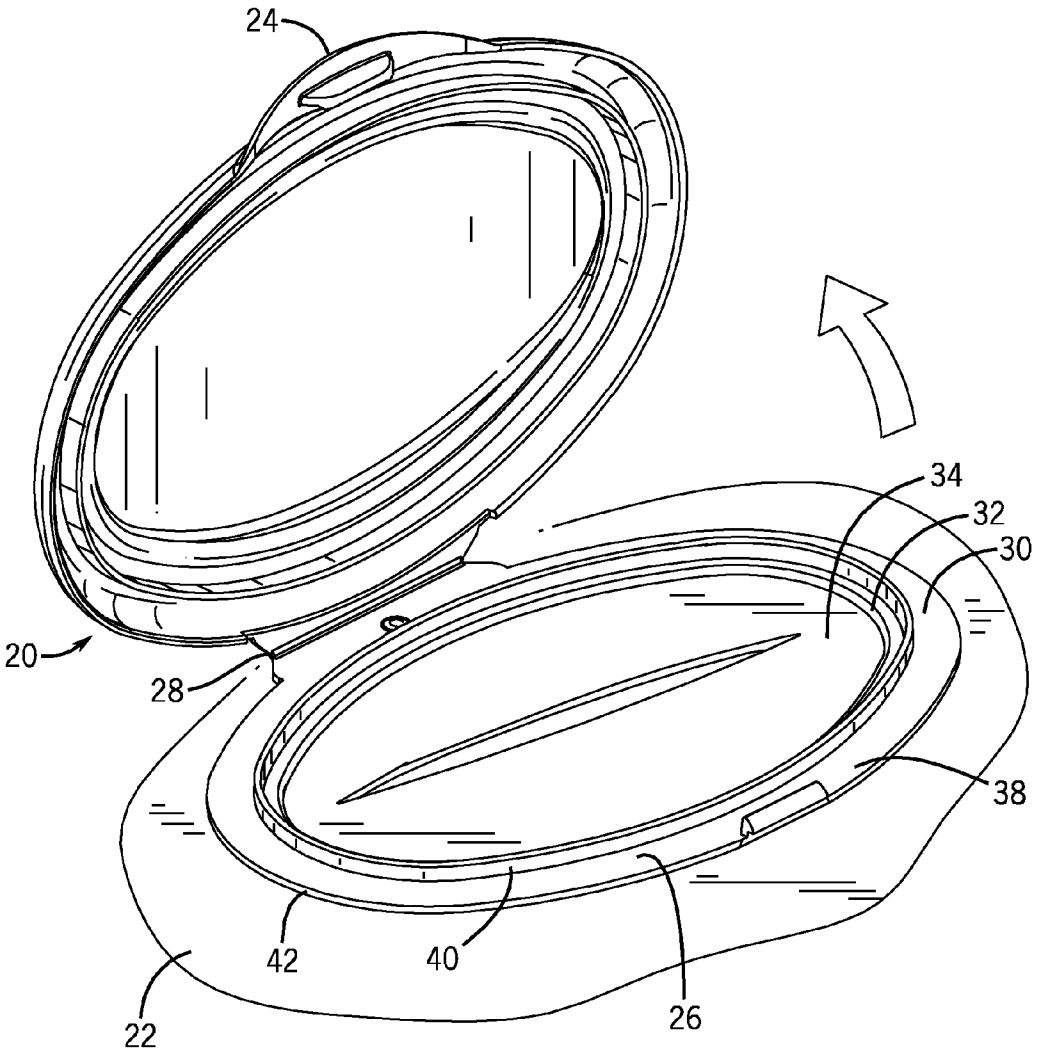
(52) **U.S. Cl.**

CPC ***B65D 43/22*** (2013.01); ***B65D 21/0223*** (2013.01); ***B65B 5/06*** (2013.01)

USPC **220/833**; 206/508; 53/447

(57) **ABSTRACT**

Embodiments of a lid are provided. In one embodiment, the lid may be coupled to a container to provide selective access to the contents of the container. In one embodiment, the lid is configured to be stacked.



