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Christopher

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(54) **STORAGE COMPARTMENT BOX WITH SELF-ALIGNING BINS**

(71) Applicant: **Meridian International Co., Ltd.**, Shanghai (CN)

(72) Inventor: **Brent Christopher**, Centennial, CO (US)

(73) Assignee: **Meridian International Co., Ltd**, Shanghai (CN)

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B65D 25/08 (2006.01)
B65D 25/06 (2006.01)

(52) **U.S. Cl.**
CPC ***B65D 25/08*** (2013.01); ***B65D 25/06*** (2013.01)

(58) **Field of Classification Search**
CPC B65D 77/0446; B65D 2543/00518; B65D 25/04; B25H 3/021
USPC 220/23.87, 23.88
See application file for complete search history.

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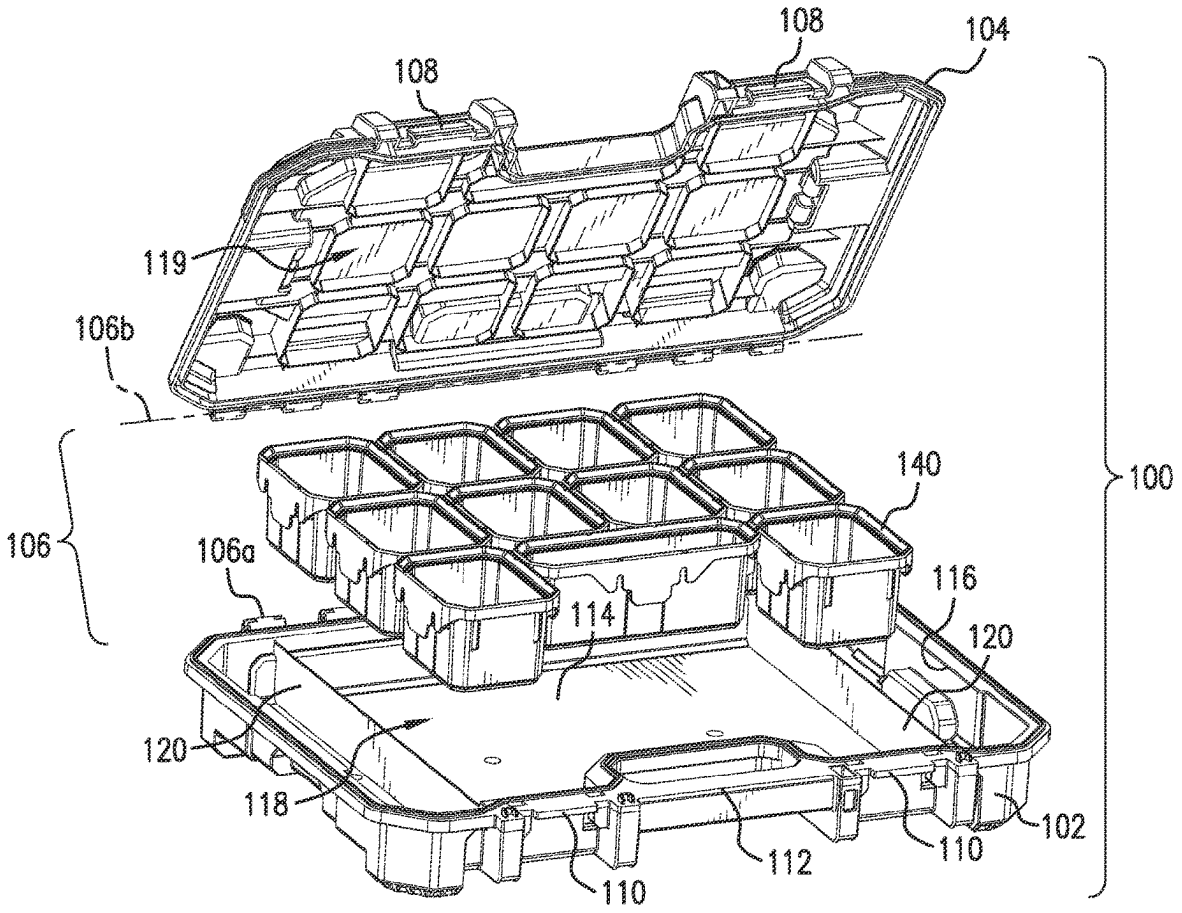
Primary Examiner — Jeffrey R Allen
(74) *Attorney, Agent, or Firm* — Eversheds Sutherland (US) LLP

(57) **ABSTRACT**

A plurality of removable bins are positionable in the interior area of the base each of which comprising a bottom surface, a plurality of sidewalls extending upward from the bottom surface to create a first storage area, a chamfer extending upward and outward from each of the sidewalls to be engaged by the lid to move the bin into alignment.

