

(19)



(11)

EP 2 072 413 A2

(12)

EUROPEAN PATENT APPLICATION

(43) Date of publication:

24.06.2009 Bulletin 2009/26

(51) Int Cl.:

B65D 21/06 (2006.01)**B65D 8/14 (2006.01)**(21) Application number: **08172185.4**(22) Date of filing: **18.12.2008**

(84) Designated Contracting States:

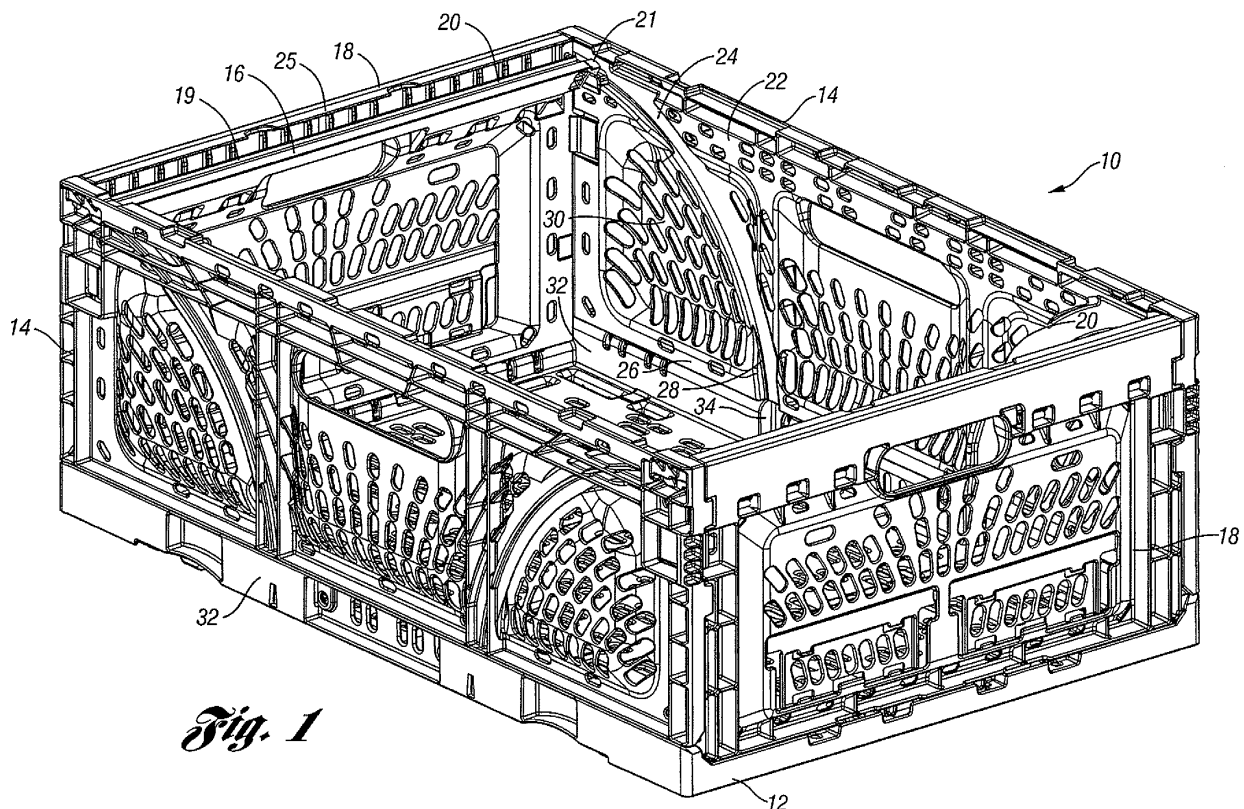
**AT BE BG CH CY CZ DE DK EE ES FI FR GB GR
HR HU IE IS IT LI LT LU LV MC MT NL NO PL PT
RO SE SI SK TR**

Designated Extension States:

AL BA MK RS(30) Priority: **21.12.2007 US 16236 P**(71) Applicant: **Rehrig Pacific Company
Los Angeles, CA 90058 (US)**(72) Inventor: **Apps, William****Alpharetta, GA 30022 (US)**(74) Representative: **Lamb, Richard Andrew****Urquhart-Dykes & Lord LLP****New Priestgate House****57 Priestgate****Peterborough****Cambridgeshire PE1 1JX (GB)**(54) **Collapsible container**

(57) A collapsible container (10) includes a plurality of walls (18,14) collapsible onto the base (12). At least one wall (18) has a support (20) pivotally mounted below a lip (25) formed on an upper edge of the wall (18). The support (20) is pivotable between a deployed position

where it is partially supported on an adjacent wall (14) and a retracted position. A torsion member (58) biases the support (20) toward the deployed position. A latch (68) deploys the support (20) as the wall (18) is moved toward the upright position.

**Fig. 1****EP 2 072 413 A2**

Description

[0001] This application claims priority to U.S. Provisional Application Serial Number 61/016,236, filed December 21, 2007.

[0002] The present invention relates generally to collapsible crates and more particularly to a collapsible crate with support members for supporting another container thereon.

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.

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.

[0003] It is therefore desirable to provide an improved collapsible crate or container which addresses the above described problems and/or which more generally offers improvements or an alternative to existing arrangements.

[0004] According to the present invention there is therefore provided a container as variously described in the accompanying claims.

[0005] An embodiment of the invention provides a collapsible container having a plurality of walls collapsible onto the base. At least one wall has a support pivotably mounted by a hinge below an upper end thereof. The support is pivotable between a support position where it can support another container thereon and a retracted position against the wall. In the support position, the lateral ends of the support are supported on the long walls. A torsion member biases the support toward the support position, such that when the support is forced into the retracted position, it will automatically return to the support position.

In the example described below, the torsion member engages the wall adjacent the one to which it is mounted, such that the torsion member only biases the support toward the support position when the walls are in the erect position.

In another feature of the present invention, a latch formed adjacent the base wall moves the support to the support position as the wall is moved from the collapsed position to the erect position.

In the particular embodiment shown, 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).

[0006] Other advantages of the present invention can be understood by reference to the following detailed description when considered in connection with the accom-

panying drawings wherein:

Figure 1 is a perspective view of the crate according to one embodiment of the present invention.

Figure 2 is a perspective view of the crate in a collapsed position.

Figure 3 is an interior perspective view of one end of one of the side walls.

Figure 4 is a front perspective view of one of the supports.

Figure 5 is a rear perspective view of the support of Figure 4.

Figure 6 is an interior perspective view of one corner of the crate of Figure 1.

Figure 7 is an exterior perspective view of the corner of Figure 6 with the end wall removed, with the support in the deployed position.