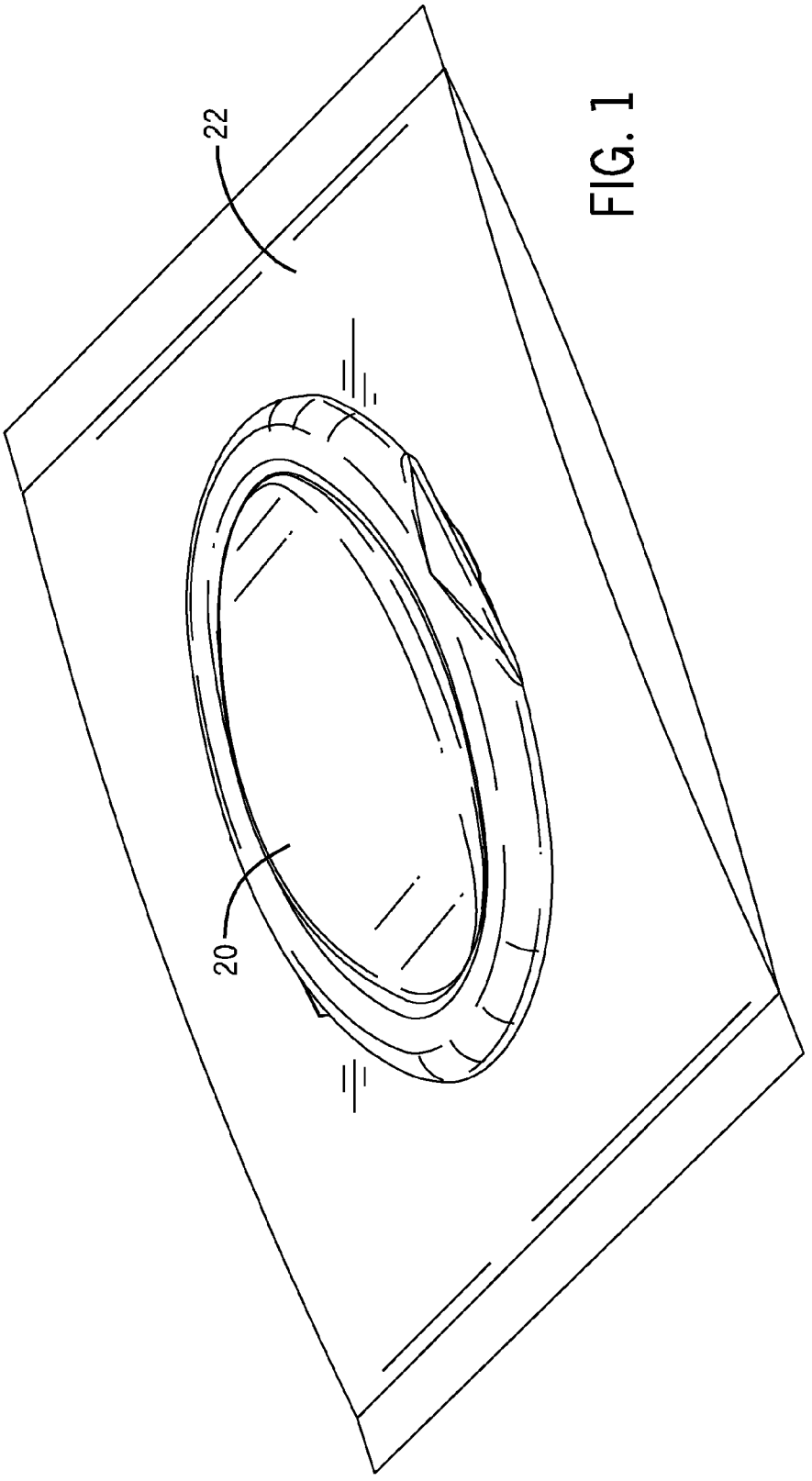


FIG. 1

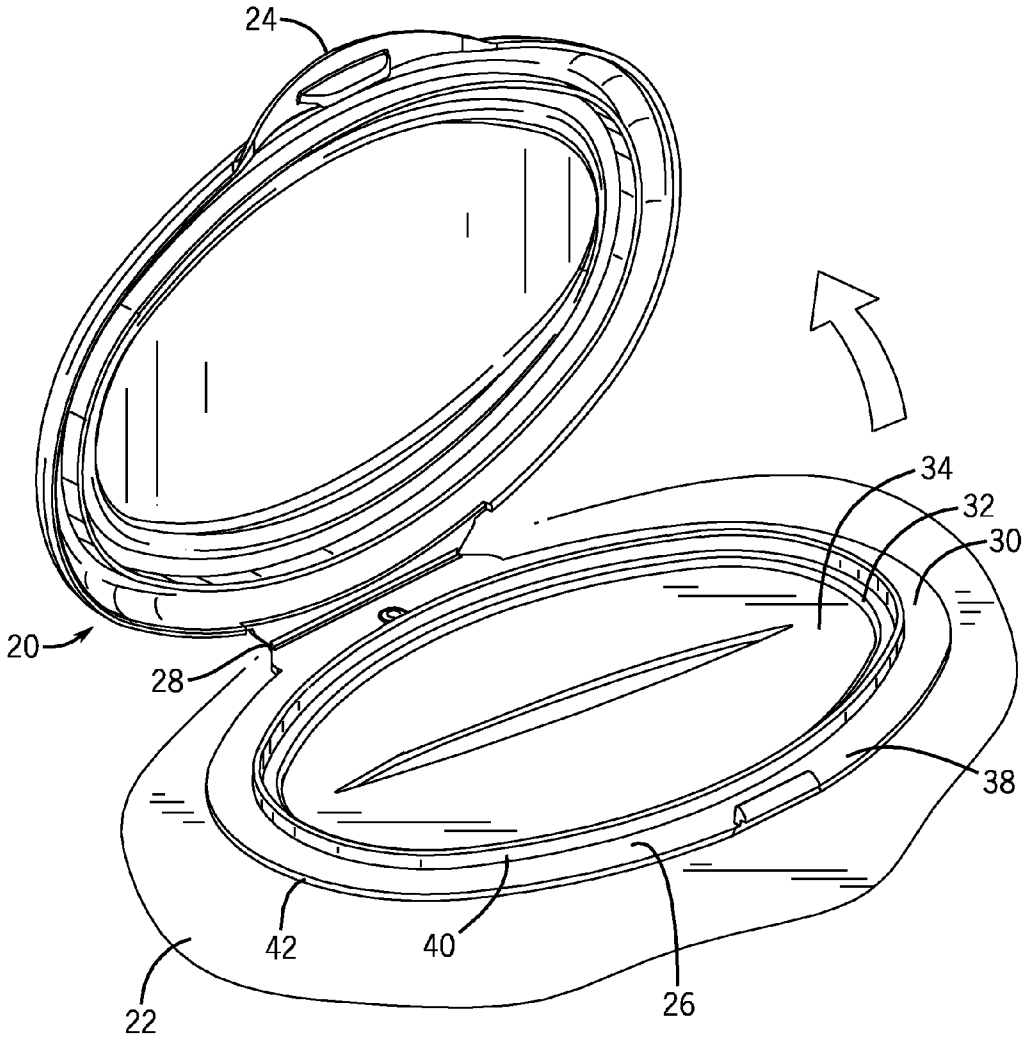


FIG. 2

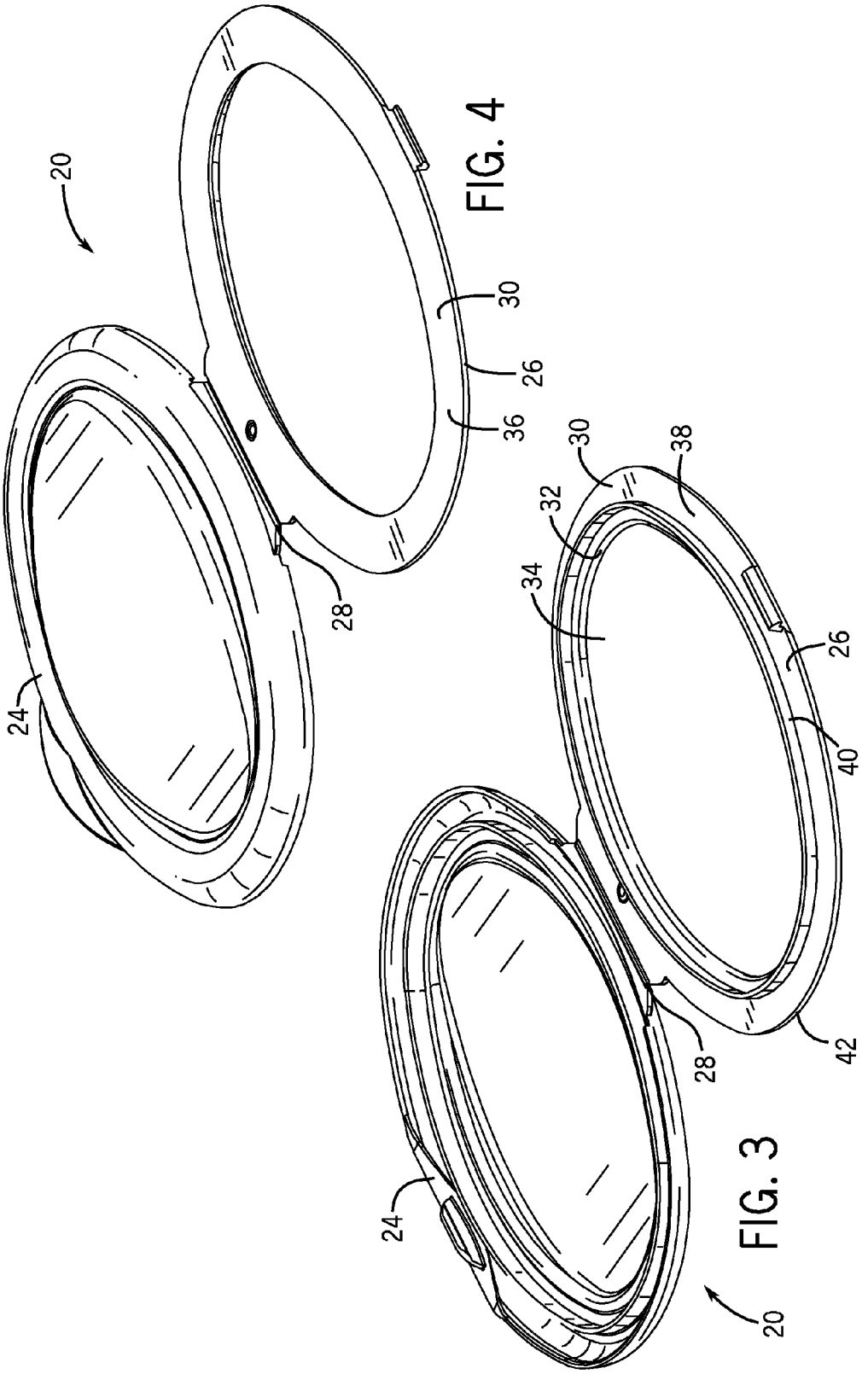
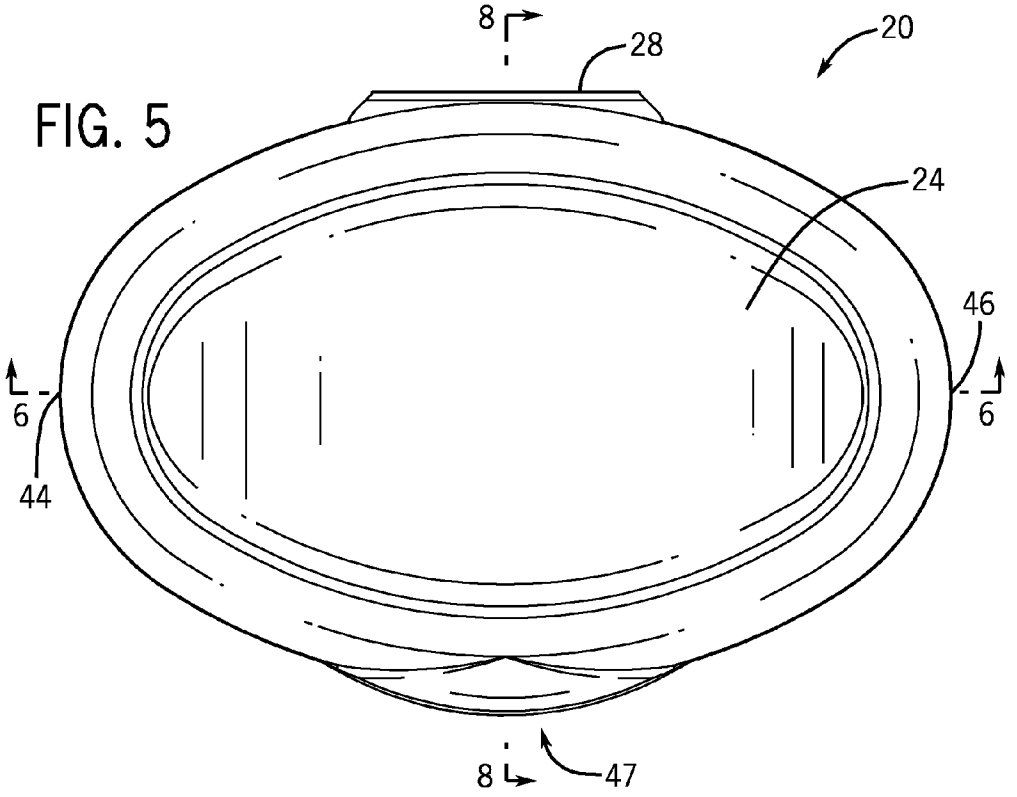