8 Claims, 9 Drawing Sheets



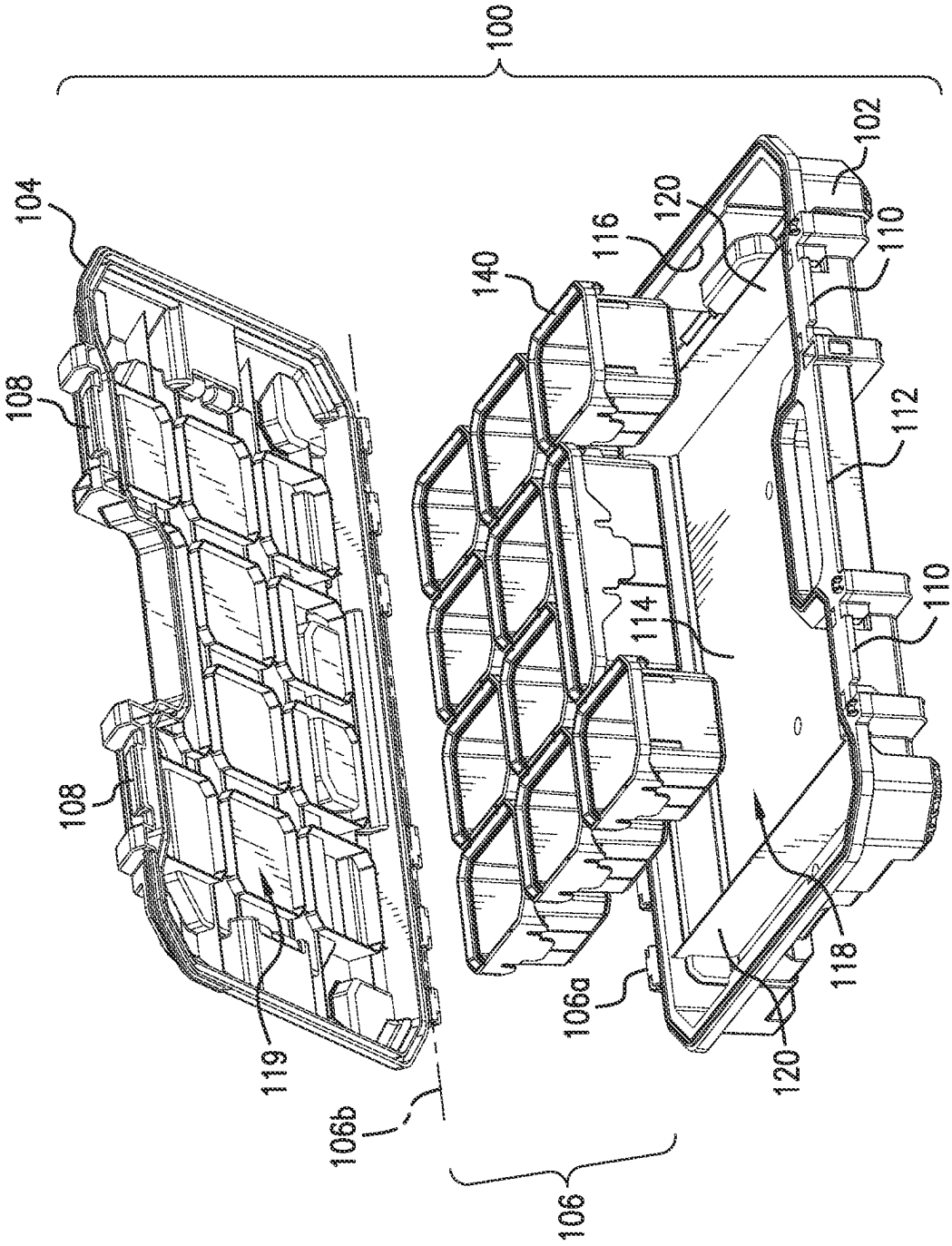

100
102
104
108
108
110
110
112
114
116
118
119
120
120
140
106a
106b
106

FIG. 1

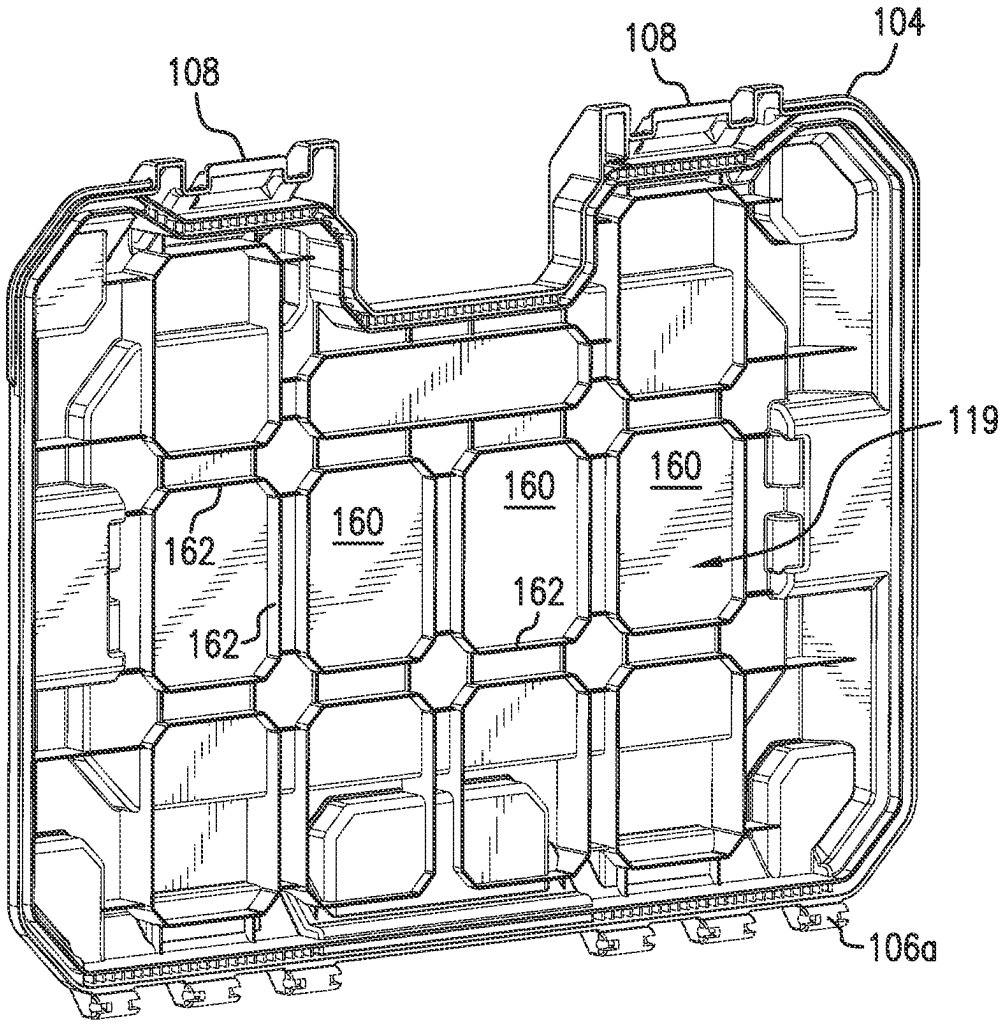


FIG. 2

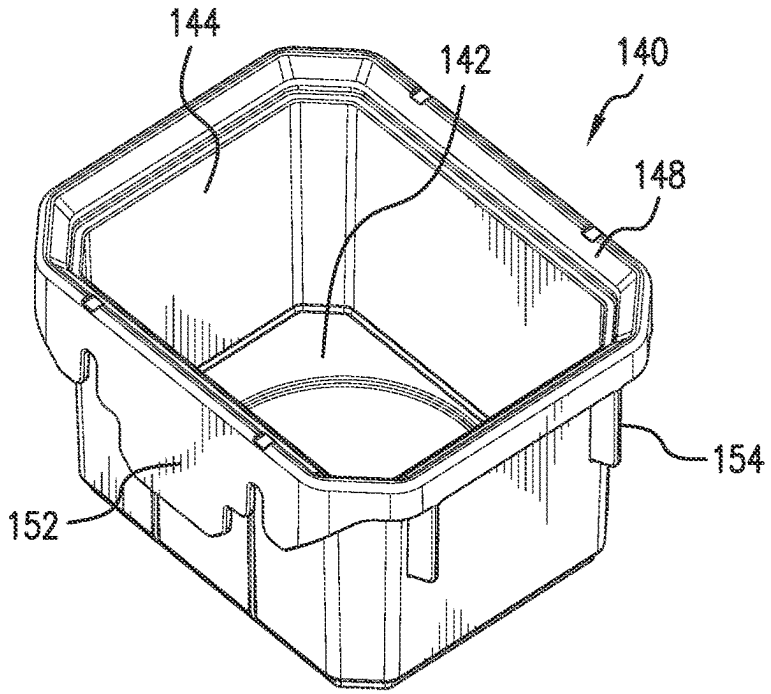


FIG.3

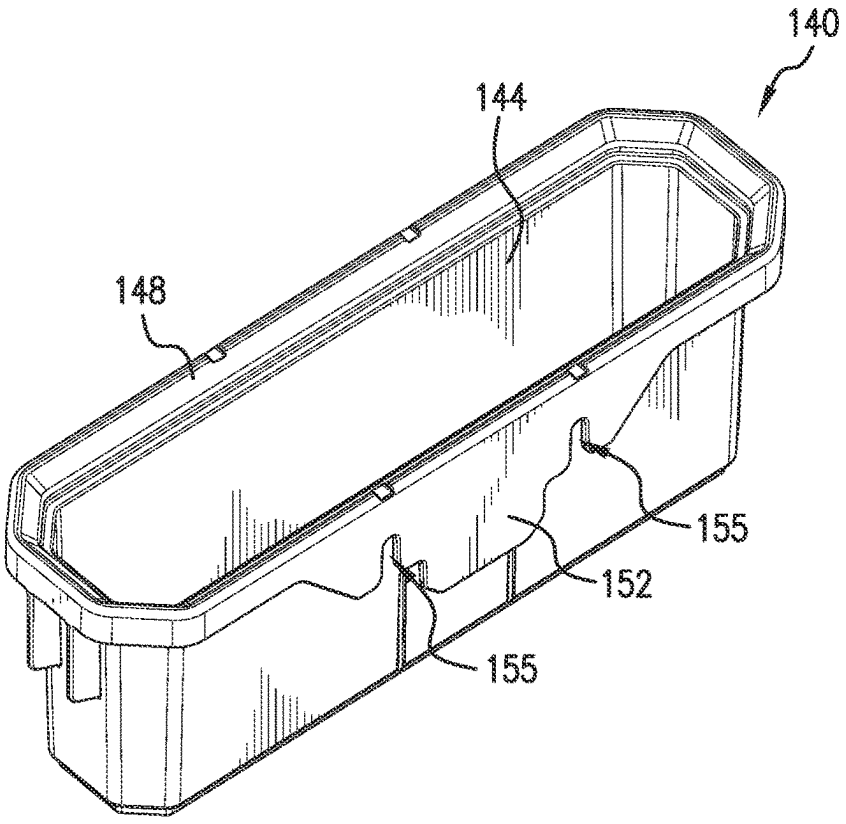


FIG.4

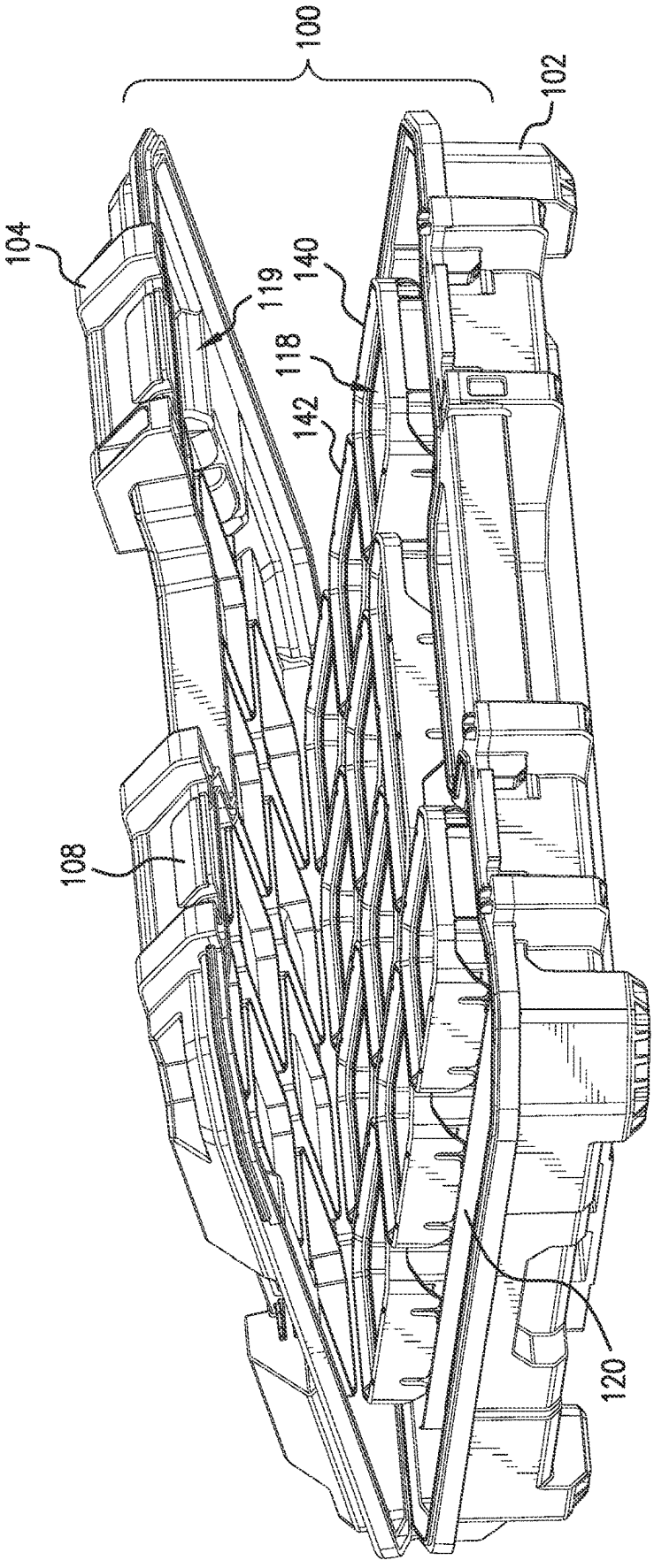


FIG. 5

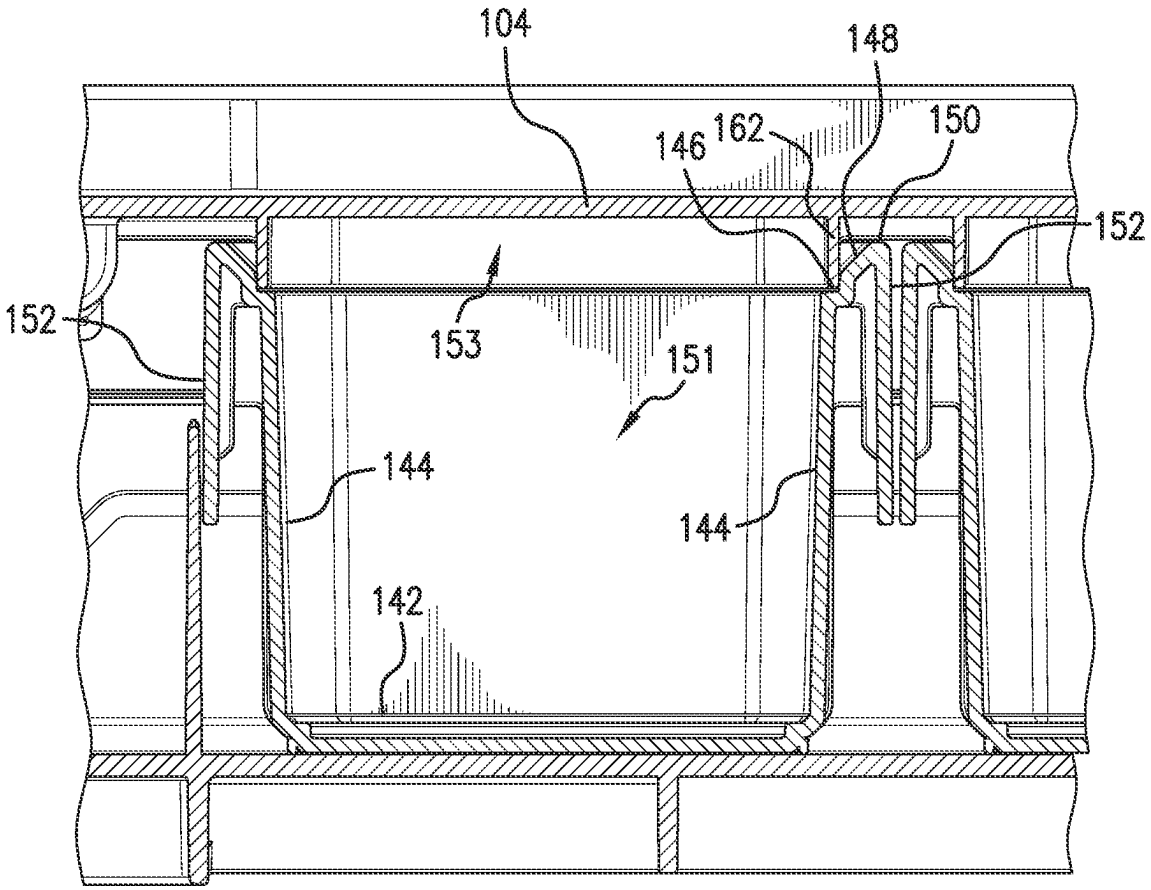


FIG.6

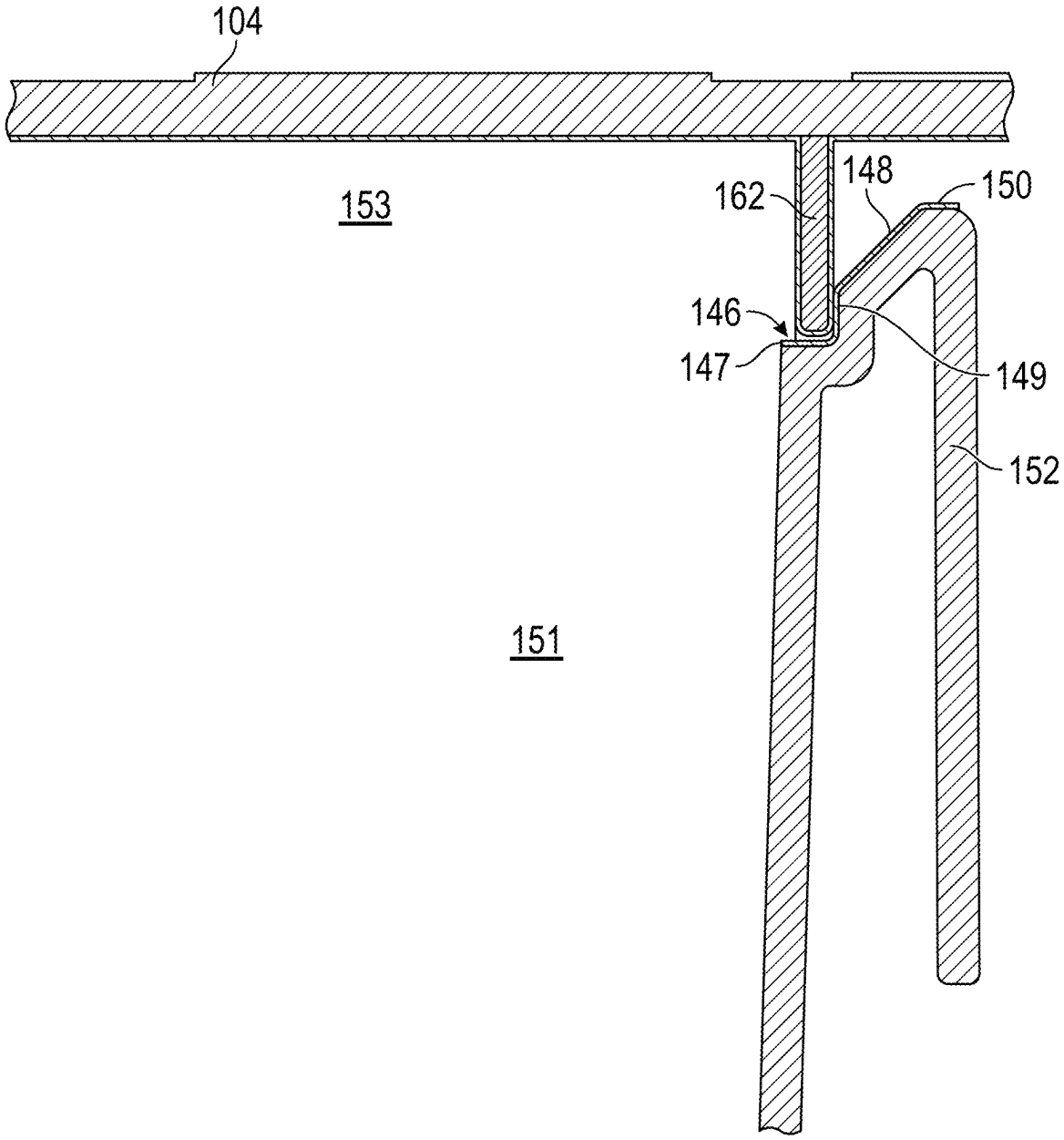


FIG. 7

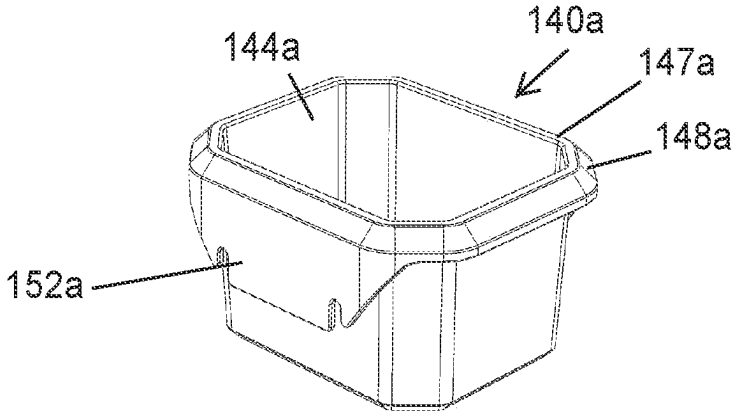


FIG. 8

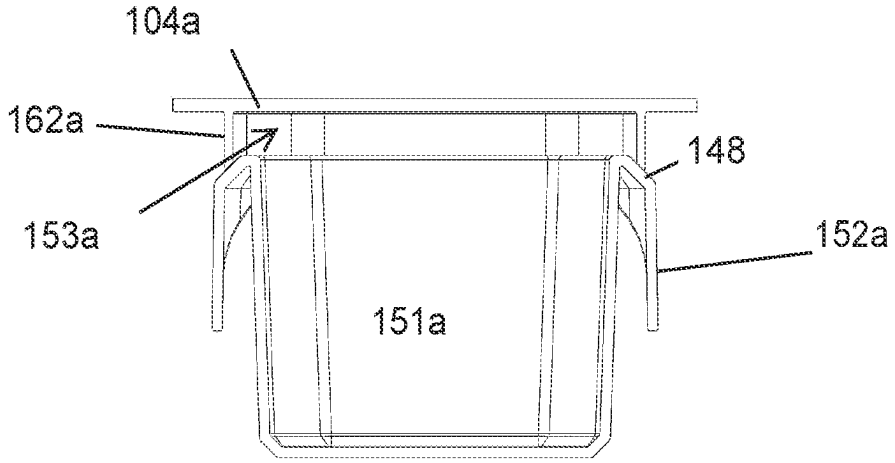


FIG. 9

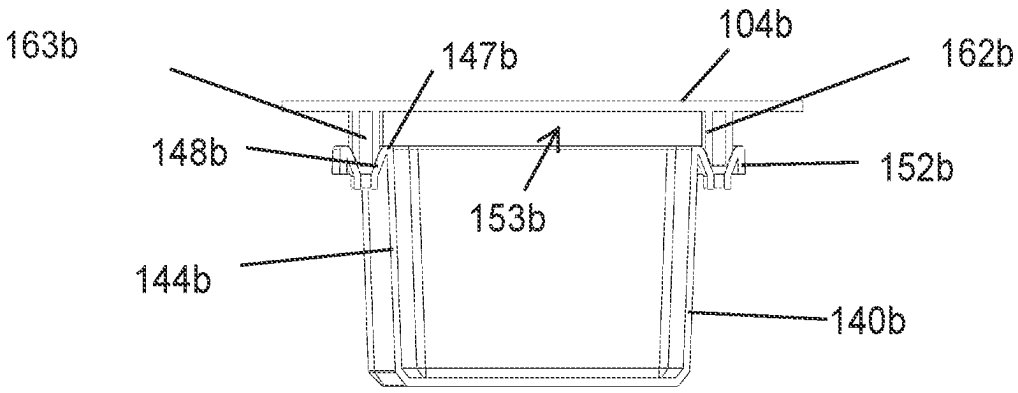

