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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) is pivotably connected to a first wall (18) such that it can extend further into a mouth of the container (10). The plurality of walls (14,18) and the support (20) being arranged such that first wall (18) is pivotable toward a collapsed position on the base (12) when the support (20) is in the support position relative to the first wall (18).

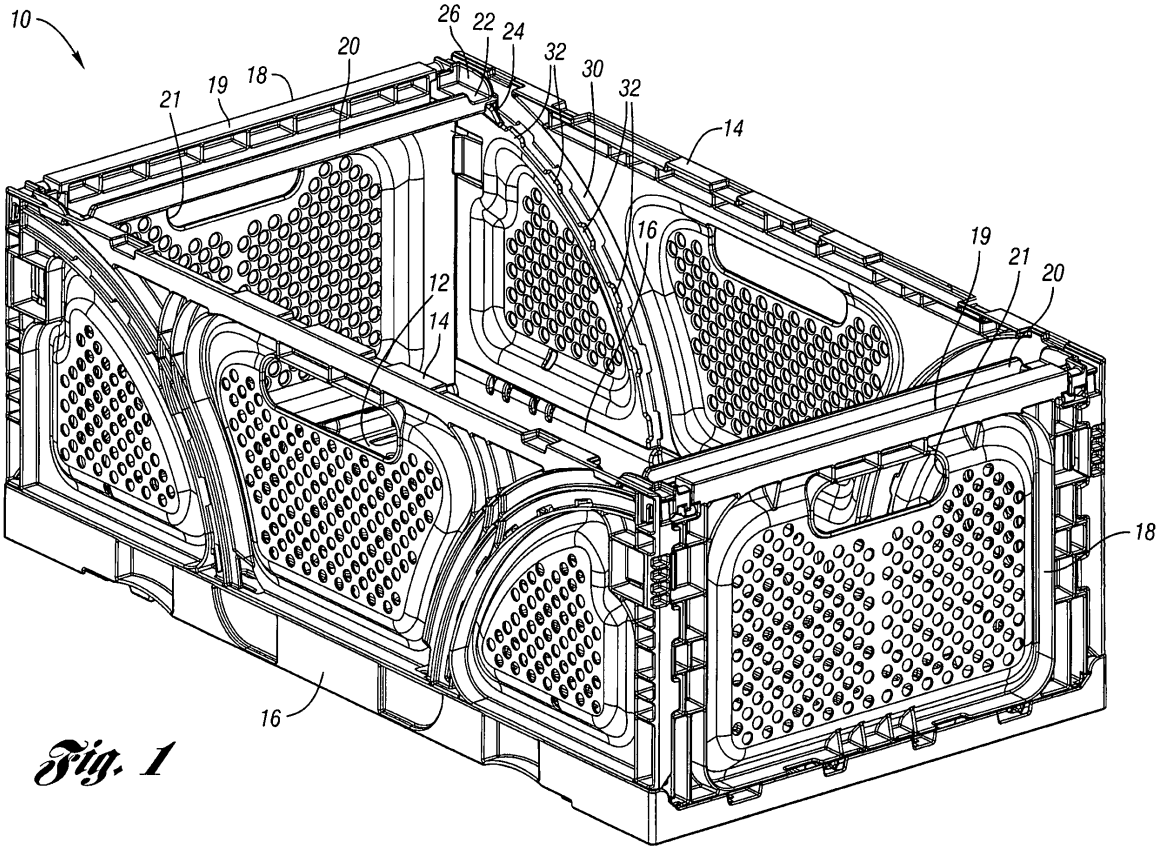

Fig. 1

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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, different-type container (typically a nestable container) can be supported thereon. One such crate includes end walls each having a support that is pivotable between a support position and a retracted position. Lower ends of the supports are pivotably connected to the end walls, with the upper edges of the supports retractable below the upper edges of the end walls. The supports on the collapsible crates do not extend very far into the mouth of the container (i.e. not far from the end wall). In contrast, the nestable crates include supports that are pivotably connected to the side walls, so the supports easily extend much further into the mouth of the crate in the support position. As a result, one problem with some of these collapsible crates is that the nestable crate can fall in between the supports if the nestable crate is not correctly placed on the supports.

[0004] Some of the existing crates automatically deploy the support when the end wall is pivoted to the upright position. Due to the position of the support on the interior surface of the end wall, the user has a tendency to grab both the support and the end wall when pivoting the end wall to the upright position. As the end wall reaches the upright position, the support must escape the grip of the user in order to be deployed, which is inefficient and uncomfortable for the user.

[0005] Another problem is that supports in some collapsible crates are sometimes knocked back toward the retracted position as the upper container is placed on the supports.

[0006] It is therefore desirable to provide an improved collapsible crate arrnagement which addresses the above described problems and/or which more generally offers improvements or an alternative to existing arrangements.

[0007] According to the present invention there is therefore provided a container as described in the accompanying claims. There is also provided a method for using a collapsible container as further described in the accompanying claims.

[0008] In an embodiment of the invention there is provided 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.

[0009] In one feature of an embodiment of the present invention, the end wall can be moved toward the collapsed position while the support is in the support position, but the support is pivoted into the retracted position just as the end wall contacts the base. This can provide several other optional benefits. First, when the end wall is collapsed onto the base, the support is spaced away from the upper edge of the end wall, so the user can grasp the end wall without also grasping the support. Second, the support must be lifted to be retracted, so it is unlikely that placing another container thereon could knock the support back to the retracted position. Third, the contact area of the support on the side wall can be increased, increasing the strength of the support. Fourth, the support extends further into the mouth of the crate, providing a more stable stacking surface.

[0010] The present invention will now be described by way of example only with reference to the following figures in which:

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;
Figure 2 is a perspective view of the container of Figure 1 with its walls in a collapsed position;
Figure 3 is a top view of the container of Figure 1;
Figure 4 is a side view of the container of Figure 1;
Figure 5 is an end view of the container of Figure 1;
Figure 6 is an interior view of one of the corners of the container of Figure 1;
Figure 7 is an enlarged view of the corner of Figure 6;
Figure 8A is a top perspective view of one end of the support;
Figure 8B is a bottom perspective view of the support of Figure 8A;
Figure 9 is a perspective view of one end of one of the end walls;
Figure 10 is an exterior perspective view of the corner of Figure 6;
Figure 11 shows the end wall being moved between the upright position and the collapsed position;
Figure 12 shows the end wall moving closer to the collapsed position;
Figure 13 shows the end wall in the collapsed position on the base;
Figure 14 is a side view, broken away, of the container of Figure 13;
Figure 15 shows the container of Figure 1 with another, different container stacked on the support;
Figure 16 is an interior perspective view of the corner of Figure 6 with the support being pivoted toward the retracted position;
Figure 17 is a view similar to that of Figure 16 with the support in the retracted position;
Figure 18 is an enlarged end view of a corner of the container;

Figure 19 is a section view taken along line 19-19 of Figure 18 and showing the support in both the support position and the retracted position;

Figure 20 is a section view taken along line 20-20 of Figure 18 and showing the support in both the support position and the retracted position;

Figure 21 is a section view taken along line 21-21 of Figure 18 showing the support in the retracted position; and

Figure 22 a view similar to that of Figure 21 showing the support in the support position.

[0011] Figure 1 is a perspective view of a collapsible 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 end walls 18 are pivotably connected along short edges of the base 12. The side walls 14 are pivotably connected to side upstanding portions 16 formed integrally with the base 12. Each end wall 18 includes a handle portion 19 defined above a handle opening 21.

[0012] Each end wall 18 has a support 20 formed of Acetal, polypropylene, glass filled Nylon or other suitable material. The support 20 is pivotably mounted to an upper end of the end wall 18. The supports 20 are shown in Figure 1 pivoted to a support position, where they project into the interior of the container 10 so they can support another container stacked thereon. The supports 20 each include a tab 22 projecting from each end into the adjacent side wall 14. A flange 24 protrudes downwardly from each tab 22. An upper flange 26 protrudes upwardly from each tab 22.

[0013] The interiors of the side walls 14 each include a pair of curved channels 30 formed therein with spaced-apart, upwardly-directed projections or tabs 32 spaced inwardly of the channels 30. The channels 30 are aligned with the tabs 22 on the supports 20, so that the end walls 18 can be pivoted onto the base 12 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.

[0014] Figure 3 is a top view of the erected container 10 of Figure 1. Figure 4 is a side view of the container 10. Figure 5 is an end view of the container 10.

[0015] Figure 6 is an interior perspective view of a quarter of the container 10 (the rest of the container is symmetric, as shown in Figure 1). As shown, the side wall 14 includes a rail 38 at the top of the curved channel 30 and generally aligned with the tabs 32. The interior of the side upstanding portion 16 includes a channel 34 opening to the bottom of the curved channel 30 and extending further along the side of the container 10. As shown in Figure 7, the flange 24 of the support 20 is received behind the rail 38 and in the channel 30, such that tab 22 of the support 20 interlocks with the side wall 14.

[0016] Figure 8A is a top rear perspective of a one end of the support 20. The support 20 includes an elongated support portion 40 having a front rail 42 extending upwardly therefrom. The support portion 40 extends between outer ends of two arms 44 (one shown) that pivotably connect at their inner ends to the end wall 18 (Figure 7). At the inner end of the arm 44, a hinge portion includes a cylindrical recess 46. A pin 48 protrudes inwardly from the arm 44 adjacent the recess 46.

[0017] Figure 8B is a bottom front perspective of end of the support 20 of Figure 8A. As shown, the flange 24 is elongated along most of the arm 44 and defines a channel 50 adjacent thereto having an upper surface 51. The arm 44 has a reinforced area 49 for transferring the load from the elongated support portion 40 to the channel 50.

[0018] Figure 9 illustrates a side end 52 of one of the end walls 18. Near the upper edge, the end wall 18 includes a hinge pin 54 having an arcuate recess 56 adjacent thereto.

[0019] Figure 10 is an exterior perspective view of one corner of the container 10. The pin 48 of the support 20 is slidably received in the arcuate recess 56 of the end wall 18. The hinge pin 54 of the end wall 18 is rotatably received in the recess 46 of the support 20. Thus, as the support 20 pivots on the end wall 18 about the hinge pin 54, the pin 48 slides within the arcuate recess 56 of the end wall 18.

[0020] Figure 11 illustrates the end wall 18 as it is being collapsed toward the base 12, after the latch 36 is released. The flange 24 of the support 20 is retained behind the tabs 32 so that the tab 22 is retained in the channel 30 in the side wall 14. Thus, the support 20 is initially in the support position as the end wall 18 is collapsed. As shown in Figure 12, the support 20 is generally in the support position relative to the end wall 18 as the support 20 passes through the side wall 14 as the end wall 18 is moving toward the collapsed position. The tab 22 and flange 24 (not visible in Figure 12) then pass into the channel 34 on the interior of the side upstanding portion 16, where they contact a curved surface 35 that pivots the support 20 upwardly relative to the end wall 18, so that the end wall 18 can lie flat on the base 12 as shown in Figures 13 and 14.

[0021] When the end wall 18 is subsequently erected again, the process is repeated in reverse, such that the support 20 is in the support position again by the time the end wall 18 is latched to the side wall 14 as shown in Figure 6. It should be noted that the handle portion 19 of the end wall 18 can be grasped in Figure 13 and held by the user without interference from the support 20 as the end wall 18 is latched into position with the side walls 14. In the container 10 shown in the drawings, the support 20 always leaves room for the user to grasp the handle 19.

[0022] With the supports 20 in the support position, another container 100 can be supported on the supports 20, as shown in Figure 15. With the support 20 extending substantially perpendicularly to the end wall 18 from its pivot point, the support 20 is resistant to being accidentally knocked back out of the support position during the placement of the container 100 on the supports 20. Further, since the support 20 extends into the interior of the

container 100 substantially farther than prior art supports, it is easier to place the container 100 stably on to the supports 20.

[0023] During loading of the container 10, the supports 20 can be pivoted to an upright position uncovering the mouth of the container 10. Figure 16 illustrates one of the supports 20 being pivoted upwardly relative to the end wall 18. Figure 17 illustrates the support 20 in the retracted, upright position.

[0024] Figure 18 is an enlarged exterior end view of one corner of the container 10 for the purpose of demonstrating the section lines for Figures 19, 20 and 21. Figure 19 illustrates a section view through the end wall 18 and support 20, which is shown in both the support position and in the retracted position. The hinge pin 54 of the end wall 18 is rotatably received in the recess 46 of the support 20. The support 20 pivots about an axis P that is above a load plane of the support 20 in the support position (i.e. the plane where the support 20 contacts the container 100 in Figure 15, which is the upper surface of the arm 44), which prevents a user from accidentally bumping the support 20 out of the support position.

[0025] Referring to Figure 20, the pin 48 moves between a lower position when the support 20 is in the support position and an upper position when the support 20 is in the retracted, upright position. In the upper position, the pin 48 contacts a stop surface 60 that limits any further movement of the support 20. In the retracted position, the center of mass of the support 20 is inward of the pivot axis P, such that the support 20 will be naturally returned to the support position by force of gravity when released.

