



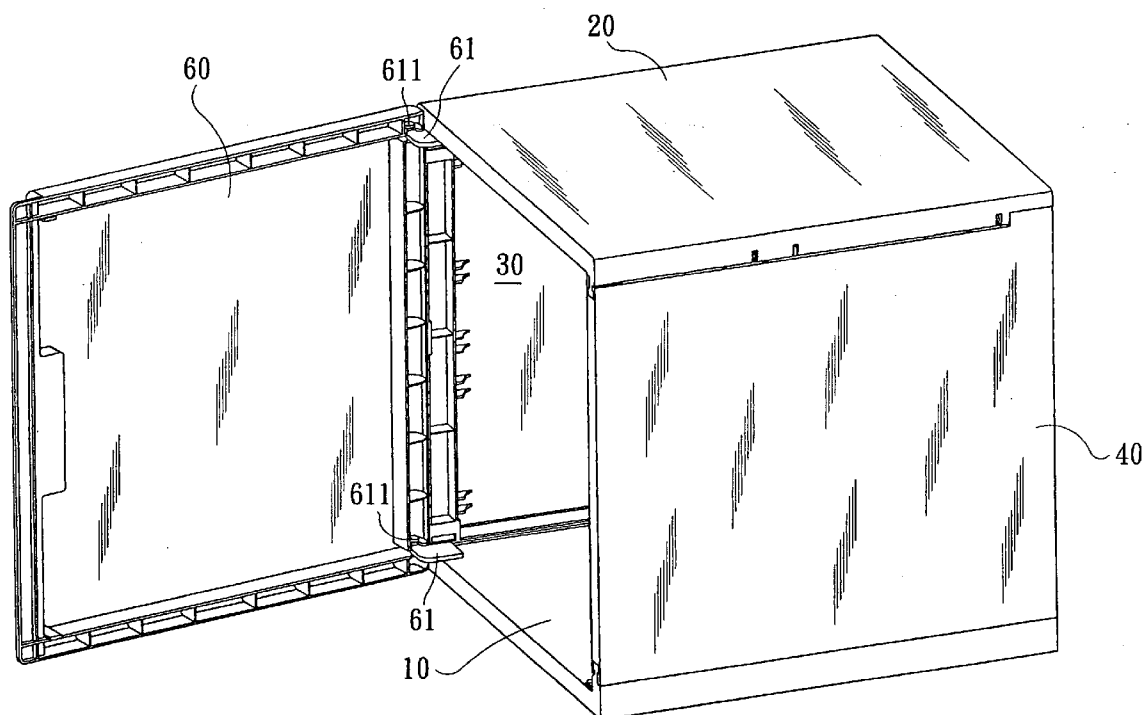
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(19) **United States**(12) **Patent Application Publication**
Chen(10) **Pub. No.: US 2009/0145897 A1**(43) **Pub. Date: Jun. 11, 2009**(54) **COLLAPSIBLE STORAGE CONTAINER****Publication Classification**(75) Inventor: **Henry Chen, Taipei (TW)**(51) **Int. Cl.**
B65D 6/00 (2006.01)(52) **U.S. Cl.** **220/4.28**

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WPAT, PC**7225 BEVERLY ST.****ANNANDALE, VA 22003 (US)**(57) **ABSTRACT**(73) Assignee: **PROTREND CO., LTD., Taipei (TW)**(21) Appl. No.: **11/950,888**(22) Filed: **Dec. 5, 2007**

A storage container includes a rectangular frame formed from pivotally connected bottom, top, left, and right panels and is therefore collapsible into a flat state to have a largely reduced volume to enable convenient storage and transport thereof at reduced cost. Any two of the four panels that are adjacent to each other are provided at joints with tenons and corresponding mortises. When the rectangular frame is in a standup state with the corresponding tenons and mortises engaged with one another, the mutually pivotally turnably connected panels of the storage container are held in place to always keep the storage container in a stable and upright position.



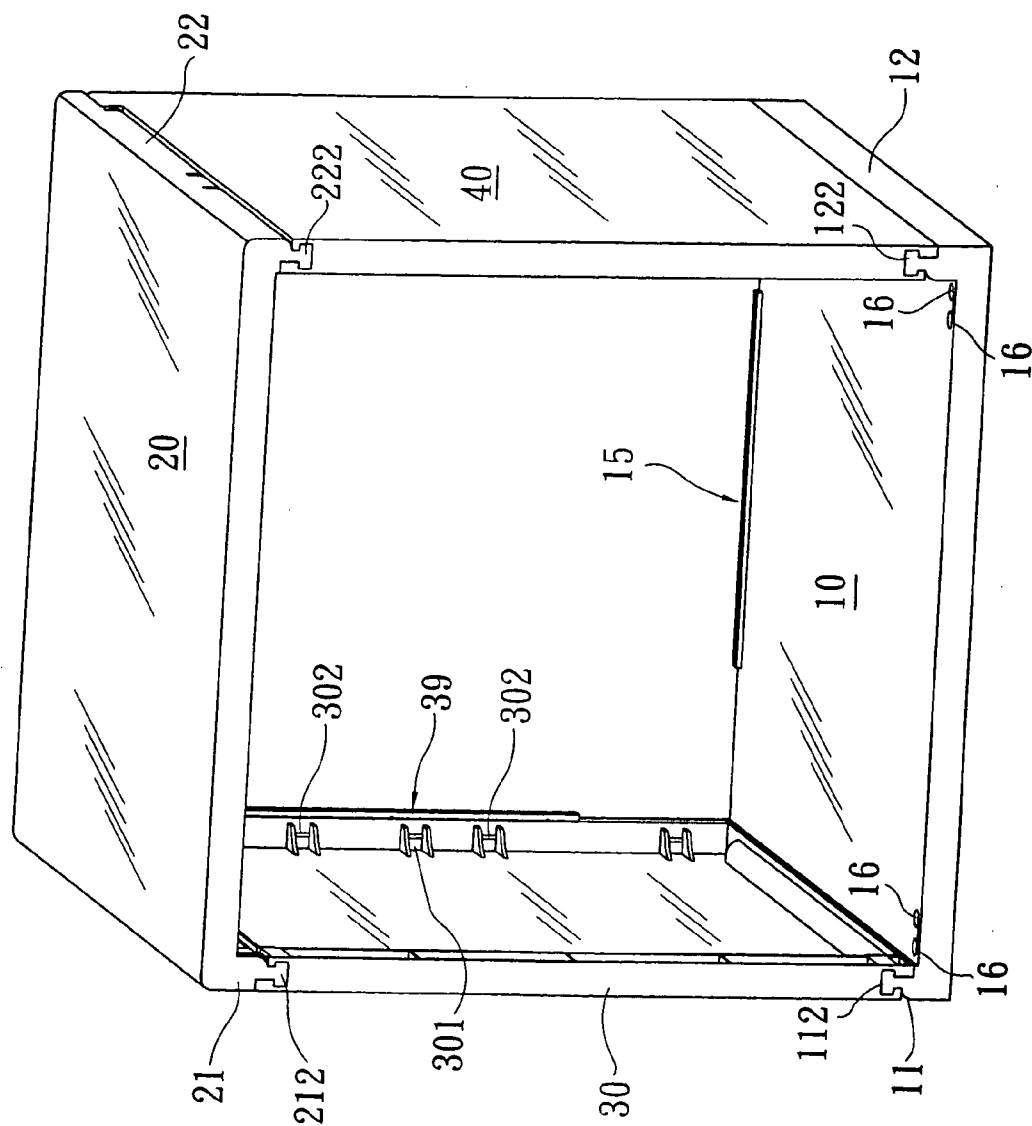
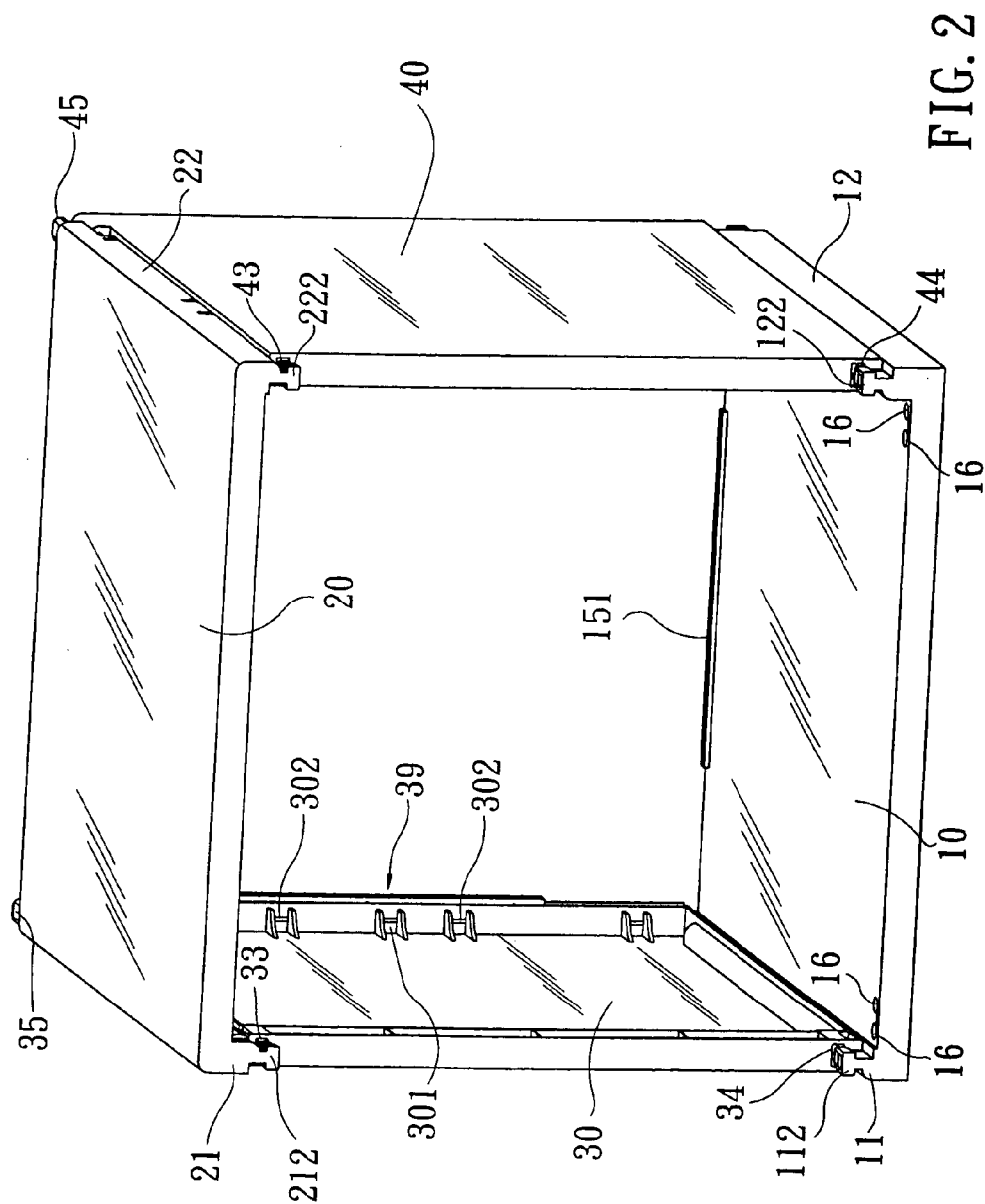