Figure 8 is similar to Figure 7, with the support in the retracted position.

Figure 9 is an interior perspective view of crate with the end wall in a collapsed position.

Figure 10 is an enlarged view of a portion of Figure 9, with the end wall removed, showing the position of the support on the base.

Figure 11 is an enlarged view similar to Figure 10, showing a portion of the end wall and the support, as the end wall is starting to move from the collapsed position.

[0007] Figure 1 is a perspective view of a container 10. 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. The support 20 is pivotably mounted at its lower edge to a position spaced below an upper edge of the end wall 18. The support 20 is shown in Figure 1 pivoted to a support position, where it projects into the interior of the container 10 where it can support another container stacked thereon. 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 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. Figure 3 illustrates one end of one of the side walls 14. The other end would be similar, as would the other side wall 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 that prevents the support 20 (Figure 1) from being knocked back into the retracted position when another container is stacked thereon. The step 40 requires the support 20 to be lifted prior to being retracted, although this can happen easily when there is no weight on the support 20.

The side wall 14 further includes an inwardly projecting member 48 having a recess 50 formed therein. The recess 50 includes an upper abutment surface 52 and a mating surface 54.

Figures 4 and 5 are front and rear perspective views, respectively, of one of the supports 20. The support 20 includes a flange 46 projecting downwardly from the tab 21. A torsion member 58, such as a torsion bar, extends laterally from the support 20 generally along the axis x of rotation of the support 20, that is, generally coaxially with hinge pins 60, which in this example are also integrally molded with the support 20. The torsion member does not have to be coaxial with the axis x or the hinge pins 60, and such other arrangements would still be within the scope of this invention. A flange 62 protrudes radially from an axial end of the torsion member 58. The flange 62 includes a generally flat abutment surface 64. Again, the particular shape is not required, as the primary purpose of the flange 62 is to create torsional leverage on the torsion member 58 (in this case, a torsion bar).

Figure 6 is an interior perspective view of one corner of the crate 10 (partially broken away) with the support 20 in the deployed position. The tab 21 of the support 20 is resting on the rail 38 and abutting the step 40, which prevents the support 20 from being moved into the retracted position. 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. In this manner, the support 20 can be intentionally moved into the retracted position when desired. Figure 7 is an exterior perspective view of the corner of Figure 6 with the end wall 18 not visible for purposes of illustration, and with the support 20 in the deployed position. When the end wall 18 (not visible) is pivoted to the upright position, the flange 62 is received in the recess 50 on the side wall 14. The flange 62 abuts the mating surface 54 and the abutment surface 64 of the flange 62 contacts the abutment surface 52 on the side wall 14. As the end wall 18 is pivoted to the upright position, the contact between the abutment surfaces 64, 52 moves the support 20 to the deployed position (if it was not already in the deployed position). Optionally, the flange 62 and

recess 50 may be configured to provide a preload on the torsion member 58, such that the flange 62 must be slightly rotated and the torsion member 58 must be slightly twisted before the end wall 18 can be latched to the side wall 14.

Figure 8 is similar to Figure 7, with the support 20 forced into the retracted position, such as may be done by hand or by automated handling equipment. Force must be applied to the support 20 to maintain the support 20 in the retracted position. As shown, the flange 62 is still in the same position relative to the recess 50, but the support 20 is now retracted, thus placing the torsion member 58 further in torsion. When force on the support 20 is released, the torsion member 58 will return the support 20 to the deployed position (Figure 7).

Figures 9-11 illustrate an additional, independent feature of the present invention. Figure 9 is an interior perspective view of the crate 10 with the end wall 18 in a collapsed position. Note that the support 20 can be freely moved to the retracted position in the end wall 18 when the end wall 18 is not latched to the side wall 14. Figure 10 is an enlarged view of a portion of Figure 9, with the end wall 18 not visible in order to show the position of the support 20 on the base 12. The base 12 includes an integrally molded latch 68 adjacent the support 20. The latch 68 includes a flexible arm 70 and a shoulder 72 at one end. An angled surface 74 is formed opposite the shoulder 72. When the end wall 18 is collapsed onto the base 12, the tab 21 of the support 20 contacts the angled surface 74 of the latch 68, thus flexing the latch 68 outwardly and permitting the tab 21 to slide under the shoulder 72 of the latch 68, as shown. Optionally, the latch 68 could also be formed integrally with the side wall 14.

Figure 11 is a view similar to Figure 10, but also showing a portion of the end wall 18 as it is starting to move from the collapsed position. As the end wall 18 begins to move upward, the support 20 is held against the base 12 by the latch 68, thus causing the support 20 to pivot about the hinge pins 60 relative to the end wall 18 as shown. This causes the support 20 to begin to move toward the deployed position, which also slides the tab 21 out from under the latch 68. When the tab 21 is free of the latch 68, the end wall 18 and support 20 can be moved to the full upright position, with the support 20 now in the deployed position. With the support 20 deployed, it is easier for the user to grasp the end wall 18, rather than grasping the end wall 18 and support 20 together, which would later work against the deployment of the support 20 by the torsion member 58 (Figure 8).

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 first wall (18) pivotably mounted relative to the base (12);
a second wall (14) pivotably mounted relative to the base (12), adjacent the first wall (18); and
a support (20) pivotably mounted to the first wall (18), the support (20) pivotable about an axis (x) generally parallel to the base (12) between a deployed position and a retracted position, a torsion member (58) biasing the support (20) toward the deployed position.

2. The container (10) of claim 1 wherein the torsion member (58) is at least substantially coaxial with the axis (x).

3. The container (10) of claim 1 or 2 wherein the torsion member (58) is integrally molded with the support (20).

4. The container (10) of any preceding claim wherein an engagement portion (62) of the torsion member (58) engages the second wall (14), such that the second wall (14) prevents rotation of the engagement portion (62) of the torsion member (58).

5. The container (10) of any preceding claim wherein the torsion member (58) is twisted by movement of the support (20) to the retracted position.

6. The container (10) of claim 1 further including a latch (68) moving the support (20) from the retracted position to the deployed position as the first wall (18) is moved from a collapsed position on the base toward an erect position.

7. The container (10) of claim 6 wherein the latch (68) is formed integrally with the base (12).

8. The container (10) of claim 6 or 7 wherein the latch (68) is deflected outwardly by the support (20) when the first wall (18) is moved from the erect position toward the collapsed position.

9. The container (10) of any preceding claim wherein the support (20) is received in the first wall (14) in the retracted position.

10. The container (10) of any of the preceding claims wherein the support (20) moves into the interior of the container (10) from the retracted position to the deployed position.

