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(54) **STACKABLE CRATE PROVIDED WITH TILTING SHELF**

(57) A crate (1) comprises a bottom wall (20), longitudinal walls (21) and transverse walls (22) disposed in such a way that the crate has a tapered shape with increasing dimensions going from the bottom wall (20) upwards to permit the insertion of the crate (1) inside a lower crate (1') that is identical to the crate (1), hinging seats

(25) with transverse axis disposed under the bottom wall (20) and in proximity of both transverse sides (23) of the bottom wall (20), an opposite pair of identical shelves (4) coupled with said hinging seats (25) in such a way that each shelf (4) can be tilted by 180°.

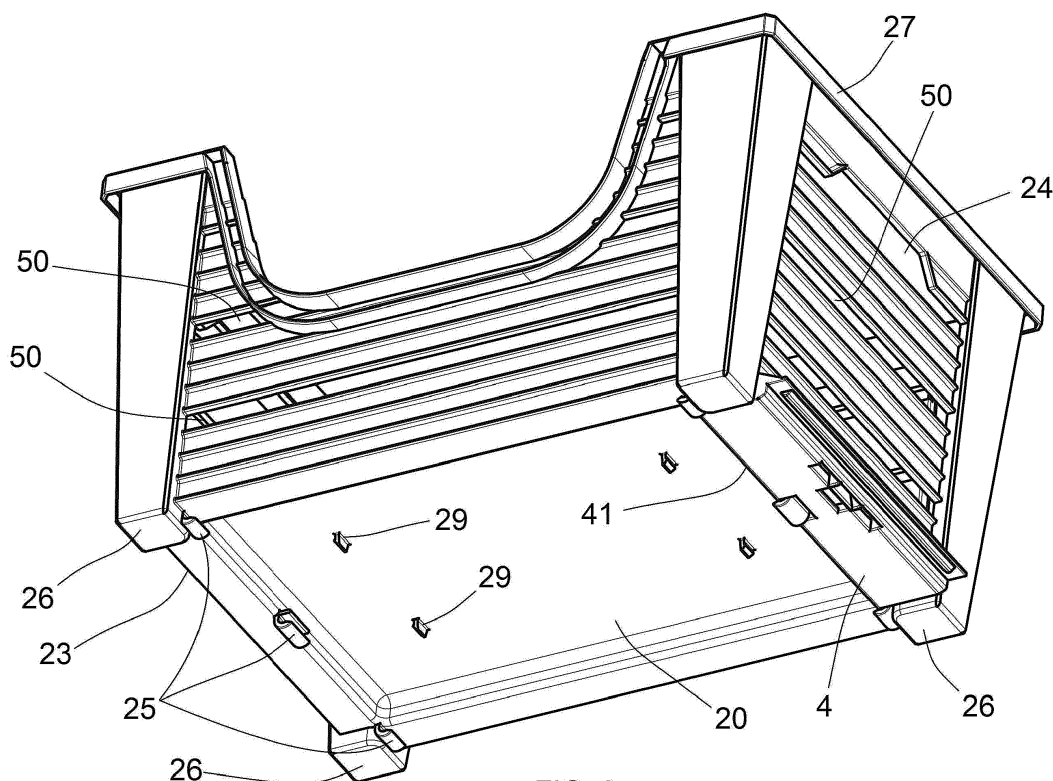


FIG. 2

Description

[0001] The present patent application relates to a stackable crate.

[0002] Various types of stackable crates are known on the market.

[0003] A first type of crates provides for crates with parallelepiped shape that can be stacked in such a way that the bottom of a crate is disposed on the upper edge of another crate, without interfering with the products contained in the lower crate. Such a type of crates is impaired by the fact that, when they are empty, the crates cannot be stacked one inside the other in a minimum volume configuration.

[0004] A second type of crates provides for crates with tapered shape that can be stacked one inside the other in a minimum volume configuration. Such a type of crates is impaired by the fact that, when they are full, the crates cannot be stacked because the bottom of a crate would be disposed on the products contained in the lower crate.

[0005] A third type of crates provides for crates with tapered shape provided with male elements (ribs) and female elements (grooves). The male and female elements are disposed asymmetrically on two opposite sides of the crate. In view of the above, when two crates are disposed in the same direction, they can be stacked one inside the other in a minimum volume configuration because the ribs of the upper crate are inserted in the grooves of the lower crate. Instead, when two crates are disposed in the opposite direction (i.e. a crate is rotated by 180° relative to the other crate), they can be stacked one on top of the other because the ribs of the upper crate do not match the grooves of the lower crate. This type of crates is impaired by the fact that the user needs to rotate and direct the crate according to the way it is to be stacked. Such an operation is especially uncomfortable when a heavy and cumbersome crate is lifted by the user and the position of the lower crate is not easy to see.

[0006] The purpose of the present invention is to eliminate the drawbacks of the prior art by providing a stackable crate suitable for being stacked on top of another crate and also for being disposed inside another identical crate, in a minimum volume configuration, without the need to give a specific direction to the crate.

[0007] Another purpose is to disclose such a crate that is practical, versatile and simple to use for the user.

[0008] Another purpose is to disclose such a crate that is reliable, inexpensive and easy to produce.

[0009] These purposes are achieved according to the invention with the characteristics of the independent claim 1.

[0010] Advantageous embodiments of the invention appear from the dependent claims.

[0011] The crate of the invention comprises a bottom wall, longitudinal walls and transverse walls disposed in such a way that the crate has a tapered shape with increasing dimensions going from the bottom wall upwards to permit the insertion of the crate inside a lower identical

crate.

