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(54) **A foldable stand with shelves**

(57) A foldable cardboard stand with shelves, the stand being foldable from a substantially flat transport configuration to a working configuration, in which the stand has a shape of a box with two side walls (20), a back wall (10) and shelves (30) mounted permanently and pivotably to the back wall (10), the shelves (30) comprising a shelf load portion (31) and a shelf support portion (32), the support portion (32) being pivotable with respect to the load portion (31) and distant from the back wall (10). The support portions (32) of the shelves (30) are fixed pivotably to both side walls (20), wherein at a half of the distance between the back wall (10) and the shelf support portions (32), each shelf (30) and each side wall (20) has a bending line (21, 35) parallel to the main plane of the back wall (10).

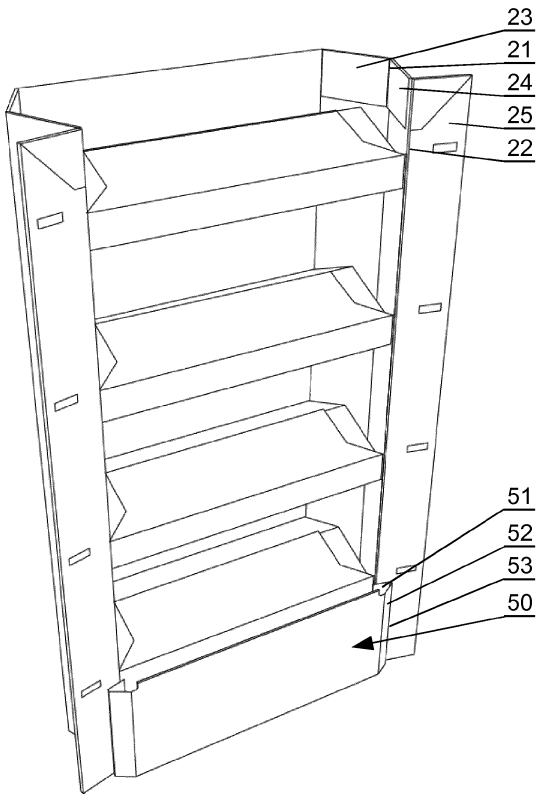

Fig. 1B

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Description

[0001] The present invention relates to foldable stands with shelves.

[0002] There are known cardboard stands, which are foldable from a flat transport configuration to a working configuration. A desirable feature of such stands is a plain construction, simple process for changing the configuration and small dimensions of the transport configuration.

[0003] A European patent application EP 1031304 presents a cardboard stand with shelves positioned in a box comprising side walls, external back wall and front walls formed of one cardboard sheet, and an internal movable back wall formed of another cardboard sheet. The shelves are fastened by gluing its back support flaps with the internal back wall. In addition, the shelves further comprise edge support flaps which can be glued with the side walls only in the working configuration. The stand can be converted from a flat transport configuration to a working configuration by vertically adjusting the internal back wall.

[0004] A European patent EP 1421879 presents a cardboard stand, which is convertible from a flat transport configuration to a working configuration, in which it has a form of a box with side walls and a back wall with shelves mounted within the walls, wherein the shelves are made of separate sheets of cardboard and are mounted on supports integral with the support construction of the box and are mounted by flaps in openings of the back wall. The side edges of the shelves are not supported.

[0005] A European patent application EP 2255703 presents a cardboard stand, which is convertible from a flat transport configuration to a working configuration, in which it has a form of a box with side walls and a back wall with shelves mounted within the walls, wherein the main surface of each shelf comprises a hinge, which folds during the transition from the working configuration to the transport configuration. This weakens the main surfaces of the shelves.

[0006] The aim of the invention is to provide an alternative foldable cardboard stand, which can be easily folded between a transport configuration and a working configuration, having shelves which provide stable support for load.

[0007] The object of the invention is a foldable cardboard stand with shelves, the stand being foldable from a substantially flat transport configuration to a working configuration, in which the stand has a shape of a box with two side walls, a back wall and shelves mounted permanently and pivotably to the back wall, the shelves comprising a shelf load portion and a shelf support portion, the support portion being pivotable with respect to the load portion and distant from the back wall, wherein the support portions of the shelves are fixed pivotably to both side walls, wherein at a half of the distance between the back wall and the shelf support portions, each shelf and each side wall has a bending line parallel to the main plane of the back wall.

[0008] Preferably, while folding from the working configuration to the transport configuration, the side walls are foldable along the bending lines outside of the stand.

[0009] Preferably, the support portions along each of the side walls are joined together by a common joint fixed pivotably to the side wall.

[0010] Preferably, the side walls comprise an additional portion pivotable with respect to a front portion, which is separated from the back portion by a bending line, along a bending line adjacent to the points where the shelf support portions are fixed to the side walls.

[0011] Preferably, the folding line divides the shelf to a back portion and a front portion, wherein an overlay is fixed to the shelf front portion.

[0012] Preferably, the overlay has a depth larger than the depth of the shelf.

[0013] Preferably, the overlay comprises attachments configured to join the overlay in the working configuration of the stand with attachments positioned in the additional portion of the side wall.

[0014] Preferably, a front cover is fixed to the bottom area of the additional portion of the side wall, the front cover having side walls with a back portion separated from the front portion by a bending line, along which the side walls of the cover fold outside of the stand while folding the stand from the working configuration to the transport configuration.

[0015] The object of the invention is shown by means of exemplary embodiments on a drawing, in which:

Figs. 1A-1C show the stand without shelf overlays in consecutive phases of transformation of the stand from a working configuration shown in Fig. 1A, via an intermediate configuration shown in Fig. 1 B, to a transport configuration shown in Fig. 1C.

Figs. 2A-2C show the stand with shelf overlays in consecutive phases of transformation of the stand from a working configuration shown in Fig. 2A, via an intermediate configuration shown in Fig. 2B, to a transport configuration shown in Fig. 2C.

Figs. 3A-3G show cardboard blanks for individual components of the stand.

[0016] Dashed lines on the drawings related to cardboard blanks correspond to bending lines. Continuous lines correspond to edges and cutting lines. Variable lines correspond to perforated bending lines. Dashed areas correspond to areas where individual elements of the blanks are joined together. In these areas the adhesive substance may be applied to one or both of the blanks.

[0017] The stand according to the invention is made of cardboard, preferably of corrugated cardboard.

[0018] Figs. 1A-1C show the stand without shelf overlays in consecutive phases of transformation of the stand from a working configuration shown in Fig. 1A, via an intermediate configuration shown in Fig. 1B, to a substantially flat transport configuration shown in Fig. 1C. The stand in the working configuration has a shape of a

box with side walls 20, a back wall 10 and shelves 30 mounted pivotably to the back wall 10. The shelves comprise a load portion 31 and a support portion 32, which is distant from the back wall 10. The shelves 30 are fixed to the back wall 10 permanently, i.e. the attachment does not detach during transformation from the transport configuration to the working configuration and vice versa. The support portions 32 of the shelves 30 are mounted pivotably to the side walls 20. At the half of the distance between the back wall 10 and the support portion 32 of the shelves, each shelf 30 comprises a bending line 35, and each side wall 20 comprises a bending line 21. The bending lines 35, 21 are parallel to the plane of the back wall 10. The bending line 35 divides the shelf 30 to a back portion 33 and a front portion 34. The bending line 21 divides the side wall 20 to a back portion 23 and a front portion 24.