FIG. 1



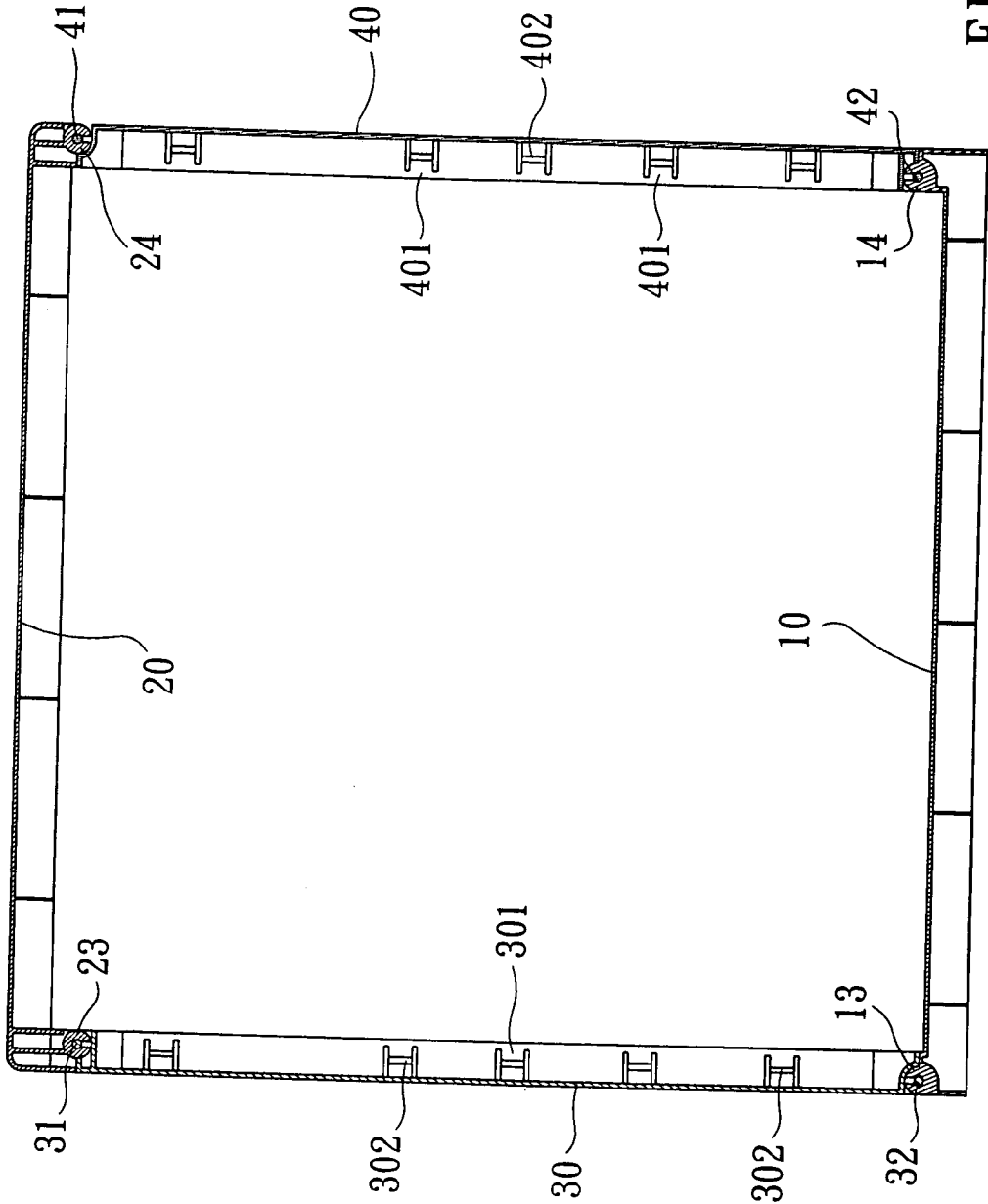


FIG. 3

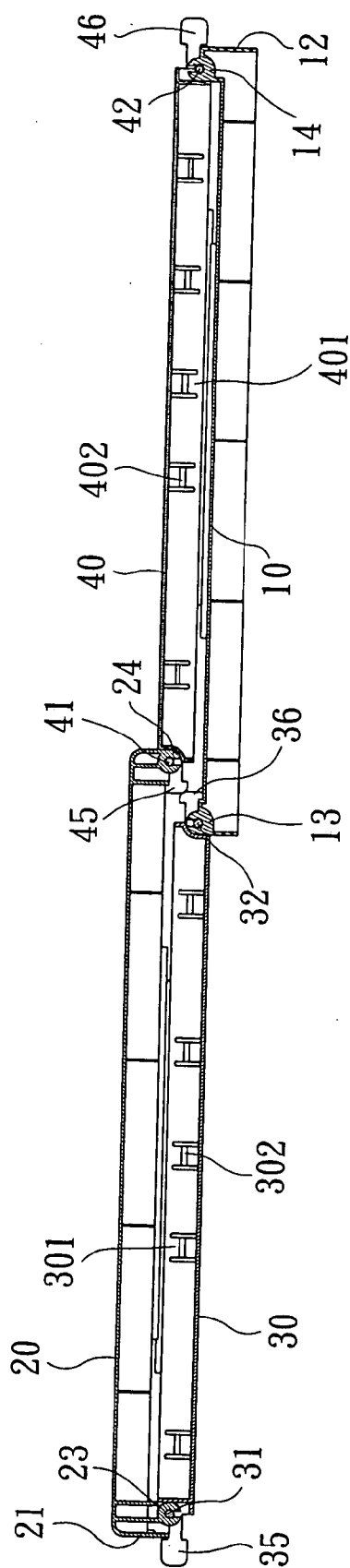


FIG. 4

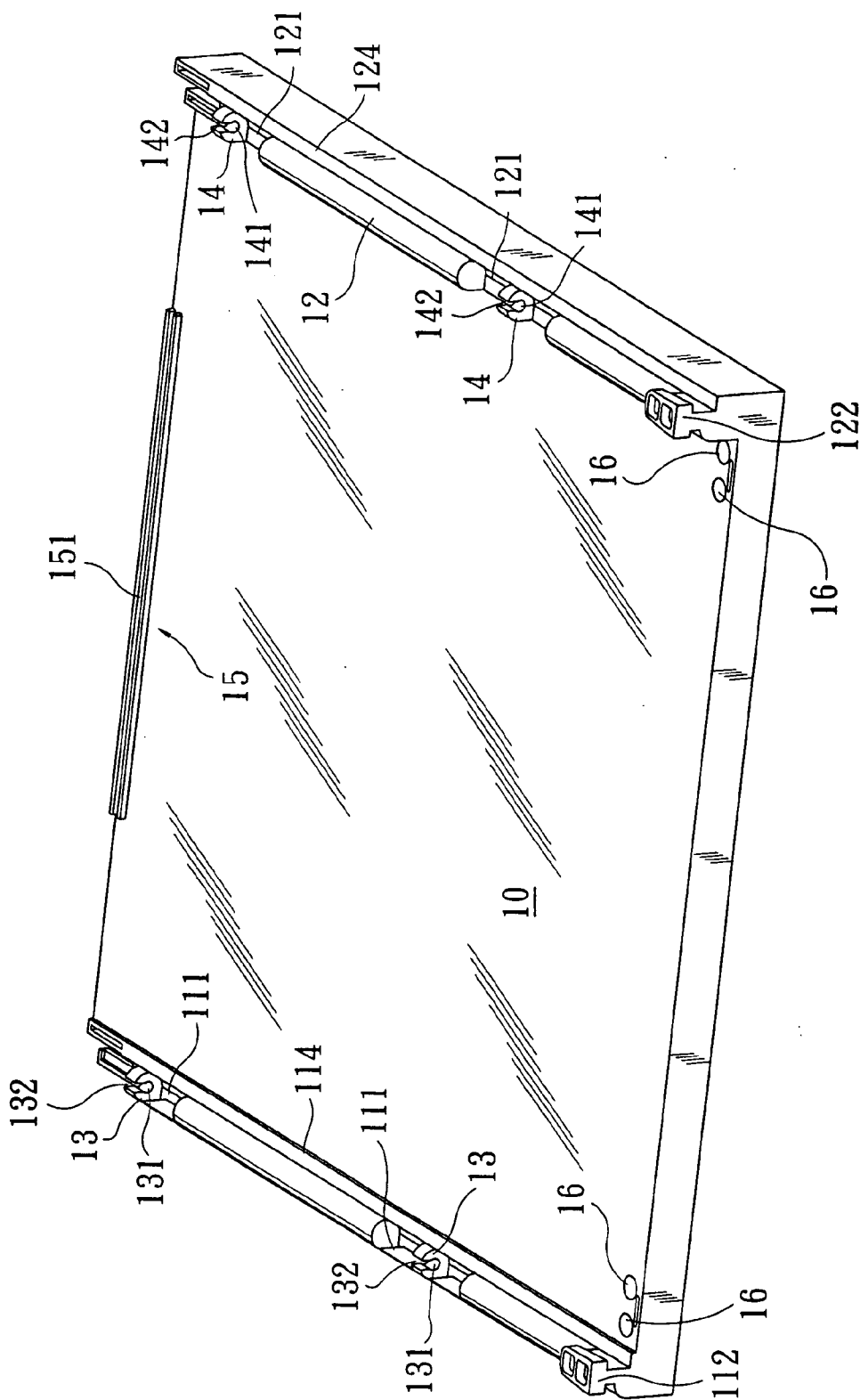


FIG. 5

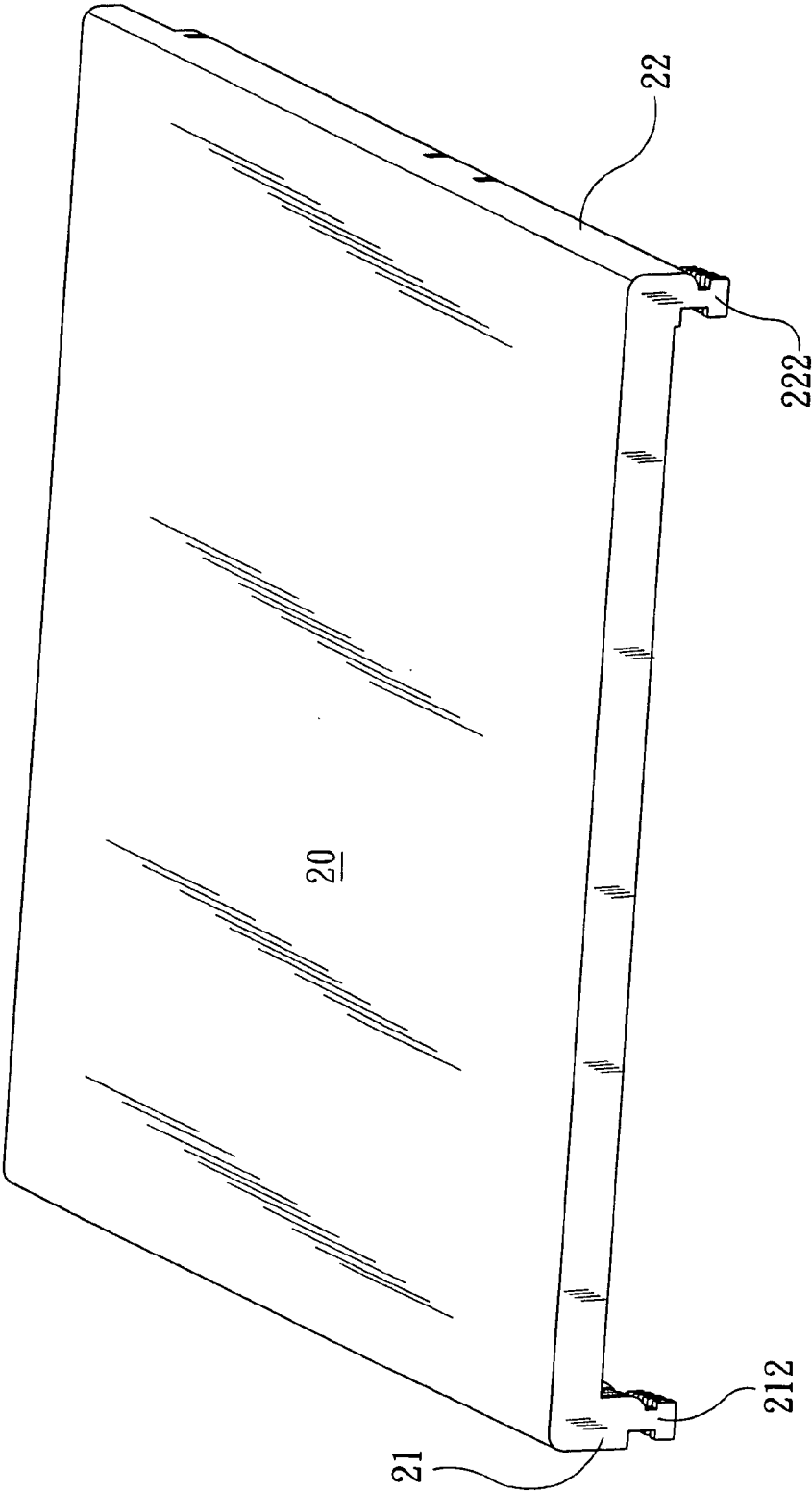
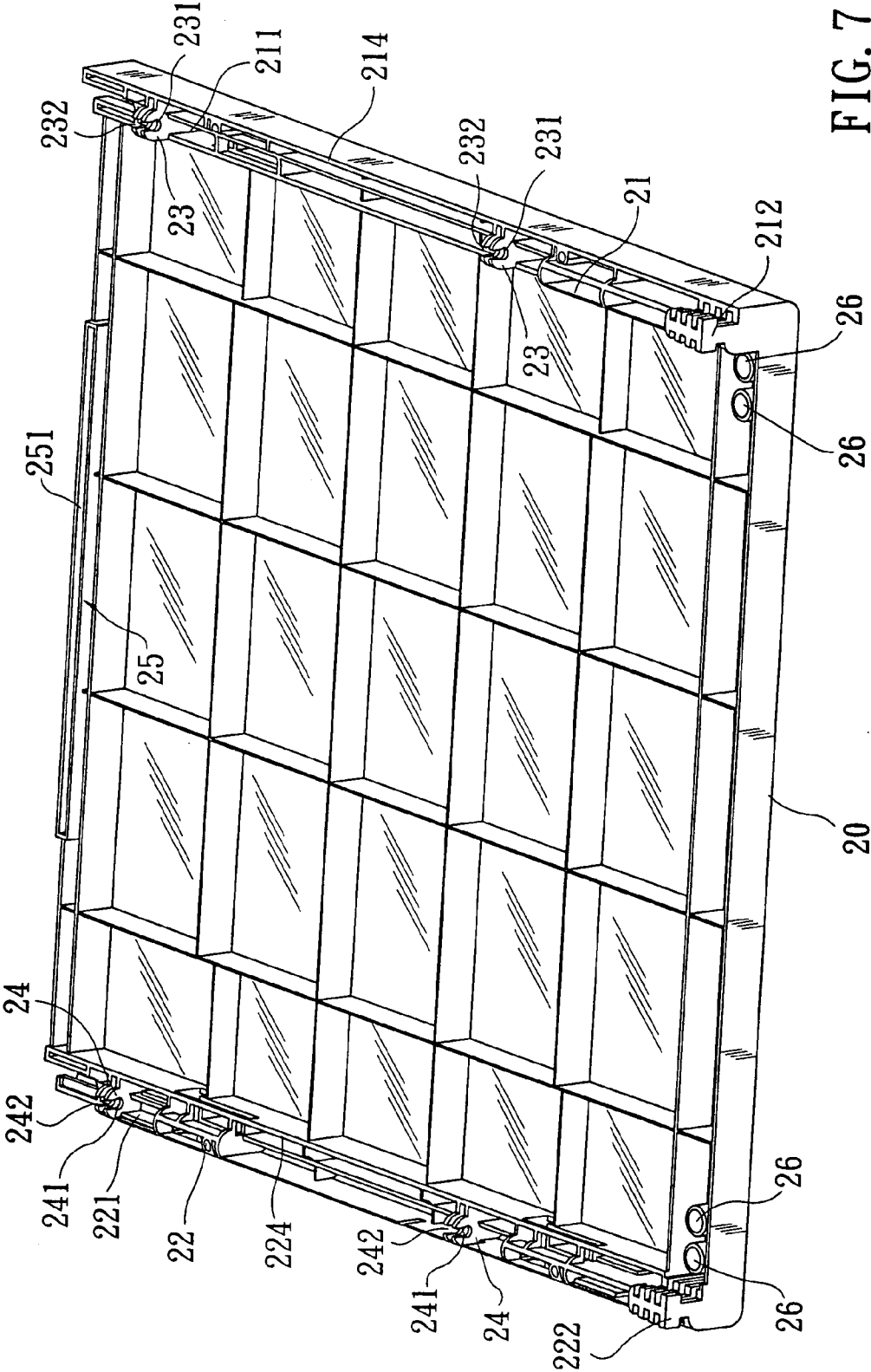


