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(54) **MULTI-CONFIGURABLE MODULAR DECKING SYSTEM WITH LOCKING COMPONENTS**

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E04F 15/02	(2006.01)
E04B 1/00	(2006.01)
E04B 1/41	(2006.01)
E04F 15/10	(2006.01)

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

CPC ***E04F 15/02183*** (2013.01); ***E04B 1/003*** (2013.01); ***E04B 1/40*** (2013.01); ***E04F 15/105*** (2013.01); *E04F 2201/0505* (2013.01); *E04F 2201/0523* (2013.01); *E04F 2203/026* (2013.01)

(58) **Field of Classification Search**

CPC E04B 1/003; E04B 1/40; E04F 15/02183; E04F 2201/0523; E04F 2203/026

USPC 52/177, 180, 403.1, 480, 582.2

See application file for complete search history.

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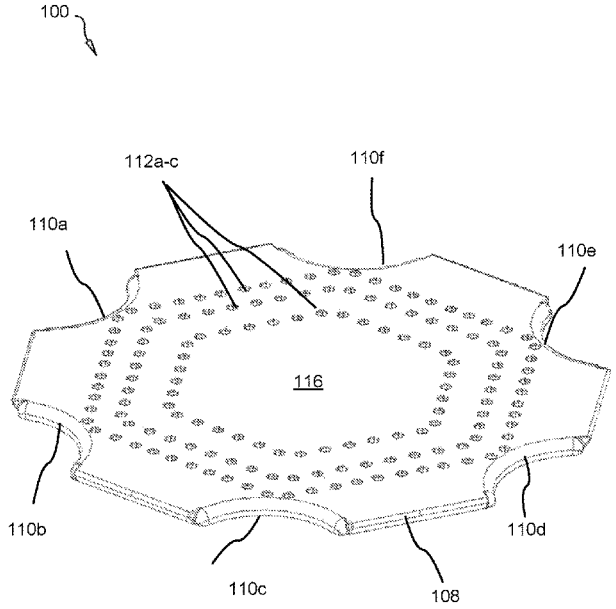
(57) **ABSTRACT**

A portable, modular, interlocking decking system or apparatus that can be assembled and disassembled for resizing, transport, relocation and expansion. The decking comprises a plurality of panels shaped and dimensioned to interlock with other panels via fastener, the fastener comprising an axially rotatable locking mechanism which have detents in some embodiments.