[0012] Moreover, the crate comprises:

- hinging seats with transverse axis disposed under the bottom wall and in the proximity of both transverse sides of the bottom wall;
- an opposite pair of identical shelves, disposed under the bottom wall and in the proximity of both transverse sides of the bottom wall; each shelf has a first free edge and a second edge coupled with said hinging seats, in such a way that each shelf can be tilted by an angle of 180°

[0013] Because of said ability of being tilted, each shelf can be:

- a) in a tilted position towards the exterior of the crate, wherein the first free edge of the shelf protrudes externally with respect to the bottom wall of the crate in order to be supported on the upper edge of the transverse walls of the lower crate, in such a way to stack the crate on the lower crate; and
- b) in a retracted position, wherein the first free edge of the shelf does not protrude externally with respect to the bottom wall of the crate in such a way not to hinder the insertion of the crate inside the lower crate.

[0014] The advantages of the crate if the invention are evident. In fact, when the tilting shelves are rotated in such a way to protrude with their first free edge externally with respect to the bottom wall of the crate, such a crate can be easily stacked on top of another crate without requiring the operator to pay attention or check the mutual direction of the two stacked crates.

[0015] On the contrary, when the tilting shelves are rotated in such a way that their first free edge is stopped against the bottom wall of the crate, then the crate can be easily and rapidly inserted inside another crate.

[0016] Additional features of the invention will appear clearer from the detailed description below, which refers to merely illustrative, not limiting embodiments, illustrated in the attached drawings, wherein:

- Fig. 1 is a top perspective view of the crate according to the present invention, with one of its tilting shelves rotated towards the exterior of the crate;
- Fig. 2 is a bottom perspective view of the crate according to the present invention, with one of its tilting shelves rotated towards the exterior of the crate;
- Fig. 3 is a bottom perspective view of the crate according to the present invention, with one of its tilting shelves rotated towards the interior of the crate;
- Figs. 4 and 5 are two perspective views, showing the two opposite sides of each of said tilting shelves, respectively;
- Fig. 6 is a top perspective view of two crates stacked one on top of the other;
- Fig. 7 is a bottom perspective view of two crates

stacked one inside the other;

- Fig. 8 is a bottom perspective view of two crates inserted one inside the other.

With reference to the Figures, the crate of the invention is disclosed, which is generally indicated with reference numeral (1).

[0017] As shown in Fig. 6, the crate (1) is stacked on a lower crate (1') that is identical to the crate (1), but sectioned in order to show the area of the crate (1) that is supported on the lower crate (1').

[0018] With reference to Figs. 1 and 2, the crate (1) comprises four stiffening corner pieces (2) disposed according to the angles of a rectangle and having an "L"-shaped cross-section.

[0019] One bottom wall (20), two longitudinal walls (21) and two transverse walls (22) are connected to the corner pieces (2), in such a way to form a rectangular crate with tapered profile and increasing dimensions going from the bottom wall (20) upwards. In view of the above, the crate (1) can be disposed inside the lower crate (1') in a minimum volume configuration, as shown in Fig. 8.

[0020] The crate (1) may be devoid of said corner pieces (2); in such a case, the longitudinal walls (21) and the transverse walls (22) are connected to the bottom wall (20).

[0021] The longitudinal walls (21) are longer than the transverse walls (22). The longitudinal walls and the transverse walls may be provided with lightening and ventilation slots (50).

[0022] The transverse walls (22) are provided with hand-holding openings (24) disposed in upper position to permit the insertion of the user's hand to lift the crate (1).

[0023] Each corner piece (2) has a lower foot (26) that protrudes in lower position with respect to the bottom wall (20) in order to rest on the ground. In view of the above, when the crate rests on the ground, the bottom wall (20) of the crate is raised from the ground.

[0024] The transverse walls (22) have an upper edge (27).

[0025] With reference to Fig. 1, the upper edge (27) of the transverse walls (22) of the crate (1) has an upward groove (28).

[0026] With reference to Fig. 2, hinging seats (25) with transverse axis are provided under the bottom wall (20), being disposed in the proximity of the transverse sides (23) of the bottom wall (20).

[0027] According to the preferred embodiment of the invention, said hinging seats (25) are composed of a spaced set of hooks (25a) that protrude in lower position from the bottom wall (20) and are aligned along a same transverse axis (X) parallel to said transverse sides (23) of the crate (1), as shown in Fig. 8; the fastening mouth (25b) of said hooks (25a) facing towards the center of the bottom wall (20).

[0028] With reference to Figs. 2, 4 and 5, the crate (1) also comprises two identical tilting shelves (4) fastened

under the bottom wall (20) and in correspondence of said hinging seats (25).

[0029] With reference to Figs. 4 and 5, each shelf (4) is shaped like a plate and comprises a first free edge (40) and a second edge (41) in opposite parallel position to the first free edge (40), fastened to said hinging seats (25).

[0030] The first (40) and the second (41) edge of the shelves (4) are parallel to the transverse sides (23) of the crate (1).

[0031] Following to a rotation of 180°, each tilting shelf (4) can go from an extracted position (see Figs. 1, 6 and 7), wherein its first free edge (40) protrudes externally with respect to the bottom wall (20), to a retracted position (Figs. 3 and 8), wherein its first free edge (40) does not protrude externally with respect to the bottom wall (20).

