



(11) **EP 2 208 437 B1**

(12) **EUROPEAN PATENT SPECIFICATION**

(45) Date of publication and mention
of the grant of the patent:
21.12.2011 Bulletin 2011/51

(51) Int Cl.:
A47B 47/00 (2006.01)

(21) Application number: **09150910.9**

(22) Date of filing: **20.01.2009**

(54) **Systemic cabinet**

Modulares Möbelement

Élément de mobilier modulaire

(84) Designated Contracting States:
**AT BE BG CH CY CZ DE DK EE ES FI FR GB GR
HR HU IE IS IT LI LT LU LV MC MK MT NL NO PL
PT RO SE SI SK TR**

(43) Date of publication of application:
21.07.2010 Bulletin 2010/29

(73) Proprietor: **Li-Chung, Hsu**
Chiayi City 600 (TW)

(72) Inventor: **Li-Chung, Hsu**
Chiayi City 600 (TW)

(74) Representative: **Lang, Christian et al**
LangRaible GbR
Patent- und Rechtsanwälte
Rosenheimerstrasse 139
81671 München (DE)

(56) References cited:
US-A- 5 590 974 US-A1- 2004 222 722
US-A1- 2007 132 345 US-B1- 7 014 267

EP 2 208 437 B1

Note: Within nine months of the publication of the mention of the grant of the European patent in the European Patent Bulletin, any person may give notice to the European Patent Office of opposition to that patent, in accordance with the Implementing Regulations. Notice of opposition shall not be deemed to have been filed until the opposition fee has been paid. (Art. 99(1) European Patent Convention).

Description**BACKGROUND OF THE INVENTION**

1. Field of the Invention

[0001] The present invention relates to a systemic cabinet, and more particularly to a systemic cabinet composed of multiple assembling boards and corresponding connecting pieces having supporting strength so that this systemic cabinet enables to be assembled or disassembled rapidly and conveniently and has various embodiments according to different uses such as CD frames, grocery racks, closets, book shelves, or shoe cabinets etc.

2. Description of Related Art

[0002] In current market of systemic cabinet, manufacturers focus on design and process to increase the utility and transportation convenience of the conventional systemic cabinet. Therefore, the conventional systemic cabinets are mostly sold in assembling kits that have to be constructed by DIY and secured immovably by tools to perform the final frames or cabinets after consumers purchase them. Once the frames or the cabinets are worn too much to use, the whole systemic cabinets will be dumped directly because it is troublesome and time-consuming to disassemble the conventional systemic cabinets into pieces. Therefore, the wasted conventional systemic cabinets are not environmental friendly at all.

[0003] Examples for modular furniture systems and connecting structures for panels and furnitures which can be easily and quickly disassembled are provided in US 7,014,267 B1, 9 US 2004/0222722 A1, US 2007/0132345 A1 and US 5,590,974.

SUMMARY OF THE INVENTION

[0004] A main objective of the present invention is to provide a systemic cabinet that has multiple boards each having mortises defined at two opposite sides to make corresponding connecting pieces with supporting strength to engage for achieving combination. By assembling the multiple boards with the connecting pieces, the systemic cabinet is constructed quickly and conveniently by wedging in operation of combination. The connecting pieces have multiple types in design variation to provide different orientation-positioning efficiency and have supporting strength to make the composed systemic cabinet firm and stable. Therefore, once one board worn and needed to be replaced, only the worn board is changed by detaching the relative connecting pieces to save other elements and to make the replacement easy and environmental for future repair.

[0005] To achieve the foregoing objective, the systemic cabinet comprises the features as defined in claim 1.

[0006] Further benefits and advantages of the present

invention will become apparent after a careful reading of the detailed description with appropriate reference to the accompanying drawings.

5 **BRIEF DESCRIPTION OF THE DRAWINGS**

[0007]

Fig. 1 is an exploded perspective view of the first embodiment showing a unit component of the systemic cabinet in accordance with the present invention;

Figs. 2A and 2B are perspective views showing two different types of connecting pieces of the systemic cabinet in accordance with the present invention; Fig. 3 is an exploded perspective view of the second embodiment of the systemic cabinet in accordance with the present invention;

Fig. 4 is an enlarged cross-sectional side view showing joints of the connecting pieces and relative boards of the systemic cabinet in Fig. 3;

Fig. 5 is an exploded perspective view of the third embodiment showing an enlarged unit component of the systemic cabinet in accordance with the present invention;

Fig. 6 is an exploded perspective view of the fourth embodiment of the enlarged unit component of the systemic cabinet in accordance with the present invention;

Fig. 7 is an enlarged cross-sectional side view showing joints of the connecting pieces and relative boards of the systemic cabinet in Fig. 6;

Fig. 8 is a perspective view of the third embodiment of the systemic cabinet in Fig. 5, wherein the enlarged unit component does not have front and rear boards;

Fig. 9 is an operational perspective view of the systemic cabinet in Fig. 8 to illustrate the attachment of the rear board;

Fig. 9A is an enlarged cross-sectional view showing joints between the rear board and a top board or a rear board;

Fig. 10 is a perspective view of the systemic cabinet in Fig. 9 to show the attachment of the front board;

Fig. 11 is an explode perspective view of the fifth embodiment of the systemic cabinet in Fig. 8 to combine with a drawer structure;

Fig. 12 is a perspective view of the systemic cabinet in Fig. 11;

Fig. 13 is a perspective view of the first embodiment of final configuration to show the systemic cabinet arranged in a ladder-shape;

Fig. 14 is a perspective view of the second embodiment of final configuration to show the systemic cabinet arranged in a T-shape;

Fig. 15 is a perspective view of the third embodiment of final configuration to show the systemic cabinet arranged in a R-shape;

Fig. 16 is a perspective view of the fourth embodiment of final configuration to show the systemic cabinet arranged in a J-shape;

Fig. 17 is a perspective view of the first embodiment of final configuration to show the systemic cabinet composed of multiple enlarged unit components arranged in a ladder shape;

Fig. 18 is a perspective view of a second embodiment of final configuration to show the systemic cabinet composed of multiple enlarged unit components with drawers arranged in vertical; and

Figs. 19-24 are perspective views of the third to seventh embodiments of final configurations of the systemic cabinets.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

[0008] A systemic cabinet in accordance with the present invention is composed of multiple boards and multiple connecting pieces. Each board has multiple mortises defined at opposite sides respectively to combine the corresponding connecting pieces with supporting strength by wedging to perform compartments of the systemic cabinet. The connecting pieces have multiple variations in design to provide orientation-positioning efficiency and have supporting strength to make the composed systemic cabinet firm and stable. Therefore, once one board is worn out, only the worn board is replaced by detaching the connecting pieces to save other elements and to make the replacement easy and environmental for future repair.

[0009] As shown in Fig. 1, a single unit compartment of systemic cabinet comprises multiple boards 1 and multiple connecting pieces 4 at corners of the unit compartment.

[0010] Each board 1 is rectangular and has a predetermined width based on total configuration in design. Two opposite sides of the board 1 have four mortises 11 defined at ends and four locking holes 12 defined on one face of the board 1 to communicate with the mortises 11 respectively. Such boards 1 are uniform and defined as top boards, bottom boards, sideboards, bridging boards, erecting boards, adjacent boards and widened boards as applied to different orientation and modification mentioned below.

[0011] Each connecting piece 4 (as shown in Fig. 2A) has a locking body 2 and at least one tenon tube 3. The locking body 2 has multiple dovetail-grooves 21 defined on faces respectively to engage a dovetail-insertion 31 formed on the corresponding tenon tube 3. The dovetail-grooves 21 are not entirely transversal through the face of the locking body 2 to reserve a block section 22 (see Fig. 2A) to keep the corresponding tenon tube 3 engaged at a limited position. Additionally, each tenon tube 3 has a protrusion 32 formed on a top face to align with the locking hole 12 on the board 1.

[0012] As shown in Fig. 2B, another type of the con-

necting piece 4' is that the tenon tube 3 and the locking body 2 are integrated into one-piece (Such a connecting piece 4' is embodied to apply to widened cabinet with widened boards). The connecting piece 4' has its length, the locking holes 33, and the protrusions 32 arranged and decided by supporting strength to the widened board 1.

[0013] With regard to assembly of the aforementioned multiple boards 1 and the multiple connecting pieces 4 (as shown in Fig. 1), the tenon tube 3 at one end of the connecting piece 4 inserts into the mortise 11 on one adjacent board 1 until the protrusion 32 on the tenon tube 3 engages the locking hole 12 on the board. By having the multiple connecting pieces 4 each composed of a locking body 2 and optional multiple tenon tubes 3, the boards 1 with predetermined sizes are combined and constructed to perform a unit component 5 (as shown Fig. 3, it is a narrow cabinet as an embodiment) easily and conveniently by wedging.

[0014] When the unit component 5 is to add more compartments (as shown in Figs. 3 and 4), four tenon tubes 3 are added to the unit component 5 and combined to the corresponding locking bodies 2 at corners respectively by engaging the dovetail-insertions 31 with the dovetail-grooves 21 snugly (as shown in Fig. 4). Moreover, each single tenon tube 3 inserts into the mortise 11 on corresponding one of two erecting sideboards 1 and is positioned by locking the protrusion 32 with the locking hole 12. Lastly, a bridging board 1 is mounted over the two erecting sideboards 1 by attaching four connecting pieces 4 at corners to perform the systemic cabinet with two components.

[0015] With regard to another embodiment of the systemic cabinet having enlarged size in assembly (as shown in Fig. 5), the connecting piece 4' in one-piece has two tenon tubes 3 arranged vertically to each other to insert into two mortises 11 of two adjacent boards 1 respectively until the protrusions 32 engage the locking holes 12. Four boards 1 are arranged one by one in loop and eight connecting pieces 4' fix the corners for four boards 1 by above-mentioned ways to compose one compartment. Because the locking body 2 and the two tenon tubes 3 of the connecting piece 4' are in one piece, the connecting piece 4' provides sufficient supporting strength to the widened boards 1 which are widened. By constructing and positioning the widened boards 1 with the one-pieced connecting pieces 4', the unit component 5' having one compartment is achieved (as shown in Fig. 6).

[0016] When the unit component 5' is to add more compartments (as shown in Figs. 6 and 7), the unit component 5' adds four tenon tubes 3 combined to the corresponding locking bodies 2 at corners respectively by engaging the dovetail-insertions 31 with the dovetail-grooves 21 snugly (as shown in Fig. 7). Moreover, each single tenon tube 3 inserts into the mortise 11 on corresponding one of two erecting sideboards 1 and is positioned by locking the protrusion 32 with the locking hole 12. Lastly, a bridging

board 1 is mounted over the two erecting sideboards 1 by attaching four connecting pieces 4' at corners to perform the systemic cabinet having two components.

[0017] The aforementioned unit compartment 5' is uncovered at front and rear sides (as shown in Fig. 8) and is selectively mounted with a rear board 51 (as shown in Fig. 9). The rear board 51 has positioning protrusions 511, 512 wedging into corresponding through holes 14 defined on the top and bottom boards 1 for positioning (as shown in Figs. 9 and 9A), wherein two of the positioning protrusions 512 at bottom are rectangular stubs and two of the positioning protrusions 511 at top are arc-shaped to make the rear board 51 easily pushed into space between the top and bottom boards 1. Moreover, the unit component 5' enables to be pivotally mounted with a front board 52 by hinges (as shown in Fig. 10, not numbered). Depending on the use of the unit component 5', a drawer 53 is accommodated inside (as shown in Fig. 12) and is composed of a U-shaped case 531 with a front plate 533 and a rear plate 532 combined into one-piece (as shown in Fig. 11) so that the combined drawer 53 is movably accommodated in the unit component 5'.

[0018] The aforementioned unit components 5 enable to be modified to different arrangements such as a ladder-shape configuration 10 (as shown in Fig. 13), a T-shape configuration 20 (as shown in Fig. 14), a R-shape configuration 30 (as shown in Fig. 15), and a J-shape configuration 40 (as shown in Fig. 16) for creating fun in decoration. With regard to unit components 5' with widened size enable to be modified to different arrangements such as a ladder-shape configuration 50 (as shown in Fig. 17), multiple file cabinet configurations 60, 70 and 80 (as shown in Figs. 18-20), a closet configuration 90 (as shown in Fig. 21), a staked configuration 100 for which each compartment has cover boards 1001 at front and rear faces (as shown in Figs. 22 and 23), and a staked configuration 110 having compartments with different sizes for creating more utility in use (as shown Fig 24).

[0019] The aforementioned systemic cabinet has the following advantages in assembly and practice:

1. By composing multiple boards with multiple connecting pieces to perform the predetermined cabinet, the assembling operation is quick and convenient and the combined cabinet is stable and firm.
2. Once the systemic cabinet is worn out too much to use, only the broken parts of systemic cabinet can be replaced by detaching the relative connecting pieces easily for material saving. Otherwise, the whole systemic cabinet can be disassembled into pieces to reduce occupied space during recycling process for environmental protection.
3. The unit components for the systemic cabinet are variable to extend and create more embodiments both for utility purpose and for decorative purpose.

Claims

1. A systemic cabinet comprising multiple boards (1) and multiple connecting pieces (4) between adjacent two of the multiple boards (1), wherein each of the multiple boards (1) has multiple mortises (11) defined at two opposite sides; and each of the multiple connecting pieces (4) has two ends respectively inserting into two mortises (11) on the adjacent two of the multiple boards (1), **characterized by** the fact that each of the multiple connecting pieces (4) has:

a locking body (2) having at least two dovetail-grooves (21) defined at sides respectively without transversally grooving to reserve a block section (22); and
a tenon tube (3) having a dovetail-insertion (31) to engage corresponding one of the at least two dovetail-grooves (21) to connect to each adjacent board (1).

2. The systemic cabinet as claimed in claim 1, wherein each of the multiple connecting pieces (4') has:

two tenon tubes (3) integrally formed on the locking body (2) to respectively connect to the adjacent two of the multiple boards (1).