FIG. 6



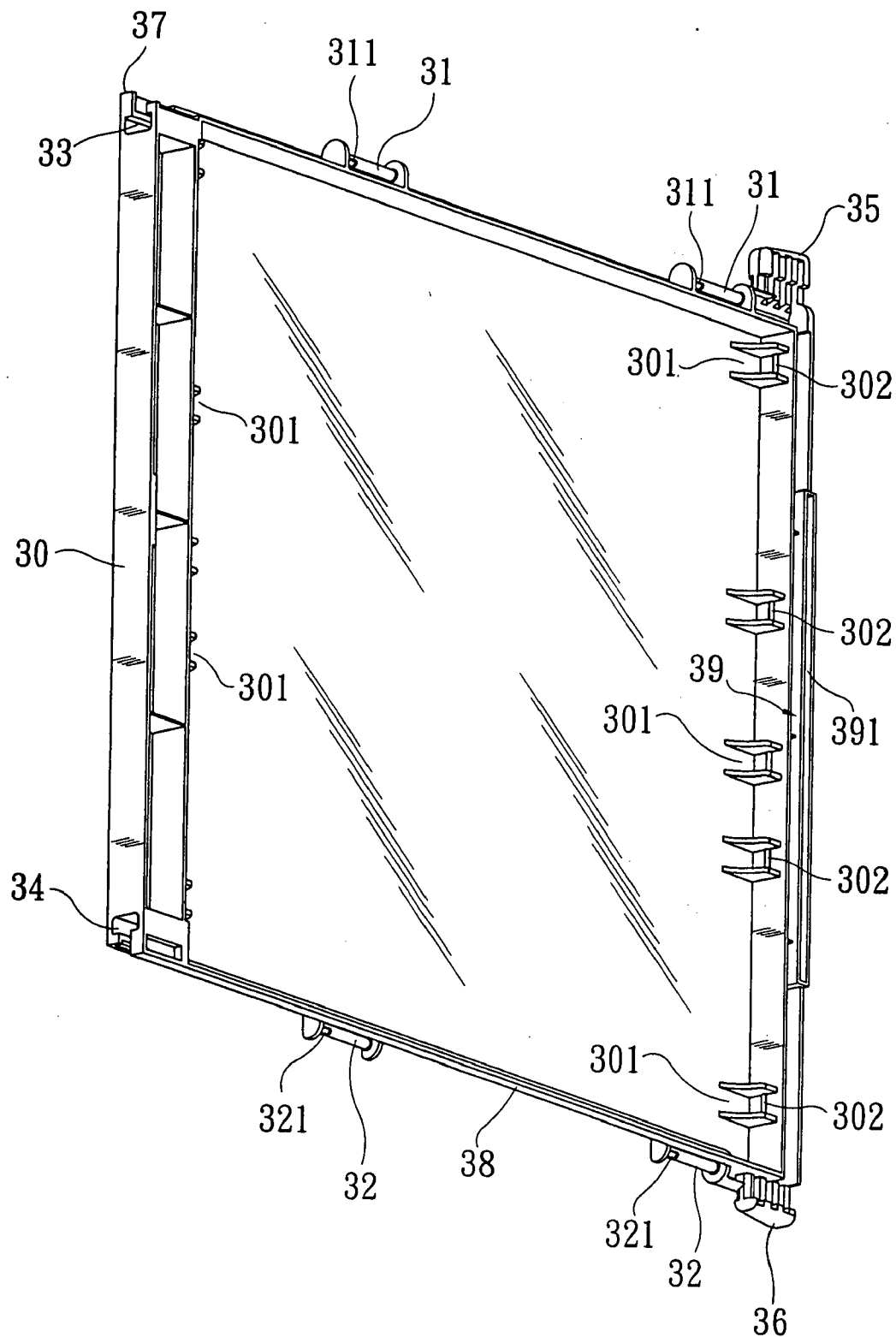


FIG. 8

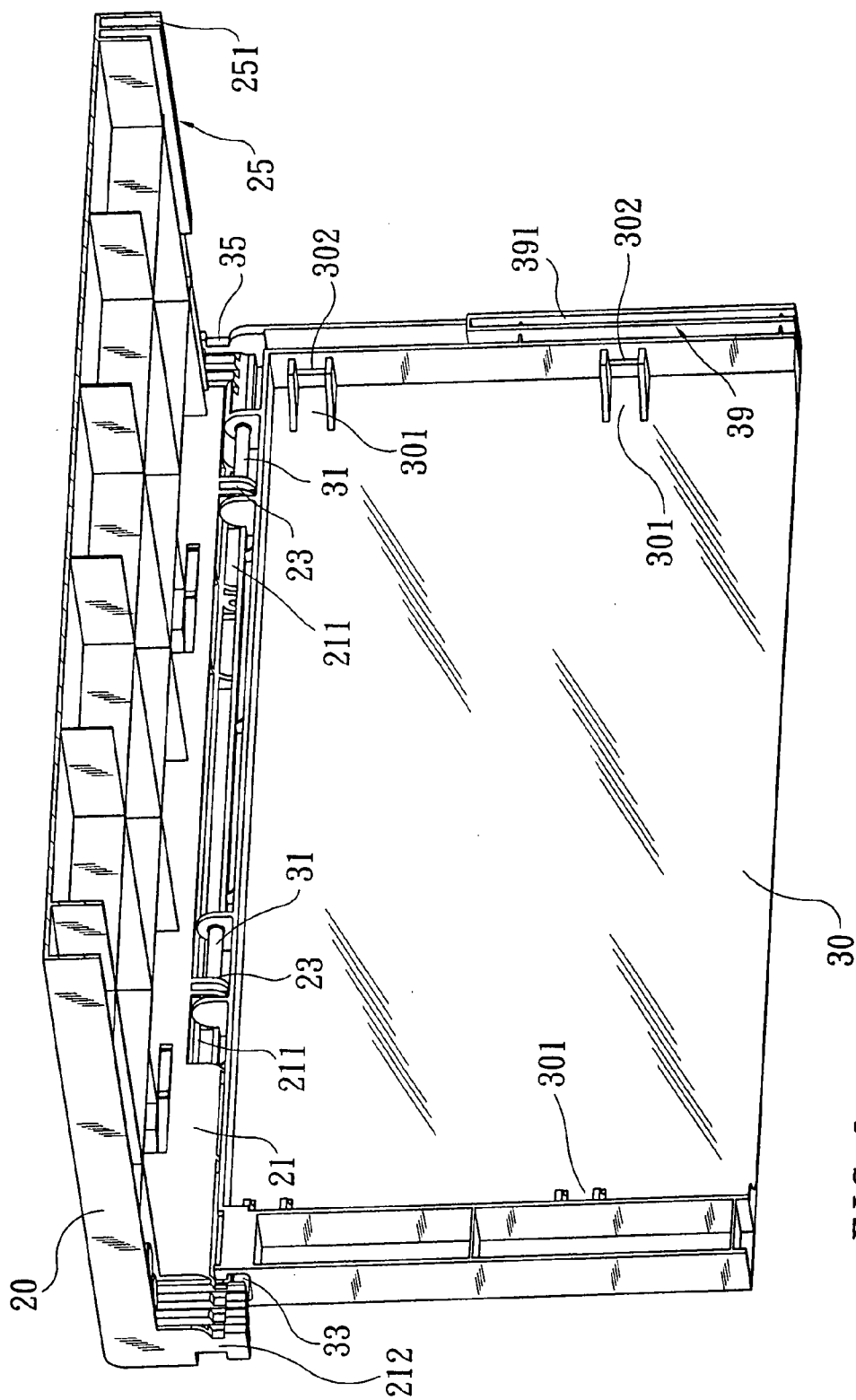
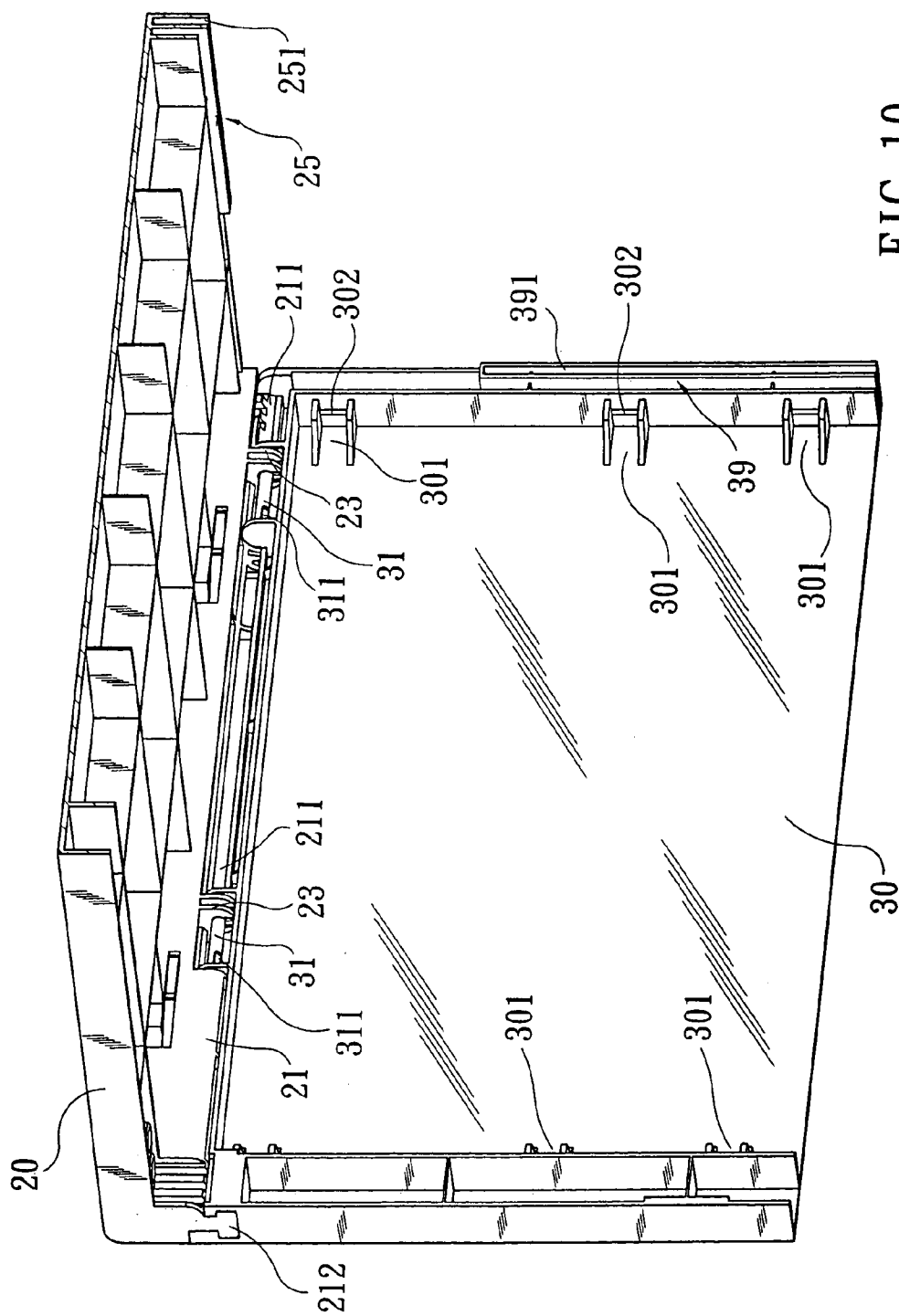