[0019] In the embodiment shown, the shelf 30 has two layers and is formed by elements of the blanks 300 and 400 shown in fig. 3C and 3D. The element 402 forms the back portion 33 of the shelf. The element 301 is overlaid on element 404 and they form together the front portion 34 of the shelf, which is two-layered and thicker than the back portion 33 of the shelf. The element 401 forms a permanent connection of the shelf 30 with the back wall 10 of the stand. The elements 302, which constitute the support portions 32 of the shelves 30, are joined along each side wall 20 by a common joint 304, which is pivotably attached along the bending line 305 to the side wall 20. The element 303 is folded by 180° and fixed at the internal side of the stand to the element 302, thereby forming an additional reinforcement for the support portion 32 of the shelf.

[0020] When the stand is folded from a working configuration to a transport configuration, the side walls 20 fold along the bending lines 21 outside of the stand, and the shelves 30 fold along the bending lines 35, preferably upwards, as shown in Figs. 1B-1C.

[0021] The blank 100 forming the back wall 10, shown in Fig. 3A, comprises areas 101, wherein it is joined with areas 211 of the blanks 200 forming the side walls, and areas 102, wherein it is joined with areas 401 of blanks 400 forming a part of the shelf.

[0022] The side wall 20 is formed by the blank 200 shown in Fig. 3B. The blank 200 comprises elements 203, 204 forming the back portion 23 and the front portion 24 of the side wall, respectively. Moreover, the side wall comprises preferably an additional portion 25, which is pivotable with respect to the front portion 24 along a bending line 22 adjacent to the points where the support portions 32 of the shelves are fixed to the side walls 20. The additional portion 25 is formed by elements 205, 206 folded together along the bending line 207. Between elements 205, 206 the element 304 of the blank 300 is fixed. Each side wall 20 is fixed to the back wall 10 by flaps 211 foldable with respect to elements 203 along the bending line 208. Moreover, the blank 200 comprises flaps 212, 213, 214 which are foldable towards the inside of the stand and fixed to elements 203, 204, 205, respectively, in order to reinforce the top edge of the stand. The element 206 comprises openings 209 for positioning therein attachments 91 for joining the side walls 20 with the attachments 92 of the shelf overlays.

[0023] The stand may further comprise shelf overlays 60, which are mounted on the shelves 30 and fixed to the front portion 34 of the shelves permanently, i.e. fixed still when transforming from the working configuration to the transport configuration and vice versa. Figs. 2A-2C show the stand with shelf overlays in consecutive phases of transformation of the stand from a working configuration shown in Fig. 2A, via an intermediate configuration shown in Fig. 2B, to a substantially flat transport configuration shown in Fig. 2C, in a manner equivalent to that shown in Figs. 1A-1C. The depth of the overlay 60 is larger than the depth of the shelf 30 and is preferably equal to the depth of the side wall 20 with the additional portion 25. The overlay 60 comprises attachments 92 configured to join the overlay 60 in the working configuration of the stand with the attachments 91 of the additional portion 25 of the side walls 20. The attachments 91, 92 can be mechanical clamps, magnetic fasteners or fasteners of other known types.

[0024] The overlay 60 is formed by blanks 600A and 600B, shown in details on Figs. 3F and 3G. The blank 600A forms the main portion of the overlay 60, and the blank 600B forms an additional reinforcement of the overlay 60. The blanks 600A, 600B are folded to the shape of the overlay 60 along bending lines, wherein the blank 600B is placed over the blank 600A such that the edge 605 corresponds to the bending line 604. The element 603 is placed between elements 601 and 602. Attachments 92 are placed within openings 606.

[0025] Moreover, the stand may comprise a front cover 50, formed from a blank 500 shown in Fig. 3E. The side walls of the front cover 50 comprise a back portion 51 formed by element 501 and a front portion formed by element 502, separated by a bending line 53. The element 501 is joined with the additional portion 25 of the side walls 20, such that during transformation of the stand from the working configuration to the transport configuration, the back portion 51 and the front portion 52 fold outside of the stand. The flap 504 is folded and attached to the internal side of the main plane 503 of the cover 50, thereby forming a reinforced top edge of the cover. The cover 50 further comprises a foldable bottom foot 505.

Claims

1. A foldable cardboard stand with shelves, the stand being foldable from a substantially flat transport configuration to a working configuration, in which the stand has a shape of a box with two side walls (20), a back wall (10) and shelves (30) mounted permanently and pivotably to the back wall (10), the shelves (30) comprising a shelf load portion (31) and a shelf

support portion (32), the support portion (32) being pivotable with respect to the load portion (31) and distant from the back wall (10), **characterized in that** the support portions (32) of the shelves (30) are fixed pivotably to both side walls (20), wherein at a half of the distance between the back wall (10) and the shelf support portions (32), each shelf (30) and each side wall (20) has a bending line (21, 35) parallel to the main plane of the back wall (10).

2. The foldable stand according to claim 1, **characterized in that** while folding from the working configuration to the transport configuration, the side walls (20) are foldable along the bending lines (21) outside of the stand.

3. The foldable stand according to claim 1 or 2, **characterized in that** the support portions (32) along each of the side walls (20) are joined together by a common joint (304) fixed pivotably to the side wall (20).

4. The foldable stand according to any of previous claims, **characterized in that** the side walls (20) comprise an additional portion pivotable with respect to a front portion (24), which is separated from the back portion (23) by a bending line (21), along a bending line (22) adjacent to the points where the shelf support portions (32) are fixed to the side walls (20).

5. The foldable stand according to any of previous claims, **characterized in that** the folding line (35) divides the shelf (30) to a back portion (33) and a front portion (34), wherein an overlay (60) is fixed to the shelf front portion (34).

6. The foldable stand according to claim 5, **characterized in that** the overlay (60) has a depth larger than the depth of the shelf (30).

7. The foldable stand according to claim 5 or 6, **characterized in that** the overlay (60) comprises attachments (92) configured to join the overlay (60) in the working configuration of the stand with attachments (91) positioned in the additional portion (25) of the side wall (20).

8. The foldable stand according to any of previous claims, **characterized in that** a front cover (50) is fixed to the bottom area of the additional portion (25) of the side wall (20), the front cover (50) having side walls with a back portion (51) separated from the front portion (52) by a bending line (53), along which the side walls of the cover (50) fold outside of the stand while folding the stand from the working configuration to the transport configuration.

