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(54) **Collapsible container**

(57) A container (10) includes a plurality of walls (14 18) extending upward from a base (12). At least one support (20) is movable between a retracted position and a support position. The support (20) may include a contact surface (56) that is angled inwardly into the container (10) to support an upper container (100) thereon. The support (20) may include a tab (50) projecting upwardly from an exterior edge of the support (20) to help retain the upper container (100) on the support (20).

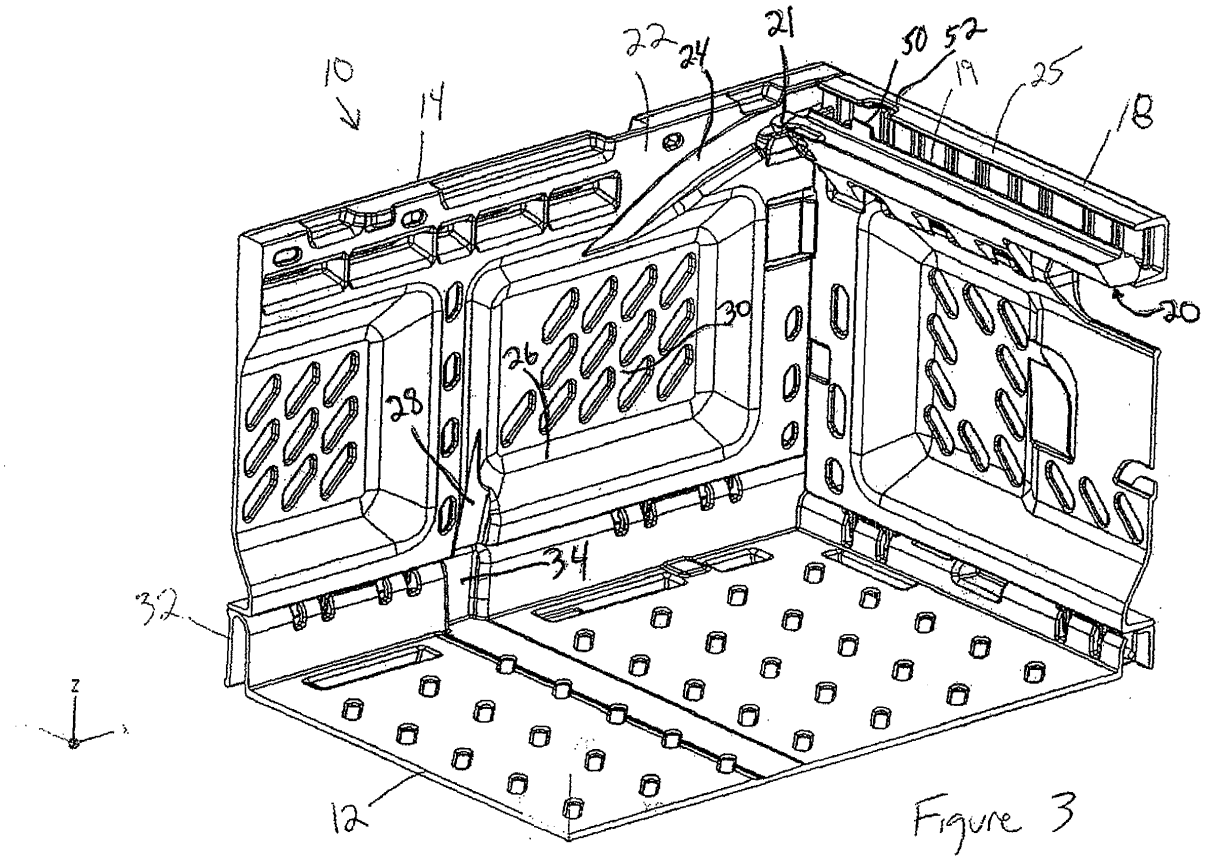

Figure 3

EP 2 098 456 A1

Description

[0001] The present invention relates generally to collapsible crates and more particularly to a collapsible crate with support members for supporting another container thereon.

[0002] Collapsible crates are well known. Four walls each connected via a hinge to a base are selectively movable about the hinge between a use position, in which the wall is generally perpendicular to the base, and a collapsed position onto the base. Various latch mechanisms have been provided to connect adjacent walls at the corner to selectively lock the crate in the use position.

[0003] Some collapsible crates also include retractable supports so that another container can be supported thereon. One such crate includes end walls each having a support that is partially supported on the adjacent walls when in the support position. One problem with some of these crates is retaining the upper container stacked on the supports. Another problem is that supports are sometimes knocked back toward the retracted position as the upper container is placed on the supports.

[0004] It is therefore desirable to provide an improved container that addresses the above described problems and/or offers improvements or an alternative to existing arrangements.

[0005] According to the present invention there is therefore provided a container as variously described in the accompanying claims.

[0006] An embodiment of the present invention provides a container having a plurality of walls extending upwardly from a base. At least one wall has a support pivotably mounted by a hinge. The support is pivotable between a support position where it can support another container thereon and a retracted position against the wall. The support may include a contact surface that is angled inwardly into the container for supporting an upper container thereon. In another feature, the support may include a tab projecting upwardly from an exterior edge of the support to help retain the upper container on the support.

[0007] In the particular embodiment shown, the walls are collapsible onto the base for ease of storage and shipping when empty. The supports are formed on short end walls of the container, such that the supports and end walls can be collapsed onto the base and the long side walls can be pivoted onto the end walls. Alternatively, the supports could be formed on the long walls (or on equally-sized walls). Also, the supports could be pivotably and/or slidably mounted to the walls.

[0008] The present invention will now be described by way of example only with reference to the following figures in which:-

[0009] Figure 1 is a perspective view of a container according to one embodiment of the present invention with its walls in an assembled, upright, use position;

[0010] Figure 2 is a perspective view of the container of Figure 1 with its walls in a collapsed position;

[0011] Figure 3 is an interior view of one of the corners of the container of Figure 1;

[0012] Figure 4 is an enlarged view of one end of one of the side walls of Figure 1;

[0013] Figure 5 is an interior perspective view of the container of Figure 1 with the support in the support position;

[0014] Figure 6 is an interior view, with a sidewall broken away, showing the support in the support position;

[0015] Figure 7 is an end perspective view of the container of Figure 6 with another container supported on the support;

[0016] Figure 8 is a side perspective view of the containers of Figure 7, with the side wall broken away; and

[0017] Figure 9 is an interior perspective view of the container of Figure 1 with the support in the retracted position.