11. A container (10) comprising:

a base (12);
a first wall (18) pivotably mounted relative to the base (12) and movable between a collapsed position and an upright position;
a second wall (14) pivotably mounted relative to the base (12), adjacent the first wall (18);
a support (20) pivotably mounted to the first wall (14), the support (20) pivotable about an axis (x) generally parallel to the base (12) between a support position and a retracted position; and
a latch (68) moving the support (20) from the retracted position to the deployed position as the first wall (18) is moved from the collapsed position toward the upright position.

12. The container (10) of claim 11 wherein the latch (68) is formed integrally with the base (12).

13. The container (10) of claim 11 or 12 wherein the latch (68) is deflected outwardly by the support (20) when the first wall (18) is moved from the erect position toward the collapsed position.

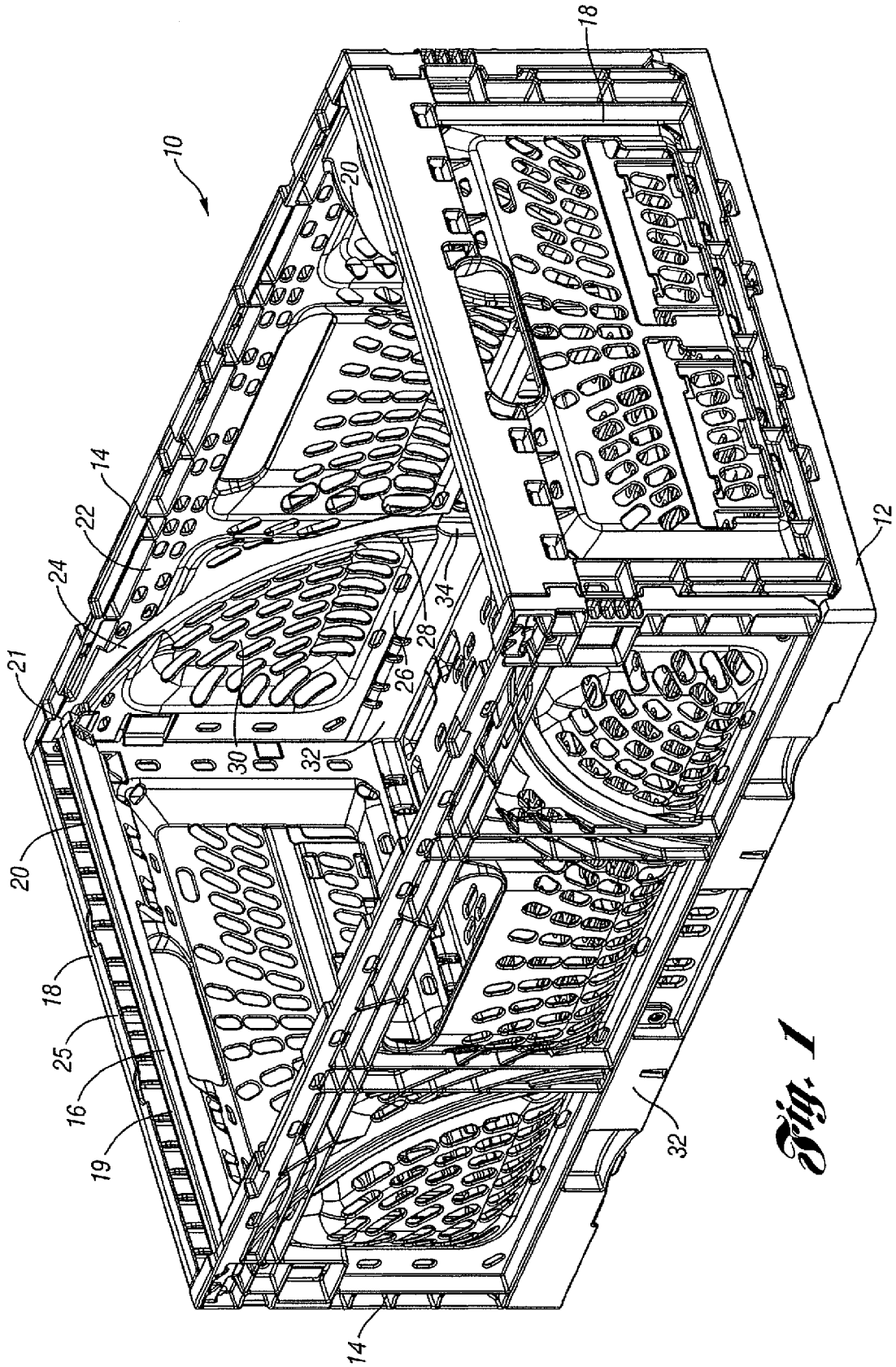


Fig. 1

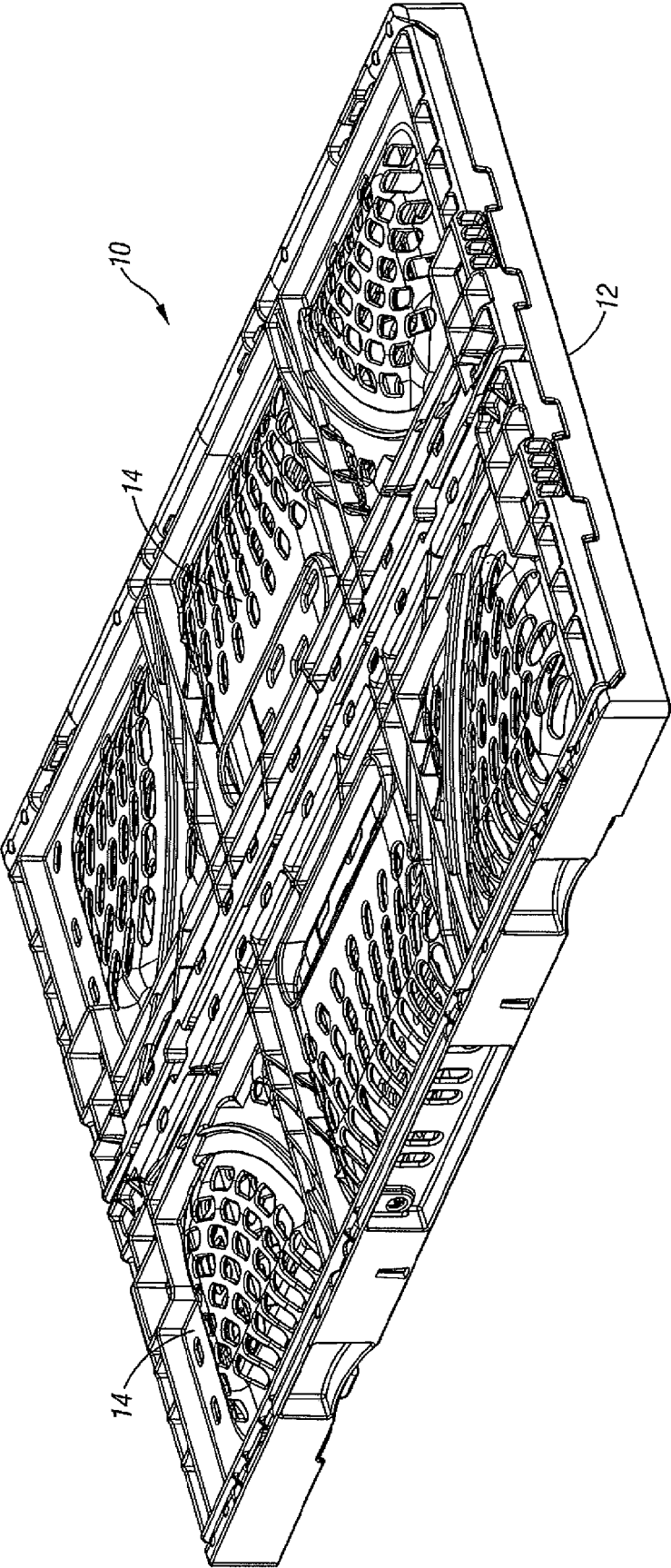


Fig. 2

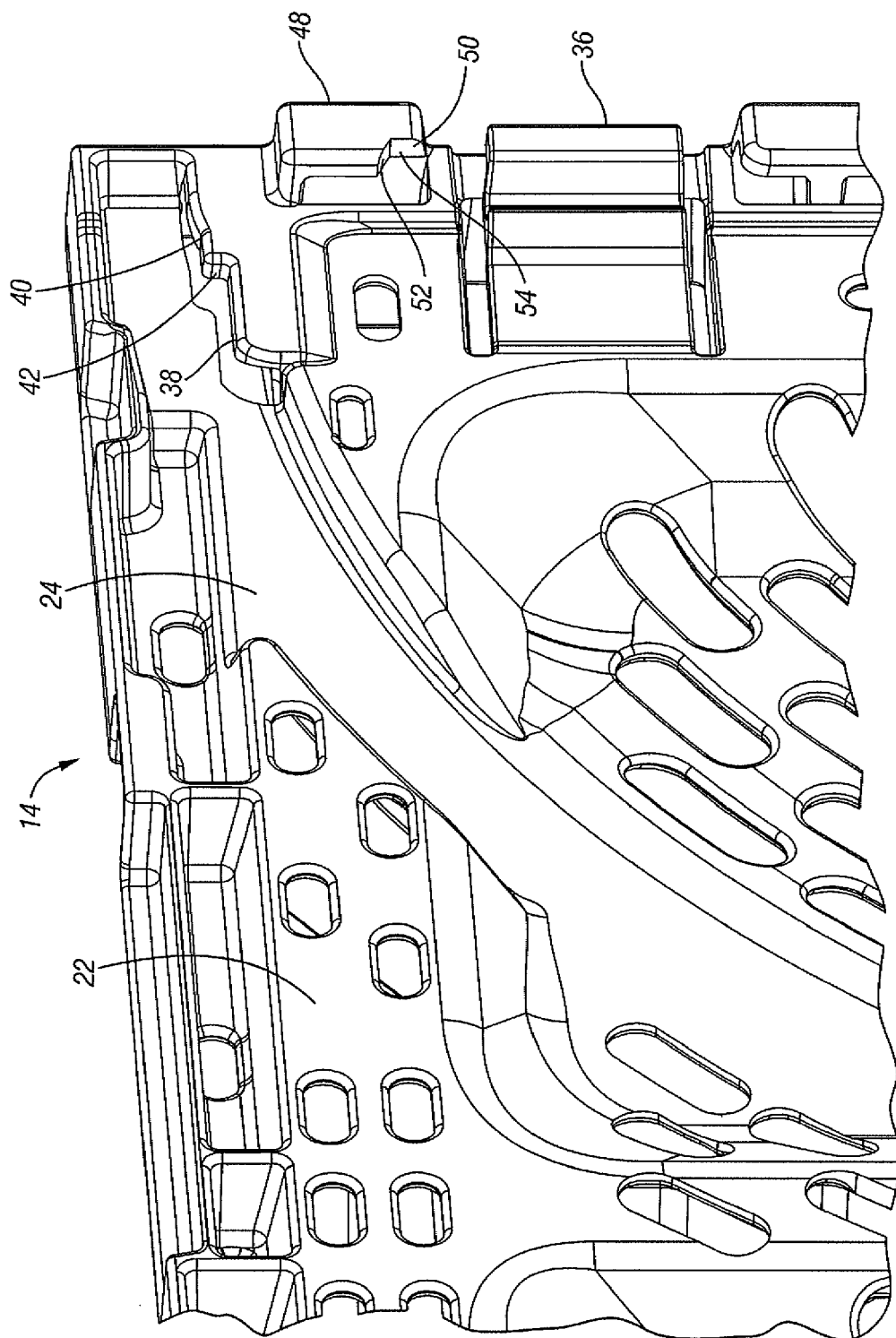


Fig. 3

Fig. 4

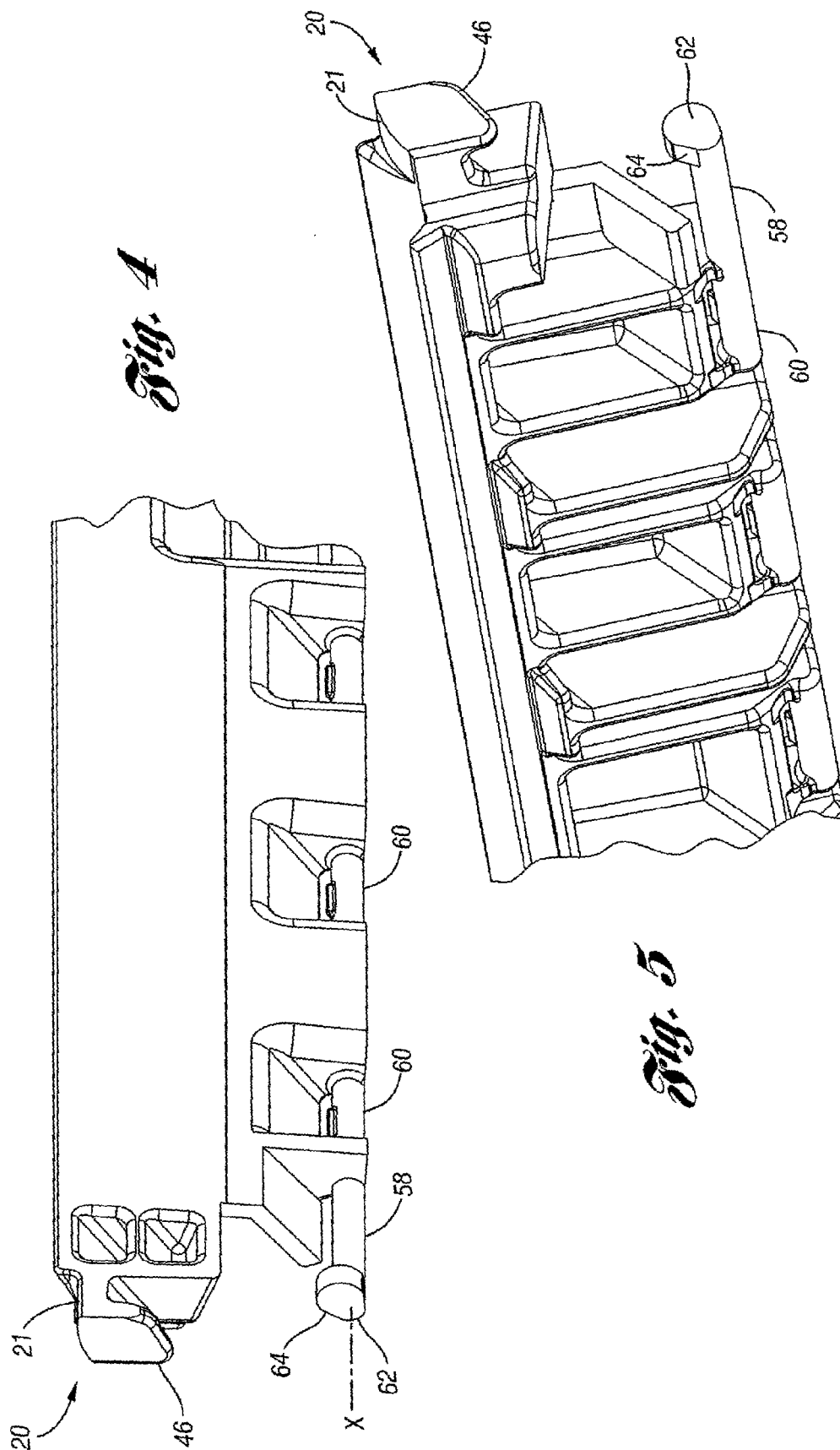
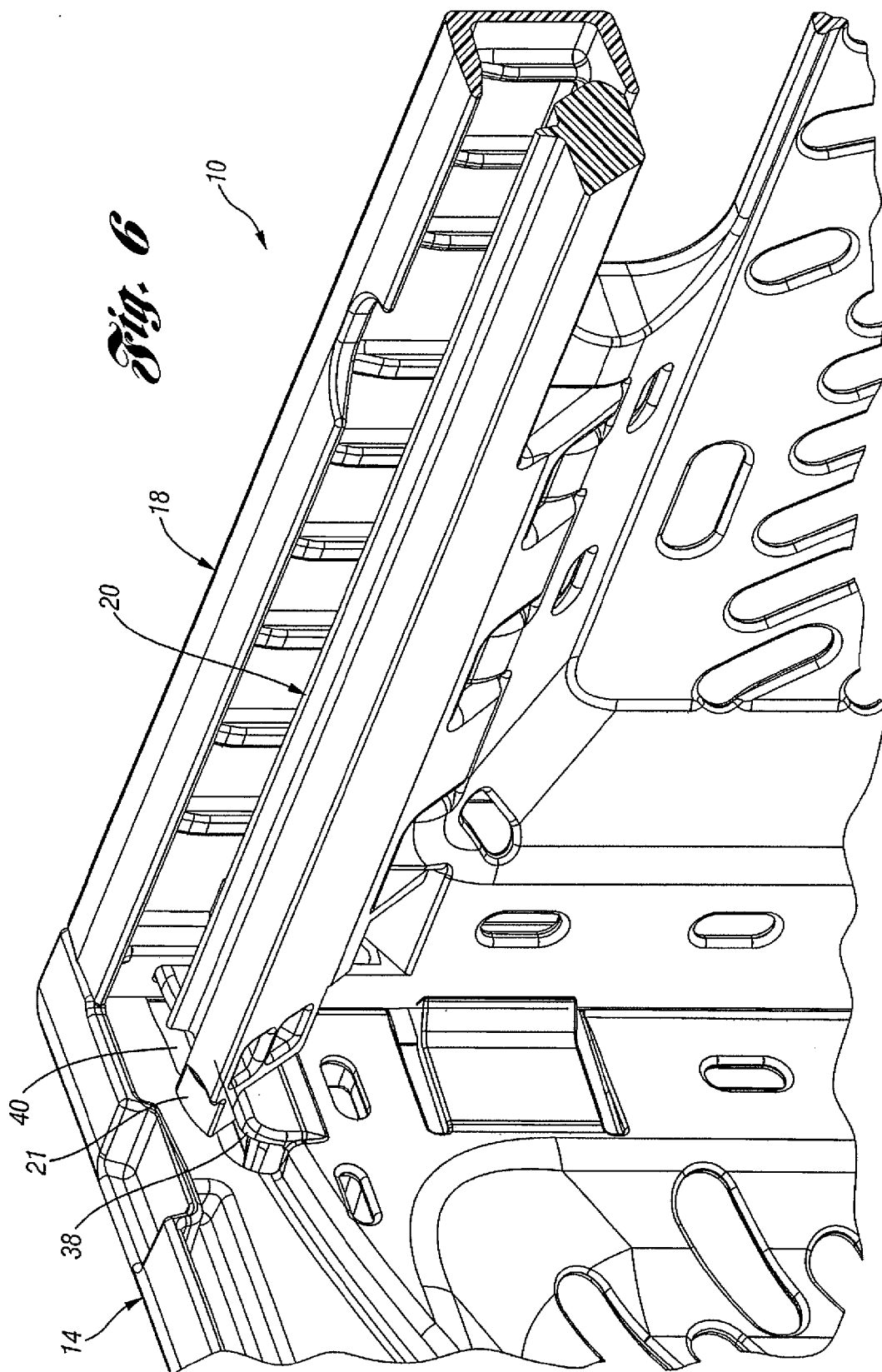