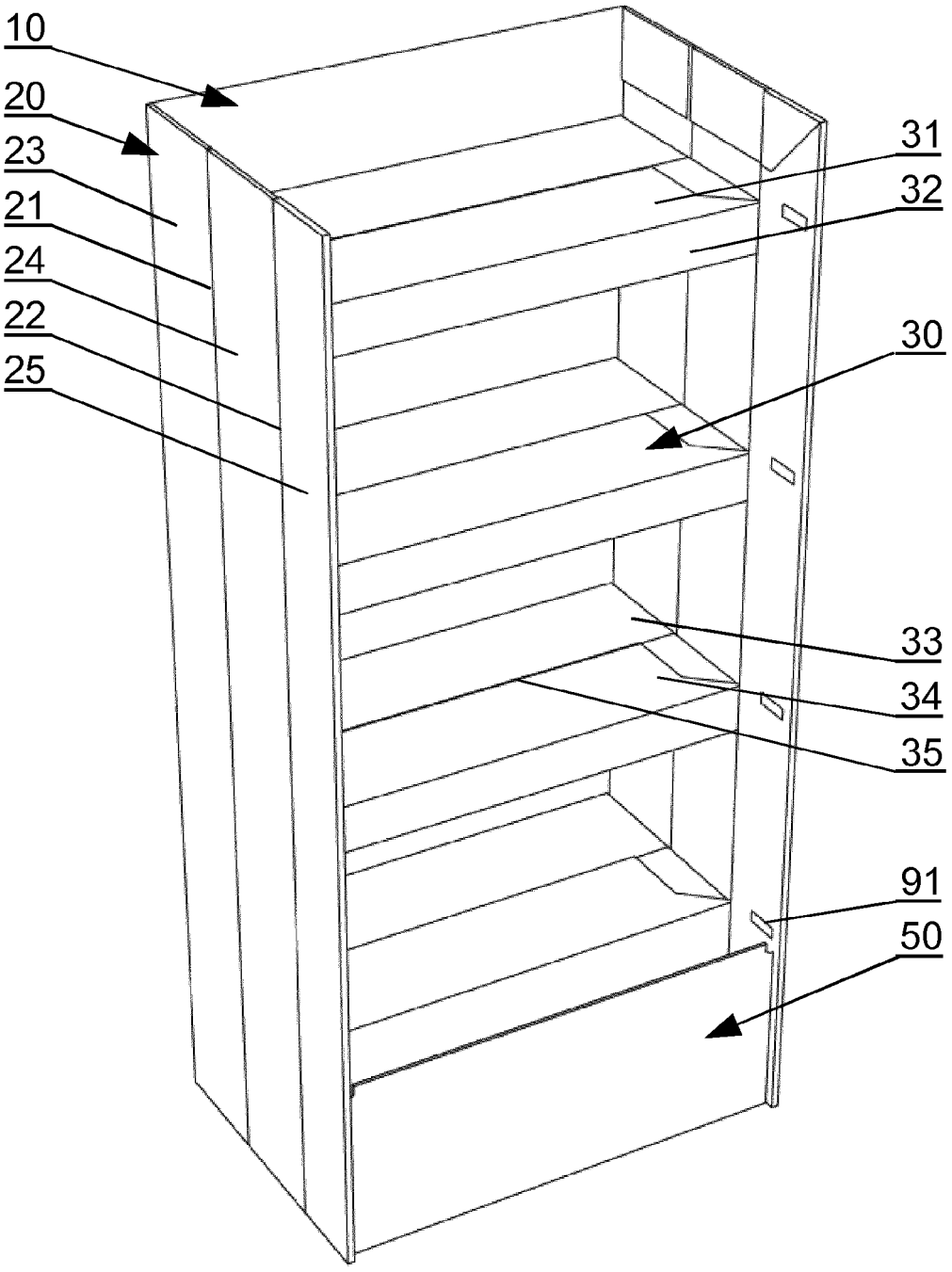

Fig. 1A

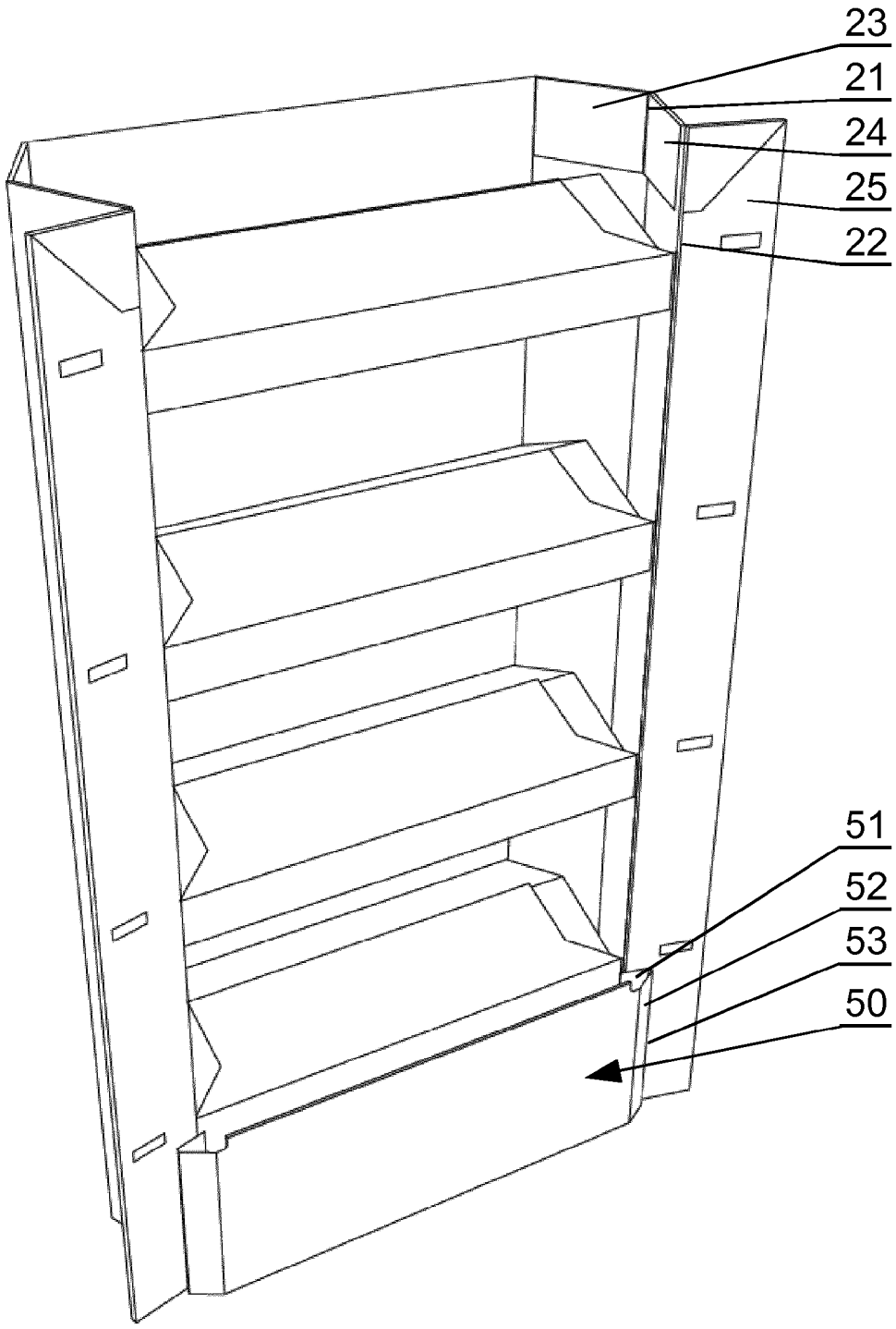

Fig. 1B

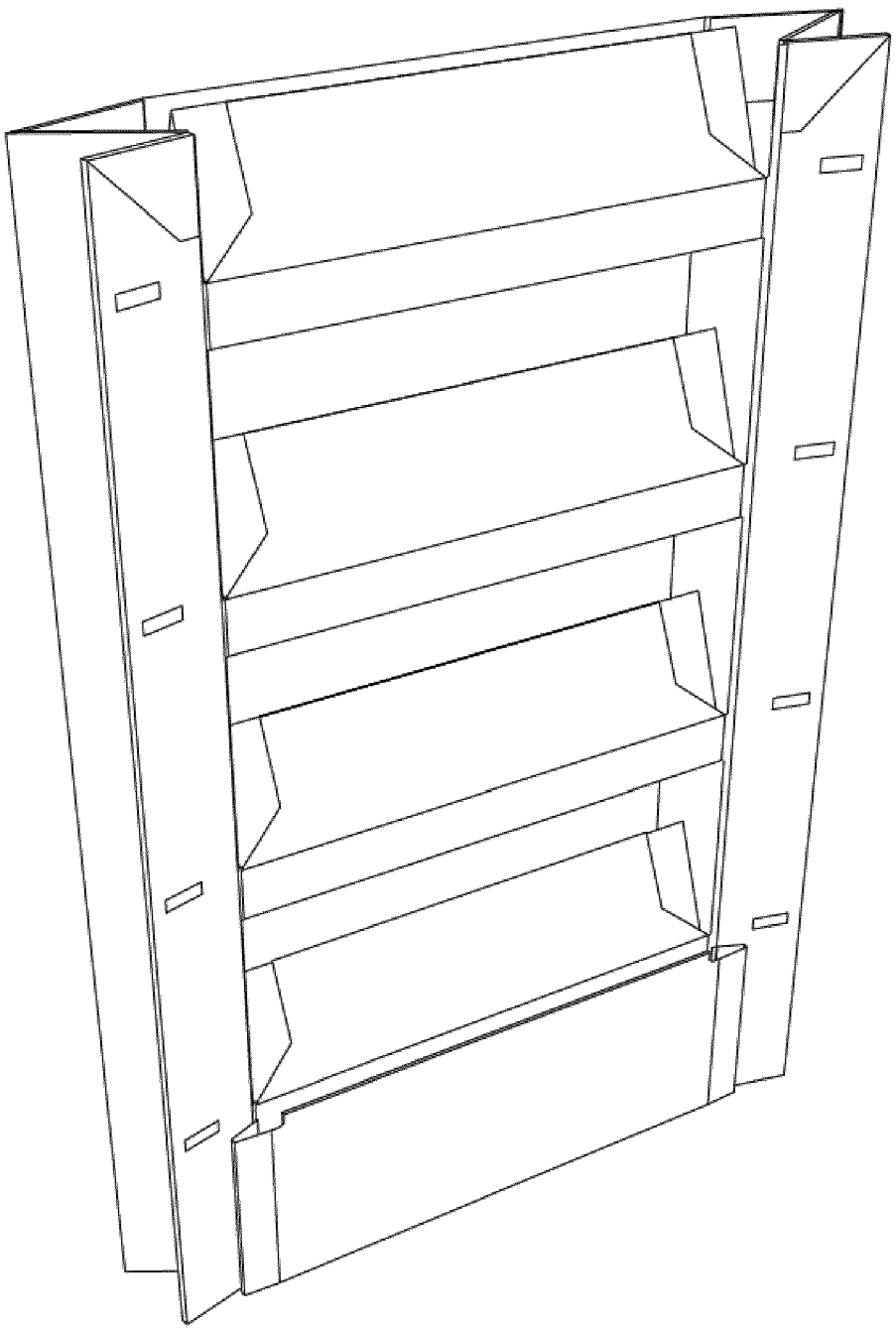

Fig. 1C

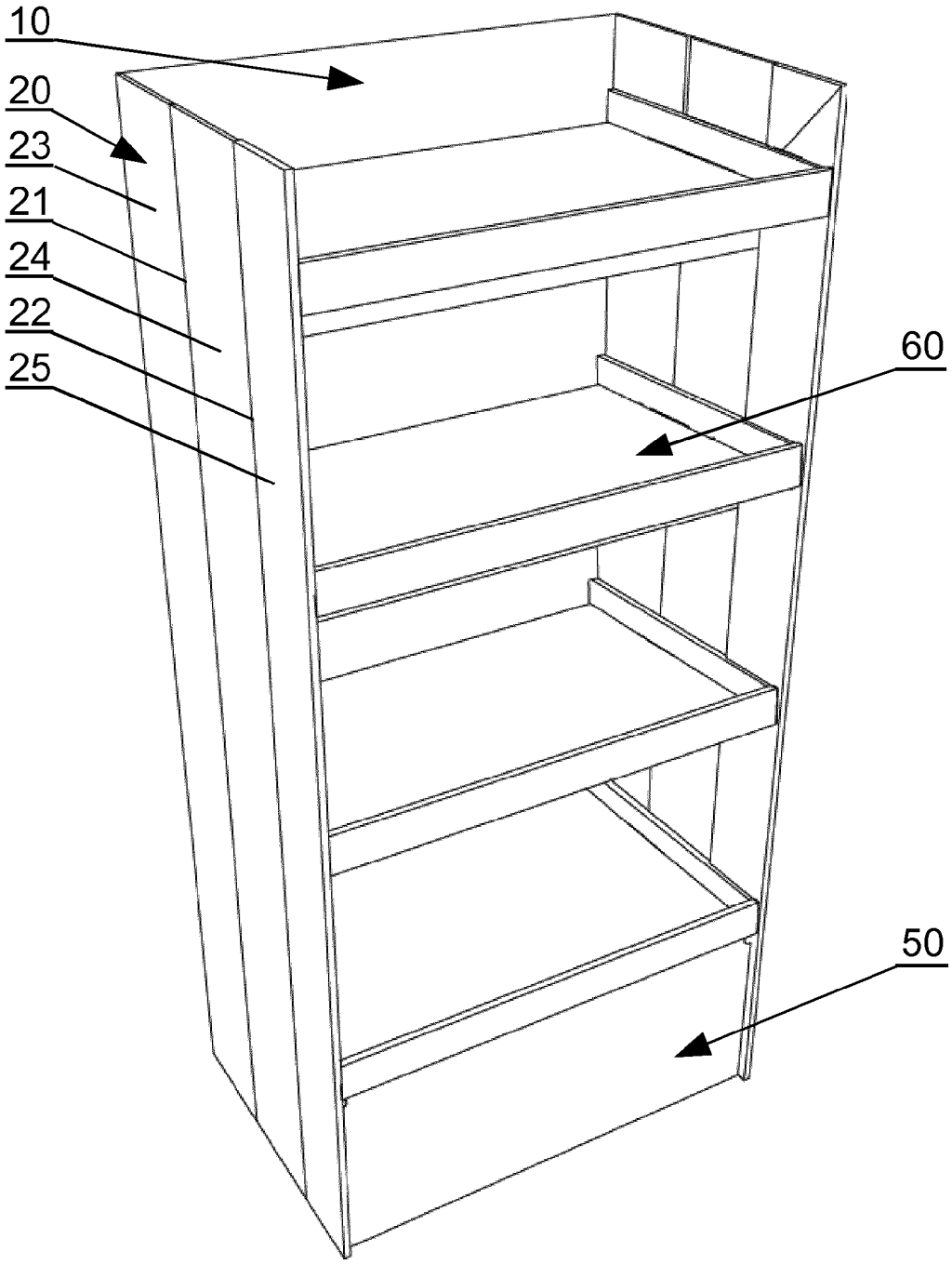

Fig. 2A

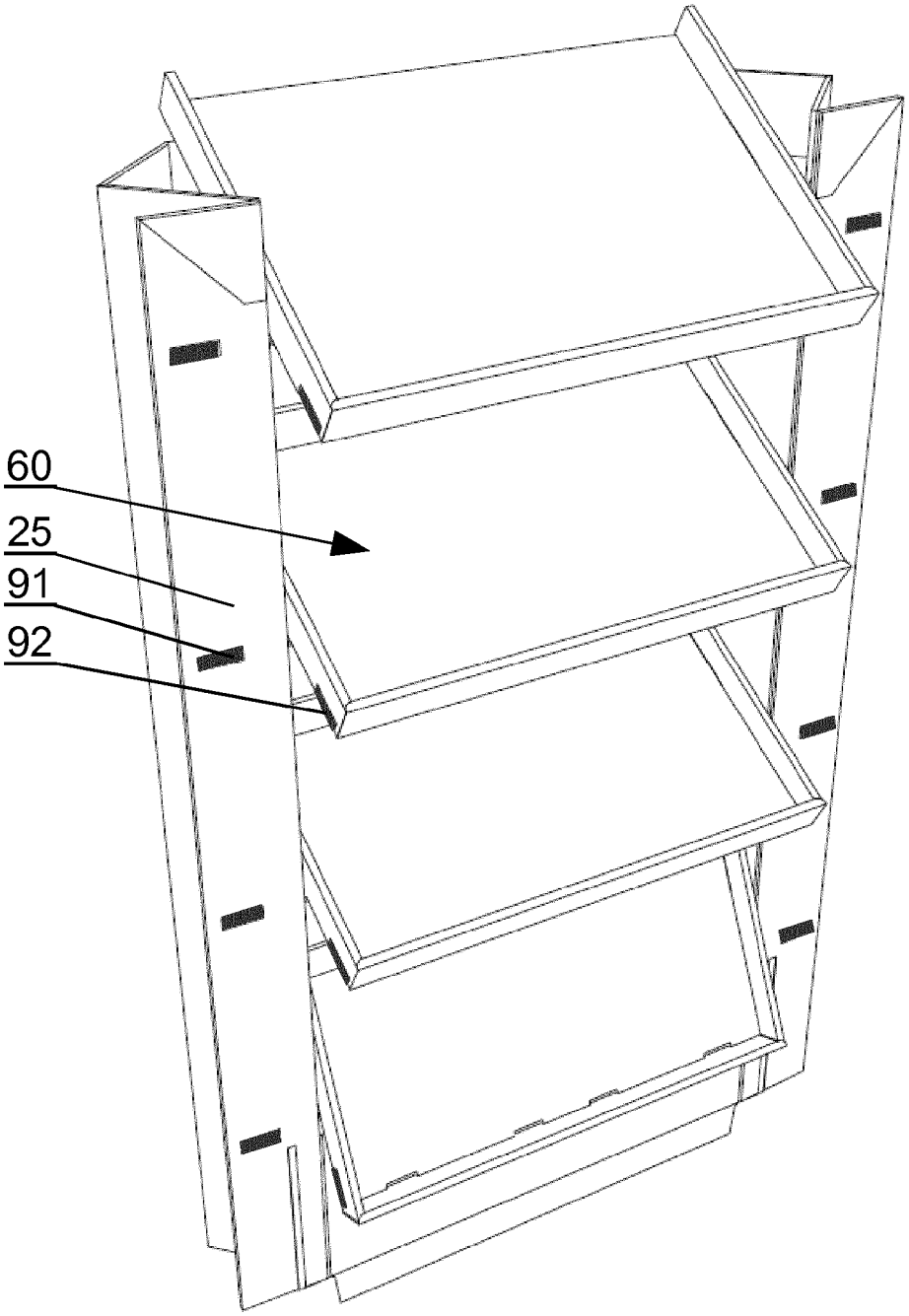

Fig. 2B

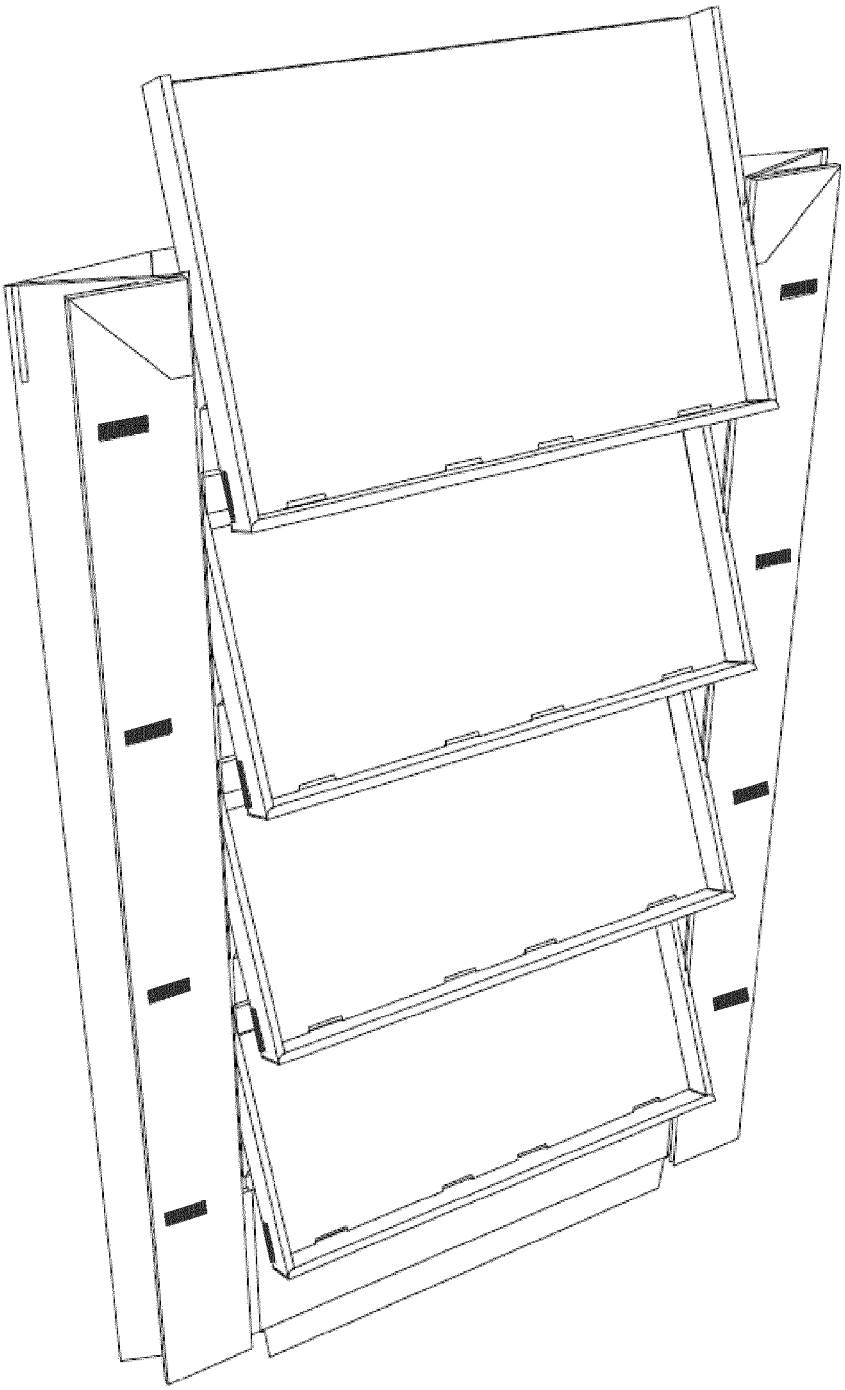

