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(54) Combination shelf structure

(57) A combination shelf structure has a design of combining storage partition layers (20) and support rods (10) of a combination shelf. The support rods (10) are installed at a right angle with the storage partition layers (20), and two support rods (10) are installed into two upper and lower insert slots (12, 13) with an interval apart from one another. Upper and lower embedding plates (23, 24) are formed on both sides of each corner position of a frame of the storage partition layer (20) respectively by a hollow stamping process, such that the embedding plate and the frame are situated on the same plane, and the storage partition layer (20) can be combined securely and easily by using the embedding plate of the frame and the insert slot of the support rod (10). In addition, the storage partitions and the insert slots (12, 13) of the support rod (10) can be rearranged with appropriate installation elements to achieve a different shape of the shelf.

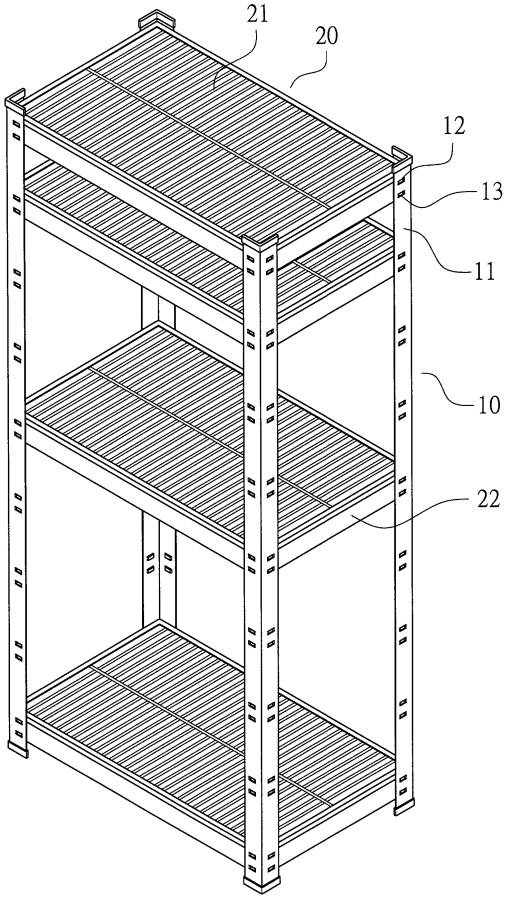

FIG. 1

EP 2 286 691 A1

Description

BACKGROUND OF THE INVENTION

Field of the Invention

[0001] The present invention relates to a combination shelf structure, in particular to a design of a combination shelf structure that combines storage partition layers with support rods, and uses an embedding plate installed at each corner position of a frame of the storage partition layer together with an insert slot formed at a position corresponding to the support rod to embed and fix the storage partition layers with the support rods securely.

Description of the Related Art

[0002] In general, a combination shelf usually comes with a structural design comprising a plurality of support rods and a predetermined number of storage partition layers. To combine the storage partition layers with the support rods, bolt holes are formed at predetermined positions of the support rods, such that bolts can be used for securing the storage partition layers, or support elements for latching and positioning the storage partition layers, so as to complete assembling the shelf.

[0003] However, the way of connecting the support rods and the storage partition layers of the aforementioned combination shelf still has the following drawbacks. If the support rods and the storage partition layers are connected directly by bolts, then the weight of stored objects is concentrated at locking positions of the bolts to result in an insufficient structural strength or fail to support a heavy weight, and thus the application of the shelf is limited. If a support element is used for latching and positioning the storage partition layer, then it is difficult to maintain a secured connection between the storage partition layer and the support rod, and both of them may be shaken or loosened easily, and thus such arrangement affects the overall applicability.

Summary of the Invention

[0004] In view of the aforementioned shortcomings of the conventional combination shelf, the inventor of the present invention based on years of experience in the related industry to conduct extensive researches and experiments, and finally designed and developed a combination shelf in accordance with the present invention to overcome the shortcomings of the prior art.

[0005] Therefore, it is a primary objective of the present invention to provide a combination shelf that embeds the storage partition layers with the support rods to achieve a secured connection and prevent the storage partition layers and the support rods from being loosened and shaken, so as to enhance the applicability of the combination shelf.

[0006] Another objective of the present invention is to provide a structural design for achieving a secured connection between a storage partition layer and a support rod to enhance the strength of carrying a weight for storing heavy objects and improving the overall applicability of the combination shelf.

[0007] A further objective of the present invention is to provide a structural design capable of installing an additional auxiliary support frame at a predetermined position of the storage partition layer to enhance the strength of carrying a weight, if needed, and store objects on the shelf in a more flexible and practical way.

[0008] To achieve the foregoing objectives, the structural design of the present invention comprises a support rod installed at a right angle, and two support rods are installed into two upper and lower insert slots with an interval apart from one another. Upper and lower embedding plates are formed on both sides of each corner position of a frame of the storage partition layer respectively by a hollow stamping process, such that the embedding plate and the frame are situated on the same plane, and the storage partition layer can be combined securely and easily by using the embedding plate of the frame and the insert slot of the support rod. In addition, the storage partitions and the insert slots of the support rod can be rearranged with appropriate installation elements to achieve a different shape of the shelf and provide a more flexible and diversified application of the shelf.

BRIEF DESCRIPTION OF THE DRAWINGS

[0009]

FIG. 1 is a perspective view of a combination shelf structure in accordance with a preferred embodiment of the present invention;

FIG. 2 is a schematic view of a portion of a combination shelf structure in accordance with a first preferred embodiment of the present invention;

FIG. 3 is a schematic view of a partial structure of a frame of a storage partition layer in accordance with a first preferred embodiment of the present invention;

FIG. 4 is an exploded view of a partial structure of a first preferred embodiment of the present invention;

FIG. 5 is a schematic view of a structural relation of a first preferred embodiment of the present invention;

FIG. 6 is a schematic view of an application in accordance with a first preferred embodiment of the present invention;

FIG. 7 is a perspective view of a combination shelf structure in accordance with a second preferred embodiment of the present invention;

FIG. 8 is a schematic view of an auxiliary support rod structure in accordance with a second preferred embodiment of the present invention;

FIG. 9 is a schematic view of an auxiliary support rod structure before it is inserted into and connected to a storage partition layer in accordance with a second preferred embodiment of the present invention; and

FIG. 10 is a schematic view of an auxiliary support rod structure after it is inserted into and connected to a storage partition layer in accordance with a second preferred embodiment of the present invention.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

[0010] The structure, assembly, technical characteristics and effects of the present invention will become apparent with the detailed description of preferred embodiment together with related drawings as follows:

With reference to FIGS. 1 to 6 for a first preferred embodiment of the present invention, FIG. 1 shows a perspective view of a combination shelf structure, FIGS. 2 and 3 show schematic views of a portion of a combination shelf structure, FIG. 4 shows an exploded view of a portion of a combination shelf structure, FIG. 5 shows a schematic view of the connection of a combination shelf, and FIG. 6 shows a schematic view of an application of a combination shelf. The structural design of the combination shelf in accordance with the first preferred embodiment of the invention comprises four support rods 10 and a predetermined number of storage partition layers 20 embedded with each other.