[0026] Referring to Figure 21, when the support 20 is in the upright retracted position (the support 20 in the support position is not shown in Figure 21), the arm 44 abuts a stop surface 64 on the side wall 14 that limits the rotation of the support 20. In the retracted position, the weight of the support 20 is inward of the pivot axis P, such that the support 20 will be naturally returned to the support position by force of gravity when released. However, when the end wall 18 is collapsed onto the base 12, the support 20 will be able to pivot fully upward relative to the end wall 18 so that the end wall 18 and support 20 can lie flat on the base 12, as shown in Figures 13 and 14, because it will not contact the stop surface 64 on the side wall 14.

[0027] Additionally, if the end wall 18 is moved toward the collapsed position when the support 20 is in the retracted position shown in Figure 21, the contact of the support 20 with the stop surface 64, which is below the pivot point P of the support 20, will force the support 20 to rotate toward the support position as shown in Figure 22.

[0028] Figure 22 is taken along the same section line as Figure 21, but shown with the support 20 in the support position. As shown, the upper surface 51 of the channel 50 formed on the underside of the arm 44 of the support 20 matches the upper edge of the rail 38 on the side wall 14. The amount of surface contact between the support 20 and the side wall 14 in this area is maximized, as this is where most of the load is supported. The flange 24 and rail 38 are elongated to provide maximum material strength interlocking between the support 20 and side wall 14.

[0029] 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); and
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, wherein the first wall (18) is pivotable toward a collapsed position on the base (12) when the support (20) is in the support position relative to the first wall (18).

2. The container (10) of claim 1 wherein the second wall (14) includes an arcuate channel (30) formed on interior surface, an end (22) of the support (20) extending into the channel (30).

3. The container (10) of claim 2 wherein the end (22) of the support (20) moves in the channel (30) as the first wall (18) is pivoted toward a collapsed position on the base (12).

4. The container (10) of claim 2 or 3 wherein the support (20) extends further into a mouth of the container when the support (20) is in the support position than when the support (20) is in the retracted position.

5. The container (10) of any of claims 2 to 4 wherein the second wall (14) includes at least one upward projection (32,38) adjacent the channel (30), the end of the support including a downward projection (22,24) interlocking behind the at least one upward projection (32) as the first wall (18) is moved toward

the collapsed position on the base (12).

6. The container (10) of any preceding claim wherein the support (20) is pivotably mounted to the first wall (18) and pivotable relative to the first wall (18) between the support position and the retracted position.

7. The container (10) of any preceding claim wherein the support (20) is pivoted to the retracted position when the first wall (18) is collapsed onto the base (12).

8. The container (10) of claim 7 wherein the support (20) in the retracted position contacts a surface (64) of the second wall (14) as the first wall (18) is pivoted away from the upright position thereby moving the support (20) to the support position.

9. The container of any preceding claim wherein the support (20) is partially supported on the second wall (14) in the support position.

10. 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) each pivotable between an upright position and a collapsed position on the base (12); and
a support (20) movable relative to the first wall (18) between a retracted position and a support position, the support (20) extending further into a mouth of the container (10) when the support (20) is in the support position than when the support (20) is in the retracted position, wherein the first wall (18) is pivotable to a position between the upright position and the collapsed position while the support (20) is in the support position relative to the first wall (18).

11. The container (10) of any preceding claim wherein the support (20) is pivoted by the second wall (14) to the retracted position as the first wall (18) is collapsed onto the base (12).

12. The container (10) of any preceding claim wherein the support (20) is pivotable relative to the first wall (18) about a pivot axis (P) and wherein an upper support surface (44) of the support (20) is lower than the pivot axis (P) when the support (20) is in the support position.

13. A method for using a collapsible container (10) having a base (12), a first wall (18) and a second wall (14), and a support (20) mounted to the first wall (18), the method including the steps of:

a) moving the support (20) from a retracted position toward an interior of the container (10) to a support position; and
b) while the support (20) is in the support position, moving the first wall (18) from an upright position toward a collapsed position on the base (12).

14. The method of claim 13 further including the step of moving the support (20) to the retracted position as the first wall (18) is moved into the collapsed position on the base (12), wherein the support (20) is generally parallel to the first wall (18) when the support (20) is in the retracted position.

15. The method of claim 13 or 14 wherein the support (20) is moved to the support position by contact with the second wall (14) as the first wall (18) is moved from the upright position toward the collapsed position.