FIG. 9



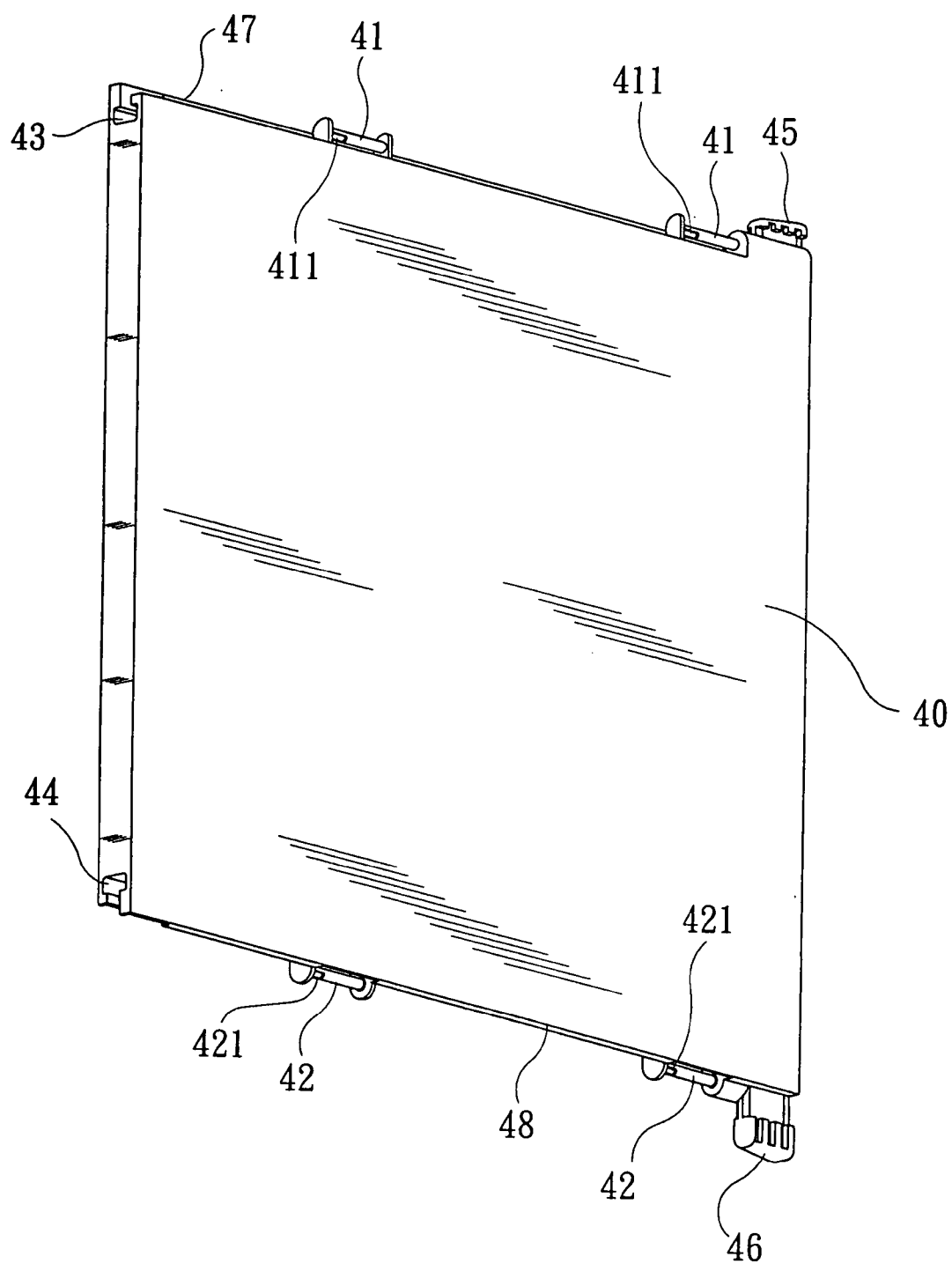


FIG. 11

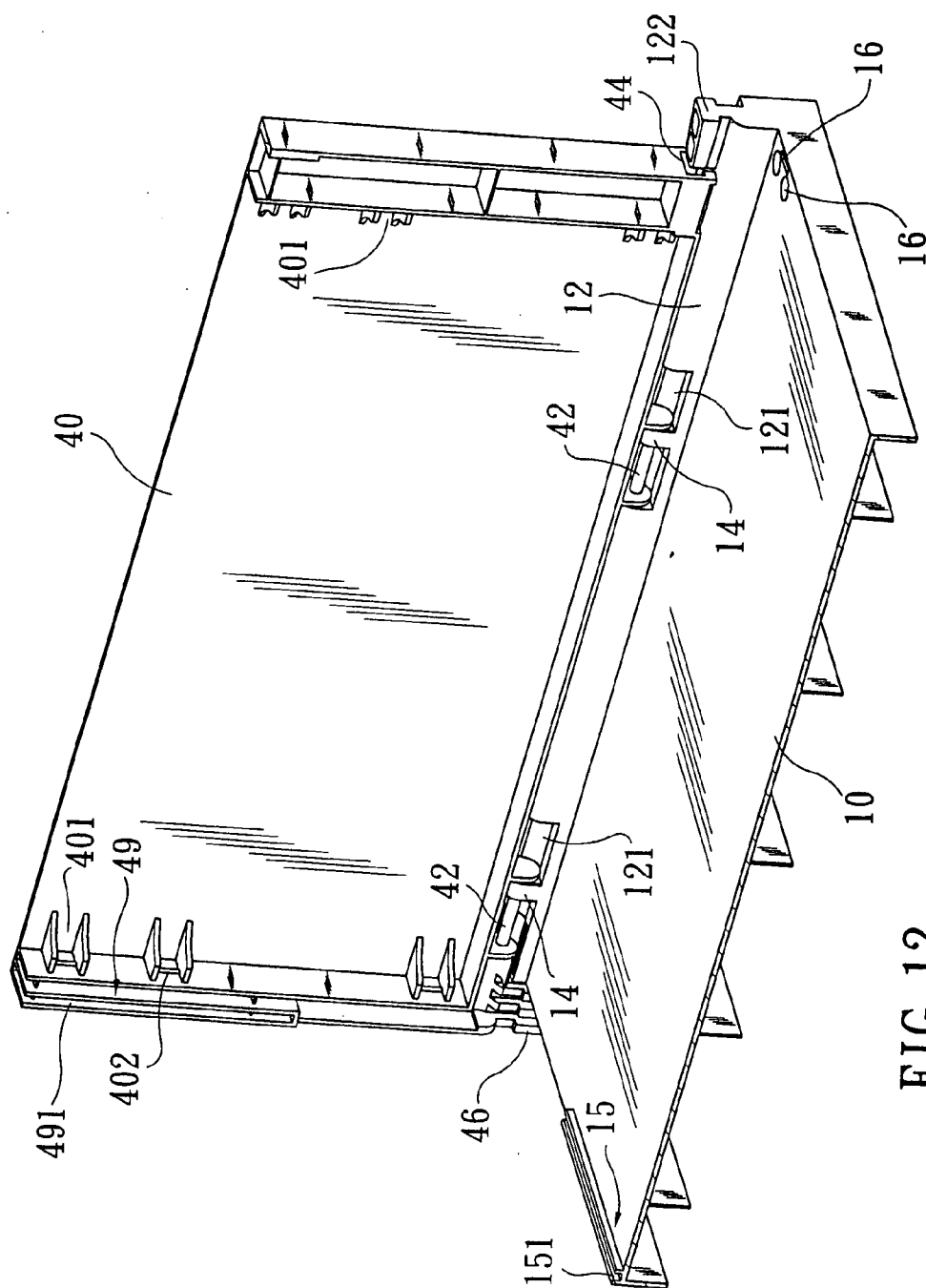


FIG. 12

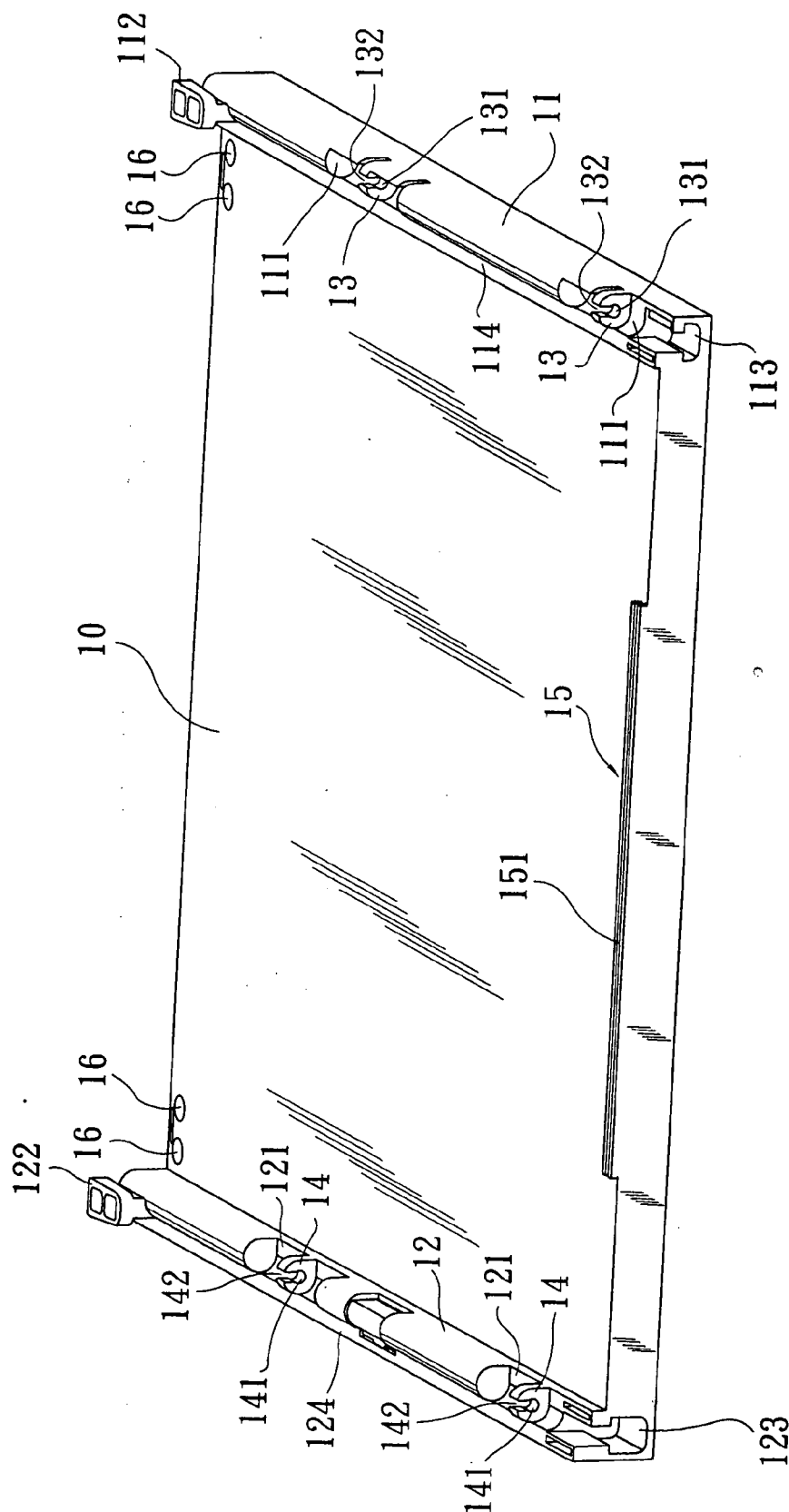


FIG. 14

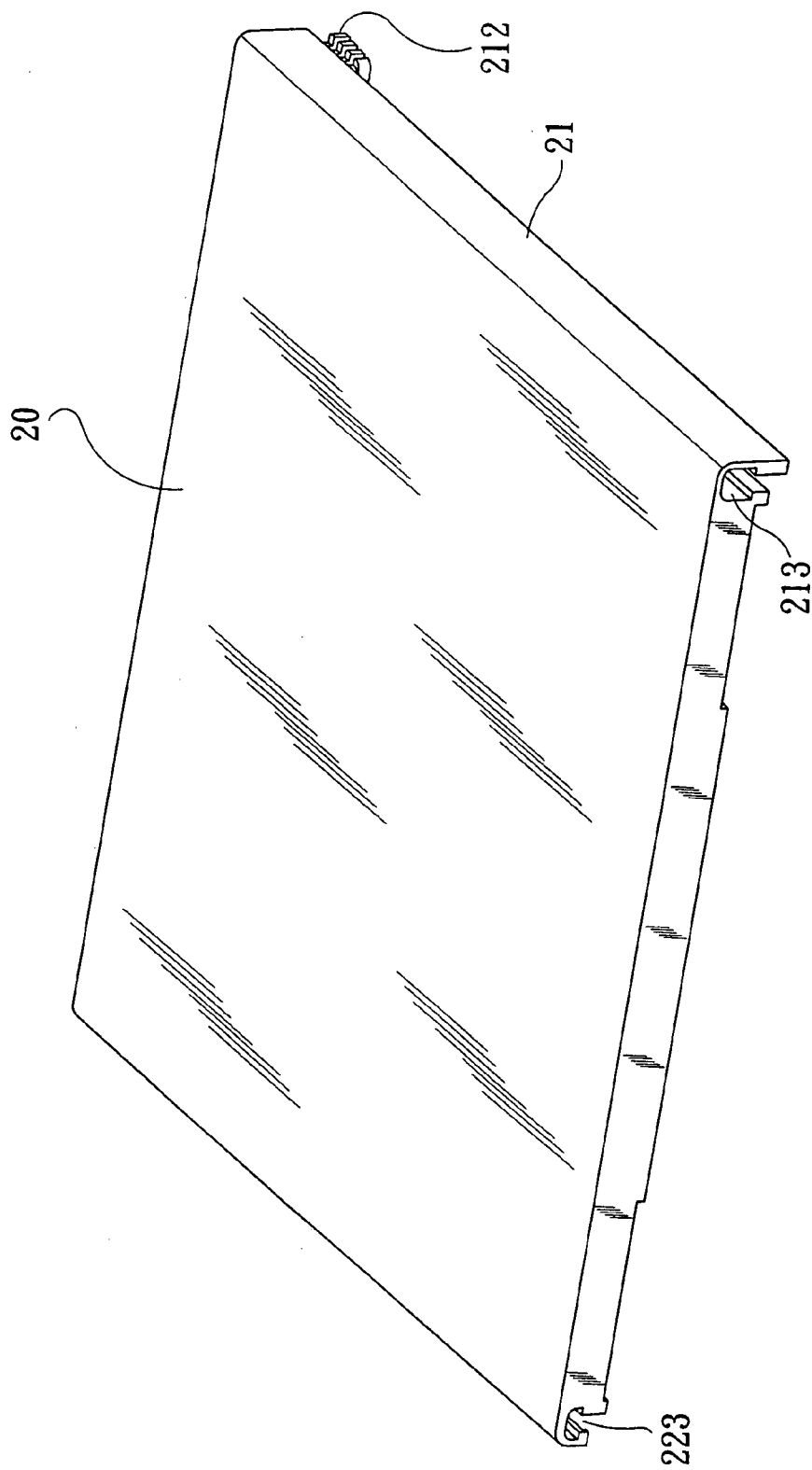


FIG. 15

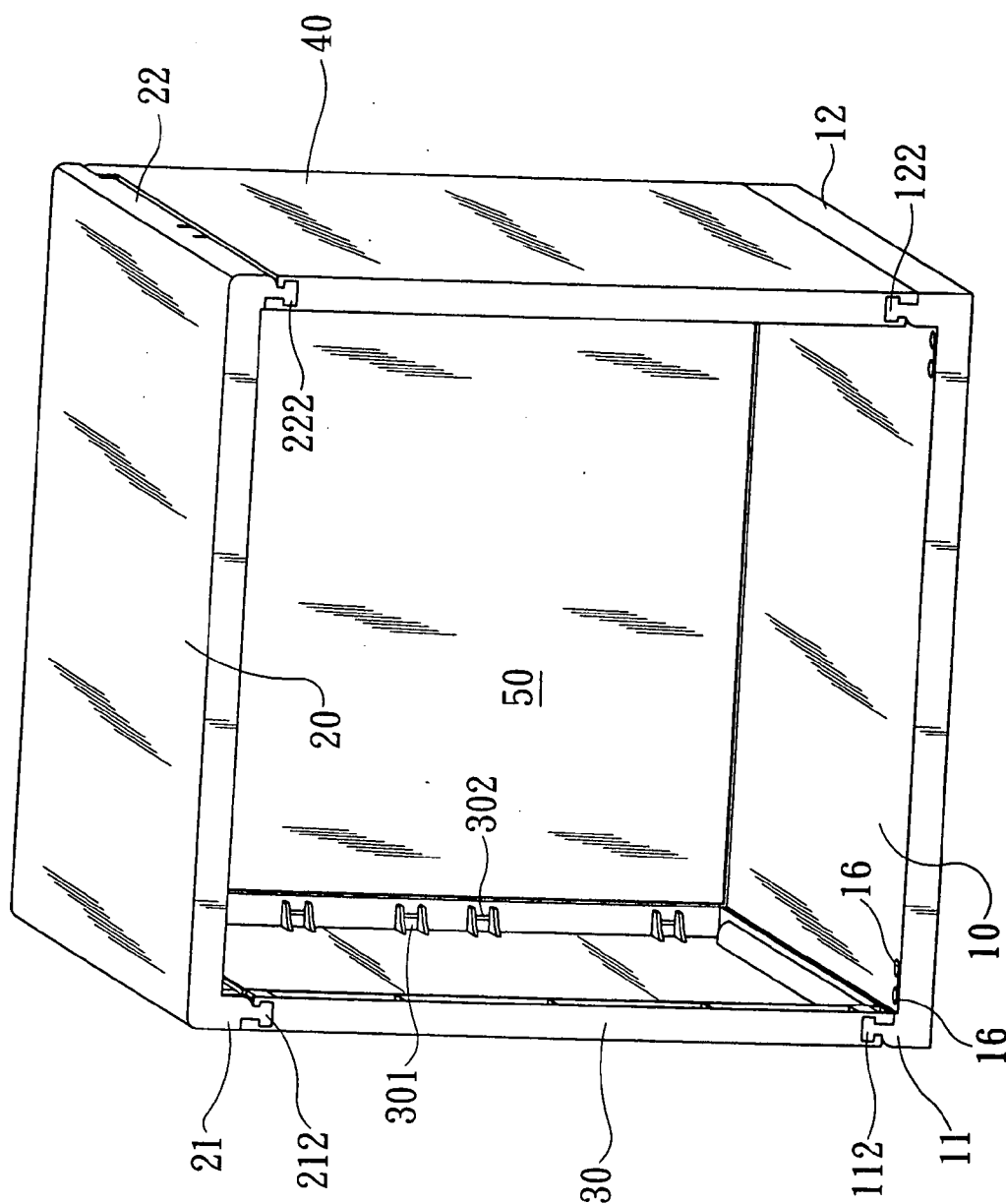


