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(54) **EXTENDED-LENGTH BULK BIN**

(57) The invention is directed to a flexible extended-length bulk bin comprising: a first plastic molded end piece; a second plastic molded end piece; a first rail extending from a first side of the first plastic molded end piece to the first side of the second plastic molded end piece; a second rail extend from a second side of the first plastic molded end piece to the second side of the second plastic molded end piece; and a first bottom panel extending between the first rail and the second rail.

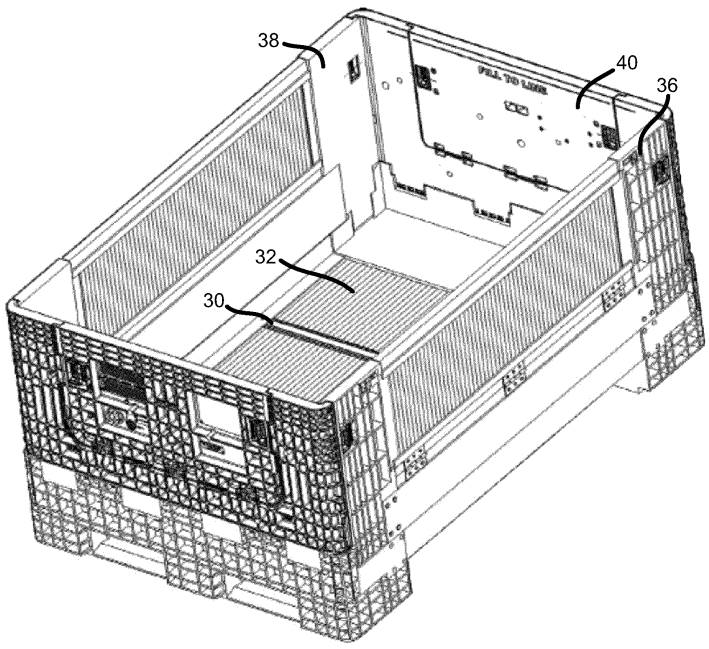

FIG. 13

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B65D 2519/00796; B65D 2519/00805;
B65D 2519/009; B65D 2519/0096;
B65D 2519/00975; B65D 2519/00985

Description

CROSS-REFERENCE TO RELATED APPLICATIONS

[0001] The present application claims priority to and the benefit of U.S. Provisional Patent Application No. 63/077,026 filed September 11, 2020 and U.S. Patent Application No. 17/462,438 filed August 31, 2021, the contents of which are incorporated herein by reference and made a part hereof.

FEDERALLY SPONSORED RESEARCH OR DEVELOPMENT

[0002] N/A

FIELD OF THE INVENTION

[0003] The present invention is directed to an extended length bulk bin having a first plastic bulk bin end piece and a second plastic bulk bin end piece separated by two metal rails supporting a bottom panel, a first side wall panel and a second side wall panel.

DESCRIPTION OF THE PRIOR ART

[0004] The North-American automotive and most other industrial manufacturing industries have standardized on mainly two footprints for large collapsible containers that are predominantly made with recyclable plastic materials (e.g., plastic bulk bins). The smaller footprint measures 32" x 30", and the larger footprint measures 48" x 45" (or sometimes 48" x 44.5"). These footprints are sized to efficiently fill standard truck trailers, most commonly 53-foot trailers.

[0005] For parts that are too large to fit a standard 48" x 45" container (for example bumpers, exhausts, trim parts, hoses, wire harnesses, etc.) a few companies offer plastic extended-length bulk containers, which keep the 48" width of the standard containers (since two 48" widths fit next to each other in a standard trailer), but offer more loading length compared to a standard (i.e., 45") bin.

[0006] The present applicant offers three extended length bulk families with footprints of 48" x 56.5", 48" x 62.5", 48" x 64.5", 48" x 70", and 48" x 77.6". Containers are offered in standard heights of 25", 34", 42", and 50". At least one other company, Buckhorn, also sells 48" x 56.5", 48" x 62.5", 48" x 64.5" and 48" x 70" footprints. The overseas markets have fundamentally similar systems, but have standardized on different footprints (e.g., 1000mm x 1200mm or 800mm x 1200mm in Europe).

[0007] It is apparent that the larger the container is, then fewer containers fit per standard trailer or truck. This increases the shipment cost per container. Therefore, the need to have a container that fits the shipped product as close as possible without giving away extra space grows with the size of the container, especially because most of the large parts that are shipped in plastic extended-length containers are relatively light and typically do not "weigh out a trailer" (meaning that a trailer can be completely filled with the same product without exceeding the allowable loaded weight of the trailer).

[0008] While the fixed-footprint plastic extended-length bulk bins mentioned above are relatively cost-efficient to produce, it is of course possible and common practice to custom-manufacture extended-length containers from various materials (for example plastic, wood, steel, or a combination thereof) for a specific application. However, these custom containers tend to be very expensive and are often difficult to recycle.

[0009] There are several reasons why dedicated plastic extended-length collapsible bulk bins are not offered in more sizes and/or by more manufacturers: (1) the required investment in tooling (e.g., injection molds) is very high due to the size of the parts; (2) individual component weights are very high and require very large molding presses (i.e., most often the bases and long side panels exceed the available shot weights of high-pressure molding machines and require structural-foam technology); and (3) the larger the container the more difficult it is to handle with fork lifts (e.g., move, stack, de-stack), which makes it more susceptible to damage, especially if the container is made from plastic (a few automotive customers have switched back to steel containers and racks because of this problem).

[0010] The present invention provides an extended length bulk bin that can overcome some or all of the problems associated with prior bins.

SUMMARY OF THE INVENTION

[0011] The present invention is directed to a flexible and collapsible extended-length bulk bin that uses plastic molded parts for the short-side ends of the container and a combination of standardized metal and sheet material for the internal parts that connect the two ends. This construction concept requires a relatively small capital investment for plastic injection molds (since the plastic parts are the same for all lengths), can very easily be adjusted to make containers of a very specific length, and keeps the part costs low compared to custom-designed containers. Furthermore, the present concept allows for relatively short lead times (when an order for production comes in) because relatively few components need to be inventoried.

[0012] In accordance with one aspect of the invention, a collapsible bulk bin family, in which each family member consists of two identical plastic molded "book-ends" that form the short-side ends of the bulk bin, is provided. Each of these ends contain one short-side sidewall with an access door, a section of the base with an integrated runner, and two corner elements with integrated hinges for the long-side walls. The two end-pieces are connected with fabricated elements forming part of the base deck and parts (i.e., segments) of the long-side sidewalls.

[0013] Having identical ends reduces the tooling cost

that is required (with single-cavity molds, two press hits are required to produce the plastic parts for one bulk bin). Moreover, incorporating as many functional features as possible into the plastic parts (e.g., all sidewall and door latches; all sidewall hinges, molded-in logos and graphics) simplifies the construction of the fabricated center section and helps to reduce part costs.

