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Gruen et al.

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(54) **HYBRID CONTAINER**

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B65D 5/64 (2006.01)
B65D 21/02 (2006.01)

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

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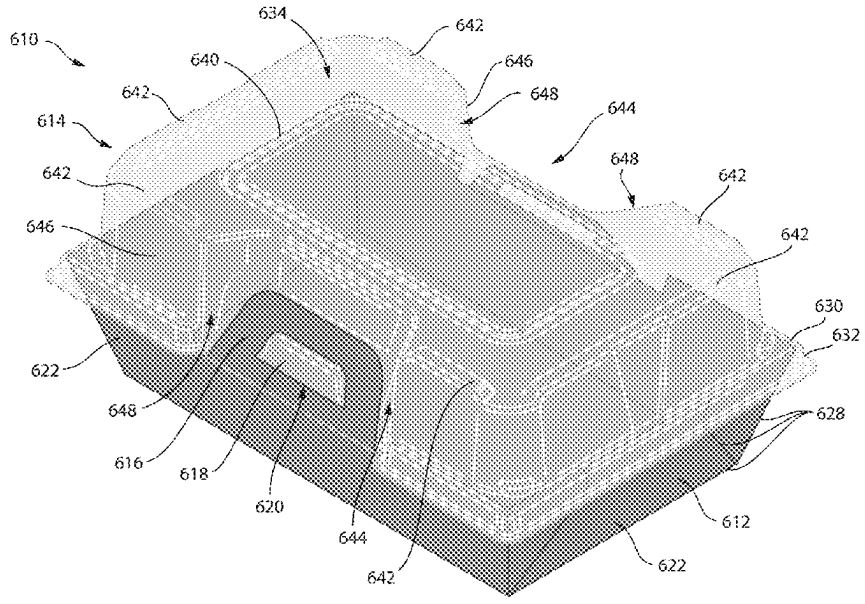
(57) **ABSTRACT**

A hybrid container has an integrally formed base made from a paper material and an integrally formed lid made from a plastic material. The base defines a volume with a bottom and opposing first sidewalls that form an upper peripheral rim. The base has at least two flaps, one extend from each opposing first sidewall, configured as a loop with a central opening and pivotable with respect to its first sidewall. The lid is dimensioned for positioning on the upper peripheral rim of the base and has an upper surface, opposing second sidewalls, and at least two receiving regions each formed on opposing second sidewalls and having a seat dimensioned for releasable engagement with the central opening of each flap. Each of the receiving regions is angled with respect to the upper surface of the lid to completely receive one flap when the connected to the seat.

12 Claims, 8 Drawing Sheets



(52) **U.S. Cl.**
CPC *B65D 2543/00296* (2013.01); *B65D 2543/00537* (2013.01); *B65D 2543/00796* (2013.01)

(58) **Field of Classification Search**
USPC 220/324, 326, 780
See application file for complete search history.

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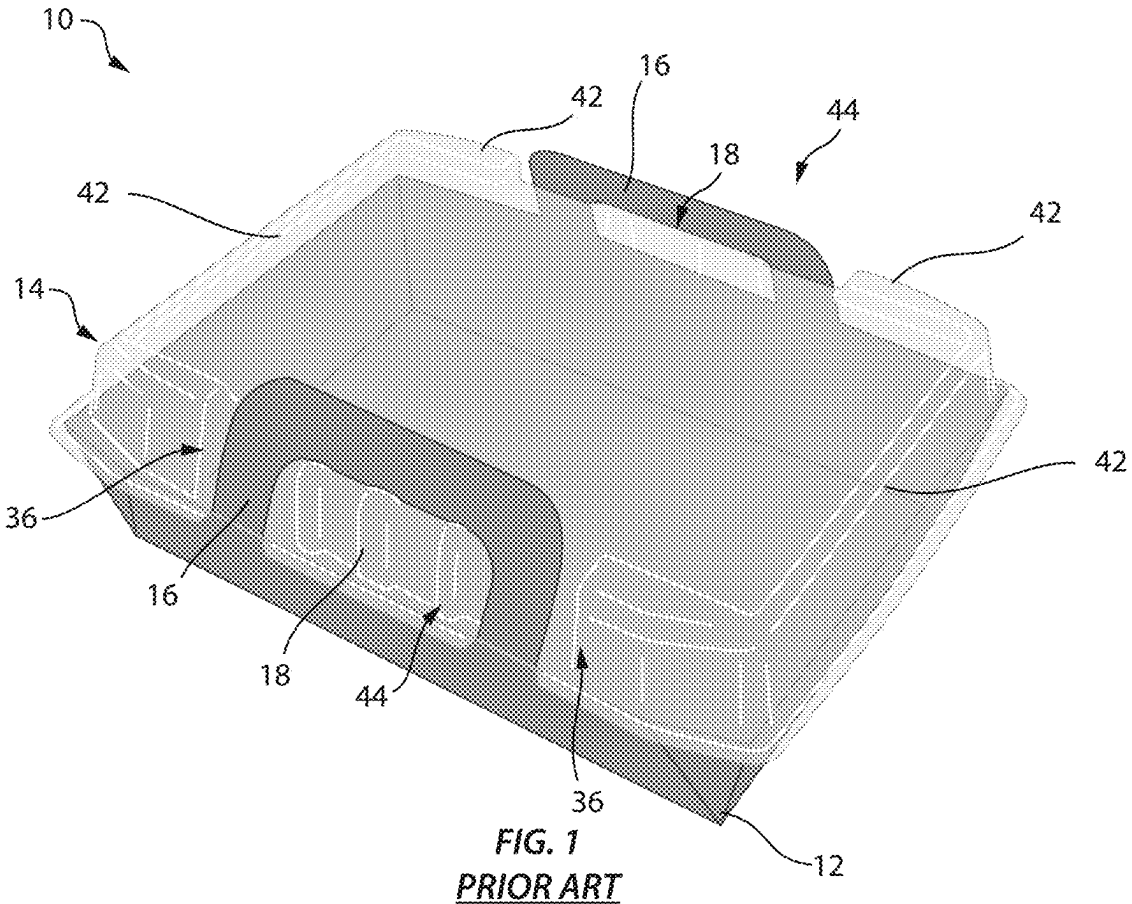