[0032] When the shelf (4) is in extracted position, the first free edge (40) of the shelf (4) can be supported on the upper edge (27) of the transverse walls (22) of the lower crate (1'), preventing the crate (1) from falling and being inserted inside the lower crate (1').

[0033] Vice versa, when the shelf (4) is in retracted position, the first free edge (40) of the shelf (4) is stopped against the bottom wall (20) and is retained in such a position by elastically flexible hooks (29) suitably provided under the bottom wall (20).

[0034] Otherwise said, said hooks (29) are capable of automatically fastening the first free edge (40) of the shelf (4) in elastically fit-in mode every time the shelf (4) is tilted towards the interior of the crate until it is stopped against the bottom wall (20), as shown in Fig. 3, wherein only one of the two shelves (4) is shown for clarity purposes.

[0035] With reference to Fig. 4, the shelf (4) comprises at least one retention tooth (42) that protrudes in lower position from its first free edge (40) in order to be engaged in the groove (28) of the upper edge (27) of the transverse walls (22) of the lower crate (1') when the shelf (4) is in extracted position.

[0036] Still with reference to Fig. 4, it must be noted that the second edge (41) of the shelf (4), which is suitable for being fastened to the hinging seats (25), is configured as a cylindrical bar (41 a) that acts as a typical pivoting pin when said cylindrical bar (41 a) is housed in the hinging seats (25).

[0037] Also in this case, the insertion of said cylindrical bar (41 a) in the hinging seats (25) is obtained by means of a forced insertion in the mouth (25b) of said hooks (25a) that, being elastically flexible, receive and engage said cylindrical bar (41 a) in elastically fit-in mode.

[0038] Equivalent variations and modifications can be made to the present embodiments of the invention, which are within the reach of an expert of the field, falling in any case within the scope of the invention as disclosed by the attached claims.

[0039] For example, the hooks (29) may be replaced with other fastening means, such as grapnels or elastic clamps suitable for cooperating with corresponding hold-

ing means obtained on the shelves (4).

[0040] Preferably, the crate (1) and the tilting shelves (4) are made of plastic material.

Claims

1. Crate (1) comprising a bottom wall (20), two longitudinal walls (21) and two transverse walls (22) disposed in such a way that the crate has a tapered shape with increasing dimensions going from the bottom wall (20) upwards in order to permit the insertion of the crate (1) inside a lower crate (1') that is identical to the crate (1),

characterized in that it comprises:

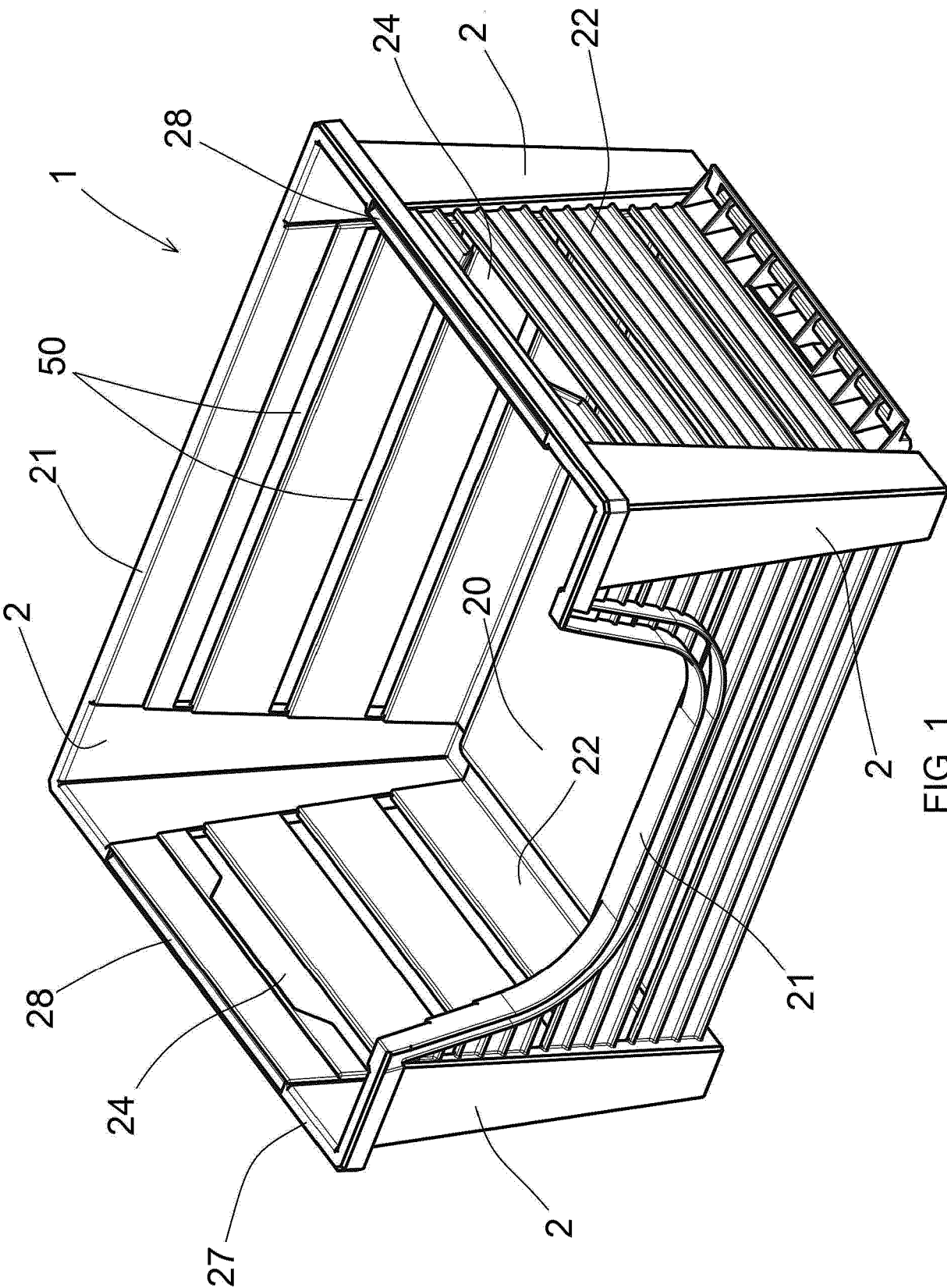
- hinging seats (25) with transverse axis, disposed under the bottom wall (20) and in the proximity of both transverse sides (23) of the bottom wall (20);
- an opposite pair of identical shelves (4), disposed under the bottom wall (20) and in the proximity of both transverse sides (23) of the bottom wall (20); each shelf (4) having a first free edge (40) and a second edge (41), in opposite parallel position to the first free edge (40), coupled with said hinging seats (25), in such a way that, after being tilted by 180°, each shelf (4) can be in two positions:

