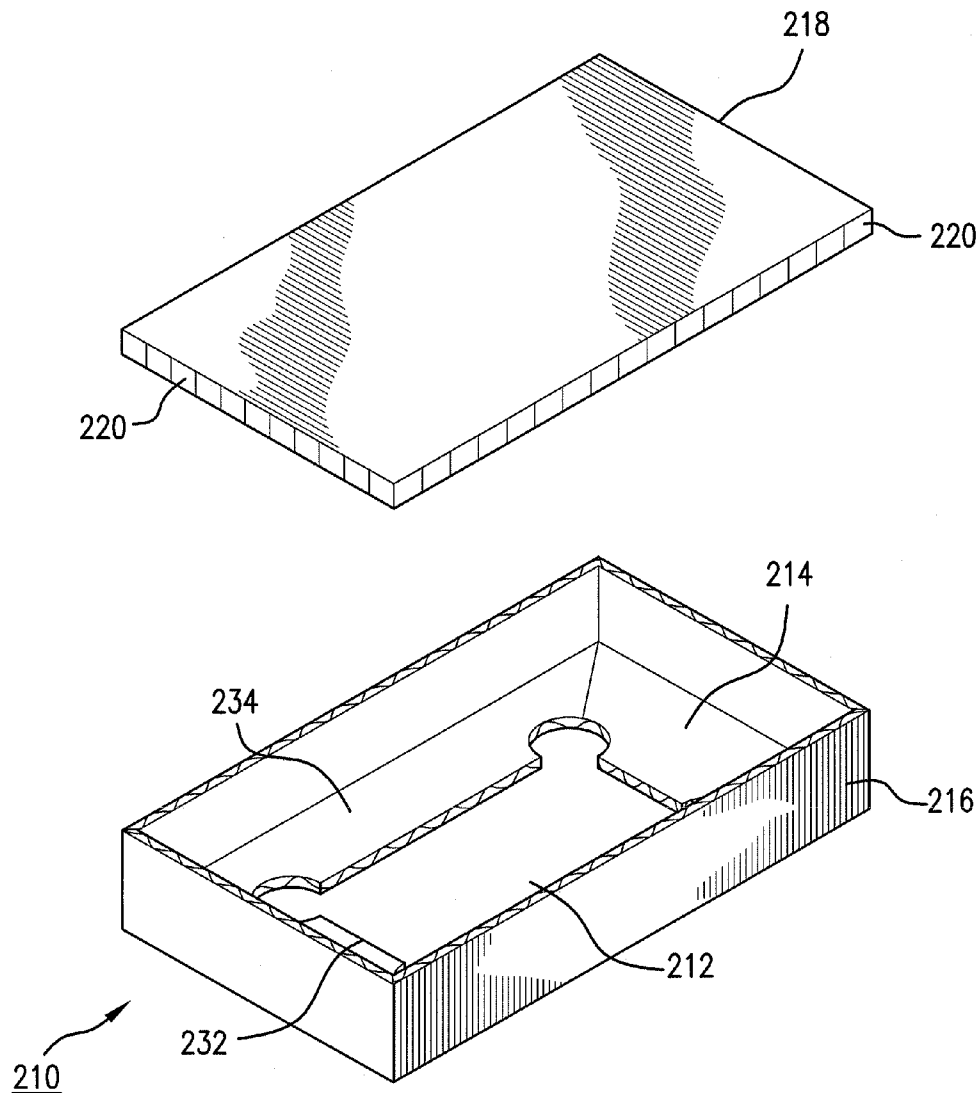




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(19) **United States**(12) **Patent Application Publication**
Jaegers(10) **Pub. No.: US 2012/0305440 A1**(43) **Pub. Date: Dec. 6, 2012**(54) **LAYERED PRODUCT STACKING
STRUCTURE**(52) **U.S. Cl. 206/564**(75) **Inventor: Robert E. Jaegers, Lake Zurich, IL
(US)**(73) **Assignee: Hexacomb Corporation, Deerfield,
IL (US)**(21) **Appl. No.: 13/464,268**(22) **Filed: May 4, 2012****Related U.S. Application Data**(60) **Provisional application No. 61/482,481, filed on May
4, 2011.****Publication Classification**(51) **Int. Cl.**
B65D 21/032 (2006.01)
B65D 71/00 (2006.01)(57) **ABSTRACT**

A product-stacking structure that holds a plurality of products on a horizontal base and includes a plurality of side sections extending generally upright from the horizontal base section (e.g., walls). The walls are configured and dimensioned for retaining bottom features of the products within. The horizontal base includes a horizontal base surface and a void region creating a boundary that restricts movement of upper features of the products in at least one horizontal direction. The product-stacking structure also includes a supportive pad affixed to the first portion over the horizontal bottom section and within the plurality of side sections to cover the void region and configured for supporting products stacked thereon.