FIG. 1
PRIOR ART

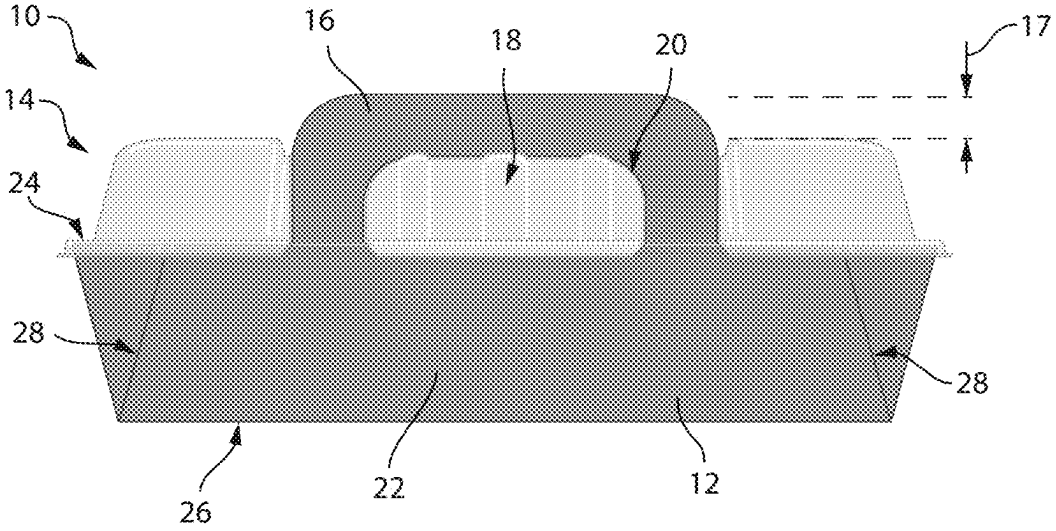

FIG. 2
PRIOR ART

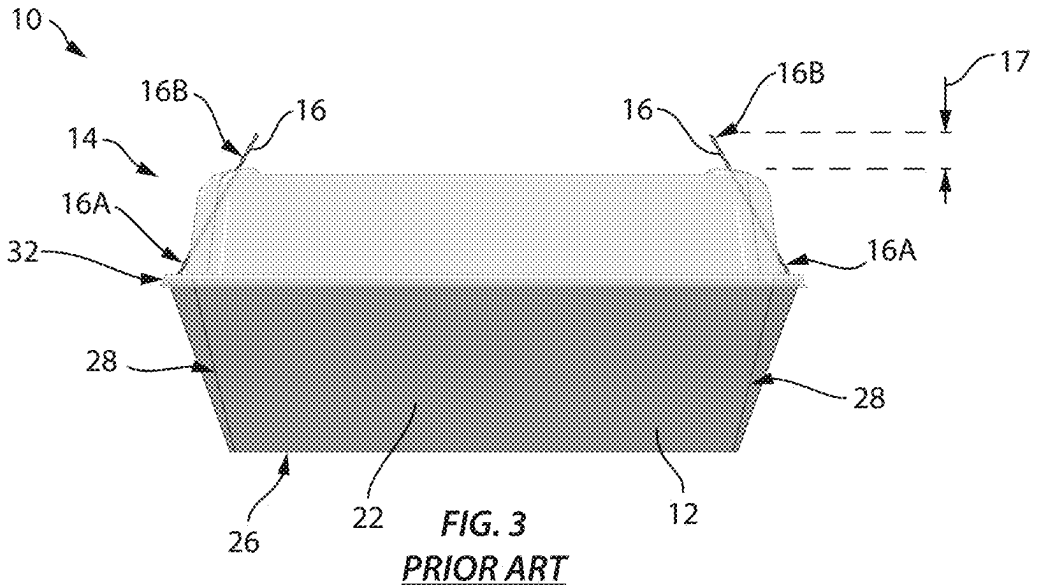

FIG. 3
PRIOR ART

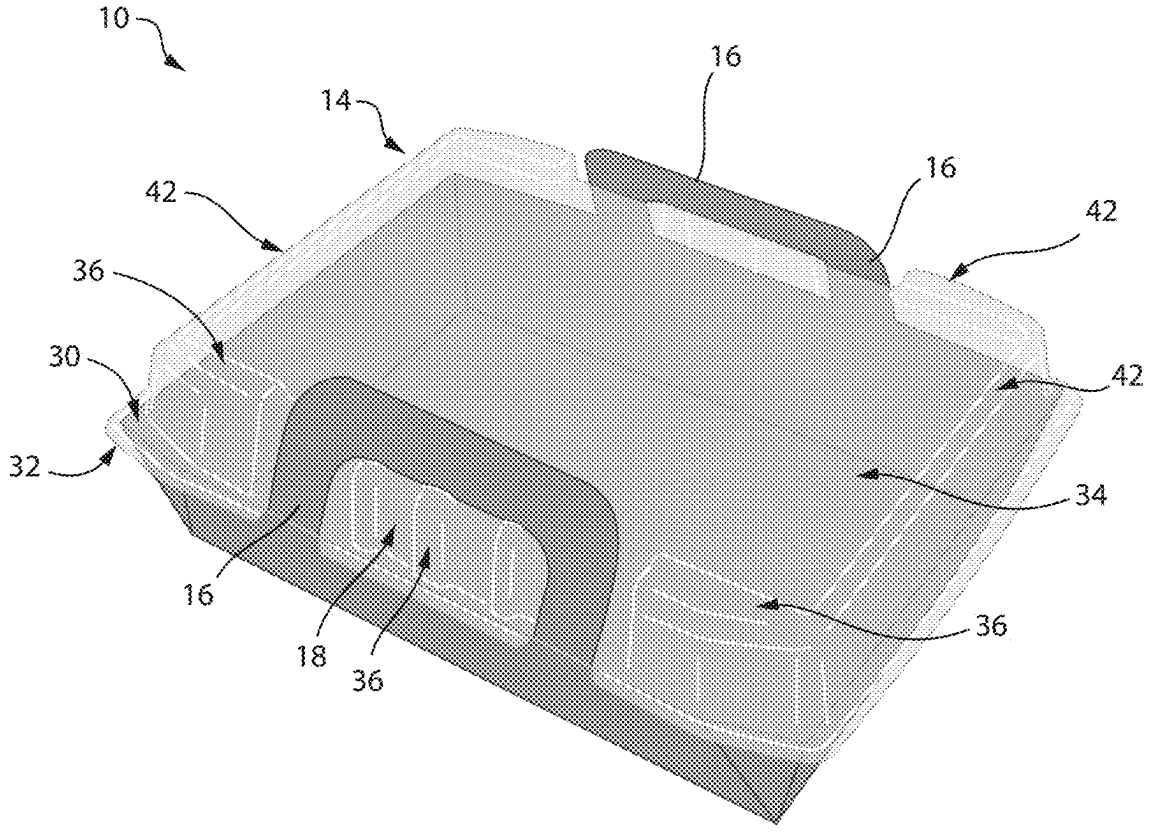

FIG. 4
PRIOR ART