[0014] In accordance with another aspect of the invention, a flexible extended-length bulk bin is provided comprising a first plastic molded end piece and a second plastic molded end piece. The bin further comprises a first rail extending from a first side of the first plastic molded end piece to the first side of the second plastic molded end piece and a second rail extending from a second side of the first plastic molded end piece to the second side of the second plastic molded end piece. A first bottom panel extends between the first rail and the second rail.

[0015] The first rail and the second rail can be metal. Also, a first cross brace can extend between the first rail and the second rail. A second cross brace (or more) can also extend between the first rail and the second rail spaced from the first cross brace. Having cross braces accommodates having a second bottom panel extending between the first rail and the second rail; and possibly a third bottom panel (or more depending on the number of cross-braces) extending between the first rail and the second rail. The bottom panels can be plastic or a wire mesh, or other similar or suitable materials.

[0016] The first plastic molded end piece can include an access door hingedly connected to an end wall of the first molded end piece. Similarly, the second plastic molded piece can include an access door hingedly connected to an end wall of the second molded end piece. In fact, the first and second plastic molded end pieces can be identical.

[0017] The extended-length bulk bin can further comprise a first side panel extending upward from the first rail between the first plastic molded end piece and the second molded end piece. Similarly, the flexible extended-length bulk bin can also include a second side panel extending upward from the second rail between the first plastic molded end piece and the second molded end piece.

[0018] The first side panel can include a solid plastic sheet. Alternatively, the first side panel can include a wire mesh. The panel can further include other similar or suitable materials.

[0019] The first and second plastic molded pieces can each include a plurality of downwardly extending feet. Also, a plastic molded runner and/or a metal sheet can extend between the feet on each piece.

[0020] The first plastic molded piece can include a first side wall segment on the first side and a second side wall segment on the second side, and the second plastic molded piece can also include a first side wall segment on the first side and a second side wall segment on the second side. The first side wall segment of the first plastic molded end piece can be hingedly attached to the first plastic molded end piece and the second side wall segment of the first plastic molded end piece can be is hingedly attached to the first plastic molded piece. Similarly, the first side wall segment of the second plastic molded end piece can be hingedly attached to the second plastic molded end piece and the second side wall segment of the second plastic molded end piece can be hingedly attached to the second plastic molded end piece.

[0021] In accordance with yet another aspect of the invention, a flexible extended-length bulk bin comprises a first plastic bulk bin end piece having a bottom segment, an end wall extending upward from the bottom segment, a first side wall segment hingedly connected to and extending upward from a first side of the bottom segment, a second side wall segment hingedly connected to and extending upward from a second side of the bottom segment. The bin also comprises a second plastic bulk bin end piece having a bottom segment, an end wall extending upward from the bottom segment, a first side wall segment hingedly connected to and extending upward from a first side of the bottom segment, a second side wall segment hingedly connected to and extending upward from a second side of the bottom segment. The bin further includes a first metal rail extending from the first side of the bottom segment of the first plastic bulk bin end piece to the first side of the bottom segment of the second bulk bin end piece, and a second metal rail extending from the second side of the bottom segment of the first plastic bulk bin end piece to the second side of the bottom segment of the second bulk bin end piece. A first bottom panel extends between the first metal rail and the second metal rail. A first side wall panel extends between the first side wall segment of the first plastic bulk bin end piece and the first side wall segment of the second plastic bulk bin end piece, and a second side wall panel extends between the second side wall segment of the first plastic bulk bin end piece and the second side wall segment of the second plastic bulk bin end piece. The end wall of the first plastic bulk bin end piece can include a hinged access door.

[0022] Other features and advantages of the invention will be apparent from the following specification taken in conjunction with the following Figures.

BRIEF DESCRIPTION OF THE DRAWINGS

[0023] To understand the present invention, it will now be described by way of example, with reference to the accompanying drawings in which:

FIG. 1 is a perspective view of a stack of erected extended length bulk bins in accordance with the present invention;

FIG. 2 is a perspective view of a stack of collapsed extended length bulk bins in accordance with the present invention;

FIG. 3 is a perspective view of a base portion of an extended length bulk bin in accordance with the present invention;
FIG. 4 is a perspective view of the bottom of the base portion of FIG. 3;
FIG. 5 is a perspective view of a plastic bulk bin end piece for use in an extended length bulk bin;
FIG. 6 is a partially exploded view of a side wall panel for use in an extended length bulk bin;
FIG. 7 is a cross-sectional view of welded plastic panels for use in one aspect of the side wall panel;
FIG. 8 is a view of a wire mesh for use in another aspect of the side wall panel;
FIG. 9 is a honeycomb panel for use in another aspect of the side wall panel;
FIG. 10 is a perspective view of three extended length bulk bins of various sizes in accordance with the present invention;
FIG. 11 is a lower perspective view of an extended-length bulk bin in accordance with the present invention;
FIG. 12 is a side perspective view of the bin of FIG. 11;
FIG. 13 is a top perspective view of the bin of FIG. 11;
FIG. 14 is a perspective view of a portion of the bin of FIG. 11 missing one of the ends and a side panel;
FIG. 15 is a perspective view of the second end of the bin of FIG. 11; and,
FIG. 16 is a perspective view of the second end of FIG. 15 without the side panel segments.

DETAILED DESCRIPTION

[0024] While this invention is susceptible of embodiments in many different forms, there is shown in the drawings and will herein be described in detail preferred embodiments of the invention with the understanding that the present disclosure is to be considered as an exemplification of the principles of the invention and is not intended to limit the broad aspect of the invention to the embodiments illustrated.

[0025] The present invention is directed to an extended-length container that is longer than standard sized bulk bins typically used in the industry. The extended-length container includes a first end piece and a second end piece that are designed as end portions of the typical standard bulk bin, and an intermediate section of having bottom and side wall panels. The intermediate section of the container can be different lengths (i.e., each creating a container having a longer than typical length of the standard bulk bins) to accommodate oversized products that require shipping. The side walls and end walls of the container can be designed to be collapsible.

[0026] In accordance with an aspect of the present invention, a stack of extended-length containers 10 in a set-up or erected configuration is shown in Figure 1. A similar stack of containers 10 - in a collapsed configuration - is shown in Figure 2.

[0027] As visible in Figures 1 and 2, each container 10 includes a first plastic bulk bin portion end piece 12 and a second plastic bulk bin portion end piece 14. The first and second end pieces 12, 14 can be identical. A metal rail 16 and a side wall panel 18 are shown extending between the first end piece 12 and the second end piece 14 - giving the container an extended length greater than standard bulk bin lengths. The side wall panel 18 and portions of the end pieces 12, 14 are not visible in the collapsed configuration of Figure 2.