11 Claims, 10 Drawing Sheets



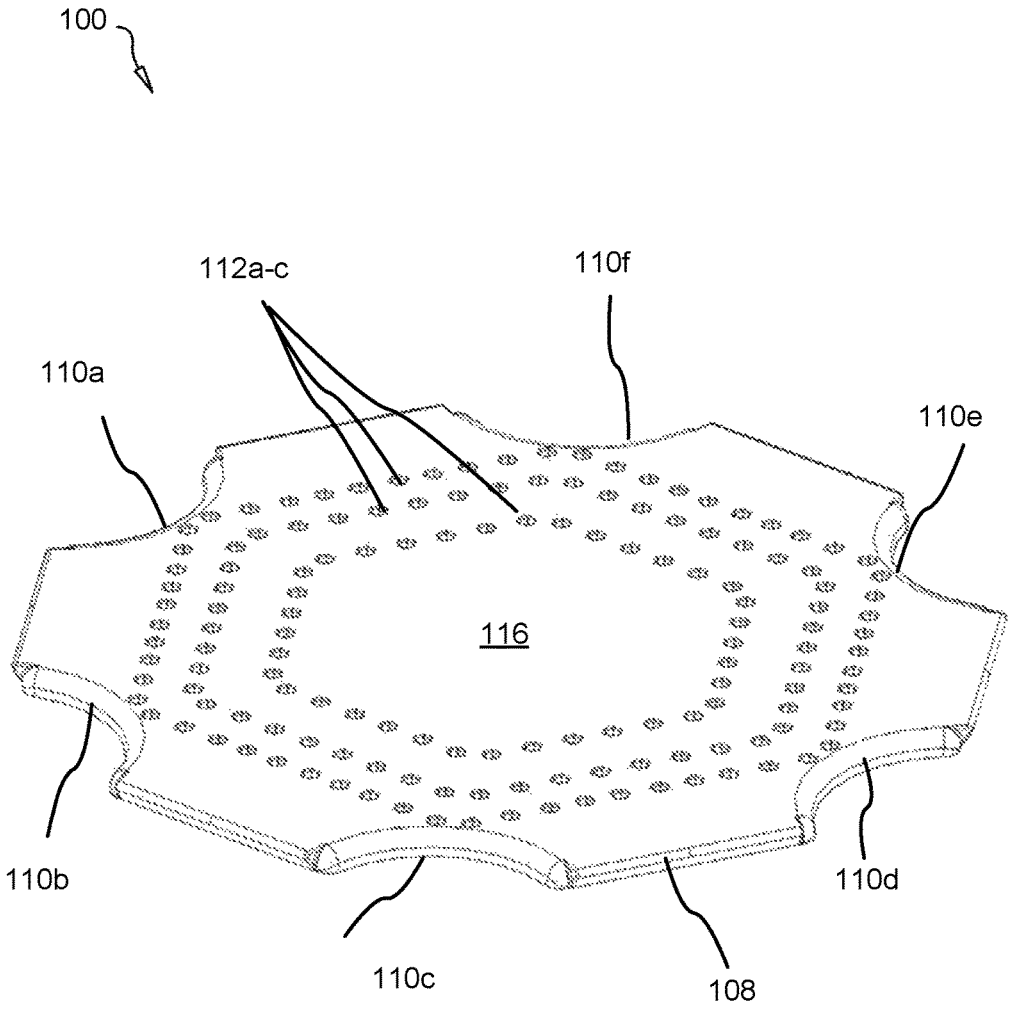


FIG. 1

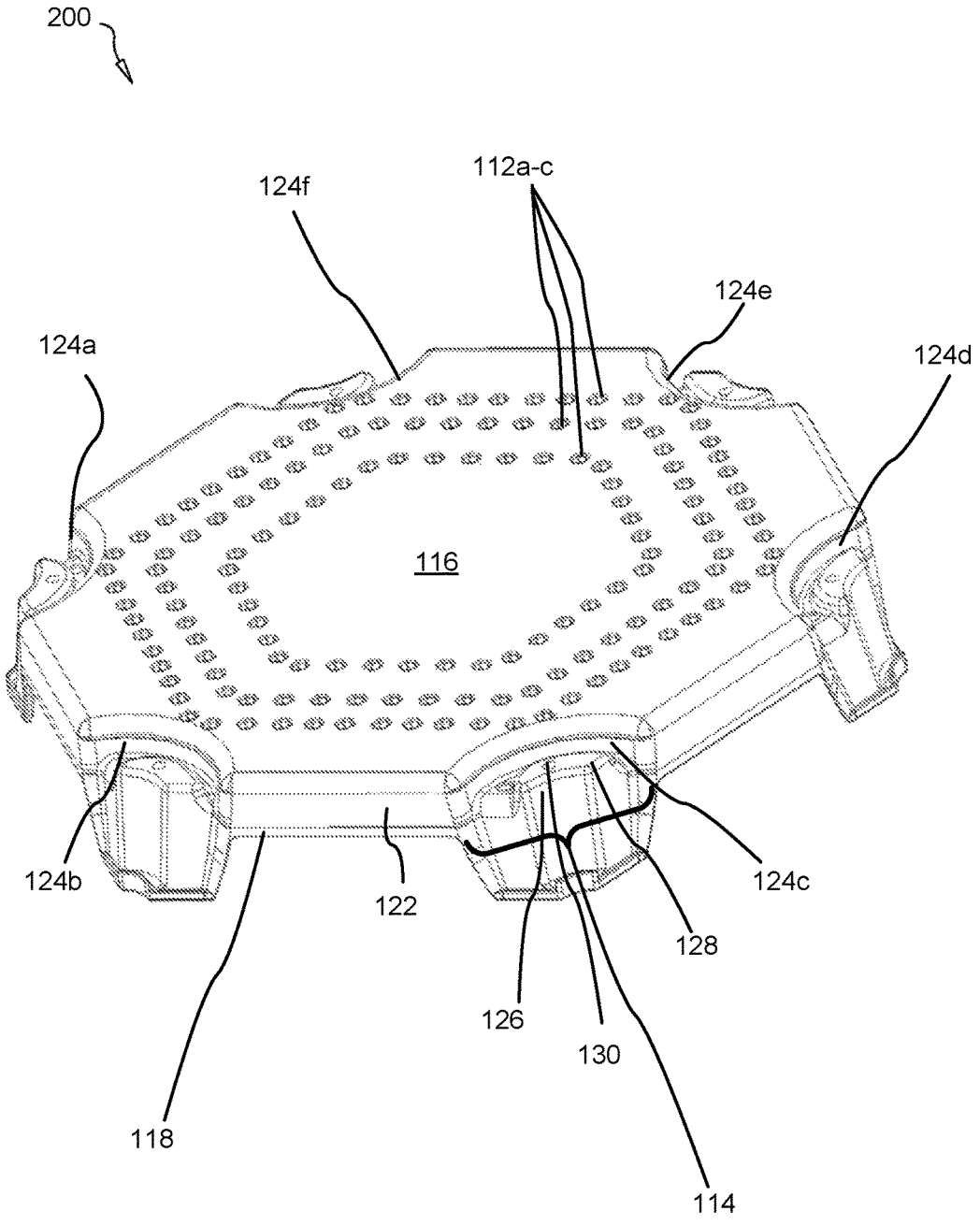

200
124f
112a-c
124e
124a
124d
116
124b
122
124c
128
126
130
118
114

FIG. 2