3. The systemic cabinet as claimed in claim 2, wherein each of the multiple boards (1) further has a locking hole (12) defined on the board (1) to communicate with each of the multiple mortises (11); and each of the two tenon tubes (3) has a protrusion (32) snugly engaging the locking hole (12) on the board (1).

4. The systemic cabinet as claimed in claim 3 further comprising a rear board with multiple positioning protrusions (511, 512) at top sides and bottom sides respectively; and each of the multiple boards (1) further has multiple through hole (14) defined on the board (1) to engage with the positioning protrusions (511, 512) respectively.

Patentansprüche

1. Systemschrank, der eine Vielzahl von Brettern (1) und eine Vielzahl Verbindungsstücke (4) zwischen zwei benachbarten Brettern (1) umfasst, wobei jedes aus der Vielzahl von Brettern (1) eine Vielzahl Zapfenlöcher (11) umfasst, die an zwei gegenüberliegenden Seiten ausgebildet sind, und jedes aus der Vielzahl von Verbindungsstücken (4) zwei Enden umfasst, die jeweils in zwei Zapfenlöcher (11) an zwei benachbarten Brettern (1) einge-

führt sind,

dadurch gekennzeichnet, dass jedes aus der Vielzahl an Verbindungsstücken (4) umfasst:

einen Verriegelungskörper (2), der wenigstens zwei Schwalbenschwanznuten (21) umfasst, die jeweils an den Seiten ohne quer auszubilden ausgebildet sind, um einen Blockierbereich (22) zurück zu behalten, und ein Zapfenrohr (3), das ein Schwalbenschwanz-einschubteil (31) umfasst, um in eine Entsprechende der wenigstens zwei Schwalbenschwanznuten zur Verbindung mit jedem benachbartem Brett einzugreifen.

2. Systemschrank nach Anspruch 1, bei welchem jedes aus der Vielzahl von Verbindungsstücken (4) umfasst:

zwei Zapfenrohre (3), die integral an dem Verriegelungskörper (2) ausgebildet sind, um sich jeweils mit den benachbarten zwei Brettern (1) aus der Vielzahl von Brettern (1) zu verbinden.

3. Systemschrank nach Anspruch 2, bei welchem jedes aus der Vielzahl von Brettern (1) ferner ein Verriegelungsloch (12) umfasst, das an dem Brett (1) so ausgebildet ist, dass es mit jeweils einem aus der Vielzahl von Zapfenlöchern (11) in Verbindung steht, und jedes der zwei Zapfenrohre (3) einen Vorsprung (32) umfasst, der eng mit einem Verriegelungsloch (12) auf dem Brett (1) in Eingriff steht.

4. Systemschrank nach Anspruch 3, welcher ferner ein hinteres Brett mit einer Vielzahl Positioniervorsprüngen (511, 512) jeweils an der Ober- und Unterseite umfasst und bei welchem jedes aus der Vielzahl von Brettern (1) ferner eine Vielzahl in dem Brett (1) ausgebildeter Durchgangslöcher (14) umfasst, um jeweils mit den Positioniervorsprüngen (511, 512) im Eingriff zu stehen.

Revendications

1. Armoire système comprenant des planches multiples (1) et des pièces de raccordement multiples (4) entre deux planches adjacentes des planches multiples (1) dans laquelle chacune des planches multiples (1) a des encoches multiples (11) définies à deux côtés opposés et chacune des pièces de raccordement multiples (4) a deux extrémités qui s'insèrent respectivement dans deux encoches (11) sur les deux planches adjacentes des planches multiples (1),

caractérisée par le fait que chacune des pièces de raccordement multiples (4) a :

un corps de verrouillage (2) ayant au moins deux rainures en queue d'aronde (21) définies sur des côtés respectivement sans rainurage dans le sens transversal pour réserver une section de bloc (22) et un tube à tenon et mortaise (3) ayant une insertion en queue d'aronde (31) pour se mettre en prise avec l'une des deux rainures en queue d'aronde correspondantes qui existent au moins (21) pour établir le raccordement avec chaque planche adjacente (1).

2. Armoire système selon la revendication 1 dans laquelle chacune des pièces de raccordement multiples (4) a :

deux tubes à tenon et mortaise (3) formés sur le corps de verrouillage (2) pour établir le raccordement respectivement avec deux planches adjacentes des planches multiples (1).

3. Armoire système selon la revendication 2 dans laquelle chacune des planches multiples (1) a de plus un trou de verrouillage (12) défini sur la planche (1) pour communiquer avec chacune des encoches multiples (11) et chacun des deux tubes à tenon et mortaise (3) a une saillie (32) qui est en prise doucement avec le trou de verrouillage (12) sur la planche (1).

4. Armoire système selon la revendication 3 comprenant de plus une planche arrière avec des multiples saillies de positionnement (511, 512) respectivement sur les côtés de dessus et les côtés de dessous et chacune des planches multiples (1) a de plus des multiples trous de passage (14) définis sur la planche (1) pour se mettre en prise respectivement avec les saillies de positionnement (511, 512).

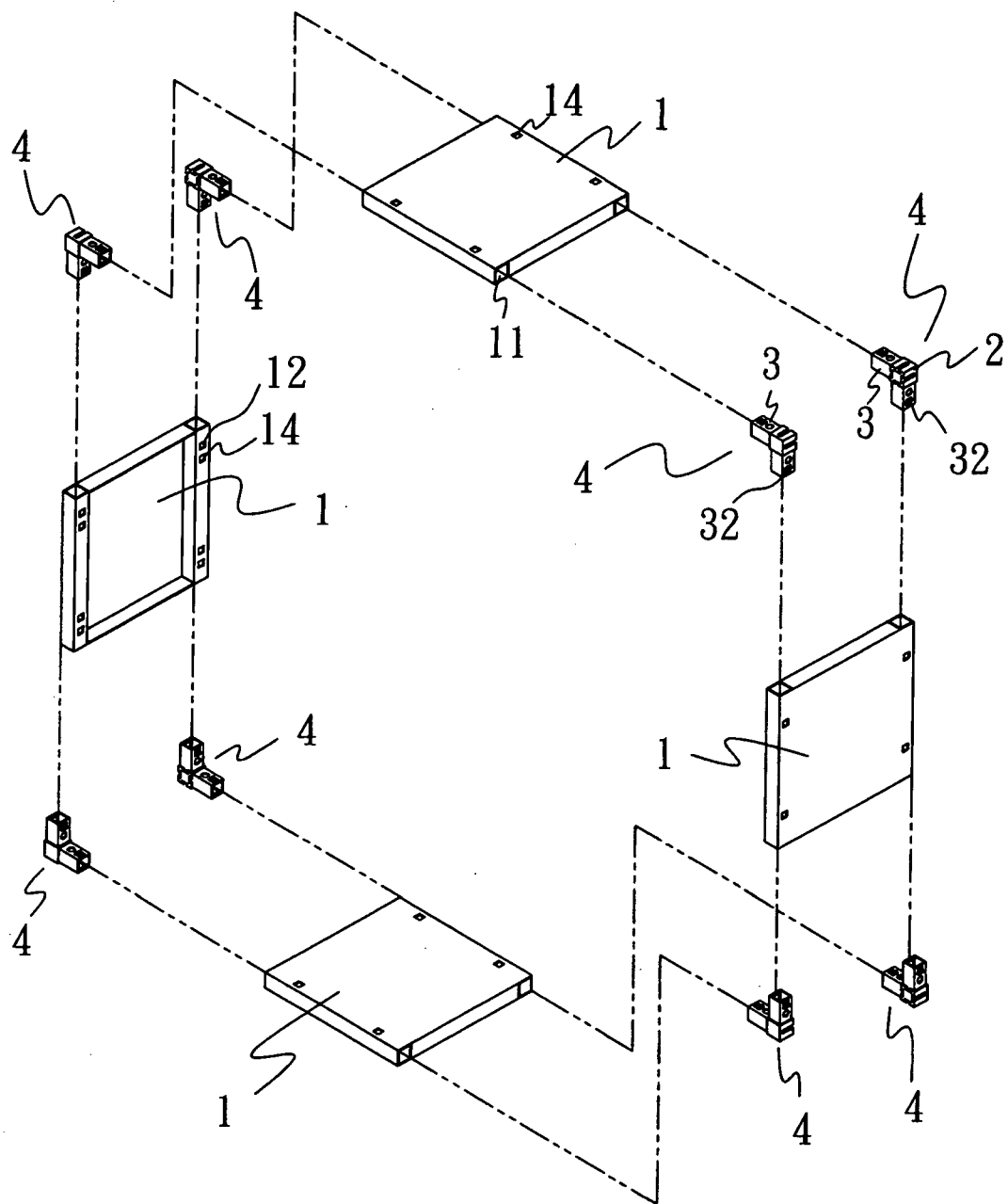
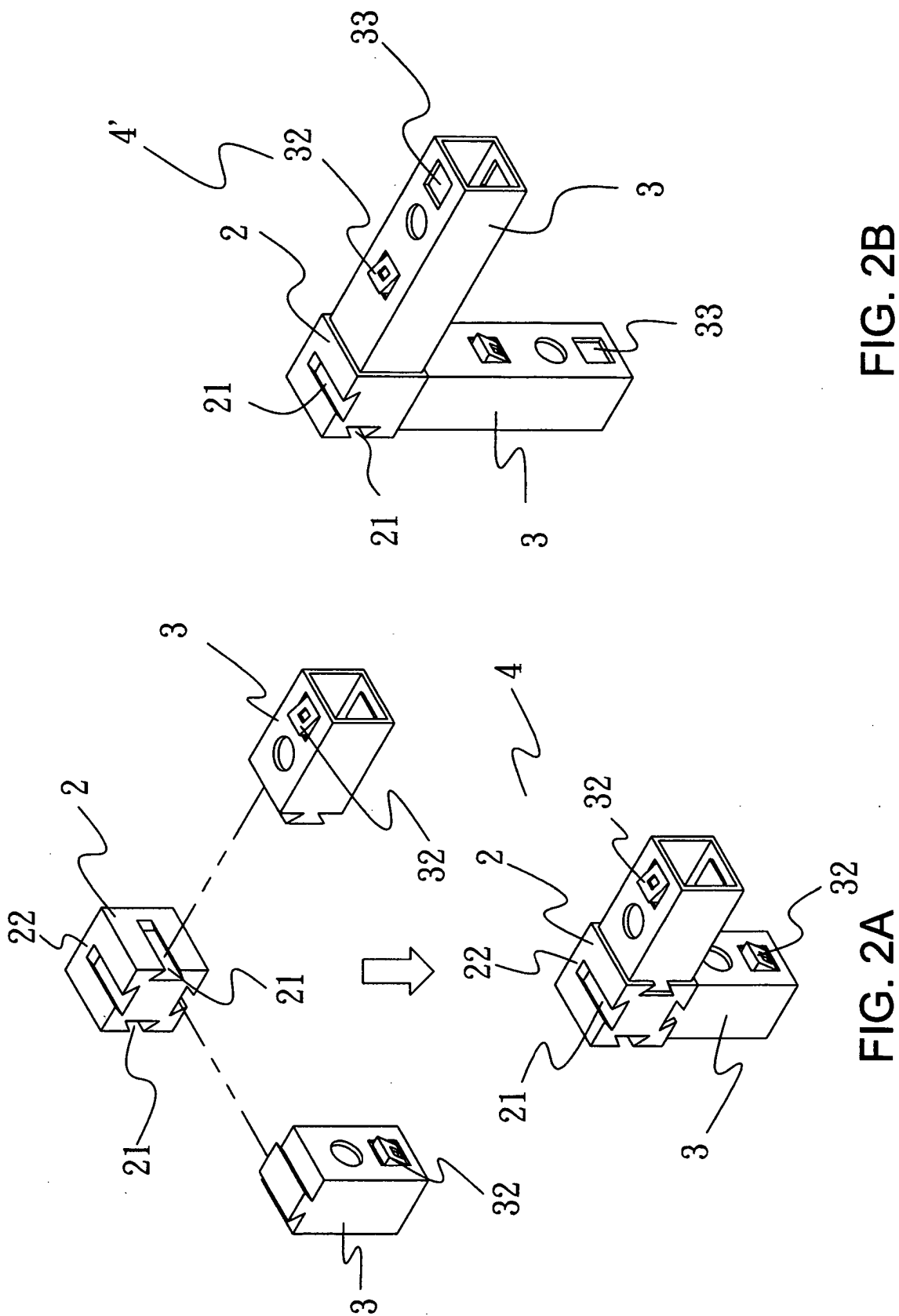