[0028] Referring to Figures 3-5, each end piece 12, 14 includes a base portion 20. The base portion 20 includes a plurality of downwardly extending legs 22. Additionally, a runner 24 can extend along the bottom of the legs 22 defining two openings 26 that can be used for forklift tines. The base portion 20 also includes a bottom wall segment 28 and structure for supporting an end wall and side wall segments discussed in more detail below.

[0029] A first metal rail 16 extends from a first side of one base portion 20 to a first side of the other base portion 20. Similarly, a second metal rail 16 extends between a second side of the base portions 20. One or more cross braces 30 can extend between the first metal rail 16 and the second metal rail 16 (the embodiment of Figure 3 shows two cross braces 30 spaced from each other).

[0030] The metal rails 16 can have L-shaped cross sectional shapes (or other similar structure) to support one or more bottom panels 32. The bottom panels 32 can be plastic structures, wire mesh or other similar materials. The bottom panels 32 along with the bottom segments 28 of the base portions 20 of the end pieces 12, 14 form a bottom wall for the container 10.

[0031] One of the end pieces 12, 14 is shown in Figure 5. Each end piece can be identical (which reduces molding costs) and comprises five structural foam molded parts along with a plurality of latch elements and hinge elements. The end piece 12, 14 includes the base 20 discussed with respect to Figures 3 and 4, an end wall 34, a first side wall segment 36 on the first side of the end wall 34, a second side wall segment 38 at the second side of the end wall 34 and an access door 40 in the end wall 34. Each of the end wall 34, first side wall segment 36 and second side wall segment 38 are connected to the base portion 20 by conventional bulk bin hinges 42. Similarly, the access door 40 is connected to the end door 34 by hinges 42. The side wall segments 36, 38 and the access door 40 are held in place to the end wall 34 by conventional bulk bin latches 44.

[0032] As is evident in Figure 5, the bulk bin end piece 12 or 14 includes a plurality of outwardly extending ribs 46. While specifically molded to the size and shape shown in Figure 5, the bulk bin end piece 12 or 14 looks as if it were a portion of a bulk bin that was cut from an actual full size bulk bin. Additionally, instead of or in addition to a plastic molded runner 24, sheet plates 60 can be connected to the feet 22 to improve durability.

[0033] Referring to Figure 6, a first side wall segment 36 of a first bulk bin end piece (the rest of the end piece

is not shown here) and a first side wall segment of a second bulk bin end piece (again, not shown here) are connected proximate a bottom portion to first end of a metal plate 46 and a second end of the metal plate 46, respectively. A side wall panel 48 is then hingedly connected to the metal plate 46 by hinges 50 (this allows for access via the long side walls of the container 10). The side wall panel 46 includes a central plastic sheet 51 having an outer rectangular frame 52. Other materials, such as a wire mesh, can replace the plastic sheet.

[0034] Figures 7-9 show various materials that can be used for the bottom panels 32 and/or the side panels 46. Figure 7 shows a hot plate welded plastic sheet 54 having two outer layers separated by ribs. Figure 8 shows a wire mesh 56, and Figure 9 shows a honeycomb panel 58.

[0035] The metal rails 16 and plates 46 can be formed from an extruded aluminum, or can be rolled formed parts or pressed-brake parts.

[0036] Figure 10 shows three extended-length bulk containers 10, 10' and 10" in accordance with the present invention of various lengths.

[0037] Figures 11-16 show additional views of the extended-length bulk bin 10. Figures 14, 15 and 16 show portions of the bin 10 without some of the other structures.

[0038] Disclosed herein is a flexible extended-length bulk bin comprising a first plastic molded end piece; a second plastic molded end piece; a first rail extending from a first side of the first plastic molded end piece to the first side of the second plastic molded end piece; a second rail extend from a second side of the first plastic molded end piece to the second side of the second plastic molded end piece; and a first bottom panel extending between the first rail and the second rail.

[0039] Optionally, the first rail and the second rail are metal.

[0040] Optionally, the flexible extended-length bulk bin further comprises a first cross brace extending between the first rail and the second rail; and a second cross brace extending between the first rail and the second rail spaced from the first cross brace.

[0041] Optionally, the flexible extended-length bulk bin further comprises a second bottom panel extending between the first rail and the second rail; and a third bottom panel extending between the first rail and the second rail.

[0042] Optionally, the first bottom panel is plastic.

[0043] Optionally, the first bottom panel is a wire mesh.

[0044] Optionally, the first plastic molded end piece includes an access door.

[0045] Optionally, the second plastic molded piece includes an access door.

[0046] Optionally, the flexible extended-length bulk bin further comprises a first side panel extending upward from the first rail between the first plastic molded end piece and the second molded end piece.

[0047] Optionally, the flexible extended-length bulk bin further comprises a second side panel extending upward from the second rail between the first plastic molded end piece and the second molded end piece.

[0048] Optionally, the first side panel includes a solid plastic sheet.

[0049] Optionally, the first side panel includes a wire mesh.

[0050] Optionally, the first plastic molded piece includes a plurality of downwardly extending feet.

[0051] Optionally, the first plastic molded piece includes a runner extending between the feet.

[0052] Optionally, the first plastic molded piece includes a metal sheet extending between the feet.

[0053] Optionally, the first plastic molded piece includes a first side wall segment on the first side and a second side wall segment on the second side, and the second plastic molded piece includes a first side wall segment on the first side and a second side wall segment on the second side.

[0054] Optionally, the first side wall segment of the first plastic molded end piece is hingedly attached to the first plastic molded end piece and the second side wall segment of the first plastic molded end piece is hingedly attached to the first plastic molded piece, and the first side wall segment of the second plastic molded end piece is hingedly attached to the second plastic molded end piece and the second side wall segment of the second plastic molded end piece is hingedly attached to the second plastic molded end piece.

[0055] Optionally, the first plastic molded end piece is identical to the second molded plastic end piece.

[0056] A flexible extended-length bulk bin is disclosed herein, comprising a first plastic bulk bin end piece having a bottom segment, an end wall extending upward from the bottom segment, a first side wall segment hingedly connected to and extending upward from a first side of the bottom segment, a second side wall segment hingedly connected to and extending upward from a second side of the bottom segment. The flexible extended-length bulk bin also comprises a second plastic bulk bin end piece having a bottom segment, an end wall extending upward from the bottom segment, a first side wall segment hingedly connected to and extending upward from a first side of the bottom segment, a second side wall segment hingedly connected to and extending upward from a second side of the bottom segment. The flexible extended-length bulk bin also comprises a first metal rail extending from the first side of the bottom segment of the first plastic bulk bin end piece to the first side of the bottom segment of the second bulk bin end piece. The flexible extended-length bulk bin also comprises a second metal rail extending from the second side of the bottom segment of the first plastic bulk bin end piece to the second side of the bottom segment of the second bulk bin end piece. The flexible extended-length bulk bin also comprises a first bottom panel extending between the first metal rail and the second metal rail. The flexible extended-length bulk bin also comprises a first side wall panel extending between the first side wall segment of the first plastic bulk bin end piece and the first side wall segment of the second plastic bulk bin end piece; and a

second side wall panel extending between the second side wall segment of the first plastic bulk bin end piece and the second side wall segment of the second plastic bulk bin end piece.

