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(54) **Foldable bookcases**

Faltbare Bücherregale

Bibliothèques pliables

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(73) Proprietor: **Haw Jou Enterprise Co., Ltd.**
Dah Tsuen Shiang
Chang hua Hsien (TW)

(72) Inventor: **Wu, Chieh-Ly**
Dah Tsuen Shiang
Chang Hua Hsien (TW)

(74) Representative: **Viering, Jentschura & Partner**
Postfach 22 14 43
80504 München (DE)

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Description

FIELD OF THE INVENTION

[0001] The present invention relates to a foldable bookcase which can be easily assembled and folded into a compact size.

BACKGROUND OF THE INVENTION

[0002] Conventional bookcases are made to be a one-piece structure which includes a top board, a bottom board, two sidewalls and one or two front doors. All of the parts are fixedly by nails (for wood boards) or by way of welding (for metal boards). The conventional bookcases are not convenient to be transported and occupy a lot of space which increases cost for the manufactures. As shown in Figs. 9 and 10, a conventional foldable bookcase 80 includes a front frame 81, a rear board 83, a foldable top board 85 and a foldable bottom board 86 both are connected between the front frame 81 and the rear board 83, two sidewalls 82 and two doors 84. Each of the top board 85 and the bottom board 86 is composed of two parts 87 which are pivotably connected to each other by pivots 871 and can be folded along the connection side located at a center of the top board 85 and the bottom board 86. The other side opposite to the connection side of each of the top board 85 and the bottom board 86 are pivotably connected to the front frame 81 and the rear board 83 by connection pieces 872. The two ends of each of the parts 87 include L-shaped engaging plates 88 which are connected to holes 821 of the sidewalls 82. Therefore, the bookcase 80 can be folded into a compact size by folding the top board 85 and the bottom board 86.

[0003] Nevertheless, the folding line, i.e. the connection side is exposed and can be seen from outside of the bookcase 80 and the engaging plates 88 need extra machining processes to be made on the parts 27 of the top board 85 and the bottom board 86. The engaging plates 88 protrude from the parts 27 and exposed so that the bookcase 80 cannot meet requirements of aesthetic purposes.

[0004] The present invention intends to provide a foldable bookcase wherein the top board, the bottom board and the two sidewalls can be folded relative to the front frame. Besides, the bookcase of the present invention has no folding lines and engaging plates can be seen from outside of the bookcase.

SUMMARY OF THE INVENTION

[0005] The present invention relates to a foldable bookcase that comprises a frame including a top side, a bottom side and two vertical sides connected between the top side and the bottom side. A top board has a first edge plate bent from a front side and two ends of the top board and a first connection portion is bent from a rear side of the top board. The front side of the top board is

pivotably connected to the top side of the frame by first pivotable members. A bottom board has a second edge plate bent from a front side and two ends of the bottom board, and a second connection portion is bent from a rear side of the bottom board. The front side of the bottom board is pivotably connected to the bottom side of the frame by second pivotable members. Two sidewalls each have a bent plate extending from a top side, a front side and a bottom side thereof. The two respective front sides of the two sidewalls are pivotably connected to the two vertical sides of the frame by third pivotable members. An L-shaped bent edge is defined in a rear side of each of the sidewalls. A rear board has an inward bent L-shaped connection portion on a top side thereof and an insertion extends from a bottom side and two vertical sides of the rear board. The L-shaped connection portion of the rear board is connected to the a first connection portion of the top board and the insertion on the bottom side and the two vertical sides of the rear board are respectively connected to the bottom side of the frame and the two L-shaped grooves of the two sidewalls.

[0006] The present invention will become more obvious from the following description when taken in connection with the accompanying drawings which show, for purposes of illustration only, a preferred embodiment in accordance with the present invention.

BRIEF DESCRIPTION OF THE DRAWINGS

[0007]

Fig. 1 is a perspective view to show the bookcase of the present invention;

Fig. 1-1 shows connection of the sidewall and the top board;

Fig. 2 is an exploded view to show the bookcase of the present invention;

Fig. 3 shows the folded status of the bookcase of the present invention;

Fig. 4 shows the top board and the bottom board are pivoted about the frame;

Fig. 5 shows the two sidewalls pivoted about the frame;

Fig. 6 shows the a top cross sectional view of the bookcase of the present invention;

Fig. 6-1 shows an enlarged cross sectional view of the connection of the rear board and the sidewall;

Fig. 7 shows the side cross sectional view of the bookcase of the present invention;

Fig. 8 shows the bookcase of the present invention equipped with two doors;

Fig. 9 is a perspective view of a conventional bookcase, and

Fig. 10 shows the folded status of the conventional bookcase.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

[0008] Referring to Figs. 1 to 5, the foldable bookcase of the present invention comprises a rectangular front frame 10 including four sides 11 which are a top side, a bottom side and two vertical sides connected between the top side and the bottom side. A top board 20 has a first edge plate 21 bent from a front side and two ends of the top board 20 and a first connection portion 23 is bent from a rear side of the top board 20. The front side of the top board 20 is pivotably connected to the top side of the frame 10 by three first pivotable members 60 and pins. At least one boss 22 extends from the first edge plate 21 on each of the two ends of the top board 20 and a first through hole 24 is defined through the first connection portion 23.

[0009] A bottom board 30 has a second edge plate 31 bent from a front side and two ends of the bottom board 30 and a second connection portion 32 is bent from a rear side of the bottom board 30. The front side of the bottom board 30 is pivotably connected to the bottom side of the frame 10 by three second pivotable members 60' and pins.

[0010] Two sidewalls 40 each have a bent plate 41 extending from a top side, a front side and a bottom side thereof. The two respective front sides of the two sidewalls 40 are pivotably connected to the two vertical sides of the frame 10 by two third pivotable members 600 and pins. An L-shaped bent edge 44 is defined in a rear side of each of the sidewalls 40 and includes a groove 43. The bent plate 41 on the top side of each of the sidewalls 40 includes a hole 42 so that the bosses 22 on the top board 20 are engaged with the holes 42 to connect the top board 20 to the two sidewalls 40 as shown in Figs. 1-1 and 7.

[0011] A rear board 50 has an inward bent L-shaped connection portion 51 on a top side thereof and an insertion 53 extends from a bottom side and two vertical sides of the rear board 50. The L-shaped connection portion 51 of the rear board 50 includes a second through hole 52 and the L-shaped connection portion 51 is connected to the a first connection portion 23 of the top board 20 by extending a bolt through the first and second through holes 24, 52. The insertion 53 on the bottom side and the two vertical sides of the rear board 50 are respectively connected to the bottom side of the frame 10 and the two grooves 43 of the two sidewalls 40 as shown in Figs. 6 and 6-1. Two stops 54 extend from an inside of the rear board 50 so as to stop two respective distal ends of the L-shaped bent edge 44 of the sidewalls 40 as shown in Figs. 6 and 6-1.