FIG. 1



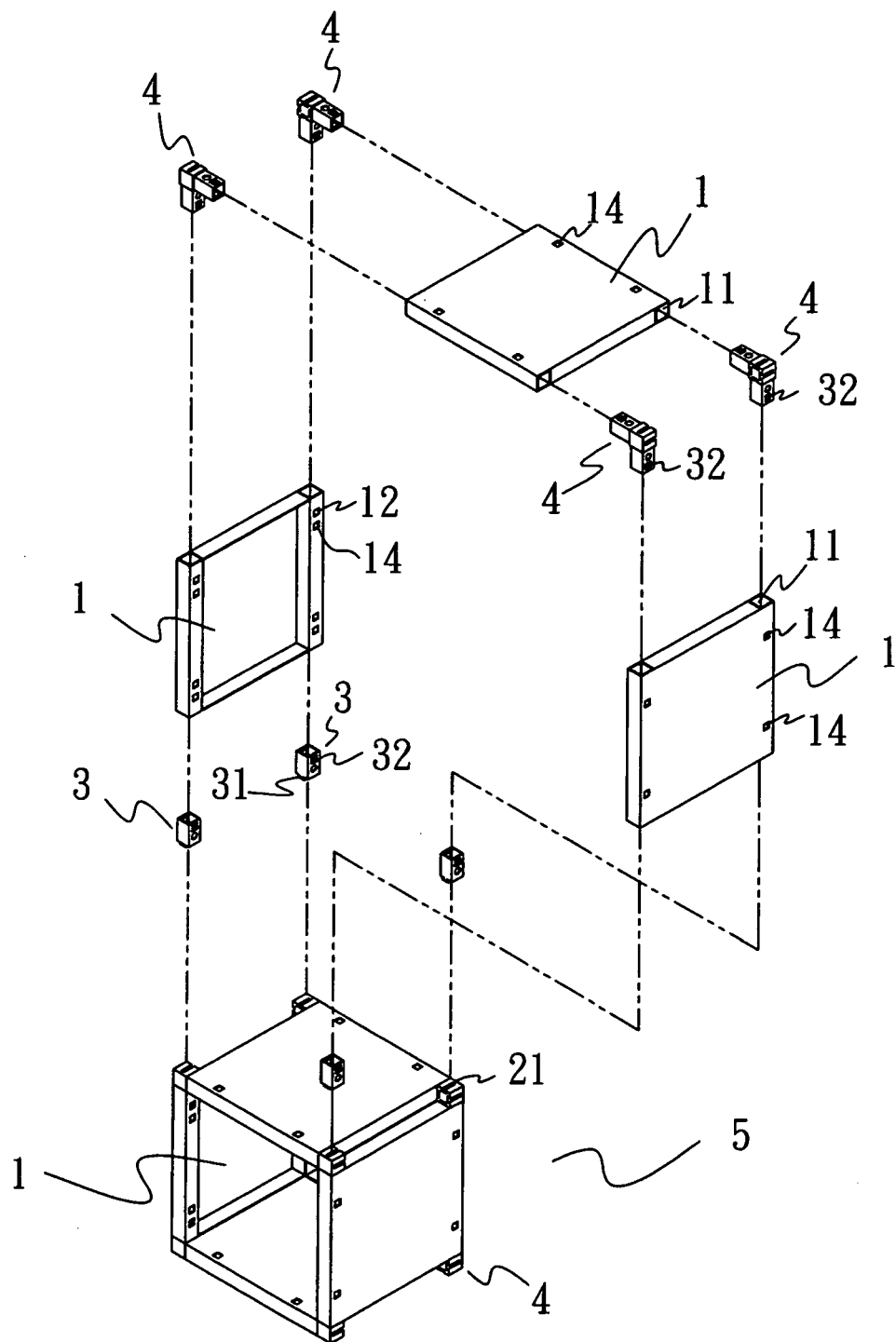


FIG. 3

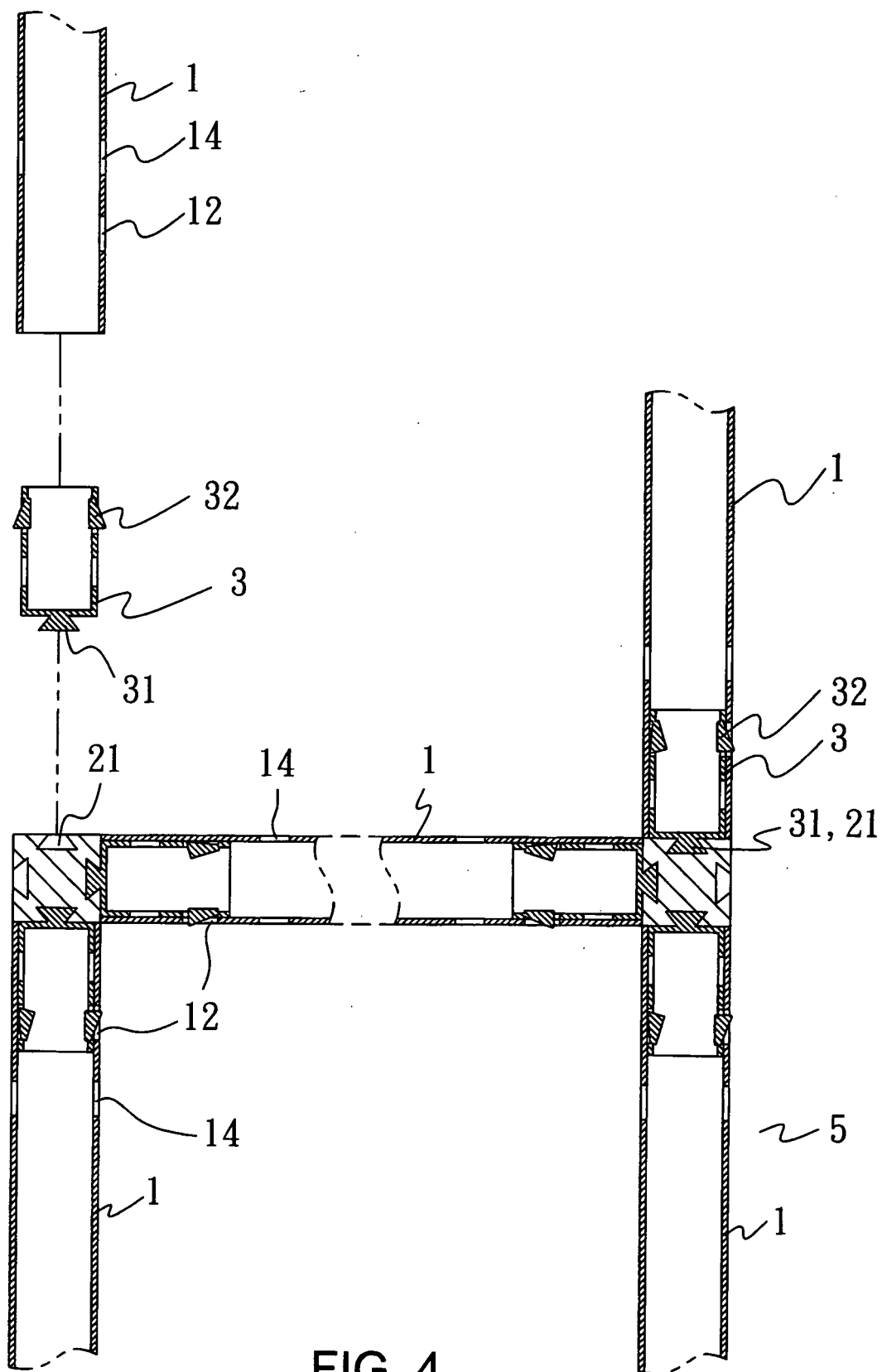
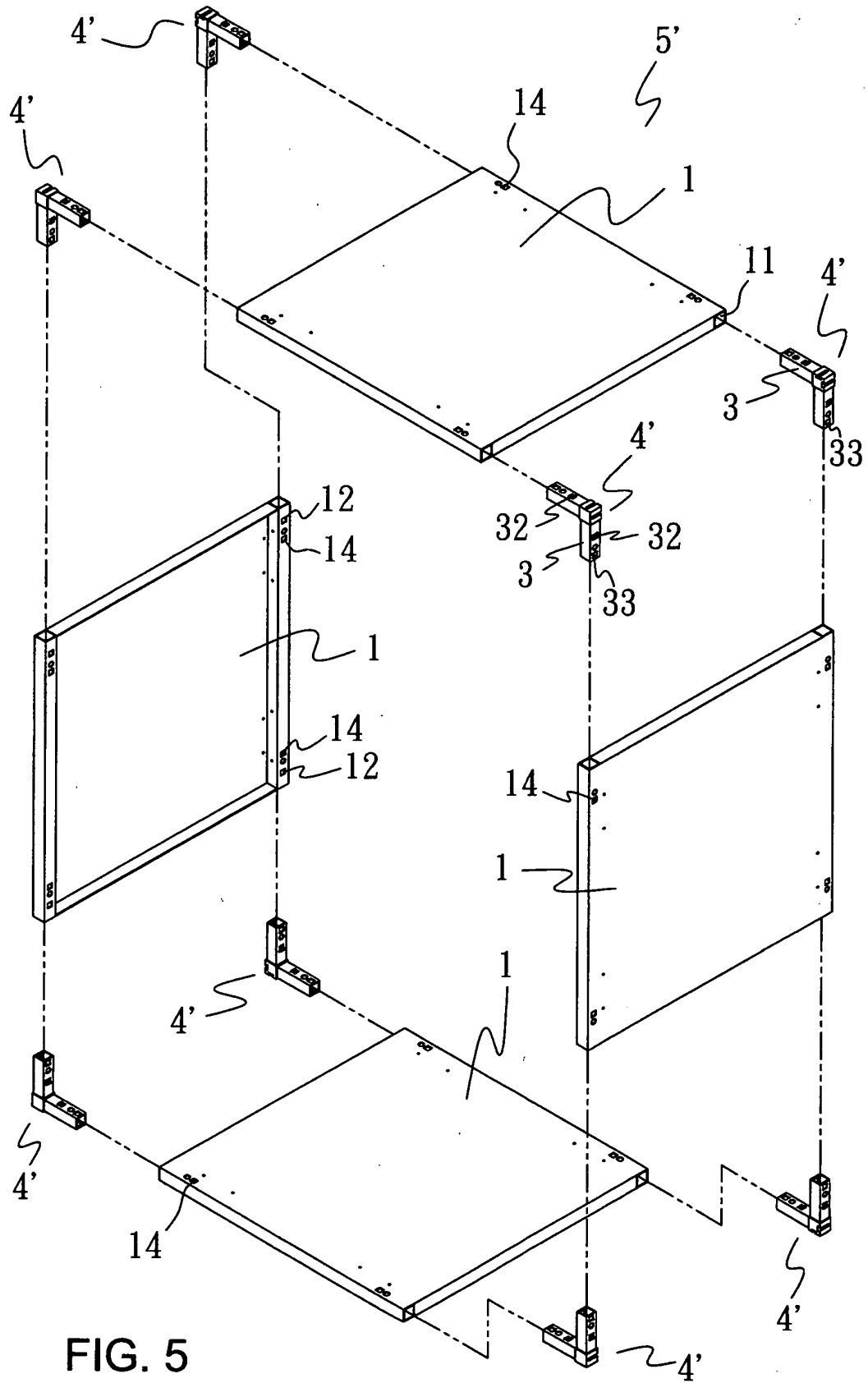


FIG. 4



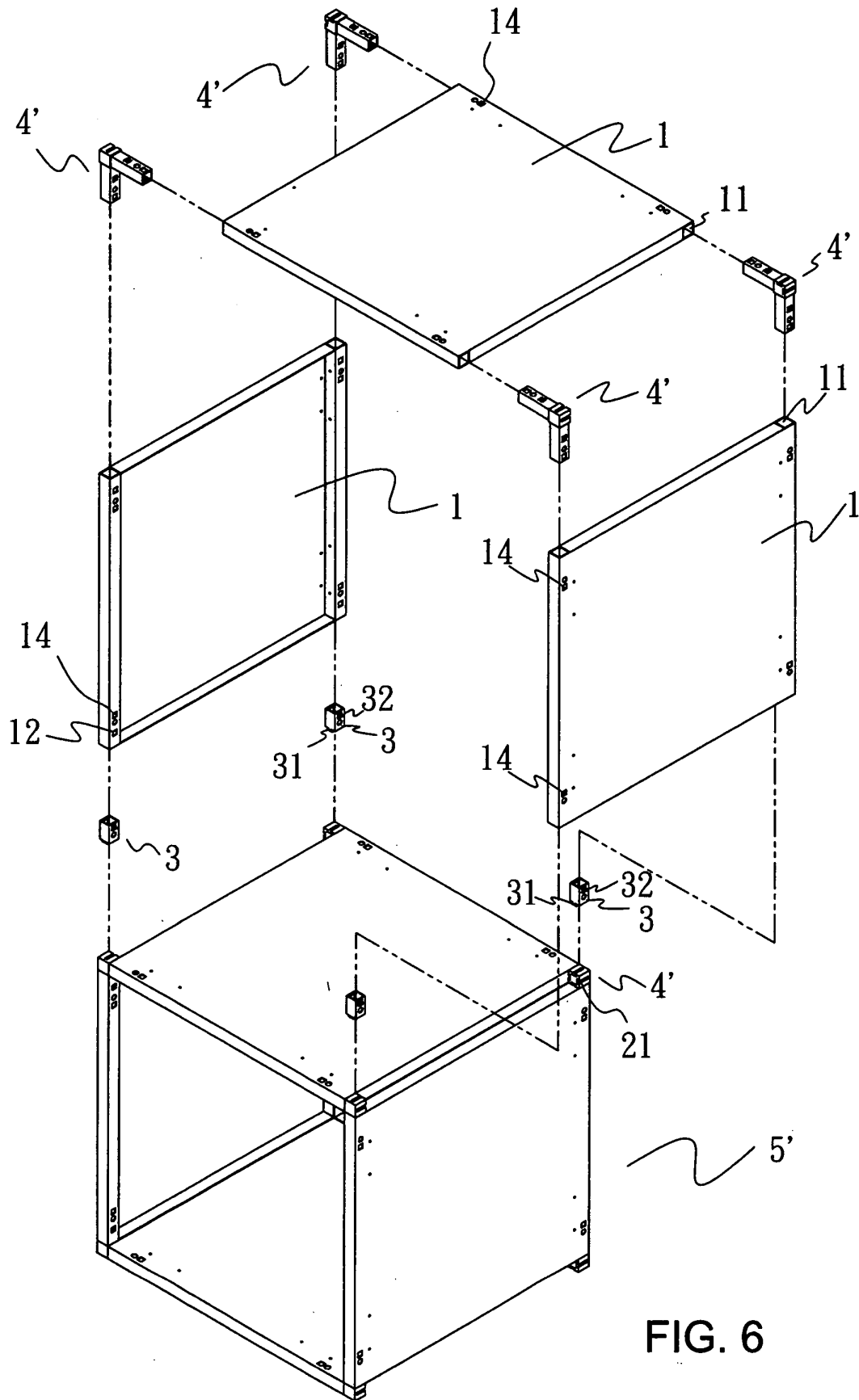
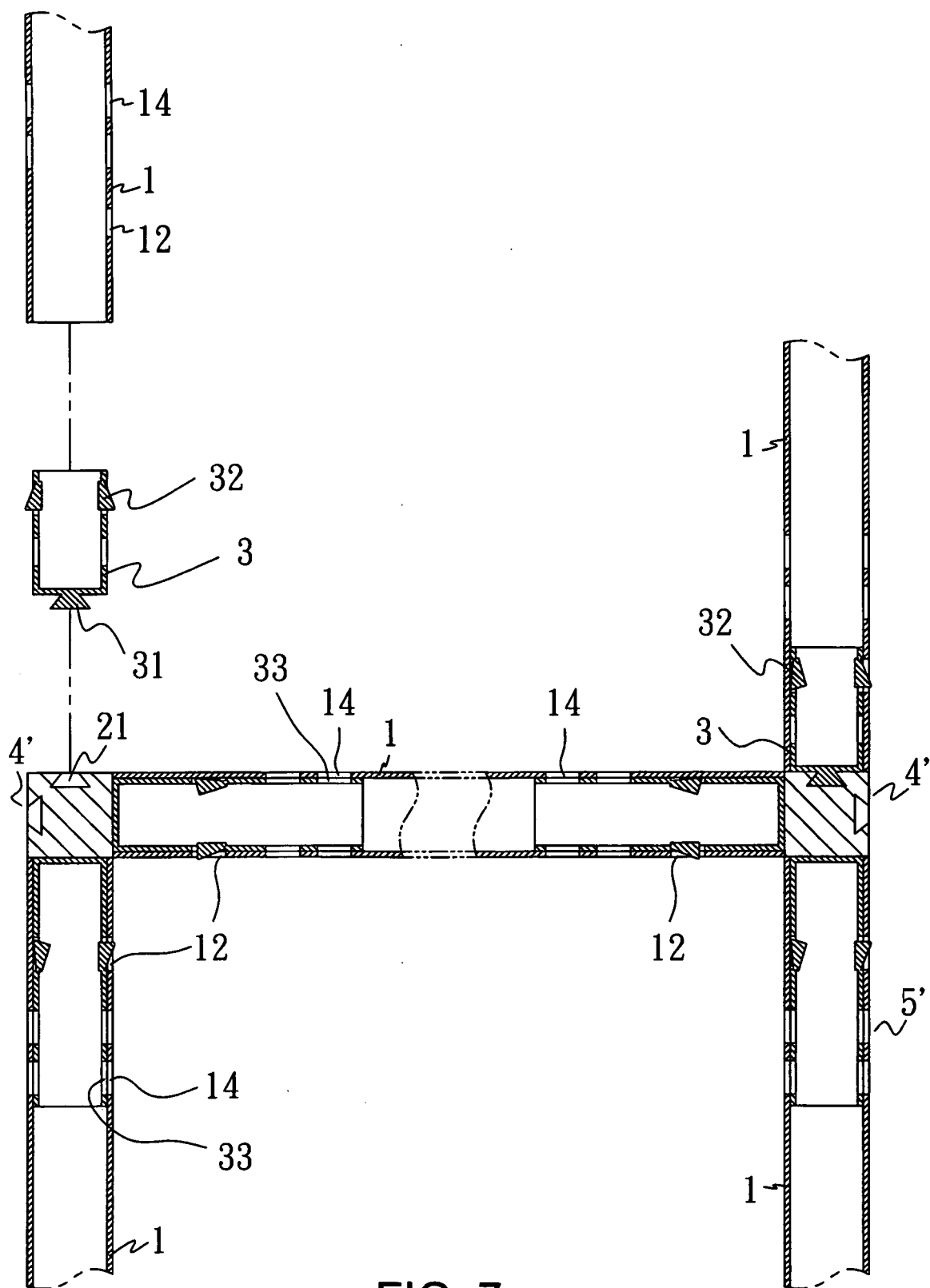