163b
147b
104b
162b
148b
152b
153b
144b
140b

FIG. 10

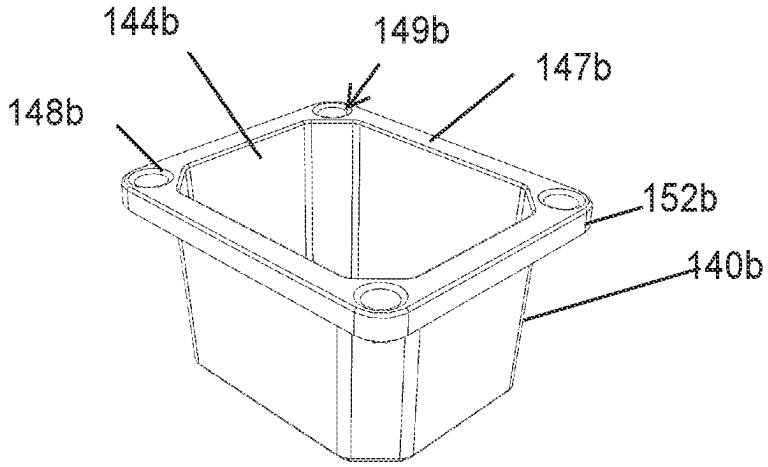

144b
149b
147b
148b
152b
140b

FIG. 11

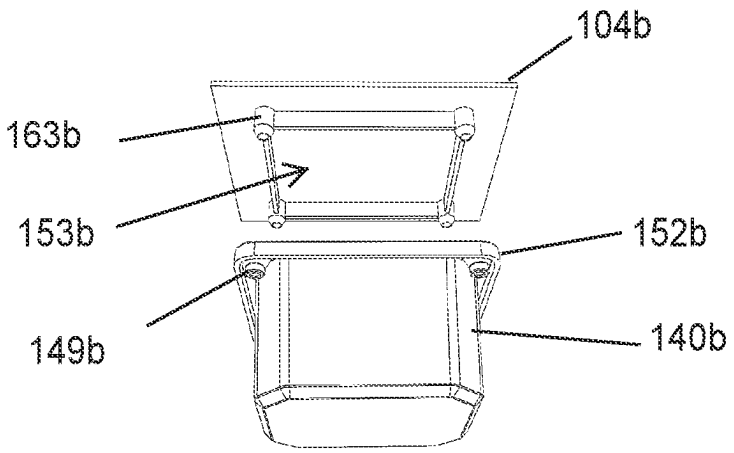


FIG. 12

STORAGE COMPARTMENT BOX WITH SELF-ALIGNING BINS

TECHNICAL FIELD

This disclosure relates to storage devices, and, more specifically, this disclosure relates to a storage device with self-aligning bins.

BACKGROUND INFORMATION

Storage compartment boxes or portable organizers have been used for separating and storing a wide variety of items such as documents, parts, tools and equipment. In