[0057] Optionally, the end wall of the first plastic bulk bin end piece includes a hinged access door.

[0058] Many modifications and variations of the present invention are possible in light of the above teachings. It is, therefore, to be understood within the scope of the appended claims the invention may be protected otherwise than as specifically described.

Claims

1. A flexible extended-length bulk bin comprising:

a first plastic molded end piece;
a second plastic molded end piece;
a first rail extending from a first side of the first plastic molded end piece to the first side of the second plastic molded end piece;
a second rail extend from a second side of the first plastic molded end piece to the second side of the second plastic molded end piece; and
a first bottom panel extending between the first rail and the second rail.

2. The flexible extended-length bulk bin of claim 1 wherein the first rail and the second rail are metal.

3. The flexible extended-length bulk bin of claim 2 further comprising:

a first cross brace extending between the first rail and the second rail; and,
a second cross brace extending between the first rail and the second rail spaced from the first cross brace.

4. The flexible extended-length bulk bin of claim 3 further comprising:

a second bottom panel extending between the first rail and the second rail; and,
a third bottom panel extending between the first rail and the second rail.

5. The flexible extended-length bulk bin of claim 1 wherein the first bottom panel is plastic.

6. The flexible extended-length bulk bin of claim 1 wherein the first bottom panel is a wire mesh.

7. The flexible extended-length bulk bin of claim 1 wherein the first plastic molded end piece includes an access door.

8. The flexible extended-length bulk bin of claim 7 wherein the second plastic molded piece includes an access door.

9. The flexible extended-length bulk bin of claim 1 further comprising a first side panel extending upward from the first rail between the first plastic molded end piece and the second molded end piece.

10. The flexible extended-length bulk bin of claim 9 further comprising a second side panel extending upward from the second rail between the first plastic molded end piece and the second molded end piece.

11. The flexible extended-length bulk bin of claim 1 wherein the first plastic molded piece includes a plurality of downwardly extending feet.

12. The flexible extended-length bulk bin of claim 11 wherein the first plastic molded piece includes a runner extending between the feet.

13. The flexible extended-length bulk bin of claim 11 wherein the first plastic molded piece includes a metal sheet extending between the feet.

14. The flexible extended-length bulk bin of claim 10 wherein the first plastic molded piece includes a first side wall segment on the first side and a second side wall segment on the second side, and the second plastic molded piece includes a first side wall segment on the first side and a second side wall segment on the second side.

15. The flexible extended-length bulk bin of claim 14 wherein the first side wall segment of the first plastic molded end piece is hingedly attached to the first plastic molded end piece and the second side wall segment of the first plastic molded end piece is hingedly attached to the first plastic molded piece, and the first side wall segment of the second plastic molded end piece is hingedly attached to the second plastic molded end piece and the second side wall segment of the second plastic molded end piece is hingedly attached to the second plastic molded end piece.