[0012] As shown in Fig. 8, the bookcase of the present invention may be equipped with two sliding doors 70 which are movably engaged with rails connected to the front frame 10.

[0013] The bookcase can be easily assembled and the two sidewalls 40 are quickly positioned relative to the top

board 20 by the bosses 22 and the holes 42. The top board 20, the bottom board 30 and the two sidewalls 40 are able to be pivoted relative to the frame 10 so as to become a thin combination which is benefit for storage and transportation. The pivotable members are not seen from outside of the bookcase so that the bookcase has smooth outer appearance.

[0014] While we have shown and described the embodiment in accordance with the present invention, it should be clear to those skilled in the art that further embodiments may be made without departing from the scope of the present invention.

Claims

1. A foldable bookcase comprising:

a frame including four sides which includes a top side, a bottom side and two vertical sides connected between the top side and the bottom side;

a top board having a first edge plate bent from a front side and two ends of the top board and a first connection portion bent from a rear side of the top board, the front side of the top board pivotably connected to the top side of the frame by first pivotable members;

a bottom board having a second edge plate bent from a front side and two ends of the bottom board and a second connection portion bent from a rear side of the bottom board, the front side of the bottom board pivotably connected to the bottom side of the frame by second pivotable members;

two sidewalls each having a bent plate extending from a top side, a front side and a bottom side thereof, the two respective front sides of the two sidewalls pivotably connected to the two vertical sides of the frame by third pivotable members, an L-shaped bent edge defined in a rear side of each of the sidewalls and including a groove, and

a rear board having an inward bent L-shaped connection portion on a top side thereof and an insertion extending from a bottom side and two vertical sides of the rear board, the L-shaped connection portion of the rear board connected to the a first connection portion of the top board and the insertion on the bottom side and the two vertical sides of the rear board respectively connected to the bottom side of the frame and the two grooves of the two sidewalls.

2. The bookcase as claimed in claim 1, wherein at least one boss extends from the first edge plate on each of the two ends of the top board and the bent plate on the top side of each of the sidewalls includes at

least one hole so that the bosses are engaged with the holes.

3. The bookcase as claimed in claim 1, wherein two stops extend from an inside of the rear board so as to stop two respective distal ends of the L-shaped bent edge of the sidewalls.
4. The bookcase as claimed in claim 1, wherein the inward bent L-shaped connection portion on the top side of the rear board is connected to the first connection portion bent from the rear side of the top board by a bolt.

Patentansprüche

1. Faltbarer Bücherkasten, aufweisend:

einen Rahmen, aufweisend: vier Seiten die aufweisen:

eine obere Seite, eine untere Seite und zwei zwischen der oberen Seite und der unteren Seite befestigte vertikale Seiten,

ein oberes Brett aufweisend: eine erste Kantenplatte, abgewinkelt von der Vorderseite und zwei Enden des oberen Bretts, und einen ersten Verbindungsabschnitt, abgewinkelt von der hinteren Seite des oberen Bretts, wobei die Vorderseite des oberen Bretts schwenkbar mit der oberen Seite des Rahmen mittels erster Drehelemente verbunden ist,

ein unteres Brett aufweisend: eine zweite Kantenplatte, abgewinkelt von der Vorderseite und zwei Enden des unteren Bretts, und einen zweiten Verbindungsabschnitt, abgewinkelt von der hinteren Seite des unteren Bretts, wobei die Vorderseite des unteren Bretts schwenkbar mit der Unterseite des Rahmen mittels zweiter Drehelemente verbunden ist,

zwei Seitenwände, jede aufweisend: eine abgewinkelte Kantenplatte, die sich von der Oberseite, der Vorder- und der Unterseite aus erstreckt, wobei die zwei jeweiligen Vorderseiten der zwei Seitenwänden schwenkbar mit den zwei Vertikalenseiten des Rahmens mittels eines dritten Verbindungselements verbunden sind, wobei ein L-förmiger abgewinkelter Rand jeweils in der Rückseite der Seitenwände definiert ist und eine Nut aufweist, und

ein Rückbrett, aufweisend: einen an seiner Oberseite nach innen abgewinkelten L-förmigen Verbindungsabschnitt und einen sich von der Unterseite und von zwei Vertikalenseiten des Rückbretts aus erstreckenden Eingriff, wobei der L-förmige Verbindungsabschnitt des

Rückbretts an den ersten Verbindungsabschnitt des oberen Bretts, und der Eingriff an der unteren Seite und die zwei Vertikalenseiten des Rückbretts an die untere Seite des Rahmens und die zwei Nuten der zwei Seitenwänden angeschlossen sind.

2. Bücherkasten nach Anspruch 1, wobei mindestens ein runder Vorsprung sich von der ersten Kantenplatte an jedem der zwei Enden des oberen Bretts aus erstreckt, und die abgewinkelte Kantenplatte an der oberen Seite der beiden Seitenwände mindestens ein Loch aufweist, so dass die Vorsprünge mit den Löchern in Eingriff sind.

3. Bücherkasten nach Anspruch 1, wobei zwei Stopper sich von der Innenseite des Rückbretts aus erstrecken zum Stoppen der zwei distalen Enden des abgewinkelten L-förmigen Rands der jeweiligen Seitenwände.

4. Bücherkasten nach Anspruch 1, wobei der an der oberen Seite des Rückbretts nach innen abgewinkelte L-förmige Verbindungsabschnitt mit dem an der hinteren Seite des oberen Bretts abgewinkelten ersten Verbindungsabschnitt mittels eines Bolzen verbunden ist.