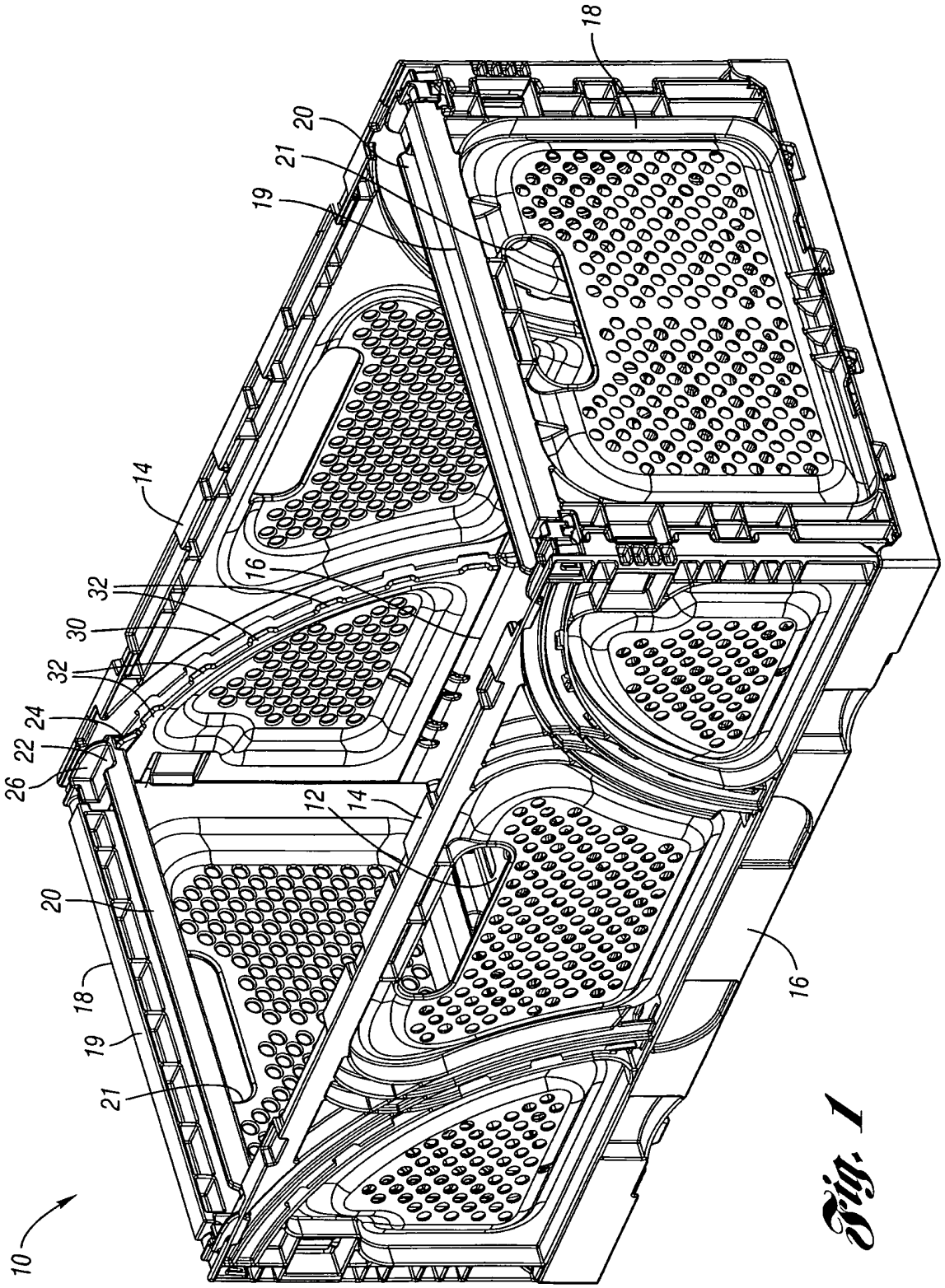


Fig. 1

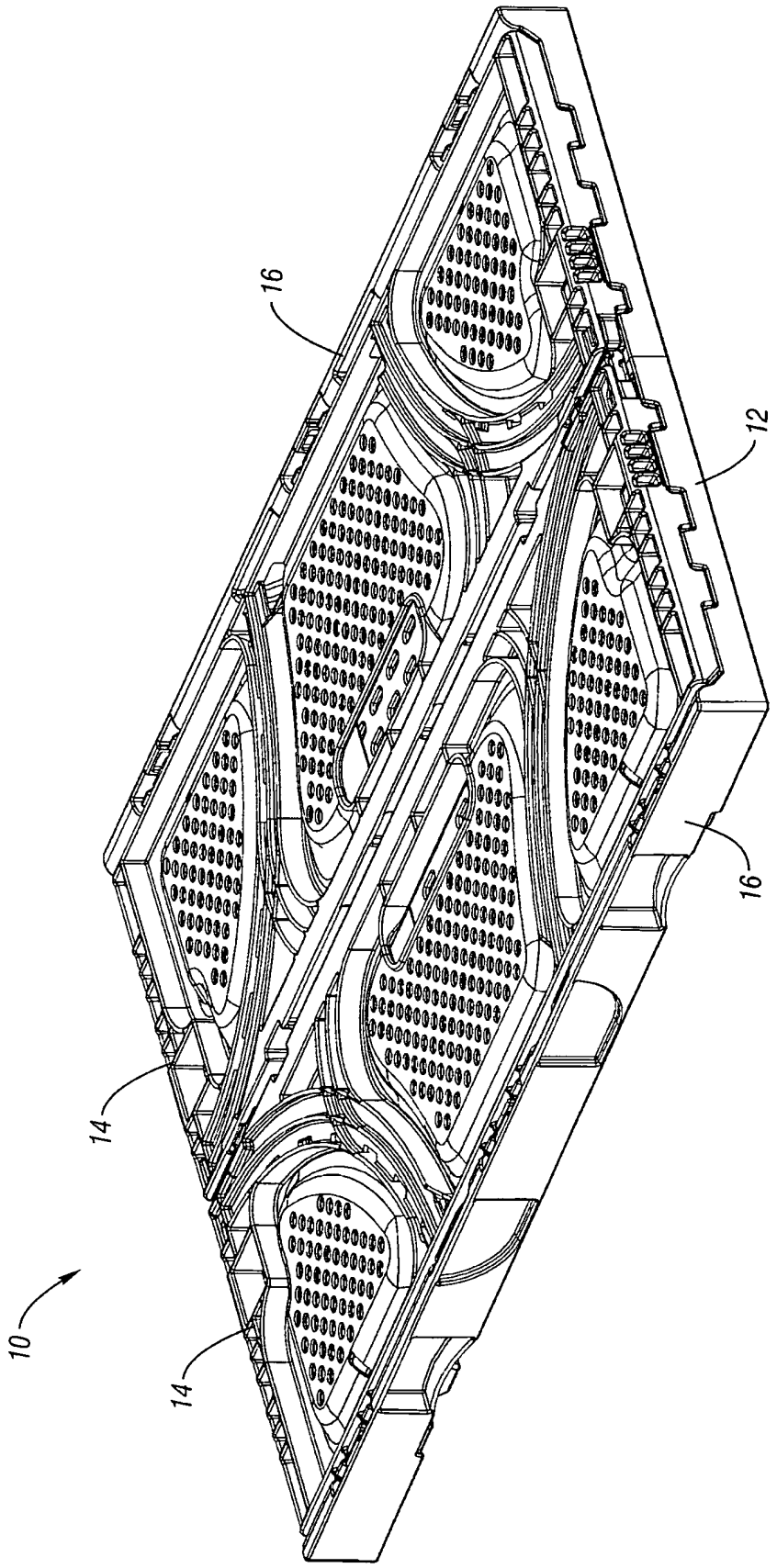


Fig. 2

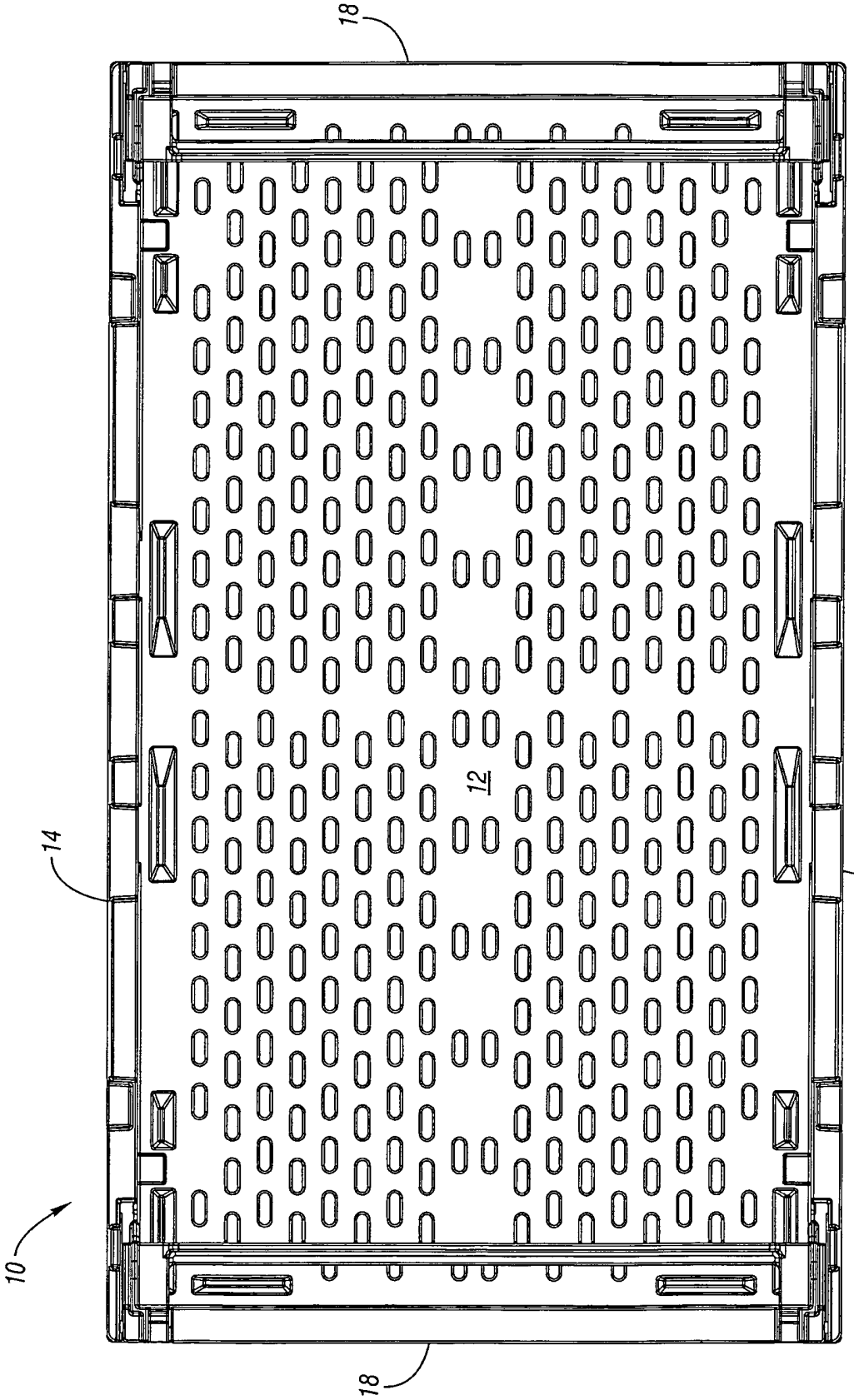


Fig. 3

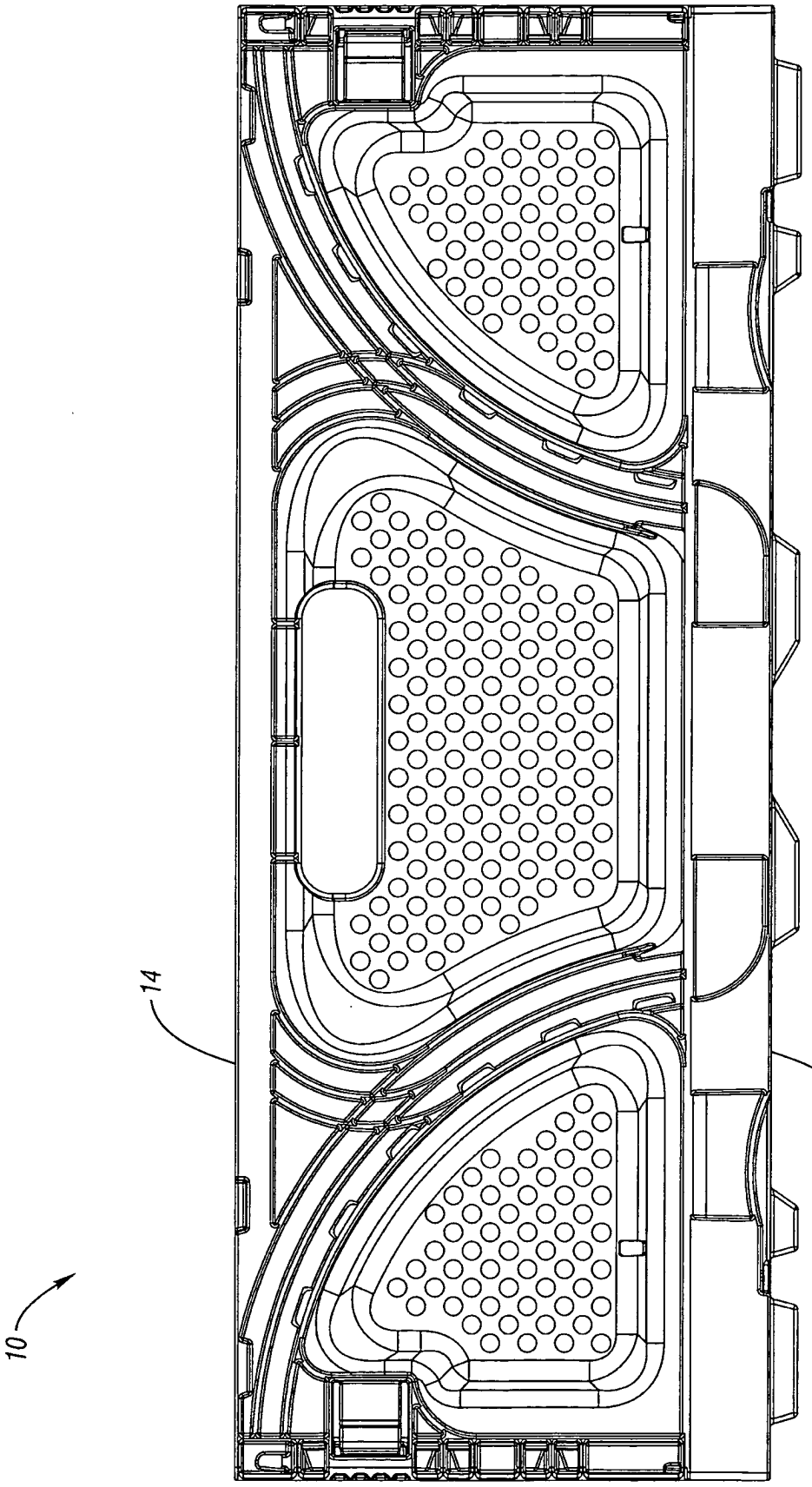


Fig. 4