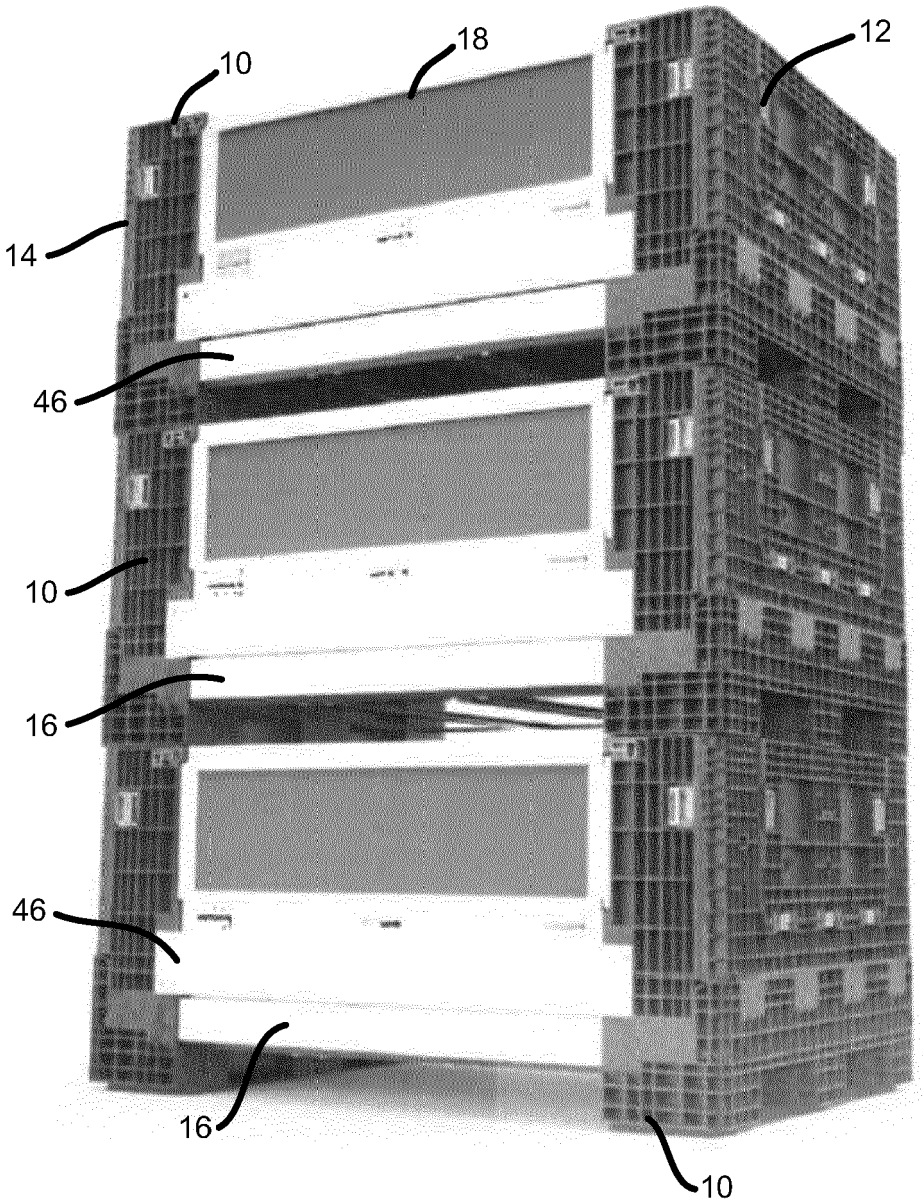

FIG. 1

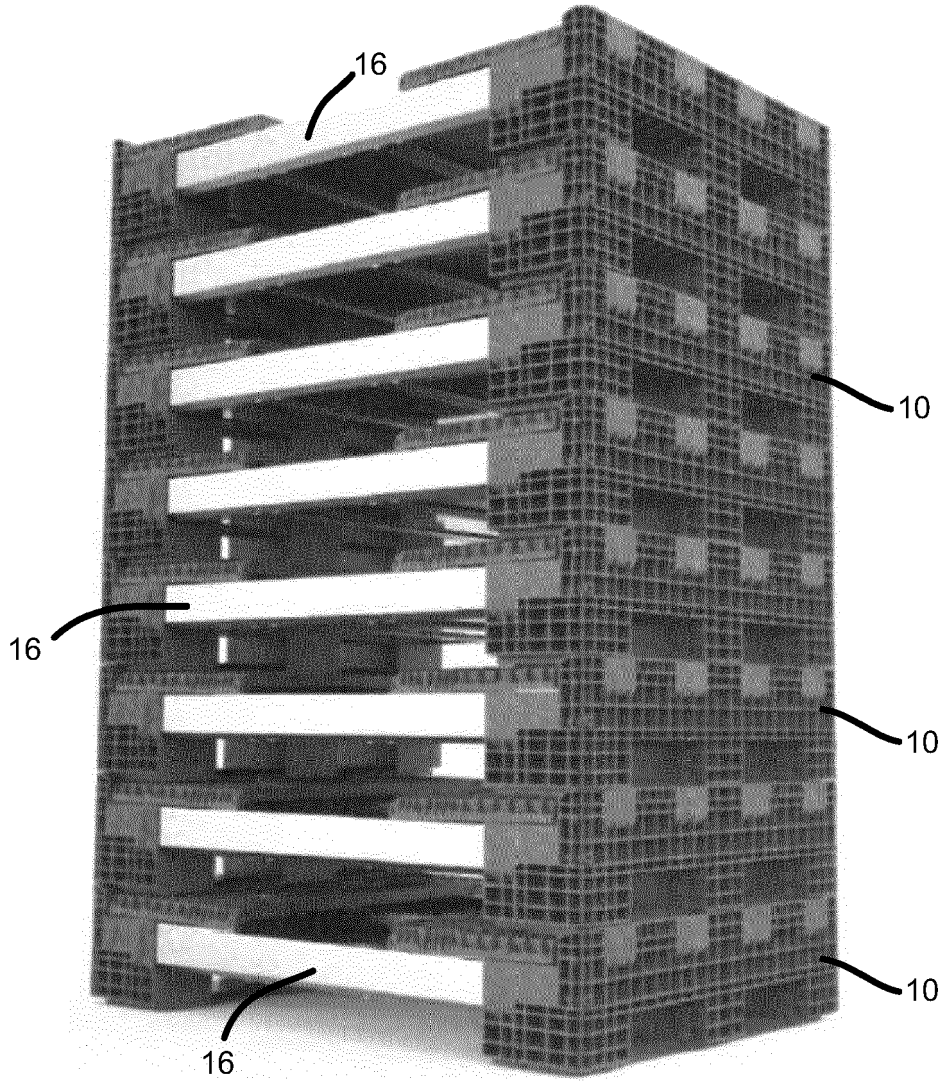

FIG. 2

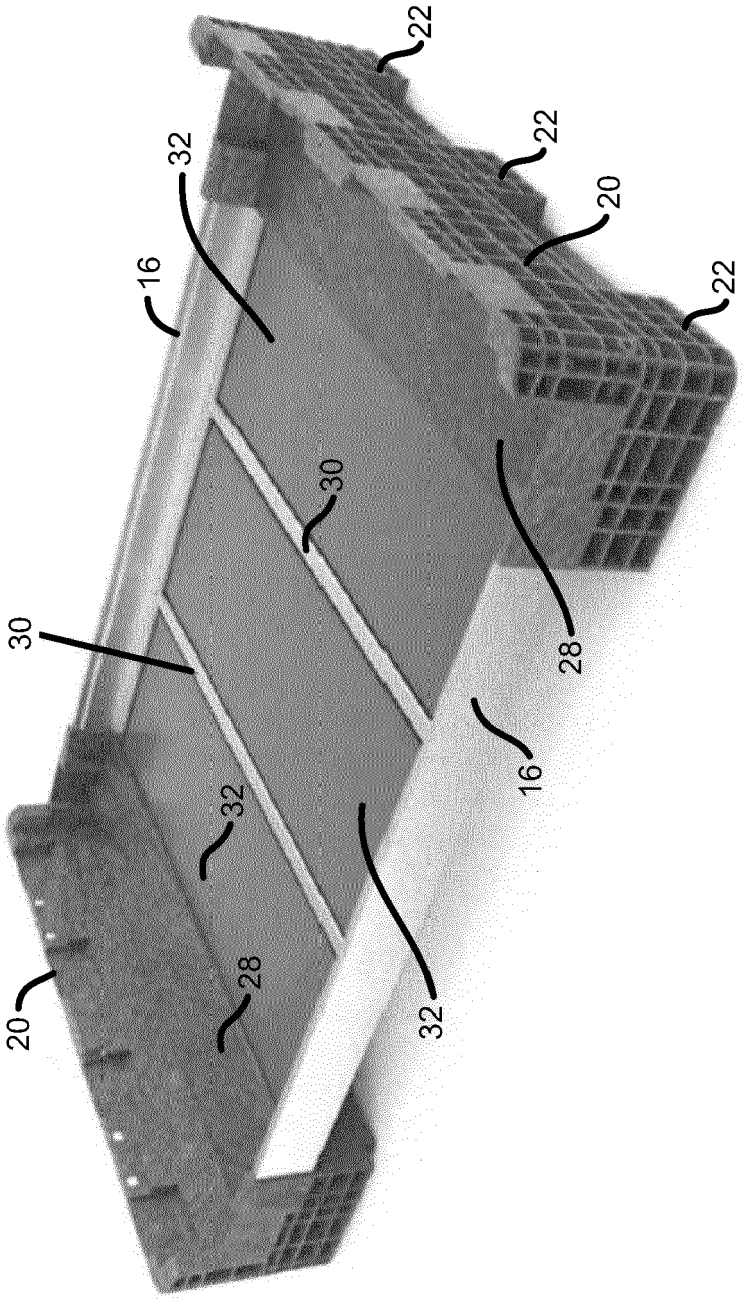