FIG. 6



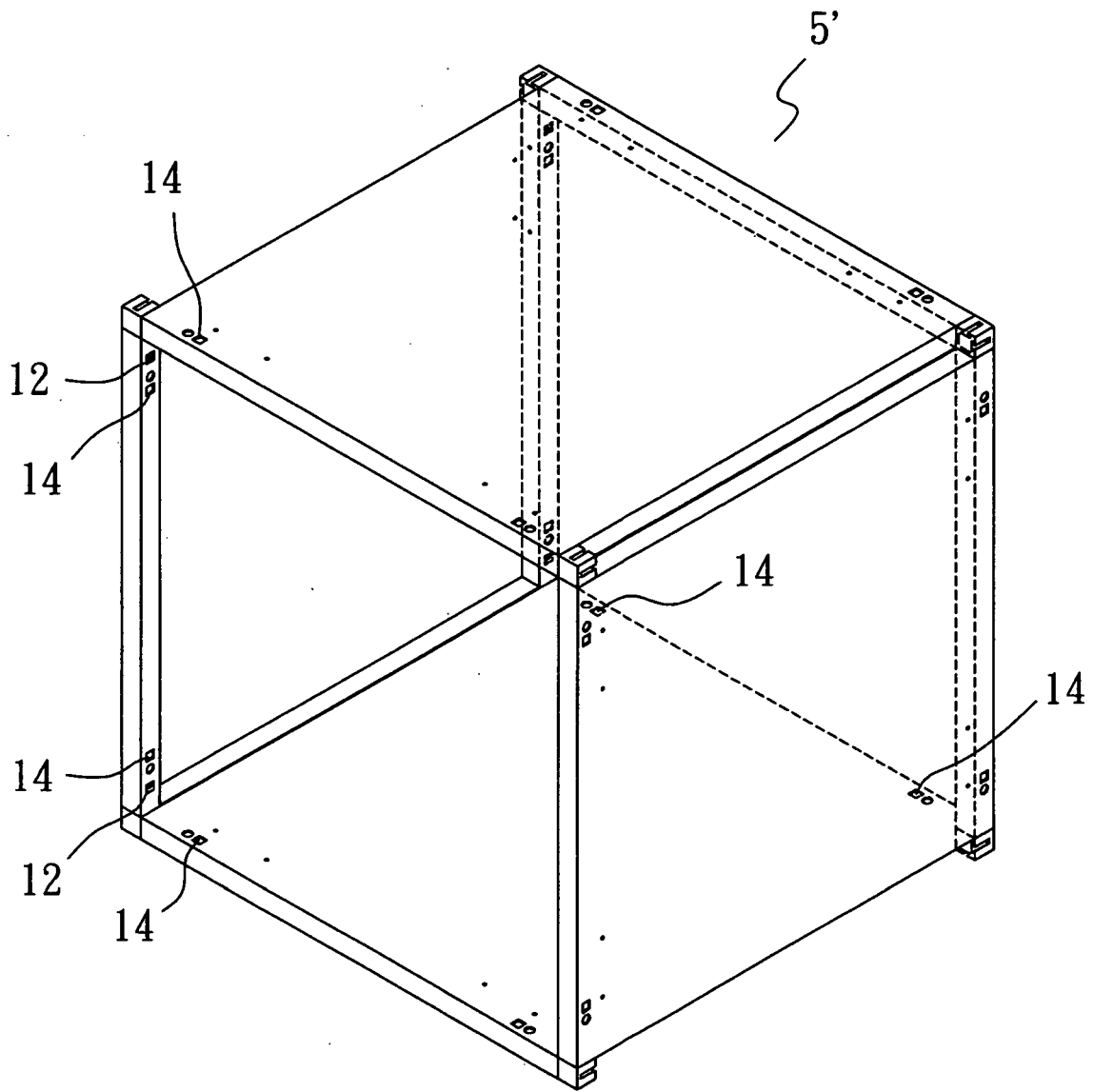


FIG. 8

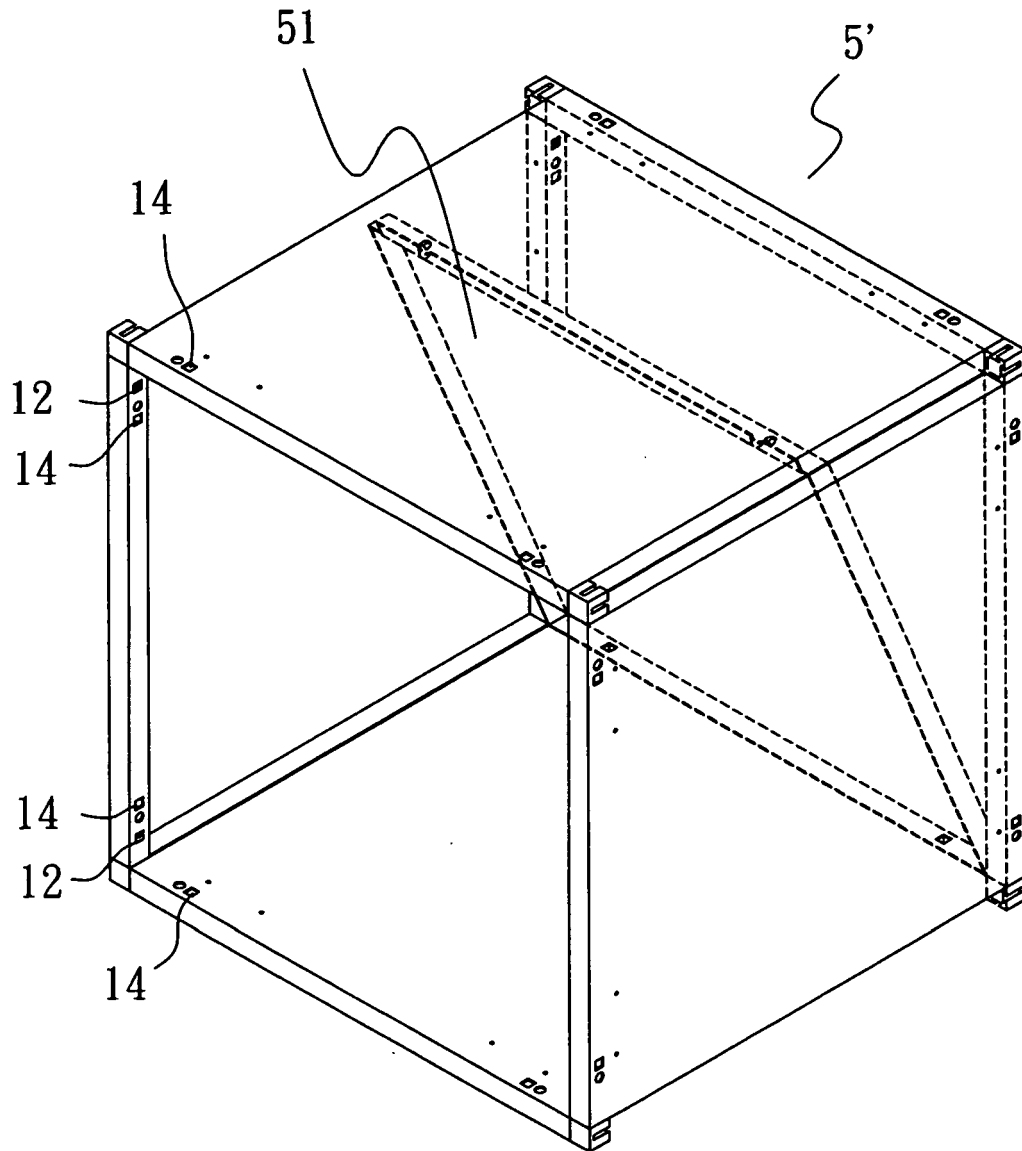
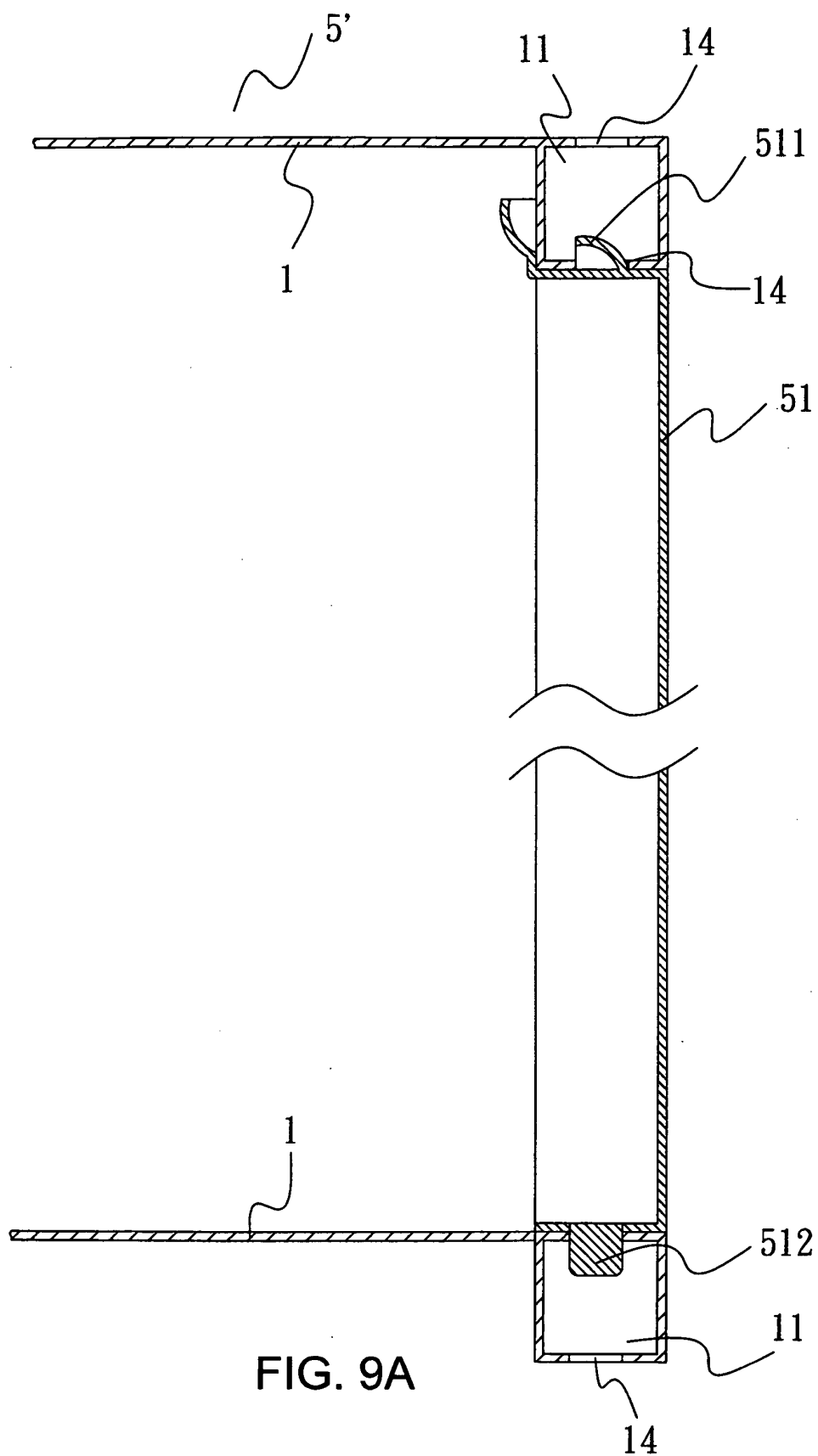