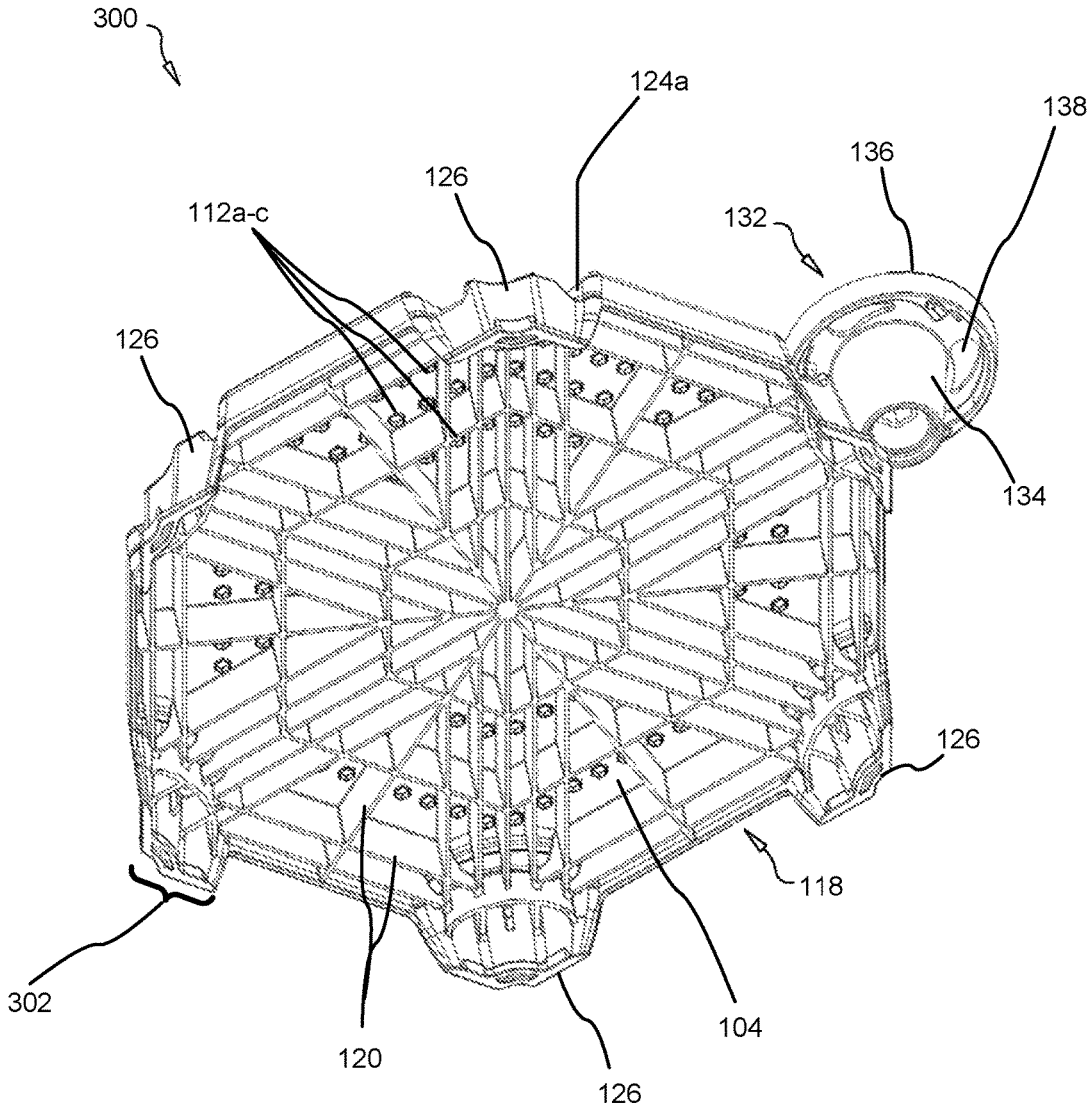


FIG. 3

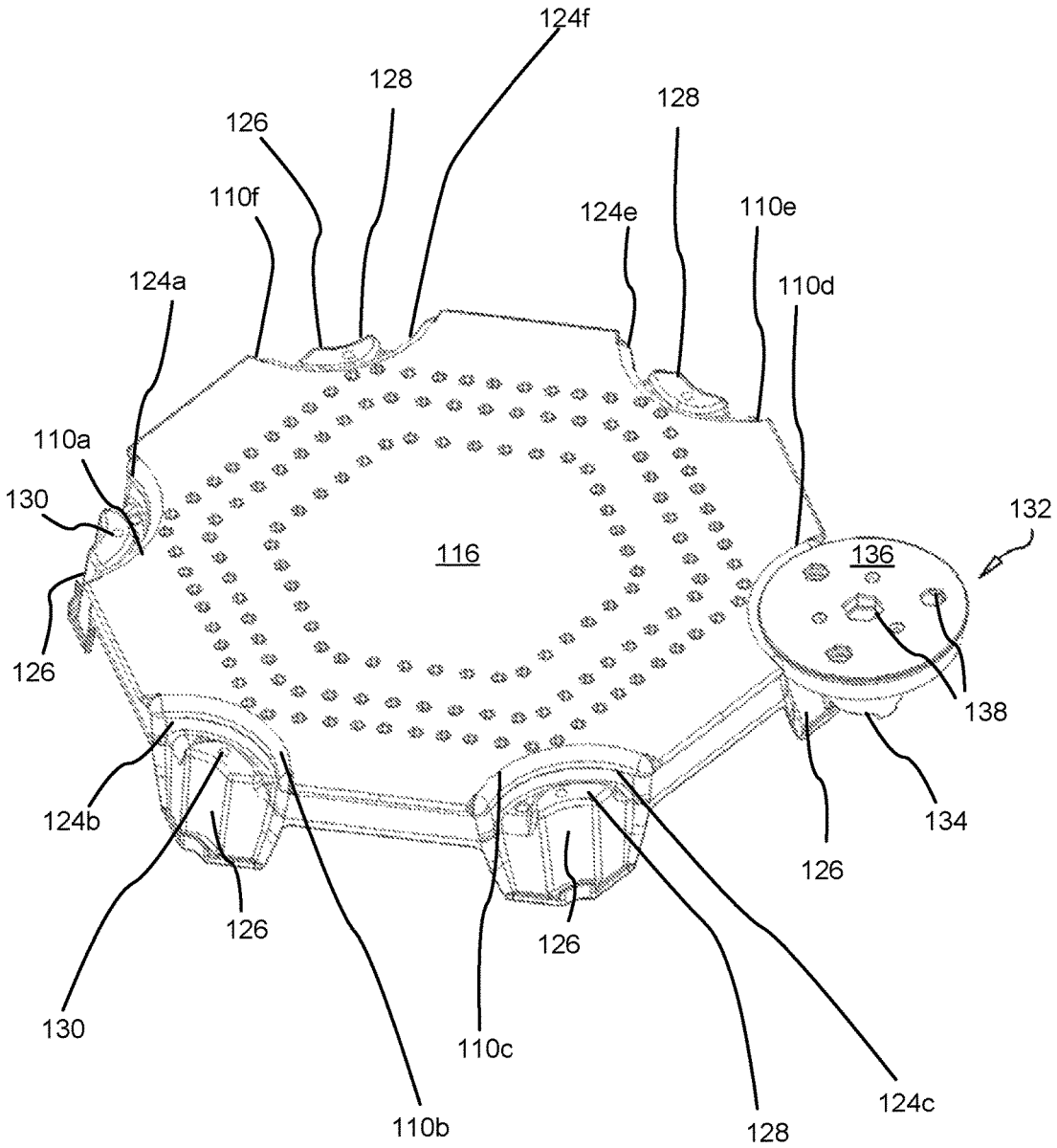

124f
128
126
128
110f
124e
110e
124a
110d
110a
130
116
132
136
126
138
124b
134
126
126
126
130
110c
124c
110b
128