FIG. 3

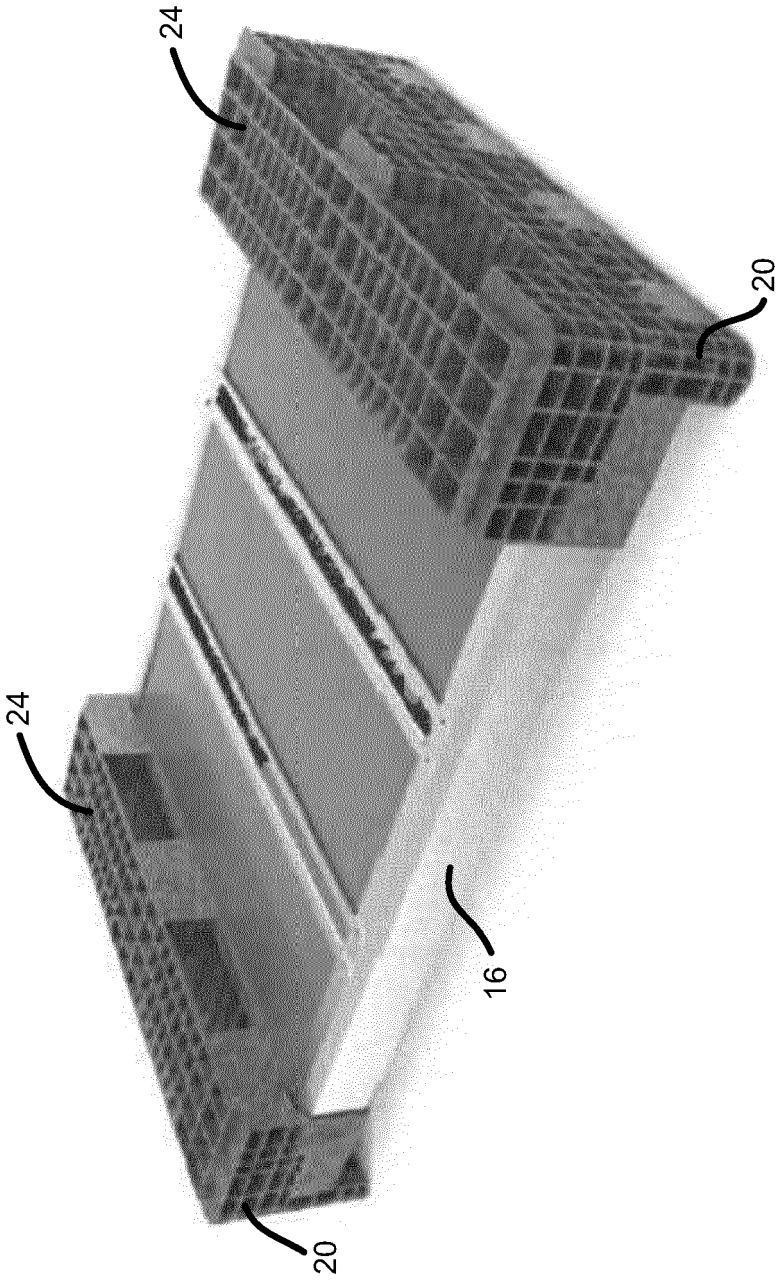

FIG. 4

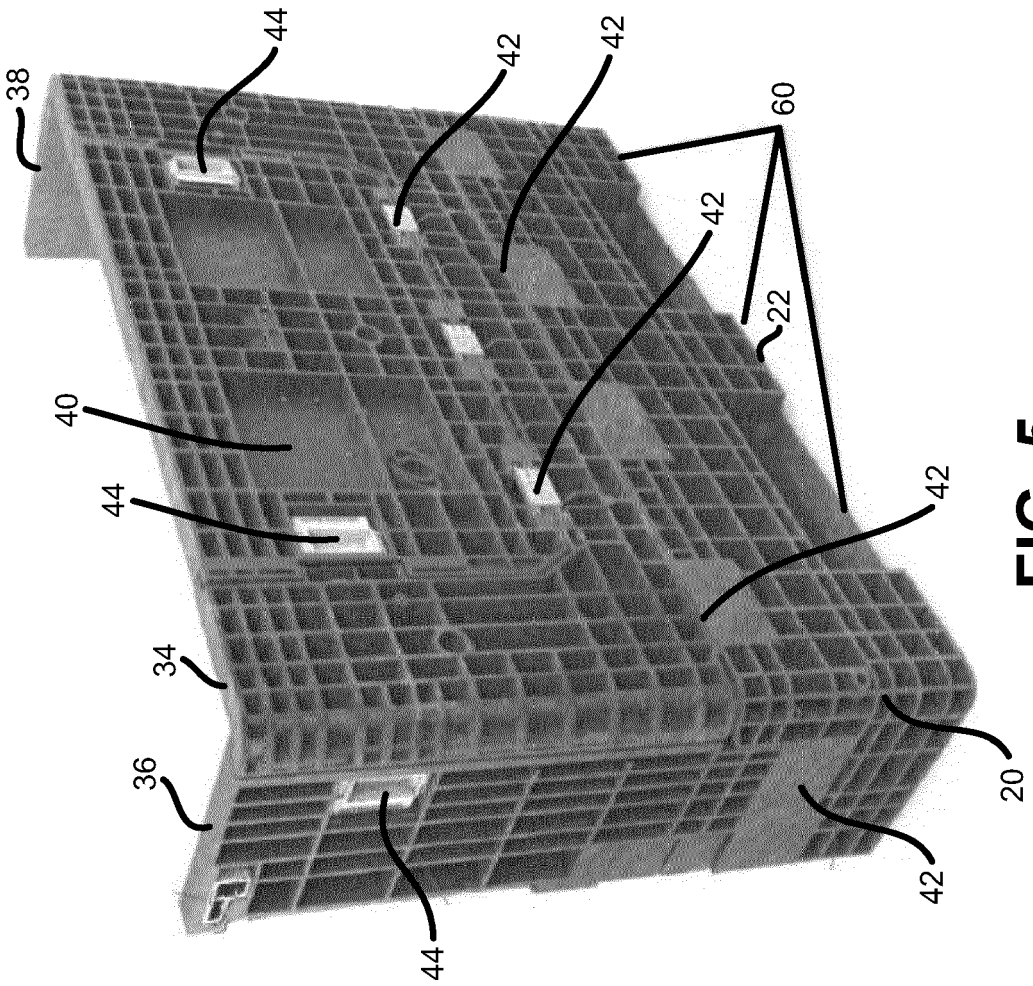

FIG. 5

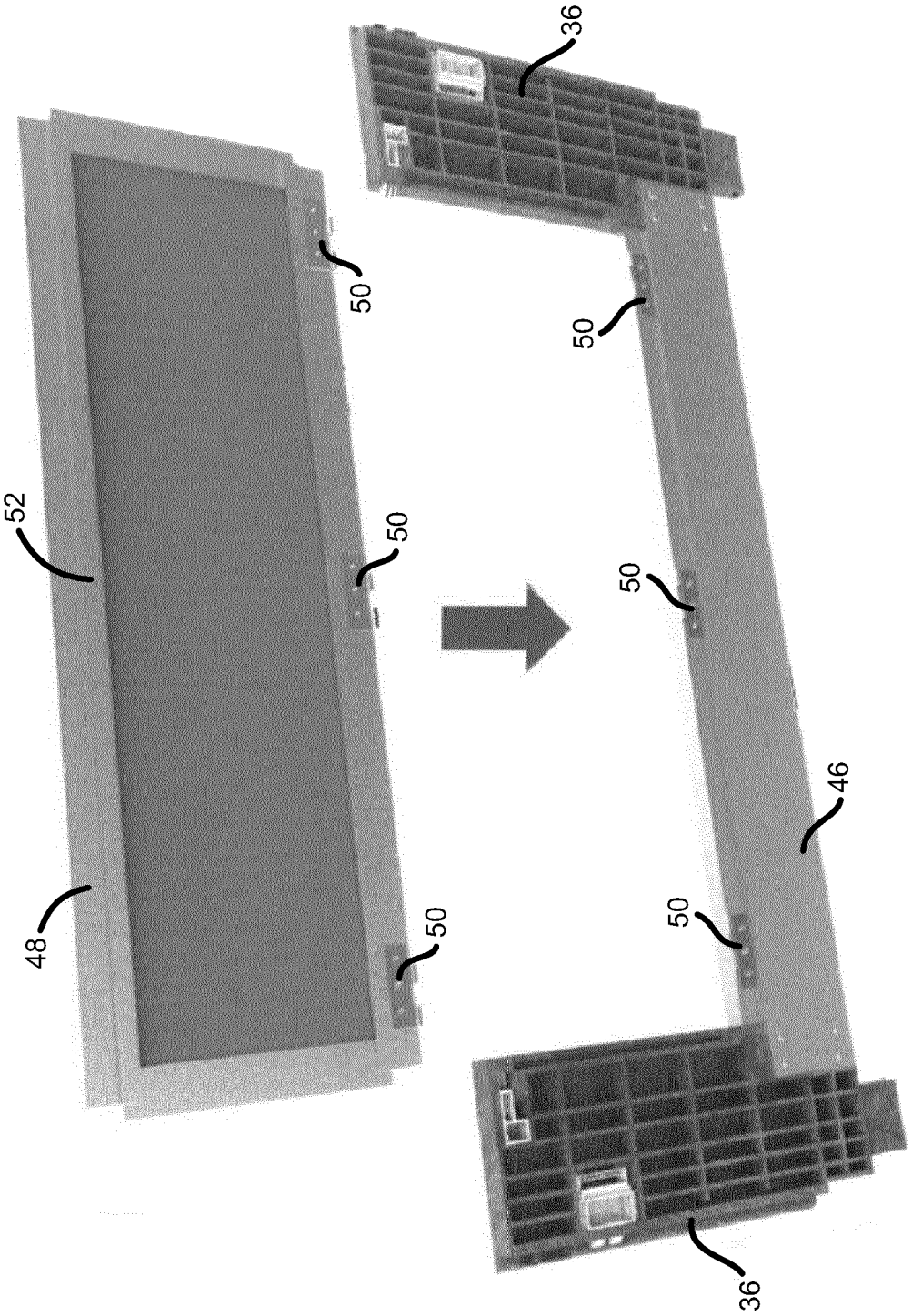