one form, storage cases have been developed as portable, transportable, hand held types of storage boxes that are made of light weight molded plastic. The portable storage box generally includes a handle for carrying, with a dual hinged clear plastic top that can be secured by two locking tabs on the handle side of the case. These storage boxes have been modified with a variety of different dividers or compartments to permit separation and organization of the contents.

A problem with these storage boxes is keeping contents confined to the bins. Gaps in the dividers or between the bin and the lid allow parts to escape the bins and intermingle defeating the purpose of a portable storage box.

Accordingly, there is a need for an improved portable storage box with bins that self-align with the lid to prevent mixing of the contents and provide more storage capacity.

SUMMARY

In accordance with one aspect of the present invention, a storage container is provided. The storage container has a base comprising an interior area. A plurality of removable bins are positionable in the interior area of the base each of which comprising a bottom surface, a plurality of sidewalls extending upward from the bottom surface to create a first storage area, and a chamfer extending upward and outward from each of the sidewalls. A lid is pivotally combined to the base comprising a plurality of second storage areas defined by a plurality of extending sidewalls projecting downward from the inside of the lid each of which plurality of extending sidewalls is configured to align with the chamfer of the plurality of bins to urge the bin into alignment, wherein the second storage area and the first storage area sum together to create a total storage area for the bin.