[0018] Figure 1 is a perspective view of a container 10 according to one example of the present invention. The container 10 includes a base 12, upstanding side walls 14 (or long walls) and upstanding end walls 18 (or short walls). The side walls 14 and end walls 18 are pivotably connected along long and short edges of the base 12, respectively. Each end wall 18 has a support 20 pivotably connected to the end wall 18. The side walls 14 and end walls 18 are pivotable onto the base 12 into a collapsed position as shown in Figure 2, with the side walls 14 on top of the end walls 18.

[0019] Referring to Figure 3, the support 20 is pivotably mounted at its lower edge to a position spaced below an upper edge of the end wall 18. Other types of supports 20 which are mounted differently could be used, depending upon the particular application. The support 20 is shown in Figure 3 pivoted to a support position, where it projects into the interior of the container 10 where it can support another container stacked thereon. The support 20 includes a back rail 19 projecting upward from an upper surface of the support 20 in the support position. The back rail 19 is spaced slightly inwardly of an outboard edge of the upper surface of the support 20. The back rail 19 extends from one end of the support 20 continuously to the opposite end of the back rail 19. A plurality of tabs 50 (one shown) extend upwardly from the back rail 19. The supports 20 each include a tab 21 projecting from each side into the adjacent side wall 14. The end walls 18 each include a lip 25 protruding inwardly from the uppermost edge above the support 20. The lip 25 includes a pair of openings 52 (one shown) therethrough aligned with the tabs 50 on the back rail 19 for accommodating the tabs 50 when the support is pivoted toward the retracted position. The openings 52 also provide access for a user to manually deploy the support 20 by pushing on the tabs 50 through the openings 52.

[0020] The interiors of the side walls 14 each include an upper frame portion 22 protruding into the container 10. A curved channel 24 is formed through each upper frame portion 22 adjacent the end wall 18. The interior of each side wall 14 further includes a lower frame portion

26 having a channel 28 formed therethrough below each curved channel 24. A recess 30 is defined between the upper frame portion 22 and the lower frame portion 26. The base 12 includes a pair of side upstanding portions 32 to which the side walls 14 are pivotably attached. Each side upstanding portion 32 includes a channel 34 formed on an interior thereof, below each channel 28. The channels 24, 28 and 34 are aligned with one another and with the tabs 21 on the supports 20, so that the end walls 18 can be pivoted to the collapsed position prior to the side walls 14 being collapsed, such that the side walls 14 are collapsed onto the end walls 18, as shown in Figure 2.

[0021] Figure 4 illustrates one end of one of the side walls 14. Each end of the side wall 14 includes a latch 36. At the top of the curved channel 24 is a rail 38 spaced inwardly into the container 10. The rail 38 includes a step 40 having a substantially vertical leading face 42. The leading face 42 forms a stop, which will be explained below.

[0022] Figures 5 and 6 illustrate the support 20 in the support position, with the tab 21 resting on the rail 38 and abutting the step 40, which prevents the support 20 from being moved into the retracted position. Each support 20 includes an upper surface having contact surfaces 56 that are angled inwardly toward the interior of the container 10. In the embodiment shown, the upper surface of the support 20 is flat and generally parallel to the base 12, while the contact surfaces 56 forms a recess that is angled inwardly. However, alternatively, the entire upper surface of the support 20 could be angled inwardly as the contact surfaces 56 is. Referring to Figure 5, the support 20 includes a flange 46 extending downwardly from the tab 21 behind (that is, toward the exterior of) the rail 38. As shown in Figure 7, in the support position, the support 20 is prevented from retracting by the face 42 of the step 40 on the rail 38.

[0023] When another container 100 is stacked on the supports 20, as shown in Figures 8 and 9, the weight on the supports 20 keeps the supports 20 down on the rail 38, such that the step 40 prevents the supports 20 from being inadvertently knocked back into the retracted position. As also shown in Figure 7, the back rail 19 on the upper surface 16 of the support 20, particularly the tabs 50, prevent the container 100 from sliding further toward the end wall 18, which could cause the opposite end of the container 100 to slide inwardly of that support 20.

[0024] As shown in Figure 8, the upper container 100, particularly lower ribs 102, rest on the contact surfaces 56 of the upper surface 16 of the support 20, while the back rail 19 of the support 20 locates the upper container 100 properly between the end walls 18. Although the upper container 100 is shown in contact with the back rail 19 and tabs 50, it is anticipated that some tolerance would be permitted. This may depend upon the particular upper containers 100 with which the container 10 is to be used. The tabs 50 extend upward sufficiently to contact the upper container 100 on its vertical outer surface, above the rounded, tapered or angled surfaces that transition to the base of the upper container 100. This prevents the upper container 100 from riding up on the back rail 19.

[0025] The contact surfaces 56 have a profile that matches that of the lower ribs 102 (which are the lower contact surfaces) of the upper container 100 as shown. This reduces the tendency of the angled surface of lower ribs 102 to push the support 20 back toward the end wall 18. The matching profiles of the lower ribs 102 and the contact surfaces 56 results in a more downward force being applied to the supports 20, which keeps the supports 20 engaged in front of the steps 40 on the rails 38 in the side walls 14 (Figure 7).

[0026] The hinge connection between the support 20 and the end wall 18 includes sufficient tolerance for the support 20 to be lifted over and onto the step 40 by the user, as shown in Figure 9. In fact, the natural movement of the support 20 being moved by a user toward the retracted position tends to lift the support 20 over the step 40, so no additional effort is required.

[0027] In accordance with the provisions of the patent statutes and jurisprudence, exemplary configurations described above are considered to represent a preferred embodiment of the invention. However, it should be noted that the invention can be practiced otherwise than as specifically illustrated and described without departing from its spirit or scope. For example, in any of the occurrences above, the hinge members and hinge pins could be reversed and formed on opposite parts. Alphanumeric identifiers on method steps are for convenient reference in dependent claims and do not signify a required sequence of performance unless otherwise indicated in the claims.