Revendications

1. Bibliothèque pliable comprenant :

un cadre comprenant quatre côtés qui comprend un côté supérieur, un côté inférieur et deux côtés verticaux reliés entre le côté supérieur et le côté inférieur ;

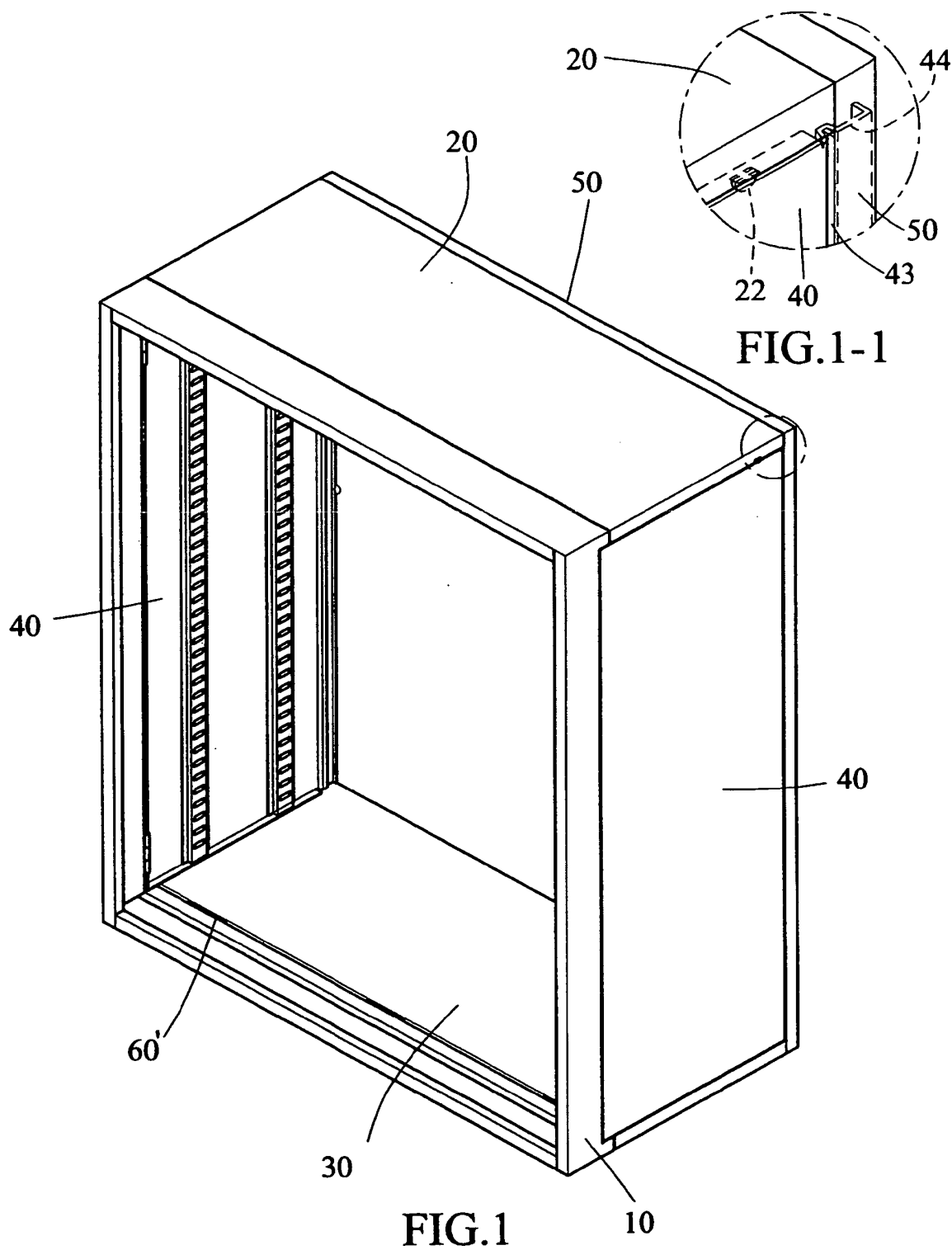
une planche supérieure ayant une première plaque de bord pliée à partir d'un côté avant et deux extrémités de la planche supérieure et une première partie de raccordement pliée à partir d'un côté arrière de la planche supérieure, le côté avant de la planche supérieure étant relié à pivotement au côté supérieur du cadre par des premiers éléments pivotables ;

une planche inférieure ayant une deuxième plaque de bord pliée à partir d'un côté avant et deux extrémités de la planche inférieure et une deuxième partie de raccordement pliée à partir d'un côté arrière de la planche inférieure, le côté avant de la planche inférieure étant relié à pivotement au côté inférieur du cadre par des deuxième éléments pivotables ;

deux parois latérales ayant chacune une plaque pliée s'étendant à partir d'un côté supérieur, un côté avant et un côté inférieur de celle-ci, les deux côtés avant respectifs des deux parois latérales étant reliés à pivotement aux deux côtés

verticaux du cadre par des troisième éléments pivotables, un bord plié en forme de L étant défini dans un côté arrière de chacune des parois latérales et comprenant une rainure, et une planche arrière ayant une partie de raccordement en forme de L pliée vers l'intérieur sur un côté supérieur de celle-ci et une insertion s'étendant à partir d'un côté inférieur et deux côtés verticaux de la planche arrière, la partie de raccordement en forme de L de la planche arrière étant reliée à la première partie de raccordement de la planche supérieure et l'insertion sur le côté inférieur et les deux côtés verticaux de la planche arrière étant reliés respectivement au côté inférieur du cadre et aux deux rainures des deux parois latérales.

2. Bibliothèque selon la revendication 1, dans laquelle au moins un bossage s'étend à partir d'une première plaque de bord sur chacune des deux extrémités de la planche supérieure et la plaque pliée sur le côté supérieur de chacune des parois latérales comprend au moins un trou de sorte que les bossages soient introduits dans les trous.
3. Bibliothèque selon la revendication 1, dans laquelle deux butées s'étendent à partir d'une partie intérieure de la planche arrière afin d'arrêter deux extrémités distales respectives du bord plié en forme de L des parois latérales.
4. Bibliothèque selon la revendication 1, dans laquelle la partie de raccordement en forme de L pliée vers l'intérieur sur le côté supérieur de la planche arrière est reliée à la première partie de raccordement pliée à partir du côté arrière de la planche supérieure par un boulon.