FIG. 4

FIG. 3

FIG. 5



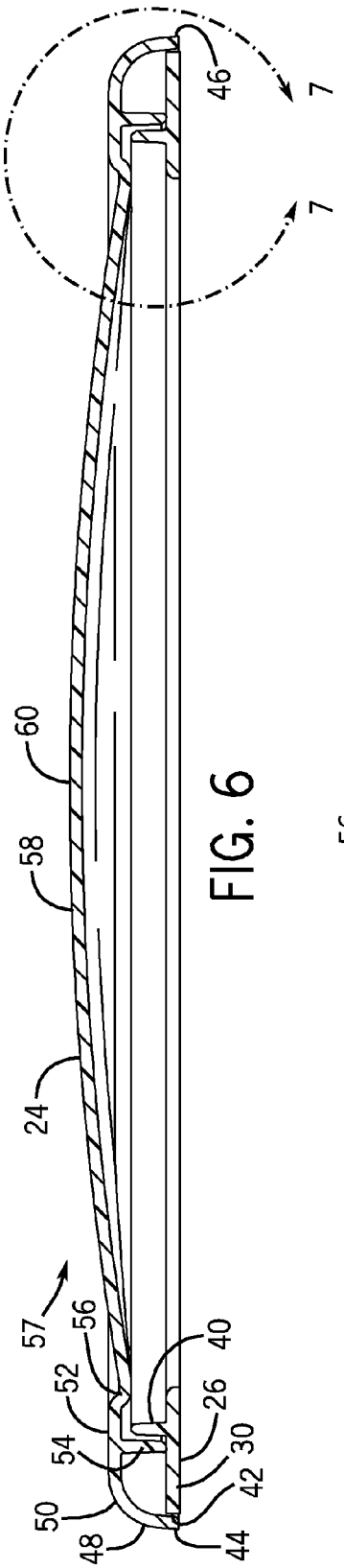


FIG. 6

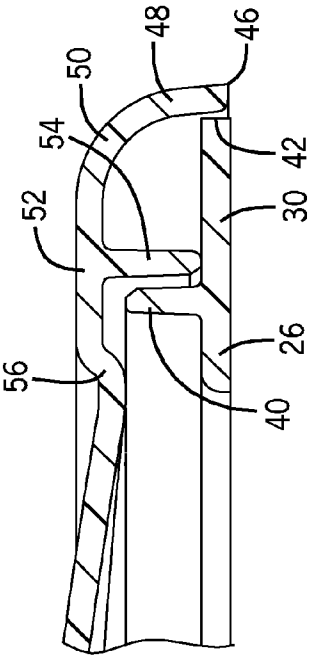


FIG. 7

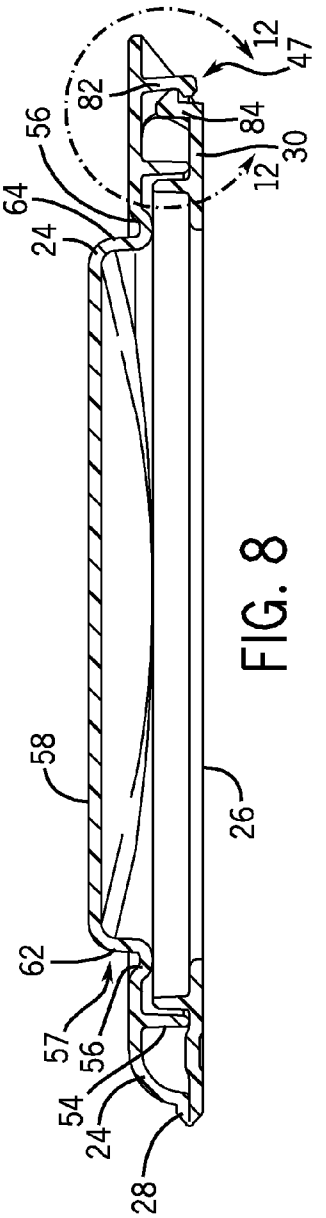


FIG. 8

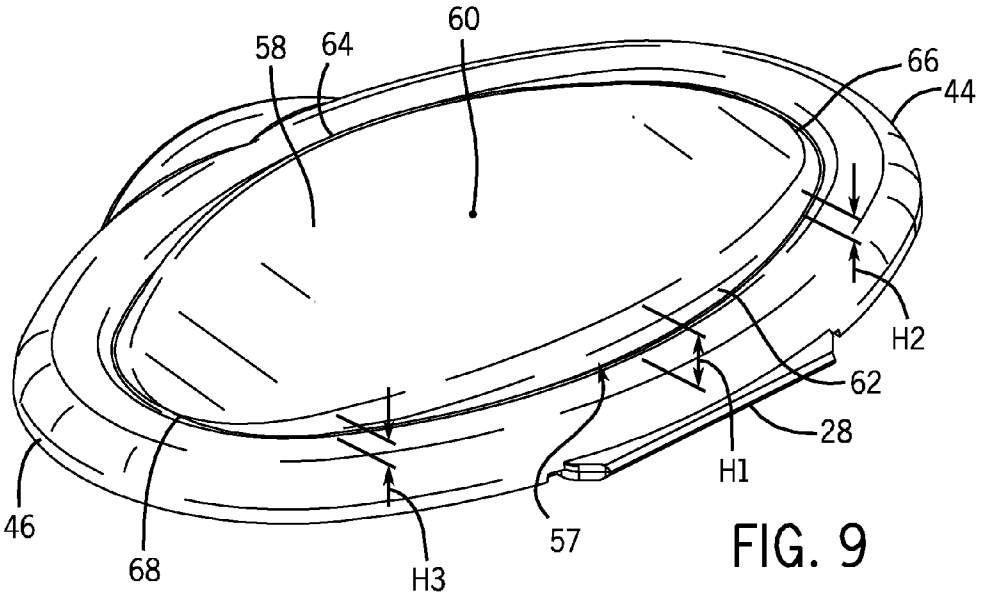
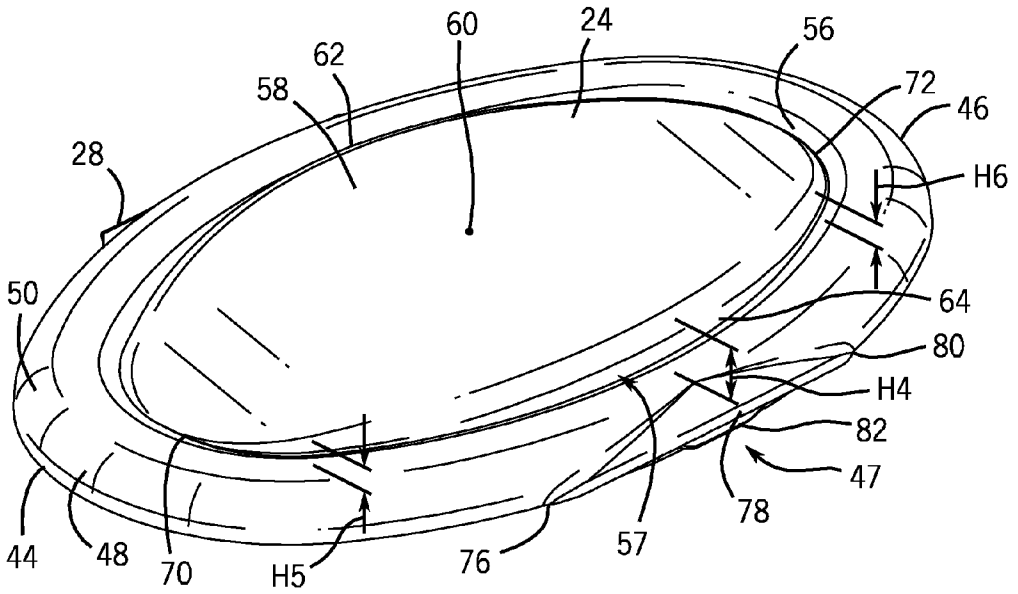

60
58
64
66
44
H2
62
28
H1
46
68
H3
57

FIG. 9


60
24
56
62
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72
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H6
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64
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H4
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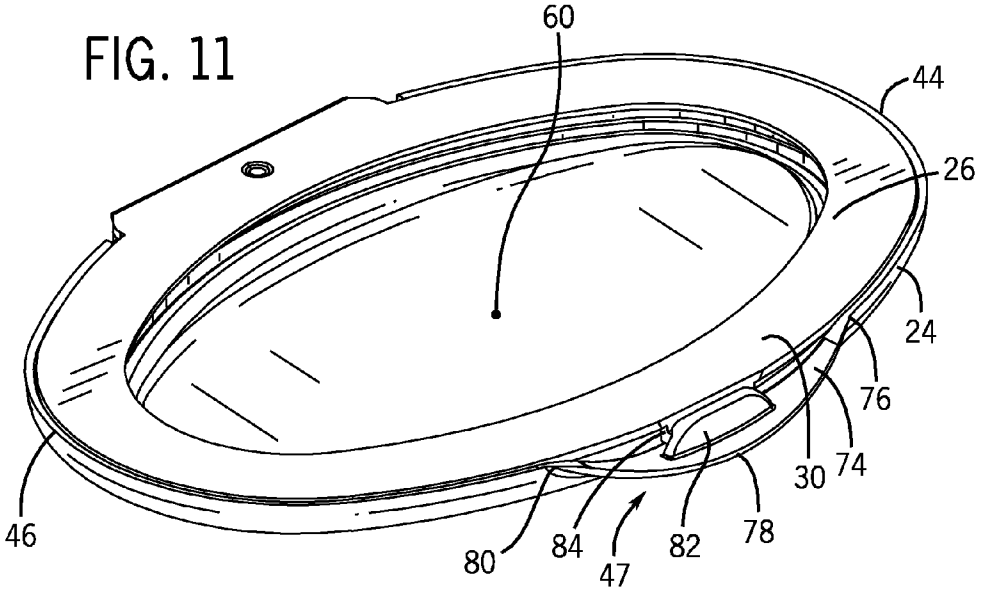
H5
76
57

FIG. 10

FIG. 11



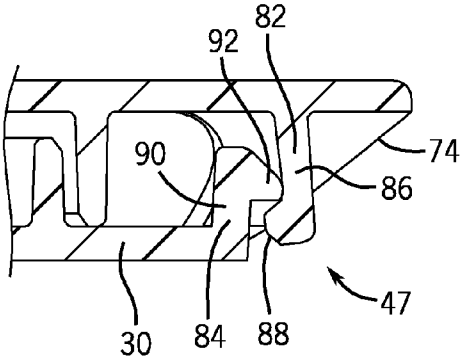


FIG. 12

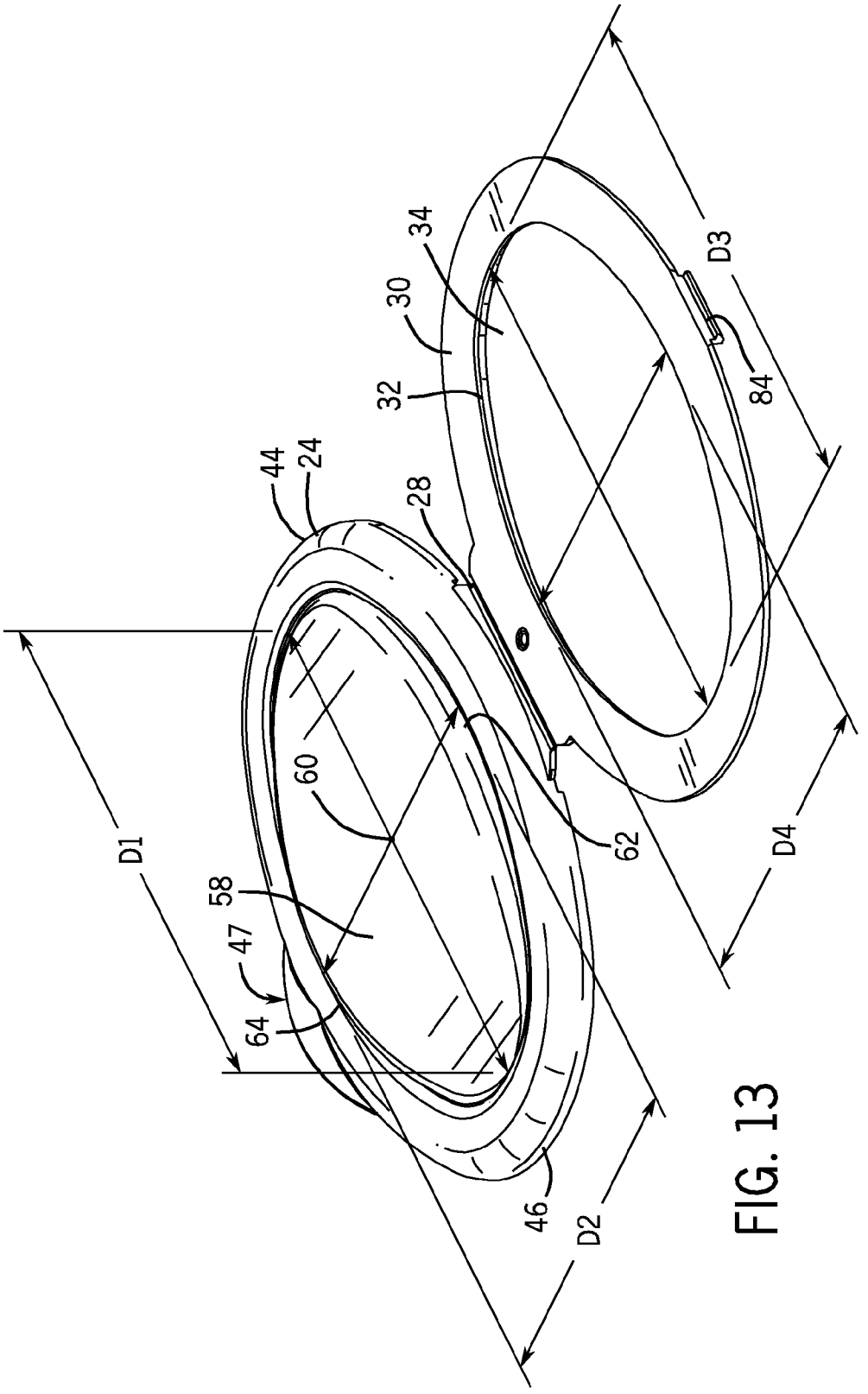
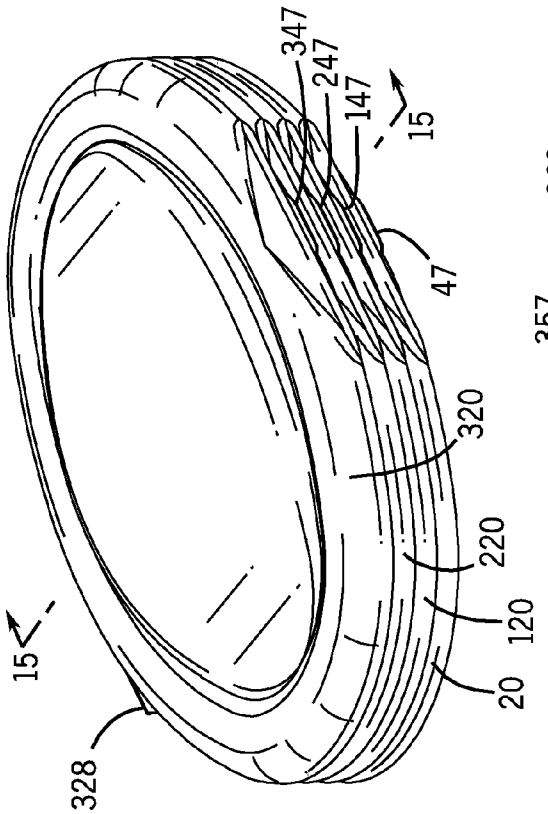