FIG. 6

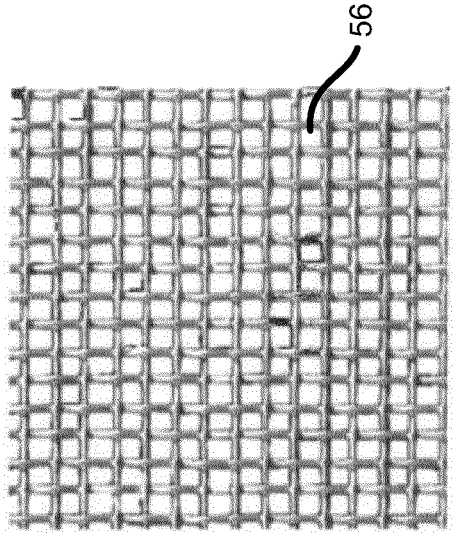

FIG. 8

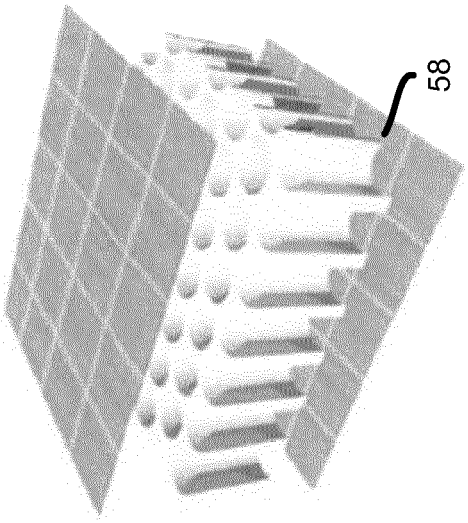

FIG. 9