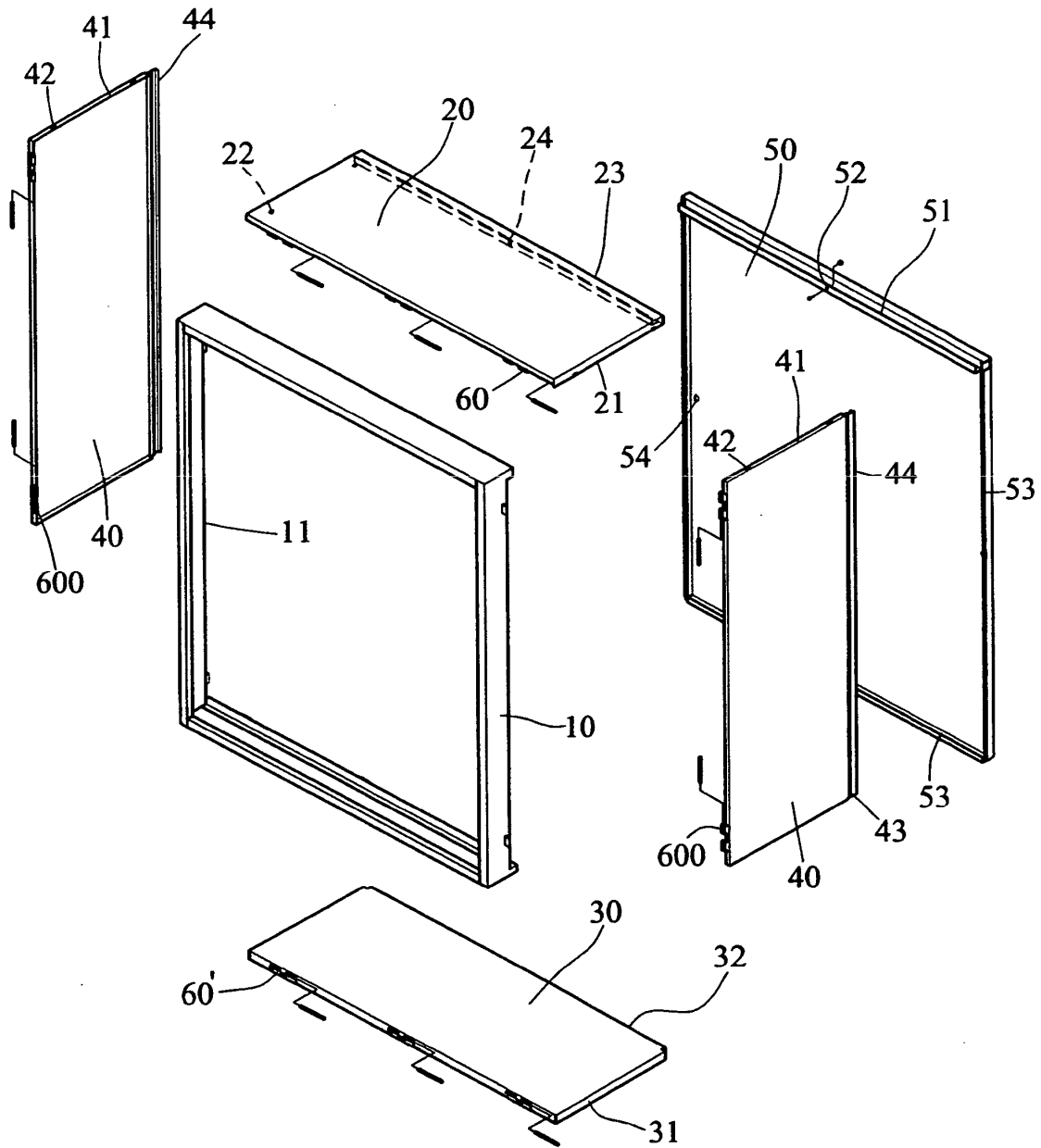


FIG.2

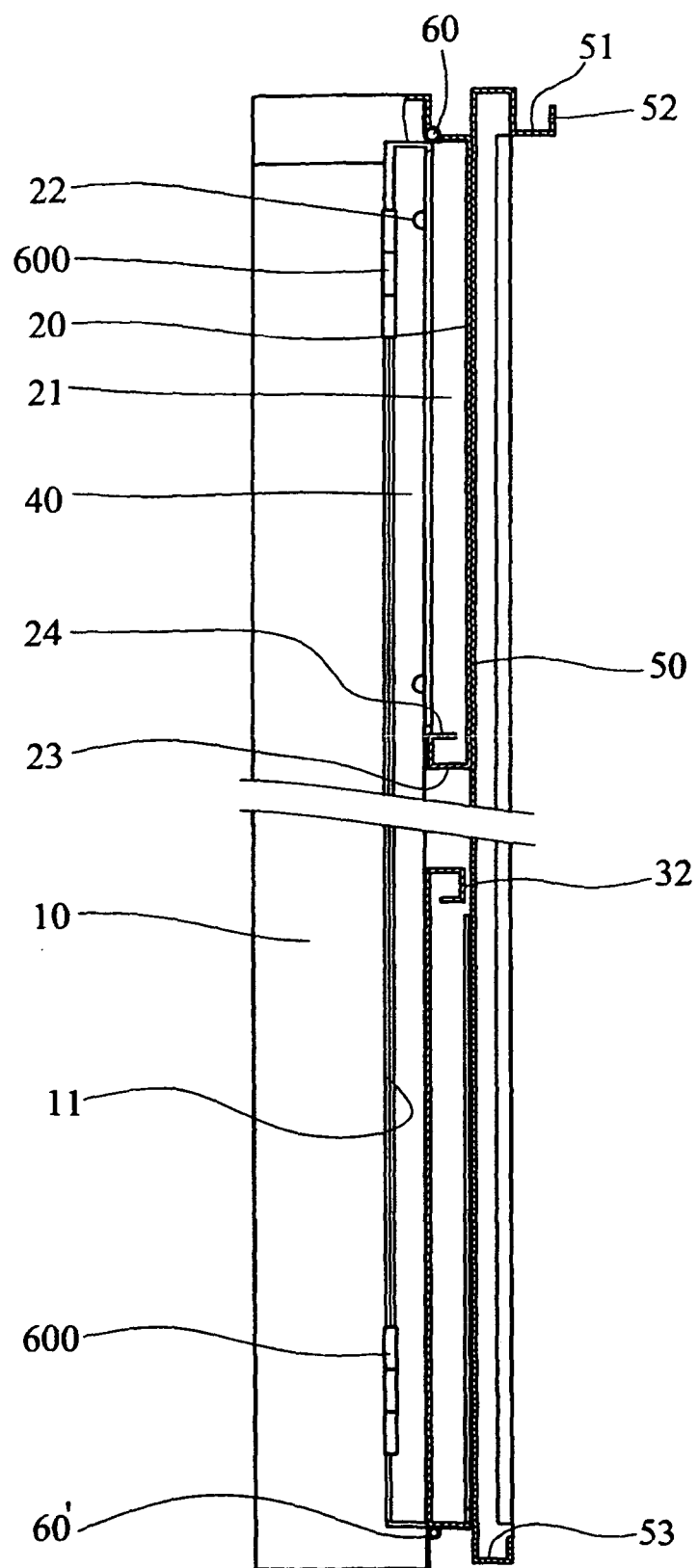


FIG.3