FIG. 16

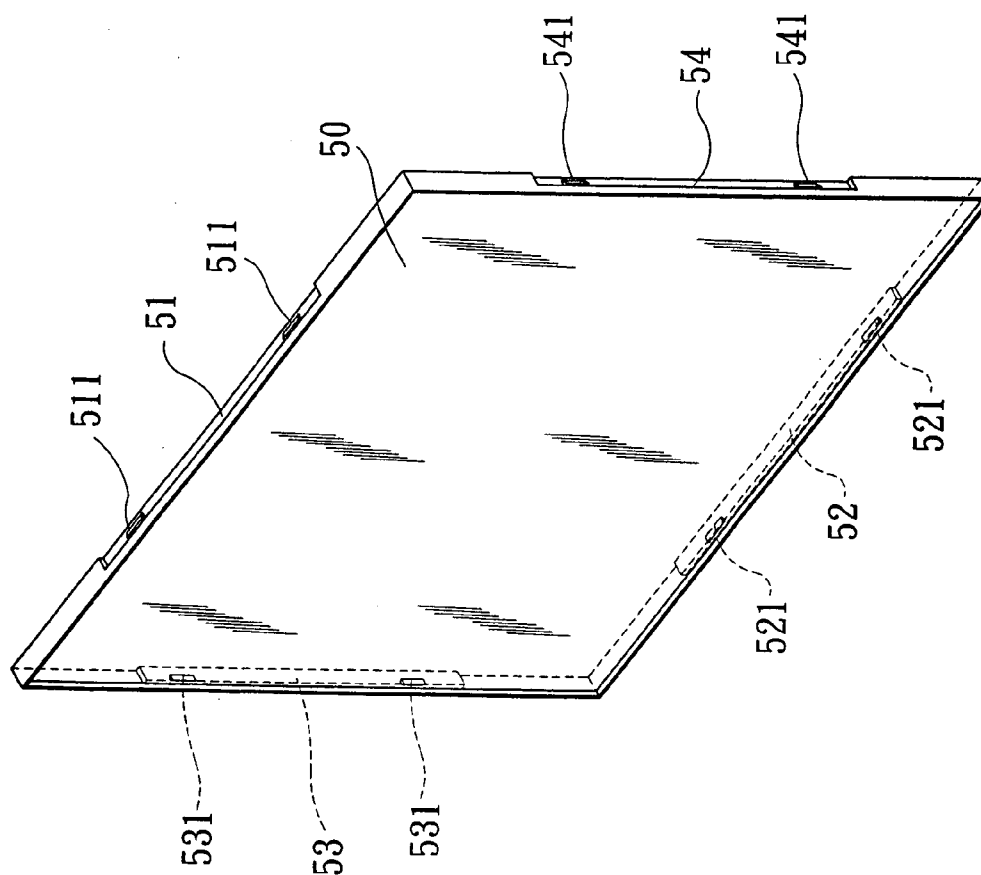


FIG. 17

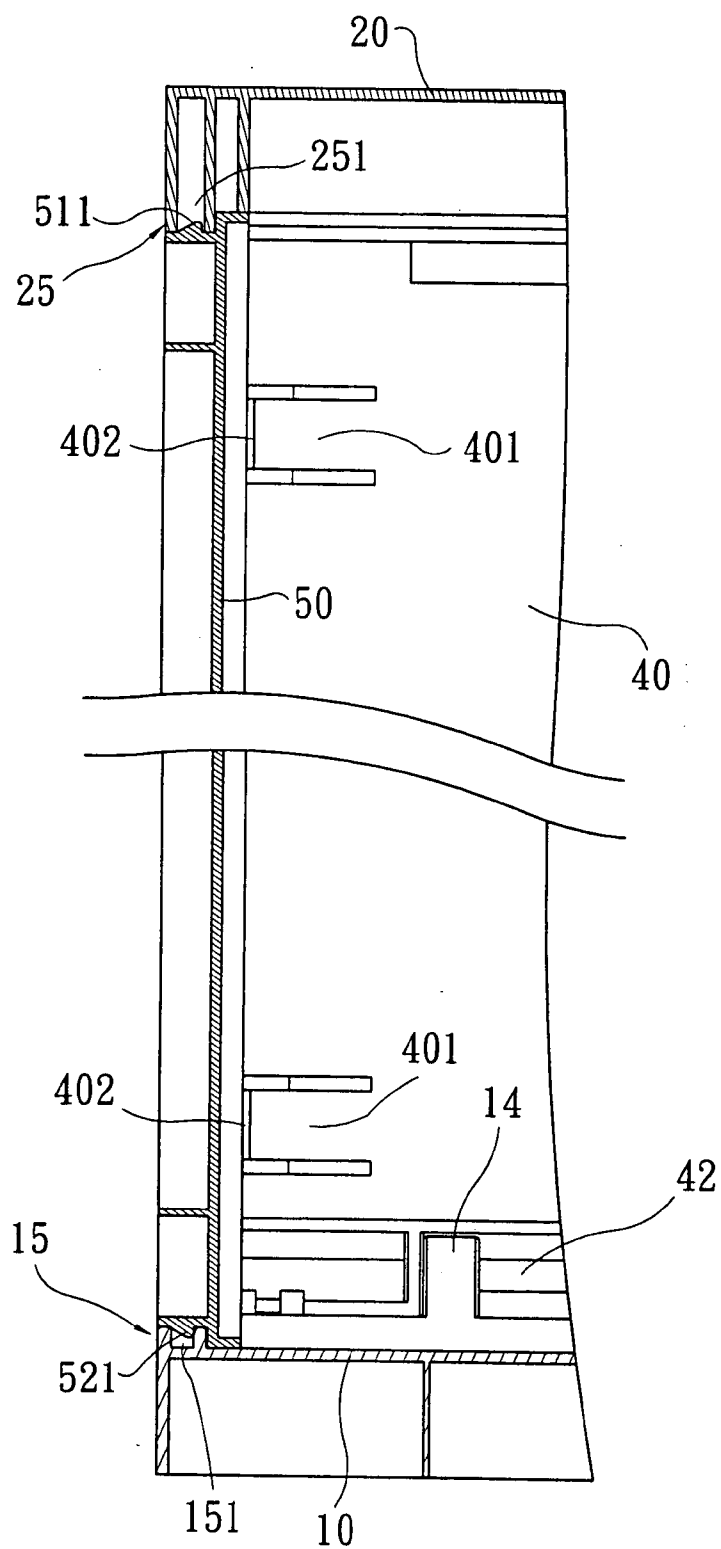


FIG. 18

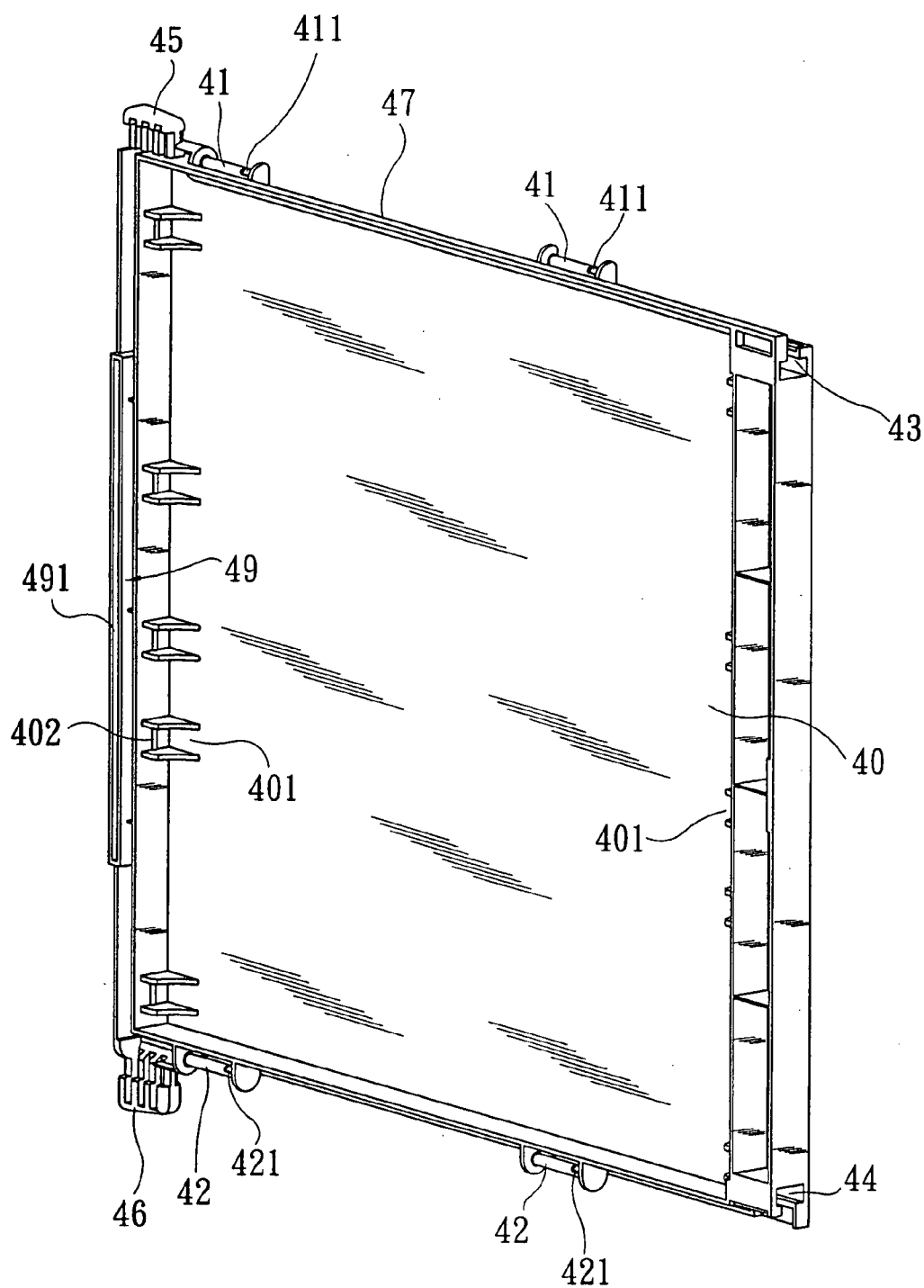


FIG. 19

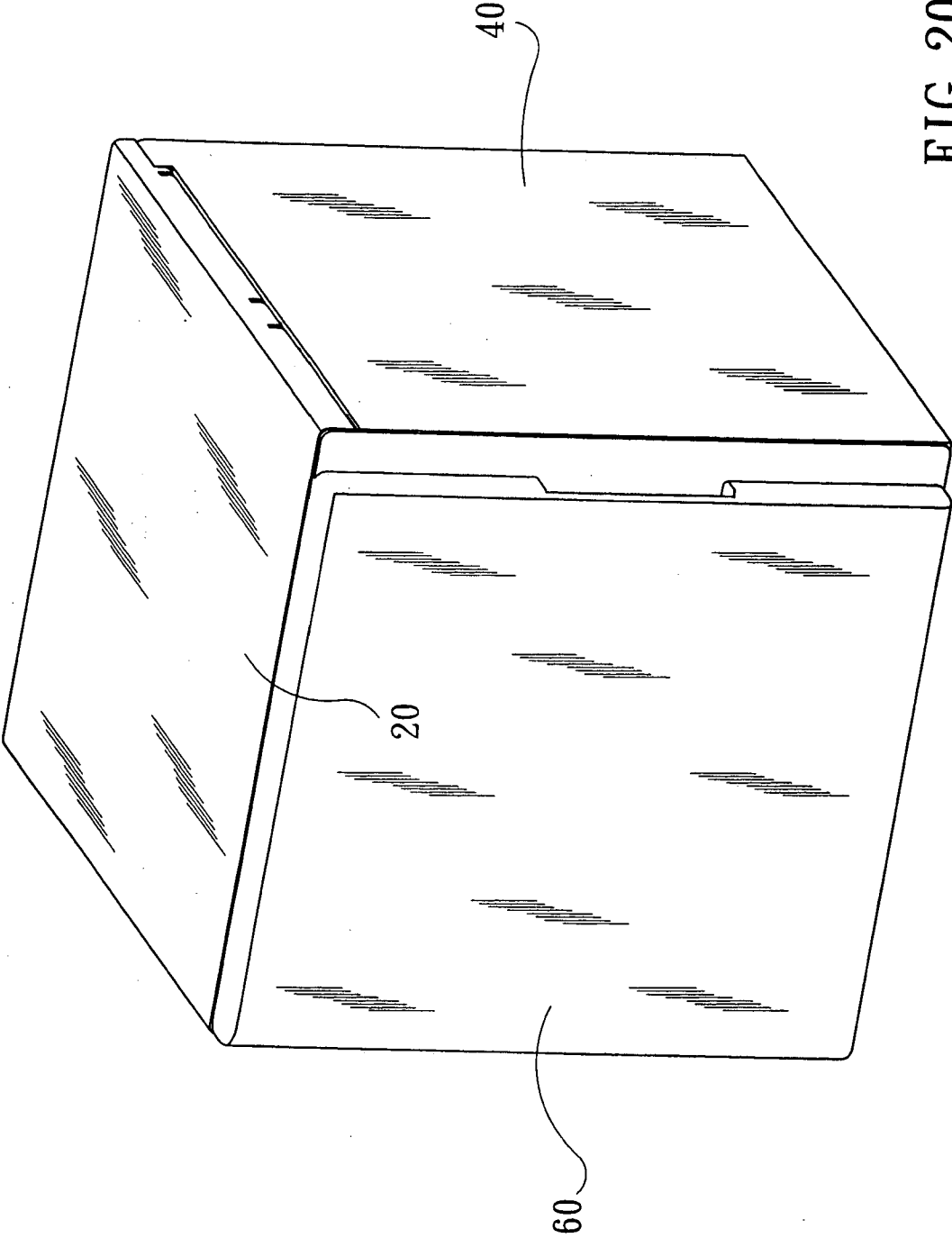
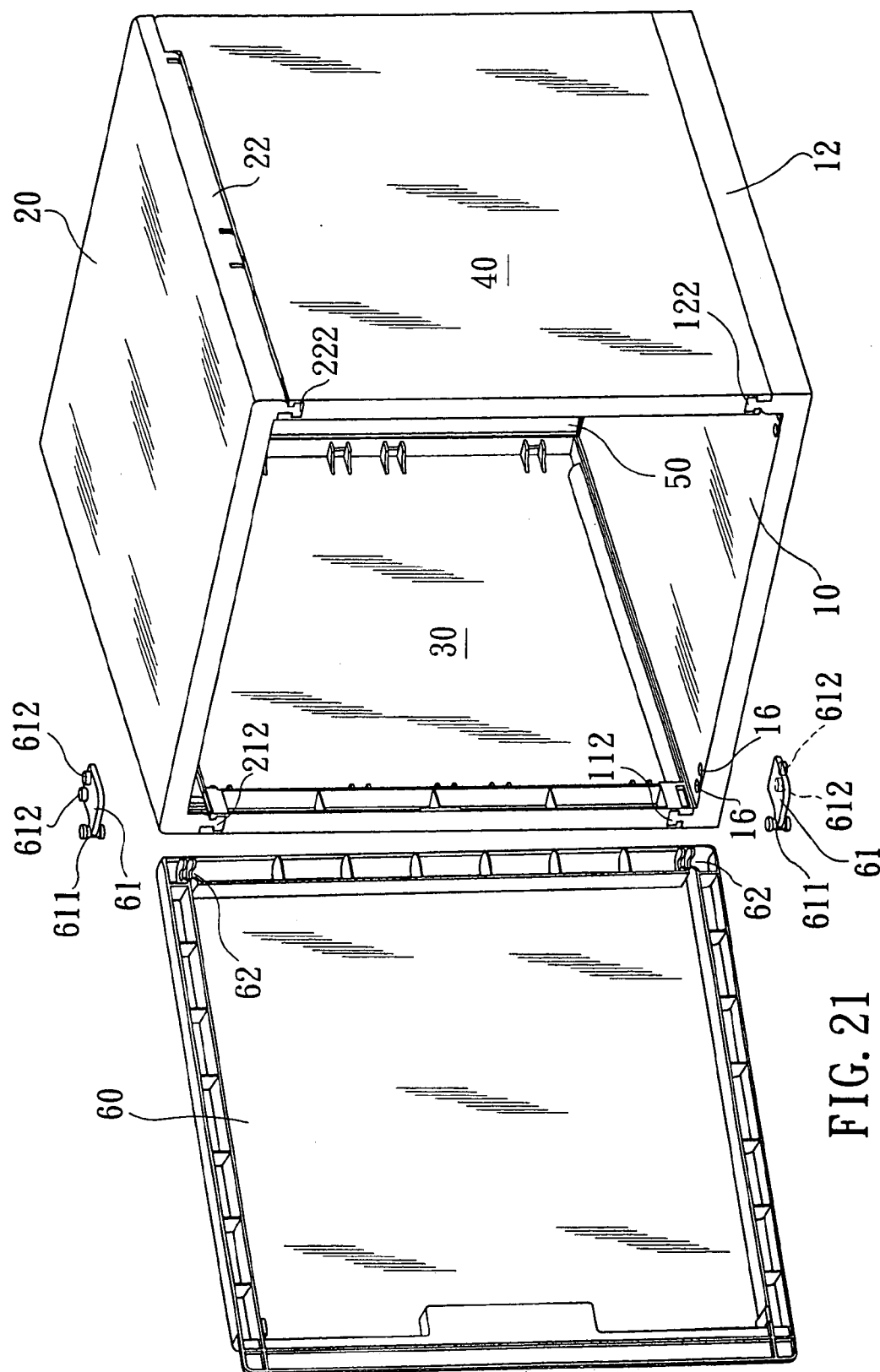