- a) an extracted position from the crate (1), wherein the first free edge (40) of the shelf (4) protrudes externally with respect to the bottom wall (20) in order to be supported on the upper edge (27) of the transverse walls (22) of the lower crate (1'), in such a way to stack the crate (1) on the lower crate (1');
- b) a retracted position, wherein the first free edge (40) of the shelf (4) does not protrude externally with respect to the bottom wall (20) of the crate (1) in such a way not to hinder the insertion of the crate (1) inside the lower crate (1').

2. The crate (1) of the preceding claims, wherein the transverse walls (22) are provided with a groove (28) obtained on the upper edge (27).
3. The crate (1) of the preceding claim, wherein said shelf (4) comprises at least one retention tooth (42) that protrudes in lower position from its first free edge (40) in order to be engaged in said groove (28) disposed on the upper edge (27) of the transverse walls (22) of the lower crate (1') when the shelf (4) is in extracted position.
4. The crate (1) of one of the preceding claims, wherein the second edge (41) of the shelf (4) is configured

like a cylindrical bar (41a) suitable for being coupled with said hinging seats (25).

5. The crate (1) of one of the preceding claims, wherein said hinging seats (25) are composed of a spaced set of hooks (25a) that protrude under the bottom wall (20) and are aligned along a same transverse axis (X) parallel to said transverse sides (23) of the crate (1); the fastening mouth (25b) of said hooks (25a) facing the center of the bottom wall (20).
6. The crate (1) of one of the preceding claims, wherein the bottom wall (20) is provided with fastening means (29) suitable for fastening each shelf (4) in elastically fit-in mode in order to keep it stopped against the bottom wall (20).
7. The crate (1) of the preceding claim, wherein the bottom wall (20) is provided in lower position with elastically flexible hooks (29) suitable for fastening in elastically fit-in mode and retain the first free edge (40) of the shelf (4) when the shelf (4) is in retracted position.