FIG. 4

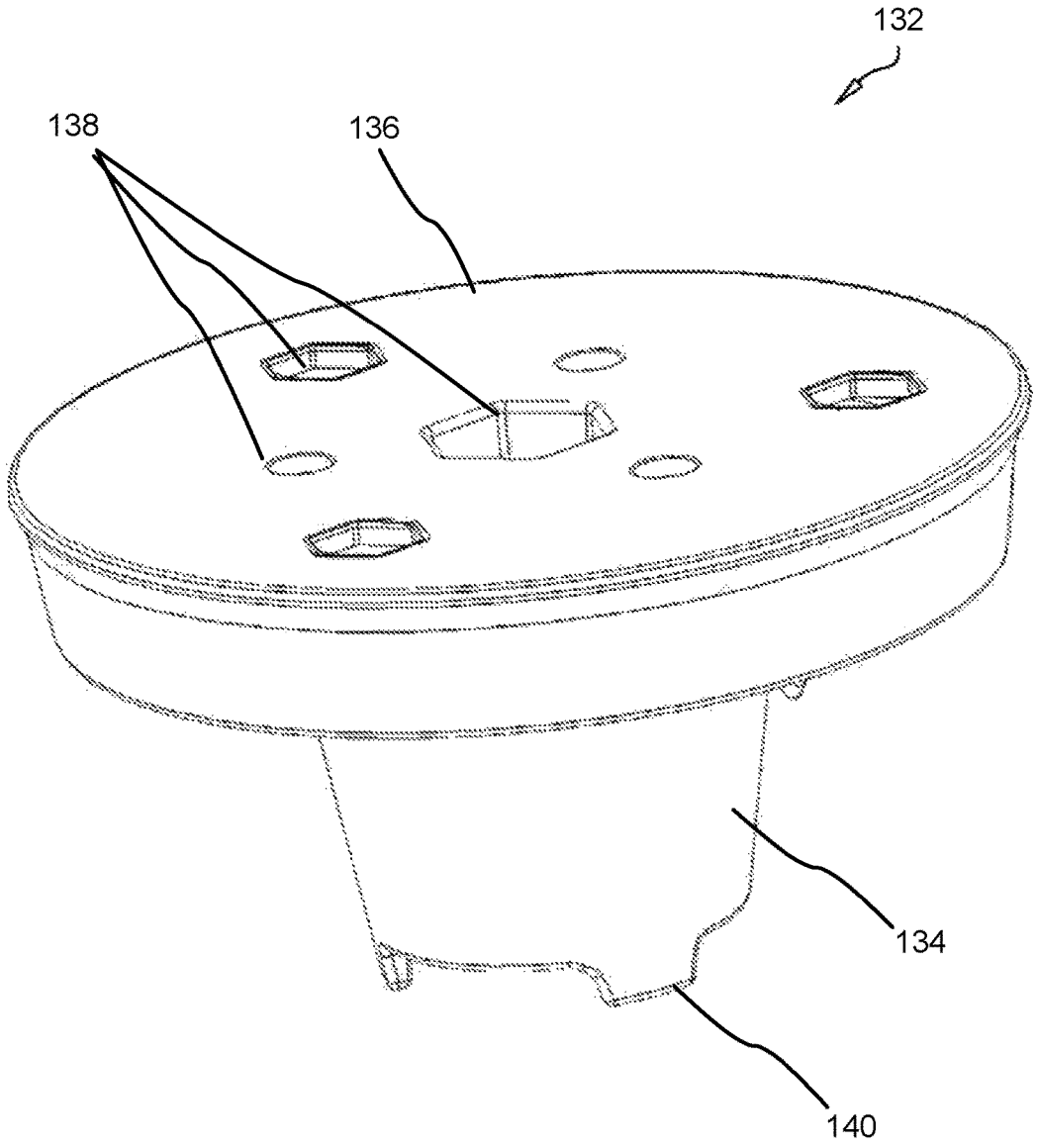


FIG. 5

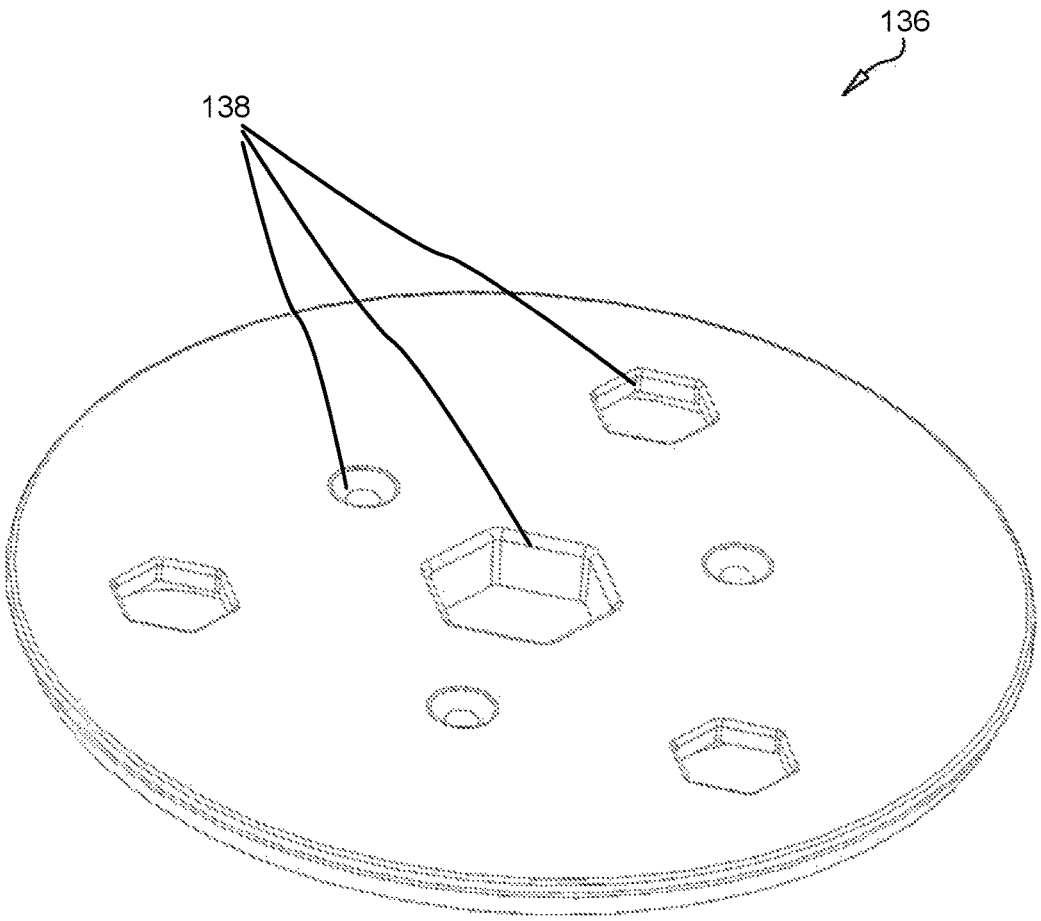


FIG. 6

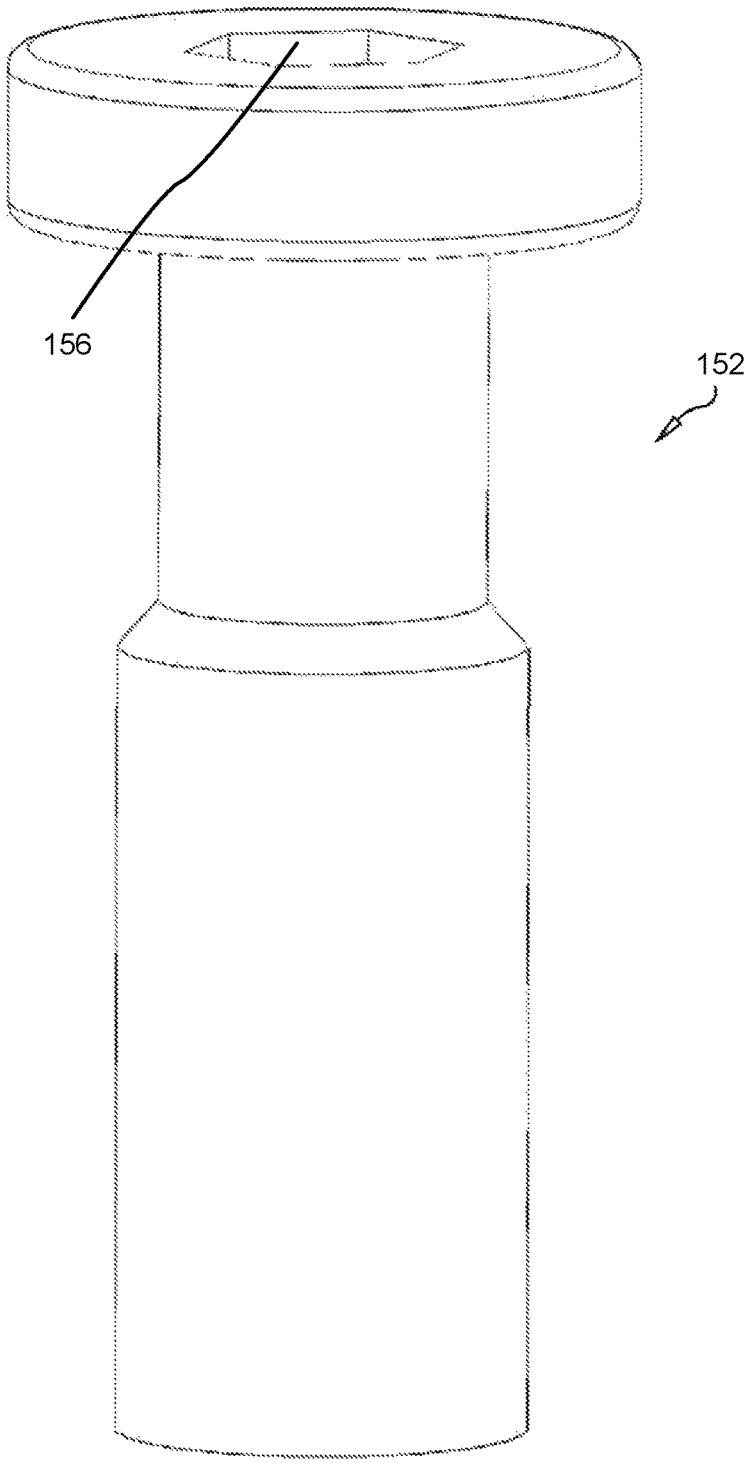


FIG. 7A

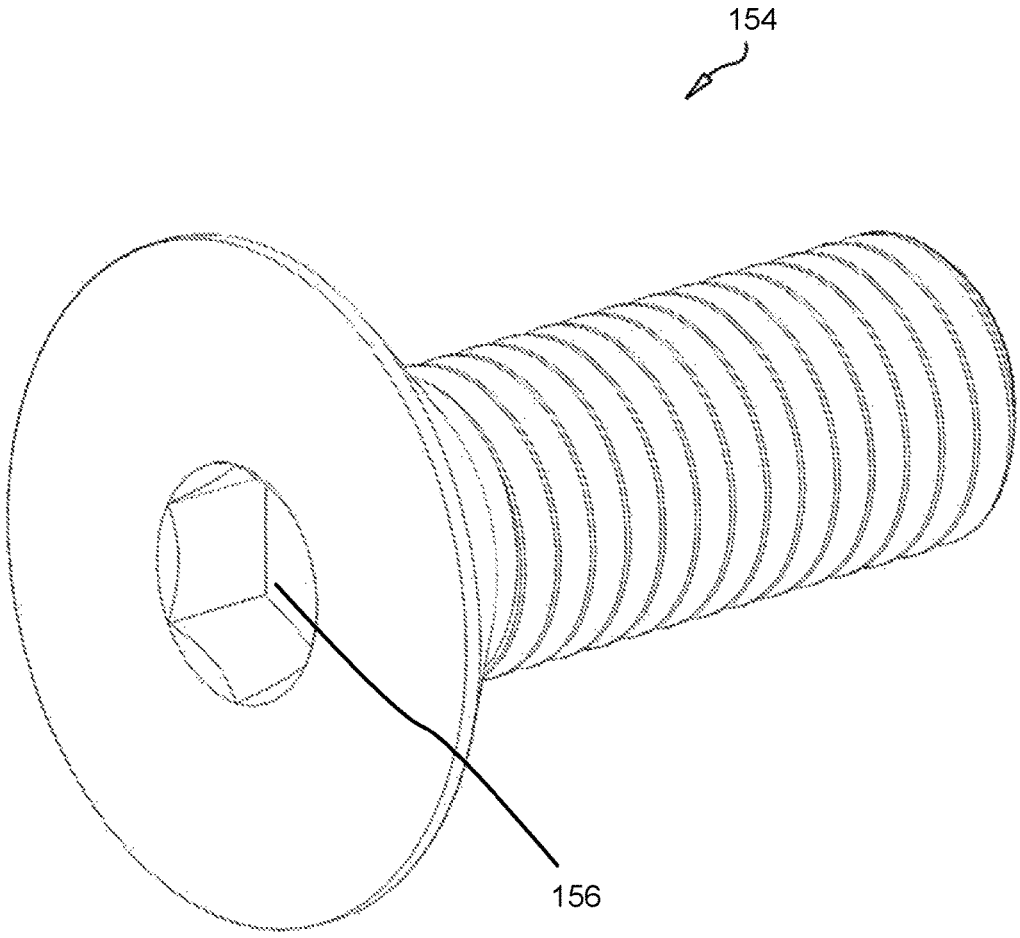


FIG. 7B

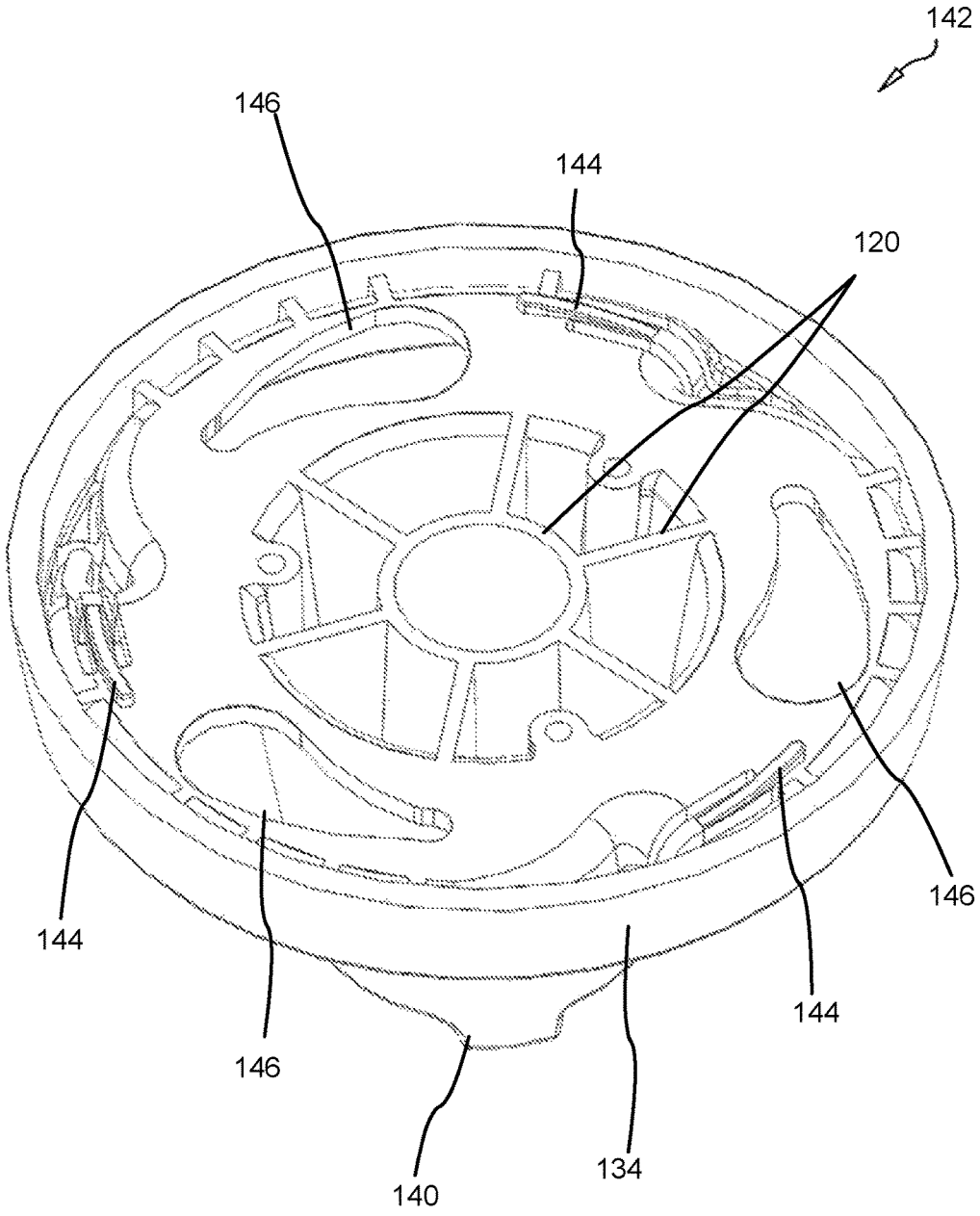


FIG. 8

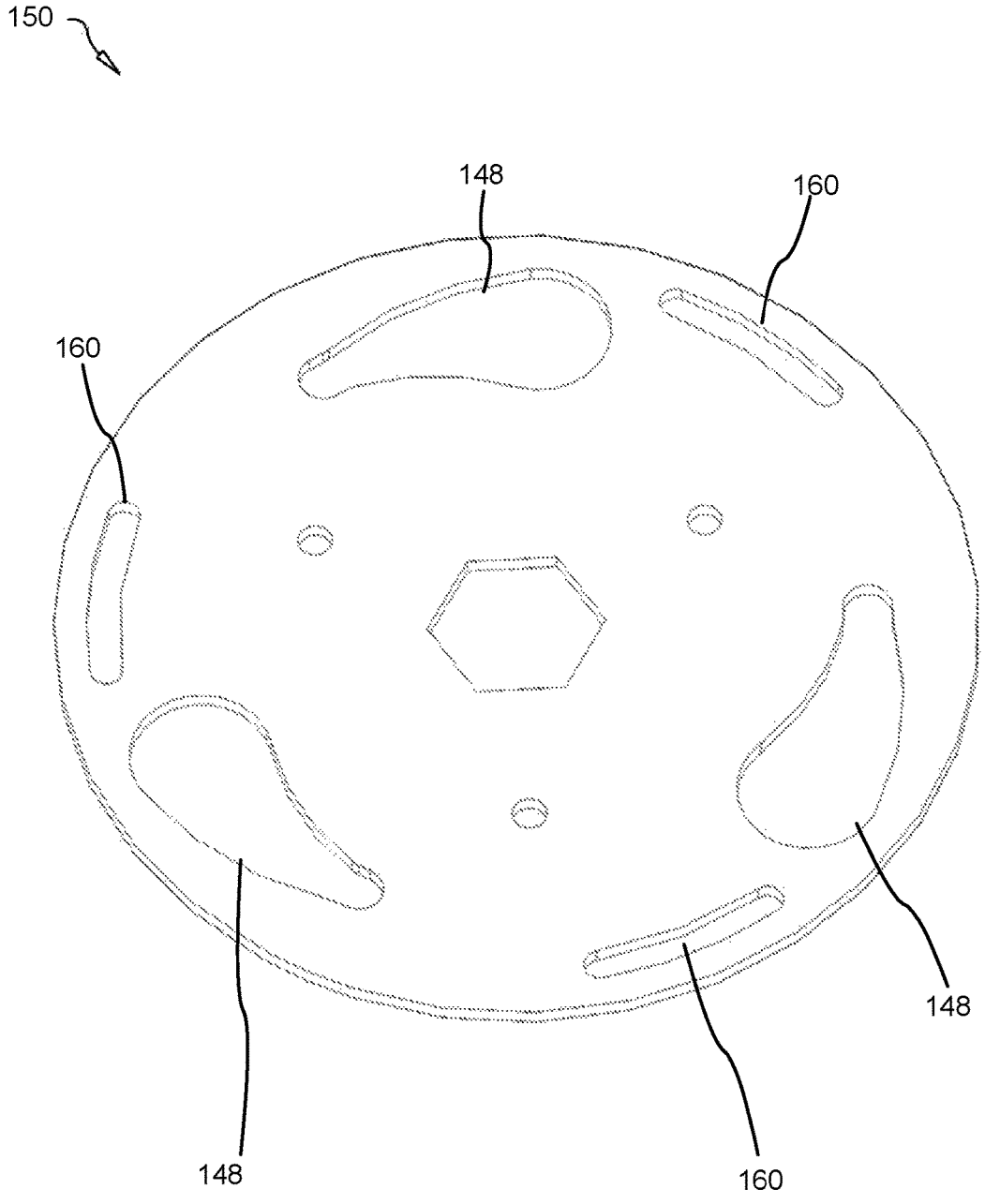


FIG. 9

MULTI-CONFIGURABLE MODULAR DECKING SYSTEM WITH LOCKING COMPONENTS

BACKGROUND OF THE INVENTION

Field of the Invention

This invention relates to a modular decking system that can be assembled and disassembled for reconfiguration, relocation, and expansion; and more particularly relates to a modular decking system comprised of panels that assemble to form a deck, anchors that uniformly bear the weight from the panels, and fastening components that rotatably lock the panels to the anchors and to the surface to restrict lateral movement therebetween.