FIG. 13

FIG. 14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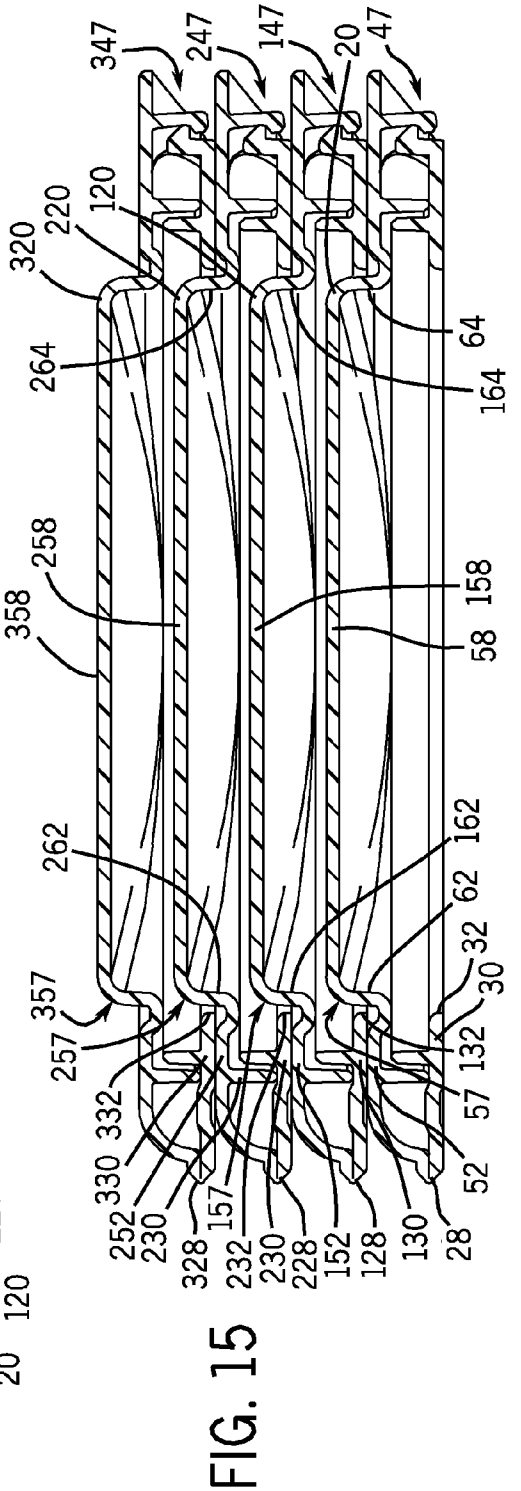
247
147
15
15
47
320
220
120
20
328


347
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320
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164
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262
162
62
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30
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332
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232
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228
152
128
130
28