FIG. 20



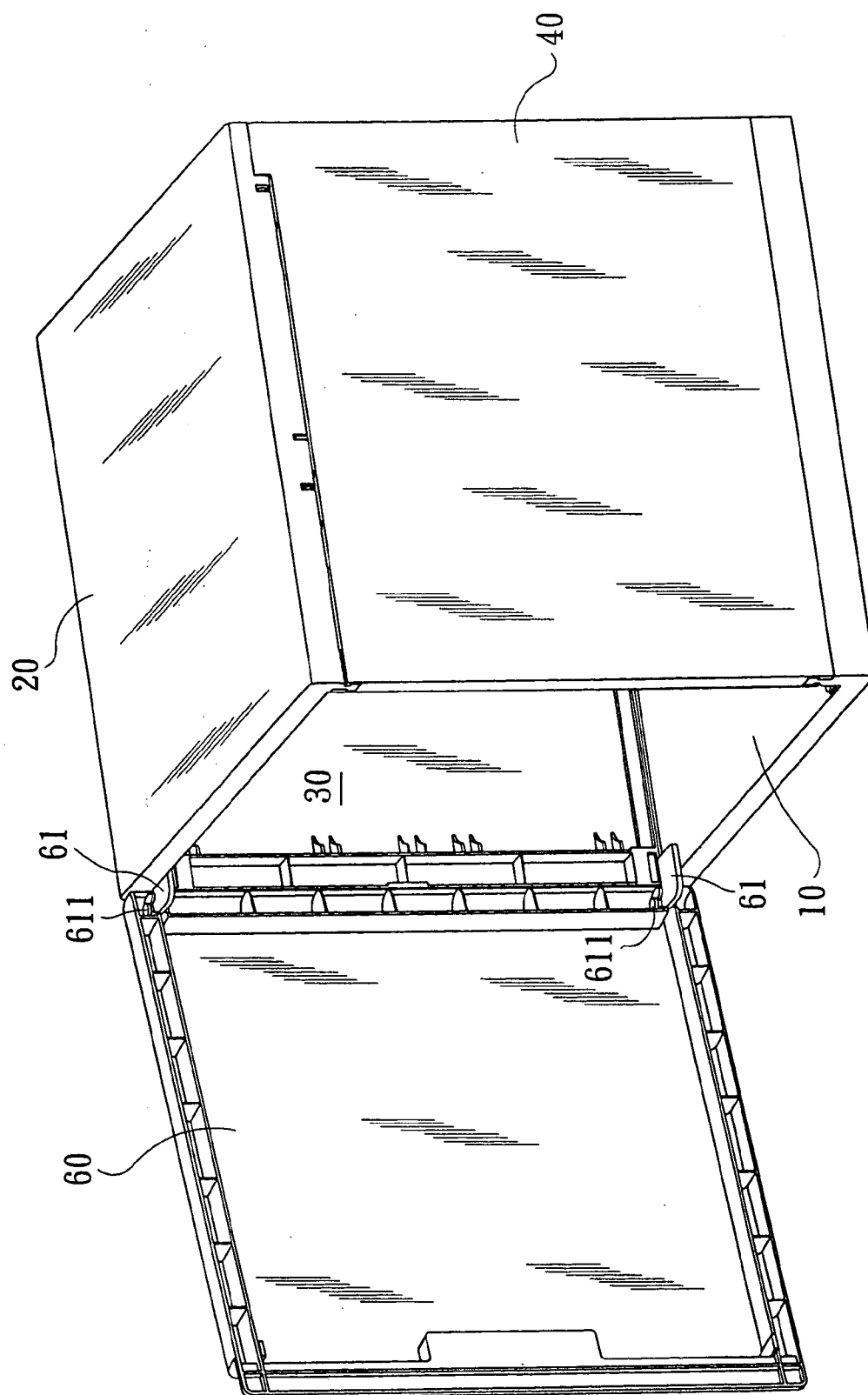


FIG. 22

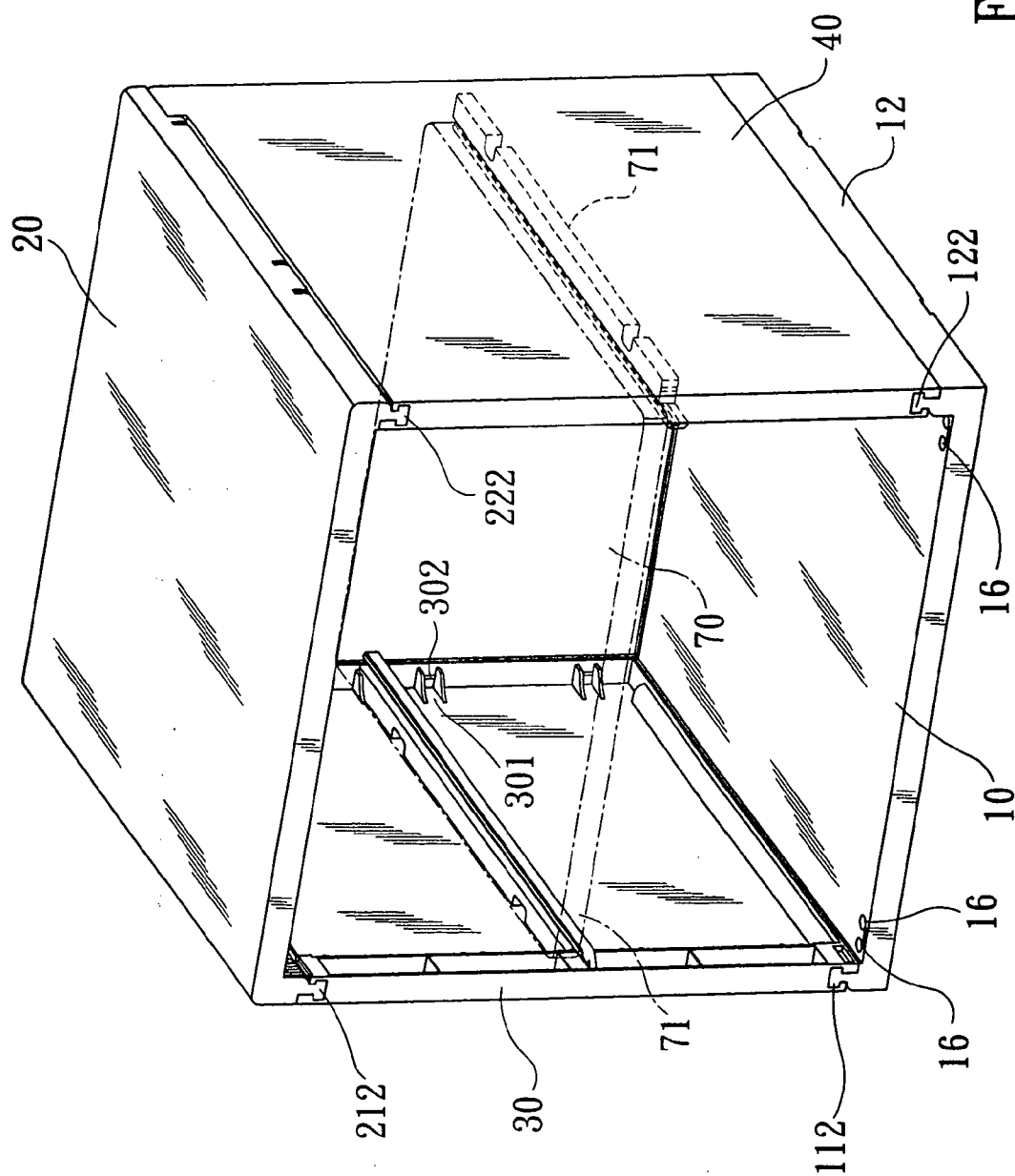


FIG. 23

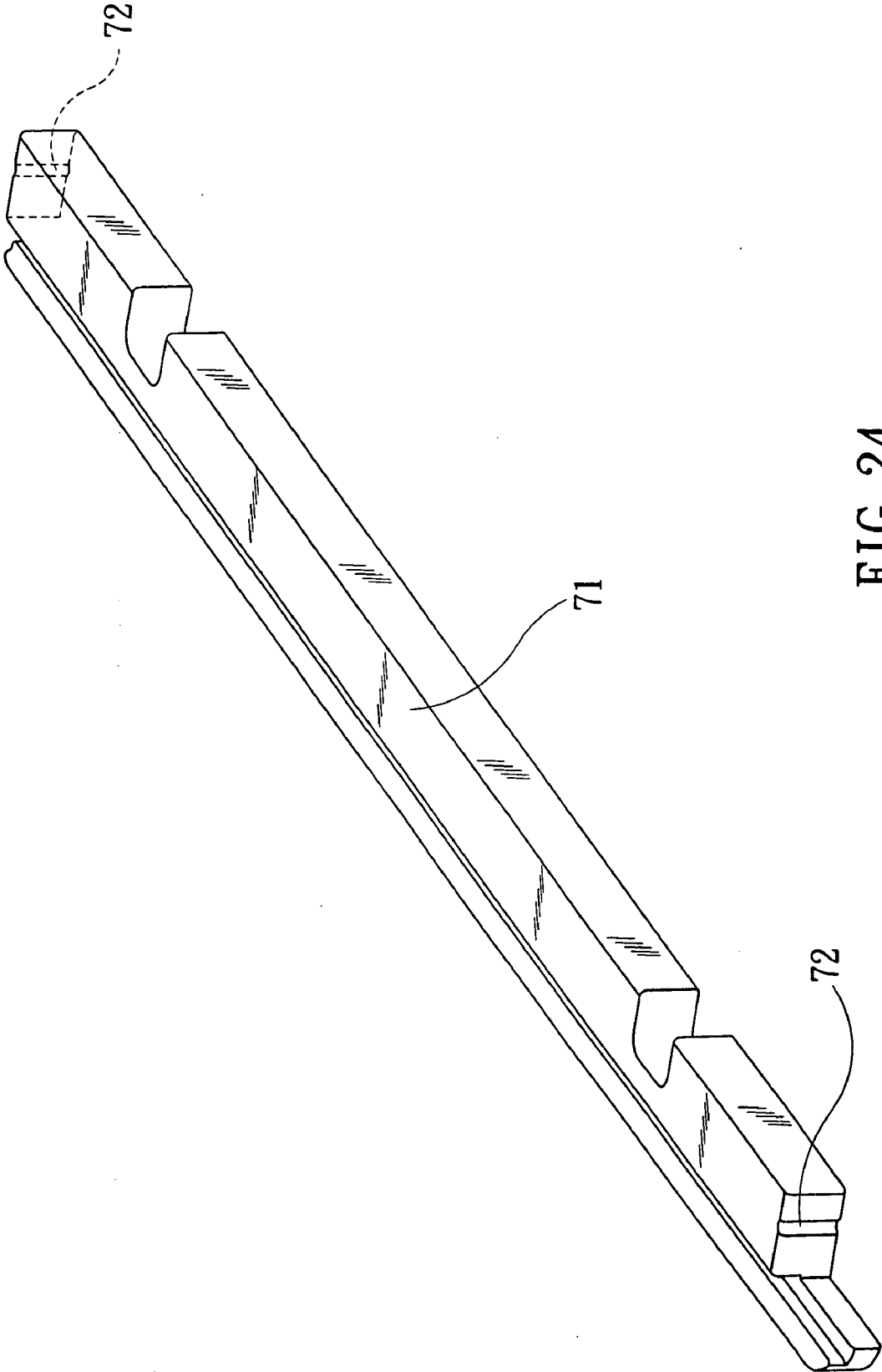
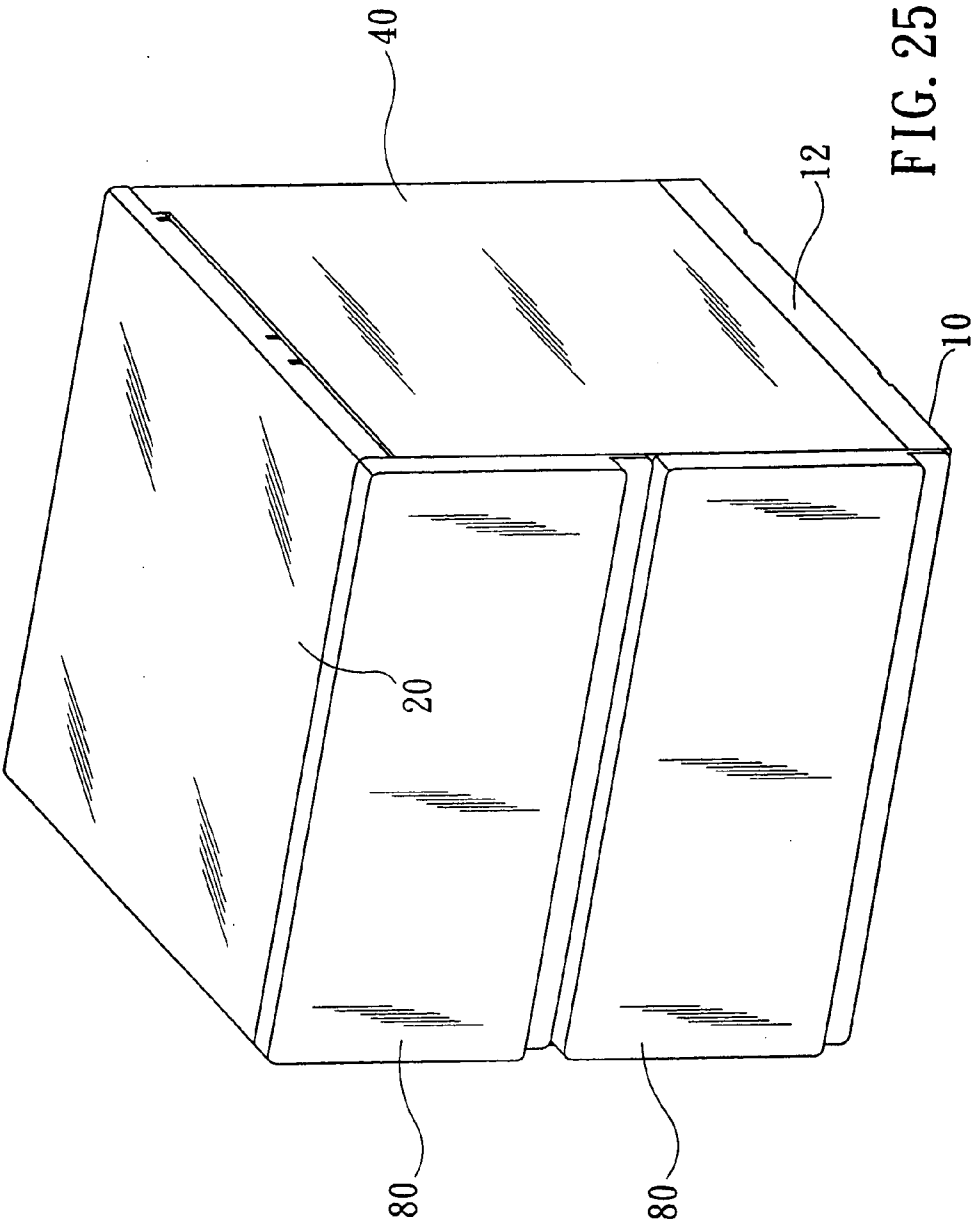


FIG. 24



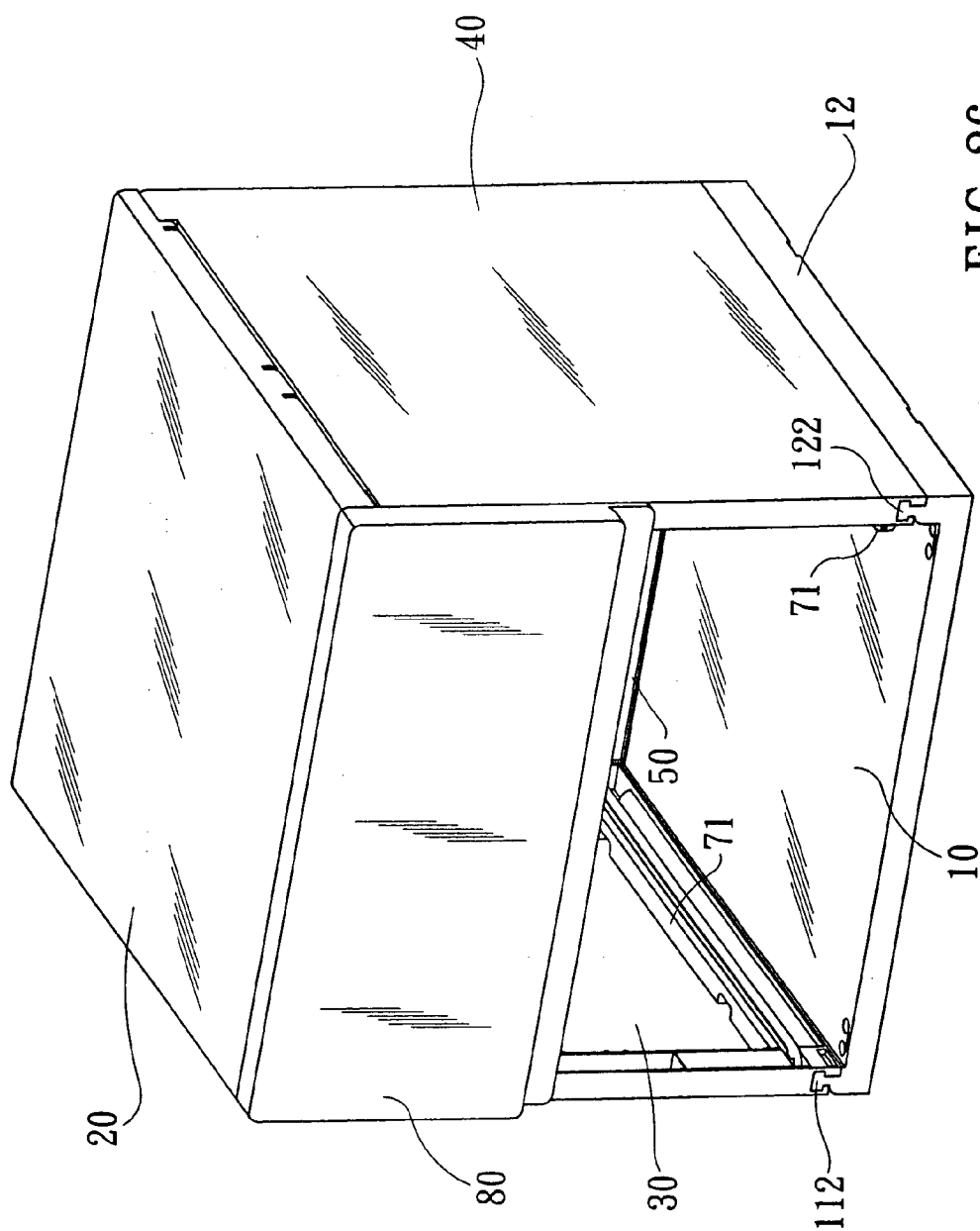


FIG. 26

COLLAPSIBLE STORAGE CONTAINER

FIELD OF THE INVENTION

[0001] The present invention relates to a collapsible storage container, and more particularly to a storage container that could be extended into a stably standup state for holding different items therein or collapsed into a flat state to occupy only a small space to enable convenient storage, package, and transport at reduced cost.