[0011] The plurality of support rods 10 are L-shaped plate-rods formed by stamping a metal sheet, and each support rod 10 has a pair of protruding insert slots 12, 13 formed at a predetermined number of horizontal levels of a combining plate 11 on each side of the support rod 10, and the insert slots 12, 13 are formed integrally by stamping the combining plate 11, and two insert slots 12, 13 at each horizontal level are formed at upper and lower positions and protruded towards an internal side of the combining plate 11, such that the insert slots 12, 13 at a multiple of horizontal levels can be used for flexibly adjusting the number of storage partition layers 20 and the interval between two storage partition layers 20 according to the requirements of storing different objects. The plurality of storage partition layers 20 can be in a form of a grid net or a slab. The grid net shaped storage partition layer 20 as shown in the figure is formed by a mesh plate 21 and a frame 22, wherein a pair of embedding plates 23, 24 are formed on each side of four corner positions of the frame 22 respectively, and the embedding plates 23, 24 are installed at upper and lower positions, such that a U-shaped hollow hole 25 is formed on a side of the upper embedding plate 23 of the frame 22 by a hollow stamping process, and a notch 26 is formed on the lower embedding plate 24 by a stamping process, such that the embedding plates 23, 24 correspond to the two insert slots 12, 13 of the support rod 10 precisely, and the embedding plates 23, 24 and the frame 22 are situated on a same plane, and both embedding plates 23, 24 have a length A greater than the depth C of the insert slots 12, 13 of the support rod 10, and an interval B between the bottom of the embedding plate 23 and the bottom of the hollow hole 25 is greater than the depth C of the insert slots 12, 13 of the support rod 10, so that the insert slots 12, 13 of the support rod 10 can be passed through the hollow hole 25 of storage partition layer 20 successfully and provided for embedding and combining the embedding plate 23, 24. With the aforementioned structural design, the upper and lower insert slots 12, 13 of the support rod 10 are provided, such that when the embedding plates 23, 24 of the storage partition layer 20 and the insert slots 12, 13 of the support rod 10 are embedded and combined with each other, dual upper and lower fixations can be achieved. In addition, the positions of the embedding plates 23, 24 and the insert slots 12, 13 on each side are predetermined to maintain a secured overall connection, and the weight of objects placed on the shelf can be shared uniformly without a risk of being shaken or loosened. With a plurality of sets of insert slots 12, 13 formed on the support rods 10, a user can selectively insert a stop plate 30 between two adjacent support rods 10 by using the insert slots 12, 13 according to the required condition of storing objects to prevent the objects from toppling or falling down and reinforce the structure. The user also can adjust the storage partition layers to meet the requirement of storing different objects or insert a support element 40 into the insert slot 12 at the same horizontal level of each support rod 10 to provide a secured support to each of the corner positions of the storage partition 20'. Therefore, the combination shelf of the present invention can provide a more flexible and practical application.

[0012] With reference to FIGS. 7 and 8 for schematic views of a combination shelf structure and FIGS. 9 and 10 for schematic views of a structural relation of a combination shelf in accordance with a second preferred embodiment of the present invention respectively, the inwardly protruded insert slots of the support rod 10 together with the embedding plates at the corner positions of the storage partition frame 22 are provided for achieving a quick and secured combination. If the size of the storage partition frame 22 is larger or a glass plate (not shown in the figure) is installed, then the user can install an auxiliary support frame 50 transversally or longitudinally into one or more pairs of inwardly protruded insert slots 27 at predetermined positions on two opposite sideboards of the frame 22 to enhance the structural strength of the storage-layer plate 20, wherein the auxiliary support

frame 50 is formed by stamping a metal sheet and includes a lower step section 51 with a height different disposed separately on both ends of the auxiliary support frame 50, and an embedding plate 52 formed by folding a distal edge downward. The height difference of the lower step section 51 is provided for avoiding an upper labial plate of the frame 22, such that the auxiliary support frame 50 and the frame 22 can be installed successfully. After the embedding plates 52 are embedded into the predetermined insert slots 27 on the sideboard of the frame 22, the top of the auxiliary support frame 22 is level with the top of the frame 22 to achieve the effects of reinforcing the support of the partition installed above and improving the weight bearing capability, so as to enhance the stability and safety of storing objects on the shelf.

[0013] In summation of the description above, the present invention combines the support rods and the storage partition layers of the combination shelf by using pairs of insert slots formed at upper and lower positions and having a predetermined interval between two combining plates of the support rod together with an embedding plate formed at each corner position of the storage partition layer by a stamping process, such that the support rod and the storage partition layer can be embedded and combined with each other in quick and simple way. In addition, the upper and lower positions of the insert slots are provided for assuring a secured connection without the issue of being loosened or shaken, so as to overcome the shortcomings of the prior art. With the insert slots, users can add storage partition layer frames and auxiliary support frames as well as stop plates and support elements to provide a more flexible and practical application of the combination shelf.

[0014] The present invention improves the prior art and complies with the patent application requirements, and thus is duly filed for patent application. While the invention has been described by means of specific embodiments, numerous modifications and variations could be made thereto by those skilled in the art without departing from the scope and spirit of the invention set forth in the claims.