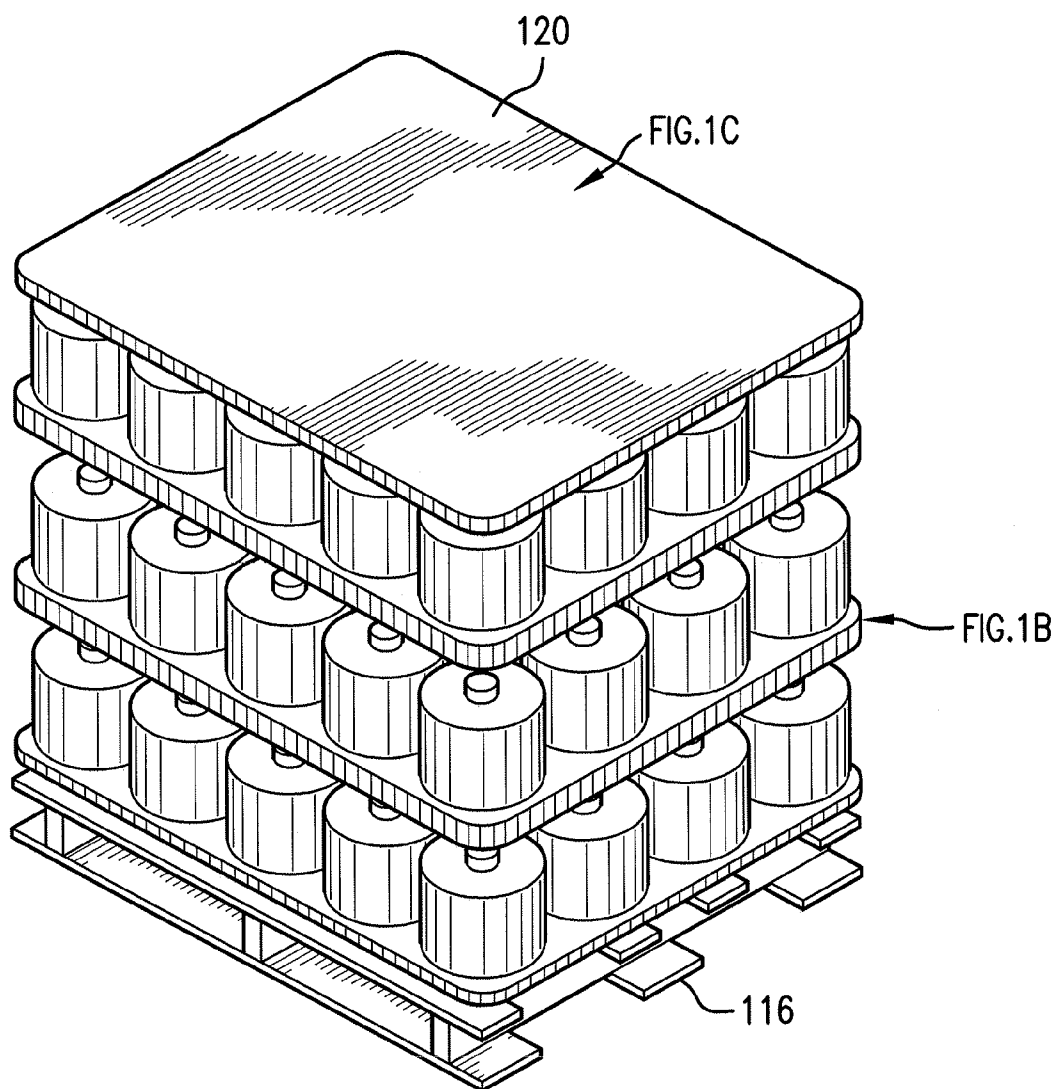


FIG. 1A

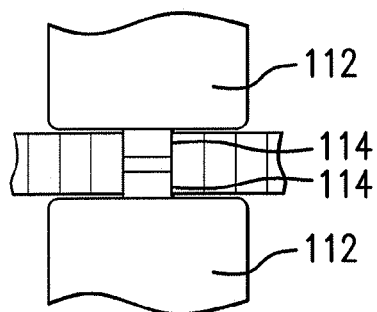


FIG. 1B

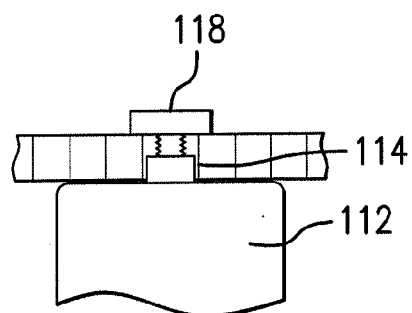


FIG. 1C

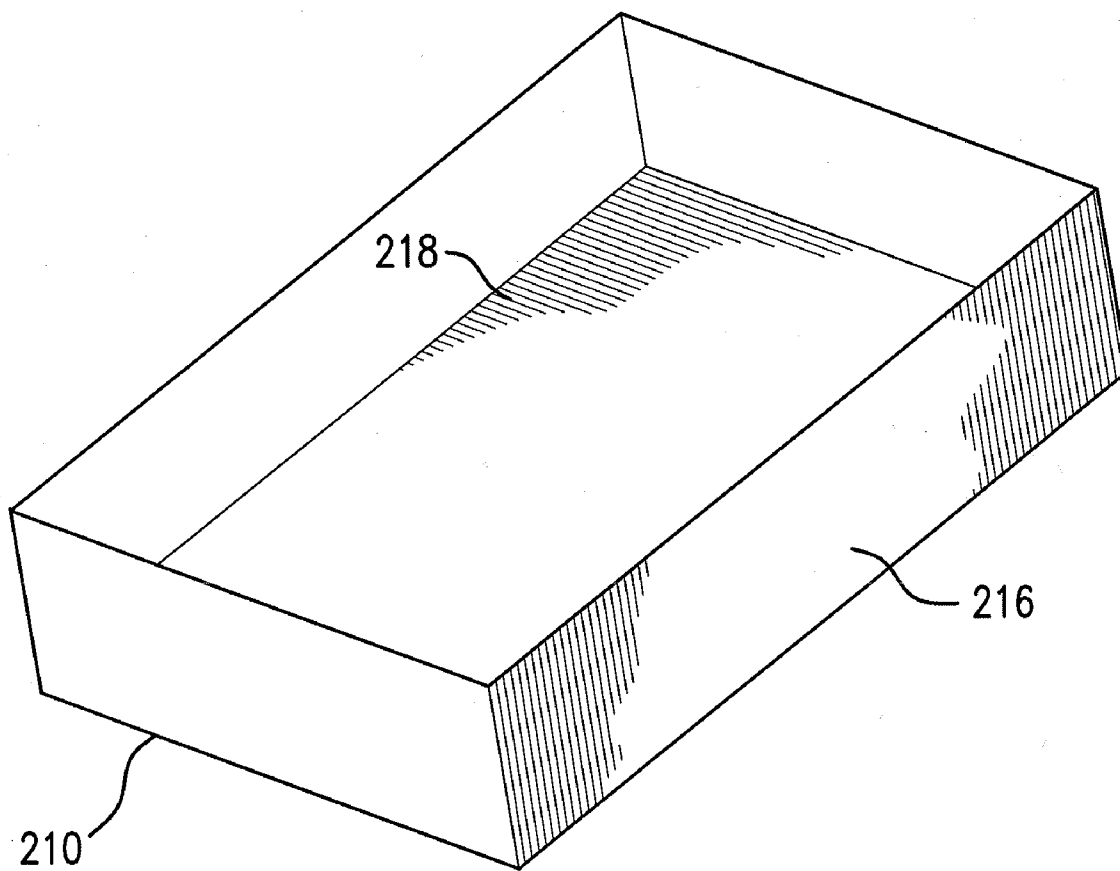


FIG. 2A

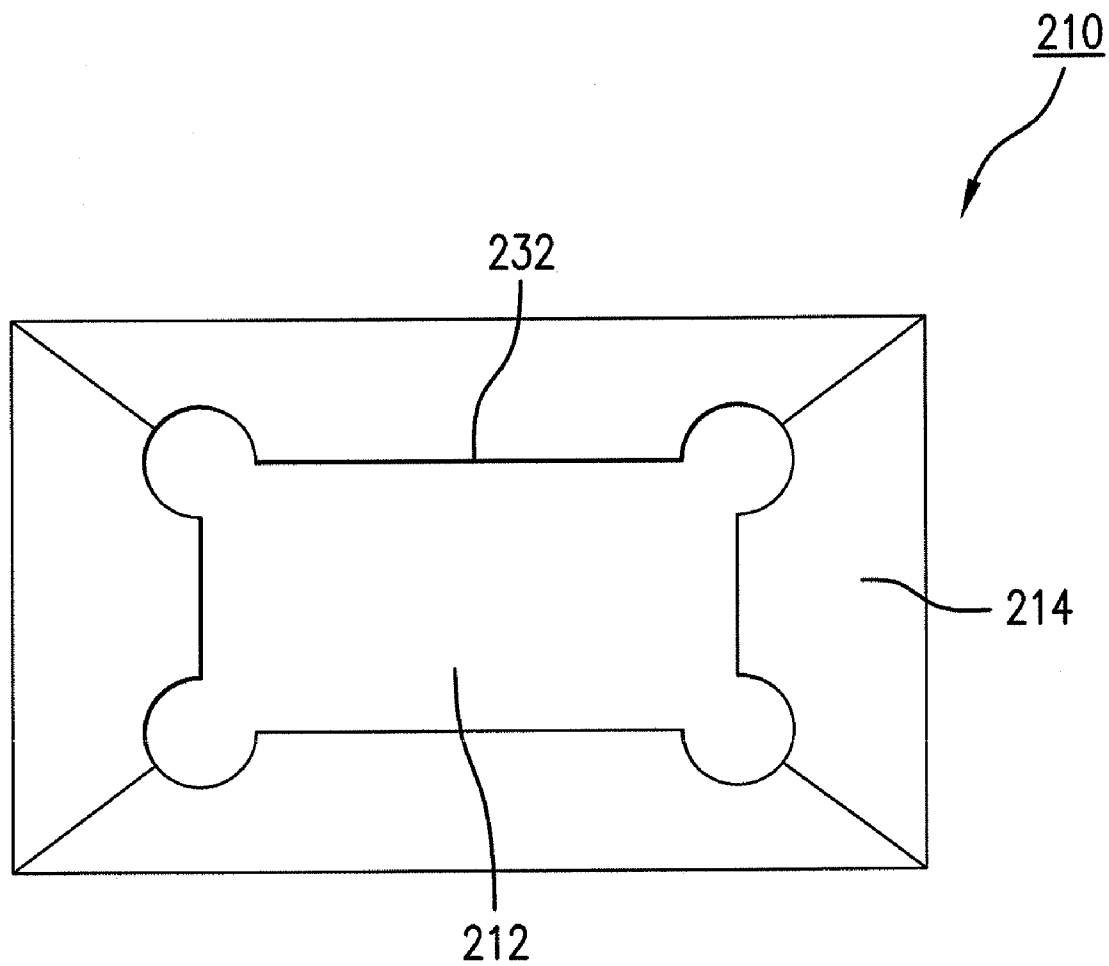


FIG. 2B

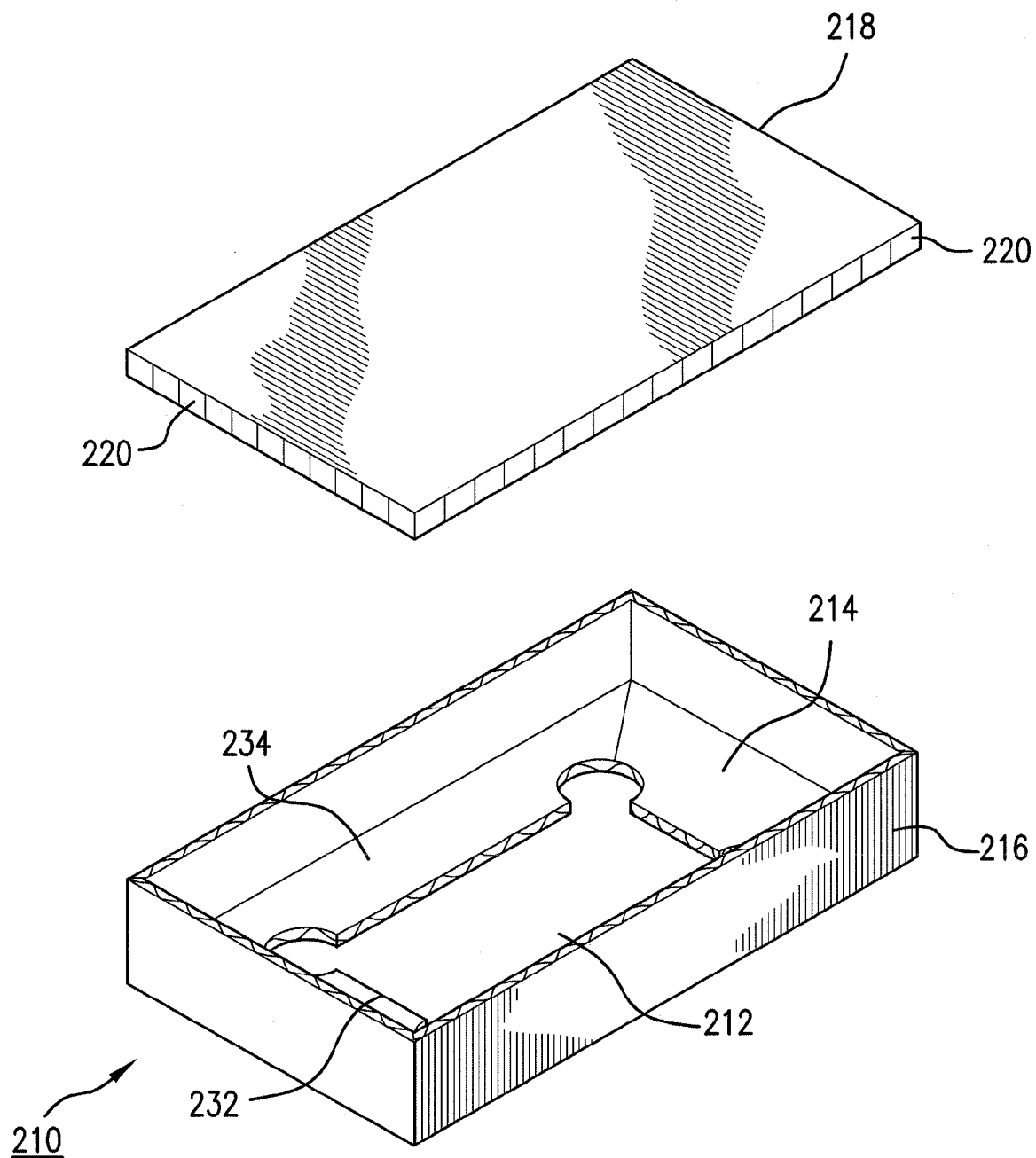


FIG.2C

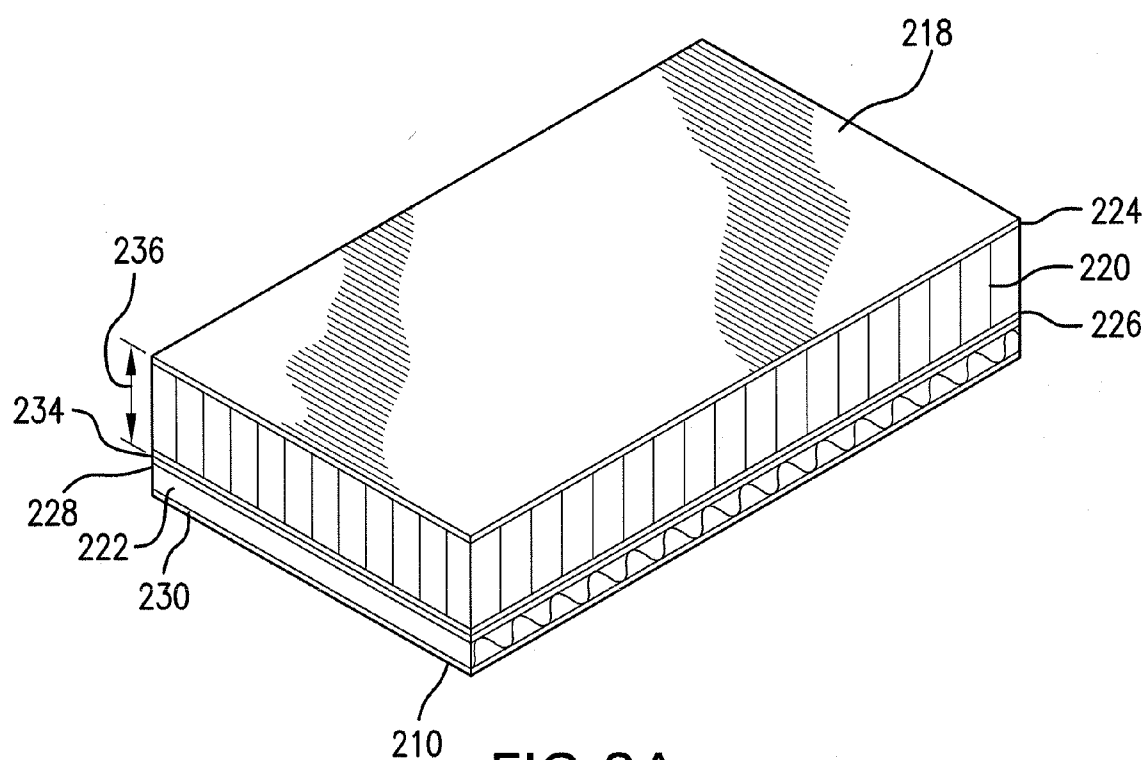


FIG. 3A

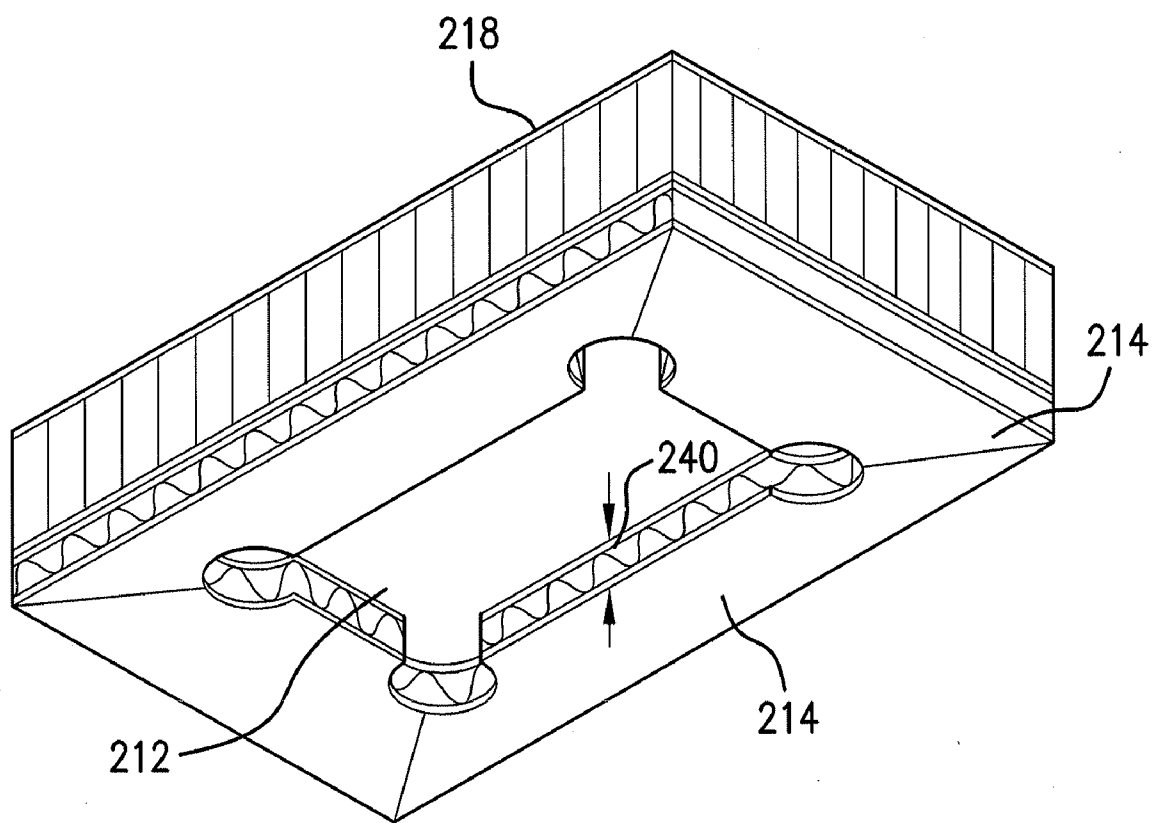


FIG. 3B

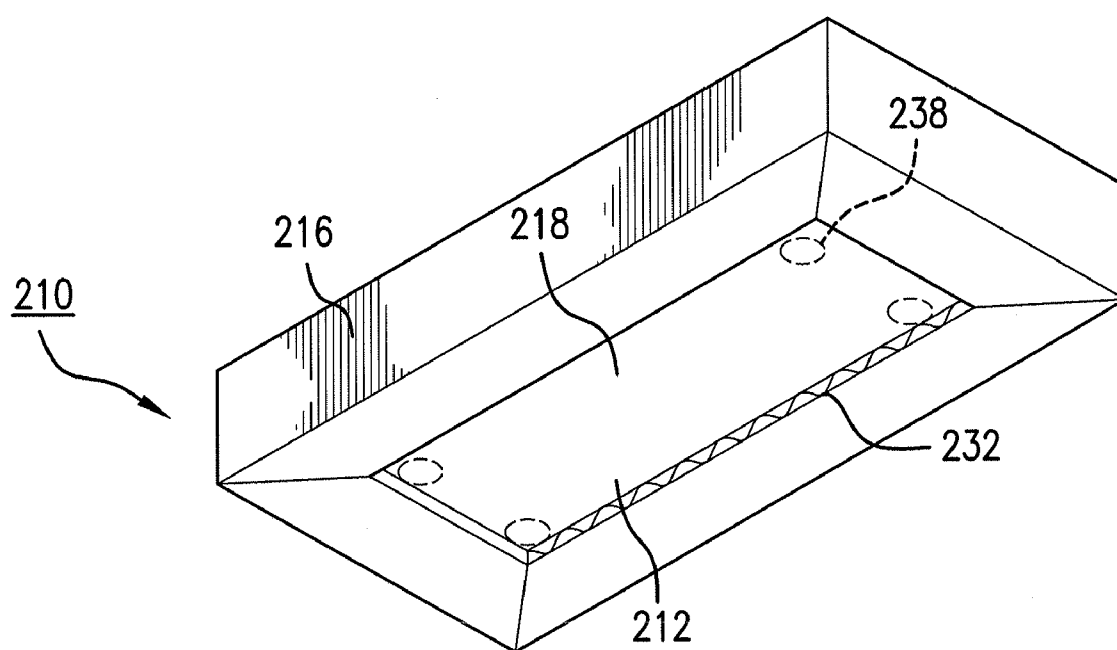


FIG.4

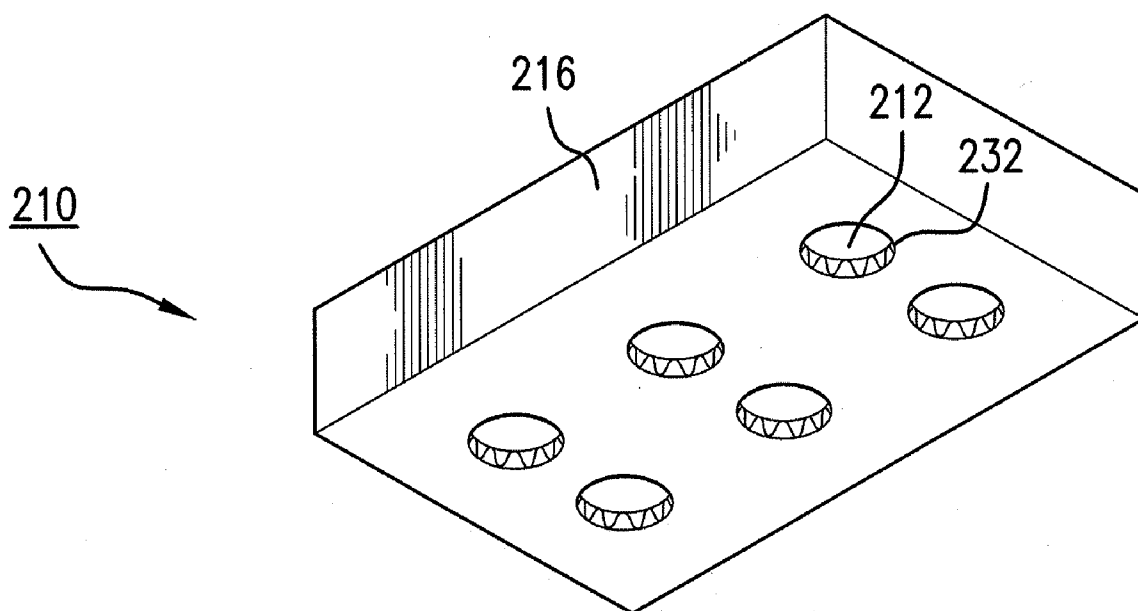


FIG.5

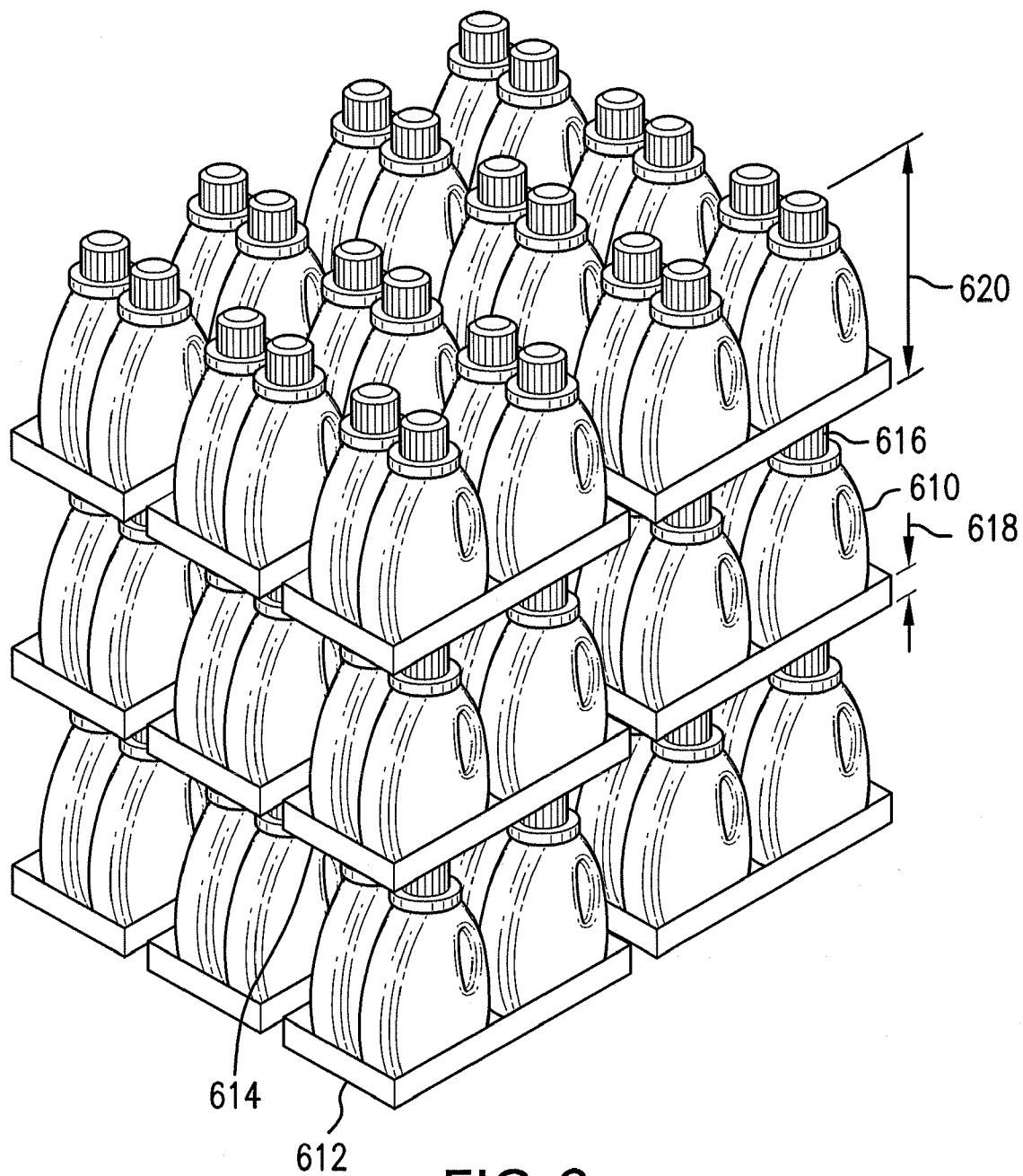


FIG. 6

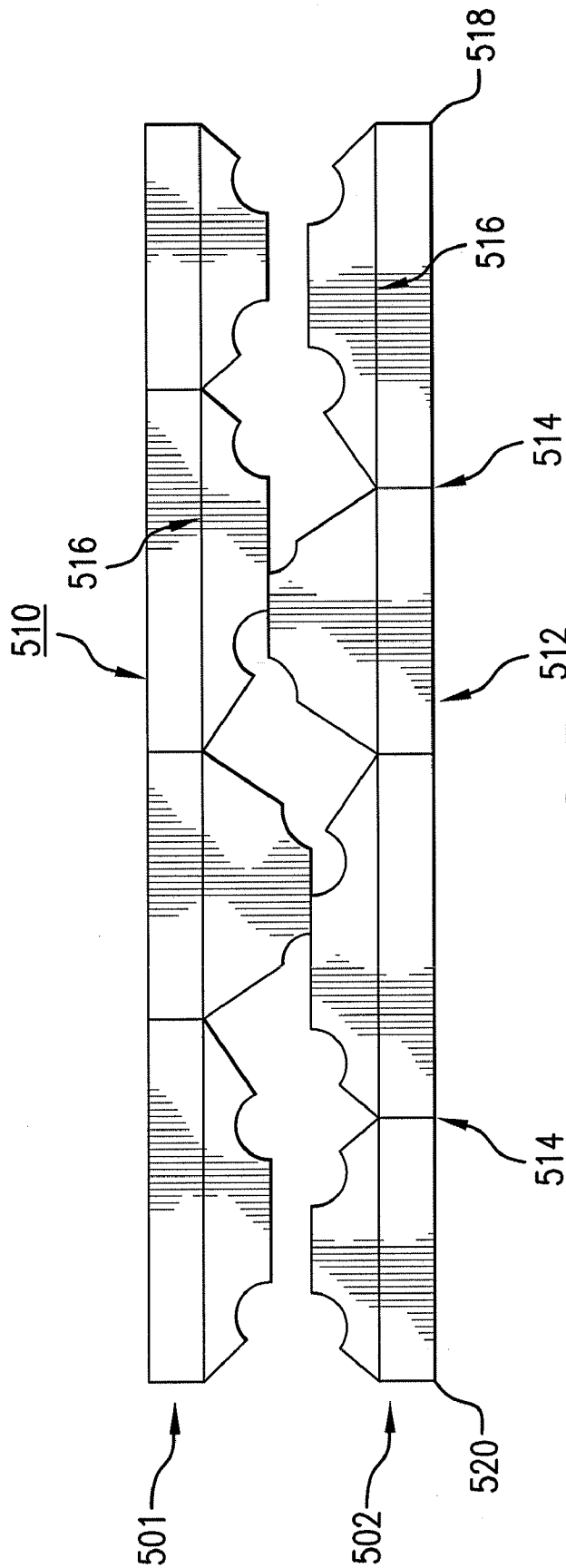


FIG. 7

LAYERED PRODUCT STACKING STRUCTURE

CROSS-REFERENCE TO RELATED APPLICATION

[0001] This application claims priority to U.S. Provisional Application No. 61/482,481 filed May 4, 2011. The entire disclosure of the above-referenced application is incorporated herein by reference in its entirety.

FIELD OF THE INVENTION

[0002] The present disclosure relates to a stacking structure for supporting products.

BACKGROUND