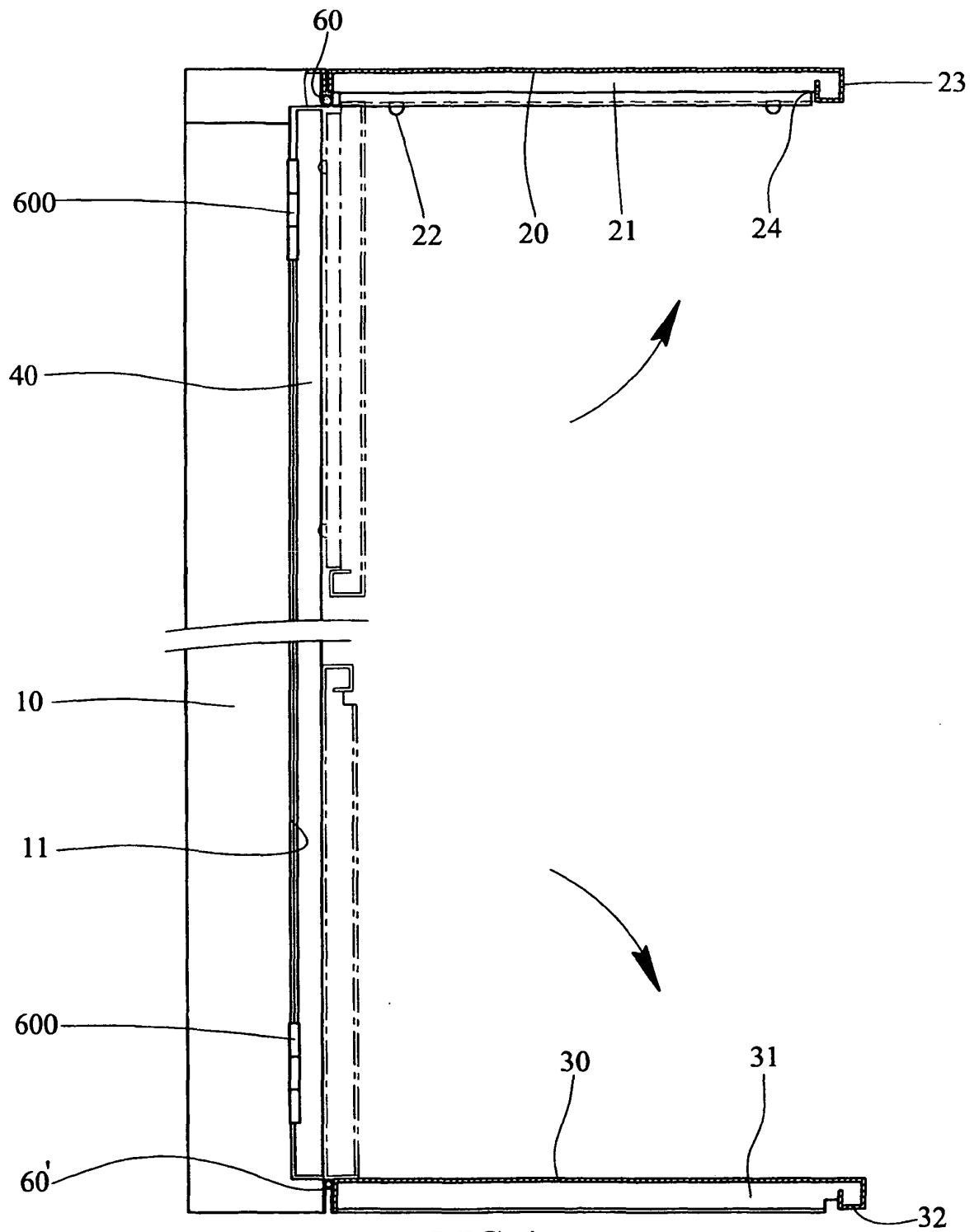


FIG.4

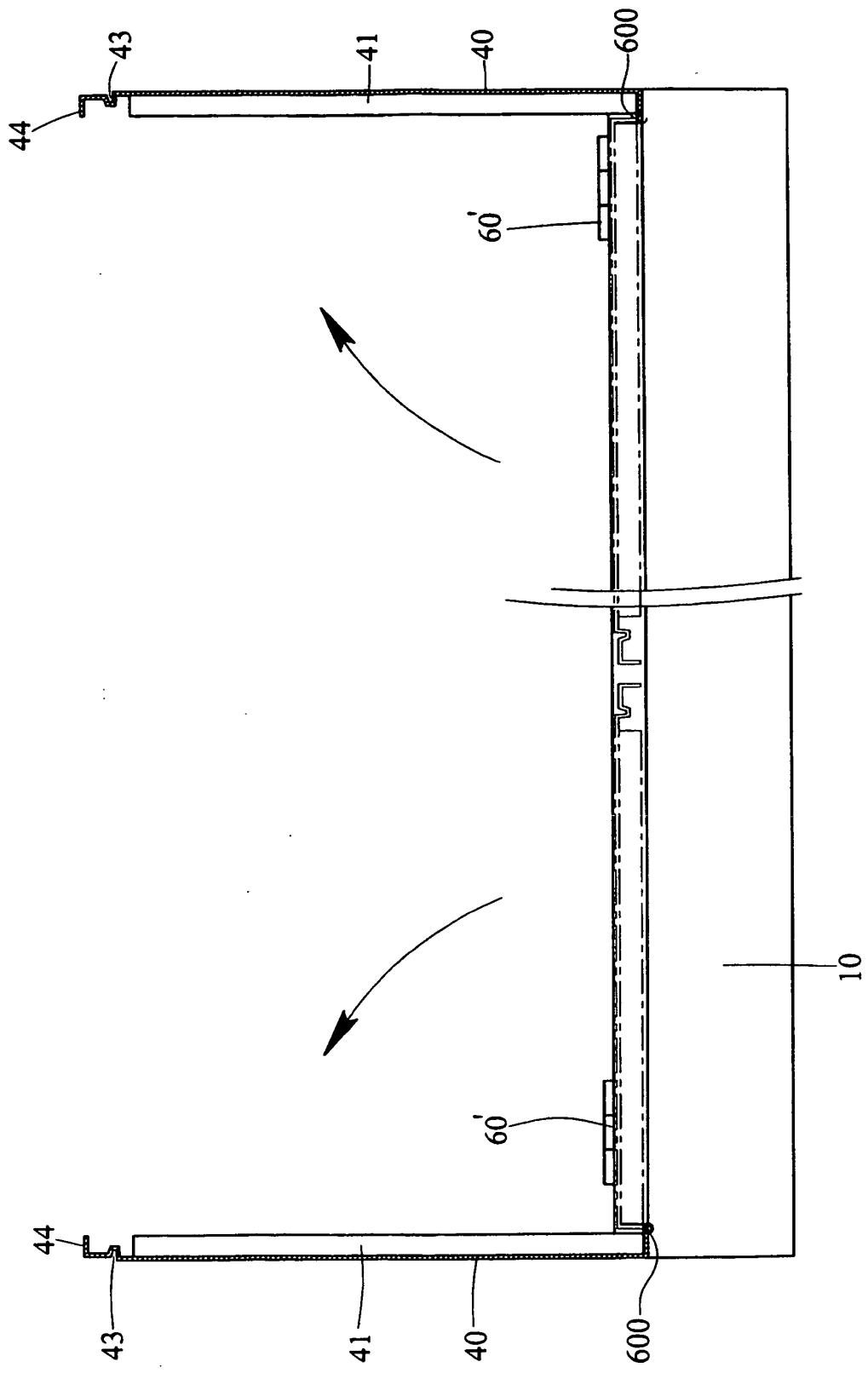


