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Liu

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(54) **EXPANDABLE TOOL BOX ASSEMBLY**

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B65D 25/20 (2006.01)
B65D 25/28 (2006.01)

(52) **U.S. Cl.**
CPC ***B25H 3/028*** (2013.01); ***B65D 25/20*** (2013.01); ***B65D 25/2841*** (2013.01)

(58) **Field of Classification Search**
CPC B25H 3/028; B65D 25/20; B65D 25/2841
USPC 206/372, 373
See application file for complete search history.

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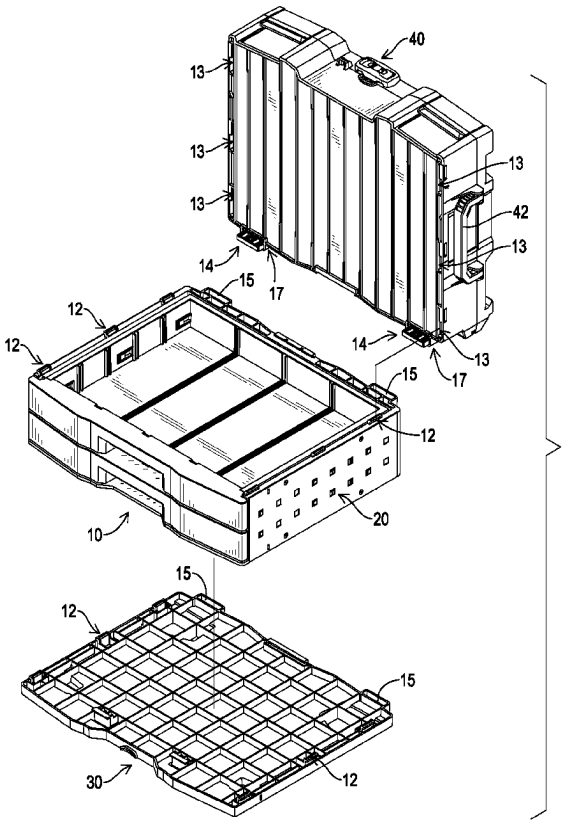
(57) **ABSTRACT**

A tool box assembly has at least one tool box, and each tool box has a container, at least one first assembling structure, at least one second assembling structure, and at least one drawer. The container of each tool box has a base and a surrounding wall erectly disposed at the base. Each second assembling structure is configured to engage with each first assembling structure. The at least one drawer of each tool box is disposed within the container of the tool box and is able to enter or exit from the container via a front opening of the container.