Claims

1. A container (10) comprising:

a base (12);
a plurality of walls (14,18) extending upward from the base (12), the plurality of walls (14, 18) including a first wall (18) and a second wall (14);
a support (20) mounted to the first wall (18) and movable relative to the first wall (18) between a retracted position and a support position; and
at least one contact surface (50) on an upper surface (16) of the support, (20) the at least one contact surface (56) angled inwardly toward the interior of the container (10) when the support (20) is in the support position.

2. The container (10) of claim 1 wherein the plurality of walls (14,18) are collapsible onto the base (12).

3. The container (10) of claim 1 or 2 wherein the support (20) is partially supported on the second wall (14) in the support position.

4. The container (10) of any preceding claim wherein the container (11) is a lower container (10) with an upper container (10) stacked thereon, the upper container (100) stacked on the support (20) of the lower container (10), the upper container (100) having a lower contact surface (102) angled downwardly toward the interior of the lower container (10), the lower contact surface (102) abutting the at least one contact surface (50).

5. The container (10) of any preceding claim wherein the support (20) further includes at least one tab (50) projecting upwardly from an exterior portion of the support (20).

6. The container (10) of claim 5 wherein the support (20) includes a back rail (19) extending along the exterior portion of the support (20), the at least one tab (50) projected upwardly from the back rail (19).

7. The container (10) of claim 4 wherein the upper container (100) includes a vertical external surface adjacent a curved surface leading to an underside of the upper container (100), the support (20) further includes at least one tab (50) projecting upwardly from an exterior portion of the support (20), the at least one tab abutting the vertical exterior surface of the upper container (100).

8. A container (10) comprising:

   a base (12);
   a plurality of walls (14,18) extending upward from the base (12), the plurality of walls (14.18) including a first wall (18) and a second wall (14);
   a support (20) mounted to the first wall (18) and movable relative to the first wall (18)between a retracted position and a support position; and
   at least one tab (50) projecting upwardly from an exterior portion of the support (20).

9. The container (10) of claim 8 wherein the plurality of walls are collapsible onto the base.

10. The container (10) of claim 8 or 9 wherein the support (20) includes a back rail (19) extending along the exterior portion of the support (20), the at least one tab (50) projected upwardly from the back rail (19).

11. The container (10) of any of claims 8 to 10 wherein the support (20) is partially supported on the second wall (14) in the support position.

12. The container (10) of any of claims 8 to 11 further including at least one contact surface (56) on an upper surface (16) of the support (20), the at least one contact surface (56) angled inwardly toward the interior of the container (10) when the support (20) is in the support position.

13. The container (10) of claim 12 wherein the container (10)is a lower container (10) with an upper container (100) stacked thereon, the upper container (100) stacked on the support (20) of the lower container (10), the upper container (100) having a lower contact surface (102) angled downwardly toward the interior of the lower container (10), the lower contact surface (102) abutting the at least one contact surface (156).

14. The container (10) of claim 13 wherein the upper container (100) includes a vertical external surface adjacent a curved surface leading to an underside of the upper container (100), the at least one tab (50) abutting the vertical exterior surface of the upper container (100).

15. The container (10) of any of claims 5 to 14 wherein the first wall (18) includes a lip (25) extending from an uppermost edge of the first wall (18) toward an interior of the container (10), the lip (25) including at least one opening (52) for accommodating the at least one tab (50) when the support (20) is in the retracted position.