In an embodiment, the step in the bin comprises a ledge extending substantially perpendicular from the sidewall away from a center of the bin and a vertical riser extending upward from the ledge to a beginning of the chamfer. A top ridge beginning at a top of the chamfer extends outward from the center of the bin.

In an embodiment, structure for hanging the bins outside the storage container can be provided. A downward member can extend downward from the top ridge of at least one side of the bin. A gap can be provided between the sidewall of the bin and the downward member for hanging the bin. Also, a pair of cutouts in the downward member for hanging the bin can be provided.

In another embodiment, the bin comprises a ledge at the top of the sidewalls extending perpendicularly outward from the center of the bin. The chamfer extends downward and outward from the ledge. A downward member extending downward from the chamfer of at least one side of the bin. A gap between the sidewall of the bin and the downward member for hanging the bin and a pair of cutouts in the downward member for hanging the bin.

In yet another embodiment, the bin comprises of a depression arranged at each corner of the bin which depression comprises the chamfer circumscribing the inner diameter of the depression. The lid further comprises a peg aligned with each depression of the bin wherein the peg comprises one of the plurality of extending sidewalls that aligns with the chamfer.

BRIEF DESCRIPTION OF THE DRAWINGS

These and other features and advantages of the present invention will be better understood by reading the following detailed description, taken together with the drawings wherein:

FIG. **1** is an exploded view of the portable storage box according to this disclosure.

FIG. **2** is a perspective view of the underside of the lid of the storage box of FIG. **1**.

FIG. **3** is a perspective view of a bin found in the storage box of FIG. **1**.

FIG. **4** is a perspective view of another embodiment of a bin according to this disclosure.

FIG. **5** is a perspective view of the portable storage box with the lid partially closed.

FIG. **6** is a cross-sectional view of the portable storage box of this disclosure.

FIG. **7** is an exploded, cross-sectional view of the portable storage box of this disclosure showing the lid interacting with the bin.

FIG. **8** is another embodiment of a bin and a lid according to this disclosure.

FIG. **9** shows the bin of FIG. **8** interacting with the lid.

FIG. **10** is yet another embodiment of a bin and a lid according to this disclosure.

FIG. **11** is a perspective view of the bin of FIG. **10**.

FIG. **12** a bottom-facing perspective view of the bin and lid of FIG. **10**.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

Referring to FIG. **1**, shown is an exploded view of a portable storage container **100** according to this disclosure. Storage container **100** comprises of a base **102** with a lid **104** that is movably coupled to base **102** to move between an open position and a closed position. In the illustrated embodiment, lid **104** is pivotally coupled to base **102** by a hinge **106**, which can be implemented in various ways but in the illustrated embodiment comprises of a plurality of cylindrical connectors **106***a* joined side-by-side by a rod **106***b*. Lid **104** includes one or more cover latches **108** to releasable secure lid **104** in the closed position to corresponding mating lugs **110** on base **102**. A handle **112** is provided on base **102** for carrying.

More specifically, base **102** comprises of a bottom surface **114** and sidewalls **116** extending from bottom surface **114** defining an interior area **118**. Interior area **118** can have one or more removable dividers **120** that mate in corresponding longitudinal channels on opposing sides of sidewalls **116**. These removable dividers allow the for a wide variety of customization of interior area **118**. Interior area **118** has a depth "D" from bottom surface **114**.

Turning to FIG. **3**, shown are perspective views of bin **140** positioned in base **102** of storage container **100**. Bins **140** are generally rectangular or square shaped when viewed from

the top (but may be any other shape, e.g., round, triangular, pentagonal, octagonal etc.). Preferably, they are sized to maximize the number of bins **140** that fit into interior area **118** of base **102**. For example, a rectangular bin **140** may be twice the length of the square bin and ½ the width, as shown in FIG. **3**. Bins **140** are then arranged in a grid pattern inside interior area **118**, as shown in FIG. **1**. Bins **140** are preferably made from plastic but can be made of any material.

Bins **140** comprise a bottom surface **142** and four sidewalls **144** extending upward from bottom surface **142**. The angel between sidewalls **144** and bottom surface **142** can be perpendicular or have an acute or obtuse taper upward to define a storage area. Turning to FIG. **7**, near the top of each of sidewalls **144** is an outward indexing step **146** comprising a ledge **147** parallel to bottom surface **142** and a vertical riser **149** that leads to a chamfer **148** to a top ridge **150**. The space in bin **140** from bottom surface **142** to ledge **147** of step **146** is a first storage area **151** and the space from ledge **147** to the top inside surface of lid **104** is a second storage areas **153**. Together first storage area **151** and second storage area **153** comprise a total storage area.

A downward member **152** extends perpendicularly downward from top ridge **150** parallel and spaced apart from sidewall **144**. One or more gussets **154** can be positioned on the outside of sidewalls **144** to brace top ridge **150**. Together downward member **152** and gusset **154** set off the sides of respective bins **140** from each other and provide the proper spacing between bins **140**.

Downward member **152** is also configured to hang off a rim. This allows bin **140** to be removed from storage container **100** and located somewhere else for convenience. Downward member **152** is also designed with a pair of cutouts **155** sized to hang bin **140** from a pair of hangers, screws, nails, or the like; for example, for hanging bins **140** on peg boards. This allows bins **140** to be used separate from storage container **100** for easy access to small parts and then placed in storage container **100** for travel.