12 Claims, 10 Drawing Sheets



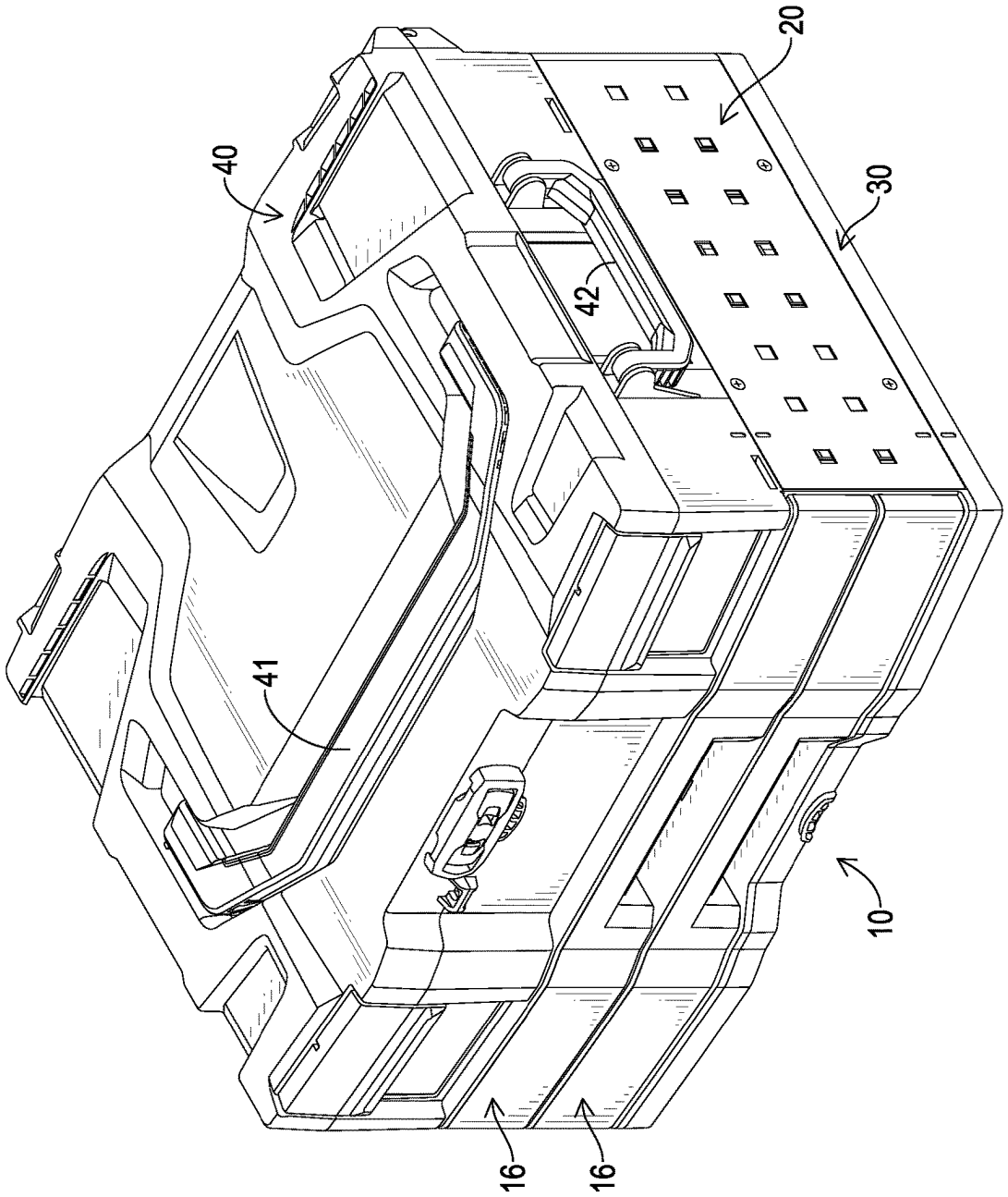


FIG.1

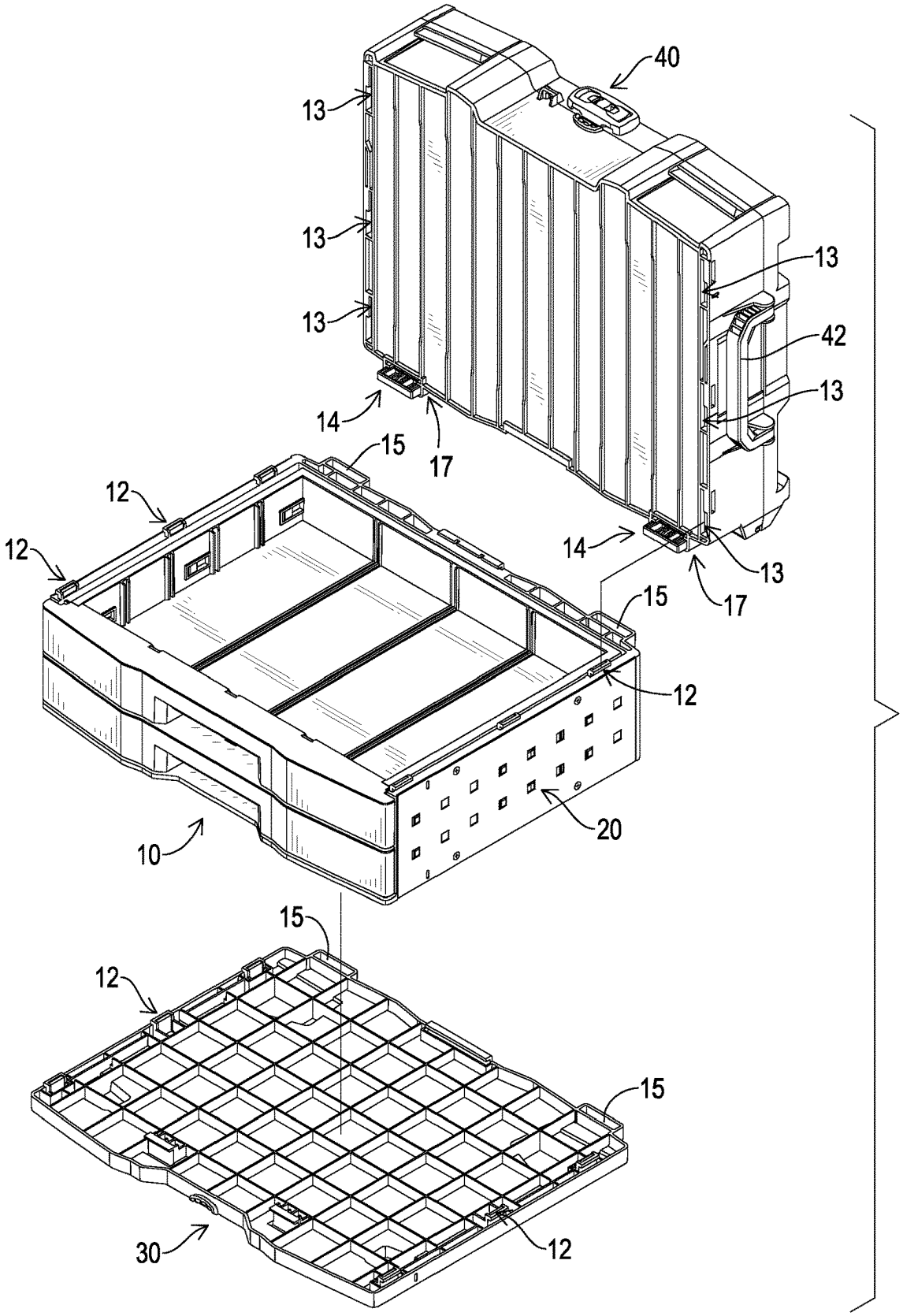


FIG.2

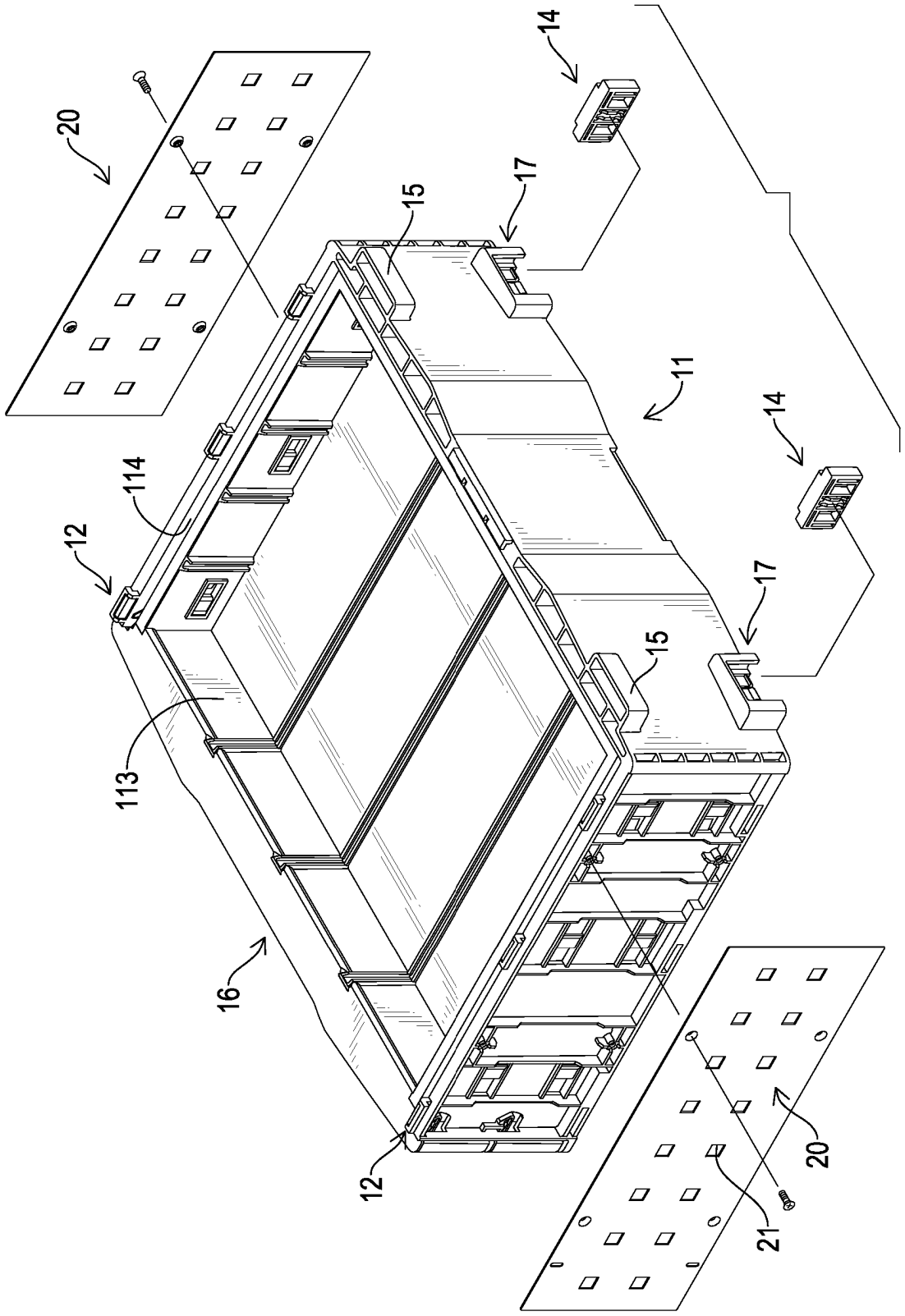


FIG.3

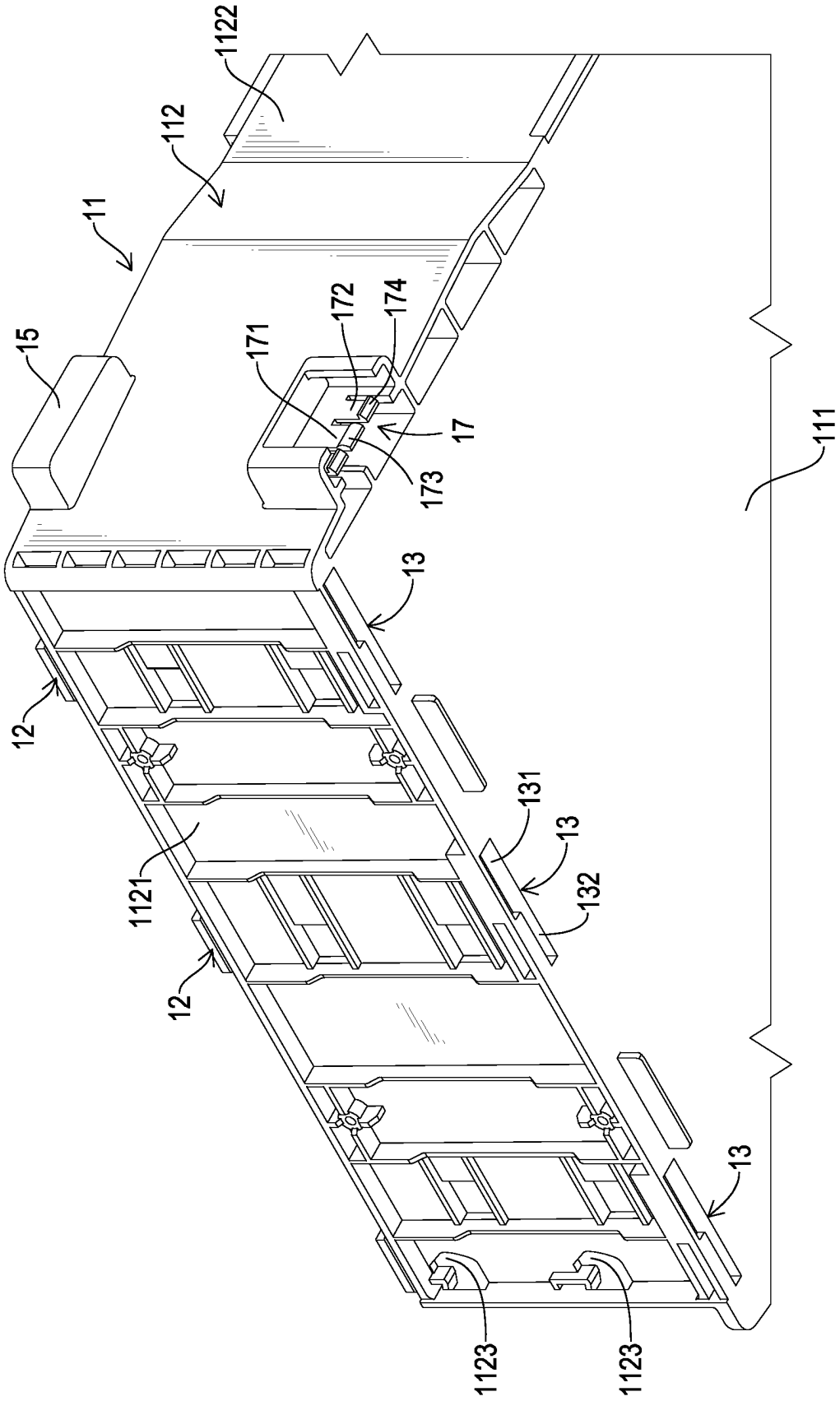

1122
112
11
15
171
172
174
17
173
111
13
12
131
13
1121
132
12
13
1123
1123

FIG.4

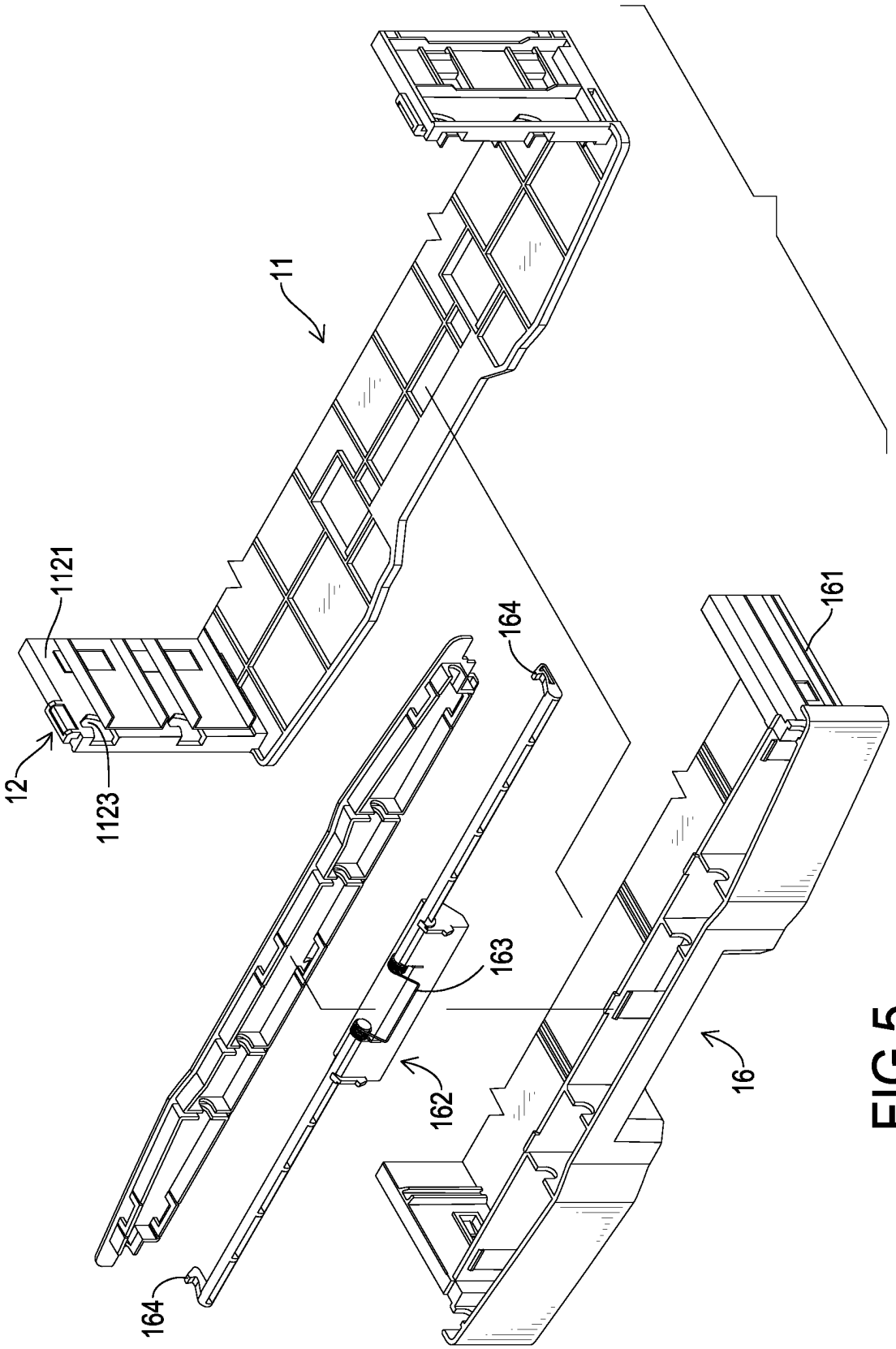


FIG.5

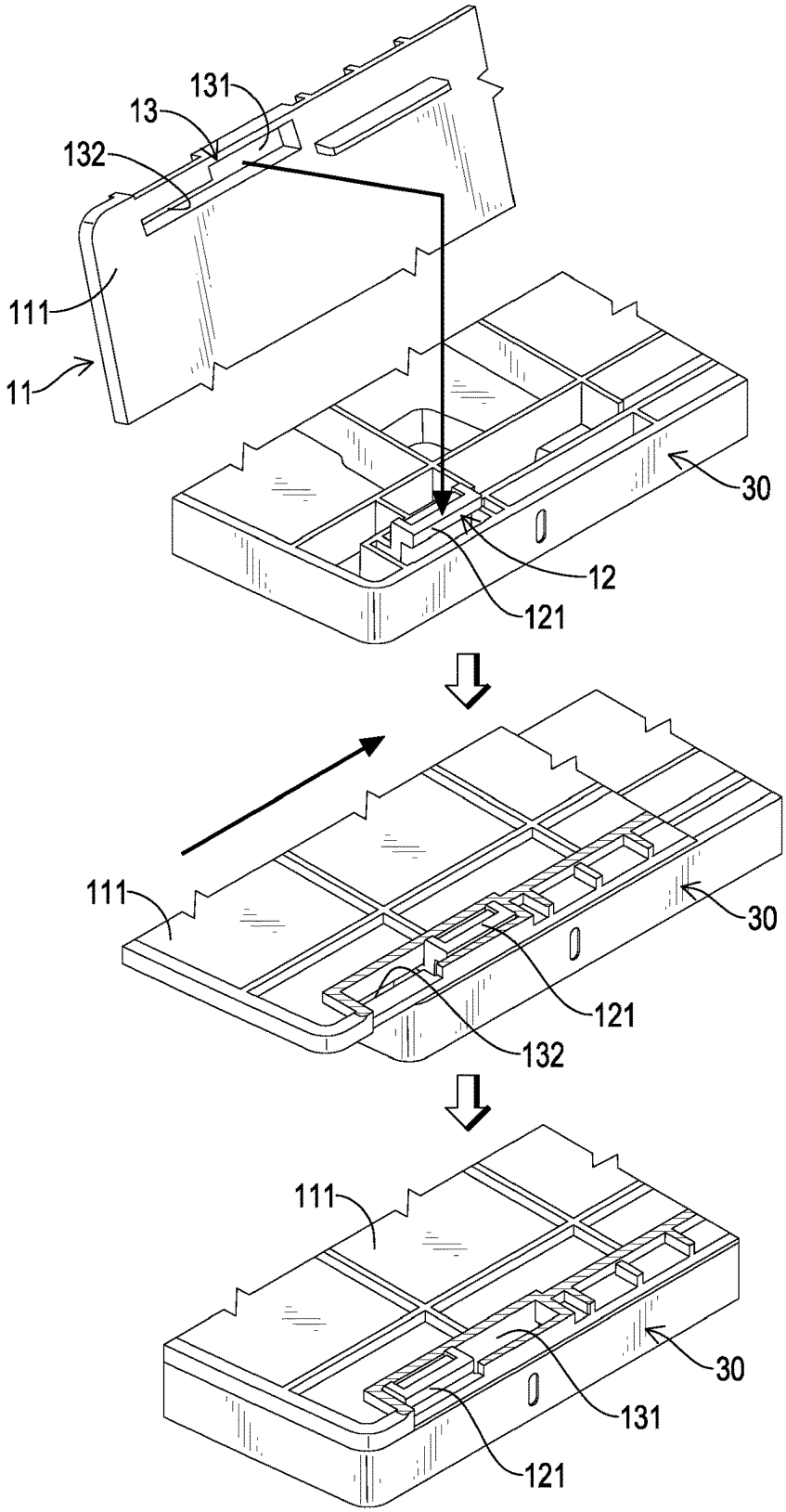


FIG.6

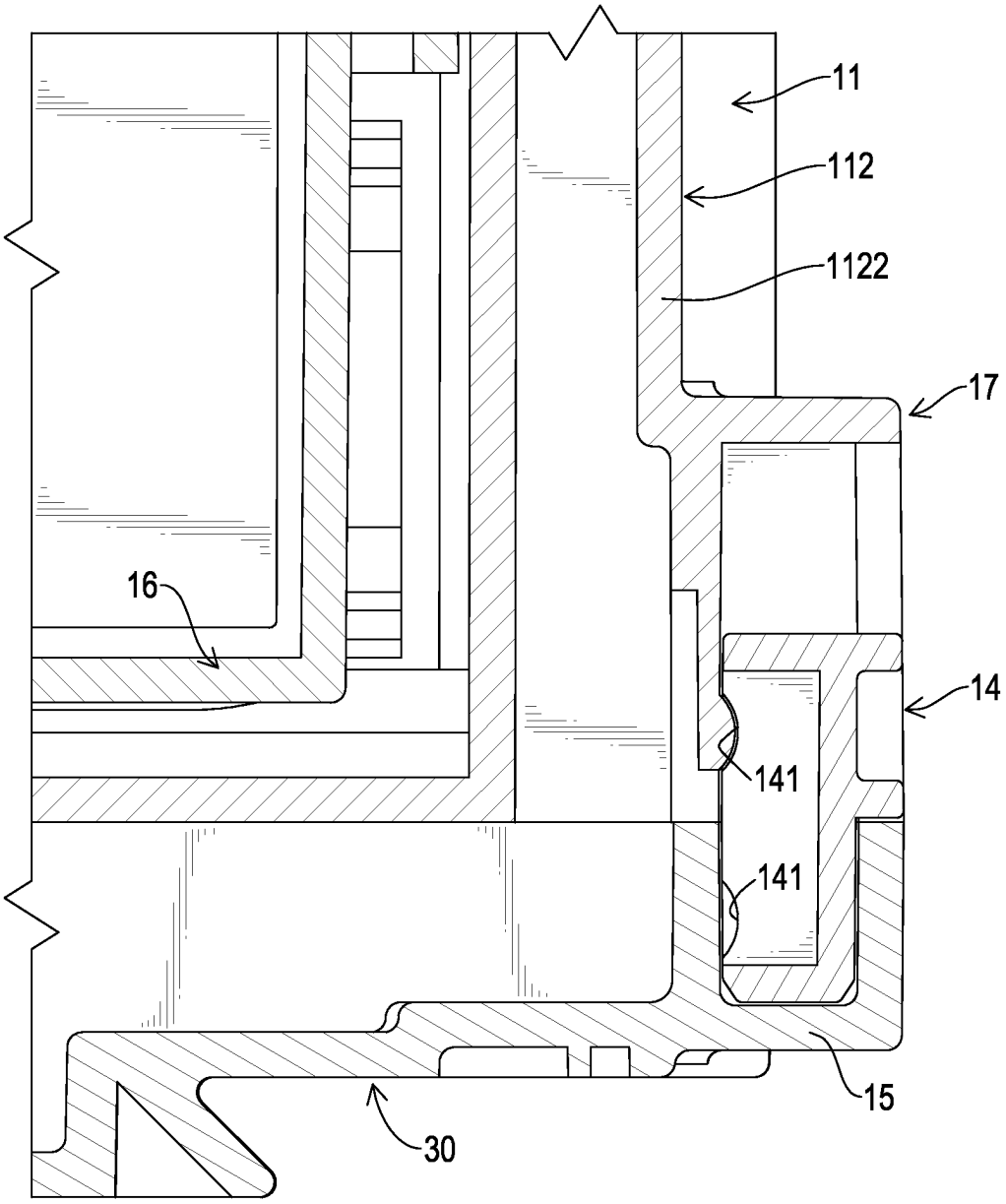


FIG.7

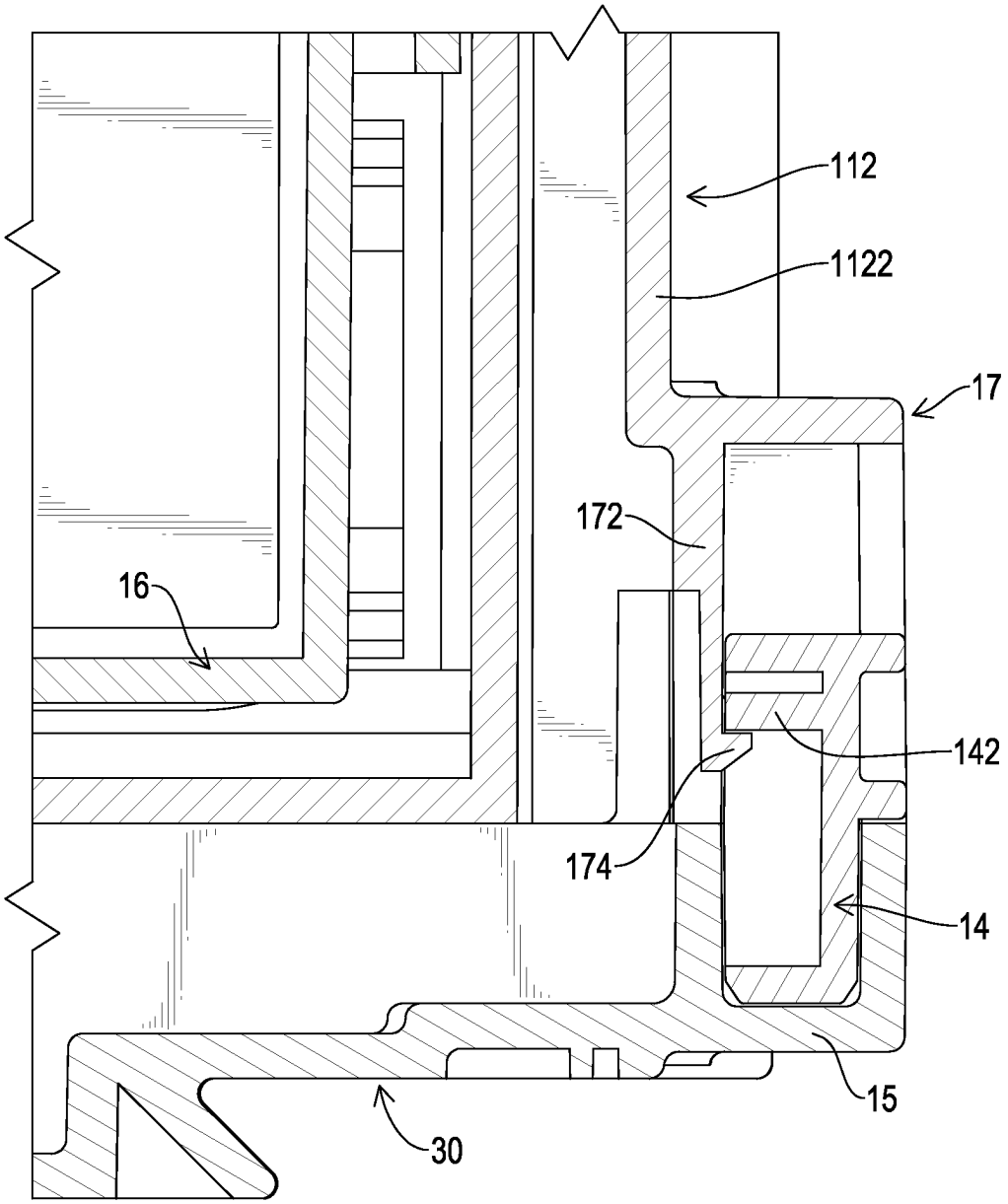


FIG.8

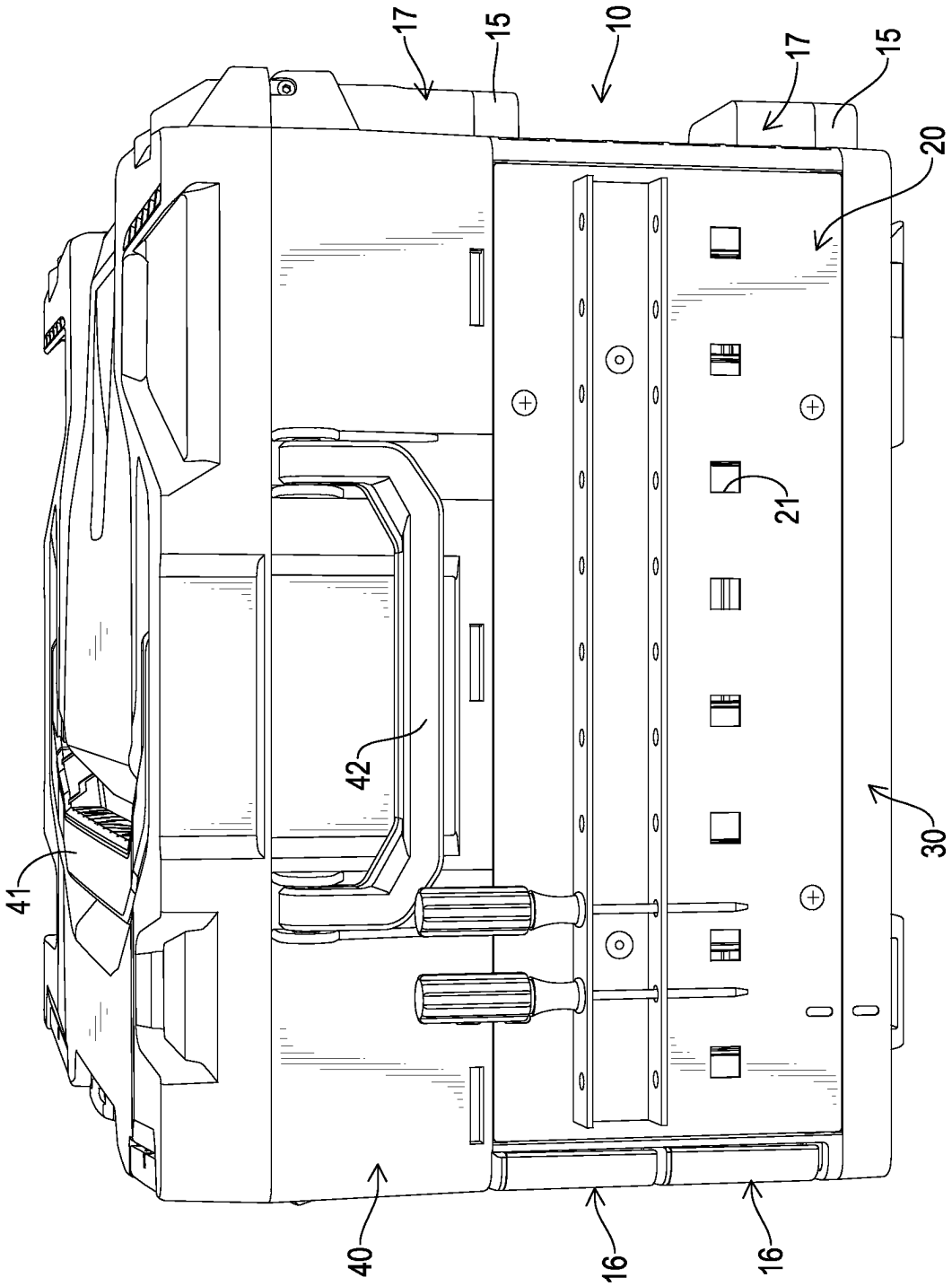


FIG.9

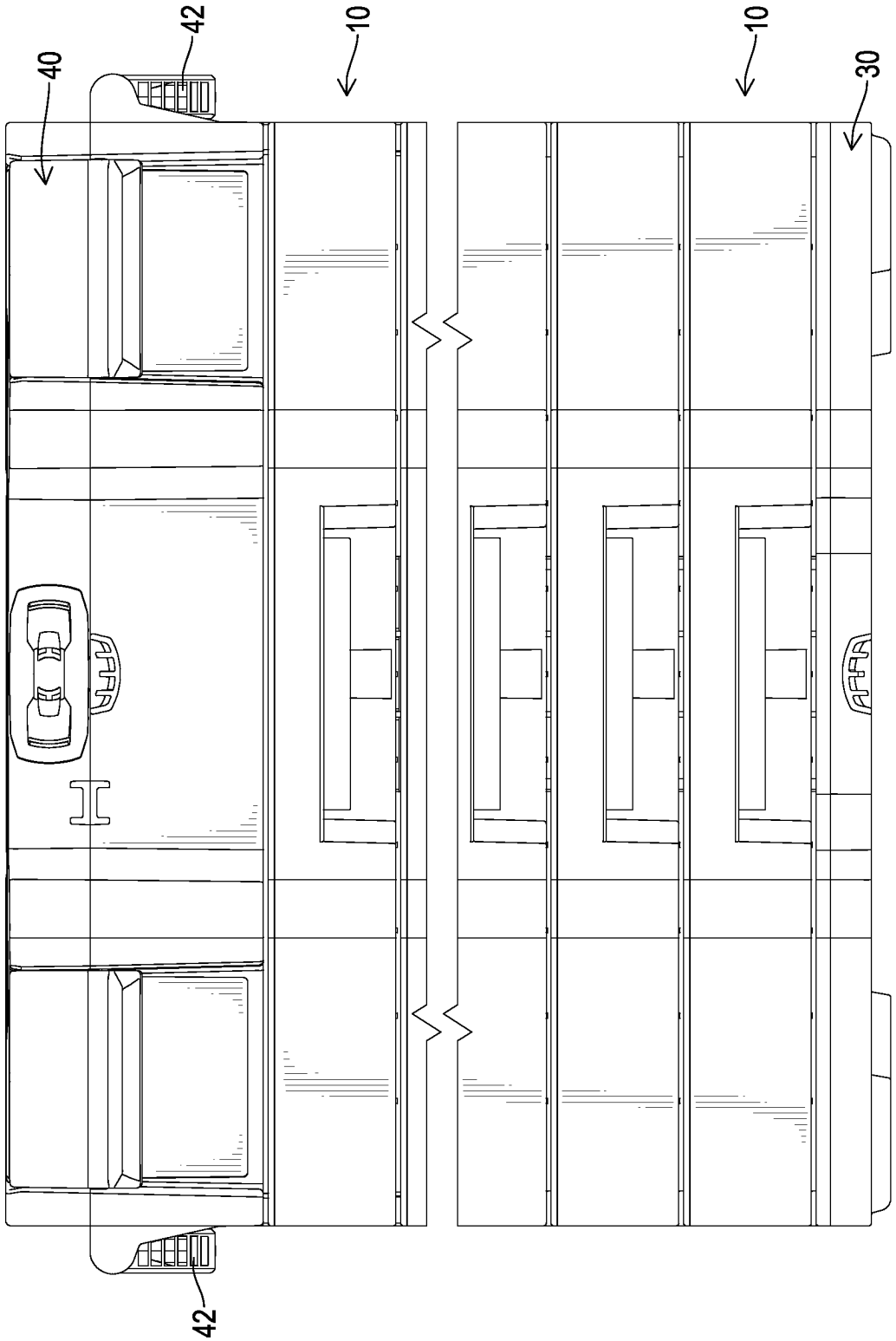


FIG.10

EXPANDABLE TOOL BOX ASSEMBLY

BACKGROUND OF THE INVENTION

1. Field of the Invention

The present invention relates to a tool box assembly, and more particularly to a tool box assembly which occupies less space and is expandable.