FIG. 15

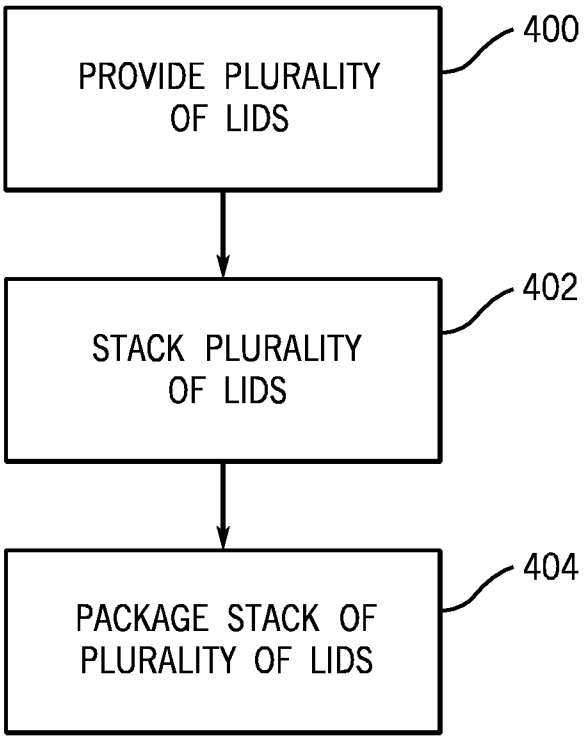

PROVIDE PLURALITY OF LIDS
400
STACK PLURALITY OF LIDS
402
PACKAGE STACK OF PLURALITY OF LIDS
404

FIG. 16

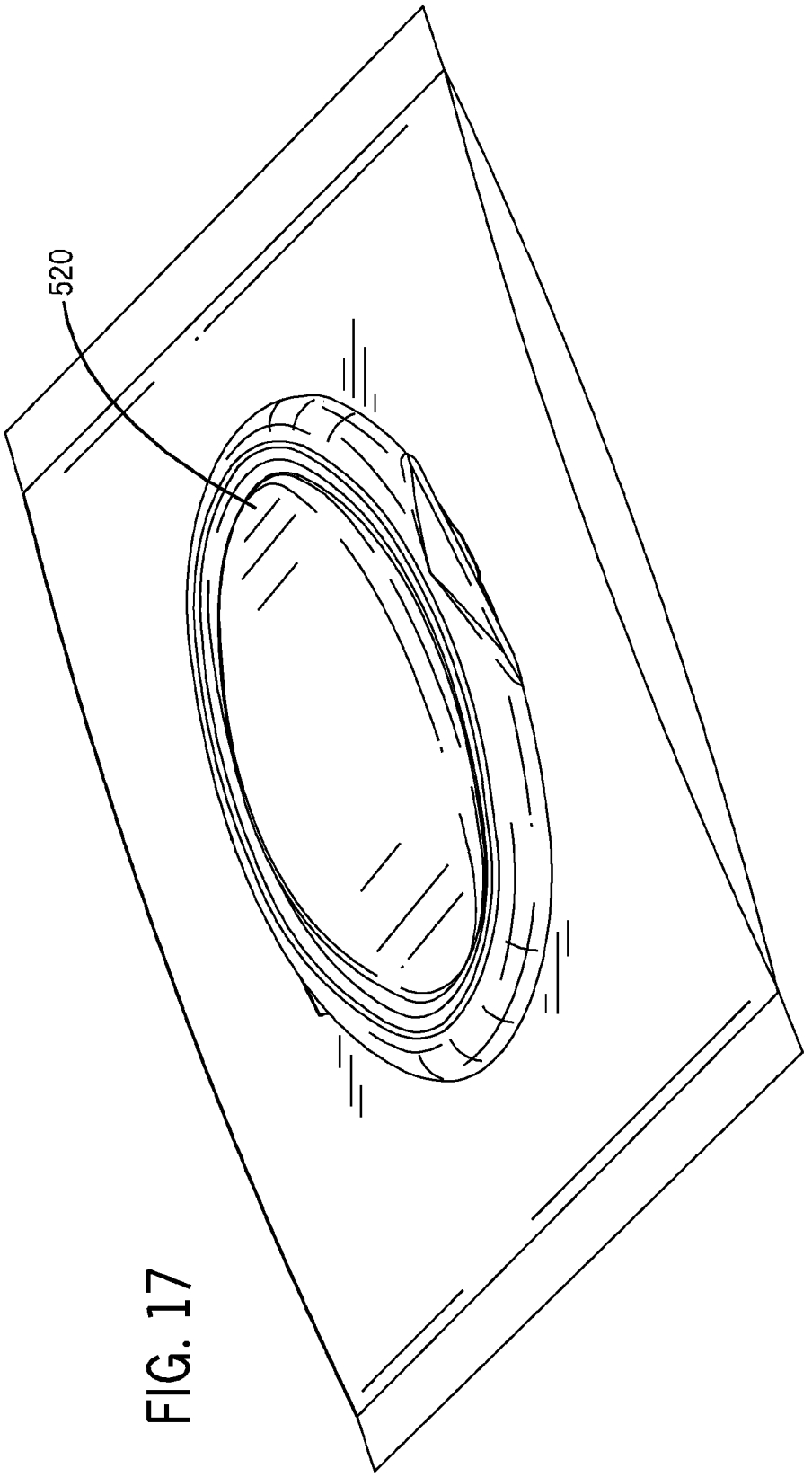


FIG. 17

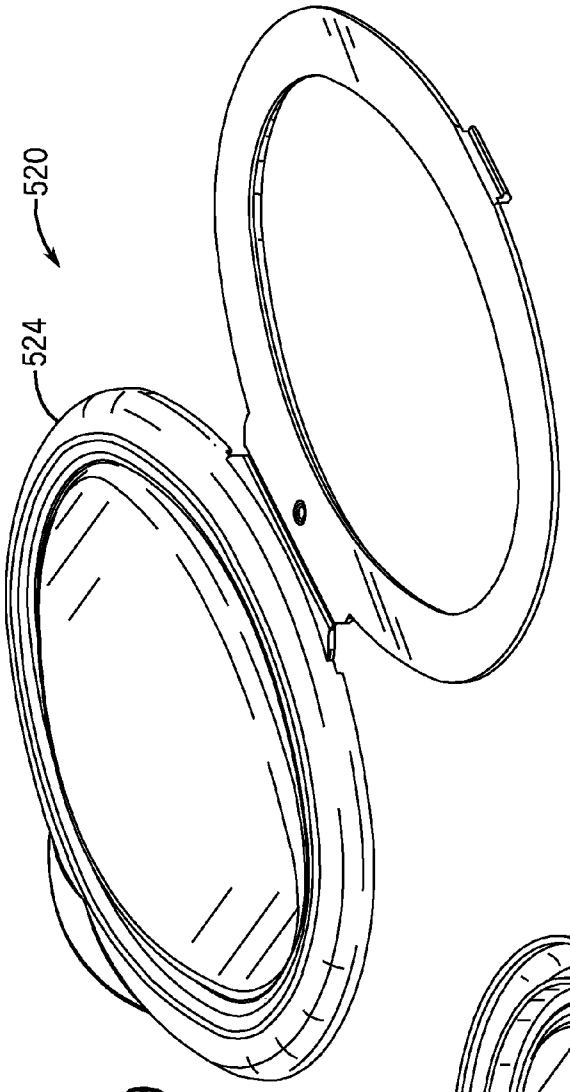


FIG. 19

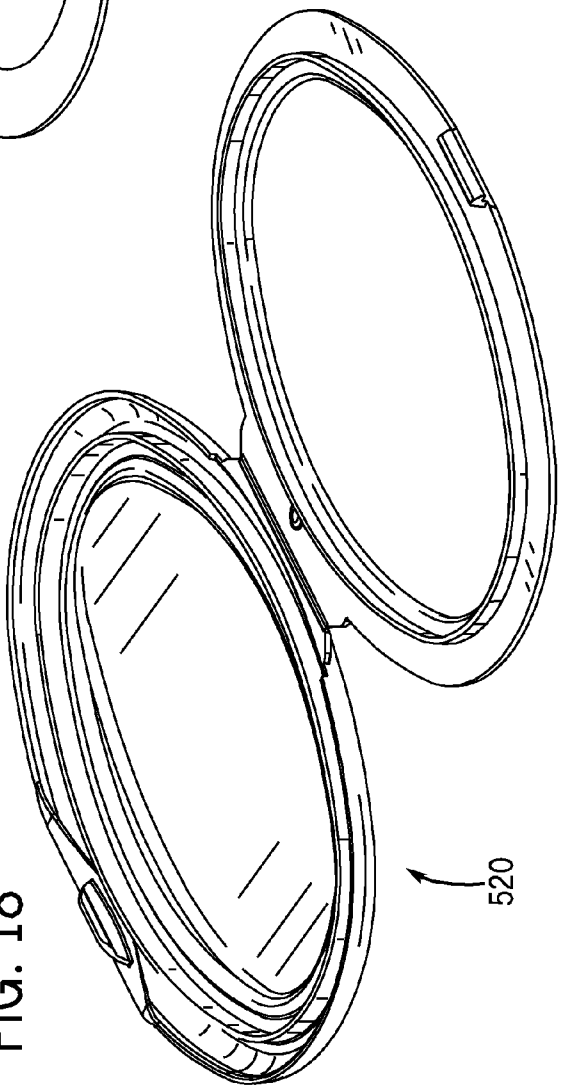


FIG. 18

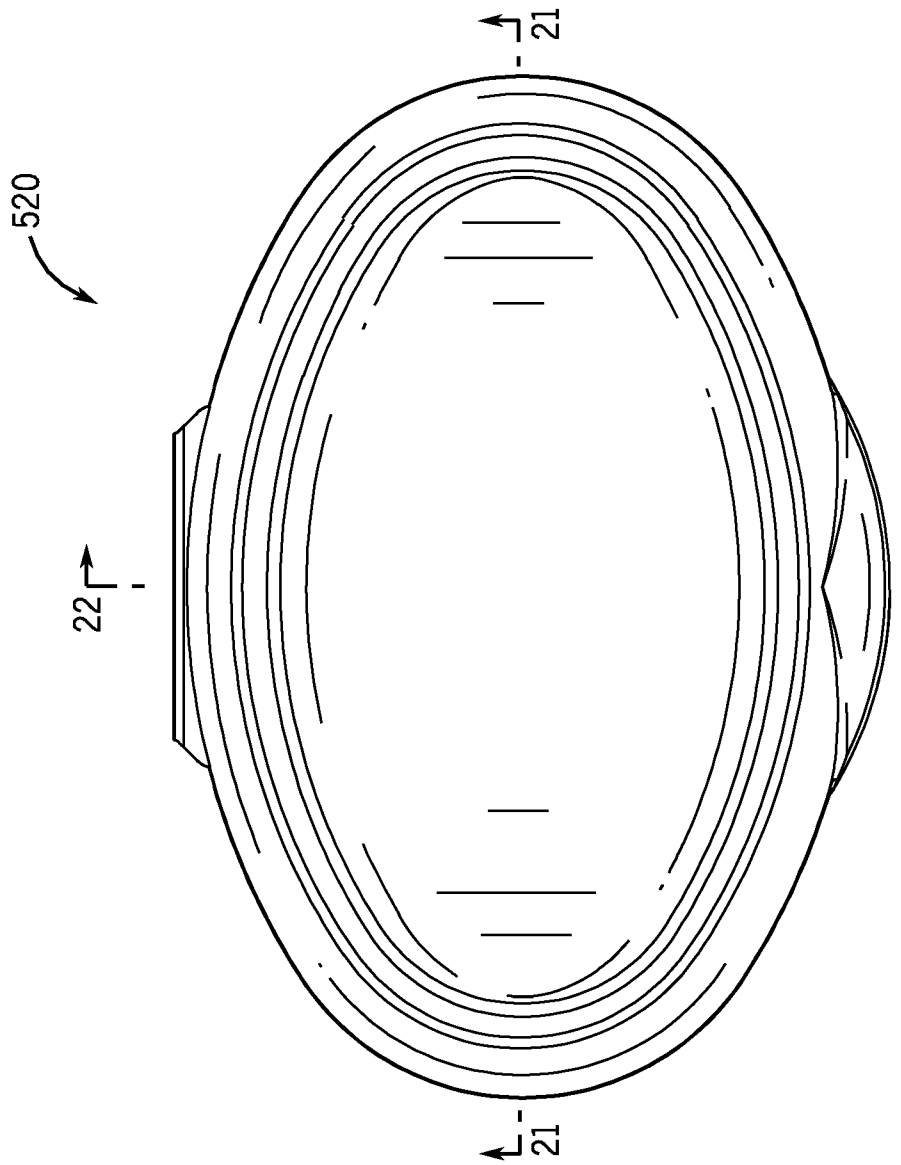


FIG. 20

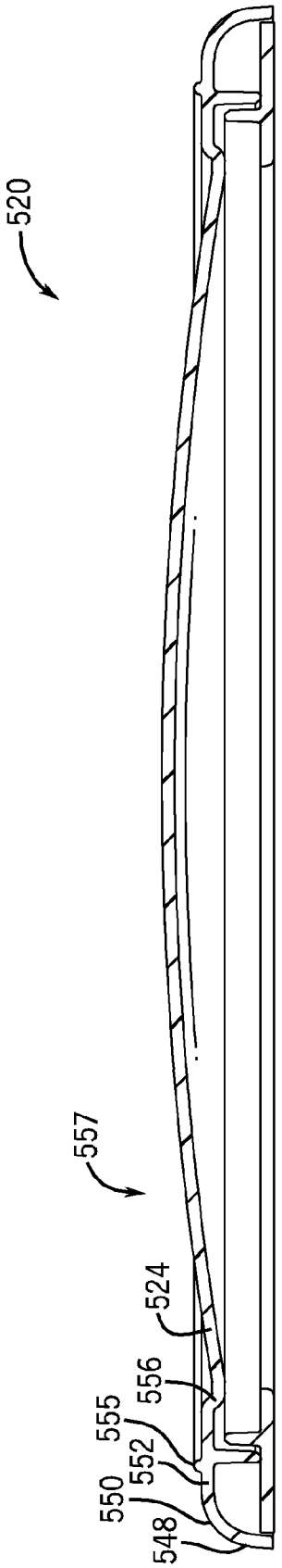


FIG. 21

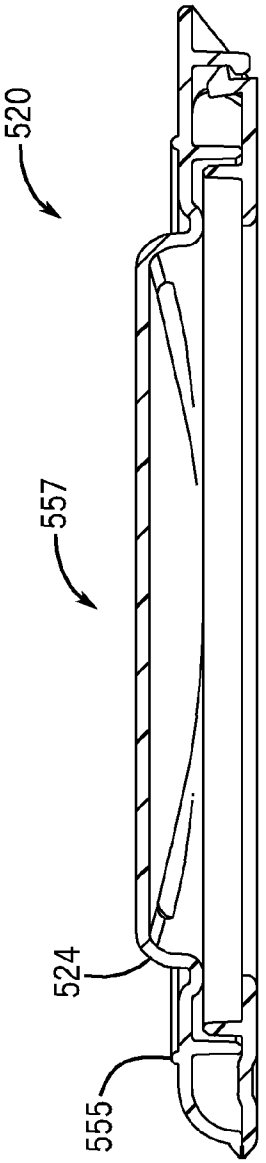


FIG. 22

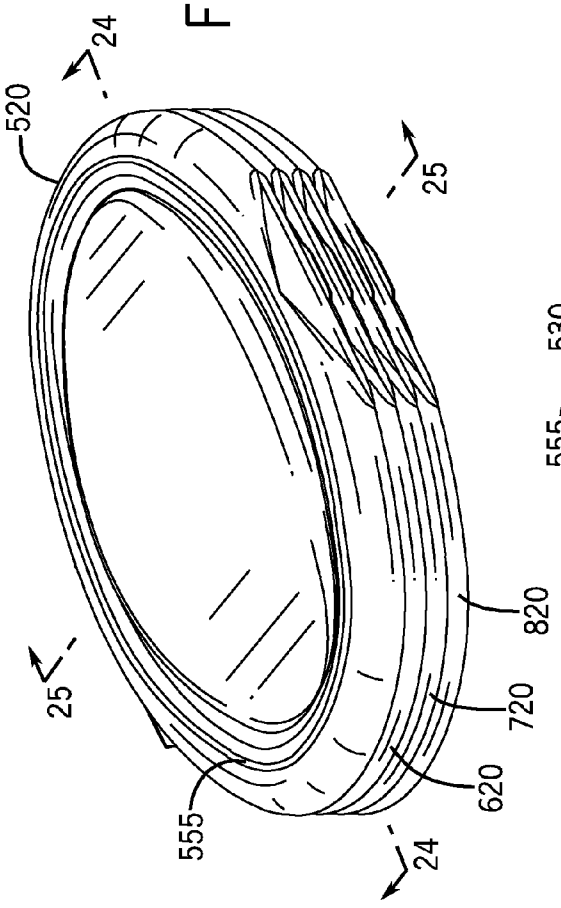
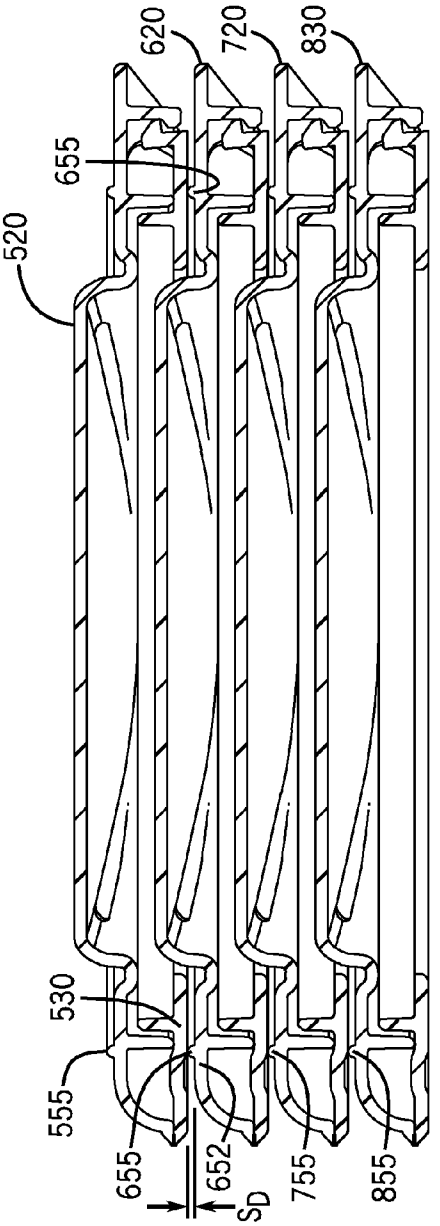

520
24
25
25
820
720
620
555
24

FIG. 23


620
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830
655
520
530
555
655
652
S_D
755
855