Description of the Related Art

Installation of permanent decking requires a specialized skill set and is labor intensive, sometimes requiring footings to be dug or other construction. Traditional decks are often constructed to be a fixed in place and cannot be relocated and can only be removed or relocated through destructive means. Although modular decking kits having attachable members are known in the art, they are often fabricated from wooden members which may warp, splinter, or rot. Most modular decking comprises rectangular decking members affixed together on a subgrade, joists, beams or framing to form a larger deck. These members are not easily secured, transported and detached. Maintenance may be required to protect wooden decking from the elements and seal the surface from moisture. Variations in temperature and humidity cause them to expand and contract, which loosens the metal connection hardware. Lumber used in constructing traditional decking is also susceptible to deterioration by mildew, mold, and infestation.

In many instances, modular decking is not efficient or easily assembled in the construction of a decking. What is needed in the art is a multipurpose, lightweight decking, which does can be easily assembled, disassembled and transported; and which is suitable to withstand inclement weather, harsh environments, heavy foot traffic, and is resilient when exposed to harsh cleaning chemicals. This modular decking should also provide lateral support, comfort, and reduction of fatigue during walking or standing by users of the tile.

It is therefore desirable that a multi-configurable modular decking system be provided which overcomes these difficulties.

SUMMARY OF THE INVENTION

From the foregoing discussion, it should be apparent that a need exists for a modular decking system having unique and multi-configurable panels, anchors, locking components.

Beneficially, such a system would overcome many of the difficulties of the prior art by providing a modular decking system comprised of panels that assemble to form a deck, anchors that uniformly bear the weight from the panels while anchored into a ground or wall surface, and fasteners that rotatably lock the panels to the anchors to restrict lateral movement therebetween. The system leverages the weight of the panels, frictional forces, and fastening components to restrict lateral movement between the panels, the anchor, and a surface.

The present invention has been developed in response to the present state of the art, and in particular, in response to the problems and needs in the art that have not yet been fully

solved by currently available apparatii and methods. Accordingly, the present invention has been developed to provide a modular decking apparatus that assembles to form a deck, the deck being disassemblable and portable, the decking system comprising: a plurality of hexagonal panels having a planar top surface, each panel defining six recesses circumscribing the top surface at evenly-spaced intervals, wherein each recess is shaped as a circular sector, each recess for receiving a fastener; wherein each panel further defines a plurality of apertures on the top surface; the panel further comprising an anchor affixed to a bottom surface of the panel, the anchor comprising: a plurality of fastener receptacles, each fastener receptacle having a foot for engaging a ground surface which protrudes downwardly, each fastener receptacle circumscribing an outside edge of the anchor at evenly-spaced intervals, each fastener receptacle disposed beneath a recess; a plurality of reinforced ribs disposed beneath the bottom surface, the plurality of reinforced ribs configured to enhance structural integrity of the panel; each fastener receptacle comprising an upwardly-protruding locking protrusion for engaging a fastener, the locking protrusion defining at least one locking hole; and a plurality of fasteners, each fastener for interconnecting a plurality of panels, each fastener locking over locking protrusions on separate panels.

The apparatus of claim **1**, wherein each fastener comprises a cylindrical base configured to abut a fastener receptacle, the at least one fastener further comprising a cap configured to overlay the base, the cap defining at least one cap hole, wherein the at least one cap hole is configured to align with the at least one locking hole of the locking protrusion from the fastener receptacle for at least partially fastening the at the at least one anchor to the at least one panel.

The plurality of apertures in the at least one panel may be drainage holes for liquid accumulating on the top surface. In some embodiments, the top surface of the anchor engages and contour a bottom surface of the panel.

The panel and anchor may be formed as an integrated piece. The plurality of reinforced ribs may comprise perpendicularly crossing beams. The base may comprise a plurality of detents configured to frictionally engage the locking protrusion of the fastener receptacle.

The cap may be substantially circular in some embodiments. The at least one cap hole may have a hexagonal shape.

The apparatus may further comprise at least one cap fastener configured to pass through the at least one cap hole and the at least one locking hole.

The at least one cap fastener is a bolt in some embodiments. The at least one cap fastener may comprise a cap fastener hole configured to receive an Allen wrench. The cap may define a plurality of teardrop-shaped locking hole.

These features and advantages of the present invention will become more fully apparent from the following description and appended claims, or may be learned by the practice of the invention as set forth hereinafter.

BRIEF DESCRIPTION OF THE DRAWINGS

In order that the advantages of the invention will be readily understood, a more particular description of the invention briefly described above will be rendered by reference to specific embodiments that are illustrated in the appended drawings. Understanding that these drawings depict only typical embodiments of the invention and are not therefore to be considered to be limiting of its scope, the

invention will be described and explained with additional specificity and detail through the use of the accompanying drawings, in which:

FIG. **1** is a top perspective view of a panel in accordance with the present invention;

FIG. **2** is a top perspective view of a panel mated with an anchor in accordance with the present invention;

FIG. **3** is a bottom perspective view of a panel in accordance with the present invention;

FIG. **4** is a top perspective view of a fastener locking the panel to the anchor in accordance with the present invention;

FIG. **5** is a top perspective view of a fastener having a base and a cap in accordance with the present invention;

FIG. **6** is a top perspective view of a cap for a fastener in accordance with the present invention;

FIGS. **7**A and **7**B are side perspective views of a cap fastener and an Allen screw in accordance with the present invention;

FIG. **8** is a top perspective view of a self-locking fastener with a self-locking cap removed from a self-locking base in accordance with the present invention; and

FIG. **9** is a top perspective view of a self-locking cap in accordance with the present invention.

DETAILED DESCRIPTION OF THE INVENTION

Reference throughout this specification to "one embodiment," "an embodiment," or similar language means that a particular feature, structure, or characteristic described in connection with the embodiment is included in at least one embodiment of the present invention. Thus, appearances of the phrases "in one embodiment," "in an embodiment," and similar language throughout this specification may, but do not necessarily, all refer to the same embodiment.

Furthermore, the described features, structures, or characteristics of the invention may be combined in any suitable manner in one or more embodiments. In the following description, numerous specific details are provided to provide a thorough understanding of embodiments of the invention. One skilled in the relevant art will recognize, however, that the invention may be practiced without one or more of the specific details, or with other methods, components, materials, and so forth. In other instances, well-known structures, materials, or operations are not shown or described in detail to avoid obscuring aspects of the invention.

As referenced in FIGS. **1-9**, a modular decking system **100** comprises at least one panel **102** that assembles to form a deck; at least one anchor **114** that mates with the panel **102** to uniformly bear the dead and/or live load weight from the panel **102** while anchored into a ground or wall surface; and at least one fastener **132** that rotatably locks the panel **102** to the anchor **114** to restrict lateral movement therebetween.

The anchors **114** position at a panel periphery **108** on each panel **102**. The generally peripheral positioning of the anchors **114** and interconnections allow for a more uniform weight distribution of a load on the decking. Additionally, the fastener **132** creates a lock through frictional forces while also providing tactile feedback to indicate when the panel **102** and the anchor **114** are locked into place. The fastener **132** also requires minimal special tools or skillset to lock or remove.

In some embodiments, the system **100** comprises at least one panel **102** and at least one anchor **114** that have substantially the same contour shape. The substantially same contour shape enables for intuitive and facilitated mating therebetween. The panel **102** and the anchor **114** interlock together at the panel periphery **108** and at an anchor periphery **122** through at least one fastener **132**. The fastener **132** uses a rotatable locking mechanism having a plurality of detents **140**. The detents **140** create frictional forces against the anchor and the panel to form a snug fit therebetween. The detents **140** also create tactile feedback during rotation of the fastener **130** to indicate when the locking is complete.

The fastener **132** has at least one cap hole **138** that can be aligned with at least one locking hole **130** in the anchor **114**. Once aligned, at least one cap fastener **152** can pass through the holes **130**, **138** to further secure the lock. In this manner, the interlocking connections are doubly secured while still maintaining their simplicity to form the interlocking interaction between panels **102** and anchors **114**.