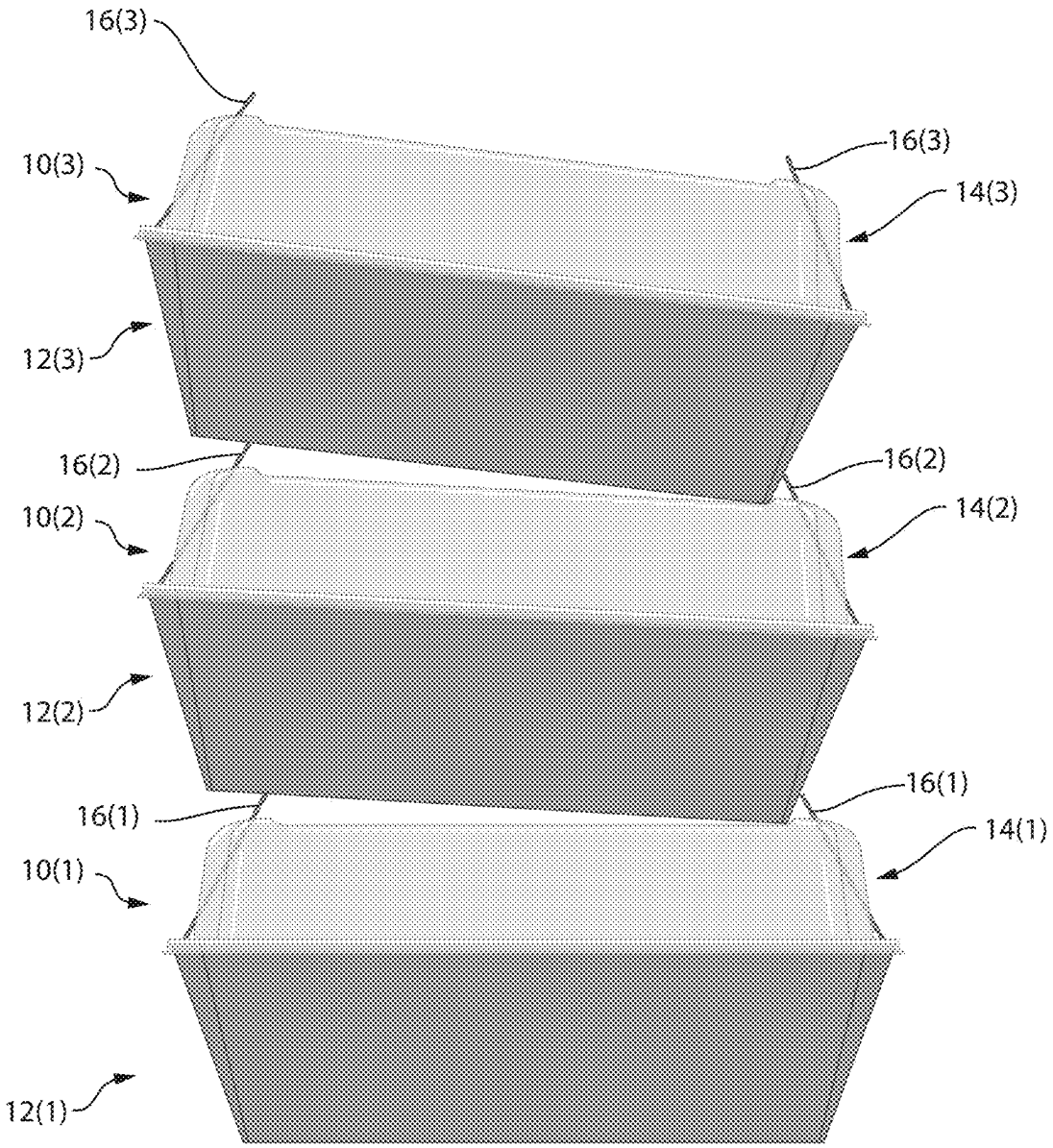

FIG. 5
PRIOR ART

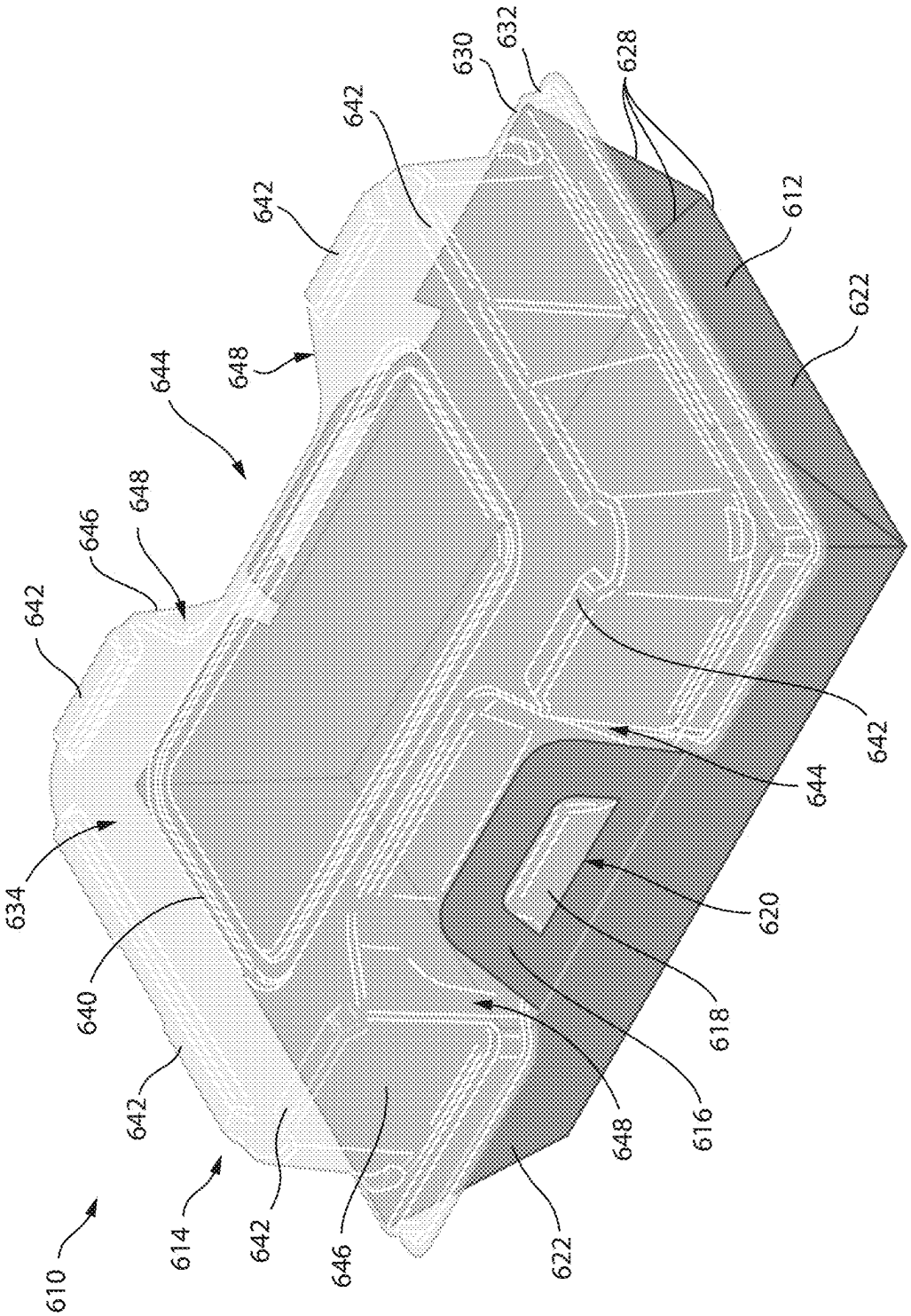
610
614
642
646
622
642
616
648
618
620
642
644
642
634
640
642
646
648
644
648
642
642
630
632
628
612
622