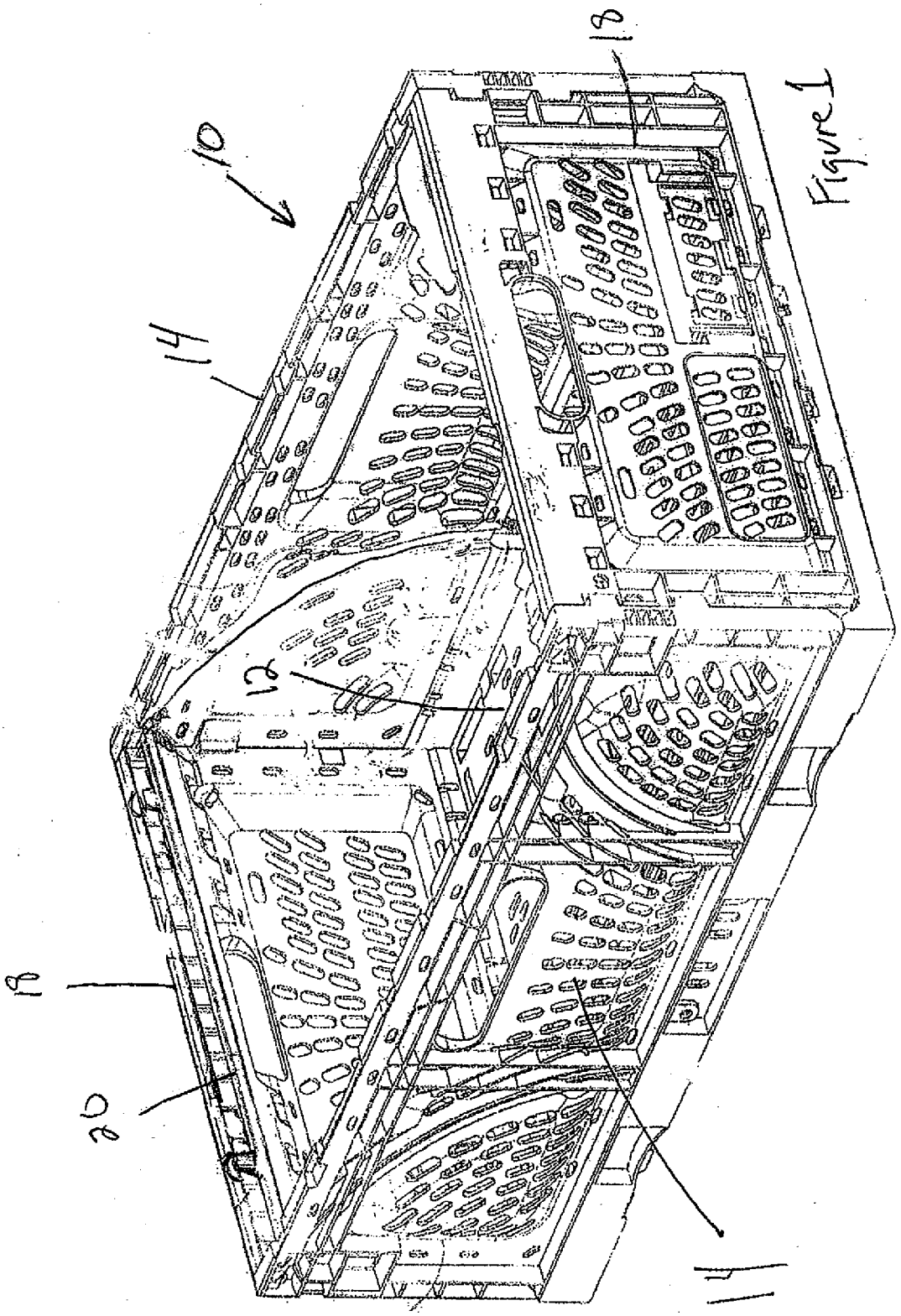

Figure 1

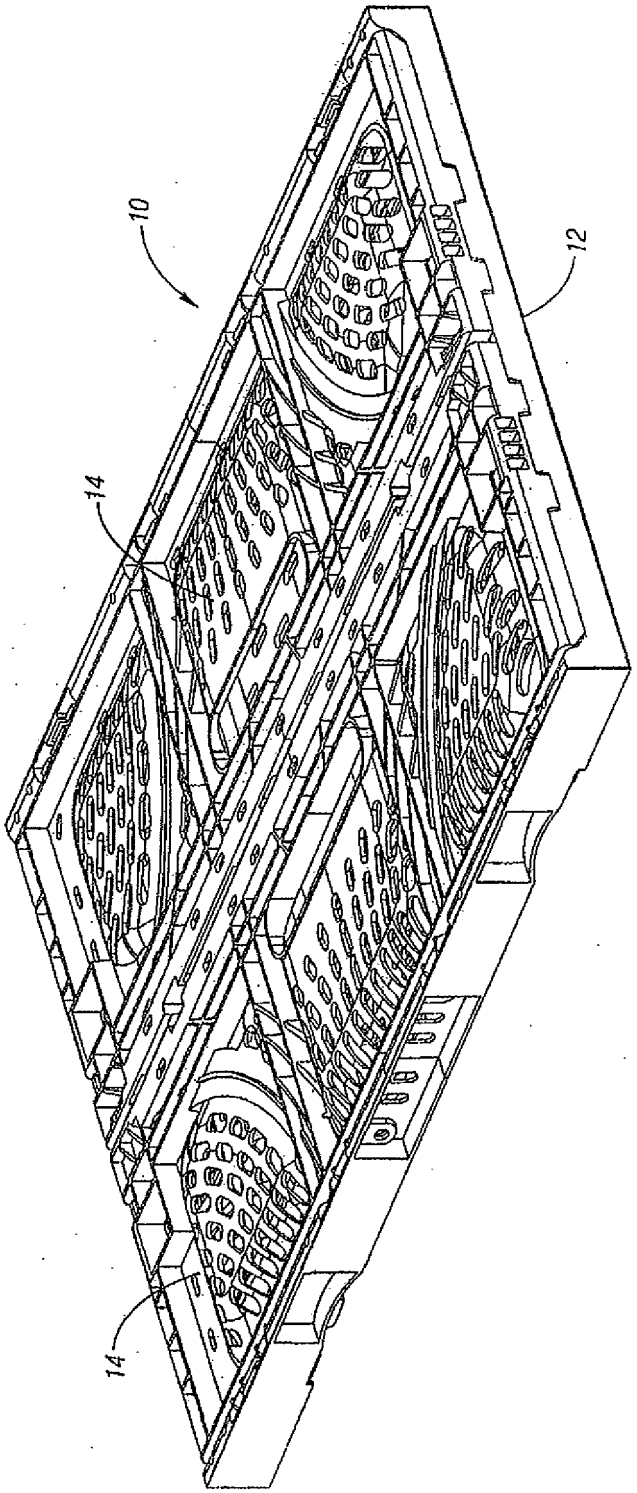

Fig. 2

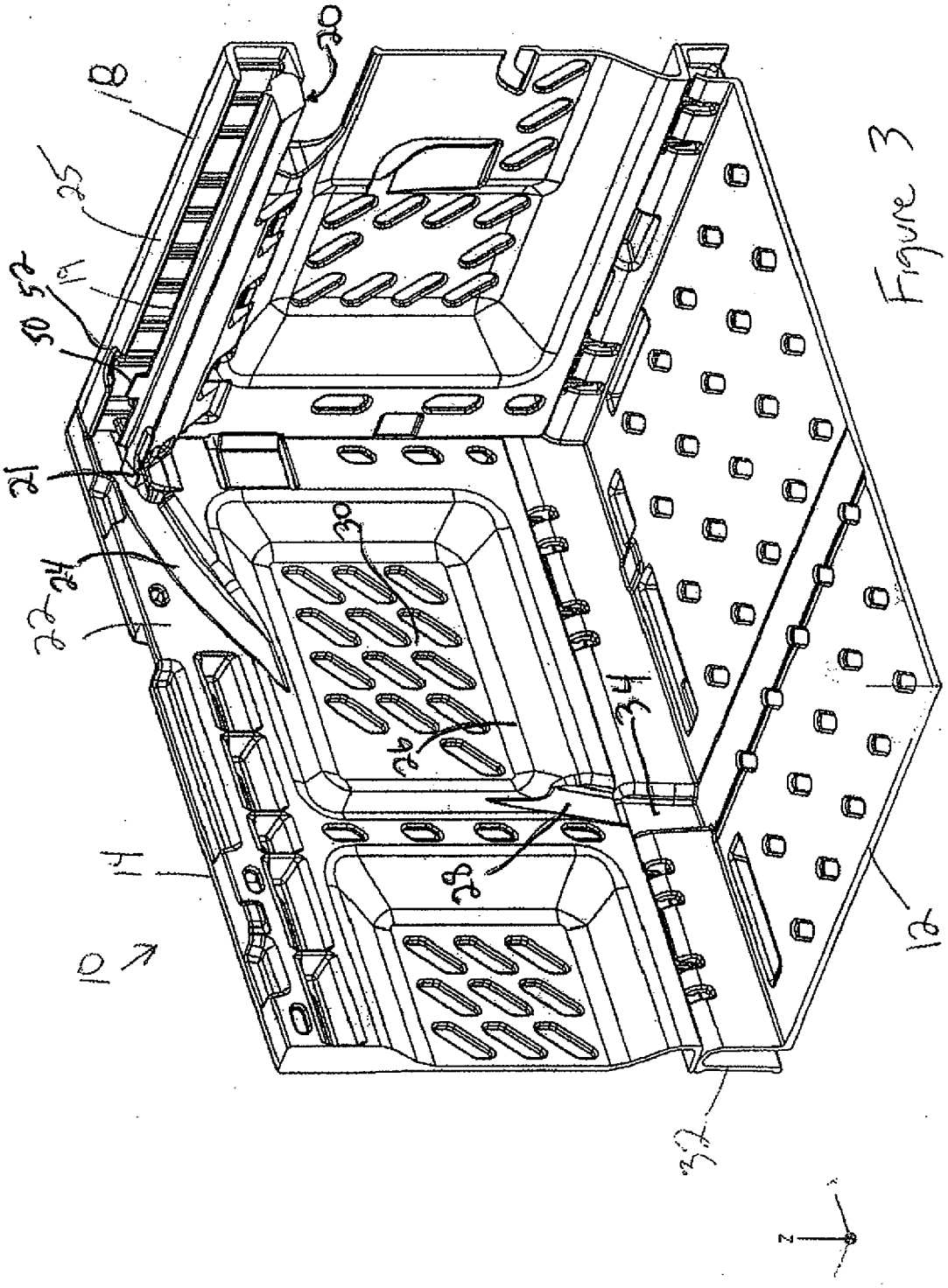

Figure 3

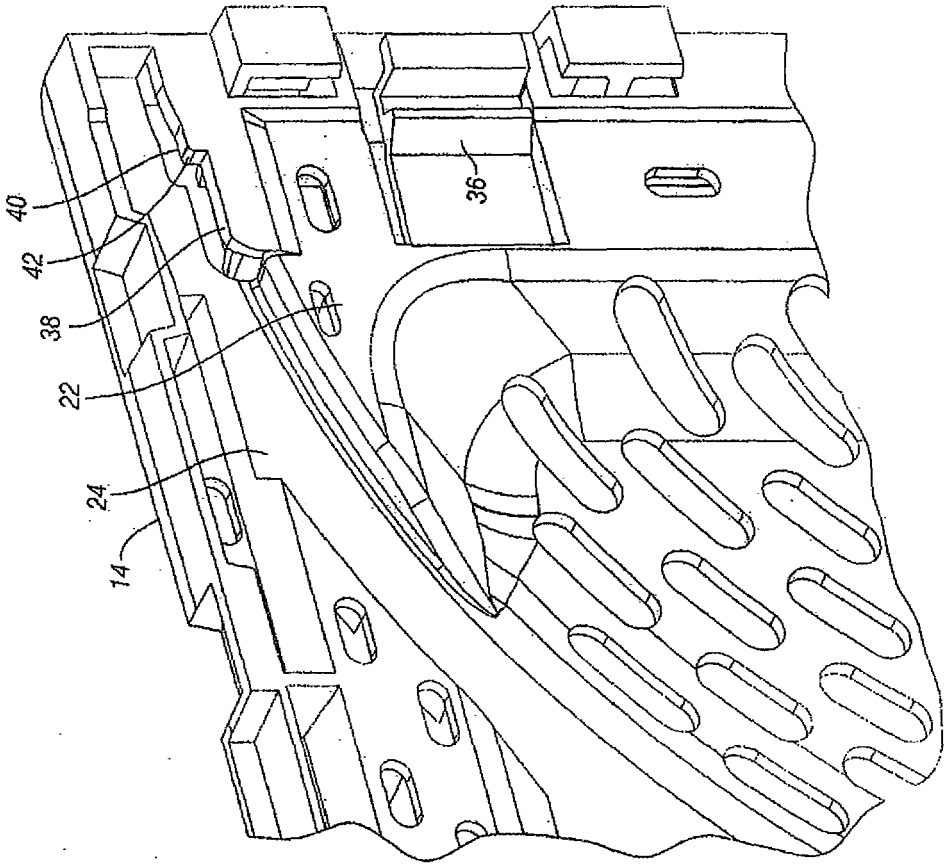