FIG. 25

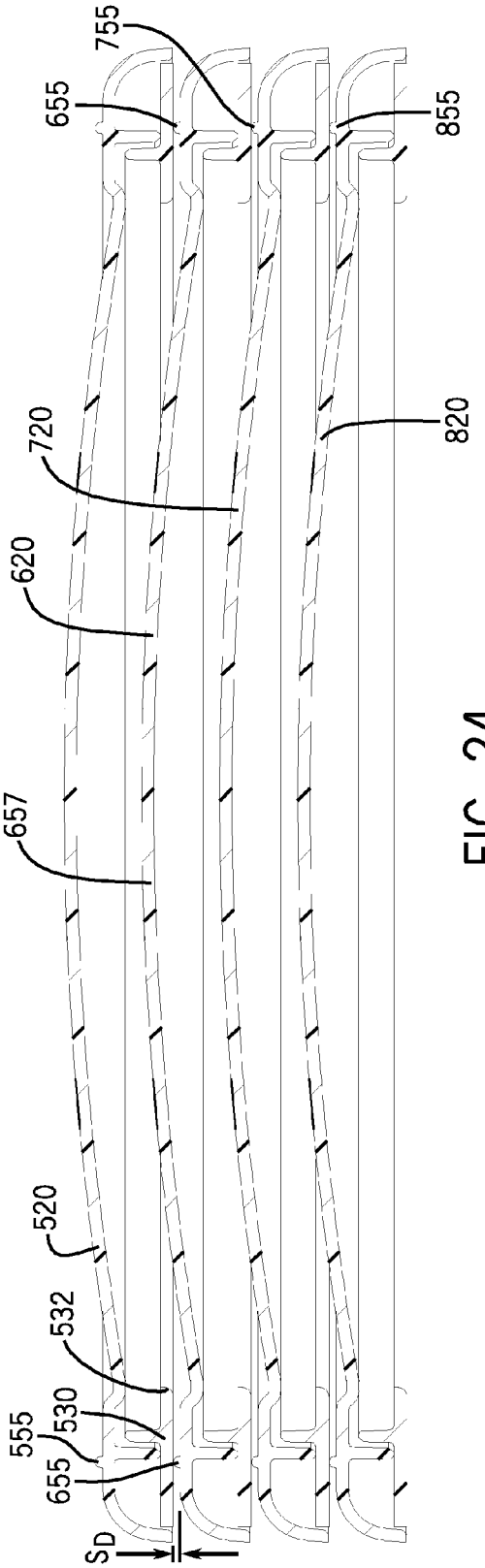

FIG. 24

LID

IDENTIFICATION OF RELATED PATENT APPLICATION

[0001] This patent application claims priority of U.S. Provisional Patent Application No. 61/708,957, filed on Oct. 2, 2012, which is entitled "Lid," which patent application is hereby incorporated herein by reference in its entirety.

BACKGROUND OF THE INVENTION

Field of the Invention

[0002] The present disclosure relates generally to lids and more particularly to lids configured to be stacked.

[0003] Containers are used to hold napkins, facial tissues, wipes, wet wipes, etc. Lids may be provided for the containers to allow selective access to the contents of the containers and to prevent access to the contents of the containers when the lids are in a closed configuration. Various lids may be used to provide resealable closure to containers, e.g., containers containing facial tissues, wet wipes, etc. Lids may be formed separately from the containers and coupled to the container after the container has been filled.

SUMMARY OF THE INVENTION

[0004] Generally, one embodiment of the invention relates to a lid. The lid includes a lower portion. The lower portion has an inner edge defining an aperture. The lid includes an upper portion. The upper portion includes a projecting feature including an upper surface extending between a first wall and a second wall. The lid includes a hinge. The hinge pivotally couples the upper portion to the lower portion. The upper portion is configured to pivot between a closed configuration in which the upper portion covers the aperture and an open configuration in which the upper portion does not cover the aperture. The upper portion includes a first latching portion distal from the hinge. The lower portion includes a second latching portion distal from the hinge. The first and second latching portions are configured to latch the upper portion in a closed configuration. The projecting feature has a perimeter smaller than the perimeter of the inner edge defining the aperture.

[0005] Another embodiment of the invention relates to a stack of lids. The stack of lids includes a first lid. The first lid includes a first lower portion having a first inner edge defining an aperture. The first lid includes a first upper portion. The first lid includes a first hinge pivotally coupling the first upper portion to the first lower portion. The stack of lids includes a second lid. The second lid includes a second lower portion. The second lid includes a second upper portion including a projecting feature. The second lid includes a second hinge pivotally coupling the second upper portion to the second lower portion. The first lid is stacked on the second lid with the lower portion of the first lid contacting the upper portion. The projecting feature of the second lid projects in the aperture with the projecting feature and the first inner edge configured to inhibit movement of the first lid relative to the second lid in at least one direction.

[0006] Another embodiment of the invention relates to a method of manufacturing lids. The method includes providing a plurality of lids, each lid having an upper portion hinged to a lower portion, the lower portions each including an inner edge defining an aperture, the upper portions each including a projecting feature. The method includes stacking the plurality of lids such that the projecting feature projects into the aperture defined by the inner edge of the above lid. The method includes packaging the stacked plurality of lids for transport.

[0007] Alternative exemplary embodiments relate to other features and combinations of features as may be generally recited in the claims.

DESCRIPTION OF THE DRAWINGS

[0008] This application will become more fully understood from the following detailed description, taken in conjunction with the accompanying figures, wherein like reference numerals refer to like elements in which:

[0009] FIG. **1** is an isometric view of an embodiment of a lid coupled to an exemplary container;

[0010] FIG. **2** is a view of the lid of FIG. **1** being opened to allow access to the contents of the container;

[0011] FIG. **3** is an isometric view of an embodiment of a lid in an open configuration;

[0012] FIG. **4** is an isometric view of the lid of FIG. **3** shown rotated 180° along an axis through the hinge portion and latching portion;

[0013] FIG. **5** is a top view of the lid of FIGS. **3** and **4** in a closed configuration;

[0014] FIG. **6** is a cross-sectional view taken along the line **6-6** in FIG. **5**;

[0015] FIG. **7** is a detail view of the portion **7-7** illustrated in FIG. **6**;

[0016] FIG. **8** is a cross-sectional view taken along the line **8-8** in FIG. **5**;

[0017] FIG. **9** is an isometric view of the lid of FIGS. **3-5** in a closed configuration;

[0018] FIG. **10** is an isometric view of the lid of FIG. **9** shown from the other side;

[0019] FIG. **11** is an isometric view of the lid of FIG. **9** shown rotated 180° along an axis through the first end and the second end;

[0020] FIG. **12** is a detail view of the portion **12-12** illustrated in FIG. **8**;

[0021] FIG. **13** is an isometric view showing dimensions of the lid of FIG. **4**;

[0022] FIG. **14** is an isometric view of an exemplary stack of embodiments of lids;

[0023] FIG. **15** is a cross-sectional view taken along the line **15-15** in FIG. **14**;

[0024] FIG. **16** is a flow diagram illustrating an embodiment of a method of providing lids;

[0025] FIG. **17** is an isometric view of another embodiment of a lid coupled to an exemplary container;

[0026] FIG. **18** is an isometric view of another embodiment of a lid in an open configuration;

[0027] FIG. **19** is an isometric view of the lid of FIG. **18** shown rotated 180° along an axis through the hinge portion and latching portion;

[0028] FIG. **20** is a top view of the lid of FIGS. **18** and **19** in a closed configuration;

[0029] FIG. **21** is a cross-sectional view taken along the line **21-21** in FIG. **20**;

[0030] FIG. **22** is a cross-sectional view taken along the line **22-22** in FIG. **20**;

[0031] FIG. **23** is an isometric view of an exemplary stack of embodiments of lids;

[0032] FIG. **24** is a cross-sectional view taken along the line **24-24** in FIG. **23**; and

[0033] FIG. **25** is a cross-sectional view taken along the line **25-25** in FIG. **23**.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

[0034] Before turning to the figures, which illustrate the exemplary embodiments in detail, it should be understood that the present application is not limited to the details or methodology set forth in the description or illustrated in the figures. It should also be understood that the terminology is for the purpose of description only and should not be regarded as limiting.

[0035] Referring generally to the figures, an embodiment of a lid is disclosed. Generally, the lid is configured to be coupled to a container (e.g., facial tissues container, wet wipes container, etc.) to provide selective access to the contents of the container and selective sealing of the container. The container may be a soft-sided container, a hard-sided container, or any other suitable type of container. The container may be formed from any suitable material. The lid may be coupled to the container by any suitable mechanism (e.g., adhesive, heat-sealing, fasteners, etc.).

[0036] In some embodiments, the lid may not be made at the same location as the container or at the same location that the container is filled. Thus, lids may be transported to a location for coupling to filled containers.

[0037] One embodiment of a lid **20** is illustrated in FIG. **1**. The lid **20** is coupled to a soft-sided container **22**.

[0038] With reference to FIG. **2**, in one embodiment, the lid **20** includes an upper portion **24** coupled to a lower portion **26** by a hinge, illustrated as a living hinge **28** in FIG. **2**. In other embodiments, the upper portion **24** may be pivotally coupled to the lower portion **26** by any suitable mechanism.

[0039] The lower portion **26** includes a substantially flat base portion **30**. The inner edge **32** of the base portion **30** defines an aperture **34**. The inner edge **32** defines the perimeter of the aperture **34**. When the lid **20** is coupled to the container **22**, the lid **20** may be positioned such that an opening of the container **22** is aligned with the aperture **34**.

[0040] The base portion **30** has a lower side **36** (illustrated in FIG. **4**) and an upper side **38**. The lower side **36** is coupled to the container **22**. The lower portion **26** includes a wall portion **40** extending generally perpendicularly to the base portion **30** from the upper side **38** of the base portion **30**. The wall portion **40** extends around the aperture **34** and is located radially outwardly from the inner edge **32** of the base portion **30** and radially inwardly from the outer periphery **42** of the base portion **30**.

[0041] The upper portion **24** is displaceable relative to the lower portion **26** between a first closed configuration, illustrated in FIG. **1**, in which the upper portion **24** covers the aperture **34** and access to the opening of the container **22** is prevented by the upper portion **24** and a second open configuration, illustrated in FIG. **2**, in which the upper portion **24** does not cover the aperture **34** and access to the opening of the container **22** is allowed.

[0042] FIGS. **3** and **4** illustrate the lid **20** in an open configuration.

[0043] With reference to FIG. **5**, which illustrates the lid **20** in a closed configuration, the upper portion **24** of the lid **20** extends generally from a first end **44** to a second end **46** and from the living hinge **28** to a latching portion **47** of the lid **20**.

[0044] As illustrated in FIGS. **6** and **7**, the upper portion **24** of the lid **20** includes a downwardly extending outer wall portion **48**. The outer wall portion **48** extends downwardly and radially outwardly of the outer periphery **42** of the base portion **30**. The outer periphery **42** of the base portion **30** is located proximate the interior surface of the outer wall portion **48** when the lid **20** is in a closed configuration. The outer wall portion **48** is located radially adjacent to the outer periphery **42** of the base portion **30**.

[0045] A rounded portion **50** extends from the portion of the downwardly extending wall portion **48** distal from the base portion **30** to a substantially flat portion **52** extending radially inwardly. Extending downwardly from the substantially flat portion **52** is an inner wall portion **54**. The inner wall portion **54** contacts the substantially flat base portion **30** of the lower portion **26** when the lid **20** is in a closed configuration. The inner wall portion **54** is located radially outwardly from the wall portion **40**. In one embodiment, the inner wall portion **54** prevents entry of moisture into or egress of moisture from a container when the lid **20** is in a closed configuration. In another embodiment, the inner wall portion **54** prevents entry of contaminants into a container when the lid **20** is in a closed configuration.

[0046] Radially inwardly from the substantially flat portion **52** the upper portion **24** includes a downwardly arched portion **56**.