BACKGROUND OF THE INVENTION

[0002] A storage container is designed to provide a specific internal space for holding different items therein, and therefore has a fixed volume. The internal space of the storage container has direct relation to the overall volume of the storage container. When the internal space is large, the storage container would have a relatively large overall volume, too.

[0003] It is known freight is an important part of the total cost of a product. The conventional storage container is usually a fixed type box that could not be collapsed and therefore occupies a relatively large space when being stored, packed, and transported and inevitably increases the warehousing and transporting costs thereof.

[0004] There is commercially available a box-type storage container formed from pivotally connected metal wire nets. While this type of storage container is collapsible to reduce an overall volume occupied by it, the storage container in an erected state has weak structural strength and tends to sway. Moreover, since there are many large through holes on the metal wire nets, the storage container formed from such metal wire nets fails to provide good shielding function to the stored items. Therefore, such collapsible storage container with metal wire nets and weak structural strength can only be applied to some small organizers for holding non-important items.

[0005] In view of the big space occupied by the conventional fixed-type storage container and the weak structure of the conventional collapsible metal wire net container, it is tried by the inventor to develop a collapsible storage container that could be collapsed into a flat state to occupy only a small space and be conveniently and economically stored, packed, and transported, or be extended into a stably standup state for holding different items.

SUMMARY OF THE INVENTION

[0006] A primary object of the present invention is to provide a collapsible storage container that can be collapsed into a flat state to largely reduce the space occupied by the container and thereby facilitates convenient and economical storage, package, and transport thereof.

[0007] Another object of the present invention is to provide a collapsible storage container that can be extended from a collapsed state into a stably standup state for holding different items therein.

[0008] To achieve the above and other objects, the collapsible storage container according to the present invention includes a bottom, a top, a left, and a right panel pivotally turnably connected to one another to form a rectangular frame.

[0009] The bottom panel is provided at left and right front ends with an upward projected substantially T-shaped tenon each, and the left and right panels are provided at respective

lower front end with a T-shaped mortise. When the left and right panels are pivotally turned into an upright position and moved forward relative to the bottom panel, the two T-shaped tenons on the bottom panel are received in the T-shaped mortises on the left and right panels to firmly hold the left and right panels in place relative to the bottom panel. Similarly, the top panel is provided at left and right front ends with a downward projected reverse T-shaped tenon each, and the left and right panels are provided at respective upper front end with a reverse T-shaped mortise. When the left and right panels are pivotally turned into an upright position and moved forward relative to the top panel, the two reverse T-shaped tenons on the top panel are received in the reverse T-shaped mortises on the left and right panels to firmly hold the left and right panels in place relative to the top panel.

[0010] In the collapsible storage container of the present invention, the bottom panel is provided at left and right rear ends with a reverse T-shaped mortise each, and the left and right panels are provided at respective lower rear end with a downward extended reverse T-shaped tenon. When the left and right panels are pivotally turned into an upright position and moved forward relative to the bottom panel, the two downward reverse T-shaped tenons on the left and right panels are received in the reverse T-shaped mortises on the bottom panel to more firmly hold the left and right panels in place relative to the bottom panel. Similarly, the top panel is provided at left and right rear ends with a T-shaped mortise each, and the left and right panels are provided at respective upper rear end with an upward extended T-shaped tenon. When the left and right panels are pivotally turned into an upright position and moved forward relative to the top panel, the two upward T-shaped tenons on the left and right panels are received in the T-shaped mortises on the top panel to more firmly hold the left and right panels in place relative to the top panel.

[0011] The collapsible storage container of the present invention in a standup position may have a back panel and a door mounted to a rear and a front open side of the rectangular frame, respectively, so that a closed receiving space may be defined in the storage container.

[0012] On or more shelves or drawers may also be provided in the storage container of the present invention to increase the uses thereof.

BRIEF DESCRIPTION OF THE DRAWINGS

[0013] The structure and the technical means adopted by the present invention to achieve the above and other objects can be best understood by referring to the following detailed description of the preferred embodiments and the accompanying drawings, wherein

[0014] FIG. 1 is a front perspective view of a collapsible storage container according to an embodiment of the present invention in a fully erected state;

[0015] FIG. 2 shows a left and a right panel of the collapsible storage container of FIG. 1 may be moved rearward relative to a top and a bottom panel of the container to enable subsequent collapse thereof;

[0016] FIG. 3 is a vertical sectional view of the storage container of FIG. 1 in a fully erected state;

[0017] FIG. 4 is a vertical sectional view of the storage container of FIG. 1 in a fully collapsed state;

[0018] FIG. 5 is a front top perspective view of the bottom panel for the collapsible storage container of FIG. 1;

[0019] FIG. 6 is a front top perspective view of the top panel for the collapsible storage container of FIG. 1;

[0020] FIG. 7 is a front perspective view of the top panel of FIG. 6 in upside-down position;

[0021] FIG. 8 is a perspective view of the left panel for the collapsible storage container of FIG. 1 viewed from an inner side thereof;

[0022] FIG. 9 is a fragmentary perspective view showing the left panel assembled to the top panel is in a rearward moved position relative to the top panel;

[0023] FIG. 10 is a fragmentary perspective view showing the left panel assembled to the top panel is in a forward moved position relative to the top panel;

[0024] FIG. 11 is a perspective view of the right panel for the collapsible storage container of FIG. 1 viewed from an outer side thereof;

[0025] FIG. 12 is a fragmentary perspective view showing the right panel assembled to the bottom panel is in a rearward moved position relative to the bottom panel;

[0026] FIG. 13 is a fragmentary perspective view showing the right panel assembled to the bottom panel is in a forward moved position relative to the bottom panel;

[0027] FIG. 14 is a rear top perspective view of the bottom panel for the collapsible storage container of FIG. 1;

[0028] FIG. 15 is a rear top perspective view of the top panel for the collapsible storage container of FIG. 1;

[0029] FIG. 16 is a perspective view showing the collapsible storage container of FIG. 1 with a back panel mounted to a rear open side thereof;

[0030] FIG. 17 is a front perspective view of the back panel for the collapsible storage container of FIG. 1;

[0031] FIG. 18 is a fragmentary sectioned side view showing the assembling of the back panel to the top and the bottom panel;

[0032] FIG. 19 is a perspective view of the right panel viewed from an inner side thereof;

[0033] FIG. 20 is a perspective view showing the collapsible storage container of FIG. 16 with a door mounted to a front open side thereof;

[0034] FIG. 21 is an exploded perspective view of FIG. 20 showing the assembling of the door to the storage container;

[0035] FIG. 22 is an assembled view of FIG. 21;

[0036] FIG. 23 is a perspective view showing the collapsible storage container of FIG. 16 with a shelf mounted therein to separate an inner space of the storage container into an upper and a lower subspace;

[0037] FIG. 24 is a perspective view of a rail used in the storage container of FIG. 23 for horizontally supporting the shelf thereon;

[0038] FIG. 25 is a perspective view showing the collapsible storage container of FIG. 16 with drawers mounted thereto; and

[0039] FIG. 26 is similar to FIG. 25 with one drawer removed therefrom to show an internal structure of the storage container.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

[0040] Please refer to FIGS. 1 to 4. A collapsible storage container according to an embodiment of the present invention includes a bottom panel 10, a top panel 20, a left panel 30, and a right panel 40, which are pivotally turnably assembled together to form a rectangular frame, such that the bottom and top panels 10, 20 and the left and right panels 30, 40 may be

turned about their joints relative to one another into a fully collapsed state, as shown in FIG. 4, so as to largely reduce an overall volume thereof to enable easy and economical storage and transport thereof.

[0041] Please refer to FIG. 5. The bottom panel 10 is provided with a left wall portion 11 and a right wall portion 12 upward extended from two upper lateral edges of the bottom panel 10. The left and right wall portions 11, 12 are respectively provided at predetermined positions with two recesses 111, 121 each. The recesses 111, 121 are respectively internally provided with an annular ring 13, 14 each. The annular rings 13, 14 respectively define an axial central through hole 131, 141 each. The left and right wall portions 11, 12 are provided at respective front end with an upward projected substantially T-shaped tenon 112, 122.

[0042] Please refer to FIGS. 6 and 7. The top panel 20 is provided with a left wall portion 21 and a right wall portion 22 downward extended from two lower lateral edges of the top panel 20. The left and right wall portions 21, 22 are respectively provided at predetermined positions with two recesses 211, 221 each. The recesses 211, 221 are respectively internally provided with an annular ring 23, 24 each. The annular rings 23, 24 respectively define an axial central through hole 231, 241 each. The left and right wall portions 21, 22 are provided at respective front end with a downward projected substantially reverse T-shaped tenon 212, 222.

[0043] Please refer to FIG. 8. The left panel 30 is provided at an upper edge with two longitudinally extended shafts 31 corresponding to the two recesses 211 at the left wall portion 21 of the top panel 20. The shafts 31 are separately extended through the central holes 231 of the annular rings 23 in the two recesses 211, and are axially movable in and relative to the annular rings 23. The left panel 30 is also provided at a lower edge with two longitudinally extended shafts 32 corresponding to the two recesses 111 at the left wall portion 11 of the bottom panel 10. The shafts 32 are separately extended through the central holes 131 of the annular rings 13 in the two recesses 111, and are axially movable in and relative to the annular rings 13. FIG. 9 shows the shafts 31 are axially moved rearward relative to the annular rings 23, and FIG. 10 shows the shafts 31 have been axially moved forward relative to the annular rings 23. The left panel 30 may be turned about the shafts 31, 32 at the upper and the lower edge thereof relative to the top and the bottom panel 20, 10, respectively, to a collapsed position.

[0044] As can be seen from FIG. 5, the bottom panel 10 is provided at a left front end with an upward extended T-shaped tenon 112; and as can be seen from FIGS. 6 and 7, the top panel 20 is provided at a left lower front end with a downward extended reverse T-shaped tenon 212. And, as can be clearly seen from FIG. 8, the left panel 30 is provided at an upper front surface with a reverse T-shaped mortise 33, and at a lower front surface with a T-shaped mortise 34. When the left panel 30 is pivotally connected to the top and the bottom panel 20, 10 and turned into an upright position, the upper reverse T-shaped mortise 33 and the lower T-shaped mortise 34 are aligned with the reverse T-shaped tenon 212 and the T-shaped tenon 112, respectively. And, when the left panel 30 is moved forward relative to the top and bottom panels 20, 10, the reverse T-shaped tenon 212 and the T-shaped tenon 112 are fitly received in the upper reverse T-shaped mortise 33 and the lower T-shaped mortise 34, respectively.

[0045] Please refer to FIG. 11. The right panel 40 is provided at an upper edge with two longitudinally extended

shafts 41 corresponding to the two recesses 221 at the right wall portion 22 of the top panel 20. The shafts 41 are separately extended through the central holes 241 of the annular rings 24 in the two recesses 221, and are axially movable in and relative to the annular rings 24. The right panel 40 is also provided at a lower edge with two longitudinally extended shafts 42 corresponding to the two recesses 121 at the right wall portion 12 of the bottom panel 10. The shafts 42 are separately extended through the central holes 141 of the annular rings 14 in the two recesses 121, and are axially movable in and relative to the annular rings 14. FIG. 12 shows the shafts 42 are axially moved rearward relative to the annular rings 14, and FIG. 13 shows the shafts 42 have been axially moved forward relative to the annular rings 14. The right panel 40 may be turned about the shafts 41, 42 at the upper and the lower edge thereof relative to the top and the bottom panel 20, 10, respectively, to a collapsed position.

[0046] As can be seen from FIG. 5, the bottom panel 10 is provided at a right front end with an upward extended T-shaped tenon 122; and as can be seen from FIGS. 6 and 7, the top panel 20 is provided at a right lower front end with a downward extended reverse T-shaped tenon 222. And, as can be clearly seen from FIG. 11, the right panel 40 is provided at an upper front surface with a reverse T-shaped mortise 43, and at a lower front surface with a T-shaped mortise 44. When the right panel 40 is pivotally connected to the top and the bottom panel 20, 10 and turned into an upright position, the upper reverse T-shaped mortise 43 and the lower T-shaped mortise 44 are aligned with the reverse T-shaped tenon 222 and the T-shaped tenon 122, respectively. And, when the right panel 40 is moved forward relative to the top and bottom panels 20, 10, the reverse T-shaped tenon 222 and the T-shaped tenon 122 are fitly received in the upper reverse T-shaped mortise 43 and the lower T-shaped mortise 44, respectively.

[0047] Please refer to FIG. 14. The bottom panel 10 is provided at a rear left and a rear right end with a reverse T-shaped mortise 113, 123, respectively. And, as can be seen from FIGS. 8 and 11, the left panel 30 and the right panel 40 are provided at respective lower rear end with a downward projected reverse T-shaped tenon 36, 46 to be fitly received in the reverse T-shaped mortise 113, 23, respectively. And, please refer to FIG. 15. The top panel 20 is provided at a rear left and a rear right end with a T-shaped mortise 213, 223, respectively. And, as can be seen from FIGS. 8 and 11, the left panel 30 and the right panel 40 are provided at respective upper rear end with an upward projected T-shaped tenon 35, 45 to be fitly received in the T-shaped mortise 213, 223, respectively.

[0048] The left and right panels 30, 40 may be pivotally turned about the shafts 31 & 32, 41 & 42 relative to the top and bottom panels 20, 10 into a standup rectangular frame, as shown in FIGS. 1 to 3, or into a fully collapsed state, as shown in FIG. 4. When the left panel 30 and the right panel 40 are turned into an upright position, the collapsible storage container is formed into a standup rectangular frame, as shown in FIG. 2. At this point, the left and the right panel 30, 40 may be moved forward relative to the bottom and the top panel 10, 20, so that the two T-shaped tenons 112, 122 at the left and right upper front ends of the bottom panel 10 are received in the two T-shaped mortises 34, 44 at the lower front ends of the left and right panels 30, 40, respectively, and the two reverse T-shaped tenons 212, 222 at the left and right lower front ends of the top panel 20 are received in the two reverse T-shaped mortises 33, 43 at the upper front ends of the left and right panels 30, 40,

respectively; and the two reverse T-shaped tenons 36, 46 at the lower rear ends of the left and right panels 30, 40 are received in the two reverse T-shaped mortises 113, 123 at left and right upper rear ends of the bottom panel 10, respectively, and the two T-shaped tenons 35, 45 at the upper rear ends of the left and right panels 30, 40 are received in the two T-shaped mortises 213, 223 at the left and right lower rear ends of the top panel 20, respectively. At this point, the standup storage container is held in a non-collapsible state, as shown in FIG. 1.