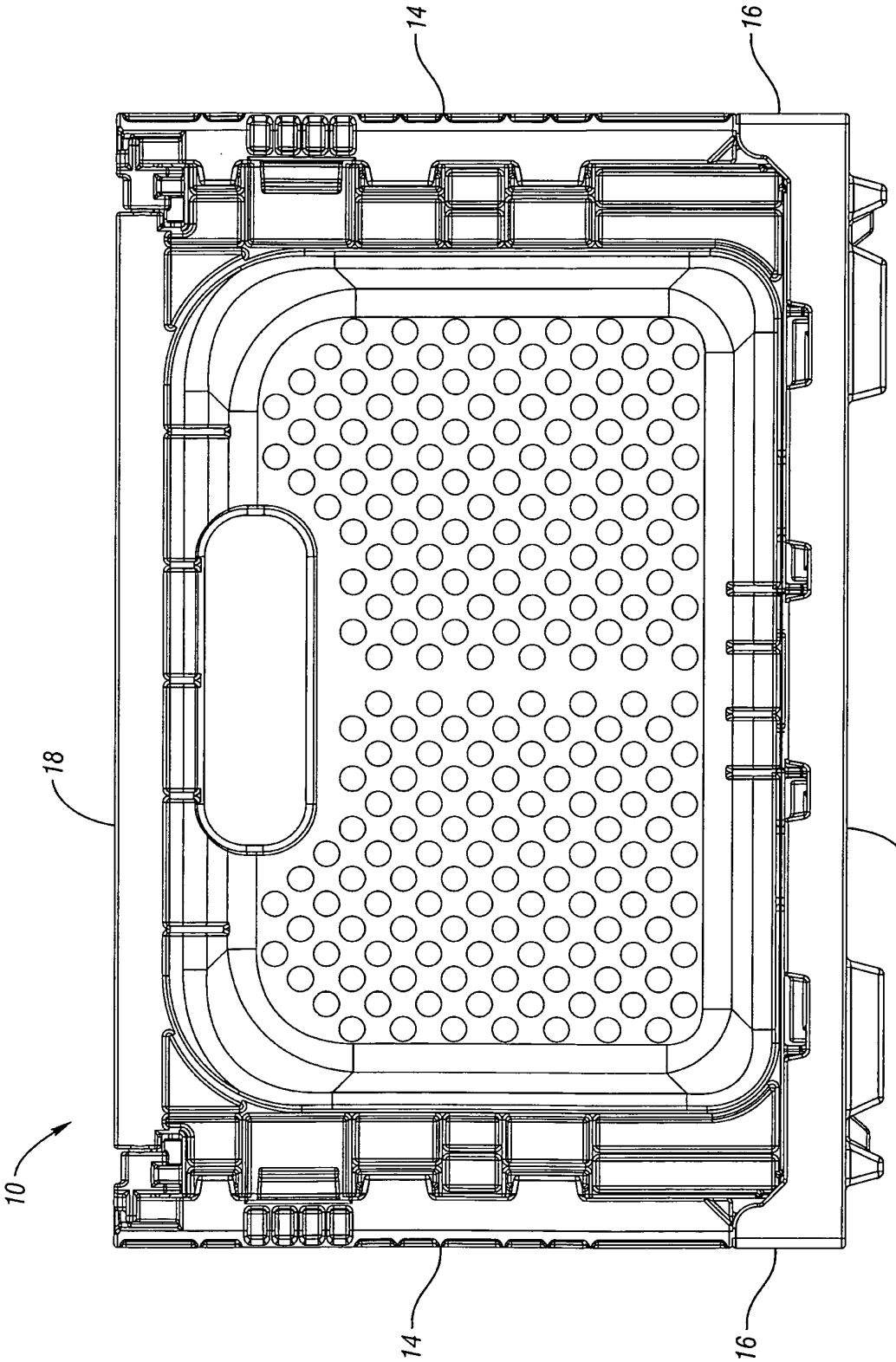


Fig. 5

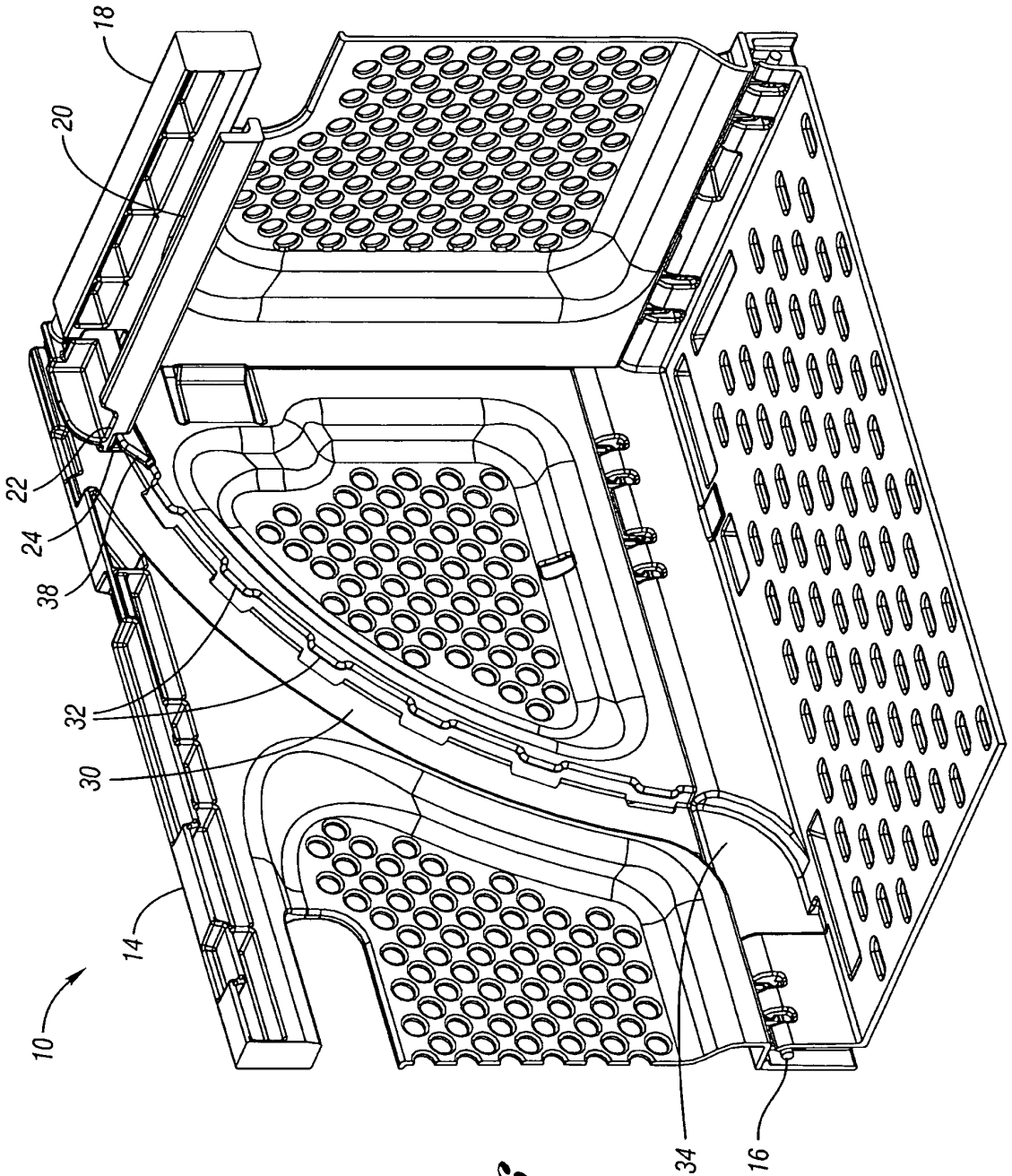


Fig. 6

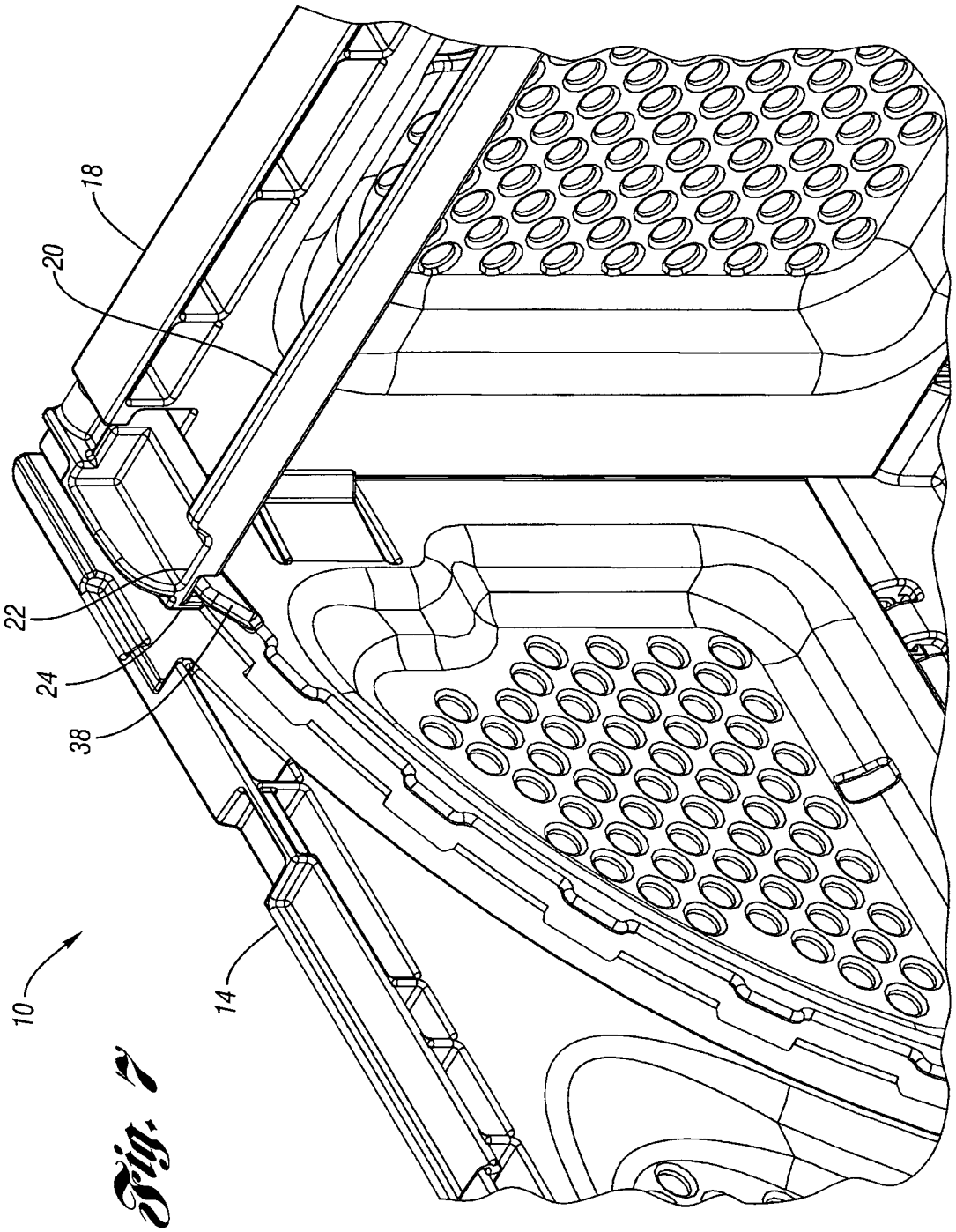


Fig. 2

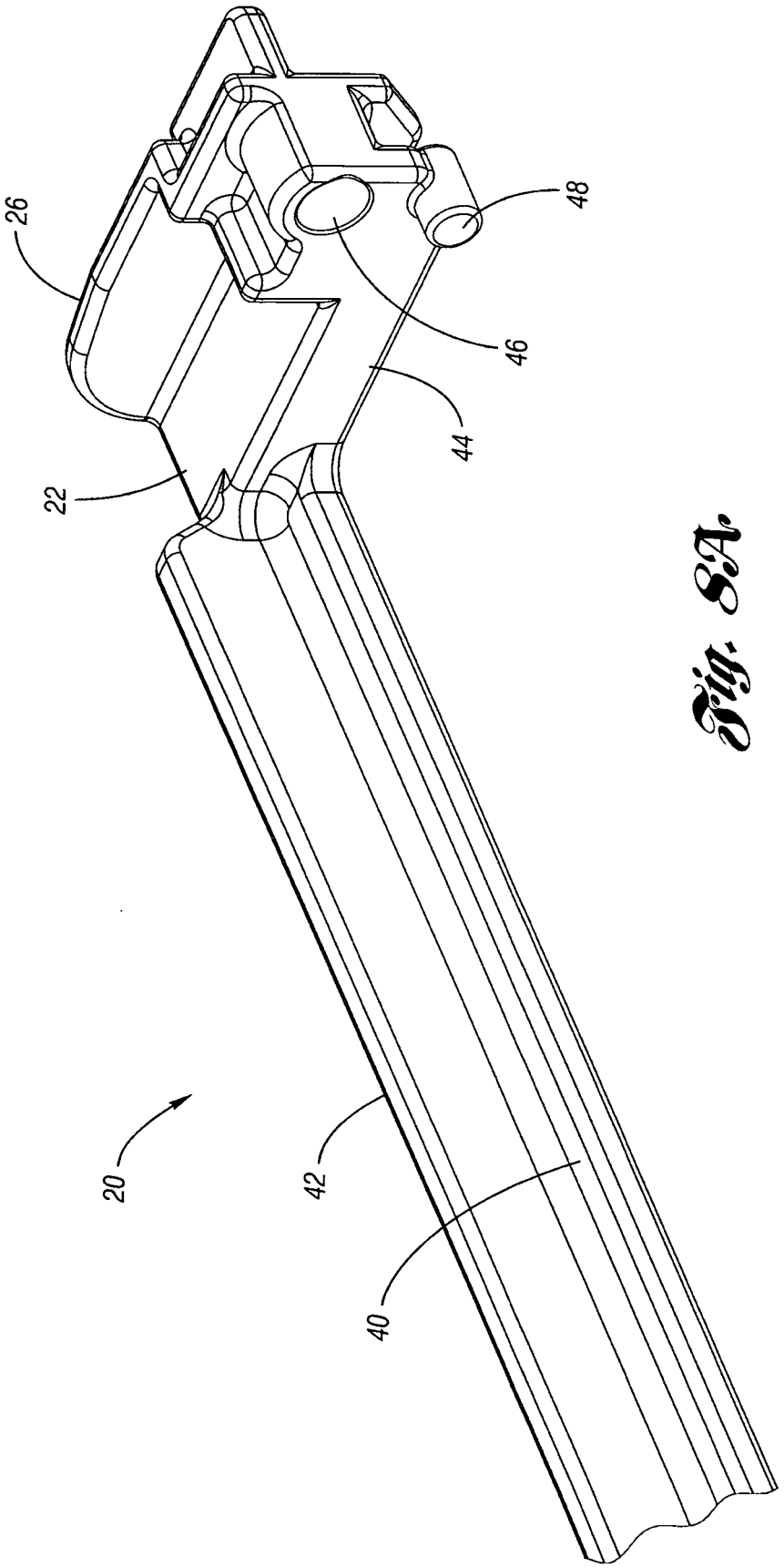


Fig. 8A.