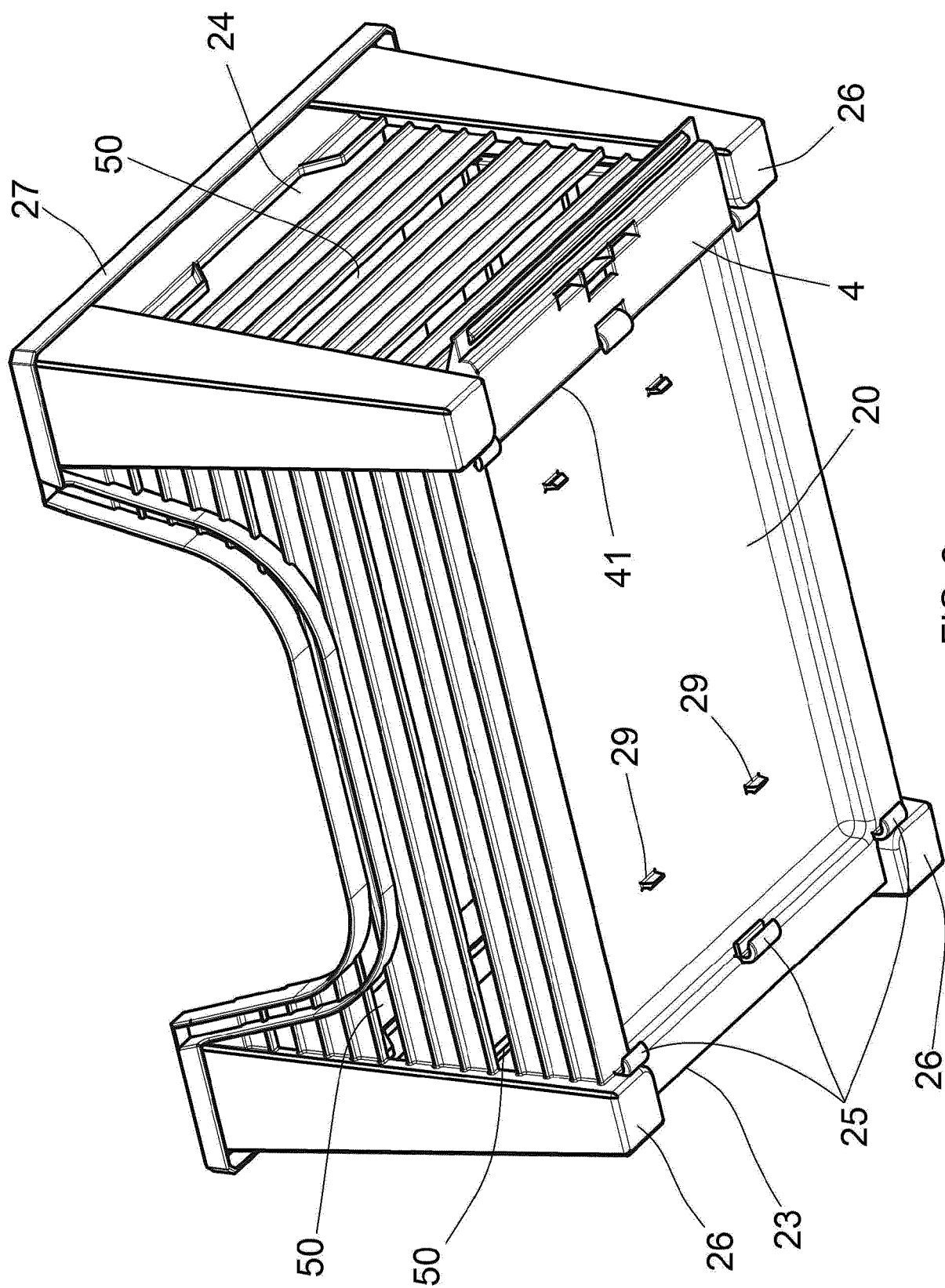


FIG. 2

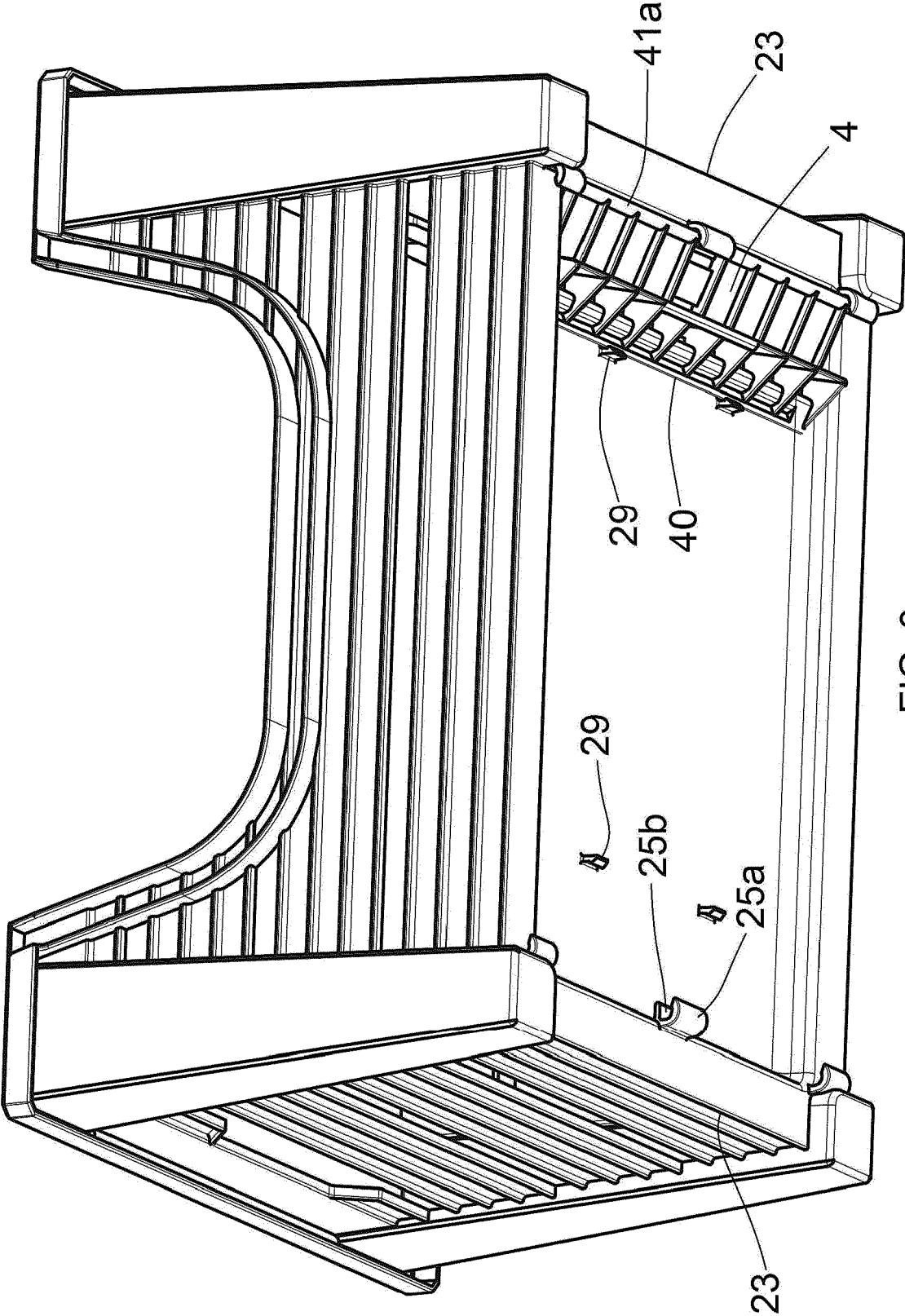