2. Description of Related Art

In order to store various kinds of hand tools systematically and for users to efficiently choose and retrieve the hand tools, the hand tools are stored in a tool box with many trays according to the kinds of the hand tools.

A traditional tool box has a container, multiple isolated plates, and multiple trays. The multiple isolated plates are disposed in parallel inside the container and divide the interior of the container into multiple chambers. The multiple trays are respectively disposed at the multiple isolated plates within the chambers.

In addition, hand tools of the same kind are stored in a container to be conveniently carried. A conventional tool box has multiple containers being longitudinally expandable for storing hand tools of various kinds respectively.

However, in the traditional tool box, the isolated plates and bottom of the trays are longitudinally stacked up and a volume of the traditional tool box is increased in a longitudinal direction. Furthermore, in the conventional tool box with multiple containers, a top and a bottom of adjacent two containers are stacked up and also longitudinally increase the volume of the conventional tool box.

Therefore, structures of the traditional tool box and the conventional tool box need to be further improved.

To overcome the shortcomings of the conventional tool box, the present invention provides a tool box assembly to mitigate or obviate the aforementioned problems.

SUMMARY OF THE INVENTION

The main objective of the present invention is to provide a tool box assembly that occupies less space and is expandable.

The tool box assembly has at least one tool box, and each tool box has a container, at least one first assembling structure, at least one second assembling structure, and at least one drawer. The container of each tool box has a base and a surrounding wall erectly disposed at the base. Each second assembling structure is configured to be engaged with each first assembling structure. The at least one drawer of each tool box is disposed within the container of the tool box and able to enter or exit from the container via a front opening of the container.

Other objects, advantages, and novel features of the invention will become more apparent from the following detailed description when taken in conjunction with the accompanying drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. **1** is a perspective view of a tool box assembly in accordance with the present invention;

FIG. **2** is an exploded perspective view of the tool box assembly in FIG. **1**;

FIG. **3** is another exploded perspective view of the tool box assembly in FIG. **1**;

FIG. **4** is a perspective view of a container of the tool box assembly in FIG. **1**;

FIG. **5** is an exploded perspective view of a drawer of the tool box assembly in FIG. **1**;

FIG. **6** is a schematic view of assembling the tool box assembly in FIG. **1**;

FIG. **7** is an enlarged side view in partial section of the tool box assembly in FIG. **1**;

FIG. **8** is another enlarged side view in partial section of the tool box assembly in FIG. **1**;

FIG. **9** is a side view of the tool box assembly in FIG. **1**; and

FIG. **10** is a front view of the tool box assembly in FIG. **1**.