FIG. 9



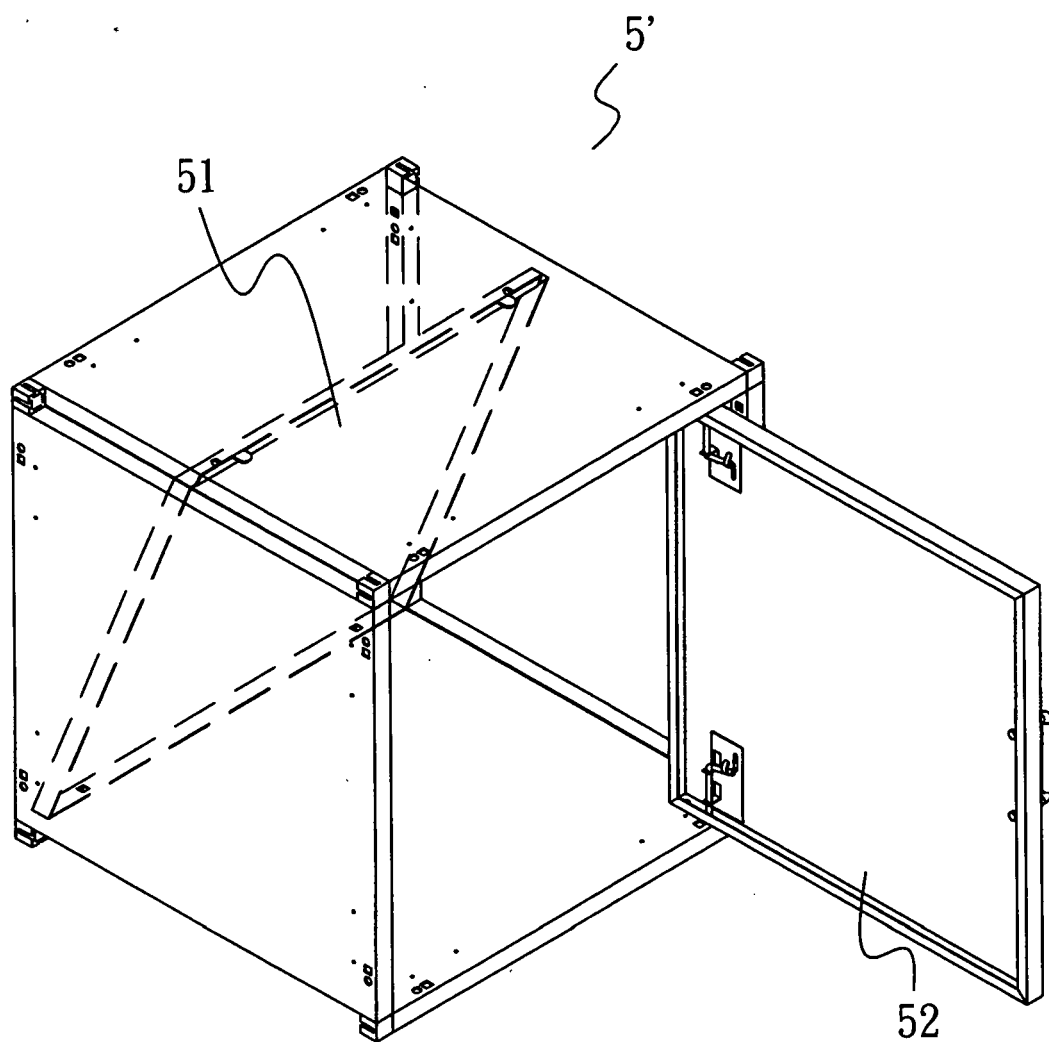


FIG. 10

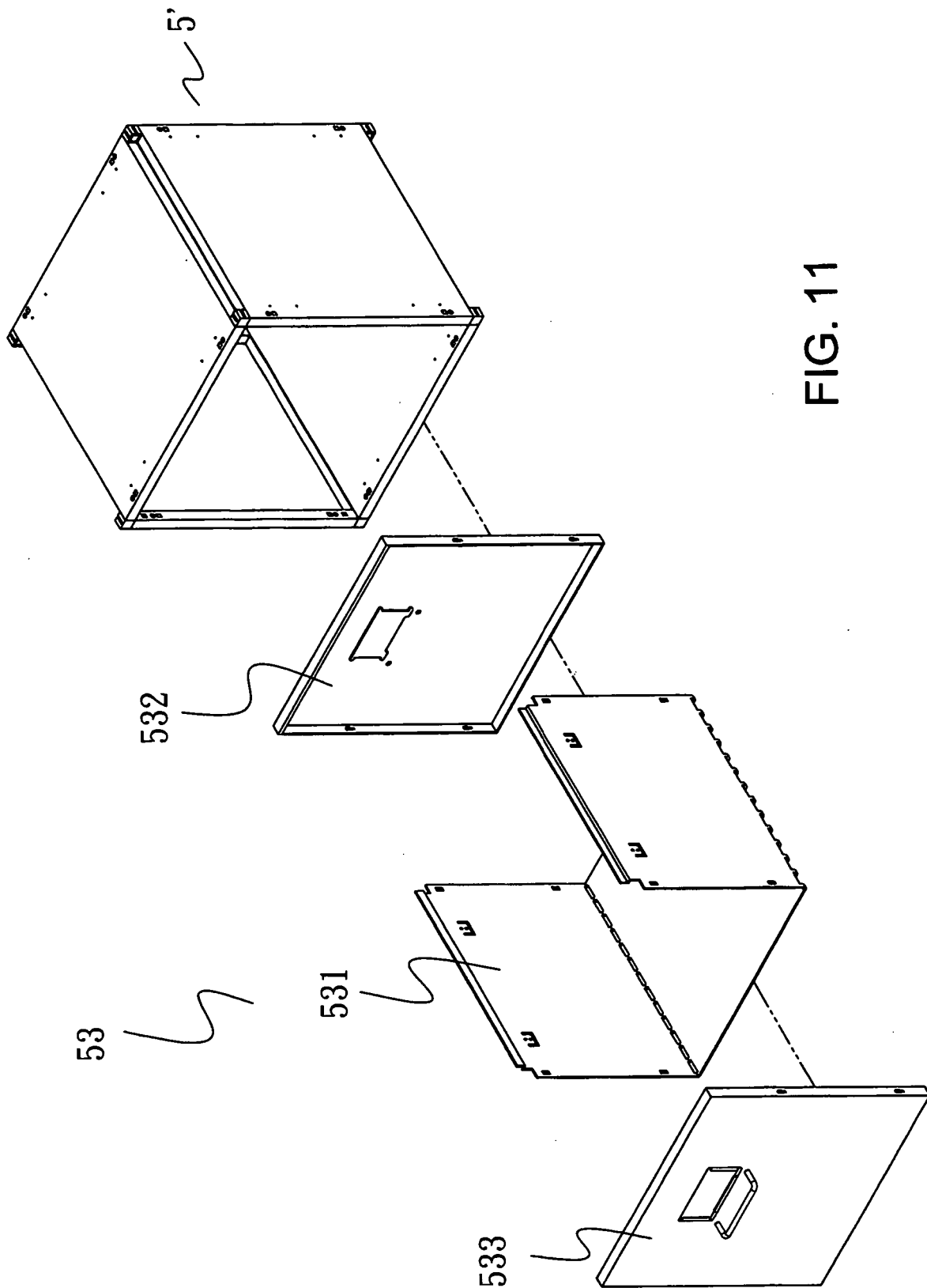


FIG. 11

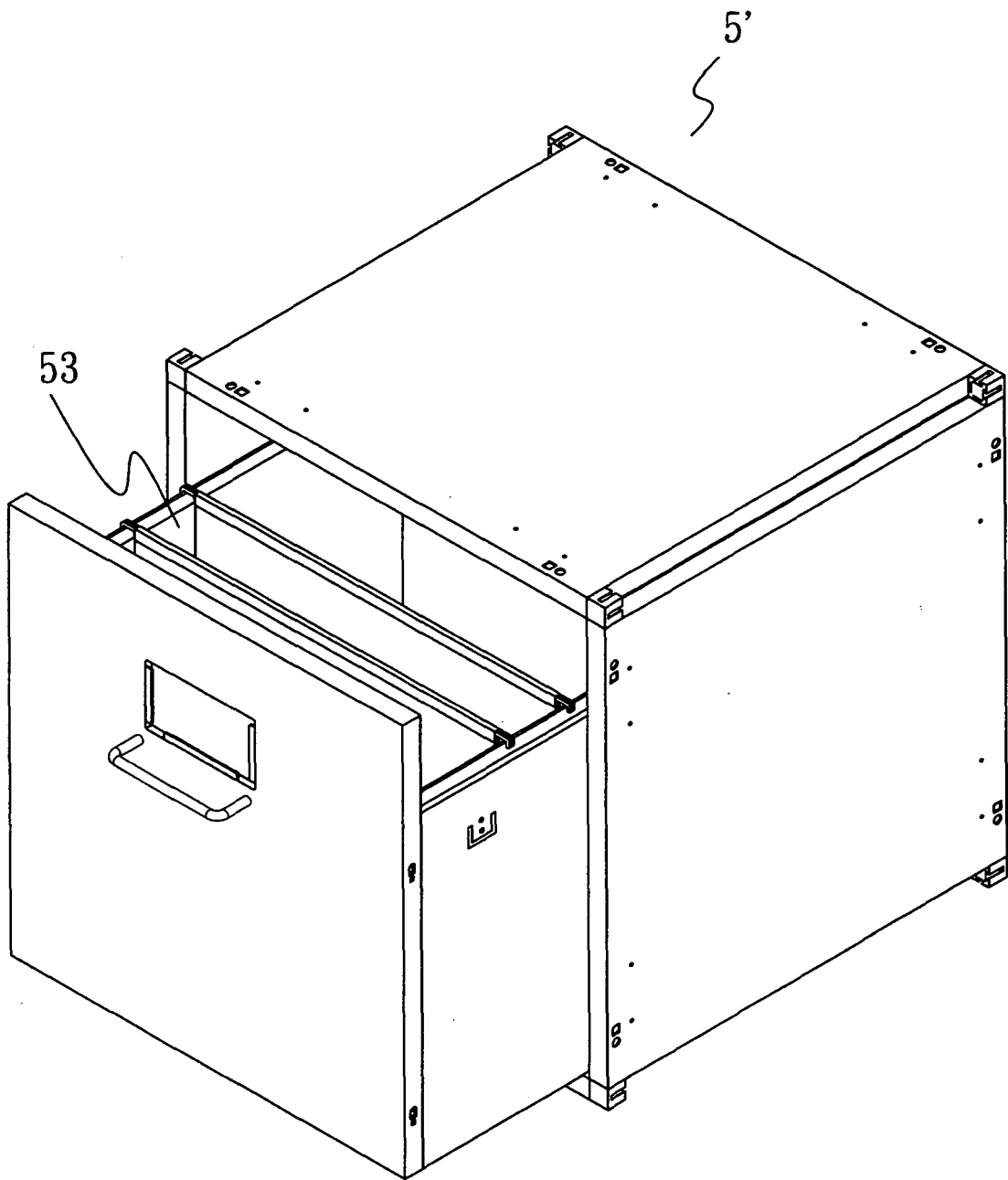


FIG. 12

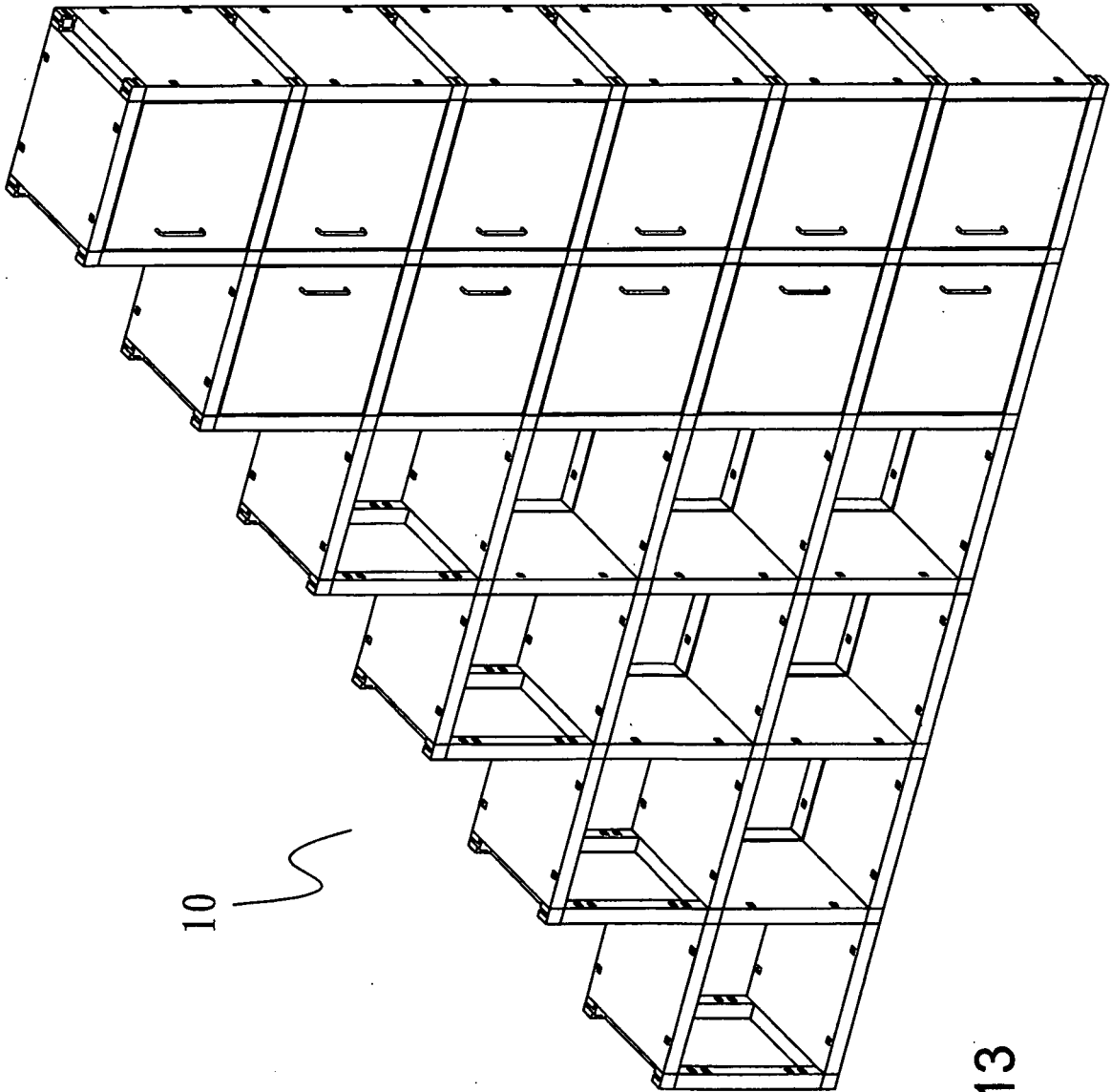


FIG. 13

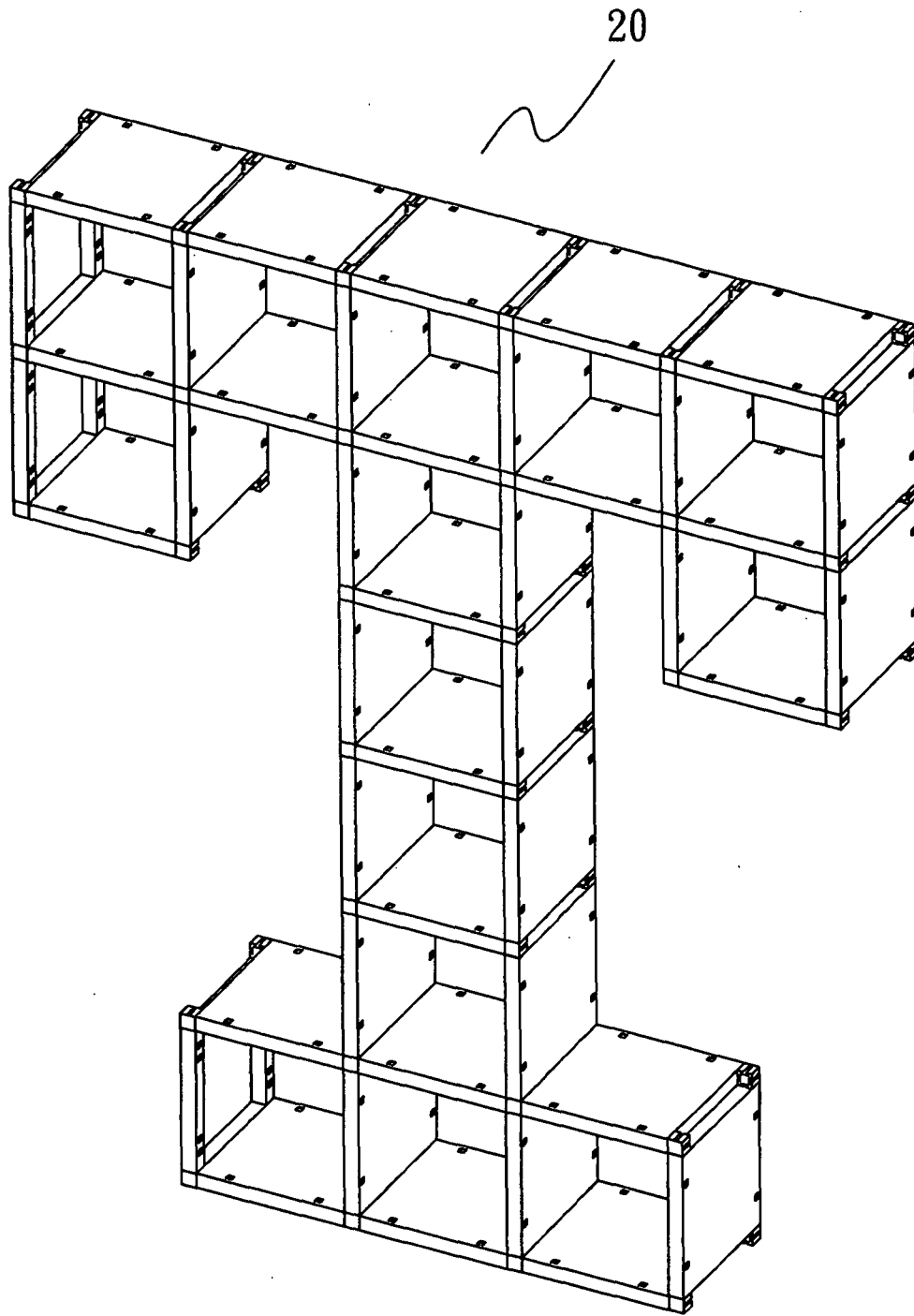


FIG. 14

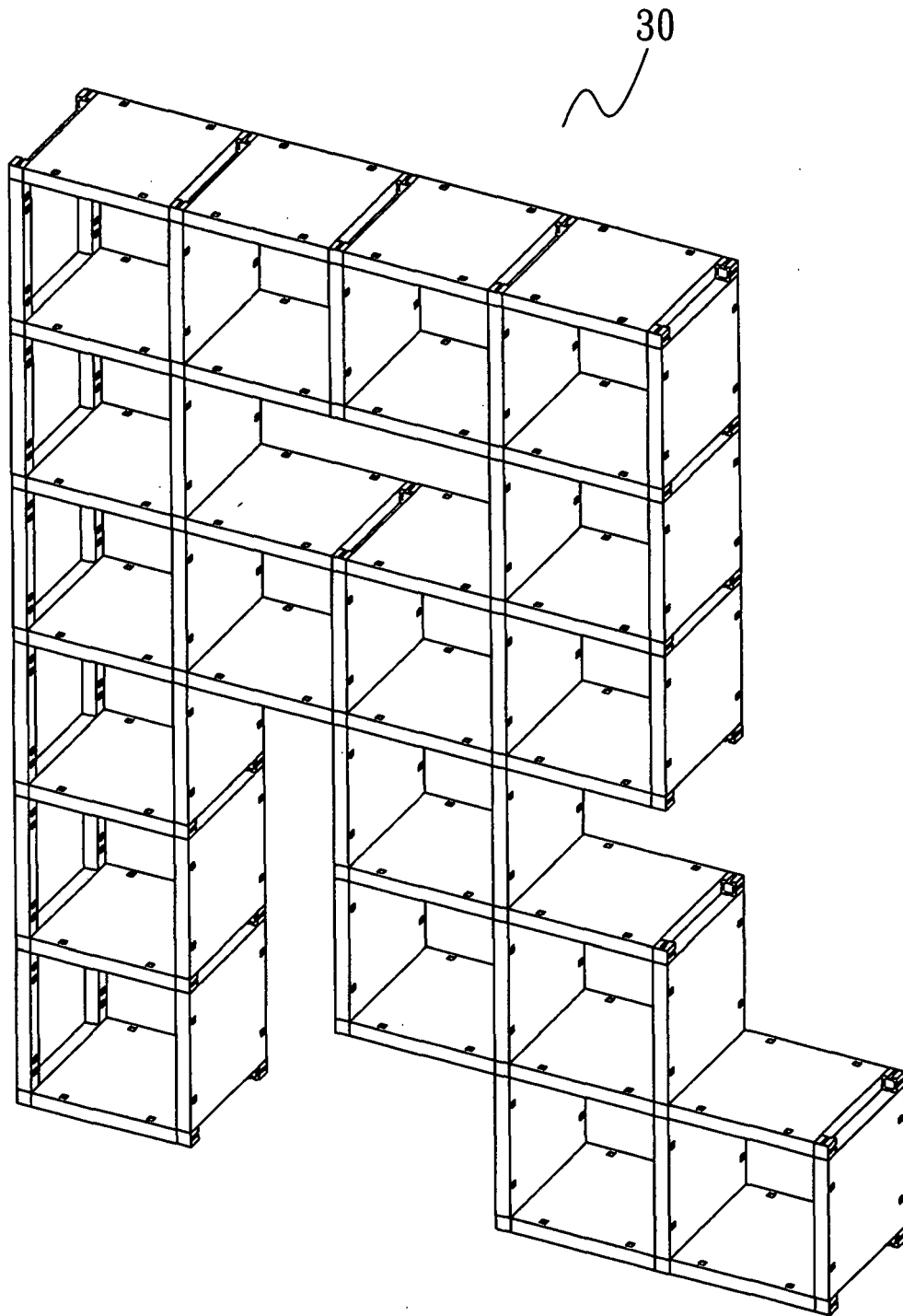