FIG. 6

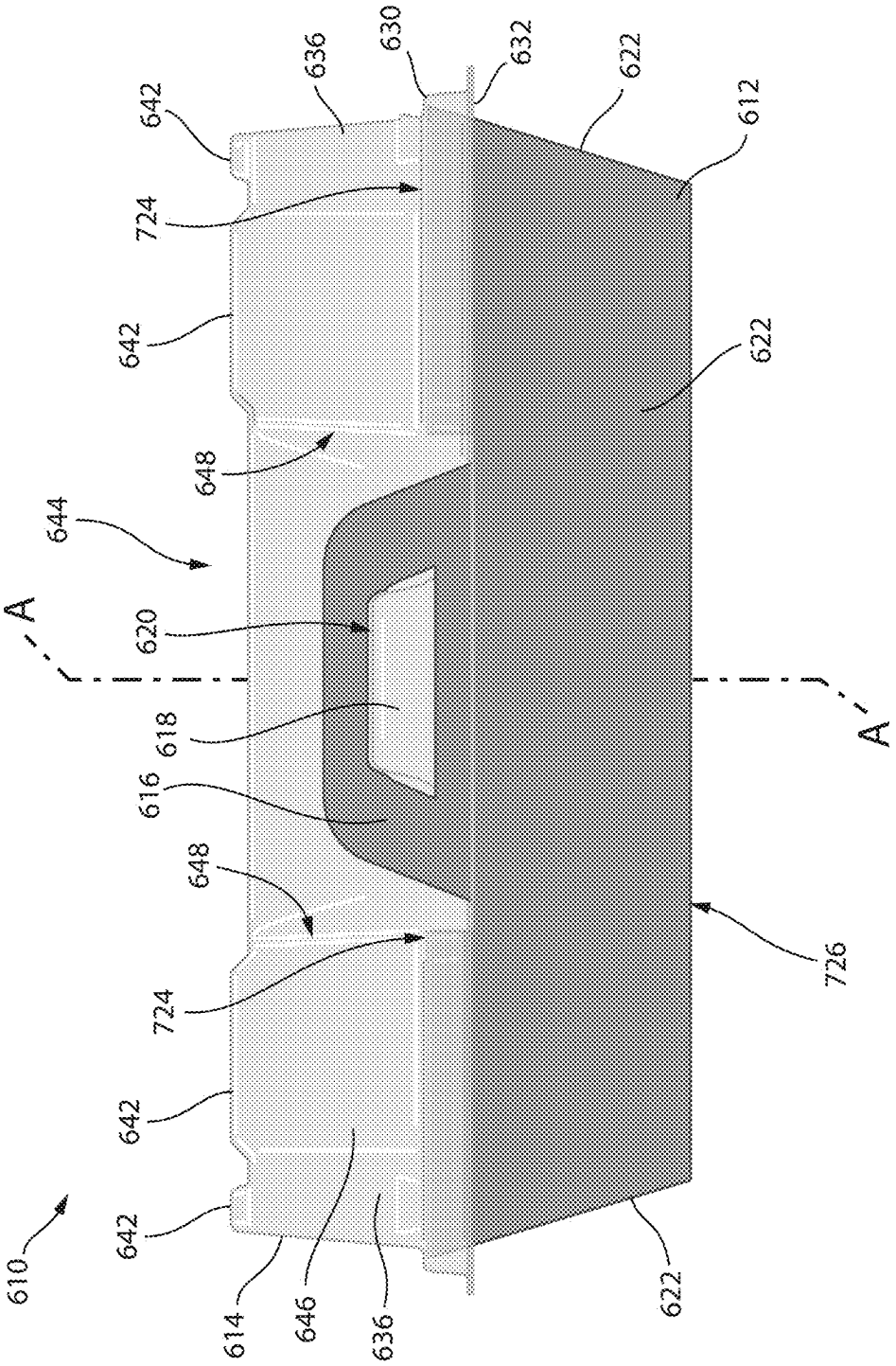
610
642
642
642
724
724
636
630
632
622
612
622
622
648
648
644
620
618
616
726
A
A'
614
646
636

FIG. 7

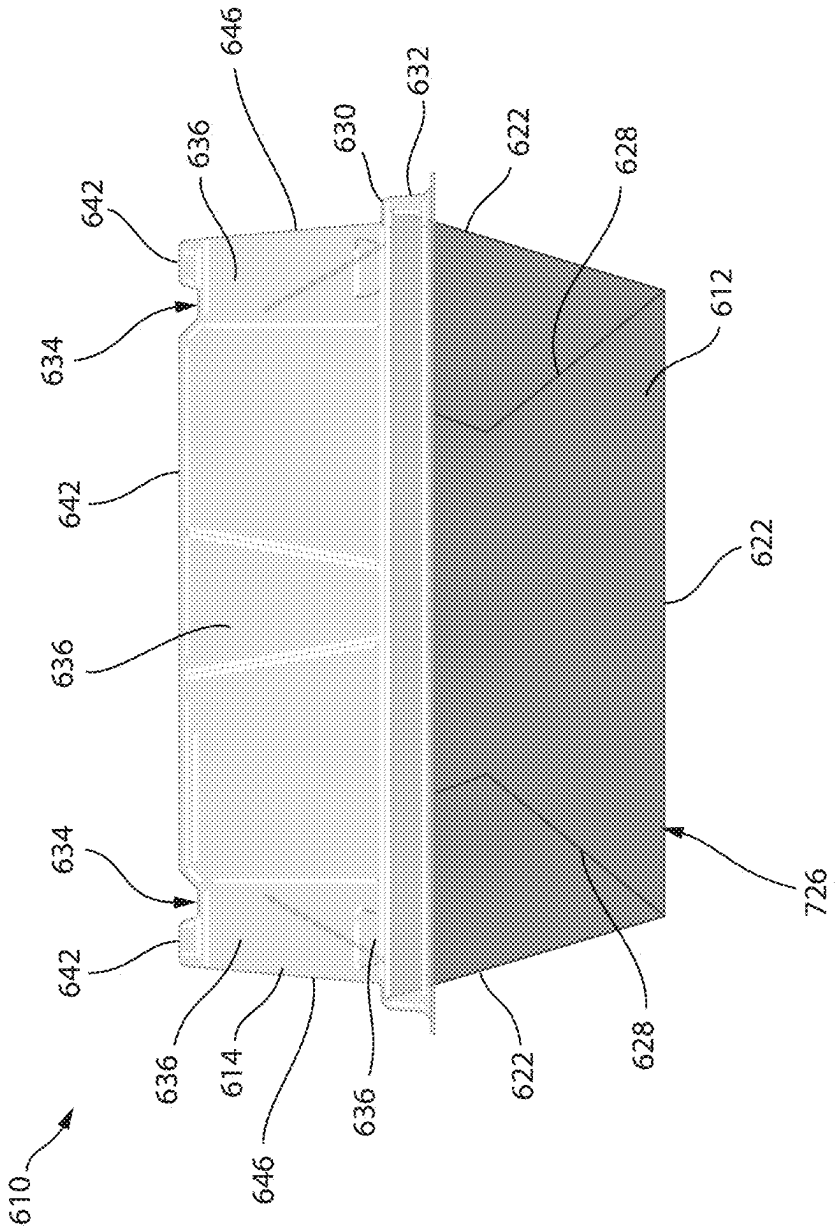
646
632
630
636
622
628
642
612
634
642
622
636
634
726
642
636
614
636
622
628
646
610