FIG. 3

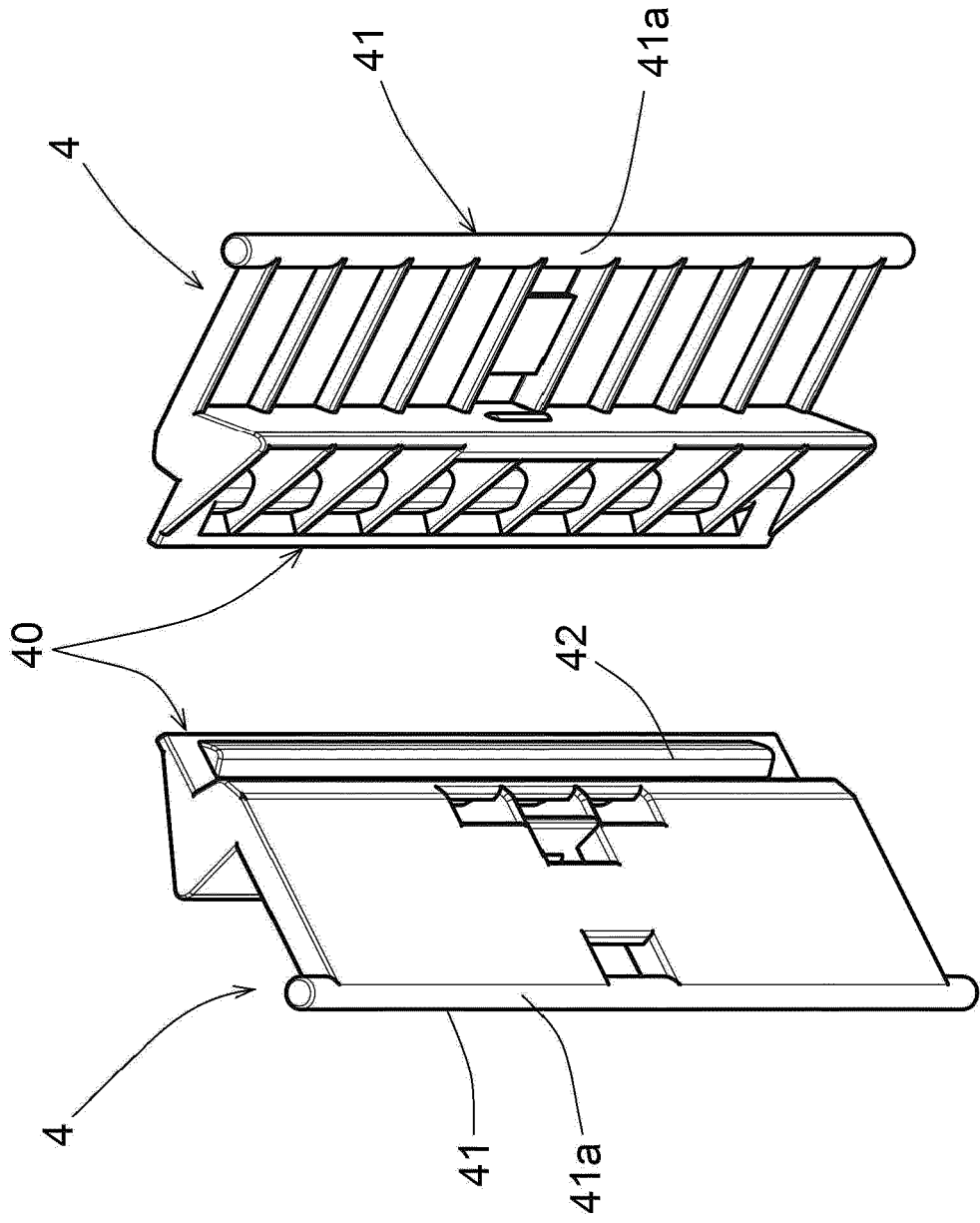


FIG. 5

FIG. 4