FIG. 15

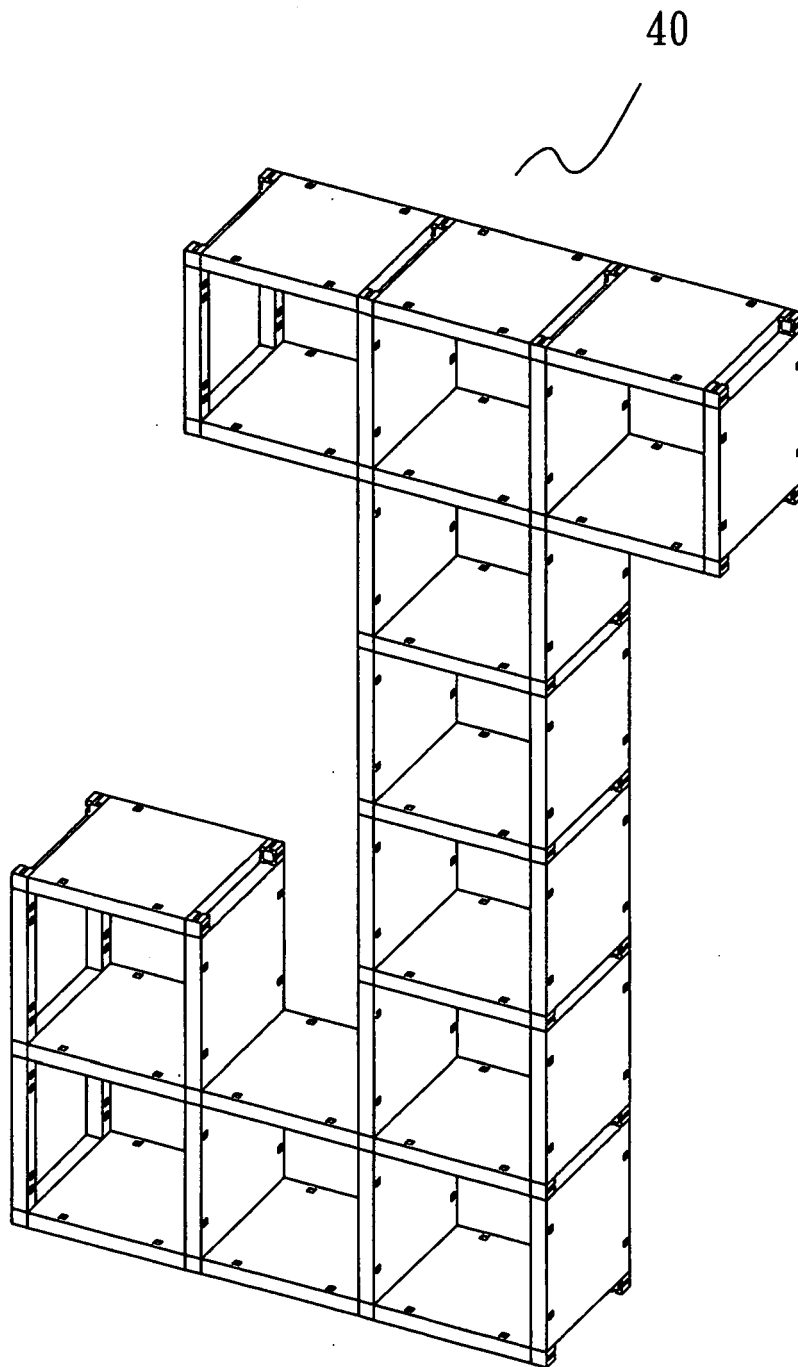


FIG. 16

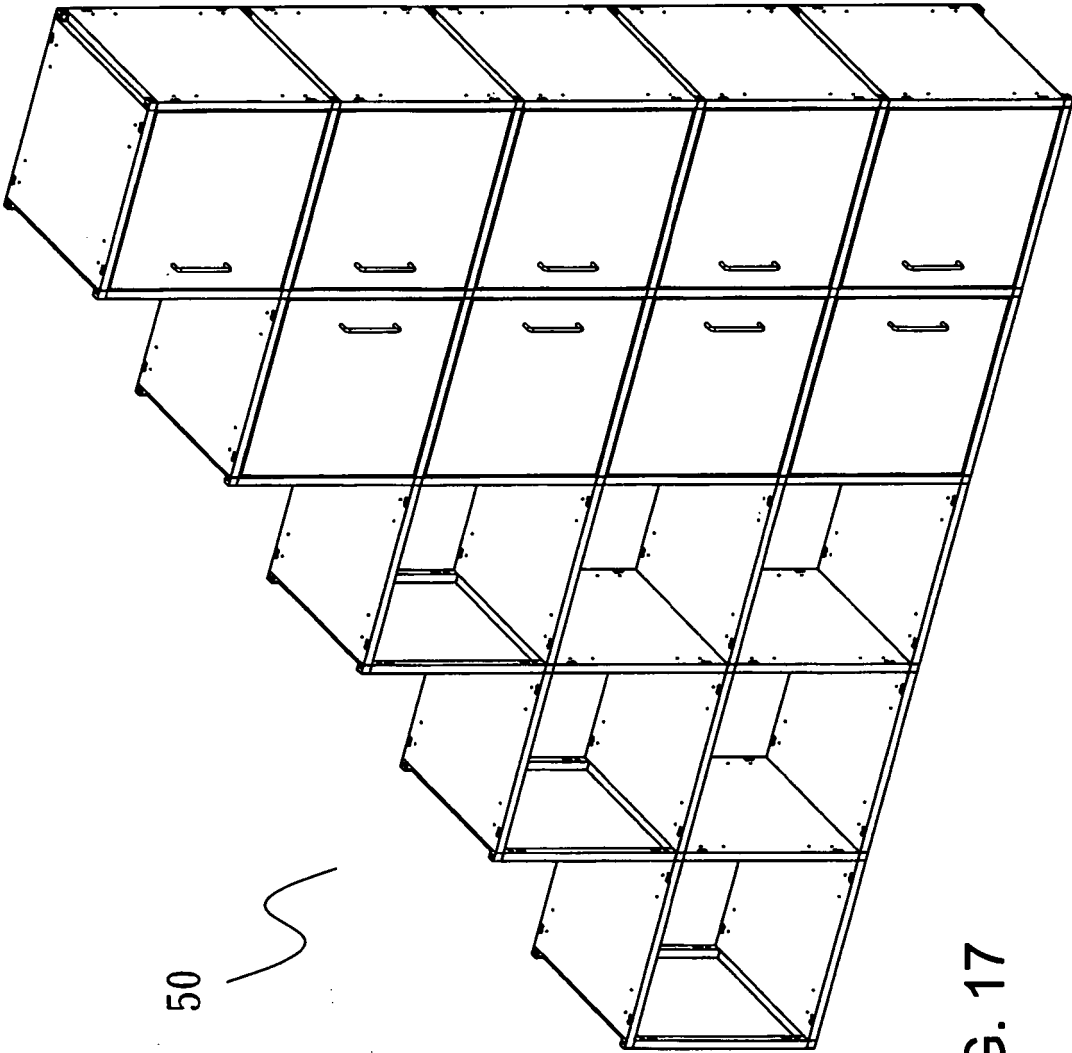


FIG. 17

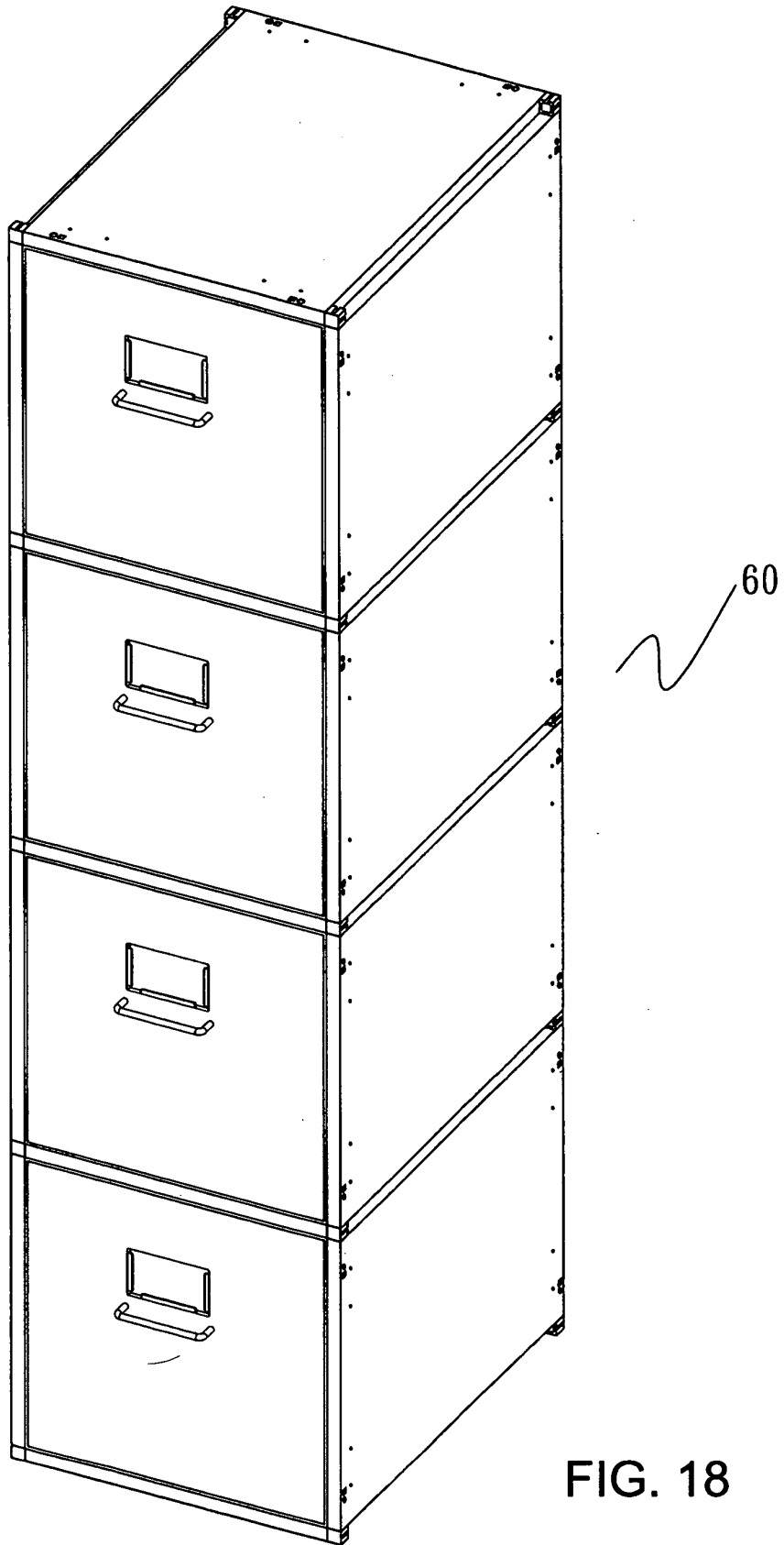


FIG. 18

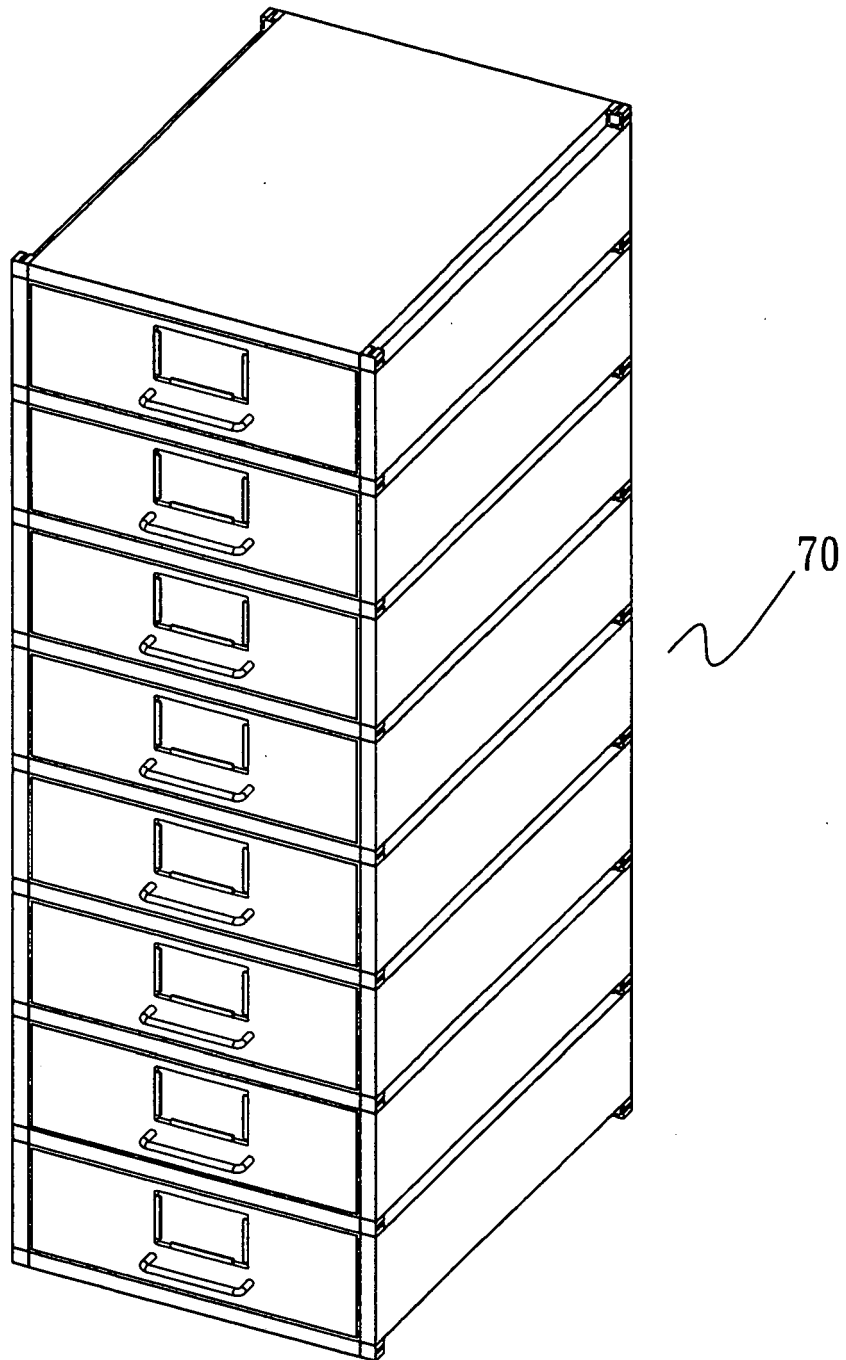


FIG. 19

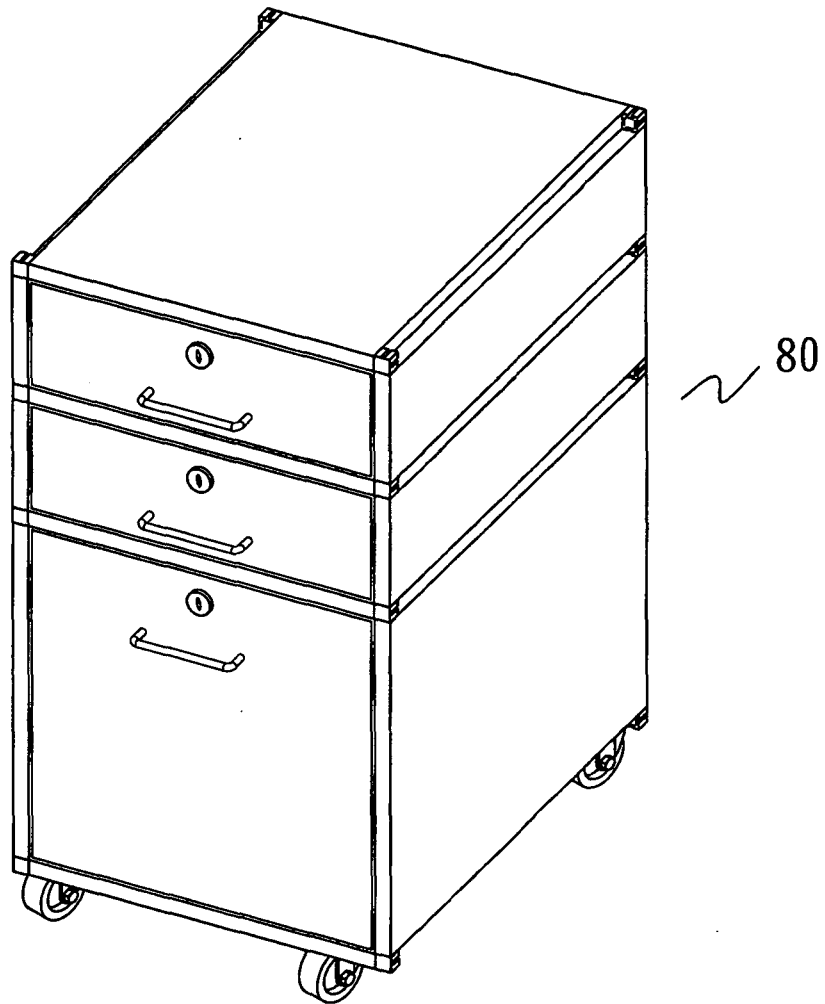


FIG. 20

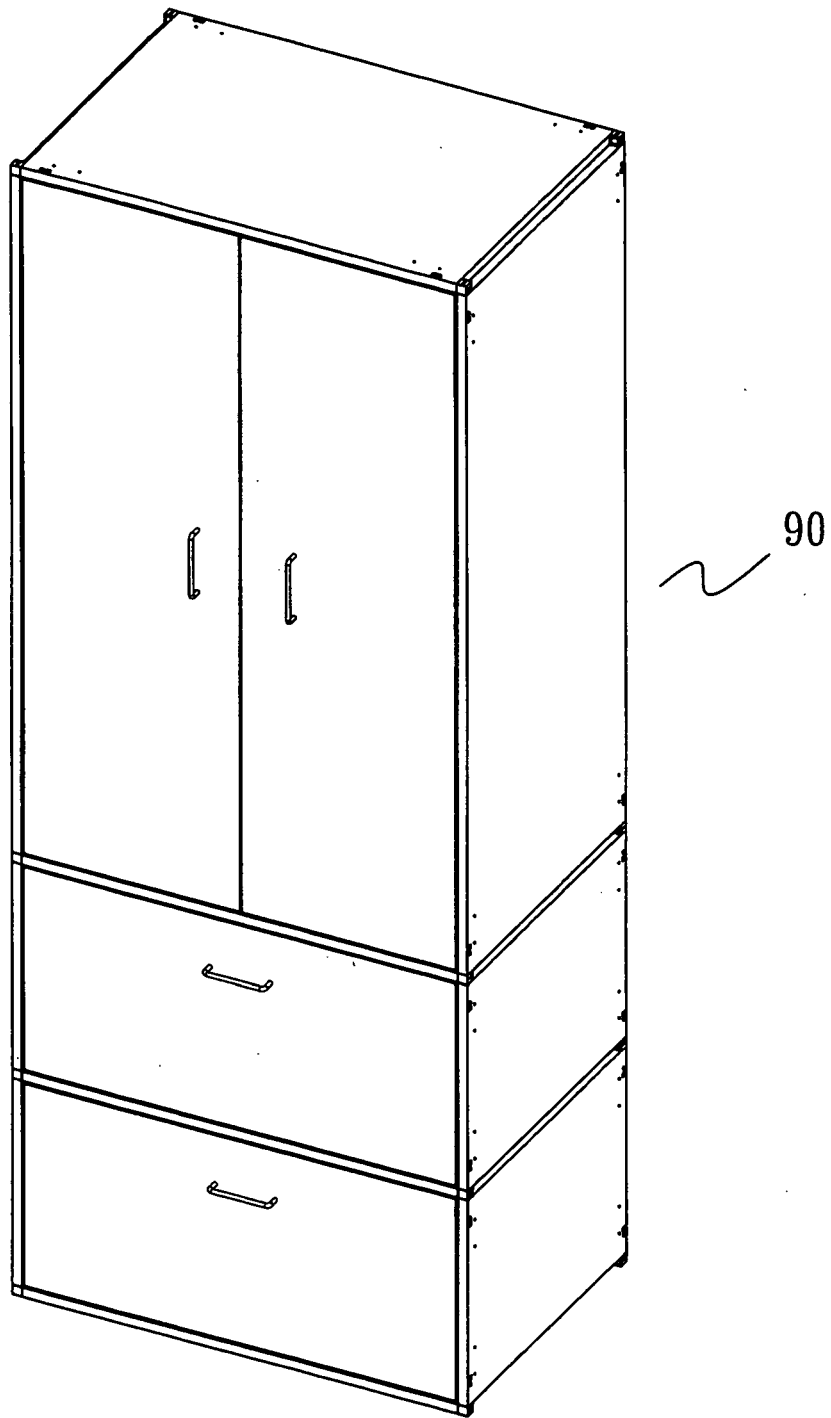