Fig. 5



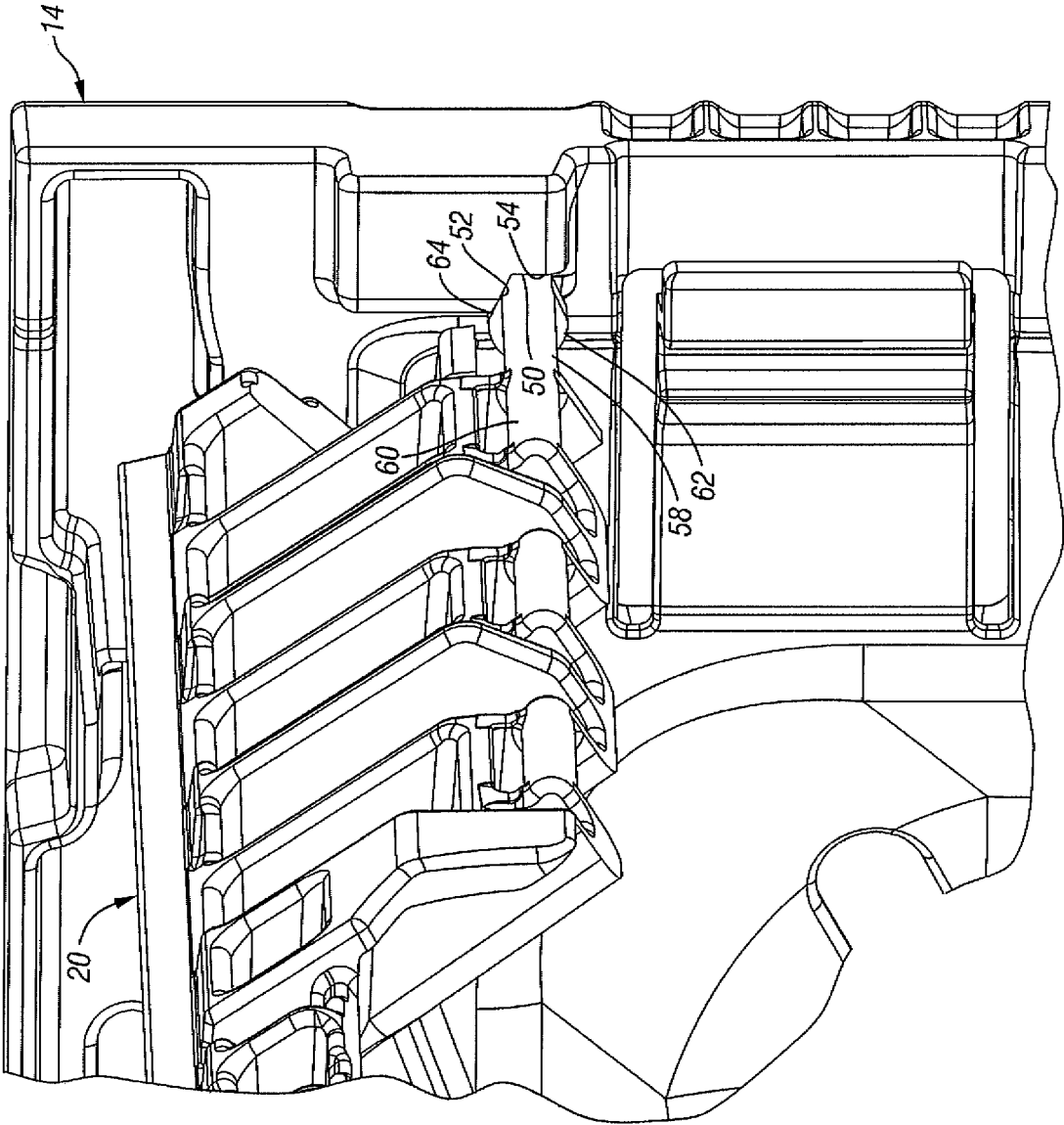


Fig. 7

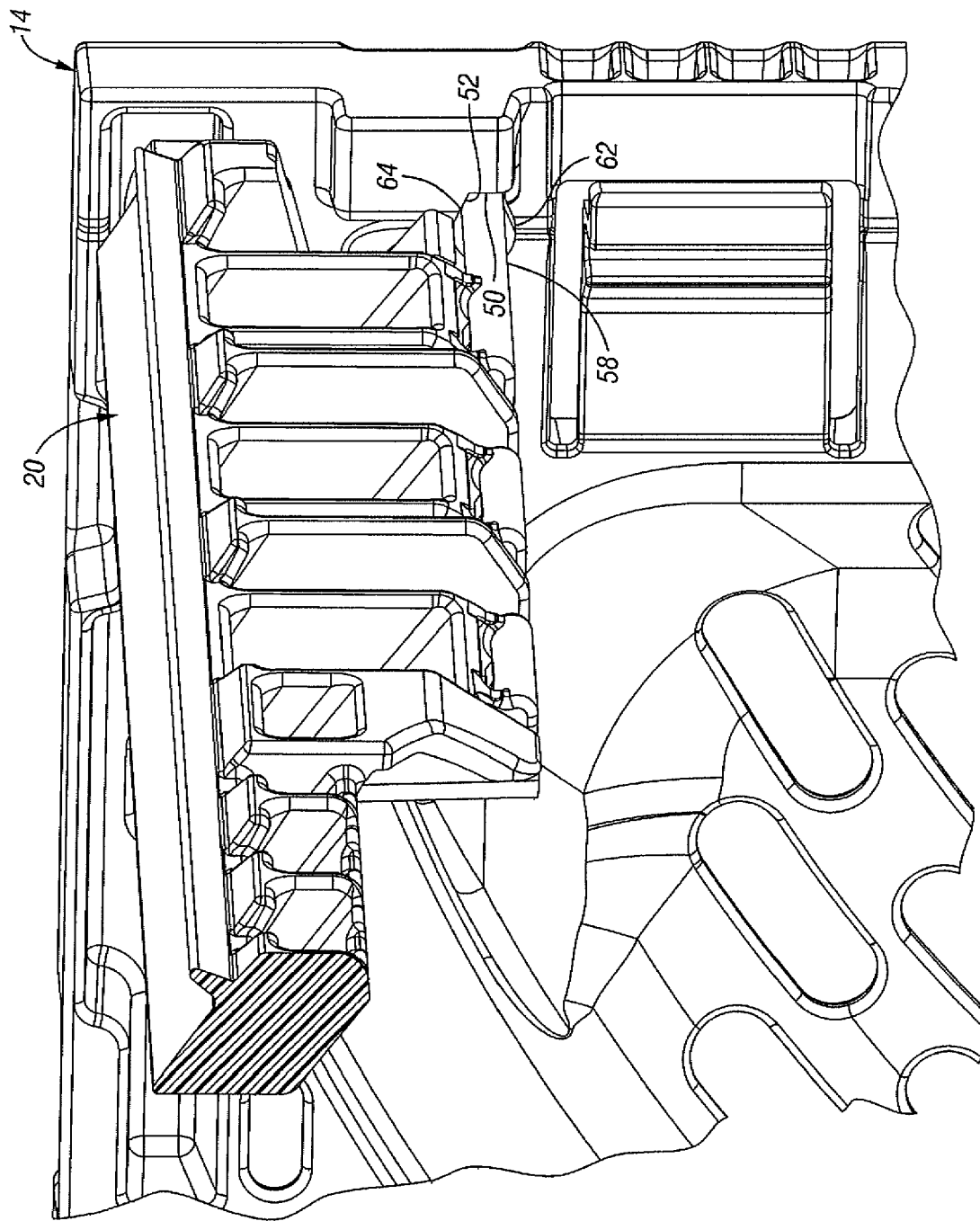