[0047] With reference to FIG. **6**, radially inwardly from the downwardly arched portion **56**, the upper portion **24** includes a projecting feature **57**, which includes an arched portion **58**. The arched portion **58** extends upwardly in the direction from the first end **44** toward the center point **60** of the upper portion **34** and in the direction from the second end **46** toward the center point **60**. The projecting feature **57** includes a perimeter extending around the peripheral edge of the arched portion **58**. In one embodiment, the perimeter of the projecting feature **57** is smaller than the perimeter of the aperture **34** defined by the inner edge **32** of the base portion **30**.

[0048] FIG. **8** illustrates a cross-sectional view of the lid **20** taken along the axis between the hinge **28** and the latching portion **47**, illustrated as the line **8-8** in FIG. **5**. The projecting feature **57** also includes, extending upwardly from the downwardly arched portion **56**, a first upwardly extending wall portion **62** proximate the hinge **28** and a second upwardly extending wall portion **64** proximate the latching portion **47**. The upwardly extending wall portions **62** and **64** extend from the downwardly arched portion up to the arched portion **58**. In one embodiment, the height of the arched portion **58** does not vary in the direction between the hinge **28** and the latching portion **47**.

[0049] With reference to FIG. **9**, the first upwardly extending wall portion **62** extends from a first end **66** proximate the first end **44** of the lid **20** to a second end **68** proximate the second end **46** of the lid **20**.

[0050] The height of the first upwardly extending wall portion **62** varies between the first end **66** and the second end **68**. The height H**1** of the first wall portion **62** is at a maximum adjacent the center point **60**. For example, the height H**1** is greater than the height H**2** of the first wall portion **62** between the portion adjacent the center point **60** and the first end **66** and greater than the height H**3** between the portion of the first wall portion **62** adjacent the center point **60** and the second end **68**.

[0051] With reference to FIG. **10**, the second upwardly extending wall portion **64** extends from a first end **70** proxi-

mate the first end **44** of the lid **20** to a second end **72** proximate the second end **46** of the lid **20**. In one embodiment, the first end **70** of the second wall portion **64** is spaced apart from the first end **66** of the first wall portion **62**, and the second end **72** of the second wall portion **64** is spaced apart from the second end **68** of the first wall portion **62**.

[0052] The height of the second upwardly extending wall portion **64** varies between the first end **70** and the second end **72**. The height H**4** of the second wall portion **64** is at a maximum adjacent the center point **60**. For example, the height H**4** is greater than the height H**5** of the second wall portion **64** between the portion adjacent the center point **60** and the first end **70** and greater than the height H**6** between the portion of the second wall portion **64** adjacent the center point **60** and the second end **72**.

[0053] With reference to FIGS. **10** and **11**, the upper portion **24** includes an arched portion **74** extending upwardly from a first end **76** proximate the first end **44** of the lid **20** to a peak **78** adjacent the center point **60** and downwardly from the peak **78** to a second end **80** proximate the second end **46** of the lid **20**.

[0054] The width dimension (perpendicular to an axis between the first end **76** and the second end **80**) of the arched portion **74** varies between the first end **76** and the second end **80**. The width of the arched portion **74** is greatest at the peak **78** and reduces proceeding towards each of the first end **76** and the second end **80**. Projecting downwardly from the arched portion **74** is an upper engagement portion **82**.

[0055] Projecting upwardly from the base portion **30** of the lower portion **26** of the lid **20** is a lower engagement portion **84**.

[0056] With reference to FIG. **12**, the upper engagement portion **82** includes a downwardly projecting wall portion **86** and a radially inwardly extending retaining projection **88**. The retaining projection **88** extends generally radially inwardly from the wall portion **86** distal from the arched portion **74** toward the lower engagement portion **84**.

[0057] The lower engagement portion **84** includes an upwardly projection wall portion **90** and a radially outwardly extending retaining projection **92**. The retaining projection **92** extends generally radially outwardly from the wall portion **90** distal from the base portion **30** toward the upper engagement portion **82**.

[0058] The upper and lower engagement portions **82** and **84** are configured such that when the lid **20** is closed, the upper surface of the retaining projection **88** engages the lower surface of the retaining projection **92** thus inhibiting upward movement of the downwardly projecting wall portion **86** (and thus inhibiting pivotal movement of the upper portion **24** of the lid **20** relative to the lower portion **26**).

[0059] To open the lid **20**, a user may apply upward pressure on the underside of the arched portion **74** which causes displacement of the upper engagement portion **82** such that the retaining projection **88** is moved radially outwardly away from and out of contact with the lower engagement portion **84**, allowing the upper portion **24** of the lid **20** to be pivotally displaced away from the lower portion **26** of the lid.

[0060] In the illustrated embodiment, the shape and configuration of the latching portion **47** of the lid generally and the arched portion **74** in particular, allow for convenient opening of the lid **20**.

[0061] With reference to FIG. **13**, in one embodiment the arched portion **58** is generally oval-shaped and has a diameter D**1** along the long axis of the oval (extending generally in the direction between the first end **44** and the second end **46** of the lid). In one embodiment, the diameter D**1** extends between approximately 2 inches and approximately 5 inches. In another embodiment the diameter D**1** is between approximately 3 inches and approximately 4 inches.

[0062] In another embodiment, the diameter D**1** is approximately 3 and 7/16 inches.

[0063] In one embodiment, the arched portion **58** has diameter D**2** along the short axis of the oval (extending generally in the direction between the hinge **28** and the latching portion **47**, generally perpendicular to diameter D**1**) between the tallest portion of the first wall portion **62** and the tallest portion of the second wall portion **64** through the center point **60**. In one embodiment, the diameter D**2** is between approximately 1 inch and approximately 3 inches. In another embodiment, the diameter D**2** is between approximately 1 and ½ inches and approximately 2 inches. In another embodiment, the diameter D**2** is approximately 1 and ⅞ inches.

[0064] In one embodiment, the base portion **30** is a substantially oval-shaped ring. In the illustrated embodiment, the oval-shaped aperture **34** defined by the inner edge **32** of the base portion **30** has a diameter D**3** along the long axis of the oval-shaped aperture **34**.

[0065] In the illustrated embodiment, the oval-shaped aperture **34** defined by the inner edge **32** of the oval-shaped ring base portion **30** has a diameter D**4** along the short axis of the oval-shaped aperture **34** extending generally in the direction between the hinge **28** and the lower engagement portion **84** (generally perpendicular to the diameter D**3**). In one embodiment, the diameter D**3** is generally the same as the diameter D**1**. In another embodiment, the diameter D**3** is larger than diameter D**1**. In one embodiment, the diameter D**4** is generally the same as the diameter D**2**. In another embodiment, the diameter D**4** is larger than diameter D**2**.

[0066] In one embodiment, the diameter D**3** extends between approximately 2 inches and approximately 5 inches. In another embodiment the diameter D**3** is between approximately 3 inches and approximately 4 inches. In another embodiment, the diameter D**3** is approximately 3 and 7/16 inches.

[0067] In one embodiment, the diameter D**4** is between approximately 1 inch and approximately 3 inches. In another embodiment, the diameter D**4** is between approximately 1 and ½ inches and approximately 2 and ½ inches. In another embodiment, the diameter D**4** is approximately 2 inches.

[0068] With reference to FIGS. **14** and **15**, the lid **20** is configured to be stacked with other generally similar lids **120**, **220**, and **320**. The inner edges **32**, **132**, **232**, and **332** of the base portions **30**, **130**, **230**, **330** are sized such that the projecting features such as **57**, **157**, **257**, and **357**, including in the illustrated embodiment arched portions **58**, **158**, **258**, and **358**, of another lid may be received within the apertures defined by the inner edges such as **32**, **132**, **232**, and **332**.

[0069] The base portion **130** of the lid **120** is supported on the substantially flat portion **52** of the lid **20** and the projecting feature **57** of the lid **20** projects in the aperture defined by the inner edge **132** and past the base portion **130** of the lid **120** when the lids **20** and **120** are stacked. Similarly, the base portion **230** of the lid **220** is supported on the substantially flat portion **152** of the lid **120**, and the base portion **330** of the lid **320** is supported on the substantially flat portion **252** of the lid **220** when the lids are stacked. The projecting feature **157** extends in the aperture defined by the inner edge **232** and past the base portion **230** of the lid **220** when the lids **120** and **220**

are stacked. The projecting feature **257** extends in the aperture defined by the inner edge **332** and past the base portion **330** of the lid **320** when the lids **220** and **320** are stacked.

[0070] When lids **20** and **120**, for example, are stacked, the inner edge **132** and first wall portion **62** inhibit movement of lid **20** relative to lid **120** in the direction of the hinges **28** and **128**. The inner edge **132** and the second wall portion **64** inhibit movement of lid **20** relative to lid **120** in the direction of latching portions **47** and **147**.

[0071] Similarly, when lids **120** and **220** are stacked, the inner edge **232** and first wall portion **162** inhibit movement of lid **120** relative to lid **220** in the direction of the hinges **128** and **228**. The inner edge **232** and the second wall portion **164** inhibit movement of lid **120** relative to lid **220** in the direction of latching portions **147** and **247**.

[0072] Similarly, when lids **220** and **320** are stacked, the inner edge **332** and first wall portion **262** inhibit movement of lid **220** relative to lid **320** in the direction of the hinges **228** and **328**. The inner edge **332** and the second wall portion **264** inhibit movement of lid **220** relative to lid **320** in the direction of latching portions **247** and **347**.

[0073] Thus, the lids **20**, **120**, **220**, and **320** may be configured in a stack and are configured to deter falling of the stack of lids. Embodiments of lids that are stacked and packaged may provide space-savings over lids that are not stacked and packaged. For example, in one embodiment lids are formed at one location and transported to a second location to be attached to filled containers. The lids may be packaged to be transported from the one location to the second location. Cost of shipping may be dependent on the volume of the packaged lids (e.g., in one embodiment, weight difference may have low to no impact on shipping cost, while volume difference may have higher impact on shipping cost).

[0074] While FIGS. **14** and **15** illustrate four lids stacked, this is merely exemplary. In other embodiments any suitable number of lids may be stacked.

[0075] FIG. **16** illustrates a flow diagram of an embodiment of a method of providing lids. The method includes step **400** of providing a plurality of lids each having an upper portion, a lower portion, and a hinge pivotally coupling the upper portion to the lower portion, with the upper portion including a projecting feature and the lower portion defining an aperture, with the apertures arranged and configured to receive the projecting features to inhibit movement of the lids relative to one another in at least one direction. The method also includes step **402** of stacking the plurality of lids. The method also includes step **404** of packaging the stacked plurality of lids for transport to a location for coupling to containers.

[0076] In one embodiment, the stacked lids are packaged in boxes. In another embodiment, the stacked lids are wrapped in packaging material. In other embodiments, the stacked lids may be packaged in any suitable packaging.

[0077] With reference to FIGS. **17-24**, another embodiment of a lid **520** is illustrated. The lid **520** includes many features similar to the lid **20**. Therefore, differences from the lid **20** are the focus of the description below. The lid **520** includes an upper portion **524**. The upper portion **524** includes a downwardly extending outer wall portion **548**. The upper portion **524** also includes a rounded portion **550** extending from the downwardly extending wall portion **548** to a generally planar portion **552**. Extending radially inwardly from the generally planar portion **552** is an angularly downwardly extending portion **556** which extends radially inwardly to the projecting feature **557**. In contrast with the previous embodiment, the upper portion **524** includes an axial projection **555** extending upwardly from the generally planar portion **552**. The axial projection **555** extends circumferentially around the projecting feature **557** radially outwardly from the angularly downwardly extending portion **556**. As is illustrated in FIGS. **21** and **22**, the axial projection **555** extends an axial distance less than the projecting feature **557**, e.g., the upper axial periphery of the axial projection **555** is lower than the upper axial periphery of the projecting feature **557**.