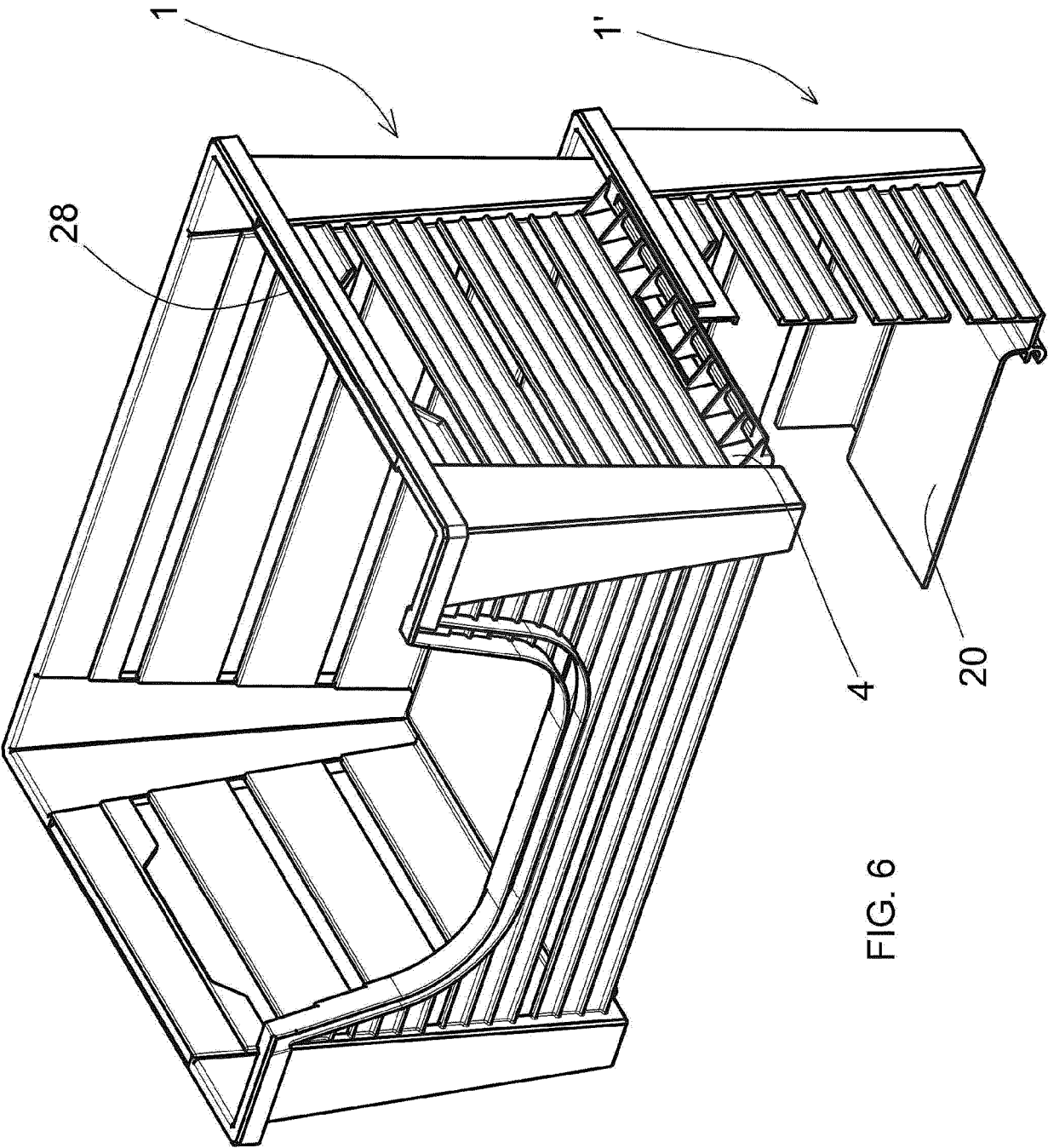
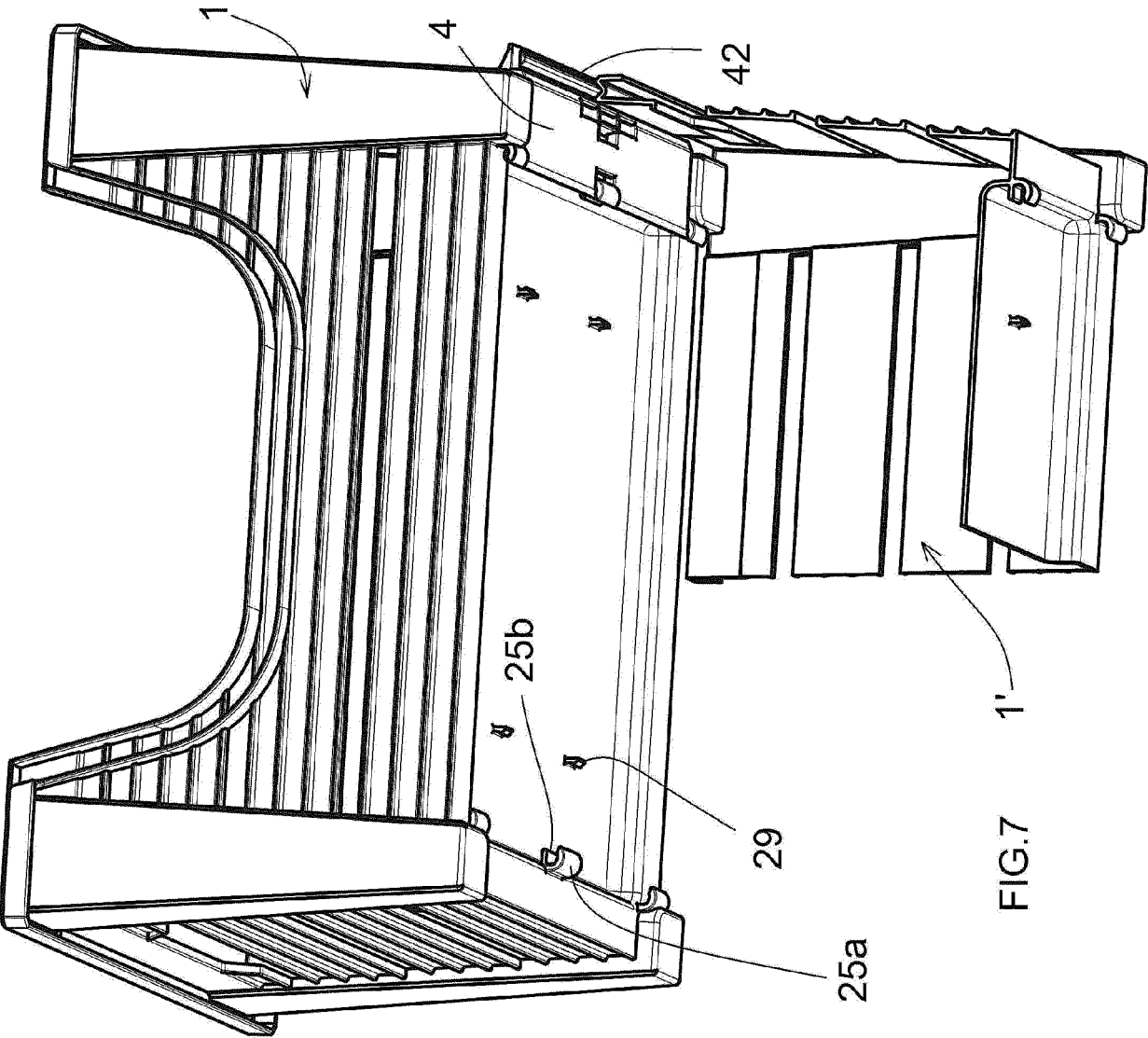