Fig. 8

Fig. 9

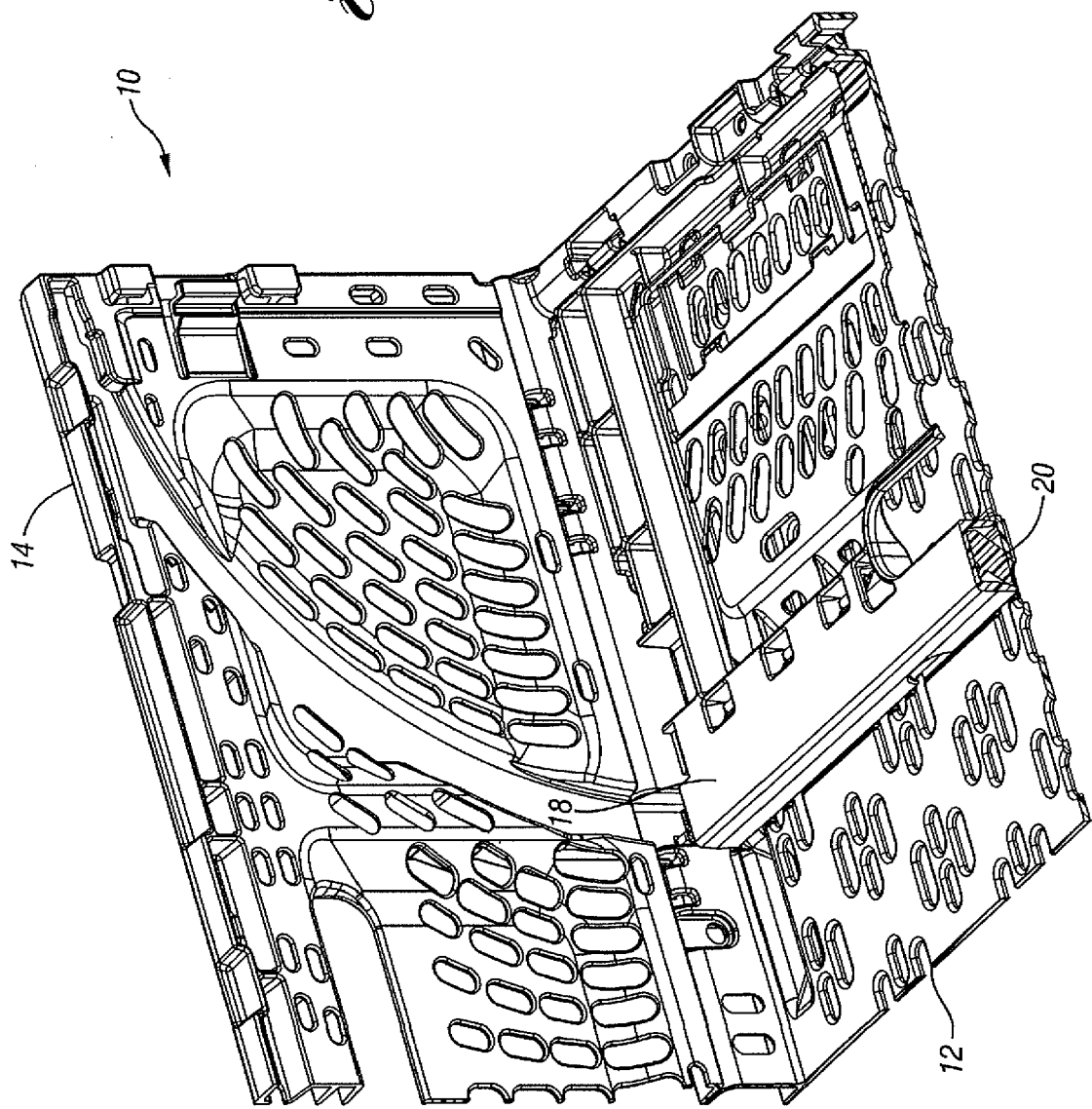
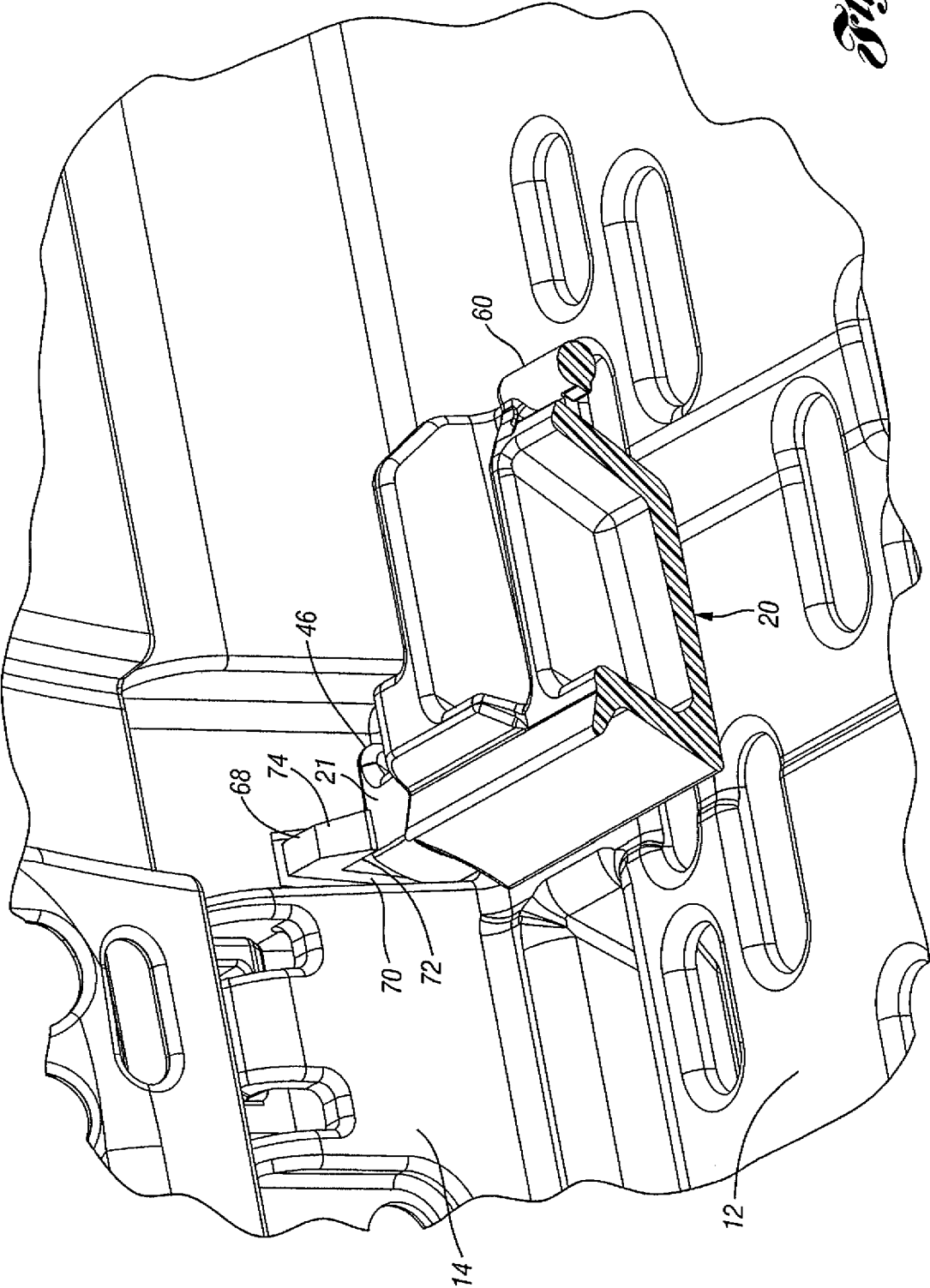