In some embodiments, the at least one panel **102** forms a substantial portion of the deck's surface. The at least one anchor **114** uniformly supports the dead and/or live load weight from the panel **102**. The points of interconnection where the fasteners **132** lock the panels **102** and anchors **114** occur at the panel recessions **110***a*-**110***f* and the anchor recessions **124***a*-**124***f*. Because the interconnections with the anchor **114** occur at the peripheries **108**, **122**, the load on the decking is more uniformly distributed.

Additionally, each panel **102** is secured in place to the anchor **114** by at least one fastener **132** that engages the anchor **114** at a plurality of anchor recessions **124***a*-**124***f* on the anchor periphery **122**. The fasteners **132** rotatably lock the panel **102** to the anchor **114** through frictional engagement, detents **140** that snap together and provide tactile feedback, and additional fastening components that pass through at least one locking hole **130** at the anchor recessions **124***a*-**124***f* and at least one cap hole **138** at the fastener **132**. In one embodiment, six anchors **114** support a single panel **102** and any number of adjacent panels **102**. The use of six anchors **114** and six correlating fasteners **132** is consistent with the hexagonal shape of the panel **102**. However, in other embodiments, any number of anchors **114** and fasteners **132** may be used.

As referenced in FIG. **1**, the system **100** comprises at least one panel **102**. The panel **102** is configured to interlock with additional panels **102** to form the decking. In some embodiments, the decking may include a floor decking, a wall, a patio, a pier, or a boat deck. The panel **102** is defined by a panel bottom surface **104** and a panel top surface **106**. The panel **102** may have a generally flat, hexagonal shape. Though in other embodiments, other shapes for the panel **102** may include, without limitation, a pentagonal, cube, triangle, and rectangle shape. Suitable materials for the panel **102** may include, without limitation, composite lumber, polymeric resins, polyvinyl chloride, virgin polyvinyl chloride, virgin/reclaimed polyvinyl chloride mixtures, compression molded rubber, rigid polymers, hard wood, soft wood, and a combination of wood fiber, plastic, and binding agents.

The panel **102** is further defined by a panel periphery **108** having a plurality of panel recessions **110***a*-**110***f*. The panel recessions **110***a*-**110***f* may form a substantially half-circle shape at evenly-spaced sections of the periphery of the panel **102**. The at least one panel **102** also includes a plurality of apertures **112***a*-**112***c* that are efficacious for enabling water, ice, or debris to pass through. One example of the apertures **112***a*-**112***c* includes drainage or weep holes passing through the panel **102** serve to shed and disperse water from the deck. The plurality of apertures **112***a*-**112***c* can take any number of shapes, and may be pre-molded, pre-drilled, or otherwise pre-made with the panel **102**.

Turning now to FIG. **2**, the system **100** is shown to include at least one anchor **114**. The anchor **114** is defined by an anchor top surface **116**, an anchor bottom surface **118**, and a cavity (not shown). In some embodiments, the anchor **114** is configured to have substantially the same contour shape as the panel **102**, whereby the panel **102** mates with the anchor **114**. The anchor **114** receives the panel **102** at the anchor top surface **116**, thereby engaging the panel bottom surface **104**. An anchor periphery **122** aligns flush against a panel periphery **108** when the panel **102** and anchor **114** engage. The panel **102** may be secured, via adhesive, molded attachment, or other means, to the anchor **114**, concealing all of its fastening components and substantially all of the panel bottom surface **104** and the anchor top surface **116**.

The anchor **114** is designed to support the panel **102**, maximizing support for the panel **102** and uniformly distributing dead and/or live load weight onto a ground or wall surface. Because the anchor **114** attaches to the panel periphery **108**, specifically at the plurality of panel recessions **110***a*-**110***f*, the weight on the decking is uniformly distributed. Furthermore, since six anchors **114** may be used, the weight is further distributed, since it is known that the larger the number of supports, the more uniform is the weight distribution.

The anchor **114** fastens to a ground or wall surface at the anchor bottom surface **118**. In some embodiments, the anchor **114** rests on a grade or level surface and is considered a temporary structure, allowing the system **100** to be utilized by more than just building component.

As illustrated in FIG. **3**, the anchor **114** forms a cavity that enables it to be portable and lightweight. To further reinforce the anchor **114** without significantly increasing its weight, the cavity in the anchor **114** is filled with a reticulated structure, such as a plurality of reinforced ribs **120**. The plurality of reinforced ribs **120** are configured to enhance the structural integrity of the anchor **114**. The ribs **120** serve to further distribute the live and dead load weight from the panel **102** to the anchors **114**. The ribs **120** may include a crosslinking series of barriers that fill the cavity. The crosslinking configuration serves to resist lateral and compressive forces that tend to destabilize the anchor **114**.

Those skilled in the art, in light of the present teachings, will recognize that by creating structural integrity in the cavity of the anchor **114** through ribs **120**, rather than filling the cavity with a solid material, the weight of the anchor **114** is reduced while still maintaining strength and stability. Additionally, the reinforced ribs **120** establish an exact, consistently-spaced gap between adjacent panels **102**, allowing for water drainage and air circulation.

The anchor **114** is further defined by a plurality of anchor recessions **124***a*-**124***f* at the anchor periphery **122**. The anchor recessions **124***a*-**124***f* have substantially the same contour shape as the panel recessions **110***a*-**110***f*, thereby enabling a flush surface with the panel periphery **108** while the panel **102** and the anchor **114** are engaged.

Each anchor recession **124***a*-**124***f* has a fastener receptacle **126** that integrates therein. The fastener receptacle **126** forms a substantially wing shaped extension to the anchor recessions **124***a*-**124***f*. Due to this unique wing shaped configuration, the fastener receptacle **126** provides a locking surface for the various fastening components to engage. The fastener receptacle **126** forms a stable surface for receiving fastening components. Thus, frictional engagement works with the detents **140** in the fastening components to lock the fastener **132** into the fastener receptacle **126**.

In one embodiment, the fastener receptacle **126** includes a locking protrusion **128** that extends perpendicularly from the fastener receptacle **126**. The locking protrusion **128** provides yet another locking mechanism to secure the fastener **132** to the fastener receptacle **126**. At least one locking hole **130** is disposed to cross transversely across the locking protrusion **128**. The locking hole **130** enables passage of fastening components that help secure the panel **102** to the anchor **114**.

Each fastener receptacle **126** extends transversely across the anchor **114**. The fastener receptacle **126** is disposed to extend beyond the anchor bottom surface **118**. In this manner, the fastener receptacle **126** forms an extension that orients perpendicularly to the anchor **114**. The fastener can be used to penetrate the ground or wall surface for anchoring. For example, six fastener receptacles **126** on the anchor periphery **122** penetrate the ground surface until the anchor **114** is level and stable relative to the ground surface. However in other embodiments, the fastener receptacle **126** may attach to the ground or wall surface through other means, including, without limitation, screws, nails, magnets, ropes, and adhesives.

It is significant to note that the panel **102** and the anchor **114** have a lightweight construction, being made of lightweight plastic or another composite material, with each panel **102** and each anchor **114** manufactured as individual single pieces. One possible form of manufacturing may include injection molding, although compression molding or any other suitable technique for molding polymeric resin may also be used. Additionally, during fabrication, the panel **102** and the anchor **114** may be reinforced by pulling reinforced fibers through the resin.

Turning now to FIG. **4**, the system **100** further comprises at least one fastener **132** that is configured to rotatably fasten against the fastener receptacle **126** at the anchor recessions **124***a*-**124***f* and the panel recessions **110***a*-**110***f*. The fasteners **132** serve to restrict lateral movement between the panel **102** and the anchor **114**. The fastener **132** also works with the fastener receptacle **126** for anchoring to the ground or wall surface. In one embodiment, six fasteners **132** engage six fastener receptacles **136**.