FIG. 6



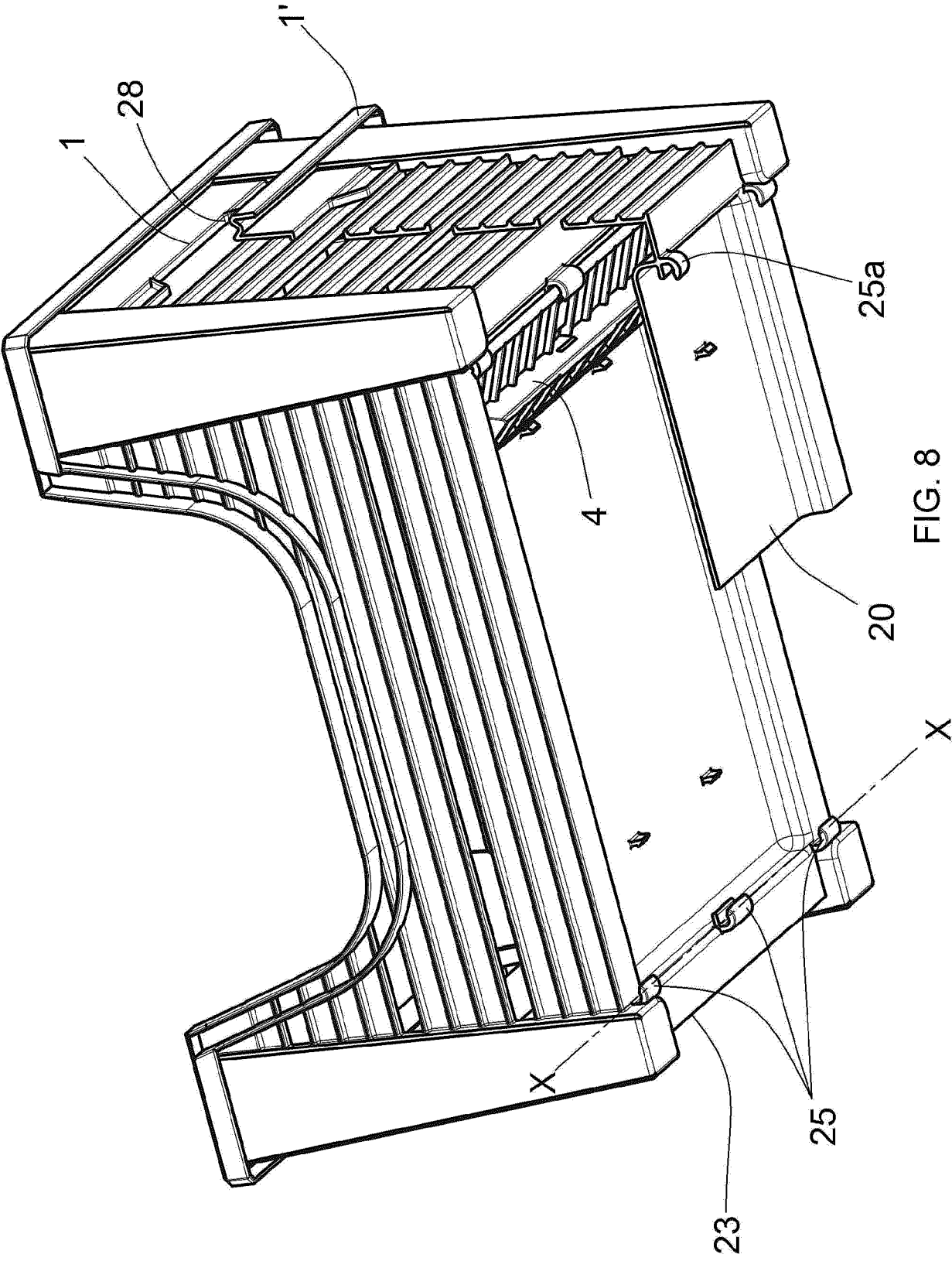


FIG. 8



EUROPEAN SEARCH REPORT

Application Number
EP 18 15 4917

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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	JP H07 165240 A (ARON KASEI KK) 27 June 1995 (1995-06-27) * figures *	1-7	INV. B65D25/00 B65D21/06
A	US 1 689 217 A (KING WHITE WILLIAM) 30 October 1928 (1928-10-30) * the whole document *	1-7	
			TECHNICAL FIELDS SEARCHED (IPC)
			B65D
The present search report has been drawn up for all claims			
Place of search The Hague		Date of completion of the search 18 July 2018	Examiner Zanghi, Amedeo
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**ANNEX TO THE EUROPEAN SEARCH REPORT
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18-07-2018

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