[0003] The packaging industry uses a variety of materials, in a variety of configurations to reduce or eliminate damage to transportable items in transit and to display items in a retail location. Typical materials include corrugated cardboard. A typical configuration may be as simple as a six-sided box, of various dimensions.

[0004] Additionally, configurations strive to reduce the time/effort required to get the contained items from loading dock to presentation shelves (e.g., in the context of retail merchandise and similar). One example may include a cut-away window in the box. This may be an ordinary box holding multiple retail items (e.g., bottles of laundry detergent), and a perforation line, such that when the perforated portion is removed, the product is at least partially visible and accessible. This way, stock workers do not need to fully unload each box onto the shelf, but may quickly remove the perforated window, and shelve the whole box. This may be directly onto the retail shelf, to allow retail customers to identify the product for sale, or may be for placement on stock-room shelves, to allow stock workers to identify the product faster than if left in enclosed boxes.

[0005] Additionally it is known in the art to use extra pads along edges and especially at corners, or to provide additional support at the base of an object or a pallet to support the base of several objects. These base pads, sometimes referred to as carriers, skids, runners, pallets, or simply bases, are used to cushion, protect, and keep together objects during storage and transport. On the base layer, multiple layers of products may be stacked, and each layer of product may include a supporting layer between. For example, FIG. 1A illustrates a bulk packaging of multiple spool-type items 110, each with a main body 112 and two protrusions 114 (e.g., the two ends of the inner spool). The spools 110 are stacked on a bottom pallet 116, and, as depicted in FIG. 1B, a dividing layer of honeycomb board has holes 118 punched out to receive the top end of each spool from the lower layer, and the bottom end of each spool from the upper layer. As depicted in FIG. 1C, the top piece 120, having no upper layer of spools, is flat, with punch-cut then crushed dimples to receive the top end of each spool on the top layer of spools.

[0006] The present disclosure provides a packaging arrangement that can provide increased structural integrity and versatility with respect to products with which it can be used.

SUMMARY

[0007] The present disclosure relates to a stacking structures for supporting a plurality of products. Example embodi-

ments may include a product stacking structure configured to hold a plurality of products having a top and bottom feature. The stacking structure is comprised of a horizontal base and a supportive pad. The horizontal base includes a horizontal base surface and an internal lateral edge that defines a central void. The supportive pad is configured to have sufficient strength for supporting products stacked thereon with the pad supported on similar products therebelow. The supportive pad also has a first pad surface which is affixed to the horizontal base covering the void region with the internal edge positioned proud of the first pad surface. The internal edge creates a boundary that restricts horizontal movement of features of the products that are positioned within the void. In the preferred embodiment, the internal lateral edge defines a central void; however, in alternative embodiments, the internal lateral edge may define a plurality of separate void regions.