FIG. 21

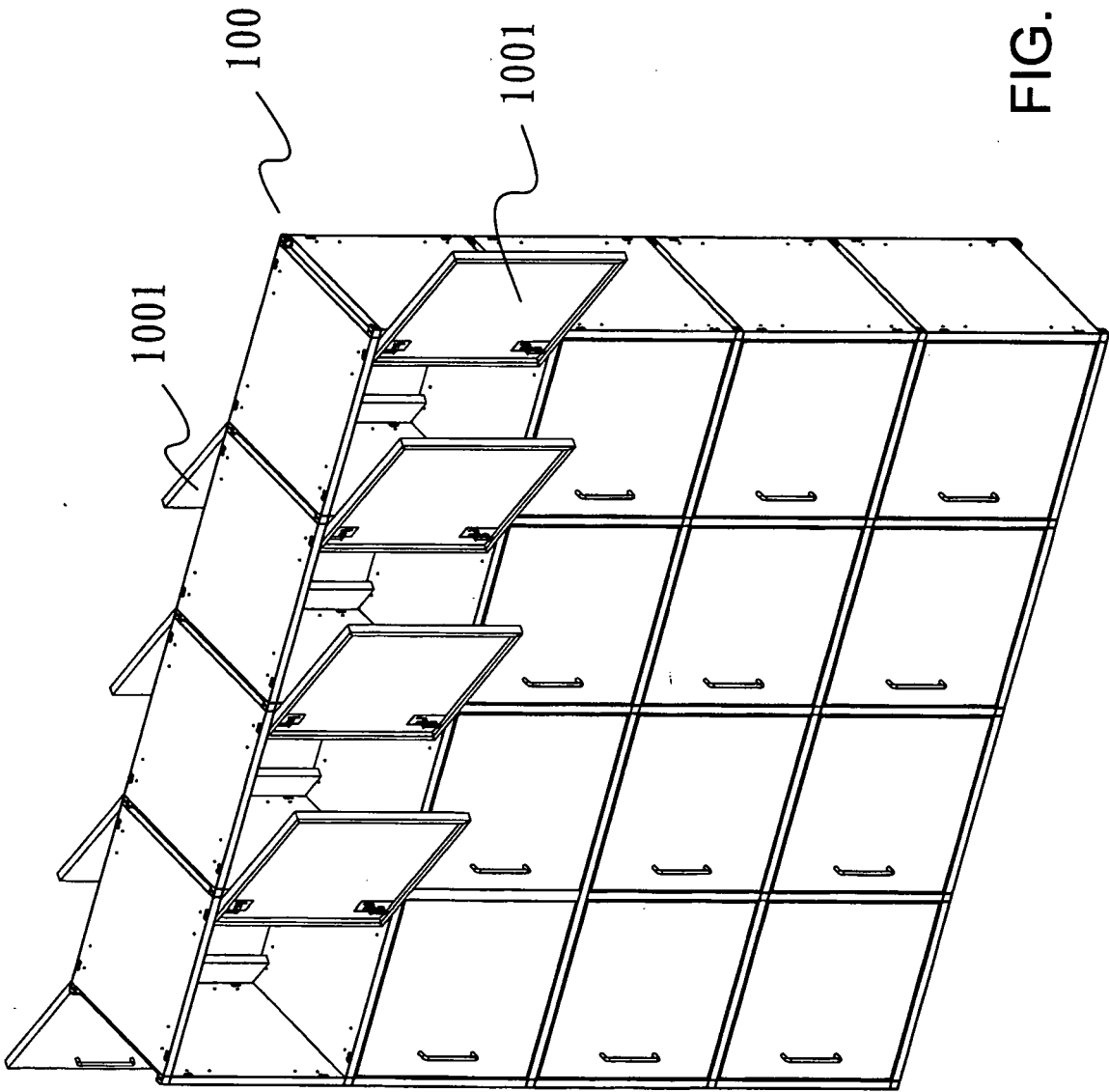


FIG. 22

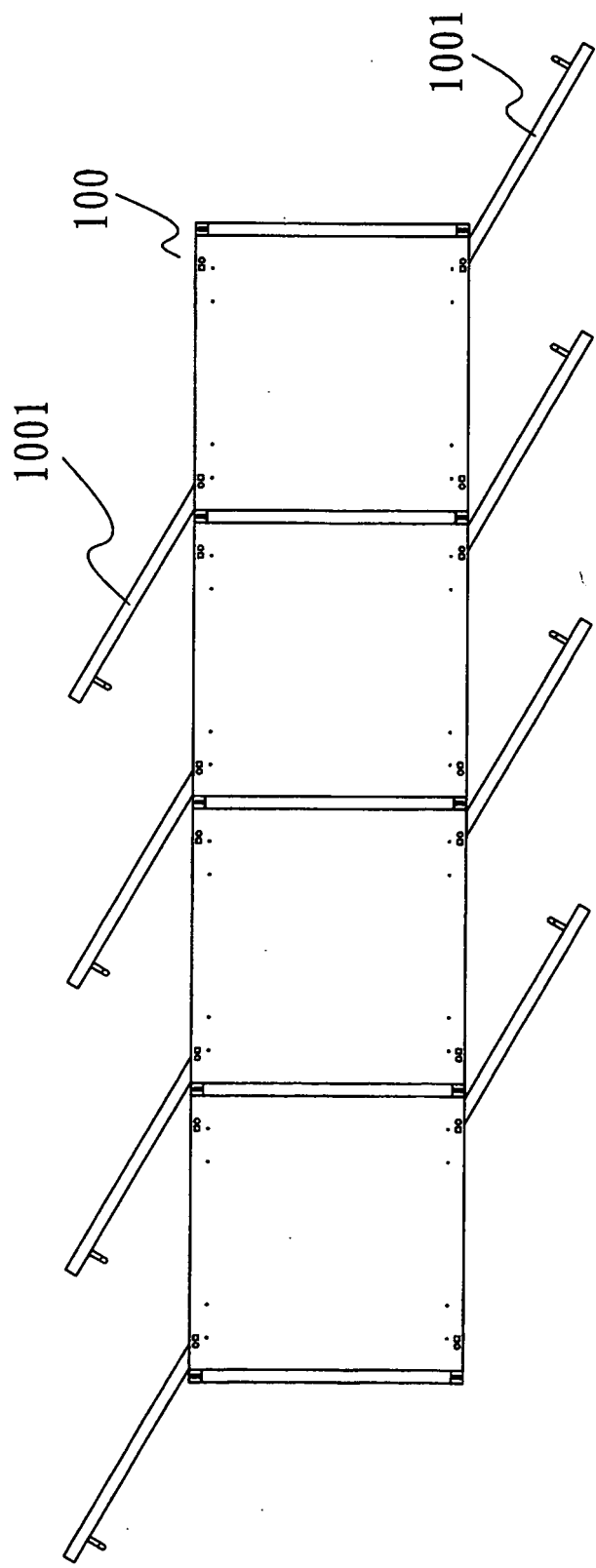
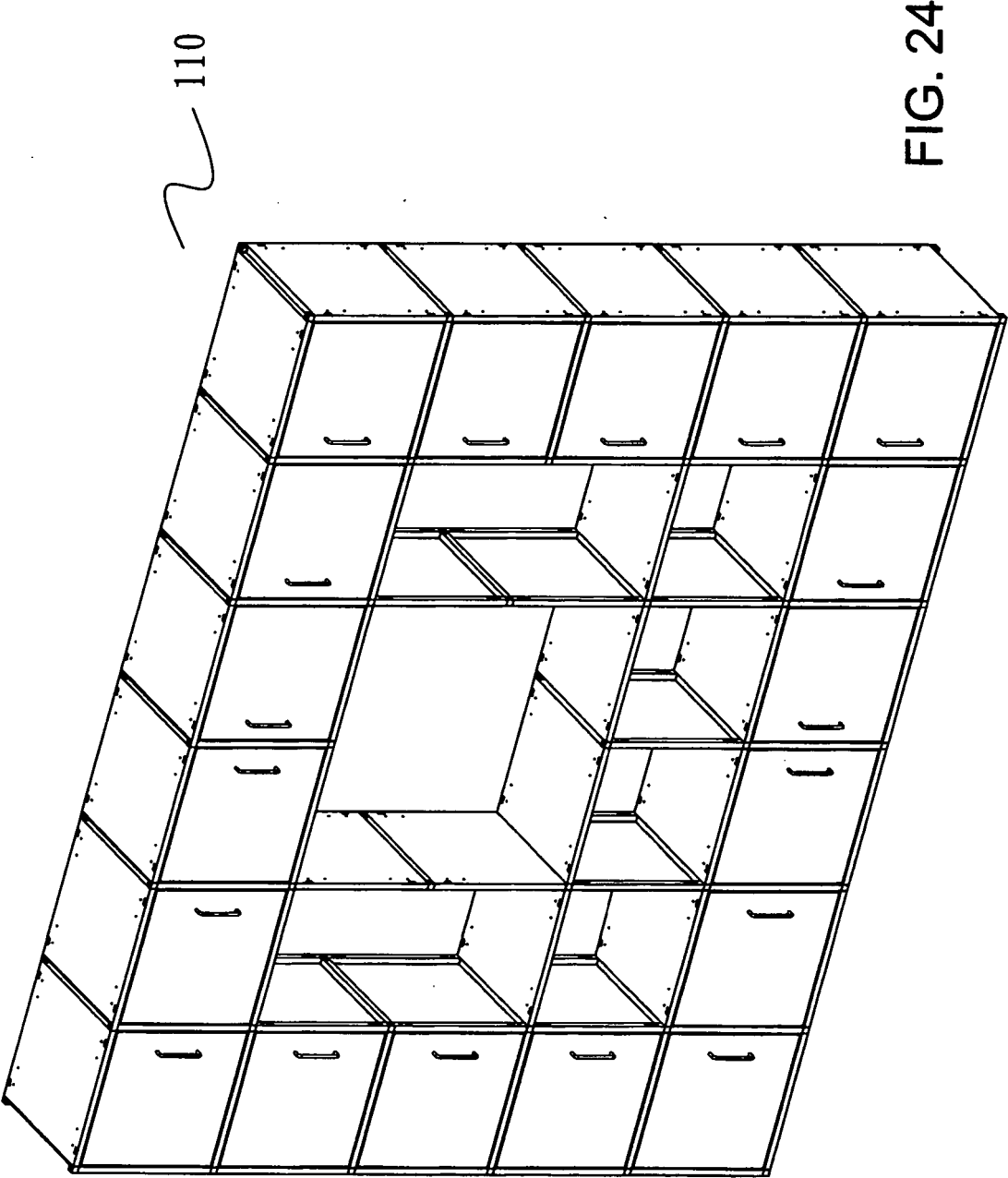


FIG. 23



REFERENCES CITED IN THE DESCRIPTION

This list of references cited by the applicant is for the reader's convenience only. It does not form part of the European patent document. Even though great care has been taken in compiling the references, errors or omissions cannot be excluded and the EPO disclaims all liability in this regard.

Patent documents cited in the description

- US 7014267 B1 [0003]
- US 20040222722 A1 [0003]
- US 20070132345 A1 [0003]
- US 5590974 A [0003]