FIG. 8

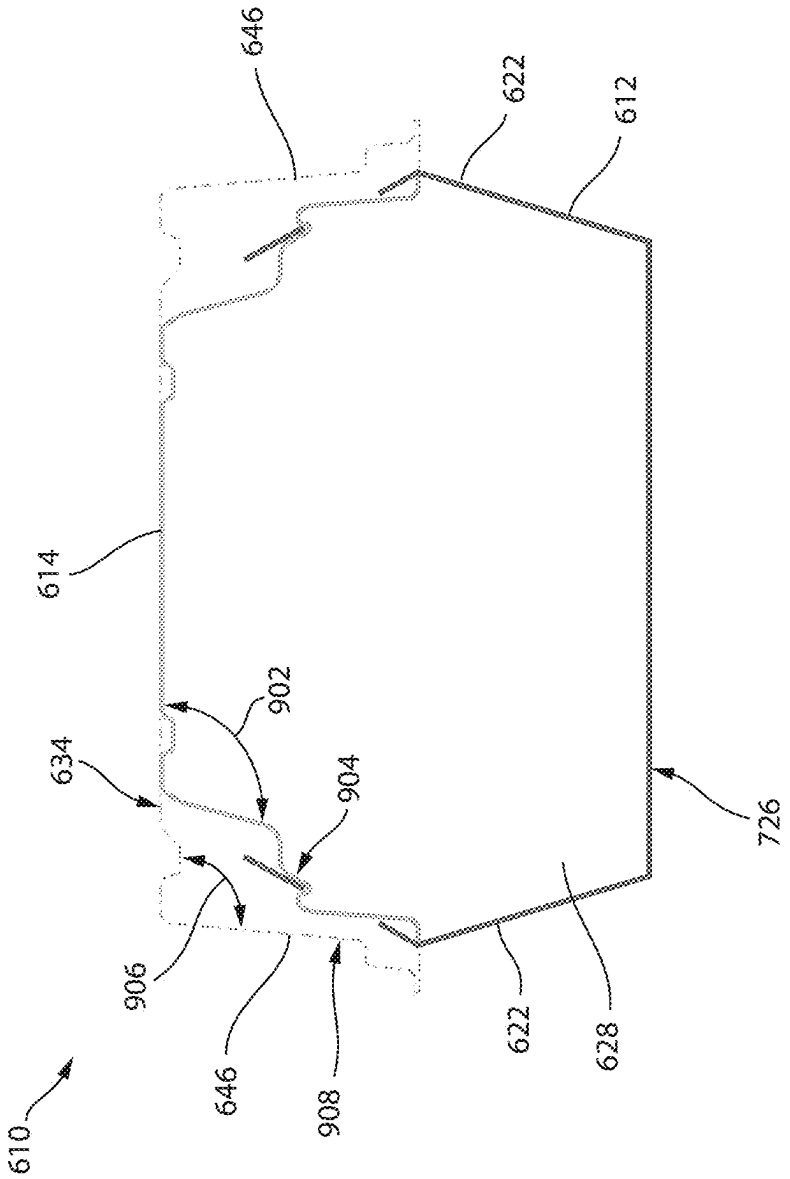

FIG. 9

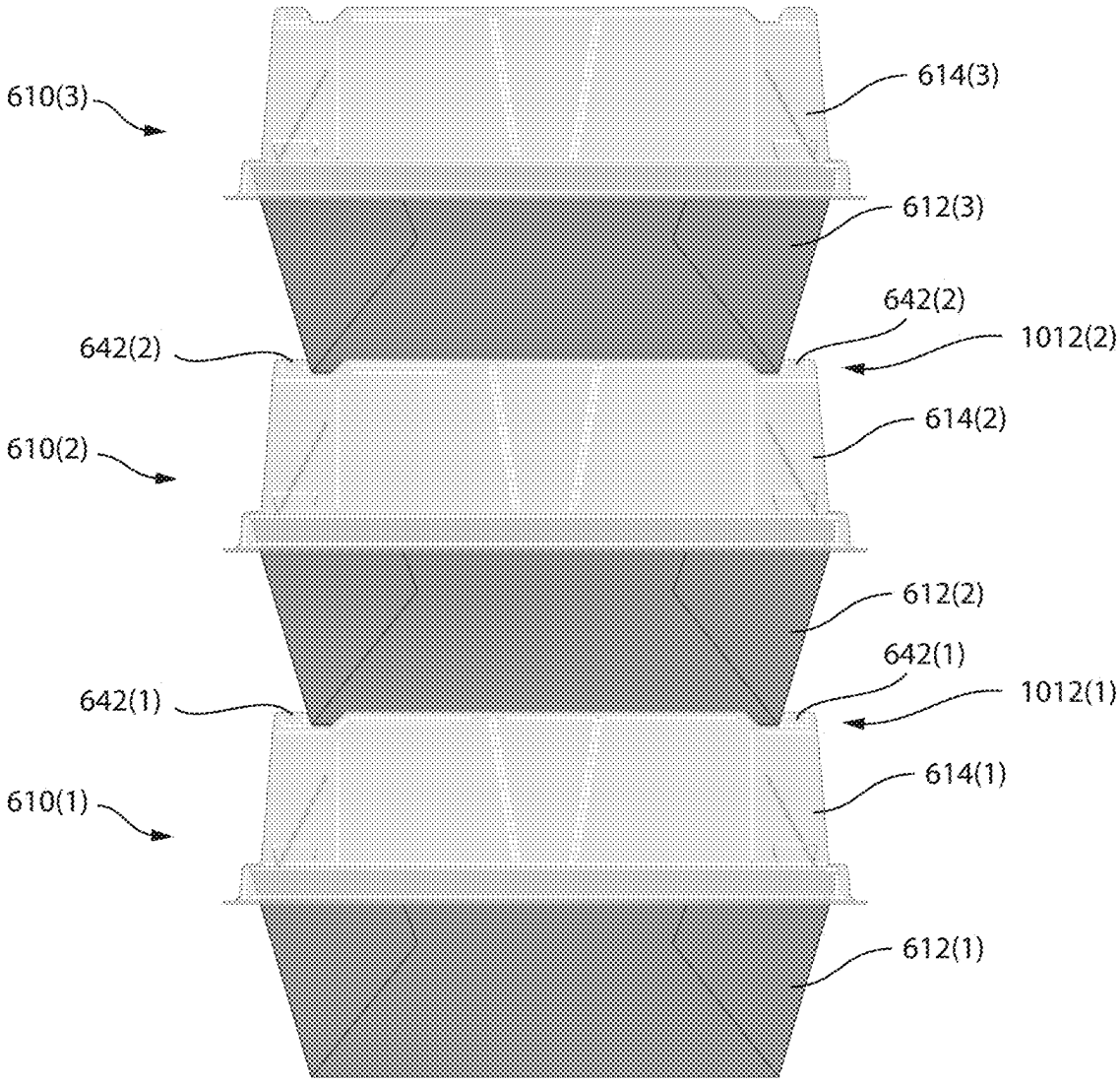
610(3)
614(3)
612(3)
642(2)
1012(2)
642(2)
610(2)
614(2)
612(2)
642(1)
1012(1)
642(1)
610(1)
614(1)
612(1)