Fig. 10



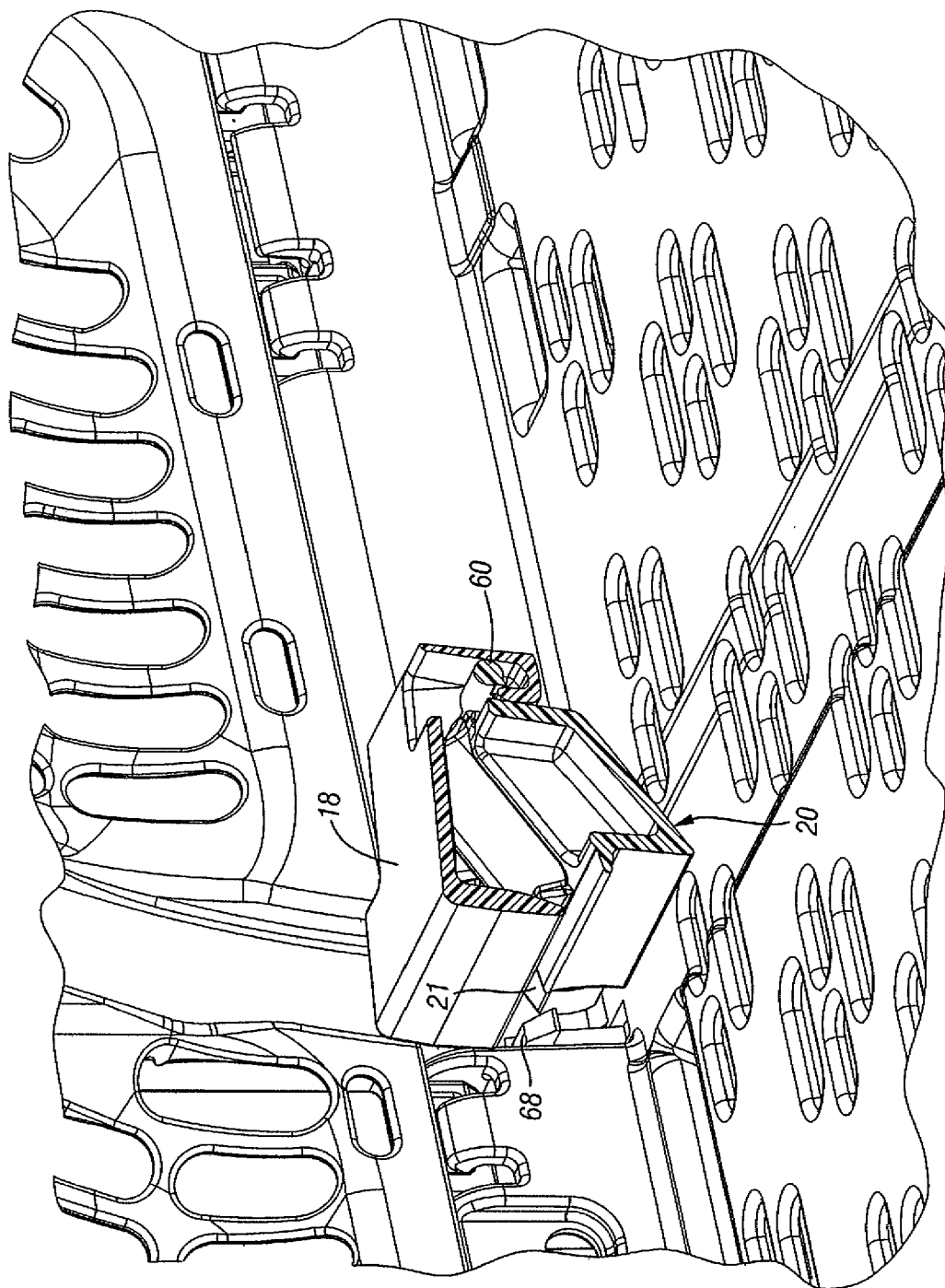


Fig. 11

REFERENCES CITED IN THE DESCRIPTION

This list of references cited by the applicant is for the reader's convenience only. It does not form part of the European patent document. Even though great care has been taken in compiling the references, errors or omissions cannot be excluded and the EPO disclaims all liability in this regard.

Patent documents cited in the description

- US 61016236 A [0001]