[0078] With reference to FIGS. **23-25**, lids **520**, **620**, **720**, and **820** are illustrated in a stacked configuration. The base portion **530** of the lid **520** is supported on the axial projection **655** of the lid **620** when the lids **520** and **620** are stacked. Thus, in a stacked configuration, the base portion **530** of the lid **520** is separated from the generally planar portion **655** of the lid **620** by a distance S_D. The separation between the base portion **530** of the lid **520** and the generally planar portion **655** of the lid **620** may allow of easy access by a user to the base portion **530** of the lid **520** to allow the user to remove the lid **520** from the stack. The projecting feature **657** of the lid **620** extends in the aperture defined by the inner edge **532** and axially past the base portion **530** of the lid **520** when the lids are stacked. The inner edge **532** and the projecting feature **657** inhibit movement of the lid **520** relative to the lid **620** in the radial direction. The lid **520** is allowed to be displaced axially relative to the lid **620** by applying axially upwardly directed force to the base portion **530** of the lid **520**.

[0079] Embodiments of lids may be generally oval in shape. Other embodiments of lids may be generally circular, ellipse-shaped, triangular, rectangular, or any other suitable polygonal or non-polygonal shape. Embodiments of the base portion **30** may be oval-shaped. In other embodiments, the base portion may be any suitable shape with an open portion which can be aligned with an opening of a container including, for example, a circular ring, oval-shaped ring, ellipse-shaped ring, triangle-shaped ring, rectangle-shaped ring, or any other polygonally-shaped or non-polygonally shaped suitable structure.

[0080] In some embodiments, the projecting feature may be any suitable shape to fit the open portion of a base portion of another stackable lid to inhibit movement of the lids relative to one another when stacked including, for example a circular shape, oval-shaped, ellipse-shaped, triangle-shaped, rectangle-shaped, or any other polygonally-shaped or non-polygonally-shaped suitable structure. In one embodiment the projecting feature includes an arched portion. In another embodiment the projecting feature includes a domed, convexly-shaped portion. In another embodiment the projecting feature includes sidewalls and a generally flat (e.g., not arched, not domed) upper surface.

[0081] In one embodiment, by providing stacked lids, a volume savings of between approximately 15% and approximately 50% may be realized over other unstacked lids (e.g., stacking feature of lids allows stacking such that approximately 15% to approximately 50% more lids may be packaged in the same volume than unstacked lids could be placed in the same volume).

[0082] In one embodiment, by providing stacked lids, a volume savings of between approximately 30% and approximately 35% may be realized over other unstacked lids (e.g., stacking feature of lids allows stacking such that approxi-

mately 30% to approximately 35% more lids may be packaged in the same volume than unstacked lids could be placed in the same volume).

[0083] One embodiment of a lid may inhibit movement of another lid stacked therewith in one direction. In other embodiments, a lid may inhibit movement of another lid stacked therewith in two directions. In other embodiments, a lid may inhibit movement of another lid stacked therewith in more than two directions. In other embodiments, a lid may inhibit movement of another lid stacked therewith in all radial directions.

[0084] In one embodiment, a lid may be formed from a suitable type of plastic (e.g., polyethylene, polypropylene, polystyrene, polyvinyl chloride, PTFE, nylon, PET, HDPE, etc.). In other embodiments, a lid may be formed from any other suitable material.

[0085] In one embodiment, a lid may be formed by 3D printing (e.g., selective laser sintering, direct metal laser sintering, fused deposition modeling, stereolithography, laminated object manufacturing, electron beam melting, power bed and inkjet head 3D printing, etc.). In another embodiment, a lid may be molded. In other embodiments, a lid may be formed by any suitable method.

[0086] In one embodiment, a lid is formed as a single, unitary piece. In other embodiments, a lid may be multiple pieces formed and coupled together.

[0087] Unless the meaning is clearly to the contrary, all ranges set forth herein are deemed to be inclusive of the endpoints.

[0088] Further modifications and alternative embodiments of various aspects of the invention will be apparent to those skilled in the art in view of this description. Accordingly, this description is to be construed as illustrative only. The construction and arrangements, shown in the various exemplary embodiments, are illustrative only. While the current application recites particular combinations of features in the various embodiments discussed herein, various embodiments of the invention relate to any combination of any of the features described herein, and any such combination of features may be claimed in this or future applications. Any of the features, elements, or components of any of the exemplary embodiments discussed above may be claimed alone or in combination with any of the features, elements, or components of any of the other embodiments discussed above.

[0089] While the current application recites particular combinations of features in the claims appended hereto, various embodiments of the invention relate to any combination of any of the features described herein whether or not such combination is currently claimed, and any such combination of features may be claimed in this or future applications. Any of the features, elements, or components of any of the exemplary embodiments discussed above may be used alone or in combination with any of the features, elements, or components of any of the other embodiments discussed above.

[0090] Although only a few embodiments have been described in detail in this disclosure, many modifications are possible (e.g., variations in sizes, dimensions, structures, shapes and proportions of the various elements, values of parameters, mounting arrangements, use of materials, colors, orientations, etc.) without materially departing from the novel teachings and advantages of the subject matter described herein. Some elements shown as integrally formed may be constructed of multiple parts or elements, the position of elements may be reversed or otherwise varied, and the nature or number of discrete elements or positions may be altered or varied. The order or sequence of any process, logical algorithm, or method steps may be varied or re-sequenced according to alternative embodiments. Other substitutions, modifications, changes and omissions may also be made in the design, operating conditions and arrangement of the various exemplary embodiments without departing from the scope of the present invention.

What is claimed is:

1. A lid comprising:

a lower portion having an inner edge defining an aperture;

an upper portion including a projecting feature including an upper surface extending between a first wall and a second wall; and

a hinge pivotally coupling the upper portion to the lower portion, the upper portion configured to pivot between a closed configuration in which the upper portion covers the aperture and an open configuration in which the upper portion does not cover the aperture;

wherein the upper portion includes a first engagement portion distal from the hinge;

wherein the lower portion includes a second engagement portion distal from the hinge, the first and second engagement portions configured to latch the upper portion in a closed configuration;

wherein the projecting feature has a perimeter smaller than the perimeter of the inner edge defining the aperture.

2. The lid of claim **1**, wherein the aperture is generally oval-shaped; and

wherein the projecting feature is generally oval-shaped.

3. The lid of claim **1**, wherein the upper surface of the upper portion is arched.

4. The lid of claim **3**, wherein the upper surface includes a first end, a center point and a second end;

wherein the upper surface extends upwardly from the first end to the center point; and

wherein the upper surface extends downwardly from the center point to the second end.

5. The lid of claim **1**, wherein the upper portion has a first end, a middle point, and a second end;

wherein the first engagement portion includes an arched portion with a width increasing in the direction from the first end toward the middle point and from the second end toward the middle point; and

wherein the arched portion is configured to receive upward force to release the first engagement portion from the second engagement portion.

6. The lid of claim **1**, wherein the upper portion includes a downwardly extending wall; and

wherein the downwardly extending wall is configured to contact the lower portion when the lid is in a closed configuration.

7. The lid of claim **1**, wherein the lower portion includes an upwardly extending wall located radially outwardly from the inner edge.

8. A stack of lids comprising:

a first lid including:

a first lower portion having a first inner edge defining an aperture;

a first upper portion;

a first hinge pivotally coupling the first upper portion to the first lower portion;

a second lid including:
a second lower portion;
a second upper portion including a projecting feature; and
a second hinge pivotally coupling the second upper portion to the second lower portion;
wherein the first lid is stacked on the second lid with the lower portion of the first lid contacting the upper portion; and
wherein the projecting feature of the second lid projects in the aperture with the projecting feature and the first inner edge configured to inhibit movement of the first lid relative to the second lid in at least one direction.

9. The stack of lids of claim **8**, further comprising:
a plurality of additional lids staked on the first lid and the second lid;
packaging surrounding the stacked first lid, second lid, and additional lids, the packaging having an inner volume;
wherein the lids are arranged and configured such that when stacked between approximately 30% and approximately 35% more lids may be placed within the inner volume of the packaging than if the lids are unstacked.

10. The stack of lids of claim **8**, wherein the projecting feature includes an upper surface extending between a first wall and a second wall, the first wall being configured to interact with the first inner edge of the first lower portion to inhibit movement of the first lid relative to the second lid in a first direction, and the second wall being configured to interact with the first inner edge of the first lower portion to inhibit movement of the first lid relative to the second lid in a second direction.

11. The stack of lids of claim **10**, wherein the upper surface is arched.

12. The stack of lids of claim **11**, wherein the second lid includes a first end, a middle point, and a second end; and
wherein the height of the first wall increases from the first end toward the middle point and decrease from the middle point toward the second end.

13. The stack of lids of claim **8**, wherein the first upper portion of the first lid includes a downwardly extending wall; and
wherein the downwardly extending wall is configured to seal against the first lower portion when the lid is in a closed configuration.

14. The stack of lids of claim **8**, wherein the first lower portion includes an upwardly extending wall located radially outwardly from the first inner edge and radially inwardly from the outer periphery of the first lower portion.

15. The stack of lids of claim **8**, wherein the second lower portion includes a second inner edge defining an aperture.

16. The stack of lids of claim **8**, wherein the first upper portion includes a downwardly extending wall located radially outwardly from and adjacent the outer periphery of the first lower portion when the first lid is in a closed configuration.

17. The stack of lids of claim **8**, wherein the first lower portion of the first lid is generally oval-shaped, including a first diameter and a second diameter disposed in a first plane;
wherein the second lower portion of the second lid is generally oval-shaped, including a third diameter and a fourth diameter disposed in a second plane; and
wherein the first plane is parallel to the second plane.

18. A method of manufacturing lids, the method comprising:
providing a plurality of lids, each lid having a upper portion hinged to a lower portion, the lower portions each including an inner edge defining an aperture, the upper portions each including a projecting feature;
stacking the plurality of lids such that the projecting feature projects into the aperture defined by the inner edge of the above lid; and
packaging the stacked plurality of lids for transport.

19. The method of manufacturing lids of claim **18**, further comprising shipping the plurality of lids to a location where containers are filled to be coupled to the containers.

20. The method of manufacturing lids of claim **18**, wherein the projecting features and the inner edges defining the apertures into which the projecting features project are configured to interact to inhibit movement of the stacked lids in at least one direction relative to one another.

21. The method of manufacturing lids of claim **18**, wherein the projecting features each include an arched upper surface.

22. The method of manufacturing lids of claim **18**, wherein the lids include a latching portion configured to latch the upper portion in a closed configuration relative to the lower portion.

23. The method of manufacturing lids of claim **18**, wherein the packaging defines an inner volume; and
wherein the step of stacking the lids includes configuring the lids such that between approximately 15% and approximately 50% more stacked lids are packaged with the inner volume of the packaging than if the lids are not stacked.

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