Fig. 4

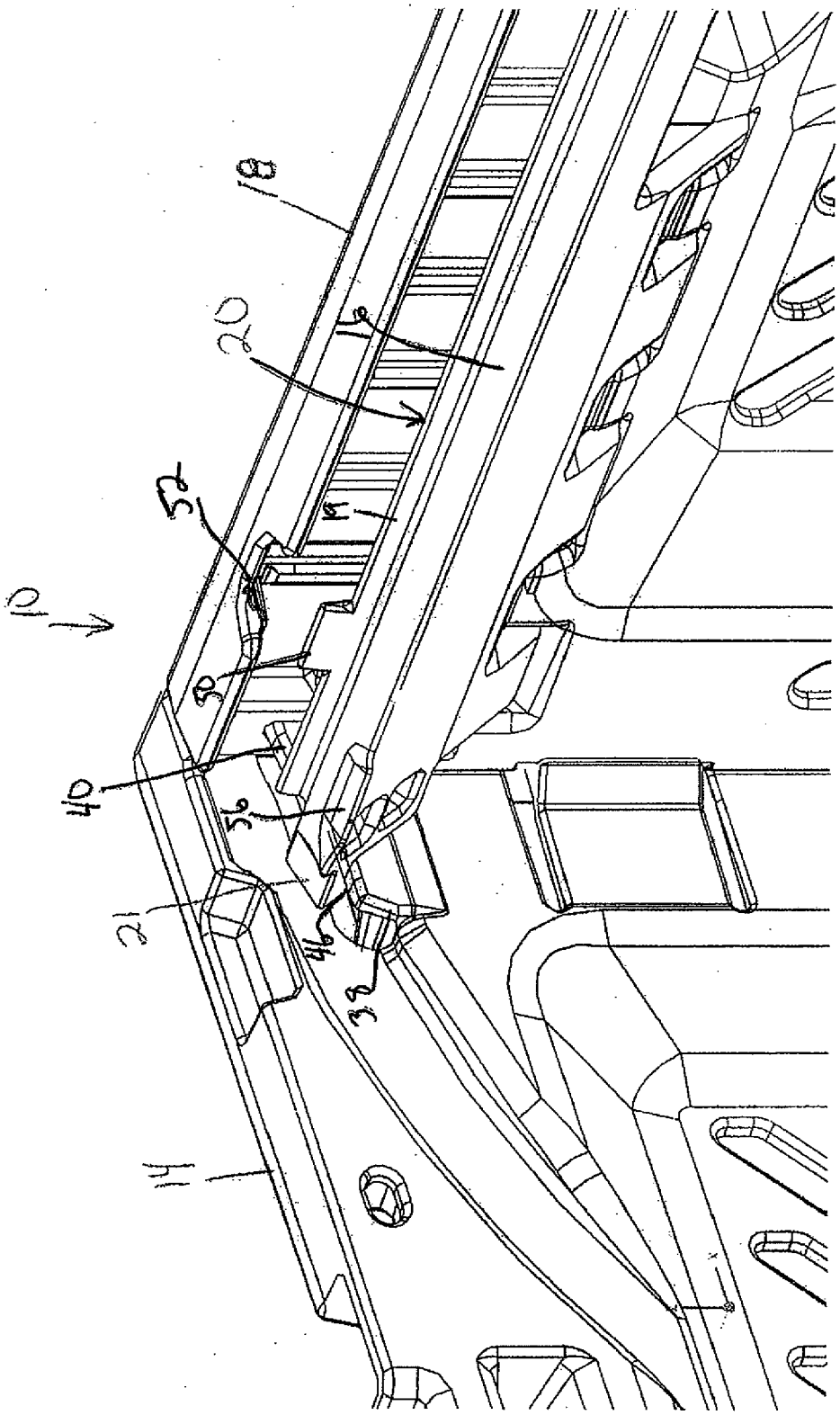

Figure 5

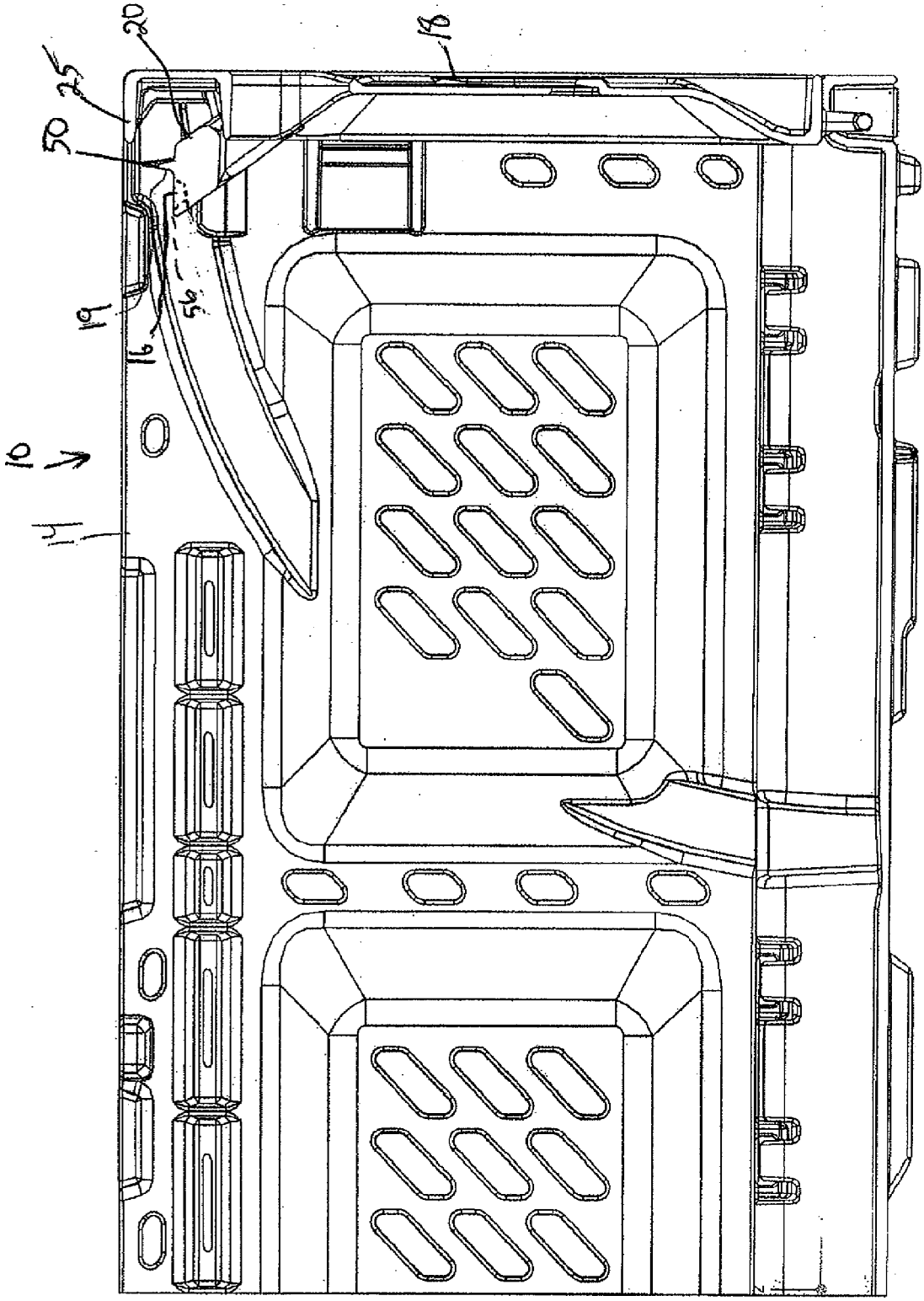

Figure 6

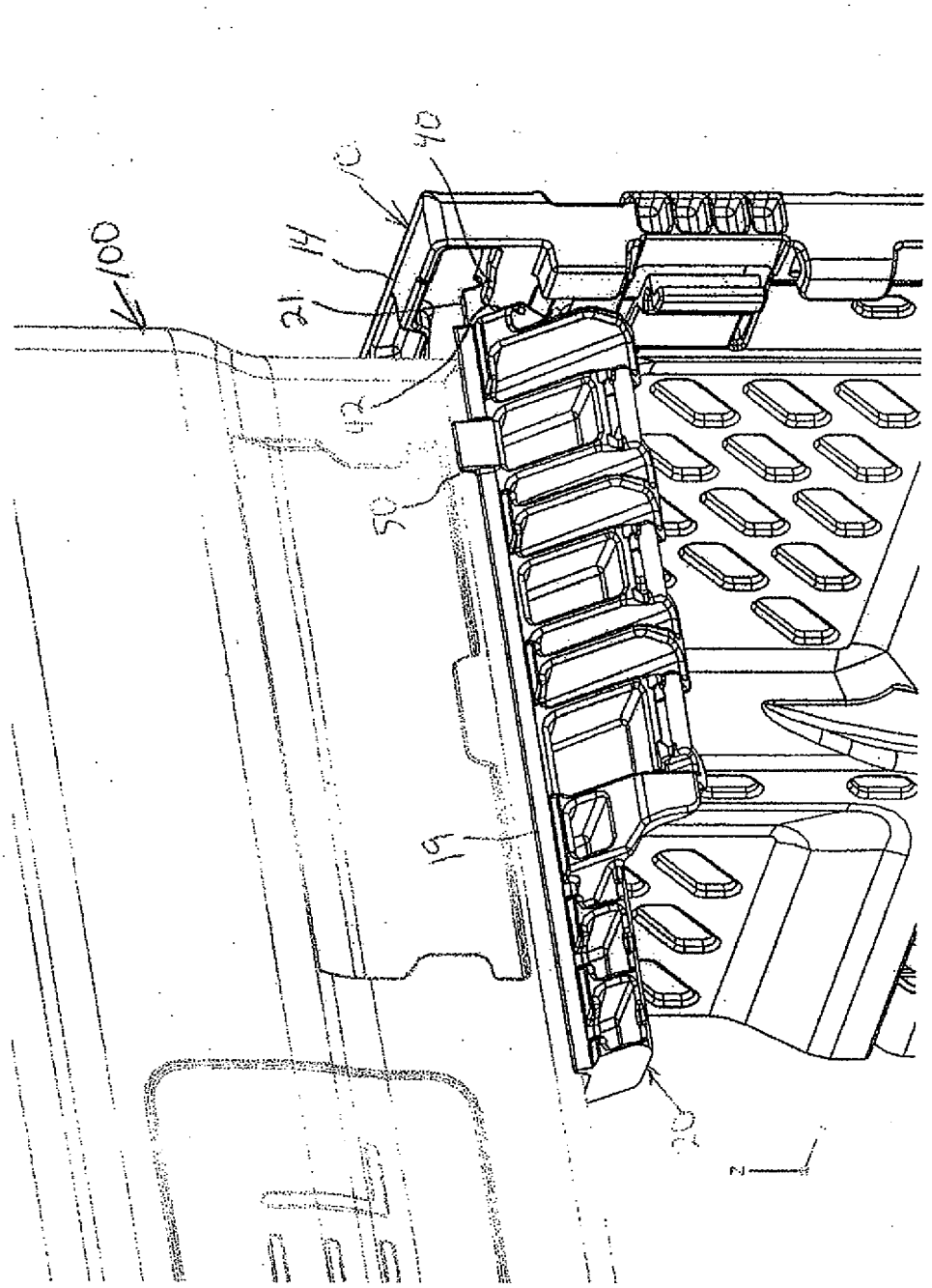

Figure 7