[0049] When the standup storage container is not in use, it may be collapsed for convenient storage without occupying too much space. To do so, first move the left and right panels 30, 40 rearward relative to the bottom and top panels 10, 20, so that the T-shaped tenons 112 & 122, 35 & 45, and the reverse T-shaped tenons 212 & 222, 36 & 46 are moved out of respective corresponding T-shaped mortises 34 & 44, 213 & 223 and reverse T-shaped mortises 33 & 43, 113 & 123, as shown in FIG. 2. At this point, the top panel 20 may be moved leftward, bringing the left panel 30 and the right panel 40 to turn at respective lower edge about the shafts 32, 42 into a horizontal position, so that the top panel 20 is flatly laid above the left panel 30 and the whole storage container is collapsed into a flat state, as shown in FIG. 4.

[0050] It is noted the right wall portion 12 of the bottom panel 10 is slightly higher than the left wall portion 11, and the right wall portion 22 of the top panel 20 is slightly shorter than the left wall portion 21. In this manner, when the storage container is collapsed into the flat state, the left wall portion 11 of the bottom panel 10 would not interfere with the turning of the left panel 30 to the horizontal position, and the right wall portion 22 of the top panel 20 would not compress against the right panel 40. The left panel 30 and the right panel 40 have the same height. The four pairs of shafts 31 & 32, 41 & 42 pivotally connecting the left and the right panel 30, 40 to the top and the bottom panel 20, 10 actually form four vertexes of a parallelogram. Therefore, the bottom and the top panel 10, 20 are always located in a horizontal position during and after the collapse of the storage container. With the predetermined height differences between the wall portions 11 and 12 of the bottom panel 10 as well as between the wall portions 21 and 22 of the top panel 20, the left and right panels 30, 40 of the fully collapsed storage container are always in a horizontal position, allowing the fully collapsed storage container to have a minimized overall thickness.

[0051] As can be seen from FIG. 5, the left and right wall portions 11, 12 of the bottom panel 10 have an arched top. The bottom panel 10 is provided at and along an inner side of the left wall portion 11 with a flat-topped belt portion 114 that has a top lower than that of the left wall portion 11, and at and along an outer side of the right wall portion 12 with a flat-topped belt portion 124 that has a top higher than that of the right wall portion 12. When the left and right panels 30, 40 are pivotally turned rightward to an upright position, a lower edge surface 38 of the left panel 30 (see FIG. 8) is pressed against the belt portion 114 at the inner side of the left wall portion 11 of the bottom panel 10, and a lower edge surface 48 of the right panel 40 (see FIG. 11) is pressed against the belt portion 124 at the outer side of the right wall portion 12 of the bottom panel 10, so that the left and right panels 30, 40 are prevented from turning rightward any further.

[0052] Similarly, as can be seen from FIG. 7, the top panel 20 is provided at an outer side of the left wall portion 21 with a flat-topped belt portion 214 that has a bottom higher than

that of the left wall portion 21, and at an inner side of the right wall portion 22 with a flat-topped belt portion 224 that has a bottom higher than that of the right wall portion 22. When the left and right panels 30, 40 are pivotally turned rightward to an upright position, an upper edge surface 37 of the left panel (see FIG. 8) is pressed against the belt portion 214 at the outer side of the left wall portion 21 of the top panel 20, and an upper edge surface 47 (see FIG. 11) of the right panel 40 is pressed against the belt portion 224 at the inner side of the right wall portion 22 of the top panel 20, so that the left and right panels 30, 40 are prevented from turning rightward any further. In this manner, in extending the storage container, when the left and right panels 30, 40 have been turned to a position that does not allow the two panels 30, 40 to turn any further, it means the storage container has been fully extended. Therefore, the left and right panels 30, 40 are allowed to be pivotally turned leftward to a horizontal position or rightward to an upright position.

[0053] As can be seen from FIGS. 5 and 7, the annular rings 13 & 14, 23 & 24 on the bottom and top panels 10, 20, respectively, are provided at a top with an axial groove 132, 142, 232, 242 each to communicate the central through holes 131, 141, 231, 241 of the annular rings 13, 14, 23, 24 with external space, respectively. Meanwhile, as can be seen from FIGS. 8 and 11, the shafts 31 & 32, 41 & 42 on the left and right panels 30, 40, respectively, are provided at a front end with a size-reduced flat section 311, 321, 411, 421 each, at where the shafts 31 & 32, 41 & 42 are guided into the central through holes 231 & 131, 241 & 141 of corresponding annular rings 23 & 13, 24 & 14 via the grooves 232 & 132, 242 & 142.

[0054] Please refer to FIG. 16. The storage container of FIG. 1 may be provided with a back panel 50 to close a rear open side thereof and thereby form a box-type container. Please refer to FIG. 17. The back panel 50 is provided at upper rear, lower rear, left rear, and right rear edges with a recess 51, 52, 53, 54 each. In each of the recesses 51, 52, 53, 54, there are provided two spaced protrusions 511, 521, 531, 541. And, as can be seen from FIGS. 5, 7, 8, 19, the bottom, top, left, and right panels 10, 20, 30, 40 are provided at respective inner side on an edge adjacent to the back panel 50 with an inward raised channeled strip 15, 25, 39, 49 corresponding to the recess 52, 51, 53, 54. The channeled strips 15, 25, 39, 49 define a channel 151, 251, 391, 491 each, and may be fitted into the corresponding recesses 52, 51, 53, 54 with the protrusions 521, 511, 531, 541 stuck in the channels 151, 251, 391, 491, respectively. FIG. 18 is a sectioned side view showing the back panel 50 is connected to the top and bottom panels 20, 10 with the protrusions 511, 521 stuck in the channels 251, 151 respectively.

[0055] Please refer to FIG. 20. The storage container of FIG. 16 may be provided with a door 60 to close a front open side thereof to form a container defining a closed inner space. As can be seen from FIG. 21, the door 60 is connected to the storage container using a lower and an upper hinge device 61, each of which includes a pivot shaft 611 and two locating pins 612. From FIGS. 5 and 7, it can be seen that the bottom and the top panel 10, 20 are correspondingly provided at predetermined positions on an inner front side with at least two pin holes 16, 26, respectively, for engaging with the two locating pins 612 of the lower and upper hinge devices 61. The pivot shafts 611 of the upper and lower hinge devices 61 are received in two retaining slots 62 correspondingly provided at inner upper and inner lower corners of the door 60, respec-

tively, as shown in FIG. 22, so that the door 60 may be pivotally turned about the pivot shafts 611 of the upper and lower hinge devices 61 between a closed and an open position relative to the storage container.

[0056] Please refer to FIG. 23. The storage container of FIG. 16 may be provided with at least one shelf 70 to divide an internal space of the storage container into an upper and a lower subspace. As can be seen from FIG. 8, the left panel 30 is correspondingly provided on inner front and rear edge surfaces with at least one rail holder 301 each, so that a rail 71 as shown in FIG. 24 may be horizontally held to and between two corresponding rail holders 301 on the inner side of the left panel 30, as shown in FIG. 23. Each of the rail holders 301 is provided on an inner wall surface thereof with a vertical rib 302 for engaging with a vertical groove 72 correspondingly formed at each of two ends of the rail 71. When the rail 71 is mounted to the inner side of the left panel 30 with two ends of the rail 71 fitted in two corresponding rail holders 301, the ribs 302 in the two rail holders 301 are fitly engaged with the grooves 72 at two ends of the rail 71 to firmly hold the rail 71 to the inner side of the left panel 30. Similarly, as can be seen from FIG. 19, the right panel 40 is correspondingly provided on inner front and rear edge surfaces with at least one rail holder 401 each, so that another rail 71 as shown in FIG. 24 may be horizontally held to and between two corresponding rail holders 401 on the inner side of the right panel 40, as shown in FIG. 23. Each of the rail holders 401 is provided on an inner wall surface thereof with a vertical rib 402 for engaging with the vertical groove 72 correspondingly formed at each of two ends of the rail 71. When the rail 71 is mounted to the inner side of the right panel 40 with two ends of the rail 71 fitted in two corresponding rail holders 401, the ribs 402 in the two rail holders 401 are fitly engaged with the grooves 72 at two ends of the rail 71 to firmly hold the rail 71 to the inner side of the right panel 40. The shelf 70 may be then horizontally supported on the two rails 71 mounted to the inner side of the left and right panels 30, 40 to divide the inner space of the storage container into an upper and a lower subspace.

[0057] The storage container of FIG. 16 may be otherwise provided with one or more drawers 80 therein, as shown in FIG. 25. The drawer 80 is slidably supported on two horizontal rails 71 correspondingly mounted to the inner side of the left and right panels 30, 40, as shown in FIG. 26.

[0058] The storage container of the present invention is formed from pivotally turnably connected panels, and can therefore be collapsed from a standup state into a flat state having a minimized volume to facilitate convenient storage, package, and transport thereof at reduced cost. The storage container of the present invention may also be mounted with shelves, doors, and drawers to enable varied usages and increased value thereof.

What is claimed is:

1. A collapsible storage container, comprising:

- a bottom panel being provided with a left wall portion and a right wall portion upward extended from two upper lateral edges of the bottom panel; the upward left and right wall portions being provided at predetermined positions with two recesses each, which are internally provided with an annular ring each to define an axial central through hole; and the upward left and right wall portions being provided at respective front end with an upward projected substantially T-shaped tenon;
- a top panel being provided with a left wall portion and a right wall portion downward extended from two lower

lateral edges of the top panel; the downward left and right wall portions being provided at predetermined positions with two recesses each, which are internally provided with an annular ring each to define an axial central through hole; and the downward left and right wall portions being provided at respective front end with a downward projected substantially reverse T-shaped tenon;

a left panel being provided at an upper edge with two longitudinally extended shafts corresponding to the two recesses at the downward left wall portion of the top panel to axially movably extend through the central holes of the annular rings in the two recesses, and at a lower edge with two longitudinally extended shafts corresponding to the two recesses at the upward left wall portion of the bottom panel to axially movably extend through the central holes of the annular rings in the two recesses, such that the left panel is pivotally turnable about the shafts at the upper and the lower edge thereof relative to the top and the bottom panel, respectively; and the left panel being provided at an upper front surface with a reverse T-shaped mortise for engaging with the downward extended reverse T-shaped tenon provided at the front end of the left wall portion of the top panel, and at a lower front surface with a T-shaped mortise for engaging with the upward extended T-shaped tenon provided at the front end of the left wall portion of the bottom panel; and

a right panel being provided at an upper edge with two longitudinally extended shafts corresponding to the two recesses at the downward right wall portion of the top panel to axially movably extend through the central holes of the annular rings in the two recesses, and at a lower edge with two longitudinally extended shafts corresponding to the two recesses at the upward right wall portion of the bottom panel to axially movably extend through the central holes of the annular rings in the two recesses, such that the right panel is pivotally turnable about the shafts at the upper and the lower edge thereof relative to the top and the bottom panel, respectively; and the right panel being provided at an upper front surface with a reverse T-shaped mortise for engaging with the downward extended reverse T-shaped tenon provided at the front end of the left wall portion of the top panel, and at a lower front surface with a T-shaped mortise for engaging with the upward extended T-shaped tenon provided at the front end of the right wall portion of the bottom panel.

2. The collapsible storage container as claimed in claim 1, wherein the bottom panel is provided at a rear left and a rear right end with a reverse T-shaped mortise each, and the left and right panels are provided at respective lower rear end with a downward projected reverse T-shaped tenon to be fitly received in the reverse T-shaped mortises at the rear left and rear right ends of the bottom panel, respectively.

3. The collapsible storage container as claimed in claim 1, wherein the top panel is provided at a rear left and a rear right end with a T-shaped mortise each, and the left and right panels are provided at respective upper rear end with an upward projected T-shaped tenon to be fitly received in the T-shaped mortises at the rear left and rear right ends of the top panel, respectively.

4. The collapsible storage container as claimed in claim 1, wherein the annular rings on the bottom and top panels are

provided at respective top with an axial groove to communicate the central through holes of the annular rings with external space; and the shafts on the left and right panels are provided at respective front end with a size-reduced flat section, at where the shafts are separately guided into the central through holes of corresponding annular rings via the axial grooves.

5. The collapsible storage container as claimed in claim 1, wherein the right wall portion of the bottom panel is slightly higher than the left wall portion of the bottom panel, and the right wall portion of the top panel is slightly shorter than the left wall portion of the top panel; the left panel and the right panel have the same height; and the four pairs of shafts at the upper and lower edges of the left and right panels pivotally connecting the left and the right panel to the top and the bottom panel actually form four vertexes of a parallelogram.

6. The collapsible storage container as claimed in claim 1, wherein the bottom panel is provided at and along an inner side of the left wall portion thereof with a flat-topped belt portion that has a top lower than that of the left wall portion, and at and along an outer side of the right wall portion thereof with a flat-topped belt portion that has a top higher than that of the right wall portion, such that when the left and right panels are pivotally turned into an upright position, a lower edge surface of the left panel is pressed against the belt portion at the inner side of the left wall portion of the bottom panel, and a lower edge surface of the right panel is pressed against the belt portion at the outer side of the right wall portion of the bottom panel.

7. The collapsible storage container as claimed in claim 1, wherein the top panel is provided at an outer side of the left wall portion thereof with a flat-topped belt portion that has a bottom higher than that of the left wall portion, and at an inner side of the right wall portion thereof with a flat-topped belt portion that has a bottom higher than that of the right wall portion, such that when the left and right panels are pivotally turned into an upright position, an upper edge surface of the left panel is pressed against the belt portion at the outer side of the left wall portion of the top panel, and an upper edge surface of the right panel is pressed against the belt portion at the inner side of the right wall portion of the top panel.

8. The collapsible storage container as claimed in claim 1, further comprising a back panel for closing a rear open side of a rectangular frame formed from the bottom, the top, the left, and the right panel.

9. The collapsible storage container as claimed in claim 8, wherein the back panel is provided at upper, lower, left, and right edges with at least one protrusion each; and wherein the top, bottom, left, and right panels are provided at respective inner side on an edge adjacent to the back panel with a channel corresponding to the protrusions at the upper, lower, left, and right edges of the back panel, respectively, for engaging with the protrusions.

10. The collapsible storage container as claimed in claim 1, further comprising a door, and an upper and a lower hinge device for mounting the door to a front open side of a rectangular frame formed from the bottom, the top, the left, and the right panel; each of the upper and lower hinge devices including a pivot shaft and two locating pins; the locating pins of the upper and lower hinge devices being inserted into two pin holes correspondingly provided at predetermined positions on an inner front side of the top and the bottom panel, respectively; and the pivot shaft of the upper and the lower hinge

device being respectively received in a retaining slot correspondingly provided at an inner upper and an inner lower corner of the door.

11. The collapsible storage container as claimed in claim 1, further comprising at least one shelf and at least one pair of rails for supporting the shelf thereon; and wherein the left panel is correspondingly provided on inner front and rear edge surfaces with at least one rail holder each, so that at least one rail may be horizontally held to and between two corresponding rail holders on the inner side of the left panel, and the right panel is correspondingly provided on inner front and rear edge surfaces with at least one rail holder each, so that at least one rail may be horizontally held to and between two corresponding rail holders on the inner side of the right panel; whereby the at least one shelf may be horizontally supported on the at least one pair of rails correspondingly held to the left and the right panel to thereby divide an internal space of the storage container into at least an upper and a lower subspace.

12. The collapsible storage container as claimed in claim 1, further comprising at least one drawer and at least one pair of rails for slidably supporting the drawer thereon; and wherein the left panel is correspondingly provided on inner front and rear edge surfaces with at least one rail holder each, so that at least one rail may be horizontally held to and between two corresponding rail holders on the inner side of the left panel, and the right panel is correspondingly provided on inner front and rear edge surfaces with at least one rail holder each, so that at least one rail may be horizontally held to and between two corresponding rail holders on the inner side of the right panel; whereby the at least one drawer may be horizontally supported on the at least one pair of rails correspondingly held to the left and the right panel.

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