FIG. **5** illustrates a perspective close-up view of the fastener **132**. The fastener **132** comprises a base **136** having an elongated shape that is configured to at least partially pass through the fastener receptacle **126**. The base **136** has a plurality of detents **140** configured on the outer surface of the base **136** to provide tactile feedback for when the fastener **132** is rotatably locked to the fastener receptacle **126**. The fastener **132** utilizes frictional engagement and the detents **140** to form a snug fit with the fastener receptacle **126**. In this manner, the panel **102** and the anchors **114** are securely held into place with minimal tools or skillsets needed.

Each fastener **132** passes through the panel recessions **110***a*-**110***f* and the anchor recession **124***a*-**124***f*, locking into place with the fastener receptacle **126** by means of a vertical 360° rotation. In one embodiment, detents **140** in the fastener **132** engage depressions in the fastener receptacle **126**. The detents **140** provide tactile feedback once the turn is complete and the fastener **132** is locked into place. In one embodiment, the system **100** utilizes six fasteners **132** to engage six fastener receptacles **126**. Additional fastening components may be used to further secure the fastener **132** to the anchor **114** and the panel **102**.

As shown in FIG. **6**, the fastener **132** comprises a cap **136** that is disposed to overlay the base **136**. The cap **136** comprising at least one cap hole **138**. The cap hole **138** may have a variety of shapes, including, without limitation, circles, tear drops, hexagons, pentagons, and cubes. For

example, FIG. **6** illustrates a central hexagonal-shaped cap hole **138** concentric to outer circular and smaller hexagonal holes. The at least one cap hole **138** is configured to align with the locking hole **130** of the protrusion **128** from the fastener receptacle **126**.

Once the cap hole **138** aligns with the locking hole **130** in the locking protrusion **128**, then at least one cap fastener **152** (FIG. **7**A), such as a screw, bolt, nail, and nut, can pass through the aligned cap hole **138** and the locking hole **130** to fasten the anchor **114** to both the panel **102** and the ground or wall surface. FIG. **7**B illustrates an Allen screw **154**, which is an alternative embodiment of the cap fastener **152**. The cap fastener **152** comprises a cap fastener hole **156** that provides a grip for a wrench to rotatably fasten the cap fastener **152** or the Allen screw **154**. It is significant to note that while having small structural differences, both types of cap fasteners **152**, **154** enable rotatable tightening and loosening of the cap **136** relative to the base **136**, and also fasten the fastener **132** to the fastener receptacle **126**.

FIGS. **8** and **9** illustrate an alternative embodiment of a self-locking fastener **142** having a self-locking base **158** with an internal clip **144** to attach a self-locking cap **150**. The clip **144** is disposed inside the self-locking base **158**. As the self-locking cap **150** is rotated, the clip **144** clamps down on a teardrop cap hole **148** on the self-locking cap **150** through a clip slot **160**. The self-locking base **158** comprises a teardrop locking hole **146** that aligns with the teardrop cap hole **148**. Once aligned, the self-locking fastener **142** can be made to attach the fastener receptacle **126** with the cap fastener **152**. It is significant to note however, that the self-locking fastener **142**, though having slightly different mechanisms, operates in substantially the same manner as the fastener **132** discussed above.

In some embodiments, the system **100** utilizes components that are precut and assembled with minimal tools or skillset. The system **100** is efficacious for constructing a solid, yet easily detachable and portable surfaces, for a deck, floor, wall, ceiling, or roof. Those skilled in the art will recognize that the modular, portable capacity of the system **100** provides numerous solutions to decking.

For example, renters, condominium owners, and secondary residences, such as cottages or trailers, can benefit from the interlocking and modular decking system **100**. These users are ideally able to relocate, reconfigure, expand, or store the system **100**, as needed. Additionally, the components of the system **100** are designed to be easily packaged on and within the dimensions of standardized palettes traditionally used for shipping and storage purposes.

Additionally, the universal, interlocking design of the system **100** allows for the addition of accessory components, consisting of, but not limited to: stairways, umbrellas, benches, tables, railings, storage bins, light fixtures, gazebos, planters, and other accessories. The accessories can be supported on the same anchors **114** that support the panel **102**.

During installation of a deck utilizing the system **100**, the area where the installation will take place is preferably level. Where minor discrepancies occur, the length of the fastener receptacles **126** on the anchor recessions **124***a*-**124***f* can be increased or decreased, as needed. The fastener receptacles **126** from the anchors **114** may then penetrate the ground surface of the designated deck area for preparation to receive the panels **102**. The panel **102** is then attached to the anchors **114** at the panel periphery **108** using the fastener **132** to hold the panels **102** in place against the anchor **114**. The fasteners **132** are inserted into the fastener receptacles **126** of the anchor recessions **124***a*-**124***f* and rotated up to 360°. A plurality of detents **140** in the base **136** of the fastener **132** provide tactile feedback once the locking rotation is complete and the fastener **132** locked into place.

Additional fastening components, such as screws or bolts, are passed through the locking hole **130** and cap hole **138** to enhance the attachment. Additional anchors **114** may be placed on the ground to receive additional panels **102**. This installation process continues until the desired dimensions of the deck have been completed. The system **100** may be disassembled through simple removal of the fasteners **132**, without requiring excessive force or breakage of the panels **102** or anchors **114**.

The present invention may be embodied in other specific forms without departing from its spirit or essential characteristics. The described embodiments are to be considered in all respects only as illustrative and not restrictive. The scope of the invention is, therefore, indicated by the appended claims rather than by the foregoing description. All changes which come within the meaning and range of equivalency of the claims are to be embraced within their scope.

What is claimed is:

1. A modular decking apparatus that assembles to form a deck, the deck being disassemblable and portable, the decking system comprising:

a plurality of hexagonal panels having a planar top surface, each panel defining six recesses circumscribing the top surface at evenly-spaced intervals, wherein each recess is shaped as a circular sector, each recess for receiving a fastener;

wherein each panel further defines a plurality of apertures on the top surface;

the panel further comprising six anchors affixed to a bottom surface of the panel, each of the six anchors comprising:

a fastener receptacle having a foot for engaging a ground surface which protrudes downwardly, each fastener receptacle circumscribing an outside edge of the anchor at evenly-spaced intervals, each fastener receptacle disposed beneath a recess;

a plurality of reinforced ribs disposed beneath the bottom surface, the plurality of reinforced ribs configured to enhance structural integrity of the panel;

the fastener receptacle comprising an upwardly-protruding locking protrusion for engaging a fastener, the locking protrusion defining at least one locking hole; and

a plurality of fasteners, each fastener for interconnecting a plurality of panels, each fastener locking over locking protrusions on separate panels.

2. The apparatus of claim **1**, wherein each fastener comprises a cylindrical base configured to abut a fastener receptacle, each fastener further comprising a cap configured to overlay the base, the cap defining at least one cap hole, wherein the at least one cap hole is configured to align with the at least one locking hole of the locking protrusion from the fastener receptacle for at least partially fastening the at the at least one anchor to the at least one panel.

3. The apparatus of claim **1**, wherein the plurality of apertures in the at least one panel are drainage holes for liquid accumulating on the top surface.

4. The apparatus of claim **1**, wherein the plurality of reinforced ribs comprise perpendicularly crossing beams.

5. The apparatus of claim **2**, wherein the cylindrical base comprises a plurality of detents configured to frictionally engage the locking protrusion of the fastener receptacle.

6. The apparatus of claim **2**, wherein the cap is substantially circular.

7. The apparatus of claim 2, wherein the at least one cap hole has a hexagonal shape.

8. The apparatus of claim 2, further comprising at least one cap fastener configured to pass through the at least one cap hole and the at least one locking hole.

9. The apparatus of claim 8, wherein the at least one cap fastener is a bolt.

10. The apparatus of claim 9, wherein the at least one cap fastener comprises a cap fastener hole configured to receive an Allen wrench.

11. The apparatus of claim 8, wherein the cap defines a plurality of teardrop-shaped locking holes.

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