Claims

1. A combination shelf structure, comprising a plurality of support rods (10) and a predetermined number of storage partition layers (20) engaged with each other, wherein:

   the plurality of support rods (10) are L-shaped plate-rods, each having a pair of protruding insert slots (12, 13) formed at a predetermined number of horizontal levels respectively on each side of the support rod (10), and every two insert slots (12, 13) at each horizontal level are formed at upper and lower positions, and protruded towards an internal side of the combining plate (11);

   the plurality of storage partition layers (20), each having a pair of embedding plates (23, 24) disposed at predetermined positions on each side of four corner positions of the frame, and the embedding plates (23, 24) are installed at upper and lower positions, such that the embedding plates (23, 24) correspond to the two insert slots (12, 13) of the support rod (10) precisely, and the embedding plates (23, 24) are situated on a same plane of the frame (22);

   thereby, the insert slot (12, 13) of the combining plate (11) of the support rod (10) is provided for embedding and combining the embedding plate (23, 24) of the frame (22) of the storage partition layer (20) to achieve a secured connection between the support rod (10) and the storage partition layer (20).

2. The combination shelf structure of claim 1, wherein the upper embedding plate (23) of the frame (22) of the storage partition layer (20) has a U-shaped hollow hole (25) formed on a side of the frame by a hollow stamping process, and the lower embedding plate (24) has a notch (26) formed by a stamping process, such that the embedding plate (23, 24) has a length A greater than the depth C of the insert slot (12, 13) of the support rod (10), and an interval B between the lower edge of the upper embedding plate (23) and the lower edge of the hollow hole (25) is greater than the depth C of the insert slot (12, 13) of the support rod (10), and the insert slot (12, 13) of the support rod (10) can be passed successfully into the hollow hole (25) of the storage partition layer (20) for embedding and combining the embedding plate (23).

3. The combination shelf structure of claim 1, wherein the insert slot (12, 13) of the support frame is selectively inserted into a stop plate (30) for stopping and limiting a position of placing an object on the storage partition layer (20), preventing the object from toppling or falling down, and reinforcing the shelf structure.

4. The combination shelf structure of claim 1, wherein the insert slot of the support frame is selectively inserted into a support element (40) for placing the storage partition layer (20).

5. The combination shelf structure of claim 1, wherein the frame of the storage partition layer (20) includes one or more pairs of inwardly protruded insert slots formed at predetermined positions on both sides of the frame for inserting and installing an auxiliary support frame (50) and achieving the effects of enhancing a support effect and increasing a supporting capability.

6. The combination shelf structure of claim 1, wherein the frame of the storage partition layer (20) includes one or more pairs of inwardly protruded insert slots (27) formed on two opposite side plates for inserting and installing an auxiliary support frame (50), and the auxiliary support frame (50) include a lower step section (51) with a height difference formed separately at both ends of the auxiliary support frame (50), and an embedding plate (52) formed by downwardly extending and folding a distal end of the auxiliary support frame (50), so that a height difference of the lower step section can be used for avoiding an upper labial plate of the frame to complete inserting and combining the auxiliary support frame (50) with the frame, and maintain the top of the auxiliary support frame (50) in level with the top of the frame, so as to enhance a stable support effect to a partition layer there above.