DETAILED DESCRIPTION OF PREFERRED EMBODIMENTS

With reference to FIGS. **1** and **2**, a tool box assembly in accordance with the present invention has a tool box **10**, two pegboards **20**, a basal plate **30**, and a portable case **40**.

With reference to FIGS. **2** and **3**, the tool box **10** has a container **11**, six first assembling structures **12**, six second assembling structures **13**, two first positioning structures **14**, two second positioning structures **15**, and two drawers **16**. The container **11** has a base **111**, a surrounding wall **112**, a front opening **113**, and a top opening **114**. The base **111** is a plate. The surrounding wall **112** is erectly disposed at the base **111**, forms the front opening **113** and the top opening **114**, and has a top portion disposed opposite to the base **111**. Specifically, the surrounding wall **112** has two lateral plates **1121** and a rear plate **1122**. The two lateral plates **1121** are respectively disposed at two opposite sides of the container **11**. The rear plate **1122** is disposed at a rear side of the container **11**.

With reference to FIGS. **2** and **3**, the front opening **113** communicates with an interior of the container **11**, is disposed at a front side of the container **11**, and is opposite to the rear plate **1122**. The top opening **114** communicates with the interior of the container **11**, is disposed at the top portion of the surrounding wall **112**, and is opposite to the base **111**.

With reference to FIGS. **2**, **3**, and **6**, each one of the six first assembling structure **12** is disposed at the top portion of the surrounding wall **112** and has a blocking plate **121**. The blocking plate **121** of each first assembling structure **12** protrudes laterally and extends toward the front opening **113**. In the embodiment of the present invention, three of the six first assembling structures **12** are disposed at one of the two lateral plates **1121**, and the other three of the six first assembling structures **12** are disposed at the other one of the two lateral plates **1121**.

With reference to FIG. **4**, each one of the six second assembling structures **13** is disposed at the base **111**. Each second assembling structure **13** is configured to be engaged with each first assembling structure **12** and has an inserting hole **131** and an engaging groove **132**. The inserting hole **131** of each second assembling structure **13** communicates with the engaging groove **132** of the second assembling structure **13** in a direction toward the front opening **113**. The engaging groove **132** of each second assembling structure **13** is disposed more adjacent to the front opening **113** than the inserting opening **131** of the second assembling structure **13**. The inserting hole **131** of each second assembling structure **13** has a width larger than a width of the engaging groove of the second assembling structure **13**. In the embodiment of the present invention, the three of the six second assembling structures **13** are disposed at one of the two sides of the

container **11**, and the other three of the six second assembling structures **13** are disposed at the other one of the two sides of the container **11**.

With reference to FIGS. **2** and **3**, each one of the two first positioning structures **14** is an engaging unit, is connected to the surrounding wall **112** of the container **11**, and is moveable relative to the container **11** longitudinally. Each one of the two second positioning structures **15** is a recess and is disposed at the surrounding wall **112** of the container **11**. Each second positioning structure **15** is configured to engage with each first positioning structure **14**.

With reference to FIGS. **2** and **4**, in the embodiment of the present invention, each first positioning structure **14** is disposed at a bottom of the surrounding wall **112**, is disposed within a guiding groove **17**, and is longitudinally movable relative to the container **11** accordingly. Each first positioning structure **14** has two positioning recesses **141** and two blocking portions **142**. The guiding groove **17** has a positioning unit **171** and two restricting units **172**. The positioning unit **171** is resilient and swingable and has a positioning protrusion **173** to engage with one of the two positioning recesses **141** of each first positioning structure **14** for positioning the first positioning structure **14** in a longitudinal direction. Each one of the two restricting units **172** has a restricting hook **174** to restrict a corresponding one of the two blocking portions **142** of each first positioning structure **14** to prevent the first positioning structure **14** from detaching from the guiding groove **17**.

With reference to FIGS. **4** and **5**, each one of the two drawers **16** is disposed within the container **11** and able to enter or exit from the container **11** via the front opening **113**. Each drawer **16** has a drawer body **161**, a handle **162**, and a torsion spring **163**. The handle **162** is pivotally connected to the drawer body **161** and has two opposite ends respectively extending toward the two lateral plates **1121** of the surrounding wall **112** and two hooks **164** respectively disposed at the two opposite ends of the drawer body **161**. The torsion spring **163** is connected to the handle **162** and abuts against the drawer body **161** and the handle **162** simultaneously. The handle **162** is configured to be driven by the torsion spring **163** to engage with two engaging holes **1123** disposed at the surrounding wall **112** via the two hooks **164** of the handle **162**. The drawer **16** is prevented from accidentally moving out from the container **11** accordingly. When a user attempts to draw each drawer **16**, the handle **162** of the drawer **16** is operated to compress the torsion spring **163**. The two hooks of the handle **162** of the drawer **16** are able to detach from the two engaging holes **1123**, and the drawer **16** can be moved out from the container accordingly.

With reference to FIGS. **2**, **3**, and **9**, the two pegboards **20** are respectively screwed to the two lateral plates **1121** of the surrounding wall **112**. Each one of the two pegboards **20** has multiple peg holes **21** defined therethrough. Each peg hole **21** is configured to install a hook or for a hand tool to directly hang in the peg hole **21**.

With reference to FIG. **2**, a top portion of the basal plate **30** has six said first assembling structures **12**. A rear side of the basal plate **30** has two said second positioning structures **15**.

With reference to FIGS. **1**, **2**, and **10**, the portable case **40** has a top grip **41**, two lateral grips **42**, six said second assembling structures **13**, and two said first positioning structures **14**. The top grip **41** is pivotally connected to a top portion of the portable case **40**. The two lateral grips **42** are pivotally connected to two opposite sides of the portable case **40** respectively. Three of the six second assembling structures **13** of the portable case **40** are disposed at one of two sides of the portable case **40**, and the other three of the six second assembling structures **13** of the portable case **40** are disposed at the other one of the two sides of the portable case **40**.

With reference to FIG. **5**, when the tool box **10** and the basal plate **30** are connected together, the six first assembling structures **12** of the tool box **10** are at first respectively aligned with the six second assembling structures **13** of the basal plate **30**. The blocking plate **121** of each first assembling structure **12** of the tool box **10** is inserted to the inserting hole **131** of a corresponding one of the second assembling structures **13** of the basal plate **30**. Then the tool box **10** is pulled backward to engage the blocking plate **121** of each first assembling structure **12** of the tool box **10** with the engaging groove **132** of a corresponding one of the second assembling structures **13** of the basal plate **30**. The tool box **10** and the basal plate **30** are connected together accordingly.

With reference to FIGS. **3**, **7**, and **8**, the two positioning structures **14** of the tool box **10** are switched downward to respectively engage with the two second positioning structures **15** of the basal plate **30**. The tool box **10** and the basal plate **30** are prevented from moving relative to each other and from accidently detaching from each other.