FIG.5

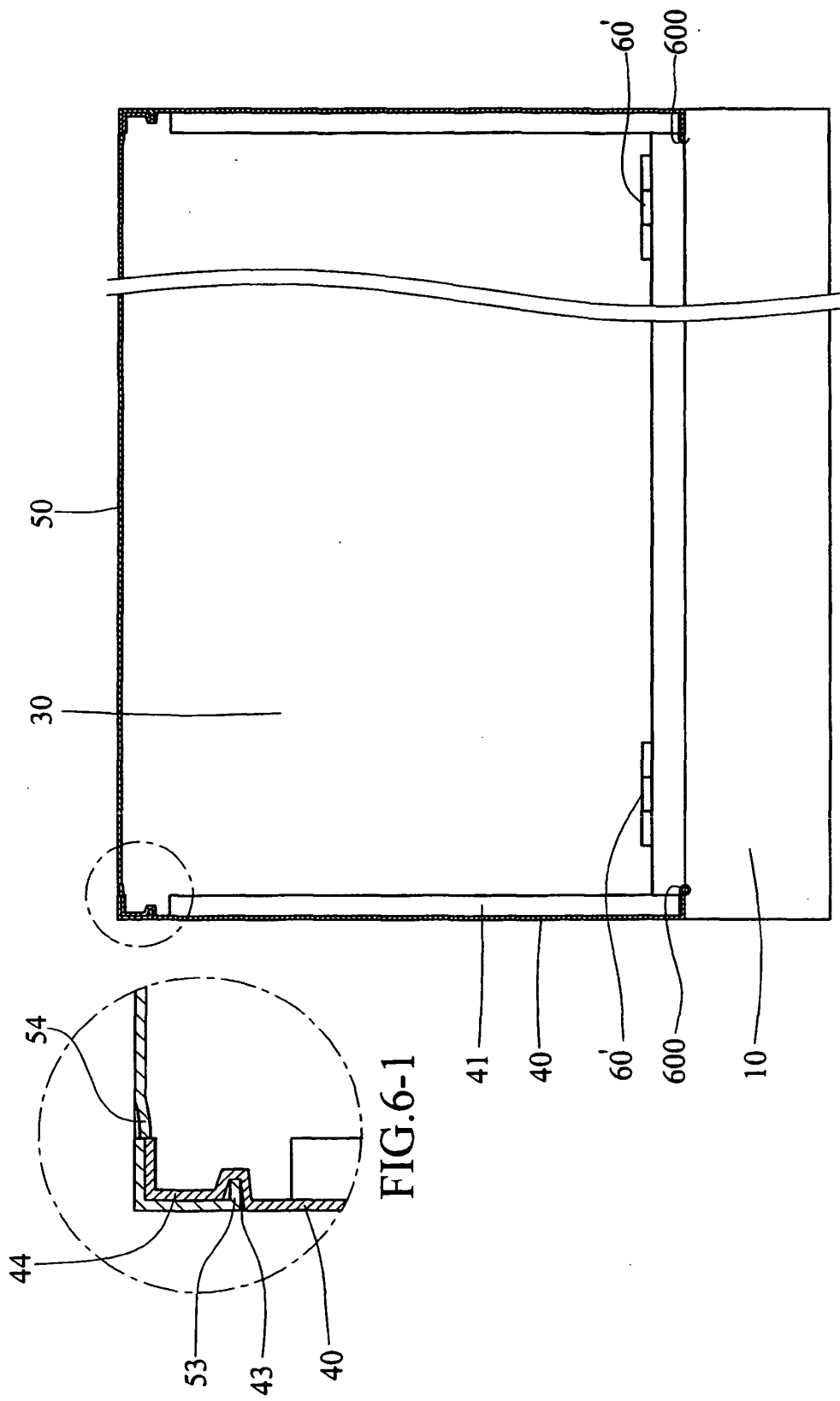


FIG.6

FIG.6-1

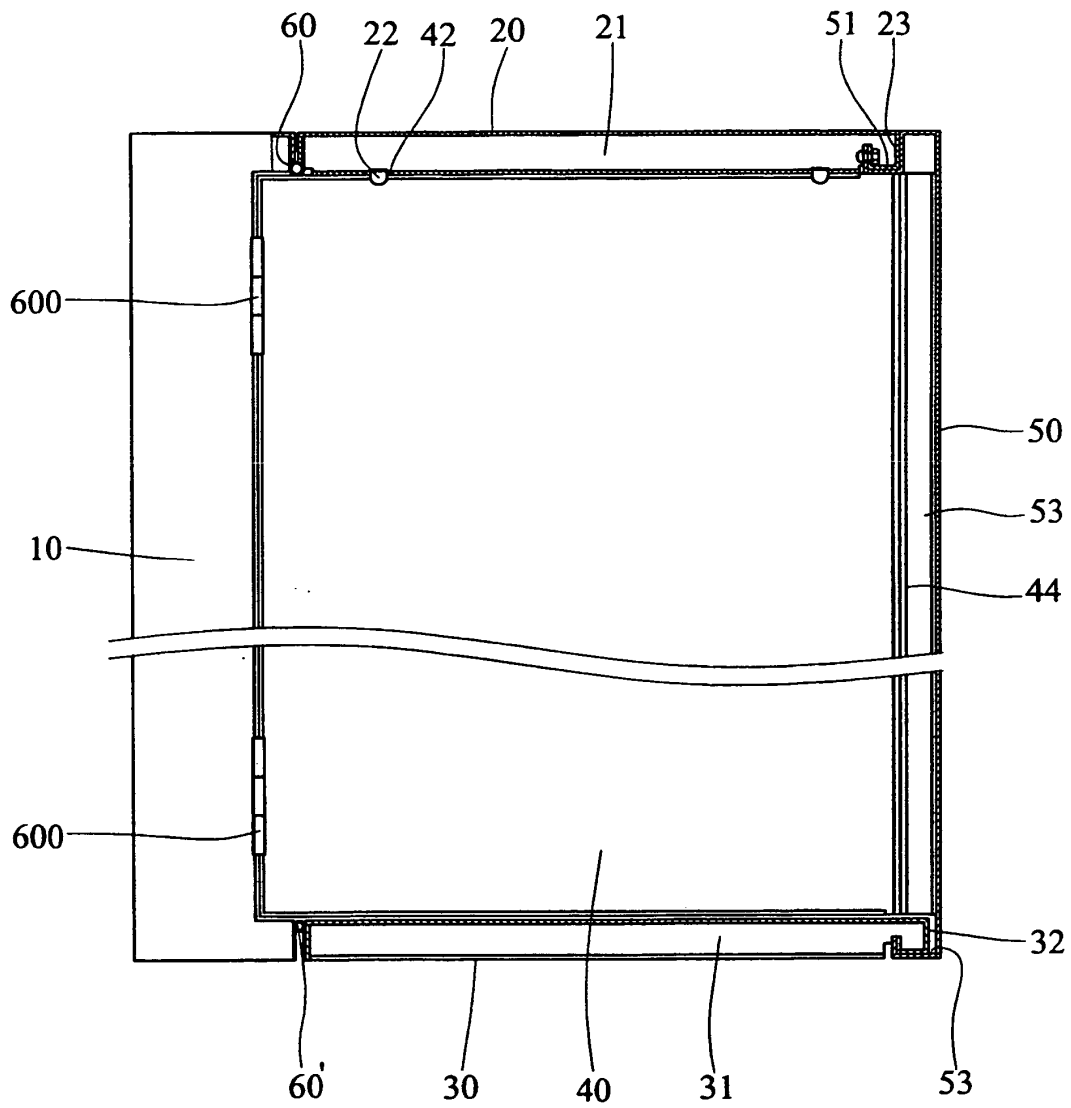