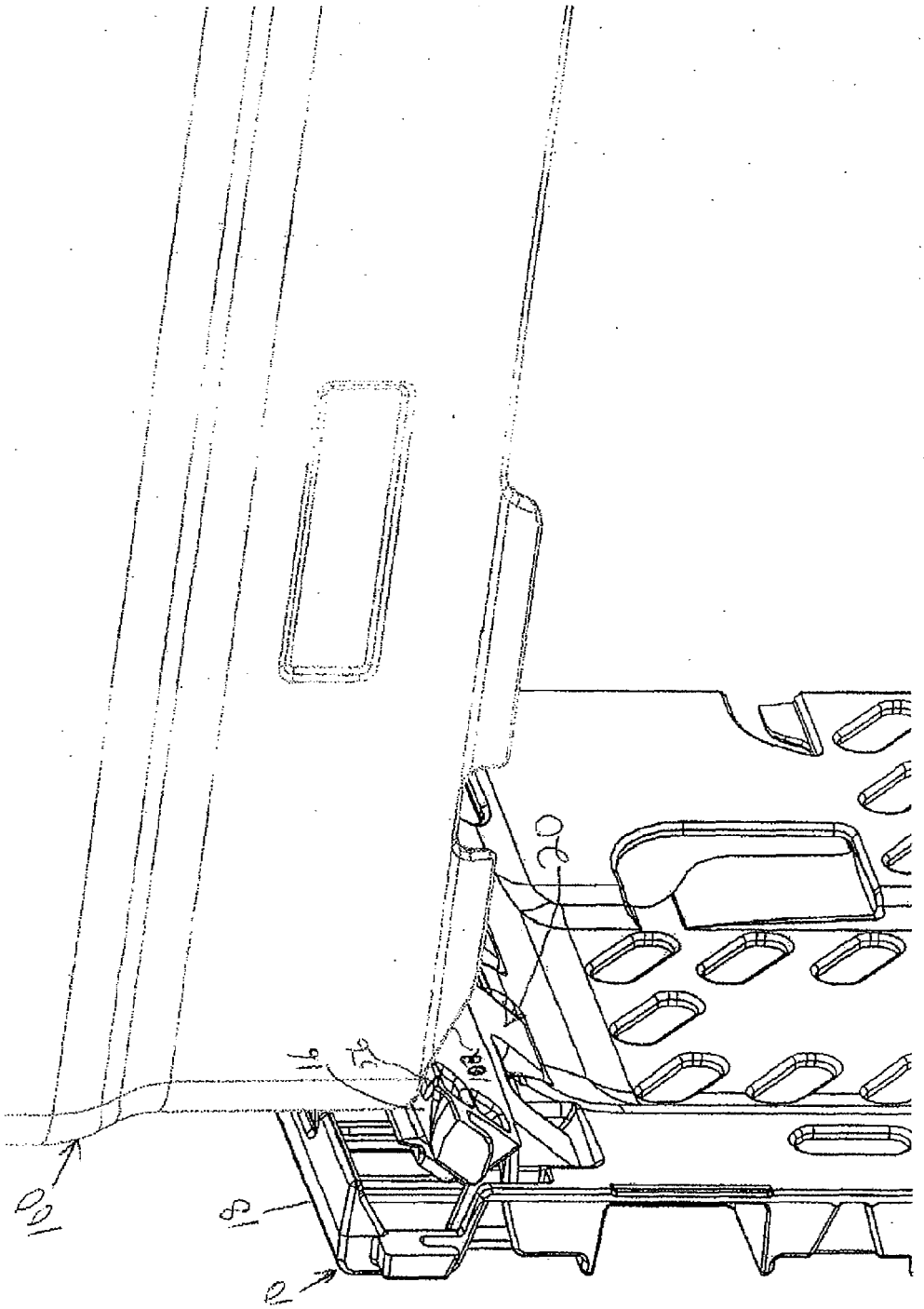

Figure 8

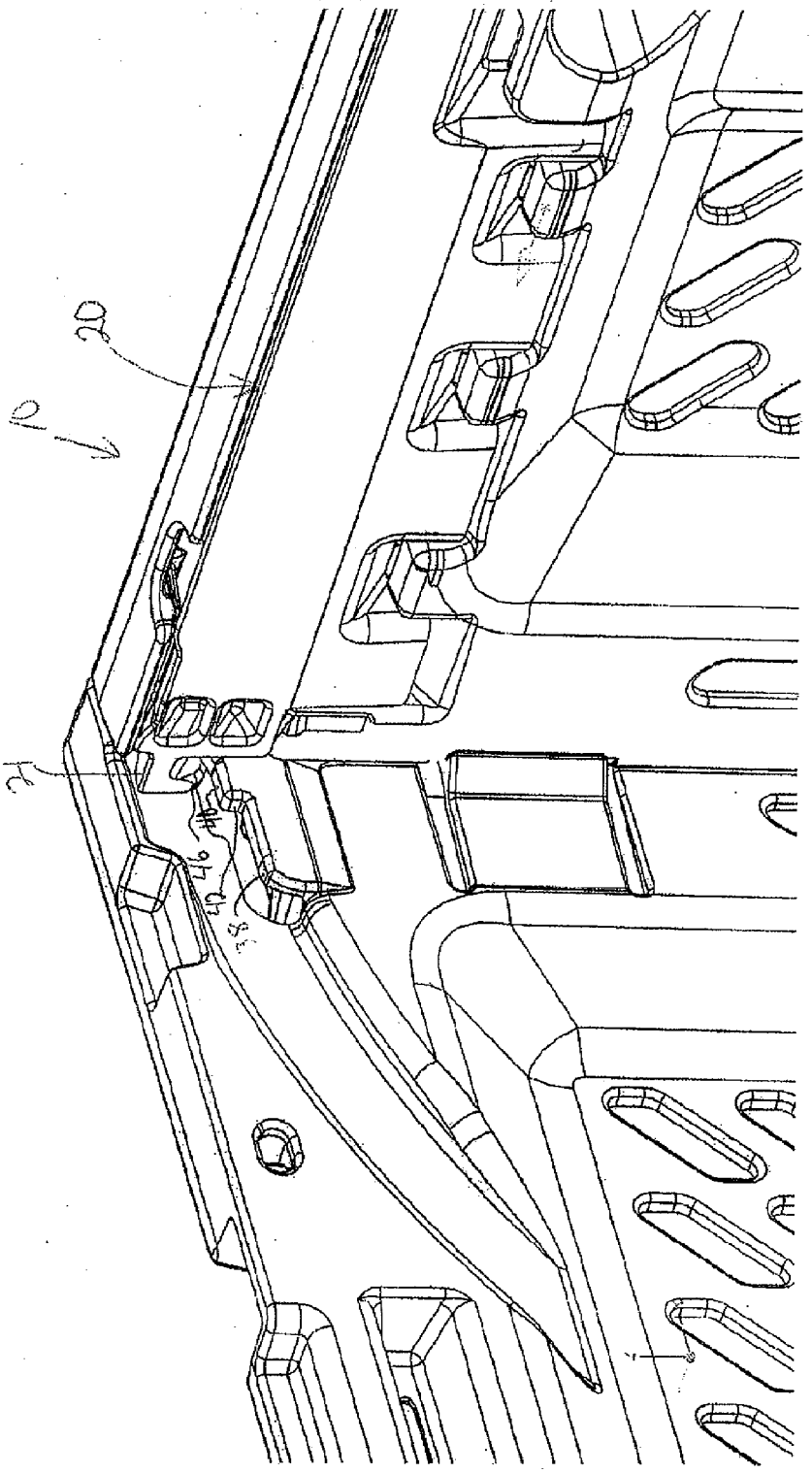

Figure 9

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EUROPEAN SEARCH REPORT

Application Number
EP 09 15 4468

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Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
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The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
Munich	7 April 2009	Rodriguez Gombau, F

CATEGORY OF CITED DOCUMENTS

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