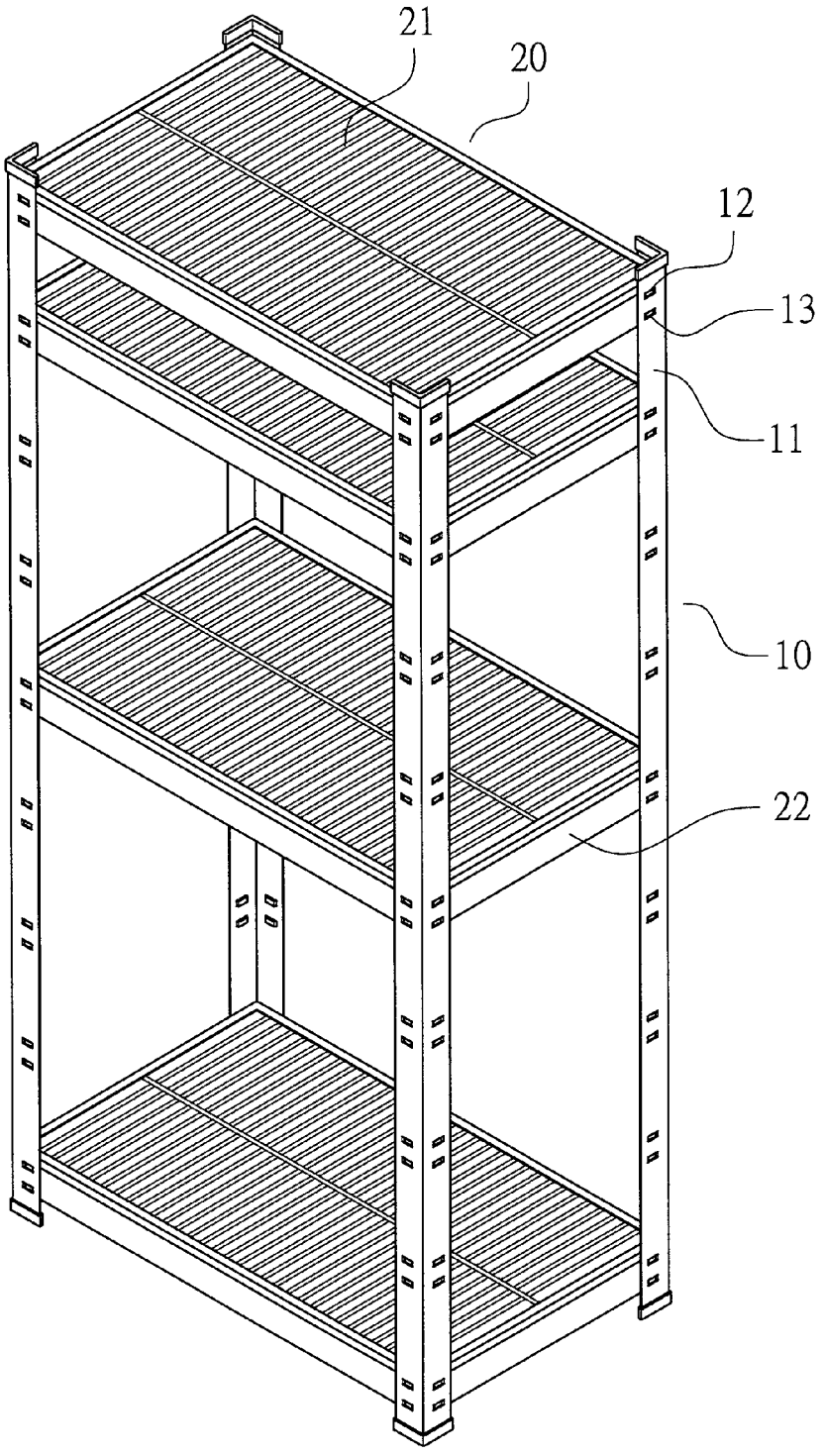

FIG. 1

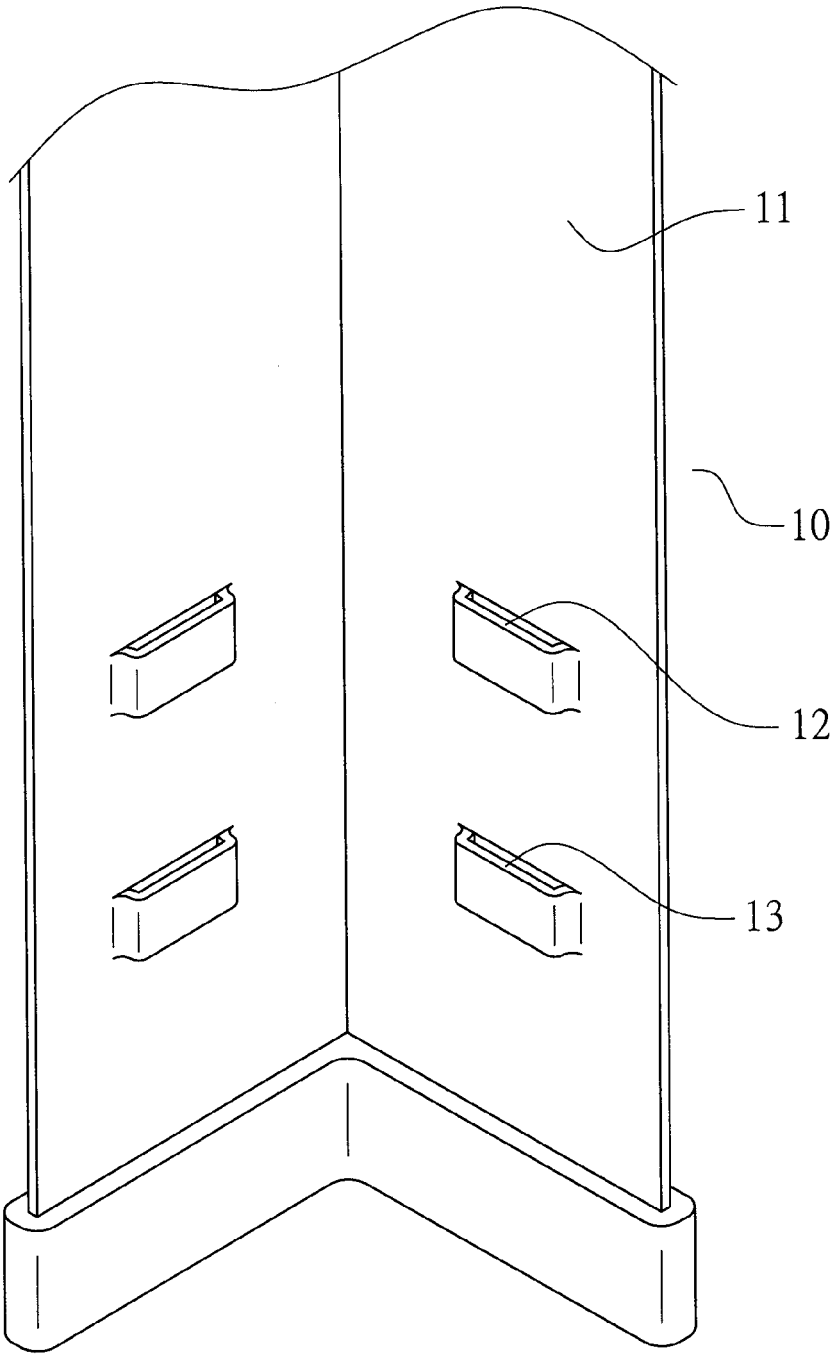

FIG. 2

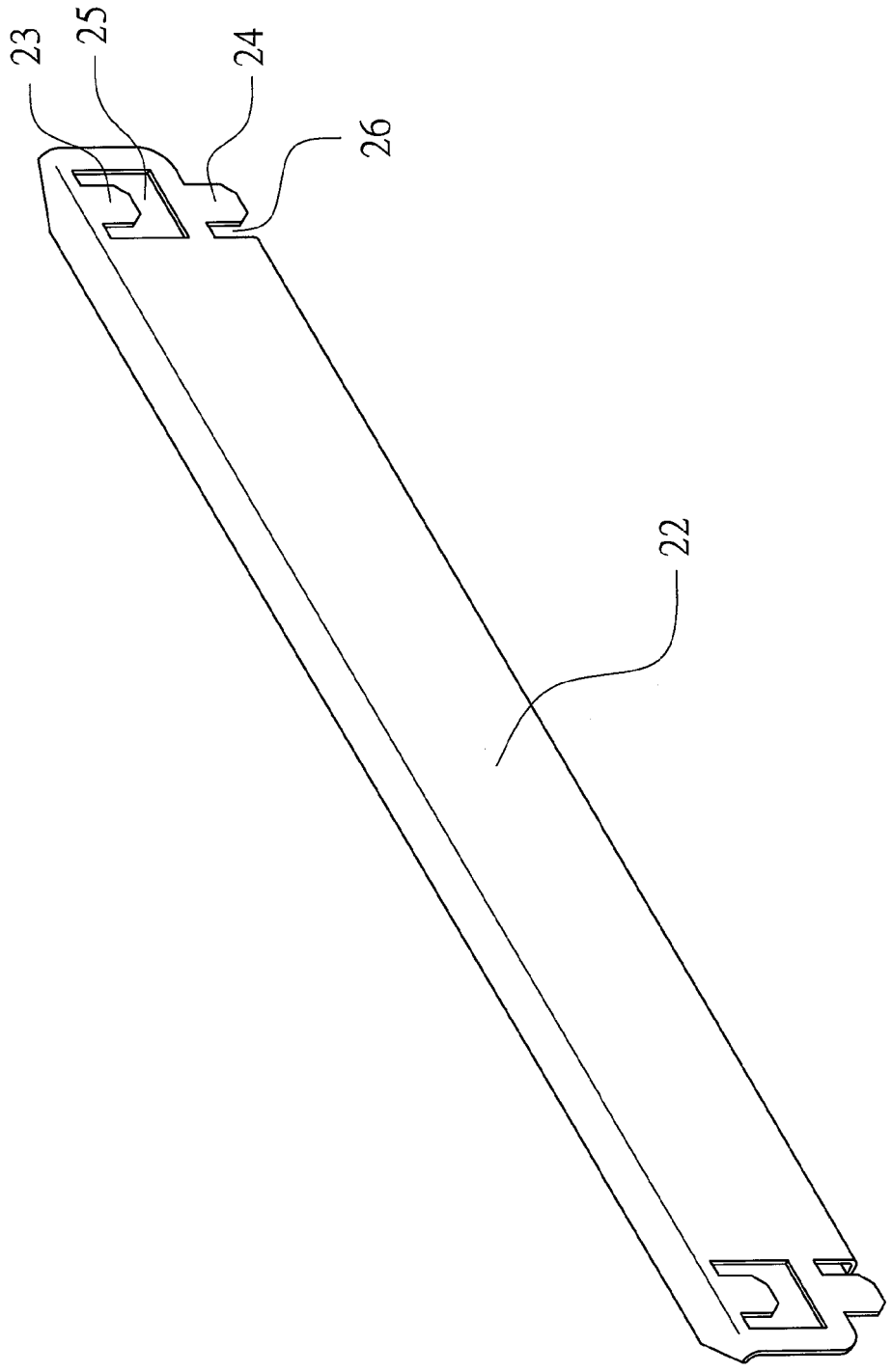

FIG. 3

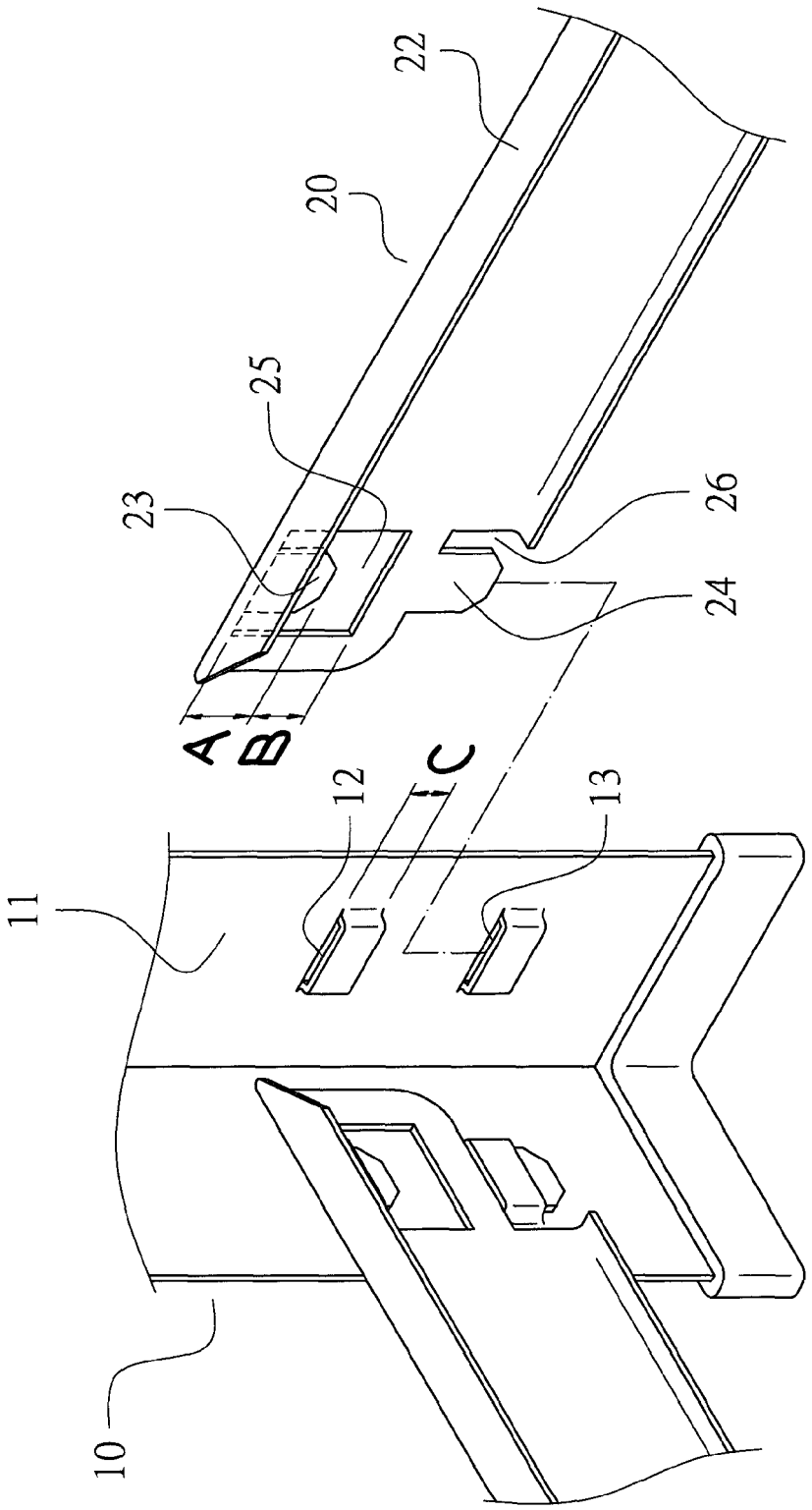

FIG. 4

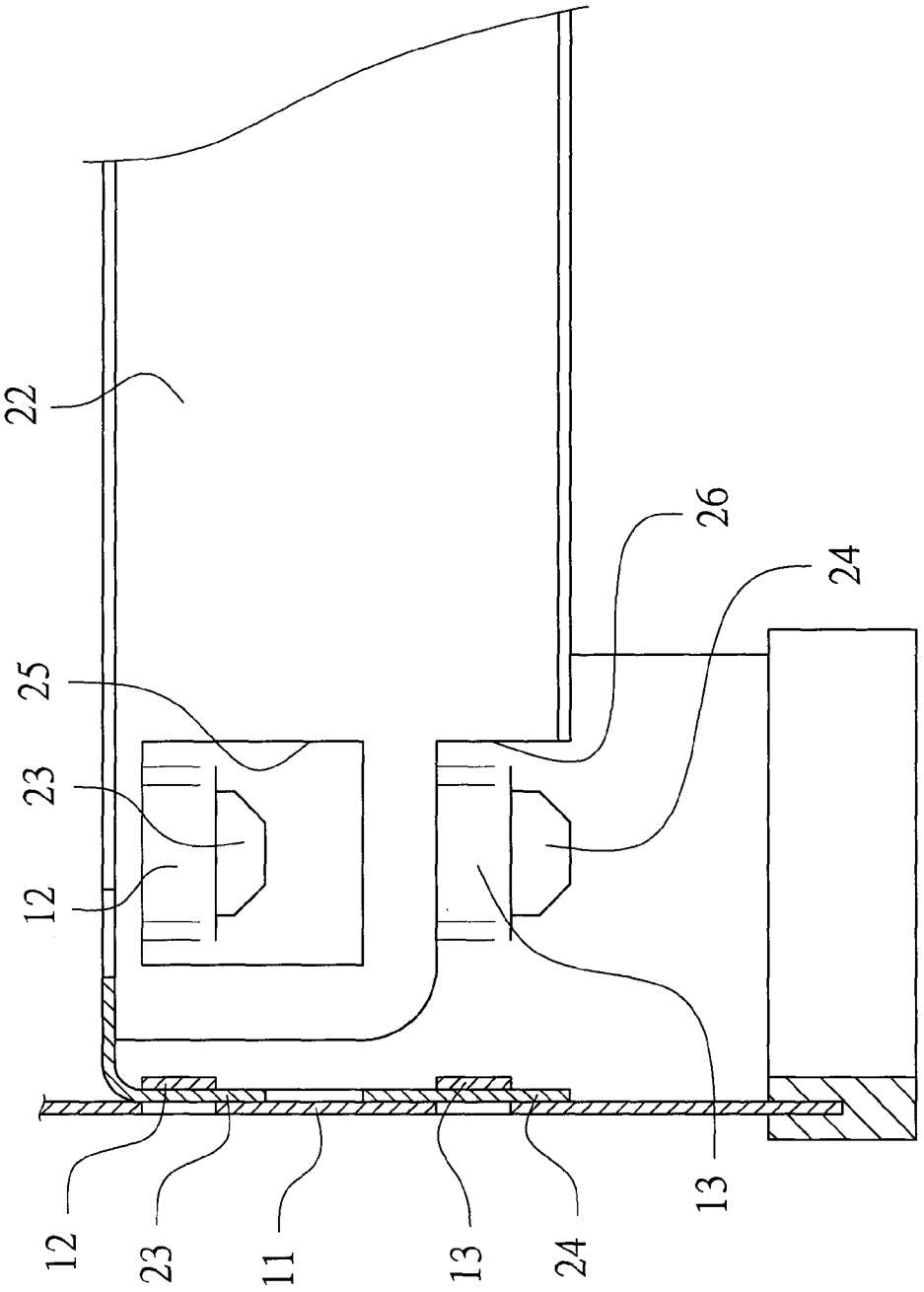

FIG. 5

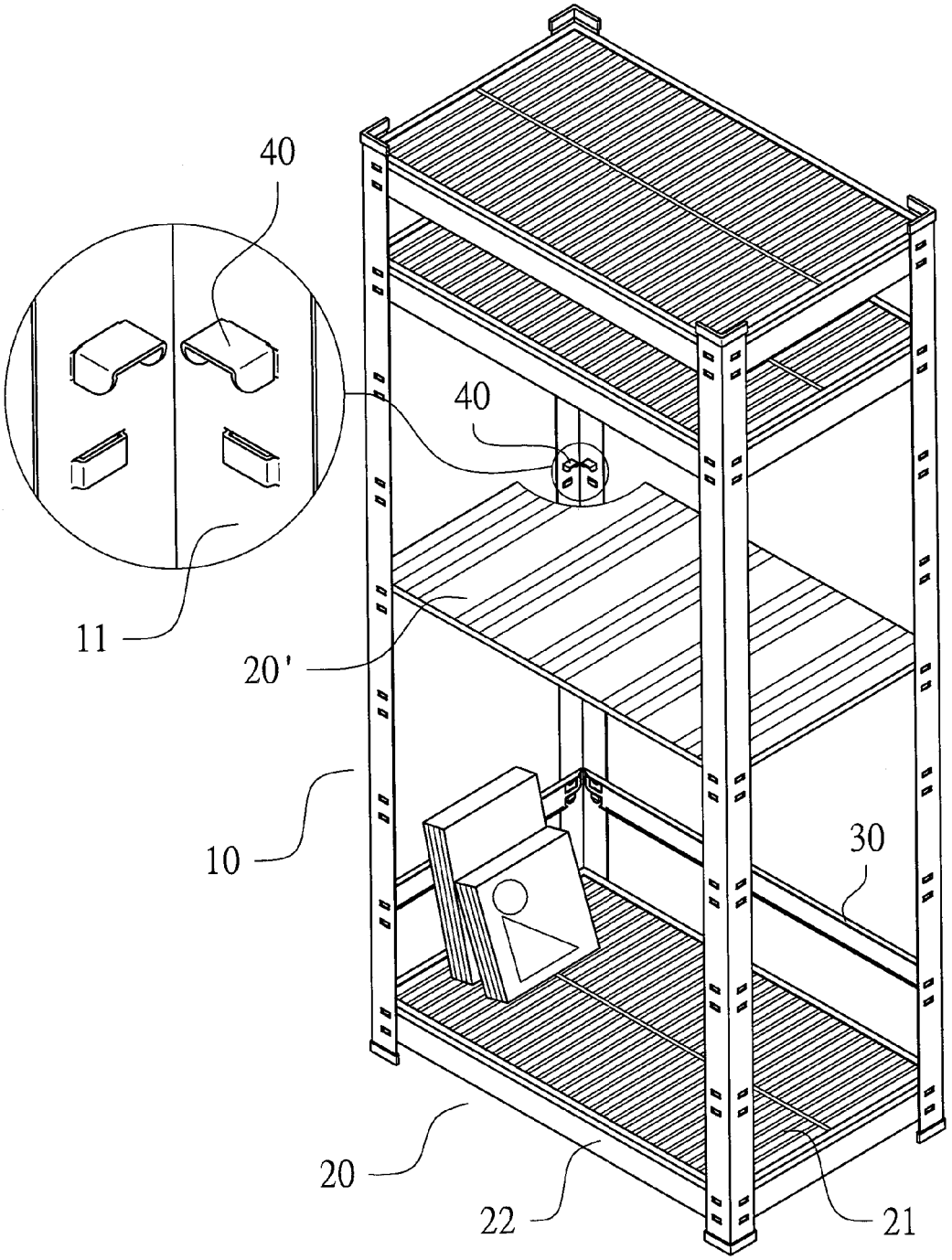