FIG.7

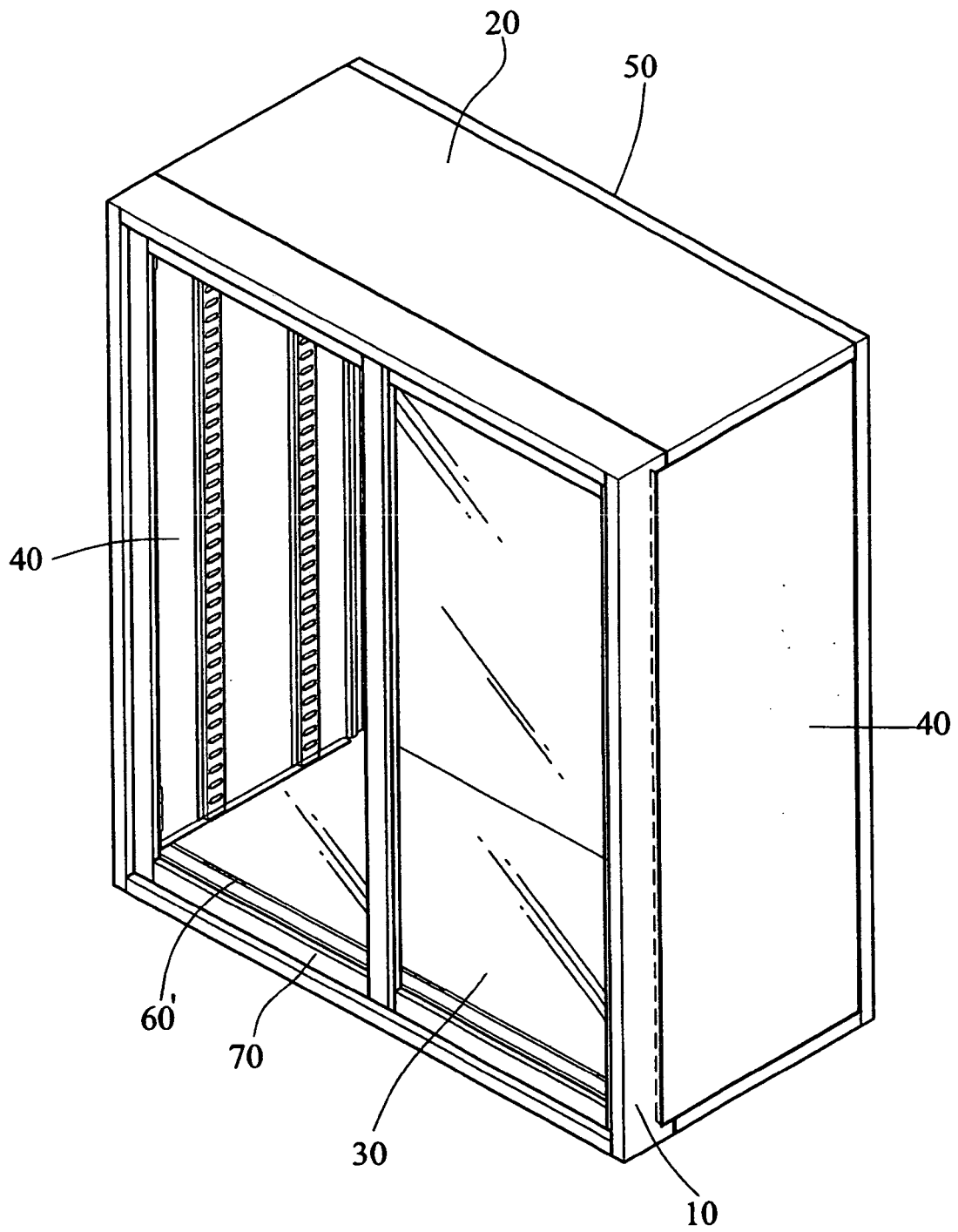
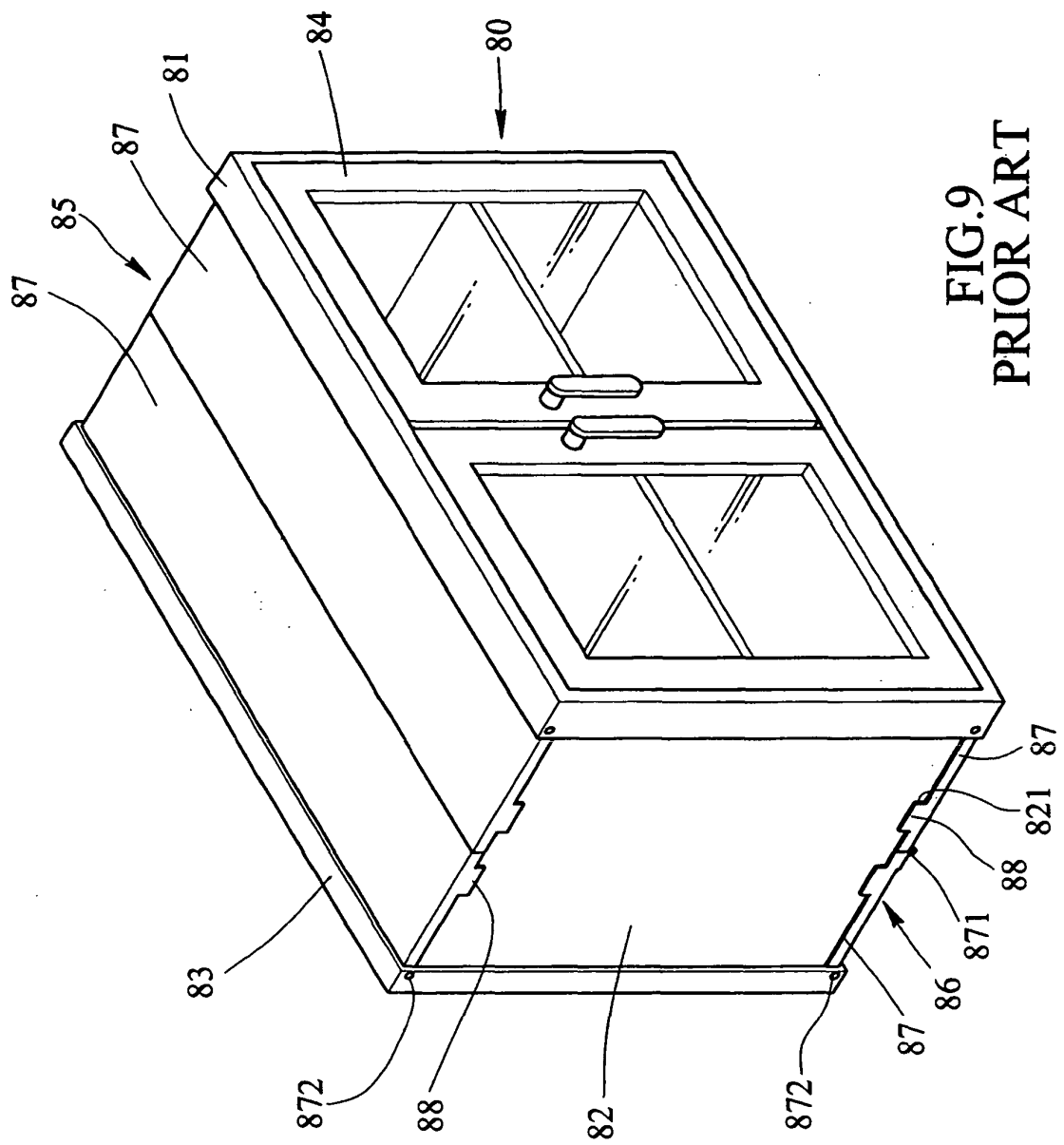