Fig. 2C

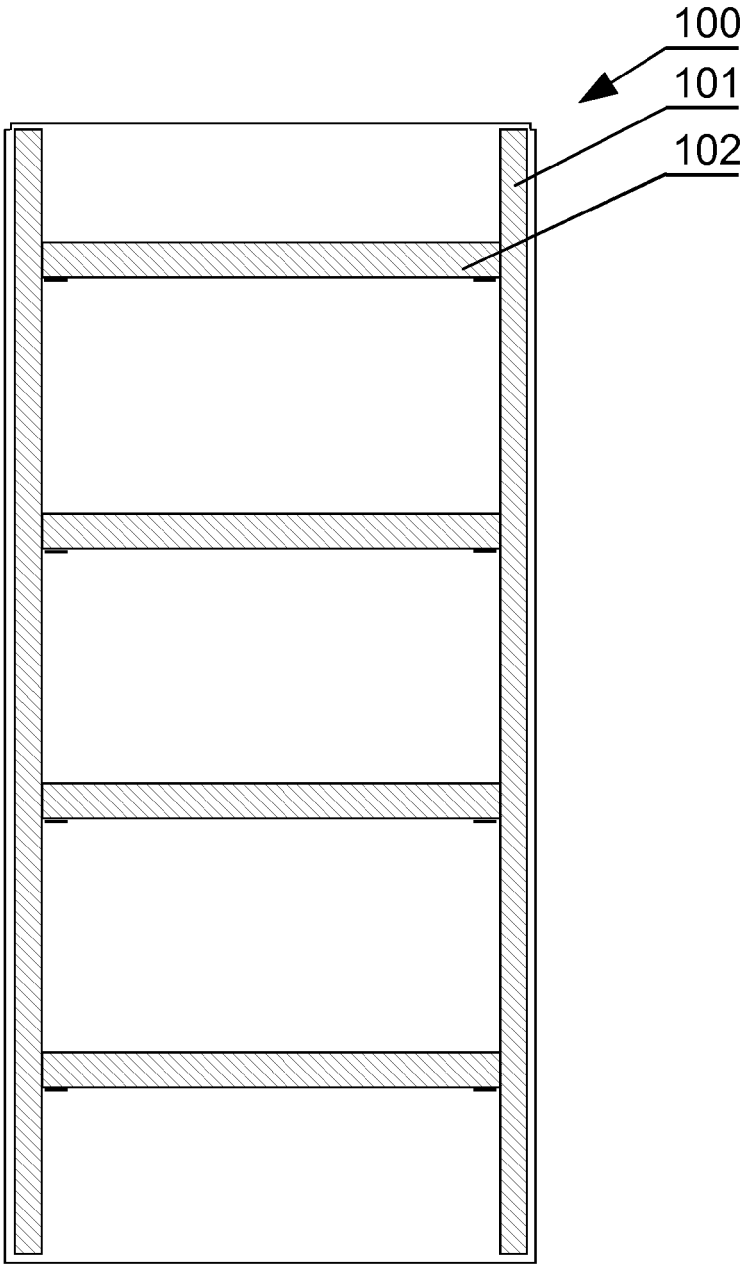

Fig. 3A

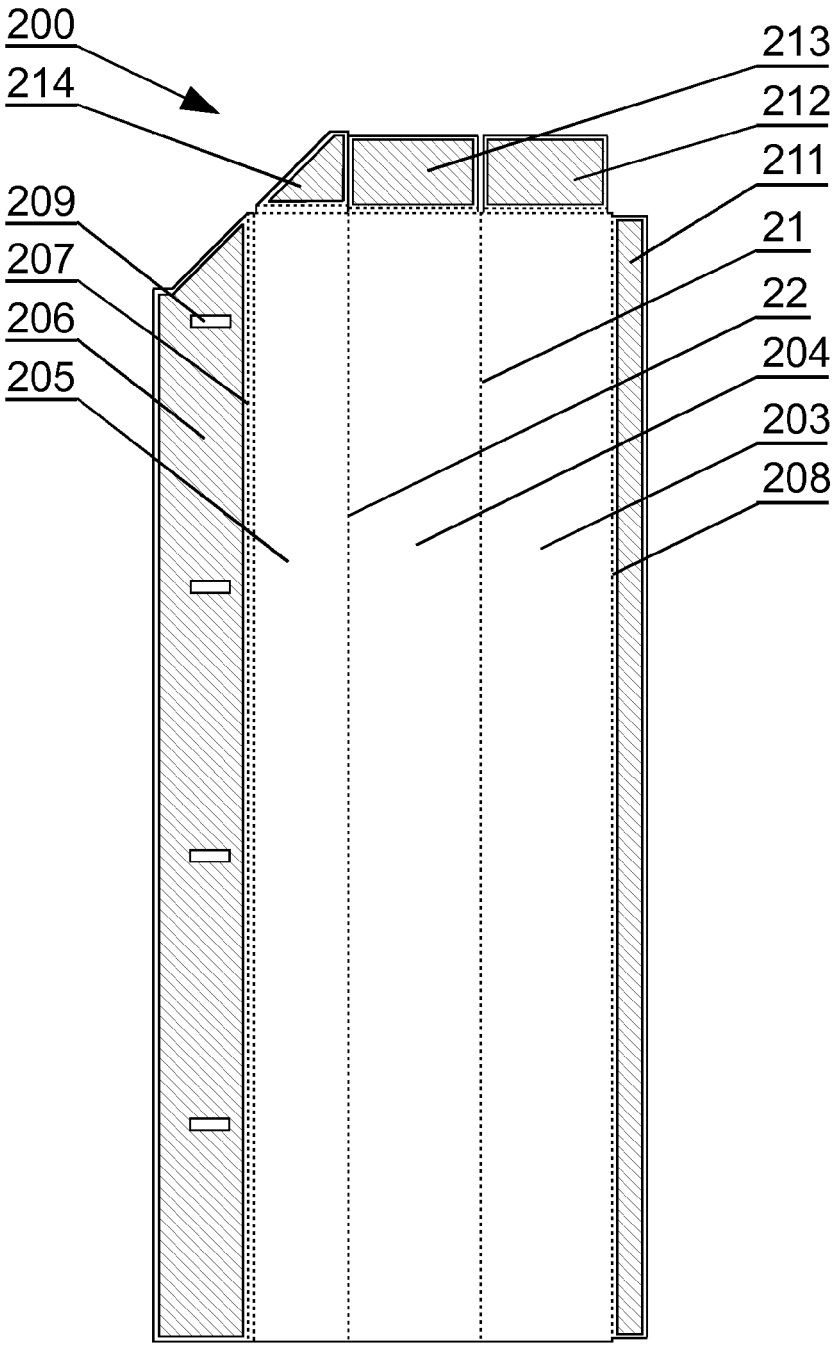

Fig. 3B

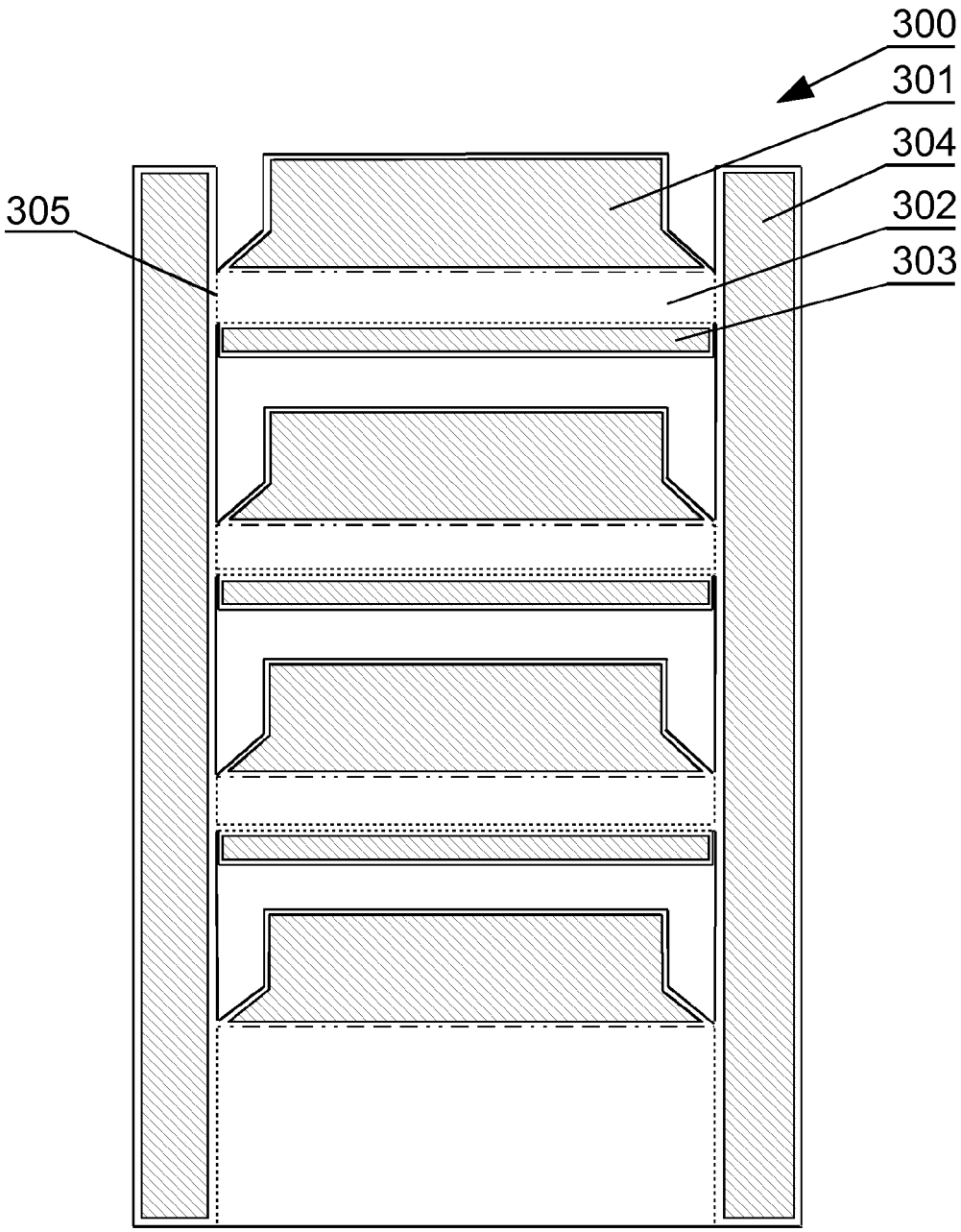

Fig. 3C

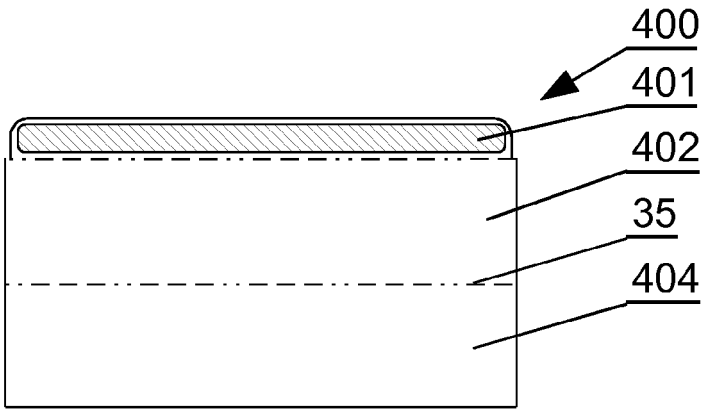

Fig. 3D

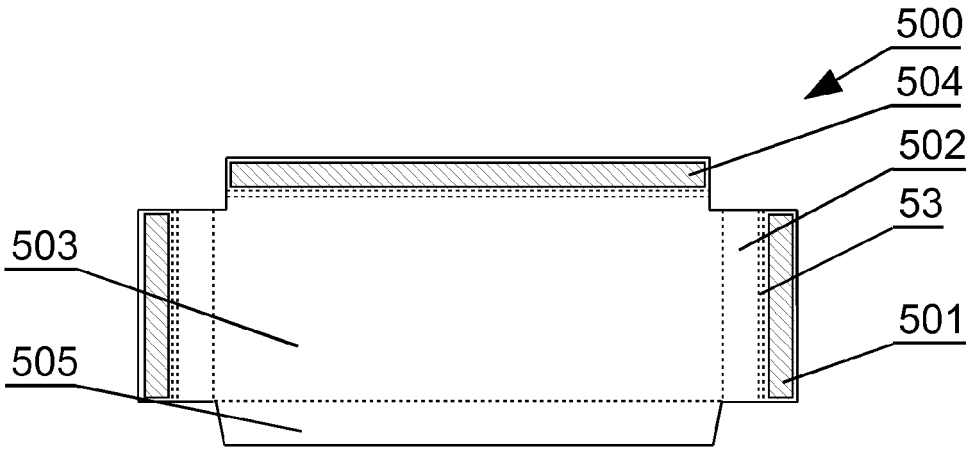

Fig. 3E

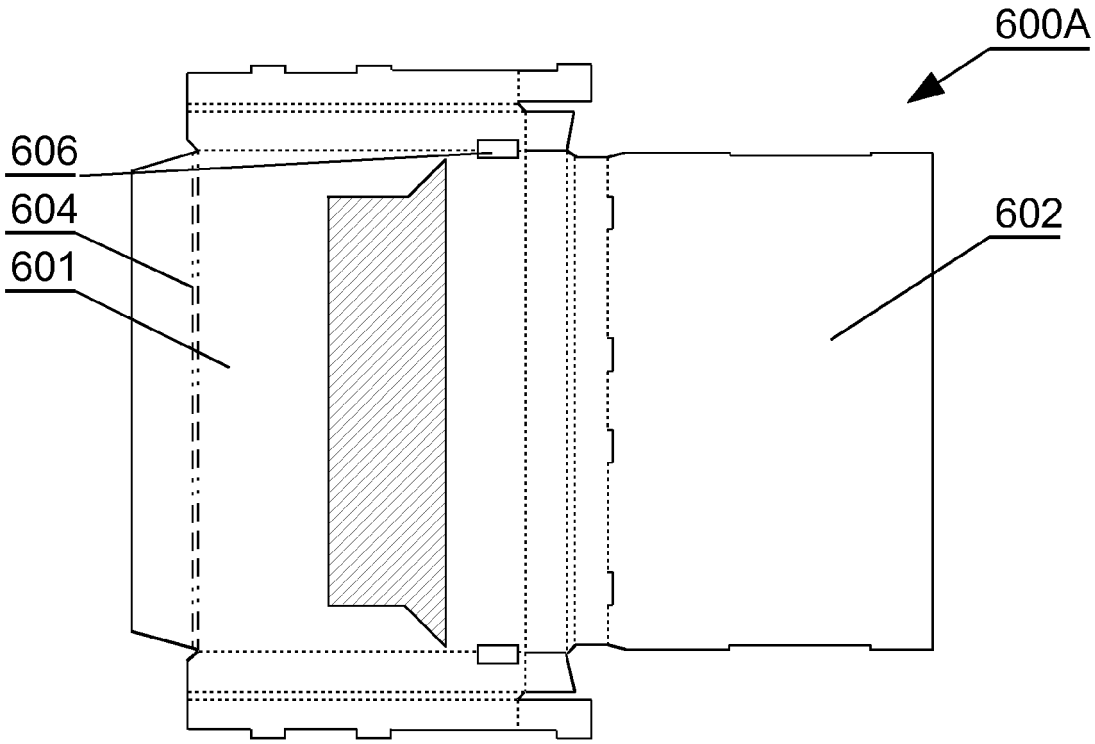