FIG. 6

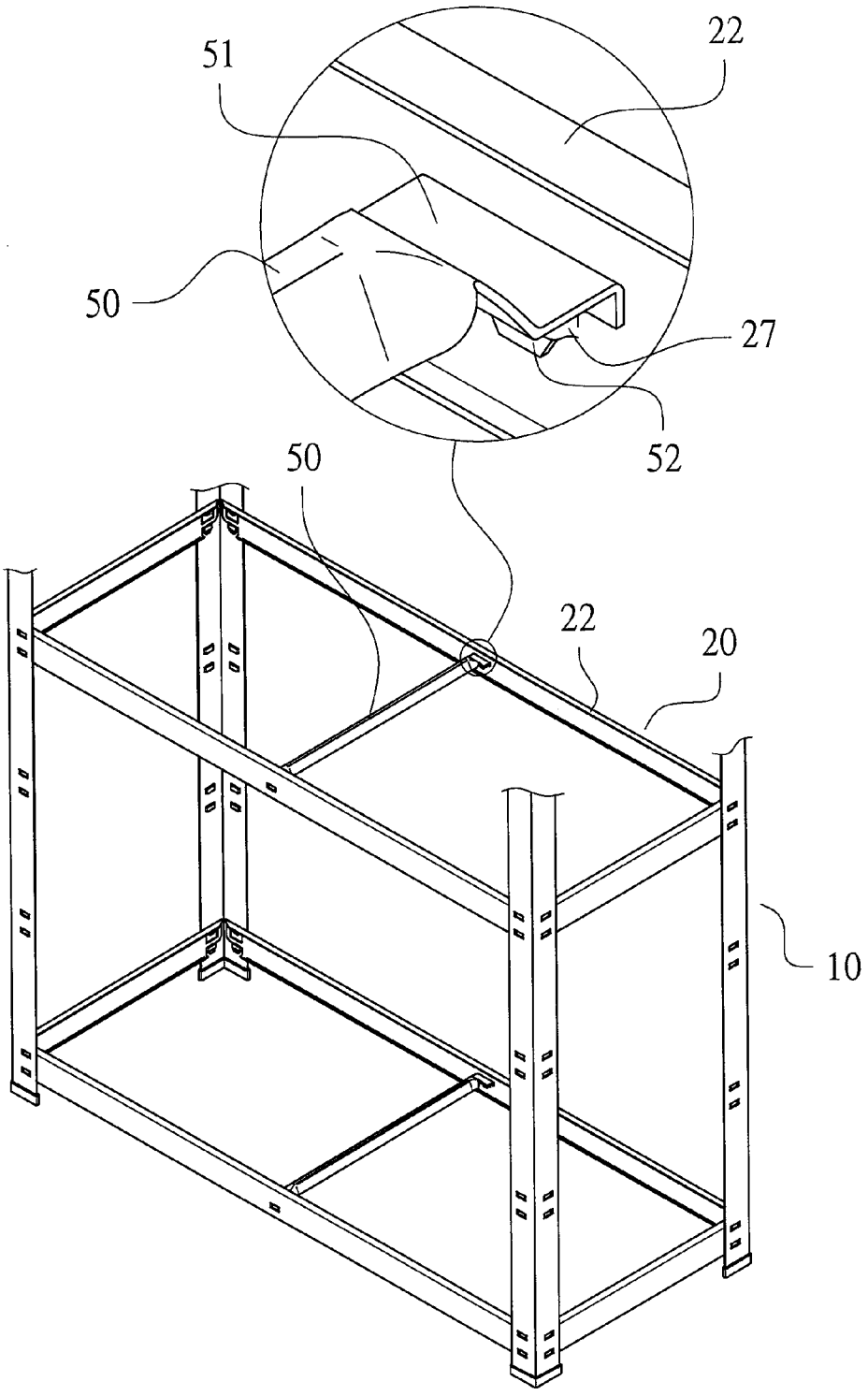

FIG. 7

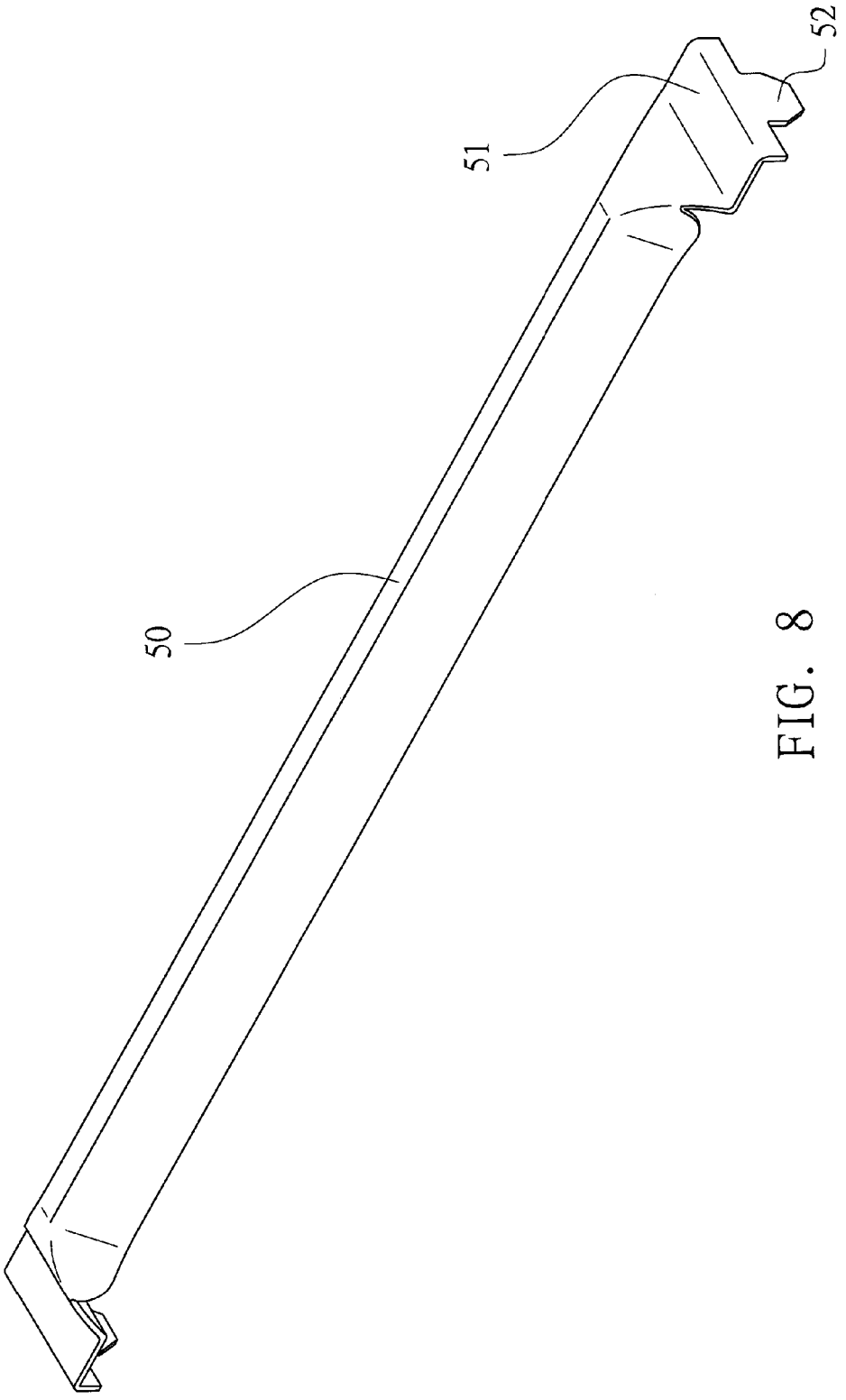

FIG. 8

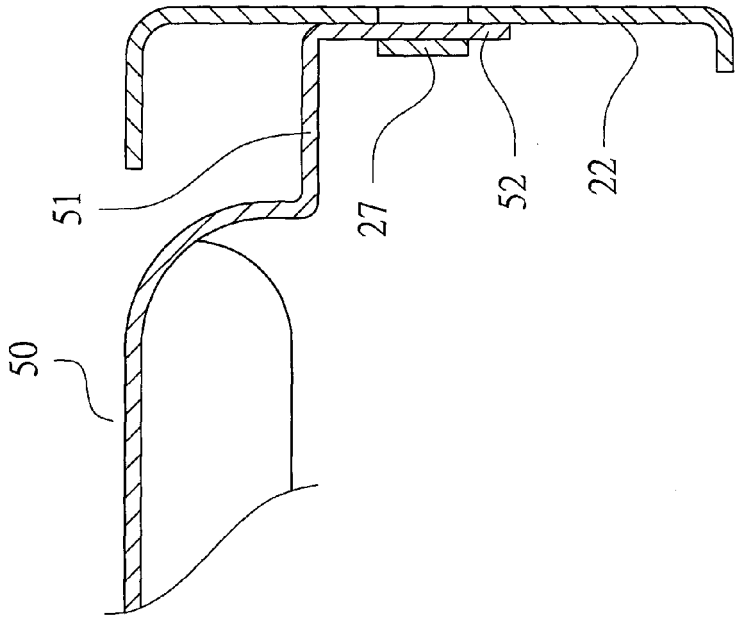

FIG. 10

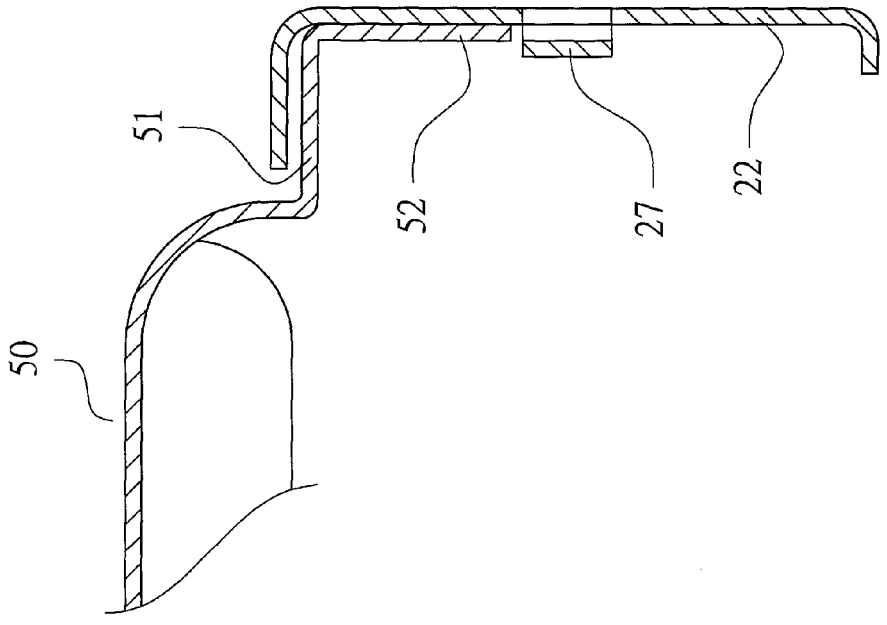

FIG. 9

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EUROPEAN SEARCH REPORT

Application Number
EP 09 16 8339

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
Y	US 4 607 576 A (KRANJEC STAN [CA]) 26 August 1986 (1986-08-26) * column 2, line 34 - column 4, line 48; figures 1-8 *	1-6	INV. A47B47/02 A47B57/20
Y	US 2002/195410 A1 (LIN JIN SHY [TW]) 26 December 2002 (2002-12-26) * paragraph [0007] - paragraph [0009]; figures 1-3 *	1-6	
A	DE 298 21 532 U1 (SCHULTE GMBH & CO KG GEB [DE]) 28 January 1999 (1999-01-28) * page 4, line 27 - page 7, line 26; figures 1-6 *	1-6	
			TECHNICAL FIELDS SEARCHED (IPC) A47B

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
Munich	4 February 2010	Klintebäck, Daniel

CATEGORY OF CITED DOCUMENTS

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04-02-2010

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