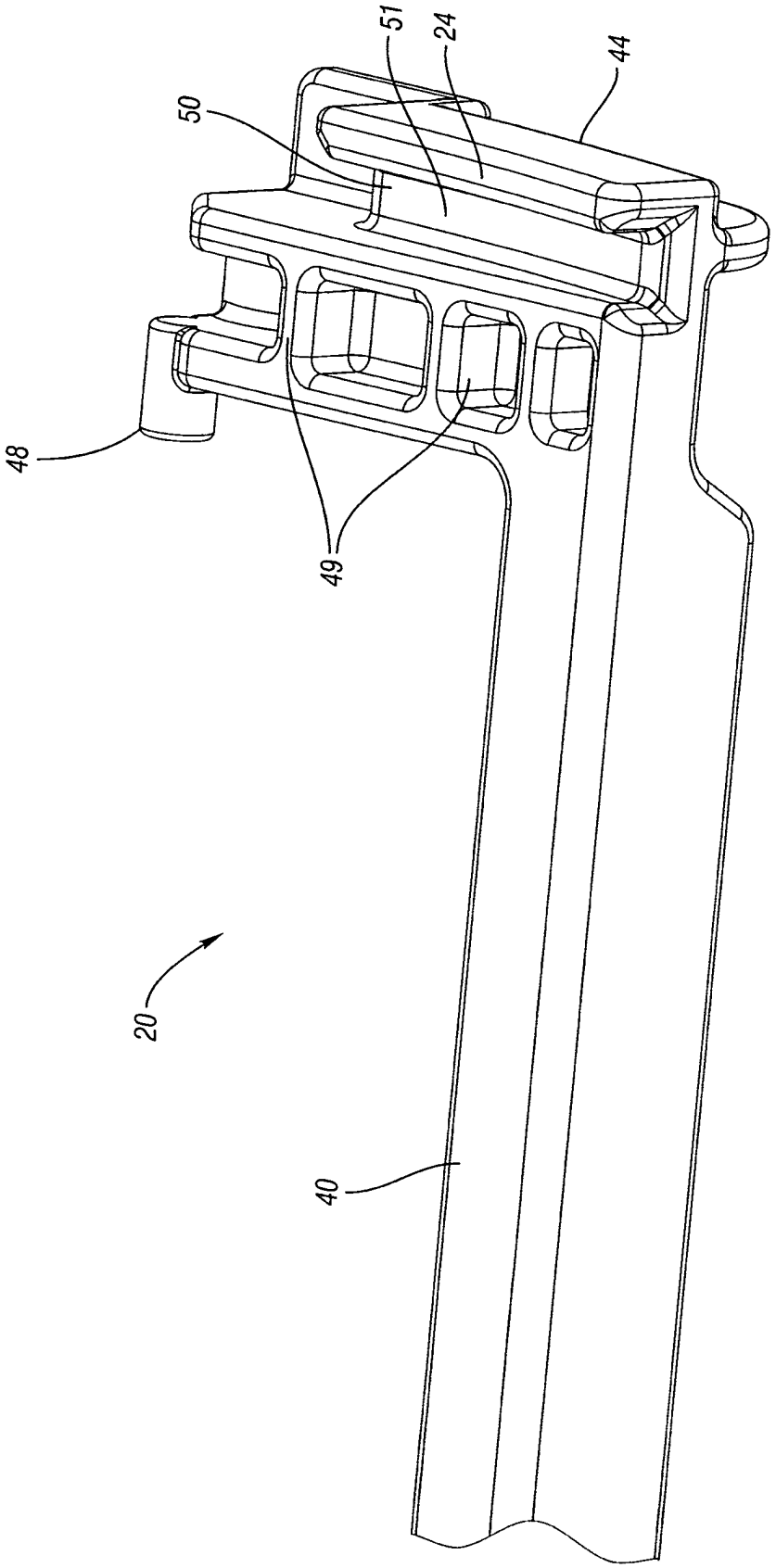


Fig. 8a

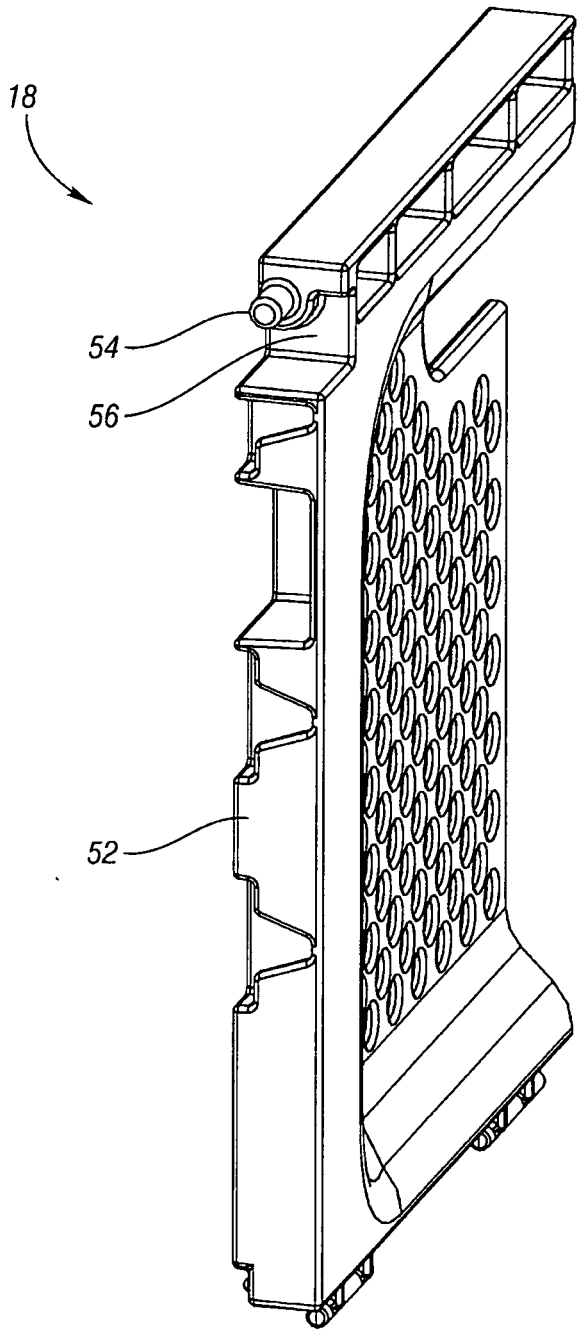


Fig. 9

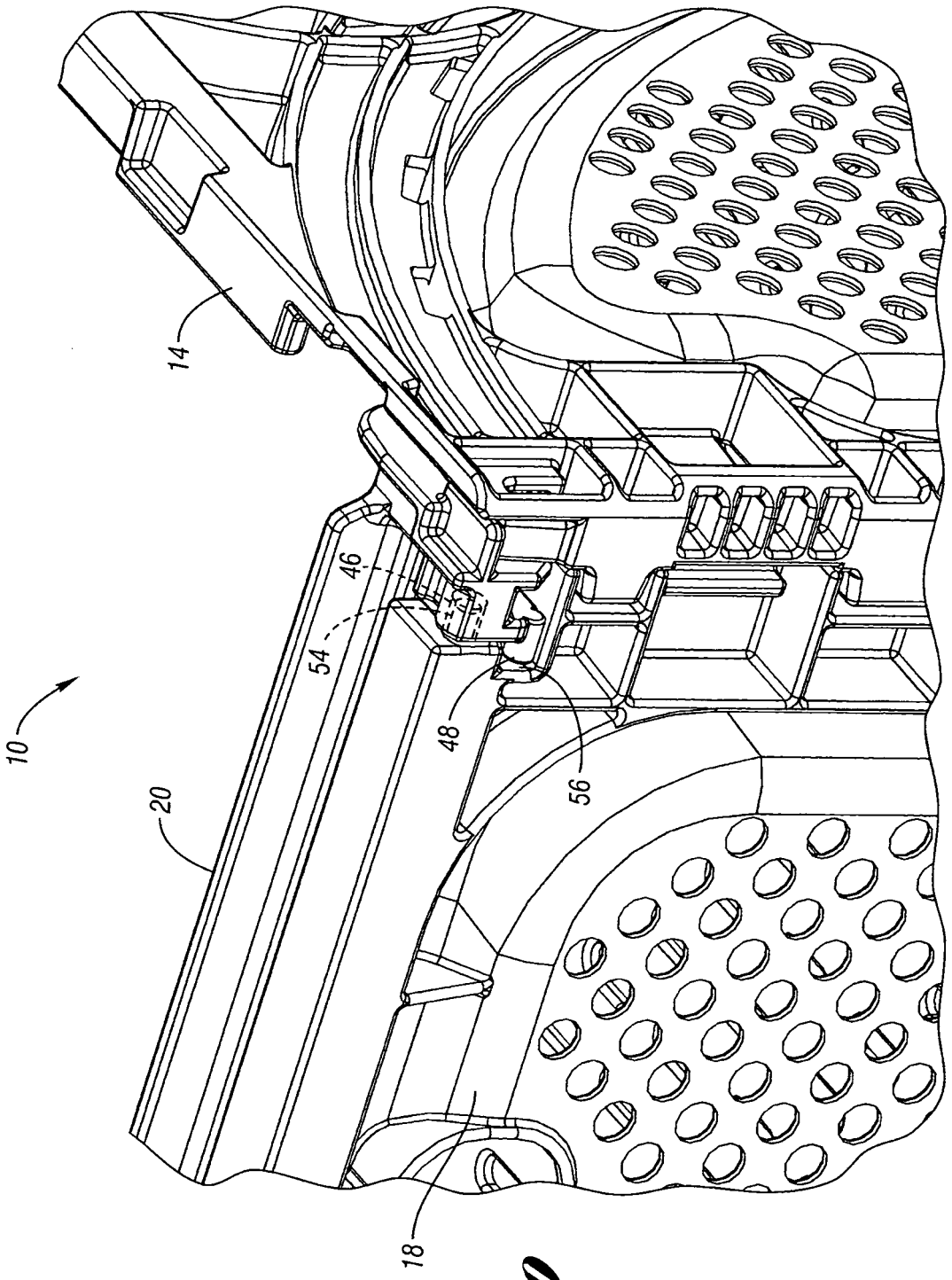


Fig. 10

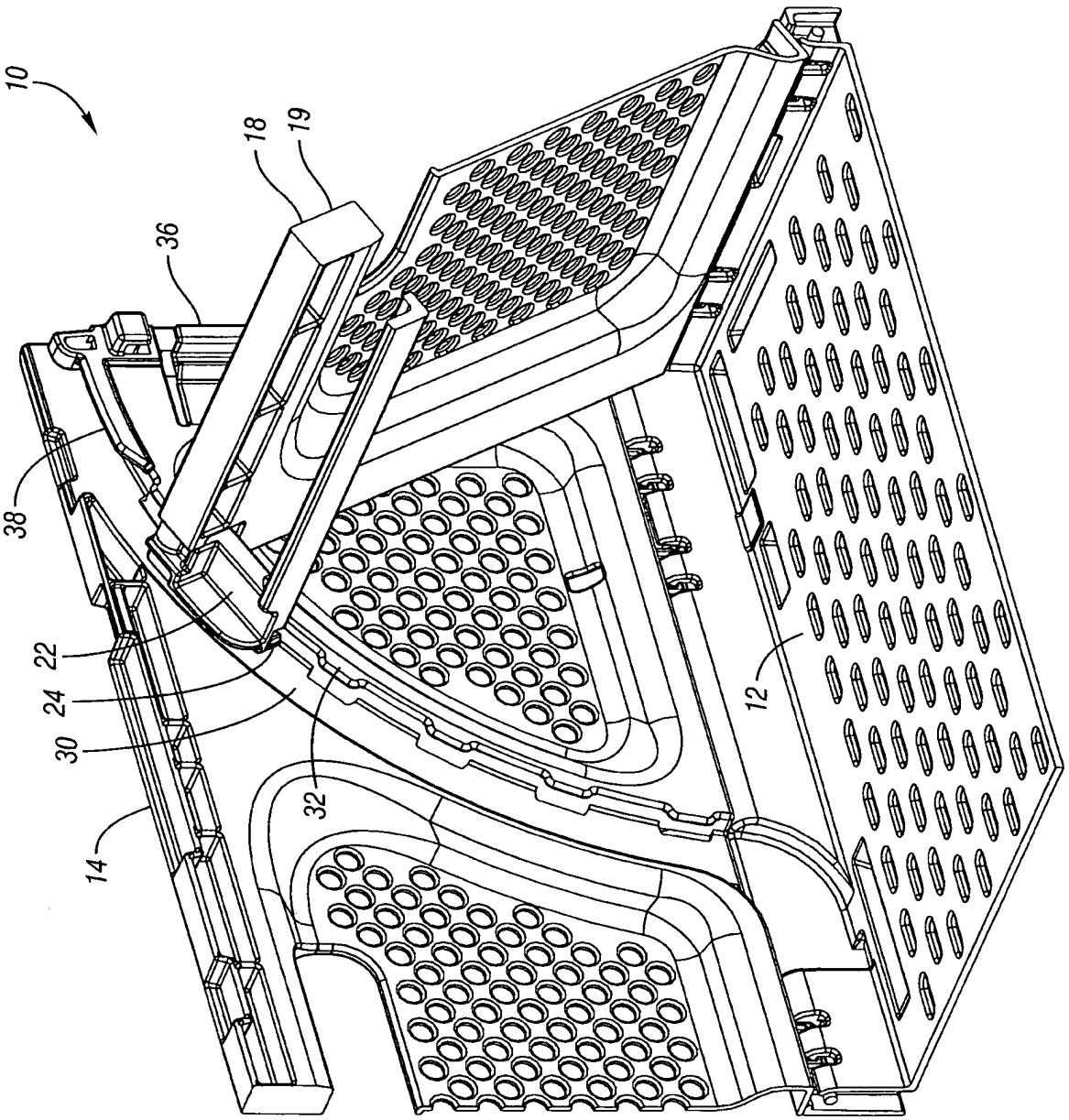


Fig. 11

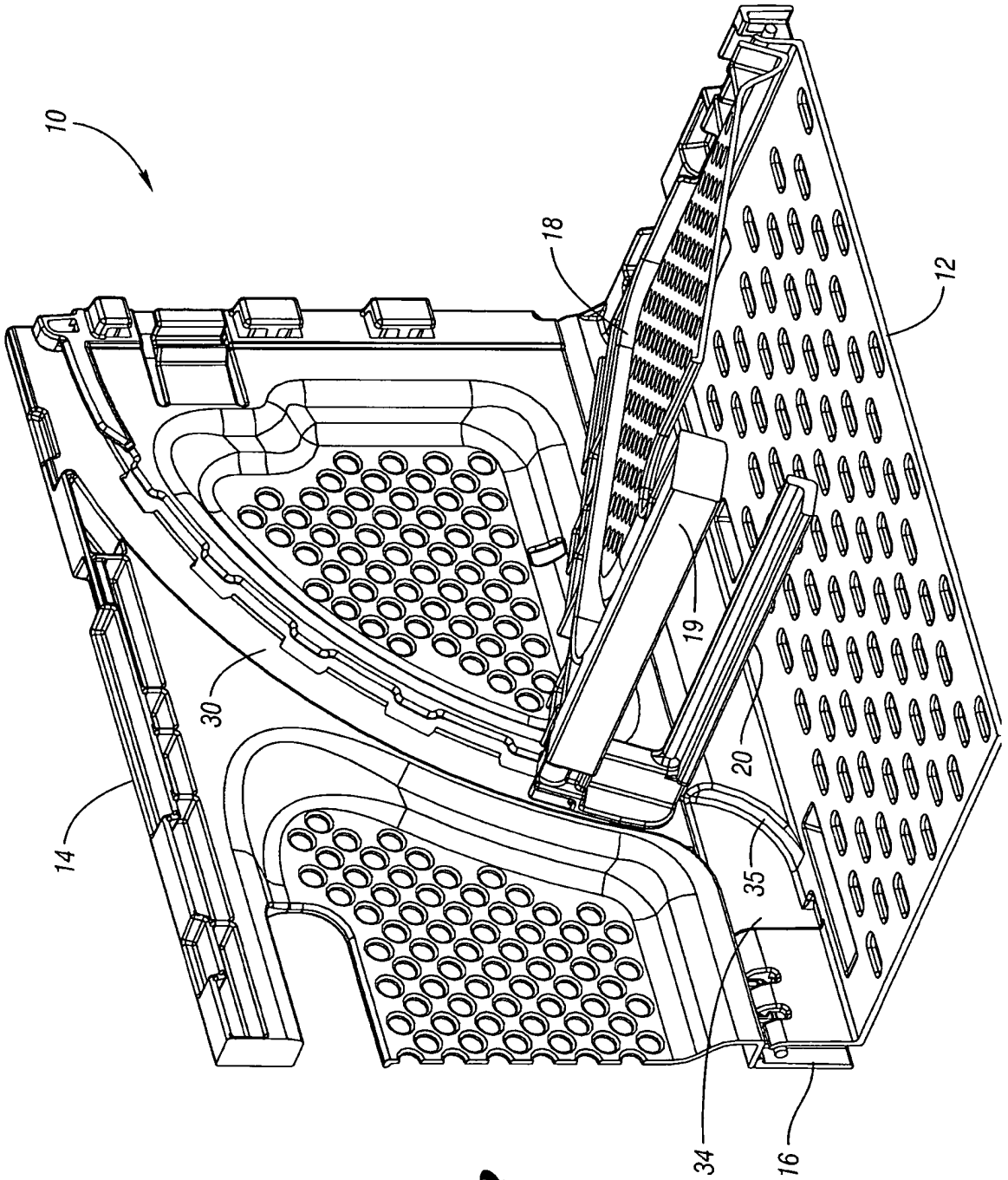


Fig. 12

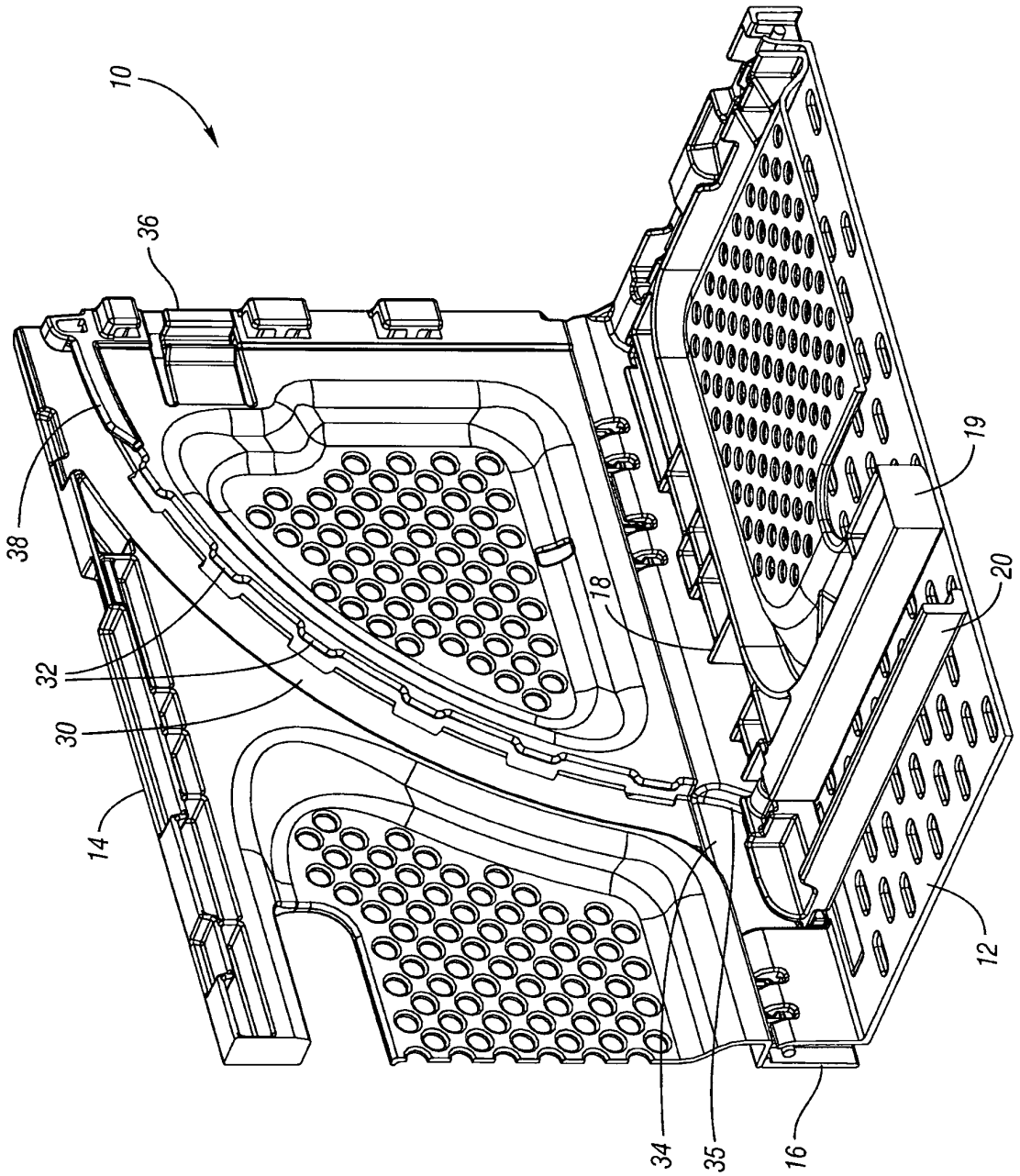


Fig. 13

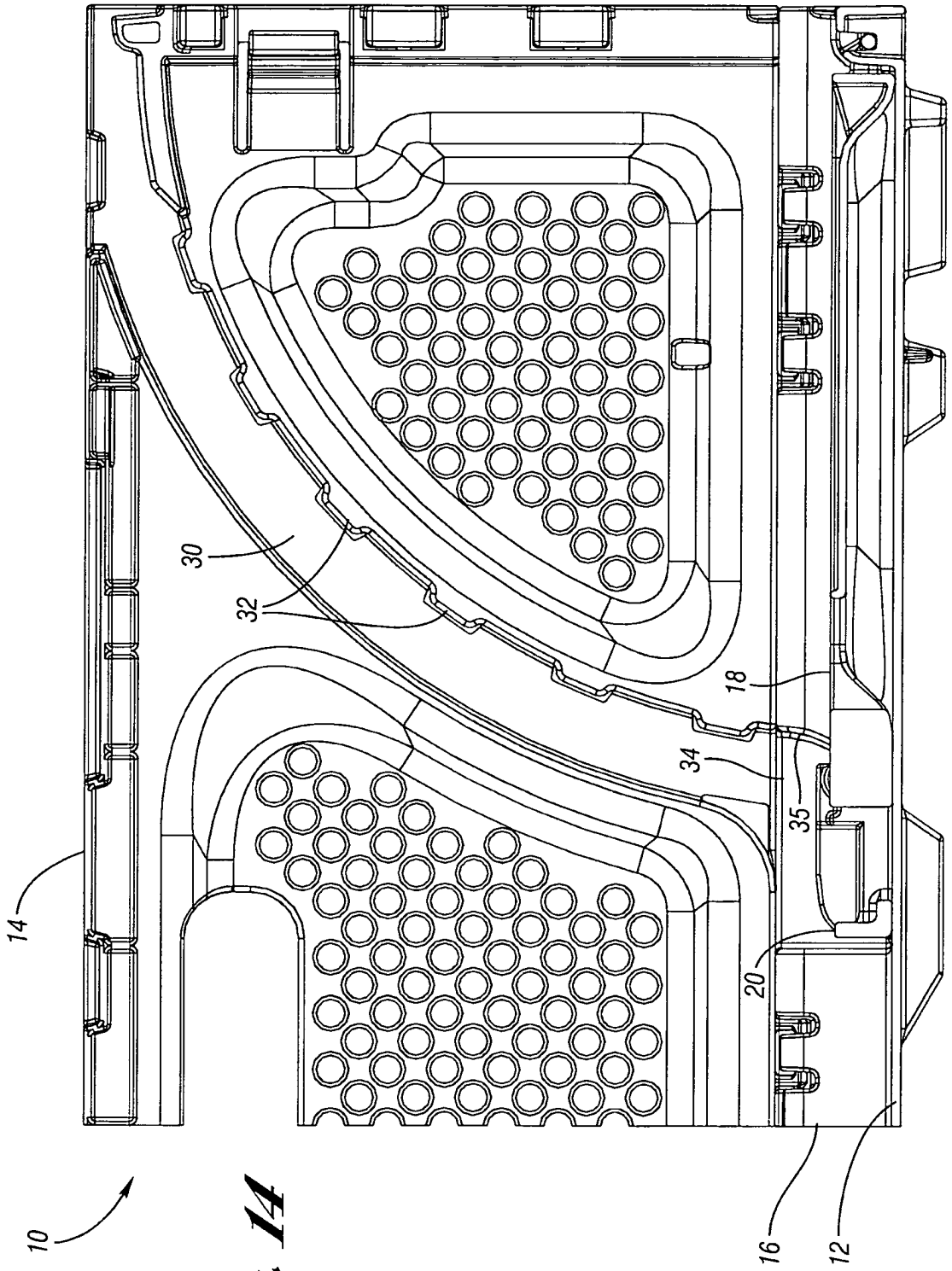