FIG. 10

HYBRID CONTAINER

RELATED APPLICATIONS

This application claims priority from U.S. Provisional Patent Application Ser. No. 63/420,394, filed Oct. 28, 2022, and incorporated herein by reference as if fully set forth.

1. FIELD OF THE INVENTION

The present invention is in the field of food storage containers which have a base and a detachable lid. More particularly, the present invention is directed to a hybrid container where the base may be formed of environmentally-friendly materials which are either recyclable or biodegradable, and the lid may be formed of a plastic translucent or transparent material that may also be recyclable.

2. DESCRIPTION OF THE RELATED ART

Food storage containers and food packaging have become increasingly common, particularly in connection with the carry-out food industry. With the rise in their prevalence, so did the environmental challenges they present. For this reason, container/packaging manufacturers are ever more tasked with developing better sustainable and eco-friendly alternatives to traditional all-plastic containers.

For many years, both plastic and paper were used for food packaging applications due to their intrinsic qualities. Plastic, due to its transparent or translucent properties, showcases the food vividly and limits food order inaccuracy by simple visual inspection of the container contents. Plastic can also be accurately formed to create reliable locking features that secure a lid and base of a container assembly to each other, and possibly to other containers as well, when the packaged food is in transit, and also effectively preserve the shelf life of the food contents. Paper, such as pressed pulp, is also a very common packaging substrate because it provides excellent branding opportunities when printed, good insulation when corrugated, cost-effective shipping efficiencies when packed flat, and many other benefits.

Although plastics used for packaging can be reclaimed and recycled, paper substrates are significantly more likely to be recycled or biodegrade overtime. For these and many other reasons, there are demonstrated benefits to develop mixed material packages that are designed to minimize the usage of plastics when possible without compromising on overall performance. These so-called hybrid containers contain a base made of a paper material, and a lid made of a plastic translucent material. The plastic material allows visual inspection of the food contained in the container, and the paper material base provides for a highly functional vessel for various food applications and branding opportunities. The combination of these two substrate categories delivers on both functionality and environmental considerations.

FIGS. **1-5** show a prior art hybrid container **10**. FIGS. **1** and **4** are perspective views of the prior art hybrid container **10**. FIG. **2** is a front view of the prior art hybrid container **10** of FIGS. **1** and **4**. FIG. **3** is a side view of the prior art hybrid container **10** of FIGS. **1** and **4**. FIG. **5** is a side view showing a stack of the prior art hybrid containers. FIGS. **1-5** are best viewed together with the following description.

The hybrid container **10** includes a base **12** made of paper, and a lid **14** made of plastic. The lid is molded in any desired shape and includes a lip **30** that engages an upper edge **24** of base **12**. The base further includes a bottom **26**, sidewalls **22**, and upper edge **24** which engages lid **14**. The sidewalls and bottom define a volume in which food is stored. The walls are tapered to provide structural integrity to the base and aid in nesting within each other when in a stack.

Base **12** is made of a flat sheet of paper stock, such as pressed pulp, which is then folded along a plurality of fold lines **28** to form an intended shape. The paper stock is of sufficient rigidity to function as a food container and may also be coated or laminated on a surface, namely the surface that forms the inside of the base, with a hydrophobic material to limit water or oil absorption. As shown, the base further contains a pair of loop-shaped flaps **16** (also known as handles) having a hollow portion cut out **20**.

The lid **14** includes an overhang **32** from lip **30** that is dimensioned to receive the upper edge **24** of base **12** when the lid is mounted thereto in an intended manner. The lid includes a top surface **34** and various strengthening features **36**, such as ribs, push outs, and so on to provide strength. The lid **14** also includes upstanding rails **42** extending from the top surface in a direction away from the base **12**. Lastly, the lid includes a pair of receiving regions **44** arranged to receive portions of loop-shaped flaps **16** of opposing sidewalls **22**. The receiving regions **44** each include a seat **18** dimensioned to engage with a hollow portion **20** of each flap **16**. In particular, the receiving regions **44** are configured as recesses with the outward seat **18** that is received in hollow portion **20** to releasably attach the flaps **16**, and thereby the base **12**, to the lid **14**.

As a result of the configuration of the lid **14** and the flaps **16**, when the lid is positioned on the base and the flaps **16** engage with seats **18** of the receiving regions **44**, portions of the flaps **16** extend a distance **17** above the lid **14**, as shown in FIGS. **2** and **3**. The flaps **16** are vulnerable to unintentional contact due to their protrusion away from lid **14** that may result in disengagement of flaps **16** from the lid **14**, and thereby release of the base **12** from the lid **14**. FIG. **3** shows this vulnerability, indicating a bottom protruding region **16**A of the flaps **16**, and a top protruding region **16**B of the flaps **16**. Thus, the container **10** of the prior art is susceptible to accidental disengagement of the base and lid after those components are connected to each other.