FIG.8



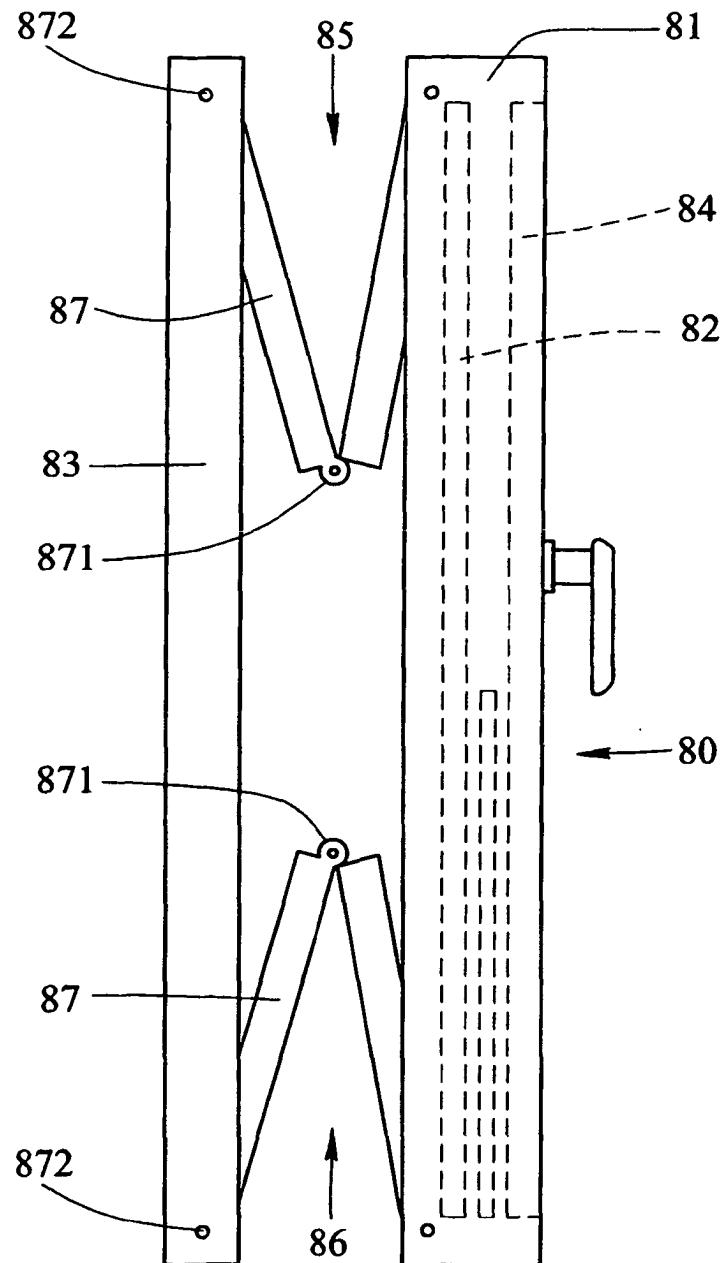


FIG.10
PRIOR ART