Fig. 14

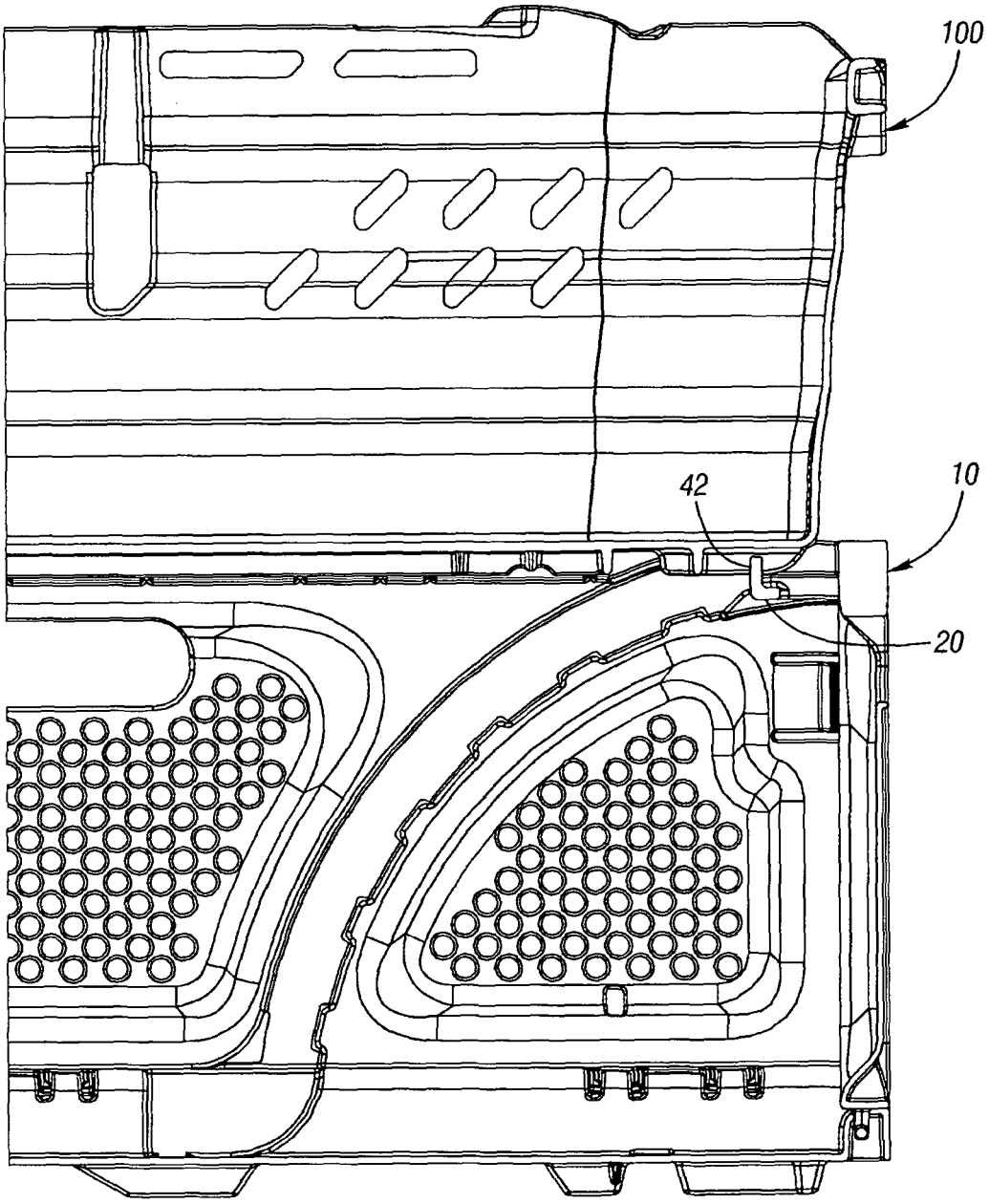


Fig. 15

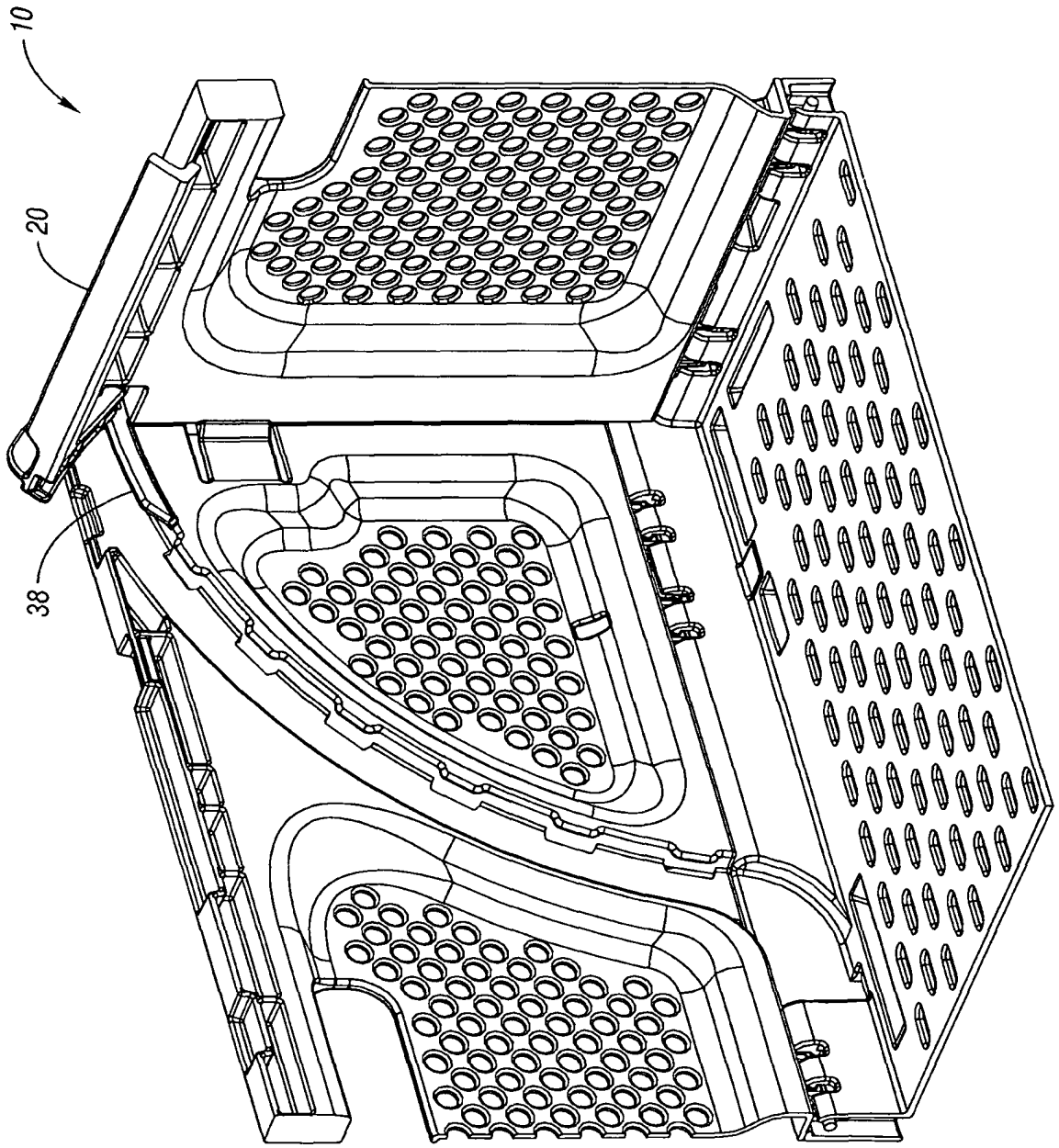


Fig. 16

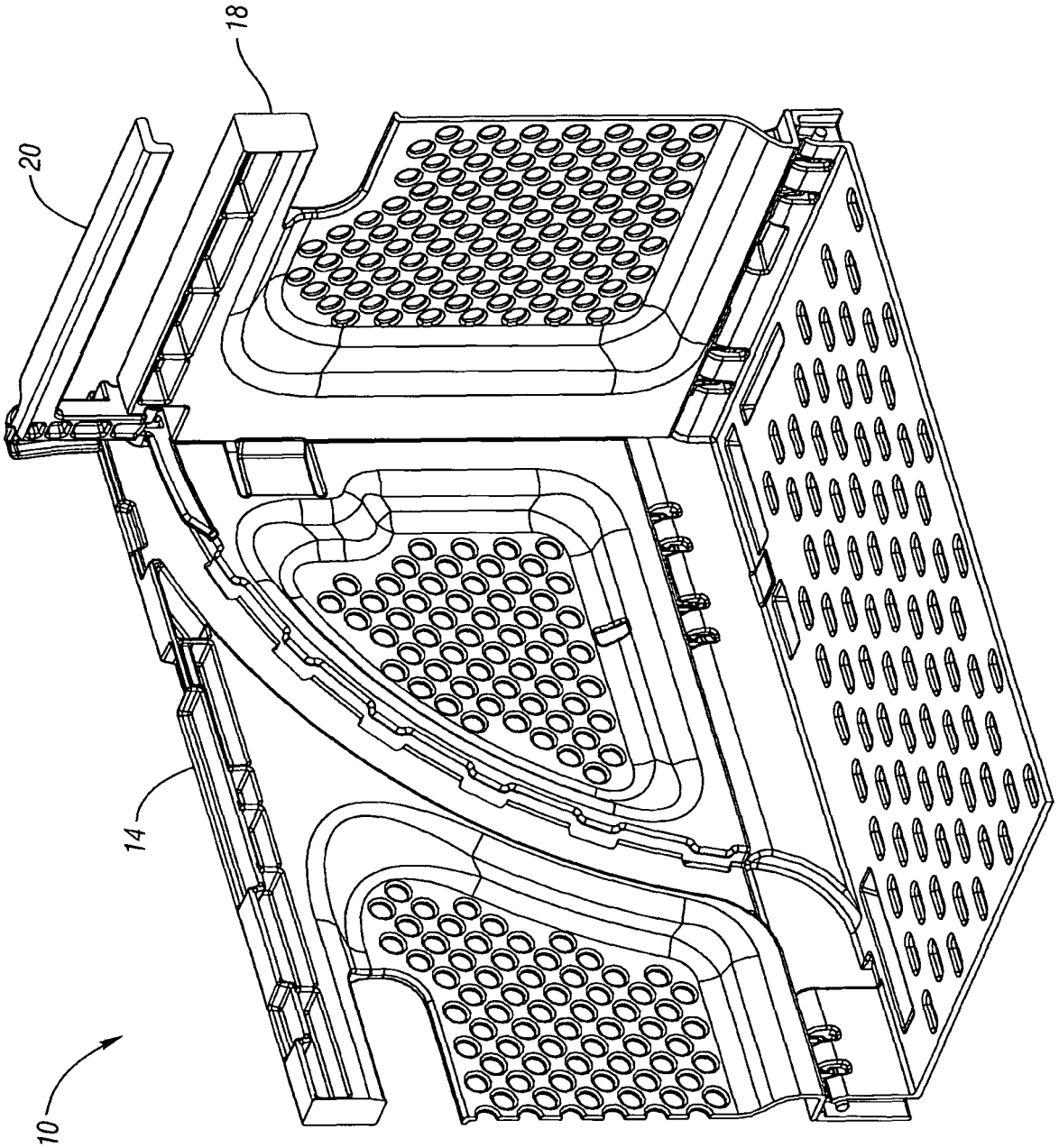


Fig. 17

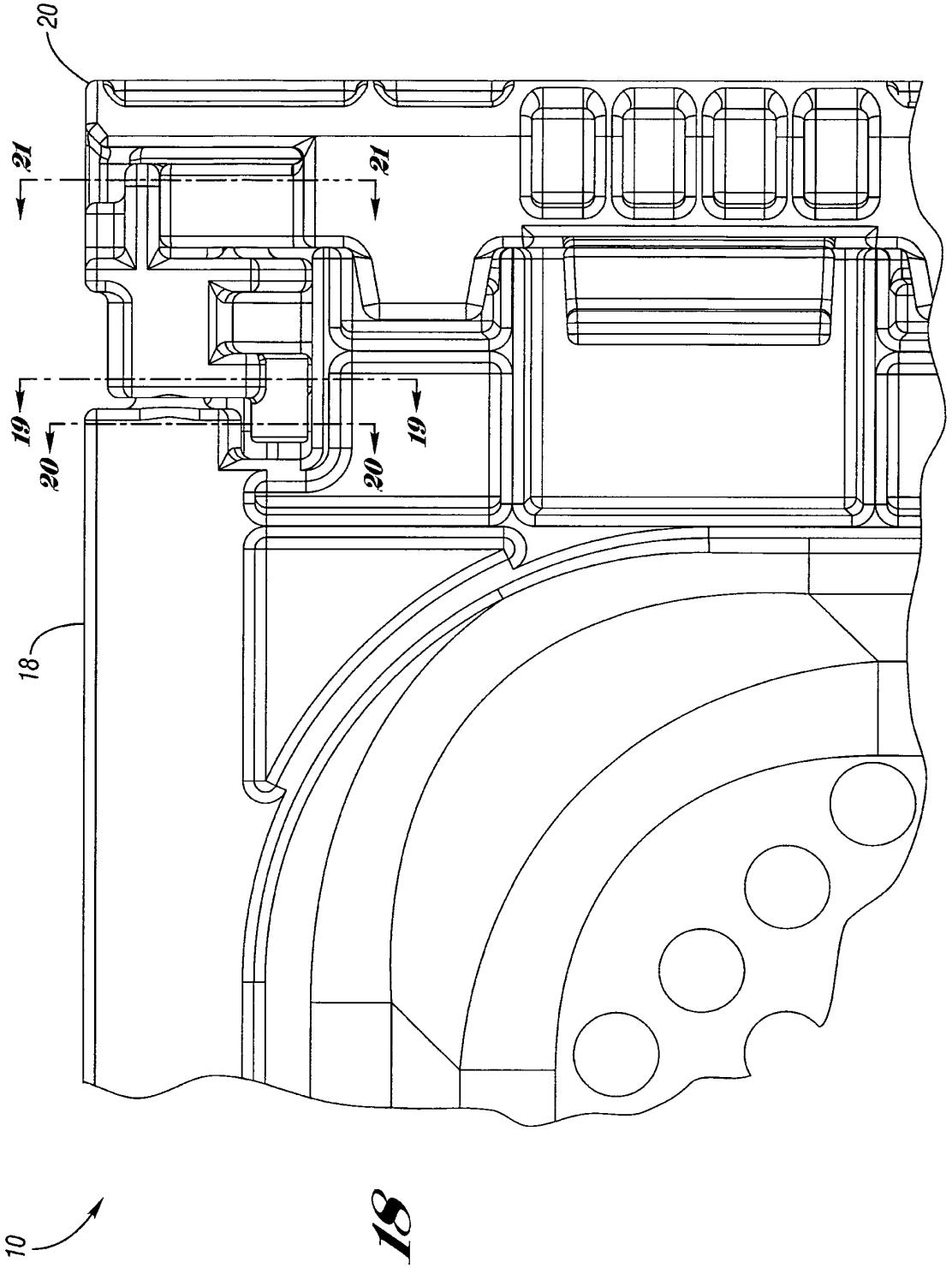


Fig. 18

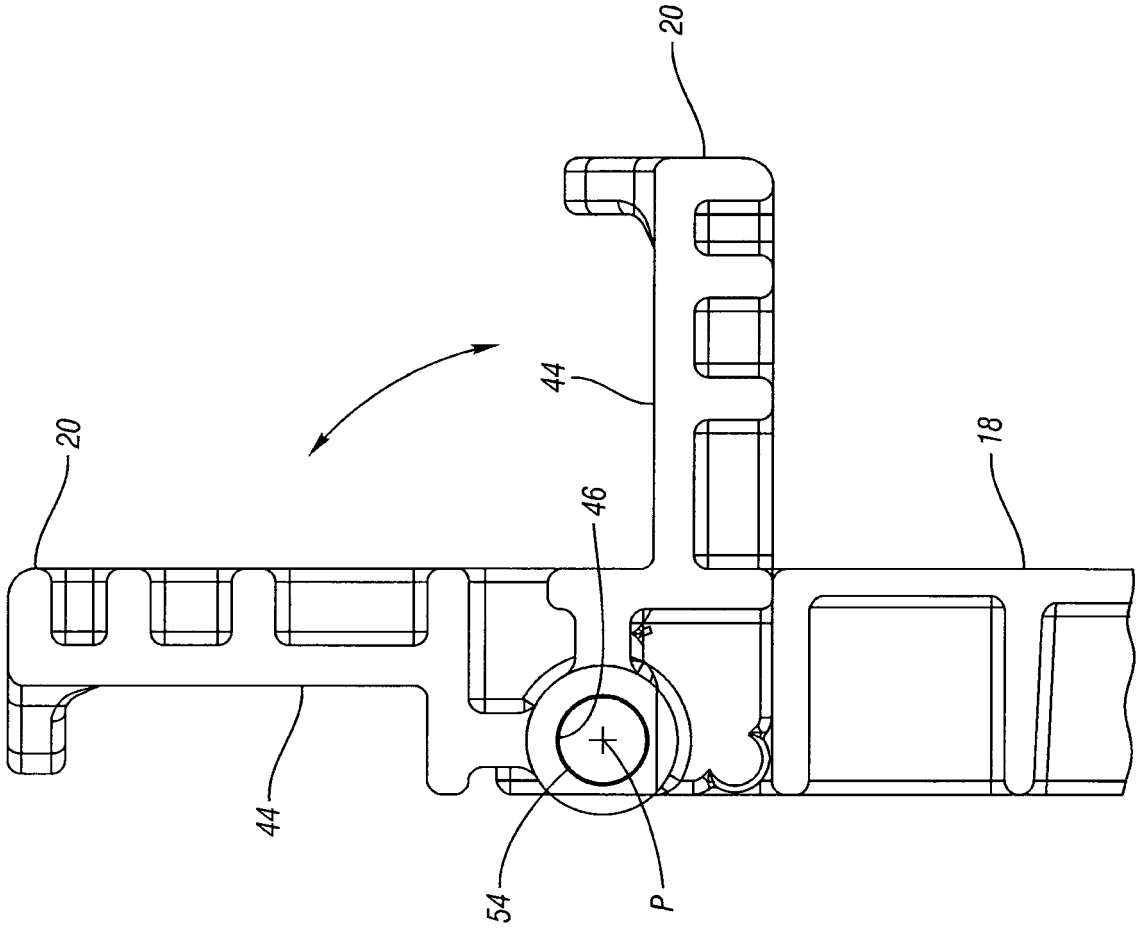


Fig. 19

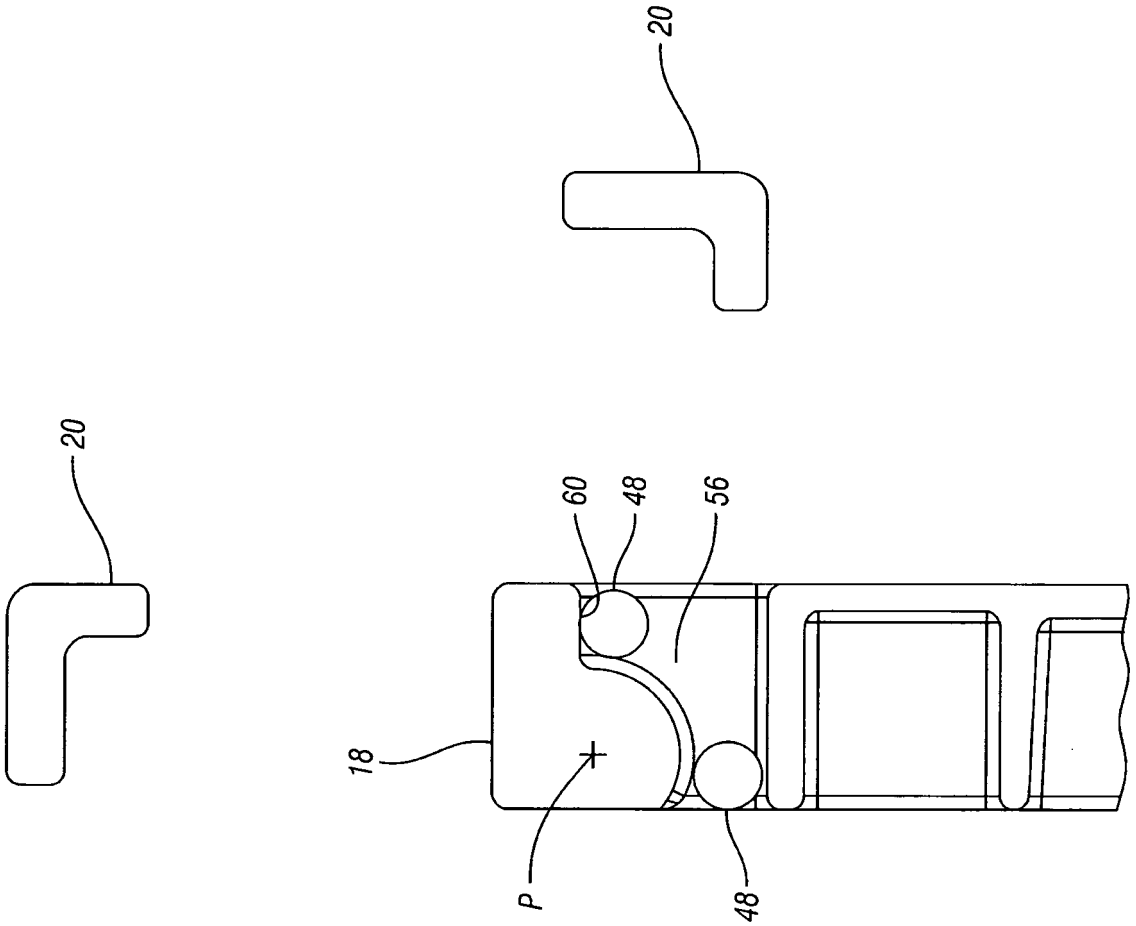