[0008] The stacking structure may further comprise of a plurality of sidewalls extending generally upright from the horizontal base and configured and dimensioned for retaining features of the products therebetween. In the preferred embodiment, the height of the plurality of sidewalls and a thickness of the surface region are configured to expose at least a major portion of the products adjacent the sidewalls for viewing.

[0009] Additionally, the supportive pad is disposed on the horizontal base and within the plurality of side sections. The boundary created by the internal edge and the side sections are configured to hold outer edges of the plurality of products, such that the plurality of products are held together against each other.

[0010] In the preferred embodiment, the horizontal base is constructed from a corrugated paper structure, and the supportive pad is constructed from a honeycomb sandwich material. Further, both the horizontal base and side sections in the preferred embodiment are constructed from a unitary blank of sheet material.

[0011] A product-stacking structure in another embodiment may also be configured to hold a plurality of products having a top and bottom feature comprising a first portion and a supportive pad. The first portion further comprises a horizontal base including a horizontal base surface and an internal lateral edge that defines a central void region, and a plurality of sidewalls extending generally upright from the horizontal base. The supportive pad is configured to have sufficient strength for supporting products stacked thereon with the pad supported on similar products therebelow. The supportive pad has a first and second pad surface on opposite sides thereof, where the first pad surface being affixed to the horizontal base covering the void region with the internal edge positioned proud of the first pad surface. In addition, the internal edge creates a boundary that restricts horizontal movement of features of the products that are positioned within the void, and the sidewalls extending beyond the second pad surface sufficiently for retaining features of products therebetween. The first portion may also be made of corrugated cardboard and the pad is made of a honeycomb sandwich material.

[0012] In addition, the stacked structures may form a stacked product arrangement comprising (1) a first and second stacking structures having a first portion and a supportive pad; (2) a first plurality of products supported on the first stacking structures and prevented from sliding laterally by the first stacking structure sidewalls; and (3) a second plurality of products supported on the second stacking structure and prevented from sliding laterally by the second stacking structure

sidewalls. The second stacking structure is disposed and supported on the first products, which are received within the void region of the second stacking structure, thereby retaining the second stacking structure laterally on the first products. In one embodiment, the stacked product arrangement may be configured to retain a first and second products having the same shape.

BRIEF DESCRIPTION OF FIGURES

- [0013] FIG. 1 A shows a prior art packaging arrangement;
- [0014] FIG. 1B is a cross-sectional view of a dividing board thereof;
- [0015] FIG. 1C is a cross-sectional view of the top board thereof;
- [0016] FIGS. 2A and 2B are top perspective and bottom views of a stacking structure according to the preferred embodiment;
- [0017] FIG. 2C is a top perspective view thereof in an unassembled configuration;.
- [0018] FIGS. 3A and 3B are top and bottom perspective views of a stacking structure of another embodiment;
- [0019] FIGS. 4 and 5 are perspective bottom views of other embodiments of a stacking structure;
- [0020] FIG. 6 illustrates a pallet load of stacking structures and packaged products according to an embodiment; and
- [0021] FIG. 7 illustrates two unassembled blanks for forming component pieces of the stacking structure of FIG. 2A-2C.

DETAILED DESCRIPTION

[0022] With reference to FIGS. 2A-2C, an embodiment of a product-stacking structure can be constructed as a shallow-walled tray. The example embodiment includes a supportive pad 218 and a tray portion. The tray portion further comprises (1) a horizontal base 210 having a horizontal base surface 214 and a void 212 formed by an internal lateral edge 232, and (2) side sections or walls 216 formed along the perimeter of the horizontal base 210 and generally extending upright from the base 210. The walls 216 may be part of the same unitary blank of sheet material used to form the base 210, such as a single piece of sheet material, for example, corrugated material, or it may alternatively be adhered or otherwise attached to the horizontal base 210 or pad 218 separately with an adhesive such as, but not limited to PVA glue, EVA glue, water based adhesives, starch based adhesives, HotMelt®, and solvent-less adhesives. The stacking structure may generally be made of a fiber-based material, such as paper or paper-board, and will be discussed in greater details below in FIGS. 3A-3B, although other suitable materials can be used.

[0023] The assembled stacking structure may be of any suitable shape. The example stacking structure has a rectangular shape when viewed from the top, with four side walls 216 to create a shallow tray. The structure, however, may be of any N-sided shape, with substantially similar side lengths, substantially similar opposing side lengths (e.g., as in a non-square rectangle), or irregular side lengths, and in some embodiments has one or more curved walls. In the case of irregular side lengths, the stacking structure may simply be irregular, may be irregular but still able to be tightly packed (e.g., as in a tessellation), or may form part of a more regular shape (e.g., as in an isosceles trapezoid, two of which form a regular hexagon).

[0024] In the preferred embodiment, four walls 216 surround the perimeter of the horizontal base 210 and are generally upright. The walls 216 may be of any height less than the height of the packed products. In the example embodiment and as seen in FIG. 6, the height 618 of the walls 216 is substantially less than the height 620 of the packed products, such that when the packed products are stacked in a first stacking structure and under a second stacking structure, the products remain substantially uncovered. While some embodiments, the height 618 of the side walls 216 can be different, in preferred embodiments, the height 618 is at least about 2%, and in some embodiments at least about 5%, and in others at least about 10% of the height 620 of the packed product 610. While an alternative embodiment can have a sidewall height 618 that reaches the next stacking structure above it, the preferred height 618 is less than about 95% of the height 620 of the packed product 610, and more preferably less than about 50%, and most preferably less than about 20% or even than about 10% depending on the strength of the walls, the configuration of the product so that the walls can keep the product from sliding, and the amount of product that is desired to remain visible when supported on the stacking structure. The height 618 of the walls 216 and the thickness 236 of the supportive pad 218 may also be configured such that when the supportive pad 218 is inserted within the walls 216 of the horizontal base 210, the packed products remain substantially uncovered when stacked. The boundary created by the internal lateral edge 232, discussed further in FIG. 2B, and the side walls 216 can be configured to hold the outer edges of the packed products such that the products are held close together against each other.

[0025] FIG. 213 illustrates the bottom view of the horizontal base section 210 of a single assembled stacking structure. As illustrated, the horizontal base 210 may include an internal lateral edge 232 that defines a void 212, where the tray material is absent, and positioned proud of the supportive pad 218. The void region is defined as the void 212 formed where the horizontal base surface 214 meets the internal lateral edge 232, and the void region is configured and dimensioned to restrict movement of the features of packed products in at least one horizontal direction. The void 212 created by the internal lateral edge 232 may be of any shape, including regular and irregular shapes. In the preferred embodiment, the internal lateral edge 232 creates one central void 212 configured to receive the top features of bottles. However, in other embodiments, the internal lateral edge 232 may form multiple voids 212 placed in various places along the horizontal base surface 214. The multiple voids 212 do not have to be substantially similar to the top features of particular packed products. For example, the internal lateral edge 232 may form multiple voids 212 along the perimeter of the horizontal base surface 214 and the top features of the packed products may be positioned between the voids 212 and not necessarily within the void 212. Example alternative embodiments of the void region may be seen in FIGS. 4 and 5.

[0026] Additionally, the internal lateral edge 232 is configured and dimensioned such that it has sufficient strength and thickness 240 to restrict movement of the features of packed products in at least one horizontal direction. The thickness 240 of the internal lateral edge 232 may be, for example, about 1/16 inch to one 1 inch thick. In the preferred embodiment, the internal lateral edge 232 has a thickness between a

$\frac{1}{4}$ inch to $\frac{1}{2}$ inch. The thickness **240** can vary, and is preferably selected for sufficient strength to retain the products placed in the void region.

[0027] In the assembled form, the recess or void **212** created by the internal lateral edge **232** may have a depth equal to the width of material used to make horizontal base **210**. The region **212** formed by the internal lateral edge **232** may be formed by original construction, or may have been formed with material that was subsequently removed (e.g., a cut-out).