Fig. 3F

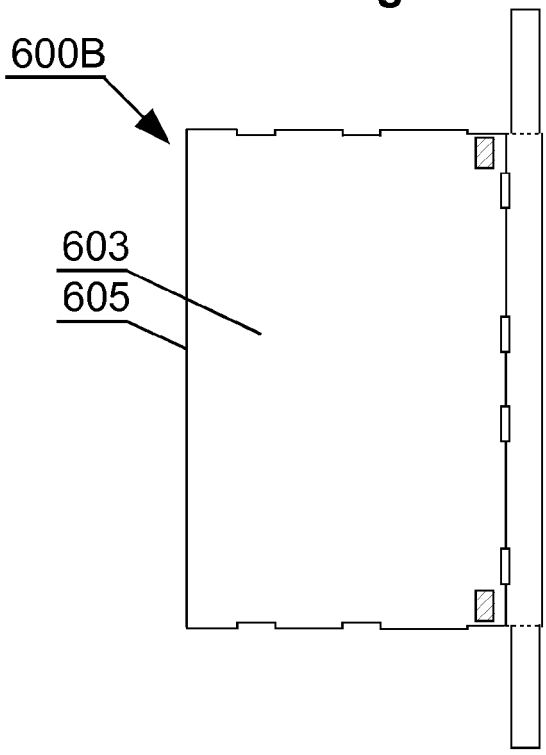

Fig. 3G

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EUROPEAN SEARCH REPORT

Application Number
EP 12 46 1519

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	EP 1 530 933 A1 (SIMPSON PRINT LTD [GB]) 18 May 2005 (2005-05-18) * the whole document *	1-8	INV. A47F5/11
A	CH 672 238 A5 (F A G ARTI GRAFICHE S R L) 15 November 1989 (1989-11-15) * the whole document *	1-8	
A	US 2010/006529 A1 (GROFF ALAN M [US] ET AL) 14 January 2010 (2010-01-14) * the whole document *	1-8	

TECHNICAL FIELDS SEARCHED (IPC)

A47F

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
Munich	15 October 2012	Cardan, Cosmin

CATEGORY OF CITED DOCUMENTS

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15-10-2012

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
EP 1530933 A1	18-05-2005	NONE	
CH 672238 A5	15-11-1989	NONE	
US 2010006529 A1	14-01-2010	NONE	

EPO FORM P0459

For more details about this annex : see Official Journal of the European Patent Office, No. 12/82

REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

- EP 1031304 A **[0003]**
- EP 1421879 A **[0004]**
- EP 2255703 A **[0005]**