In addition, it is desirable for such hybrid containers to be stackable in a vertical orientation such that carry-out food orders, or identical food products, may be arranged for vendor organization, food delivery, and/or easy consumer access. However, as shown in FIG. **5**, the prior art hybrid container **10** cannot be vertically stacked with like containers, with each hybrid container in a fully horizontal position, because the flaps **16** interfere with seating of stacked hybrid containers. As shown in FIG. **5**, the flaps **16**(**1**) of a lower hybrid container **10**(**1**) prevent the base **12**(**2**) of a middle hybrid container **10**(**2**) from sitting flush on the lid **14**(**1**) of the lower hybrid container **10**(**1**), and the flaps **16**(**2**) of the middle hybrid container **10**(**2**) prevent the base **12**(**3**) of a top hybrid container **10**(**3**) from sitting flush on the lid **14**(**2**) of the middle hybrid container **10**(**2**). Thus, stacked prior art hybrid containers **10** are susceptible to tipping. A further problem of the prior art hybrid container **10**, particularly for the lower containers when stacked, is that the flaps **16** are prone to accidental disengagement.

SUMMARY OF THE DISCLOSURE

Embodiments described herein combine functional characteristics associated with plastics such as excellent food display, robust product stacking, inherent structural integrity, and highly secured locking features, with many of the

benefits paper exhibits such as branding opportunities, sustainable attributes, various trimming and punching geometries, and much more. In addition, the disclosed embodiments improve engagement between a base and a lid of a hybrid container.

Other objects and features of the present invention will become apparent from the following detailed description considered in conjunction with the accompanying drawings. It is to be understood, however, that the drawings are designed solely for purposes of illustration and not as a definition of the limits of the invention, for which reference should be made to the appended claims. It should be further understood that the drawings are not necessarily drawn to scale and that, unless otherwise indicated, they are merely intended to conceptually illustrate the structures and procedures described herein.

In certain embodiments, a hybrid container includes an integrally formed base made from a paper material and having a bottom, opposing first sidewalls forming an upper peripheral rim, and at least two flaps each configured as a loop with a central opening and extending from a different one of the opposing first sidewalls and pivotable with respect to its first sidewall; an integrally formed plastic lid dimensioned for positioning on the upper peripheral rim of the base and having an upper surface, opposing second sidewalls, and at least two receiving regions each formed on a different one of the opposing second sidewalls and having a rear plane formed, with respect to the upper surface of the lid, at a shallower angle than an angle of a plane of its second sidewall, each receiving region forming a seat dimensioned to engage with the central opening of one of the flaps to removably retain the flap completely within the receiving region.

In one embodiment, the flaps do not extend outside of the plane of the container second sidewall when the flap is retained by its seat.

In another embodiment, the container uses plastic material which is transparent or translucent.

In another embodiment, the container lid has a strengthening ring formed at the upper surface and may also include a trough formed at the upper surface without extending above the upper surface.

In still another embodiment, the lid further has a lip which engages the upper peripheral rim of the base and has an overhang extending from the lip and dimensioned to receive the upper peripheral rim when the lip engages the upper peripheral rim.

In still another embodiment, the container lid has a plurality of upstanding rails extending from the upper surface in a direction away from the base and wherein the upstanding rails are positioned around at least part of a periphery of the upper surface to fully receive a bottom of a stacked second hybrid container.

BRIEF DESCRIPTION OF THE DRAWINGS

FIGS. **1-4** show a prior art hybrid container.

FIG. **5** is a side view showing a stack of the prior art hybrid containers of FIGS. **1-4**.

FIG. **6** is a perspective view showing one example of an improved hybrid container formed of a base and a lid that removably attach together, in embodiments.

FIG. **7** is a front view of the improved hybrid container of FIG. **6**, in embodiments.

FIG. **8** is a side view of the improved hybrid container of FIG. **6**, in embodiments.

FIG. **9** is a cross section A-A through the hybrid container of FIG. **7**, in embodiments.

FIG. **10** is a side view showing a stack of the improved hybrid containers of FIGS. **6-9**, in embodiments.

DETAILED DESCRIPTION OF THE EMBODIMENTS

FIG. **6** is a perspective view showing one example of an improved hybrid container **600** formed of a base **612** and a lid **614** that removably attach together. FIG. **7** is a front view of the improved hybrid container **610** of FIG. **6**. FIG. **8** is a side view of the improved hybrid container **610** of FIG. **6**. FIG. **9** is a cross section A-A through the hybrid container **610** of FIG. **7**. FIG. **10** is a side view showing a stack of the improved hybrid containers **610(1)**, **610(2)**, and **610(3)** of FIG. **6**. FIGS. **6-10** are best viewed together with the following description.

The base **612** is integrally formed from a paper material, and the lid **614** is integrally formed of plastic. The lid is molded in any desired shape and includes a lip **630** that engages an upper peripheral rim **724** (e.g., an upper edge) of base **612**. The base further includes a bottom **626**, sidewalls **622**, and upper peripheral rim **724** which engages lid **614**. The sidewalls **622** and the bottom **626** define a volume in which food is stored. The sidewalls **622** are tapered to provide structural integrity to the base **612** and aid in nesting within each other when in a stack prior to use for example.

In certain embodiments, the base **612** is made of a flat sheet of paper stock, such as pressed pulp, which is then folded along a plurality of fold lines **628** to form an intended shape. The paper stock is of sufficient rigidity to function as a food container and may also be coated or laminated on a surface, namely the surface that forms the inside of the base **612**, with a hydrophobic material to limit water or oil absorption. As shown, the base **612** further includes a pair of loop-shaped flaps **616** (also called handles), each having a central opening **620**.

The lid **614** includes an overhang **632** from lip **630** that is dimensioned to receive the upper peripheral rim **724** of the base **612** when the lip **630** engages the upper peripheral rim **724**, such as when the lid **614** is mounted on the base **612** in an intended manner. The lid **614** forms an upper surface **634** and may include various strengthening features **636**, such as ribs, push outs, and so on, to add strength and rigidity to the lid **614**. The lid **614** also includes a plurality of upstanding rails **642**, extending from the upper surface **634** in a direction away from the base **612**, and formed around at least part of the periphery of the upper surface **634**. The plurality of upstanding rails **642** are dimensioned to receive the base **612** of a stacked hybrid container (e.g., hybrid container **610(2)**) positioned on the upper surface **634** of hybrid container **610(1)** as shown in FIG. **10**. The bottom **726** of the stacked hybrid container **610(2)** contacts the upper surface **634** of the supporting hybrid container **610(1)** without impediment (e.g., bottom **726** sits flush with the upper surface **634**) and the plurality of upstanding rails **642** help prevent the stacked hybrid container **610(2)** from sliding off of the hybrid container **610(1)**, such as when a stack of containers is carried or transported. The upstanding rails **642** further add strength and rigidity to the lid **614**.