[0028] As illustrated in FIG. 2C, a single assembled stacking structure may include two component parts: a tray portion and a supportive pad **218**. The supportive pad **218** is configured and has sufficient strength for supporting products stacked thereon with the pad **218** supported on similar products therebelow. The supportive pad **218** has a first and second pad surface. The supportive pad **218** may be inserted onto the horizontal base **210**, such that the second pad surface is against the horizontal base **210**, and within the walls **216** creating a double layer bottom in the horizontal base surface **214** and a single layer bottom in the void **212**. In the preferred embodiment, only one supportive pad **218** is exposed through the voids **212**, and the supportive pad **218** is disposed between the walls **216** opposite the voids **212**. The supportive pad **218** may be affixed to the horizontal base **210**, or the supportive pad **218** may not be affixed such that it is removable. In the preferred embodiment, an adhesive **234**, such as those described below, is placed on the top surface of the horizontal base surface **214** and the supportive pad **218** is affixed thereto. In addition, the supportive pad **218** may have substantially the same width and length of the horizontal base **210** or may have a smaller width and/or length of the horizontal base **210**. In the preferred embodiment, the supportive pad **218** has substantially the same width and length as the horizontal base **210**.

[0029] In addition, the supportive pad **218** in the preferred embodiment is made from a single piece of continuous material without any indentations. Alternatively, the supportive pad **218** may be made of more than one piece of material. In addition, the first pad surface (e.g. the side facing opposite the bottom-side of the stacking structure) may also have indentations, grooves, or cut-outs for receiving the bottom features of the packed products and to help prevent the packed products from moving in at least one horizontal direction in some embodiments. Further, in addition to or as an alternative to the shallow-wall feature of the stacking structure, a bottom piece may be used that envelopes more of each product's bottom feature edge, than the wall does. For example, a second pad or horizontal base having one or more void regions may be positioned over and optionally affixed to the first pad **218**. These void regions or indentations may create a second boundary that substantially matches the products' bottom features, securing the bottom end of the products, similarly to the top end of the items. Other bottom inserts are also possible, such as thicker inserts, multiple inserts, or inserts including a void spaces.

[0030] With reference to FIGS. 3A-3B, the product-stacking structure in one embodiment includes a supportive pad **218** and a horizontal base **210** having a horizontal base surface **214** and an internal lateral edge **232** that defines a void **212**. The supportive pad **218** may be inserted on top of the horizontal base **210**, creating a double layer bottom of the horizontal base surface **214** and a single layer bottom where the internal lateral edge **232** creates the void **212**. In

assembled form, the void created by the internal lateral edge **232** may have a depth equal to the width of material used to make the horizontal base **210**.

[0031] FIG. 3A illustrates the top view of one embodiment of the product-stacking structure. In FIG. 3A, the supportive pad **218** may include a core layer **220**, an upper surface, **224**, and a lower surface **226**. Similarly, the horizontal base **210** may include a core layer **222**, an upper surface **228**, and a lower surface **230**. The supportive pad **218** and horizontal base **210** may generally be made of a fiber-based material, such as paper or paper-board, as will be discussed in greater detail below.

[0032] The upper surface **224** and lower surface **226** of the supportive pad **218** in one embodiment are paper facings that sandwich the core layer **220**, which can be a honeycomb material, such as paper, although other materials can alternatively be used for the facings and core. The honeycomb structure can have cells of six walls having a hexagonal shape, or can alternatively have an octagonal shape, or a shape with more or less sides, such as 3-4 sides. Because of the ease of working with paper materials and the availability of various honeycomb structures, products can be manufactured in a variety of shapes and sizes to meet any particular requirements. The honeycomb structure **220** can provide for plenty of air spaces within or in between the cell walls to provide for a low-density honeycomb material. Alternative pads can be made of solid paper board or one or more layers of corrugated cardboard, for example, and in other embodiments, other materials can be used, such as plastic sheet.

[0033] In the preferred embodiment, the supportive pad **218** has a thicker and stronger core **220** than the tray portion which is made of a corrugated structure. However, in other embodiments, a honeycomb or other low-density construction may be used in place of the corrugated structure in the tray portion. A typical thickness **236** of the supportive pad **218** may range from $\frac{1}{4}$ inch to two inches, although this height can be varied depending on the strength, such as the compressive or beam strength, for example, desired. The thickness **236** of the supportive pad **218** is sufficient for supporting products stacked thereon with the pad supported on similar products therebelow.

[0034] The use of paper materials can be cost competitive to materials such as wood, metal, and plastic, while at the same time offering benefits that are not available through the use of traditional wood materials. Paper products can be made lighter than wood, plastic, or metal products, and when formed into a honeycomb structure may have remarkable strength, including increased bending stiffness over other configurations.

[0035] Various adhesives may be used between the layers to adhere the sheets between the layers to each other, as well as to adhere the supportive pad structure **218** to the horizontal base **210** and/or the creases formed between the horizontal base **210** and the wall sections **216**, such as, but not limited to PVA glue, EVA glue, water based adhesives, starch based adhesives, HotMelt [®], and solventless adhesives. Preferred embodiments may utilize PVA glue, especially as between honeycomb walls.

[0036] As illustrated in FIG. 3A, the supportive pad **218** is affixed onto the horizontal base **210** to form one embodiment of the stacking structure. In the preferred embodiment, the adhesive **234**, such as those described above, is positioned between the supportive pad **218** and horizontal base **210**. The stacking structure may be of any N-sided shape, with sub-

stantially similar side lengths, substantially similar opposing side lengths (e.g., as in a non-square rectangle), or irregular side lengths. As illustrated in the example embodiment, the stacking structure has a rectangular shape. Some or all of the sides can be curved in some embodiments, such as those with a round shape.

[0037] FIG. 3B illustrates the bottom view of the horizontal base **210** of a single assembled stacking structure. As illustrated, the horizontal base section **210** may include a void **212** formed by an internal lateral edge **232**, and a horizontal base surface **214**. The void **212** may be formed by original construction, or may have been formed with material that was subsequently removed (e.g., a cut-out).

[0038] In another embodiment of the stacking structure, the stacking structure comprises of a horizontal base **210** having a surface region **214** and a void region **212**, but without the supportive pad **218**. The tray may also comprise of walls **216** formed along the perimeter of the horizontal base **210** and generally extending upright from the base **210**.

[0039] FIG. 4 illustrates an angled bottom view of an alternative example embodiment. In this alternative embodiment, the recessed region **212**, e.g., the void region of the stacking structure has straight internal lateral edges **232** creating straight boundary lines. The dashed circles **238** in the figure illustrate where product top features may sit, with their tops in contact with the pad structure, and the elevated regions (e.g., the horizontal base surface) holding the product top features at two points (e.g., where the circular top feature contacts the boundary lines of each corner of the elevated portion of the recessed region. In this configuration, the bottles are still held from falling in any direction away from the center of the group, and the other bottles being likewise held from moving, prevent the bottles from moving in any direction. This may include even bottles with no contact with the boundary of the elevated portion, such as the center bottle of a three-by-three configuration.

[0040] FIG. 5 illustrates an angled bottom view of an alternative example embodiment. In this alternative embodiment, the internal lateral edges **232** create boundaries for multiple voids or recesses **212**. Each individual void **212**, for example, may be configured to receive top features of individual packed products.

[0041] Once the stacking structures are constructed, one or more items may be placed within the stacking structure. Next, a second stacking structure may be placed on top of the items, with at least a portion of the void region receiving the top features of the packed products, repeating for as many layers as desired. Packed products may include items having a uniform shape or non-uniform shape and may weigh up to 100 pounds and have a width of 8 feet. In the preferred embodiment, the packing trays are configured to receive bottles, such as detergent bottles, weighing up to 200 ounces and having a width up to 15 inches. However, the tray may also be configured to receive other items such as cans, cups, vases, and other items including containers and other products.

[0042] FIG. 6 illustrates a pallet of stacking structures and packaged products. In the preferred embodiment, the stacking structure is configured and dimensioned such that one or more packed products may be placed within (e.g. above the supportive pad **218**) the stacking structure, or below the stacking structure. The boundary created by the internal lateral edge **232** receives at least part of the bottles' tops, and envelopes some portion of the top feature of each. In the case of a round top, it may be preferable to envelope more than half the

top feature, such that the top feature can not easily move in any horizontal direction. By way of example, packed products **610** are placed within a first packing tray **612**. A second stacking structure **614** is placed on top of the items **610**, with at least a portion of internal lateral edge **232** and void **212** receiving the top features **616** of the packed products **610**. In this illustrated example, the stacking structure holds four items that are arranged in levels, each grouping nine packing trays three-by-two, with a total of three levels. This pallet configuration includes eighteen trays and seventy-two bottles, but any other dimensions could be used, and any other sized stacking structures could be used.