With reference to FIGS. **2** and **6**, similarly, when the portable case **40** and the tool box **10** are assembled together, and the six second assembling structures **13** disposed at the bottom of the portable case **40** are respectively aligned with the first assembling structures **12** of the tool box **10** at first. The six second assembling structures **13** of the portable case **40** are respectively engaged with the six first assembling structures **12** of the tool box **10**. Then the two first positioning structures **14** are switched down and respectively engaged with the two second positioning structures **15** of the tool box **10** to prevent the portable case **40** from moving relative to the tool box **10**.

With reference to FIG. **10**, the tool box assembly of the present invention may have multiple tool boxes **10**. The tool boxes **10** can be assembled via said first assembling structures **12**, said second assembling structures **13**, said first positioning structures **14**, and said second positioning structures **15** to longitudinally expand the tool box assembly. The amount of the tool boxes **10** is not restricted in the present invention.

In the embodiment of the present invention, the tool box **10** has two said drawers **16**. Practically, the tool box **10** may have only one said drawer **16** to reduce the height of the surrounding wall **112** of the container **11** of the tool box **10**. The amount of the drawer **16** is not restricted in the present invention.

Similarly, as long as each said first positioning structure **14** is able to be engaged with each said second positioning structure **15**, the actual structures of each first positioning structure **14** and each second positioning structure **15** are not restricted.

In the present invention, the container **11** of the tool box **10** omits a top plate and has said top opening **114**. The space occupied by the top plate can be saved when the tool box assembly of the present invention is longitudinally assembled and expanded. Therefore, the tool box assembly of the present invention occupies less space. Compared to the traditional tool box or the conventional tool box, the tool box assembly of the present invention saves the space occupied by the top plate and provides a better space efficiency.

With reference to FIG. **10**, the two lateral grips **40** are respectively disposed at the two opposite sides of the portable case **40**. When the multiple tool boxes **10** are longitudinally assembled and expanded, a user can move the tool box assembly of the present invention by holding the two lateral grips **40** with two hands. The tool box assembly of the present invention may be moved by two users. Therefore, the tool box assembly of the present invention can be moved conveniently.

Even though numerous characteristics and advantages of the present invention have been set forth in the foregoing description, together with details of the structure and features of the invention, the disclosure is illustrative only. Changes may be made in the details, especially in matters of shape, size, and arrangement of parts within the principles of the invention to the full extent indicated by the broad general meaning of the terms in which the appended claims are expressed.

What is claimed is:

1. A tool box assembly comprising:

multiple tool boxes, each one of the multiple tool boxes having

a container having

a base being a plate;

a surrounding wall erectly disposed at the base and having a top portion disposed opposite to the base;

a front opening formed by the surrounding wall and communicating with an interior of the container; and

a top opening formed by the surrounding wall, disposed at a highest portion of the container, and communicating with the interior of the container;

multiple first assembling structures disposed at the top portion of the surrounding wall;

multiple second assembling structures disposed at the base, each second assembling structure corresponding to each first assembling structure in structure; and

multiple drawers disposed within the container and configured to enter or exit from the container via the front opening.

2. The tool box assembly as claimed in claim **1**, wherein

each one of the multiple first assembling structures of each one of the multiple tool boxes has a blocking plate laterally protruding and extending toward the front opening of the container of the tool box;

each one of the multiple second assembling structures of each one of the multiple tool boxes has

an engaging groove; and

an inserting hole communicating with the engaging groove in a direction toward the front opening of the container of the tool box and having a width being larger than a width of the engaging groove; and

the blocking plate of each one of the multiple first assembling structures is configured to be inserted to and engaged with the inserting hole and the engaging groove of each one of the multiple second assembling structures of the container of another tool box.

3. The tool box assembly as claimed in claim **1**, wherein

each one of the multiple second assembling structures of each one of the multiple tool boxes has a blocking plate laterally protruding and extending toward the front opening of the container of the tool box;

each one of the multiple first assembling structures of each one of the multiple tool boxes has

an engaging groove; and

an inserting hole communicating with the engaging groove in a direction toward the front opening of the container of the tool box and having a width being larger than a width of the engaging groove; and

the blocking plate of each one of the multiple second assembling structures is configured to be inserted to and engaged with the inserting hole and the engaging groove of each one of the multiple first assembling structures of the container of another tool box.

4. The tool box assembly as claimed in claim **2**, wherein

each one of the multiple tool boxes has multiple first positioning structures and multiple second positioning structures;

the multiple first positioning structures and the multiple second positioning structures of the each one of the multiple tool boxes are disposed at the surrounding wall of the container of the tool box; and

each second positioning structure corresponds to each first positioning structure in structure.

5. The tool box assembly as claimed in claim **3**, wherein

each one of the multiple tool boxes has multiple first positioning structures and multiple second positioning structures;

the multiple first positioning structures and the multiple second positioning structures of each one of the multiple tool boxes are disposed at the surrounding wall of the container of the tool box; and

each first positioning structure corresponds to each second positioning structure in structure.

6. The tool box assembly as claimed in claim **4**, wherein

the first positioning structure of each one of the multiple tool boxes is an engaging unit which is connected to the surrounding wall of the container of the tool box and is longitudinally moveable relative to the tool box; and

the second positioning structure of each one of the multiple tool boxes is a recess.

7. The tool box assembly as claimed in claim **5**, wherein

the first positioning structure of each one of the multiple tool boxes is an engaging unit which is connected to the surrounding wall of the container of the tool box and is longitudinally moveable relative to the tool box; and

the second positioning structure of each one of the multiple tool boxes is a recess.

8. The tool box assembly as claimed in claim **1**, wherein

the surrounding wall of the container of each one of the multiple tool boxes has multiple engaging holes disposed therein;

each one of the multiple drawers of each one of the multiple tool boxes has

a drawer body;

a handle pivotally connected to the drawer body and having multiple hooks; and

a torsion spring connected to the handle and abutting against the drawer body and the handle simultaneously; and

the handle of each one of the multiple drawers of each one of the multiple tool boxes is configured to be driven by the torsion spring of the drawer to respectively engage with the multiple engaging holes via the multiple hooks of the handle.

9. The tool box assembly as claimed in claim **1**, wherein

each one of the multiple tool boxes has multiple pegboards;

each one of the multiple pegboards of each one of the tool boxes is connected to the surrounding wall of the tool box and has multiple peg holes defined therethrough.

10. The tool box assembly as claimed in claim 1, wherein the tool box assembly has a portable case having multiple said second assembling structures;

the portable case is configured to be connected to one of the multiple tool boxes; and

the multiple second assembling structures of the portable case are configured to be respectively engaged with the multiple first assembling structures of each one of the multiple tool boxes.

11. The tool box assembly as claimed in claim 10, wherein the portable case has two lateral grips pivotally connected to two opposite sides of the portable case.

12. The tool box assembly as claimed in claim 1, wherein each one of the multiple tool boxes has multiple first positioning structures and multiple second positioning structures;

each one of the multiple second positioning structures is configured to engage with each one of the multiple first positioning structures;

each one of the multiple first positioning structures of each one of the multiple tool boxes is an engaging unit connected to the tool box and being longitudinally moveable relative to the tool box; and

each one of the multiple second positioning structures of the multiple tool boxes is a recess.

* * * * *