The lid **614** also forms at least two receiving regions **644** on opposing sidewalls **646** that are arranged to receive the loop-shaped flaps **616** of opposing sidewalls **622**. The receiving regions **644** each include a seat **618** dimensioned to engage and releasably retain a corresponding one of the flaps **616** through its central opening **620**. In particular, each

receiving region **644** is recessed, towards a center of the lid **614**, into an opposing sidewall **646** of the lid **614** and is bounded by receiving region walls **648** that are substantially orthogonal to a plane **908** of its opposing sidewall **646**. The seat **618** extends back outward from the receiving region **644** towards the plane **908** of its sidewall **646**, but does not extend beyond the plane **908** of its sidewall **646**. The seat **618** releasably captures the flap **616** via the central opening **620** and thereby releasably couples the base **612** and the lid **614** together. Relative to the upper surface **634**, a rear plane **904** of the receiving region **644** is at a shallower angle **902** than an angle **906** of the plane **908** of its sidewall **646**. Particularly, angle **902**, and thus the depth of the receiving region **644** relative to the plane **908** of its sidewall **646**, is sufficient such that flap **616**, when captured by the seat **618**, does not extend above the upper surface **634** (or a plane thereof) and does not extend outside the plane **908** of its sidewall **646**. Advantageously, it is not easy to inadvertently dislodged the flap **616** from the seat **618** during handling of the hybrid container **610**. Further, region walls **648** add strength and rigidity to lid **614**.

Hybrid container **610** includes many improvements over prior art hybrid container **10** of FIGS. **1-5**. For example, as compared to the prior art regions **44**, the receiving regions **644** for the flaps **616** are deeper and more sharply angled. Also, unlike the prior art flaps **16**, the flaps **616** do not extend above the upper surface **634** of the lid **614** when engaged with seats **618**.

A comparison of the side view of the hybrid container **610** of FIG. **8** to the prior art hybrid container **10** shown in FIG. **3** shows further benefits of the hybrid container **610** over the prior art hybrid container **10**. In particular, the flaps **616** have no exposed regions when each flap **616** is engaged with its respective seat **618**, unlike exposed regions **16**A and **16**B of prior art flaps **16**. In other words, receiving region walls **648** of the receiving regions **644** in which the seats **618** are located, are sufficiently angled inward toward the upper surface **634** such that the entire flaps **616** are shielded from inadvertent contact when handling or stacking the hybrid container **610**. See, for example, the side view of the hybrid container **610** shown in FIG. **8** where the flaps **616** are not visible.

Although the embodiment of FIGS. **6-10** show the flaps **616** terminating well below the upper surface **634**, the flaps **616** may, instead, terminate at, but not above, the upper surface **634** without departing from the scope hereof.

The lid **614** may also include a strengthening ring **640**, formed at upper surface **634** and centrally located, to provide additional support for a stacked hybrid container. In this embodiment, strengthening ring **640** is a trough formed in the surface **634**. Advantageously, the upper surface **634** of the lid **614** between the rails **642** is substantially planar to allow stacking of hybrid containers **610**. In addition, the flaps **616** are fully contained within the receiving regions **644** when retained by the seat **618** and do not extend upward above upper surface **634** (as opposed to flaps **16** of prior art hybrid container **10** shown in FIG. **3**), each container **610** may be positioned in a fully horizontal state (e.g., the bottom **626** of base **612** of a stacked hybrid container **610** is coplanar with upper surface **634** of the lid **614** of a stacked hybrid container **610**) when stacked vertically as shown in FIG. **10**. This allows for more efficient use of counter or refrigerated display space and also reduces susceptibility to tipping while the stacked hybrid containers **610** are in transit (e.g., for take-out delivery).

The improved hybrid container **610** may be described as having: an integrally formed base made from paper and having a bottom and opposing side walls with an upper peripheral rim, and defining a volume, and at least two flaps, one on each opposing sidewall, with each flap pivotable with respect to its sidewall, wherein each flap is configured as a loop having a central opening;

An integrally formed lid of transparent or translucent plastic material and dimensioned for positioning on the rim of the base, the lid having an upper surface, side walls and receiving regions on at least two opposing side walls, the receiving regions bounded by receiving region walls and angled with respect to the upper surface of the lid and having a seat dimensioned for releasable engagement with the loop of each flap of the base, wherein the receiving regions completely receive each flap when the flaps are connected to the seats.

Thus, while there have shown and described and pointed out fundamental novel features of certain embodiments, it will be understood that various omissions and substitutions and changes in the form and details of the devices illustrated, and in their operation, may be made by those skilled in the art without departing from the scope hereof. For example, it is expressly intended that all combinations of those elements and/or method steps which perform substantially the same function in substantially the same way to achieve the same results are within the scope hereof. Moreover, it should be recognized that structures and/or elements and/or method steps shown and/or described in connection with any disclosed form or embodiment may be incorporated in any other disclosed or described or suggested form or embodiment as a general matter of design choice. It is the intention, therefore, to be limited only as indicated by the scope of the claims appended hereto.

What is claimed is:

1. A hybrid container, comprising:

an integrally formed base made from a paper material and having

a bottom,

opposing first sidewalls forming an upper peripheral rim, and

at least two flaps each configured as a loop with a central opening and extending from a different one of the opposing first sidewalls and pivotable with respect to its first sidewall; and

an integrally formed plastic lid dimensioned for positioning on the upper peripheral rim of the base and having an upper surface,

opposing second sidewalls having a planar surface forming a first angle with the upper surface, and

at least two receiving regions each formed on a different one of the opposing second sidewalls and having a rear planar surface formed, with respect to the upper surface of the lid, at a second angle larger than the first angle, each receiving region forming a seat dimensioned to engage with the central opening of one of the flaps to removably retain the flap completely within the receiving region, wherein the flaps are fully contained within the receiving regions when the flaps are retained by the seats.

2. The hybrid container of claim **1**, each of the flaps not extending outside of the planar surface of its second sidewall when retained by its seat.

3. The hybrid container of claim **2**, each of the flaps not extending above the upper surface when retained by its seat.

4. The hybrid container of claim **1**, the plastic material being one of transparent and translucent.

5. The hybrid container of claim 1, each seat extending outward from its corresponding rear plane and not extending beyond the plane of the its second sidewall.

6. The hybrid container of claim 1, the lid further comprising a strengthening ring formed at the upper surface.

7. The hybrid container of claim 6, the strengthening ring comprising a trough formed at the upper surface without extending above the upper surface.

8. The hybrid container of claim 1, the lid further comprising a lip to engage the upper peripheral rim of the base and an overhang extending from the lip and dimensioned to receive the upper peripheral rim when the lip engages the upper peripheral rim.

9. The hybrid container of claim 1, the lid further comprising a plurality of upstanding rails extending from the upper surface in a direction away from the base.

10. The hybrid container of claim 9, the plurality of upstanding rails being formed around at least part of a periphery of the upper surface to receive a base of a stacked second hybrid container.

11. The hybrid container of claim 1, the bottom and opposing first sidewalls of the base defining a volume.

12. The hybrid container of claim 1, each of the receiving regions being bounded by receiving region walls formed orthogonal to the plane of its second sidewall.

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