[0043] The pallet in this example is illustrated without a top layer of stacking structures. Alternatively, a top layer of identical stacking structures may be used (e.g., with empty tray portions on top), the top layer may have a flat top, or the top may include similar stacking structures, but upside down with the pad affixed on the other side of the bottom portion (e.g., with the side walls **216** extending downward, with the bottle tops in the recessed void, and the pad affixed above

[0044] FIG. 7 illustrates an unassembled layout of a component piece of a tray portion, according to another example embodiment of the present invention. As illustrated, there are two blanks **501** and **502** with identical but reciprocal layouts. When manufacturing includes constructing a solid piece of material and then cutting out specific areas (e.g., to form the lateral edges defining the voids when assembled), this reciprocal layout, with the widest part of one piece adjacent a narrower part of the second piece and vice versa, may require less material than constructing only one piece at a time.

[0045] The unassembled tray portion **510** and **512** may include several partitions **514**. These may be formed by scoring, crushing, folding, or any other suitable technique for creating an angle in the material or preparing the material to have an angle formed at that spot in the material. FIG. 7 also illustrates a hinge line **516**, perpendicular to the partition lines, which may also be formed by scoring, crushing, folding, or any other suitable technique. Preferably, a technique may be used that maintains structural integrity of the material, since at least some of these partition/hinge lines should remain attached.

[0046] An example method of construction, according to one example embodiment, is to assemble the tray portion from a blank **501** and **502**. FIG. 7 shows two blanks **501** and **502** cut from a sheet of corrugated cardboard. Each blank **501** and **502** is folded at the partitions **514** and hinges **516** to form the tray portion, which is then glued to a pad **218**. The pattern created by the lateral edge **232** may be configured to create void **212**, when assembled, and the void region (e.g. the internal lateral edge **232** and the void **212** taken together) may be configured to partially secure the packed products.

[0047] Specific implementations (e.g., including specific boundary line configurations defining the shape of the void region(s)) could be made for any number of scenarios, products, product sizes, product groupings, etc. A particularly advantageous candidate product may be a bottle or other product with an odd or irregular shape. The stacking structure can be used with products that do not have a substantially flat, extensive horizontal area below a top protrusion (e.g., a bottle cap), such as the sloping bottles illustrated in FIG. 6. Products may include a relatively tall top protrusion since the pad limits penetration into the void region. Products with a relatively wide bottom can also be used and can be contained

within the sidewalls. It will be understood that other shapes of products can alternatively be used.

[0048] The above illustrations included a shallow-wall stacking structure to secure the bottom feature of the package items (e.g., on two sides of each product), with the other products otherwise securing the bottom feature (e.g., on the other two sides of each product). However, more than four items could be packaged, such as 2 by 3, where two middle items are secured by the wall on only one side, or 3 by 3, where a center item is secured only by other items, which are partially secured by the wall. The same can be the case, for example, for the top features secured by the boundary of the void region. A 3 by 3 arrangement may be similar to the 2 by 2 arrangements illustrated, but include additional voids or cut-outs for the four bottles along the edges and between the corners, while the center bottle may make no contact with the boundary, and be secured by only the other secured bottles. Any other configuration or arrangement may also be implemented for the void region and boundary pattern.

[0049] One having ordinary skill in the art should appreciate that there are numerous shapes and sizes of the unassembled materials, assembled wall heights, void regions, surface regions, boundary shapes, etc. which may be desired as specific implementations for particular product designs, consistent with and according to exemplary embodiments of the present invention. Additionally, one having ordinary skill in the art will appreciate that although the preferred embodiments illustrated herein reflect a generally shallow and rectangular tray, any number of shapes, depths, or configurations are possible. The supportive pad material and/or the tray portion material may be any number of materials, such as a corrugated or honeycomb sheet structure, as well as multiple layers of sheet material, or other material.

[0050] As used herein, the terms “front,” “back,” and/or other terms indicative of direction are used herein for convenience and to depict relational positions and/or directions between the parts of the embodiments. It will be appreciated that certain embodiments, or portions thereof, can also be oriented in other positions.

[0051] In the example embodiments described herein, certain terms are used to describe specific implementations, but do not preclude other implementations. For example, area may be described as a cut-out area or void, but need not be literally cut out of material. The void may be achieved by other means, such as manufacturing the components to include certain recessed portions in the first instance. Additionally, several embodiments may refer to products, but any item of suitable characteristics may be used with example embodiments of the present invention, not just products, bottles, retail items, or any other limitation unrelated to an item's configured structure.

[0052] In addition, the term “about” should generally be understood to refer to both the corresponding number and a range of numbers. In addition, all numerical ranges herein should be understood to include each whole integer within the range. While an illustrative embodiment of the invention has been disclosed herein, it will be appreciated that numerous modifications and other embodiments may be devised by those skilled in the art. Therefore, it will be understood that the appended claims are intended to cover all such modifications and embodiments that conic within the spirit and scope of the present invention.

What is claimed is:

1. A product-stacking structure configured to hold a plurality of products having a top and bottom feature comprising:
 - a horizontal base including a horizontal base surface and an internal lateral edge that defines a central void; and
 - a supportive pad configured and having sufficient strength for supporting products stacked thereon with the pad supported on similar products therebelow, the pad having a first pad surface and being affixed to the horizontal base covering the void region with the internal edge positioned proud of the first pad surface, the internal edge creating a boundary that restricts horizontal movement of features of the products that are positioned within the void.
2. The stacking structure of claim 1, further comprising a plurality of sidewalls extending generally upright from the horizontal base and configured and dimensioned for retaining features of the products therebetween.
3. The stacking structure of claim 2, wherein the supportive pad is disposed within the plurality of side sections.
4. The stacking structure of claim 2, wherein the boundary and side sections are configured to hold outer edges of the plurality of products, such that the plurality of products are held together against each other.
6. The stacking structure of claim 2, wherein a height of the plurality of sidewalls and a thickness of the surface region are configured to expose at least a major portion of the products adjacent the sidewalls for viewing.
7. The stacking structure of claim 2, wherein the horizontal base and side sections are constructed from a unitary blank.
8. The stacking structure of claim 1, wherein the horizontal base is constructed from a corrugated paper structure, and the supportive pad is constructed from a honeycomb sandwich material.
9. The stacking structure of claim 1, wherein the internal lateral edge defines a plurality of separate void regions.
10. A product-stacking structure configured to hold a plurality of products having a top and bottom feature comprising:
 - first portion that includes:
 - a horizontal base including a horizontal base surface and an internal lateral edge that defines a central void region, and
 - a plurality of sidewalls extending generally upright from the horizontal base; and
 - a supportive pad configured and having sufficient strength for supporting products stacked thereon with the pad supported on similar products therebelow, the pad having first and second pad surfaces on opposite sides thereof, the first pad surface being affixed to the horizontal base covering the void region with the internal edge positioned proud of the first pad surface;
 wherein the internal edge creating a boundary that restricts horizontal movement of features of the products that are positioned within the void, and the sidewalls extending beyond the second pad surface sufficiently for retaining features of products therebetween.
11. The stacking structure of claim 10, wherein the first portion is made of corrugated cardboard and the pad is made of a honeycomb sandwich material.
12. A stacked product arrangement, comprising:
 - first and second stacking structures as described in claim 10; and

a first plurality of products supported on the first stacking structures and prevented from sliding laterally by the first stacking structure sidewalls;

a second plurality of products supported on the second stacking structure and prevented from sliding laterally by the second stacking structure sidewalls;

wherein the second stacking structure is disposed and supported on the first products, which are received within

the void region of the second stacking structure, thereby retaining the second stacking structure laterally on the first products.

13. The stacked product arrangement of claim **12**, wherein the first and second products have a same shape.

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