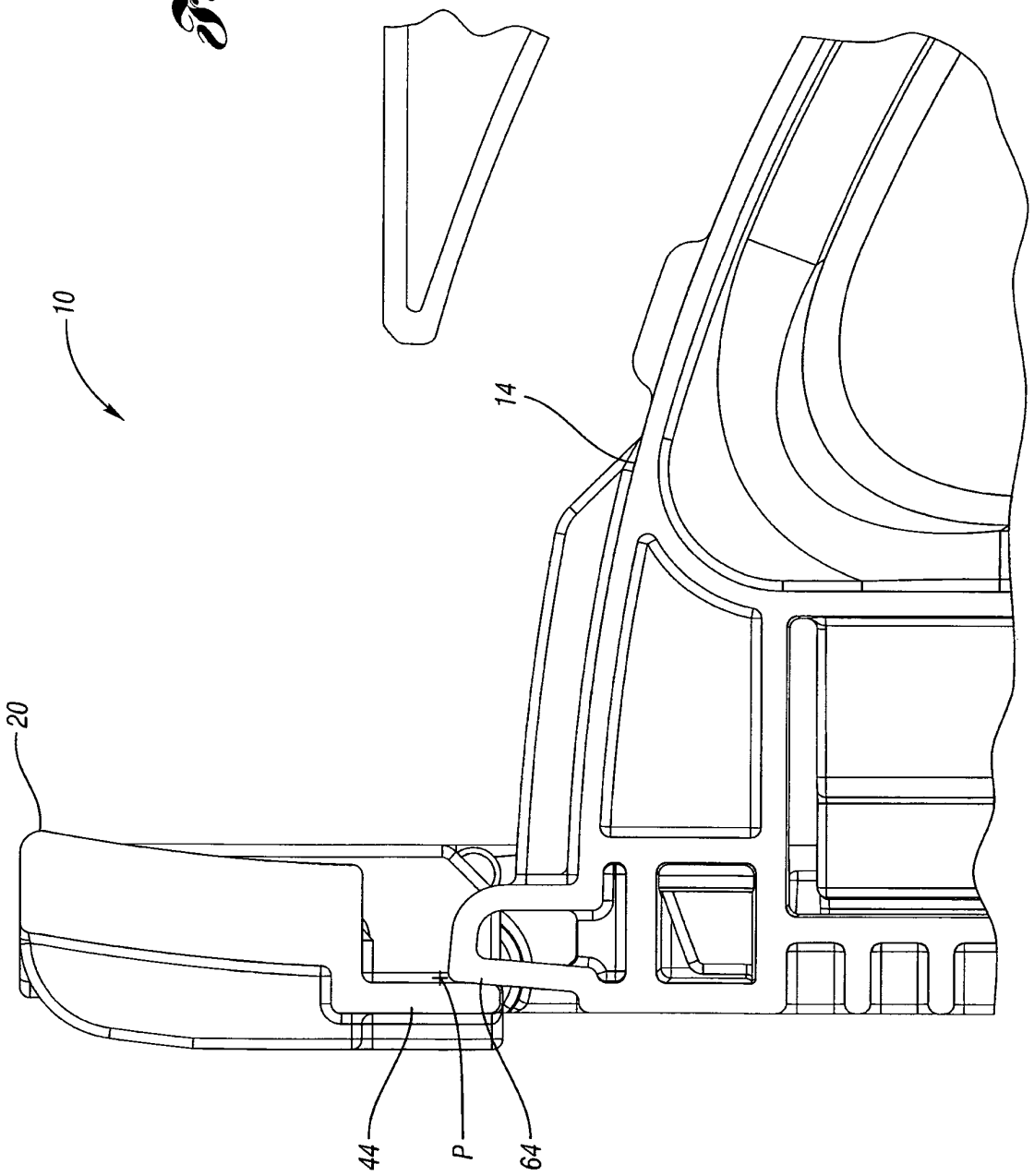


Fig. 20

Fig. 21



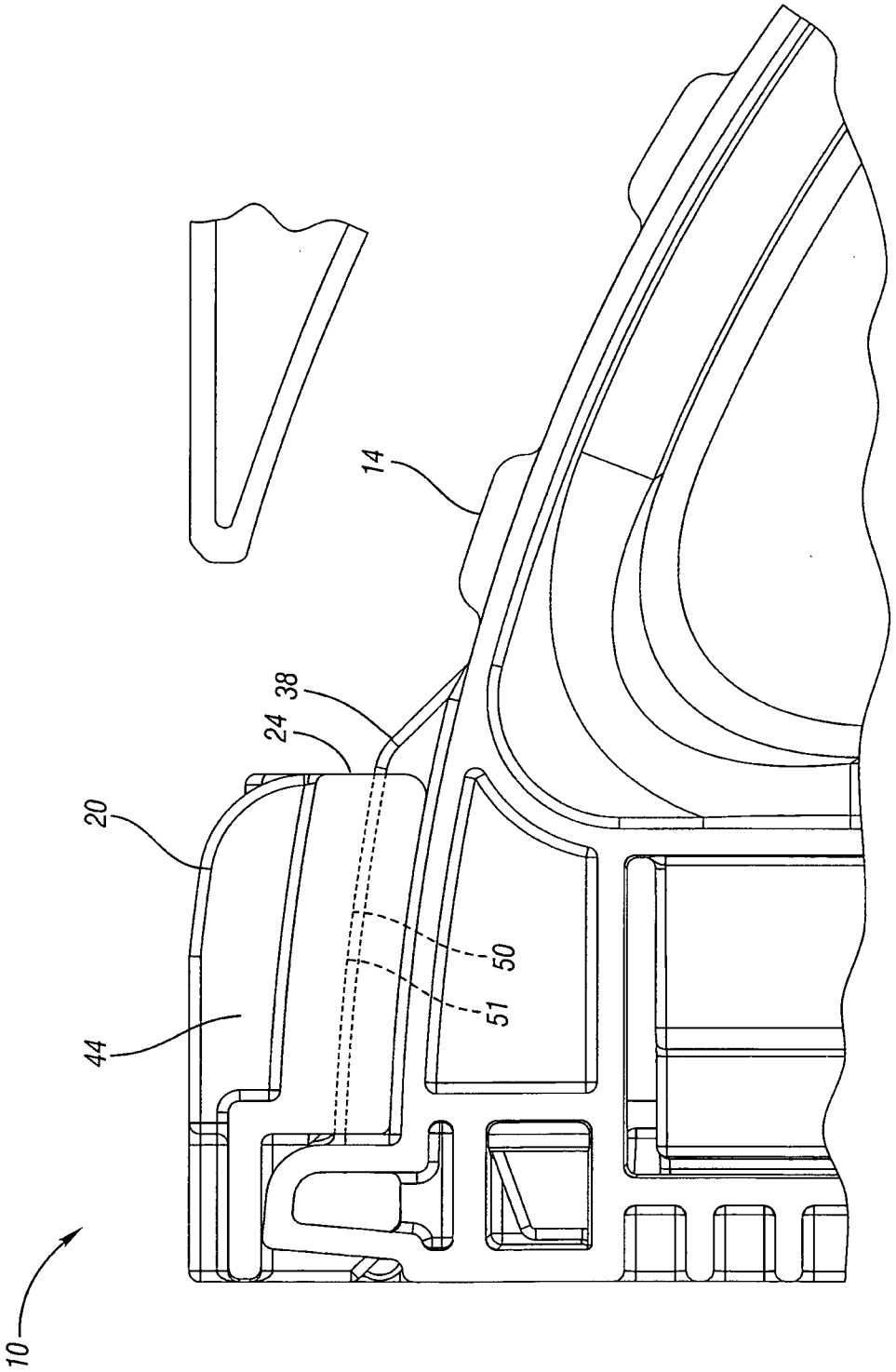


Fig. 2

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EUROPEAN SEARCH REPORT

Application Number
EP 09 16 5720

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
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B65D

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
The Hague	7 October 2009	Serrano Galarraga, J

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
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EPO FORM 1503 03.82 (P04C01)

ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO. EP 09 16 5720

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