Turning back to FIG. **2**, show is a perspective view of lid **104**. Lid **104** has a plurality of second storage areas **153** that are configured to align with bins **140** such that second storage area **153** of lid **104** and first storage area **151** of bins **140** sum to create the interior storage area for each bin **140**. Second storage area **153** are defined by a top inside surface **160** of lid **104** bounded by four extending sidewalls **162**.

Turning to FIG. **6** and FIG. **7**, shown are a cross-sectional views of a closed lid **104** on base **102** to illustrate the storage area of a bin **140**. As illustrated, one of each extending sidewall **162** rests on one of step **146** internal of bin **140**. This interaction creates a single storage area for bin **140** comprising of second storage area **153** of lid **104** and first storage area **151**. This allows the user to first storage area **151** of bin **140** above capacity and still close storage area off to prevent the spillage of contents inside bin **140**.

In operation, bins **140** are positioned inside base **102**. Downward member **152** provides a gross alignment of each bin **140** with respect to protruded interior areas **119** of lid **104**. As lid **104** is closed, extending sidewall **162** engages chamfer **148** on bin **140** to urge bin **140** into alignment so that second storage area **153** of lid **104** and first storage area **151** of bin **140** are aligned.

A key feature is the use of chamfer **148** to index bins **140** into position. In this regard, chamfer **148** can take on a variety of configurations. Turning to FIGS. **7-8**, shown is a bin **140***a* of a similar configuration of the foregoing. Instead, sidewalls **144***a* extend all the way upward to a ledge **147***a* that extends perpendicularly outward from center of bin **140***a*. Chamfer **148***a* then extends downward from ledge **147***a* and outward from the center of bin **140***a*. Again, a downward member **152***a* provides a gross alignment of each bin **140***a* with respect to second storage area **153***a* of lid **104***a*. As lid **104***a* is closed, extending sidewall **162***a* engages chamfer **148***a* on bin **140***a* to urge bin **140***a* into alignment so that second storage area **153***a* of lid **104***a* and first storage area **151***a* of bin **140***a* are aligned.

Turning to FIGS. **9-11**, shown is another embodiment of a bin **140***b* according to this disclosure. Again, sidewalls **144***b* extend all the way upward to a ledge **147***b* that extends perpendicularly outward from center of bin **140***b*. Chamfer **148***b* is created by a round depression **149***b* in ledge **147***b* which extends downward in ledge **147***b* with chamfer **147***b* circumscribing the diameter. Again, a downward member **152***b* provides a gross alignment of each bin **140***b* with respect to second storage area **153***b* of lid **104***b*. As lid **104***b* is closed, extending sidewall **162***b* (which can be a side of a peg **163***b*) engages chamfer **148***b* on bin **140***b* to urge bin **140***b* into alignment so that second storage area **153***b* of lid **104***b* and first storage area **151***b* of bin **140***b* are aligned.

Those skilled in the art will recognize that the foregoing embodiments can take various arrangements. For example, the structure comprising the chamfer of each bin and the plurality of extending sidewalls on each lid can be reversed in each embodiment. The chamfer can be connected to the respective lid or the bin in a wide variety of ways that allows the bin to be urged into alignment with the second storage area formed in the lid so that the first storage area inside the bin positively sums with the second storage area of the lid to create a total storage area that is larger than the first storage area of the bin.

While the principles of the invention have been described herein, it is to be understood by those skilled in the art that this description is made only by way of example and not as a limitation as to the scope of the invention. Other embodiments are contemplated within the scope of the present invention in addition to the exemplary embodiments shown and described herein. Modifications and substitutions by one of ordinary skill in the art are considered to be within the scope of the present invention, which is not to be limited except by the following claims.

I claim:

1. A storage container comprising:

a base comprising an interior area;

a plurality of removable bins positionable in the interior area of the base each of which comprising a bottom surface, a plurality of sidewalls extending upward from the bottom surface to create a first storage area, and a chamfer extending outward from each of the sidewalls;

a lid pivotally combined to the base comprising a plurality of second storage areas defined by a plurality of extending sidewalls projecting downward from the inside of the lid each of which plurality of extending sidewalls is configured to engage the chamfer to urge the bin into alignment so that the second storage area and the first storage area sum together to create a total storage area for the bin;

a step extending substantially perpendicular and outward from each of the sidewalls of the bin;

a ledge extending substantially perpendicular from the sidewall away from a center of the bin; and

a vertical riser extending upward from the ledge to a beginning of the chamfer.

2. The storage container of claim **1**, and further comprising a top ridge beginning at a top of the chamfer and extending outward from the center of the bin.

3. The storage container of claim 2, and further comprising a downward member extending downward from the top ridge of at least one side of the bin.

4. The storage container of claim 3, and further comprising a gap between the sidewall of the bin and the downward member for hanging the bin.

5. The storage container of claim 4, and further comprising a pair of cutouts in the downward member for hanging the bin.

6. The storage container of claim 1, and further comprising a plurality of dividers positionable inside the interior area of the base define an outer perimeter for the plurality of bins.

7. A storage container comprising:

a plurality of removable bins positionable in an interior area of the storage container each of which comprising a bottom surface and a plurality of sidewalls extending upward from the bottom surface to create a first storage area;

a lid for the storage container comprising a plurality of second storage areas defined by a plurality of extending sidewalls projecting downward from the inside of the lid, wherein the second storage area and the first storage area sum together to create a total storage area for the bin; and

a step extending substantially perpendicular and outward from each of the sidewalls of the bin;

a ledge extending substantially perpendicular from the sidewall away from a center of the bin; and

a vertical riser extending upward from the ledge to a beginning of a chamfer.

8. The storage container of claim 7, wherein the chamfer extends outward from each of the sidewalls; and wherein each of which plurality of extending sidewalls is configured to engage the chamfer to urge the bin into alignment so that the second storage area and the first storage area sum together to create a total storage area for the bin.

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