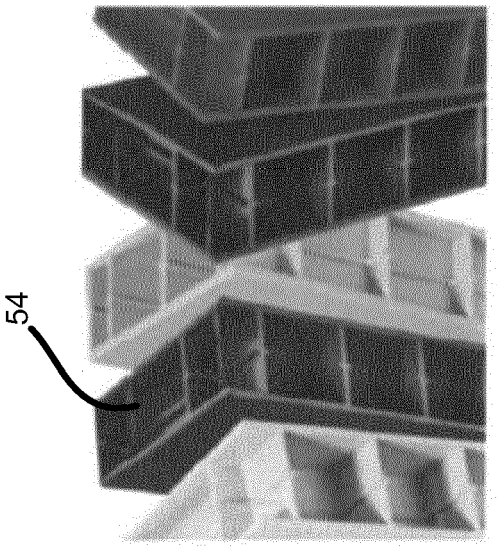

FIG. 7

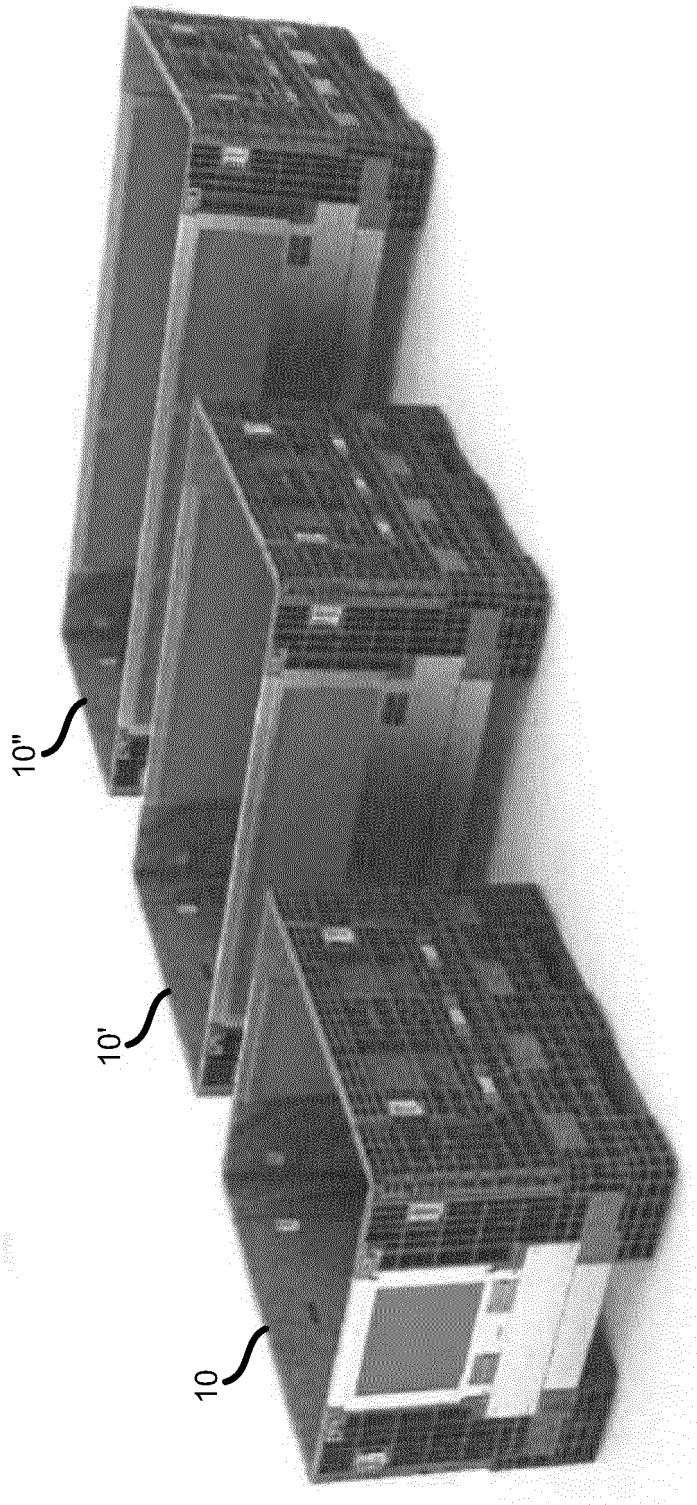

FIG. 10

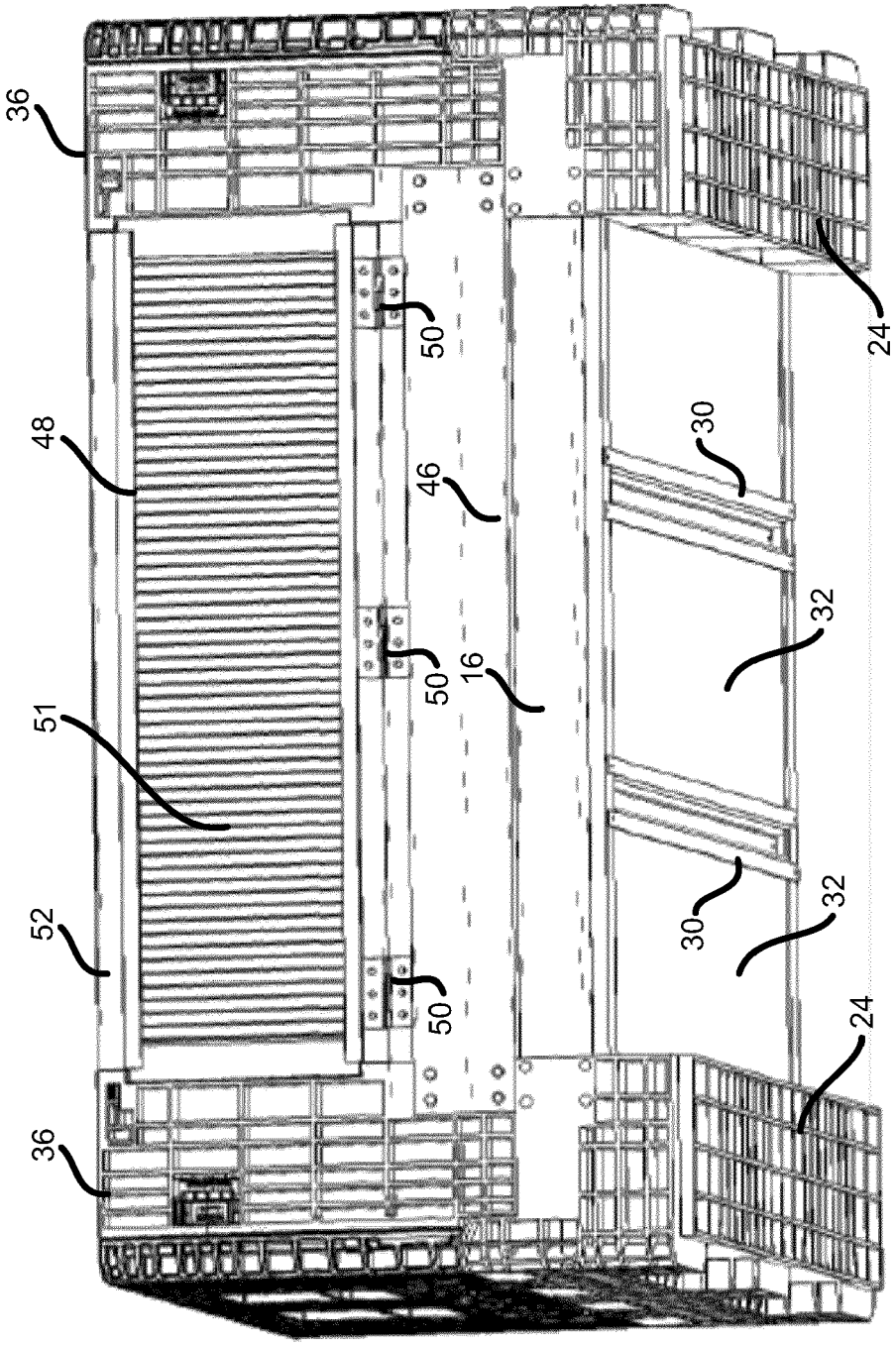

FIG. 11

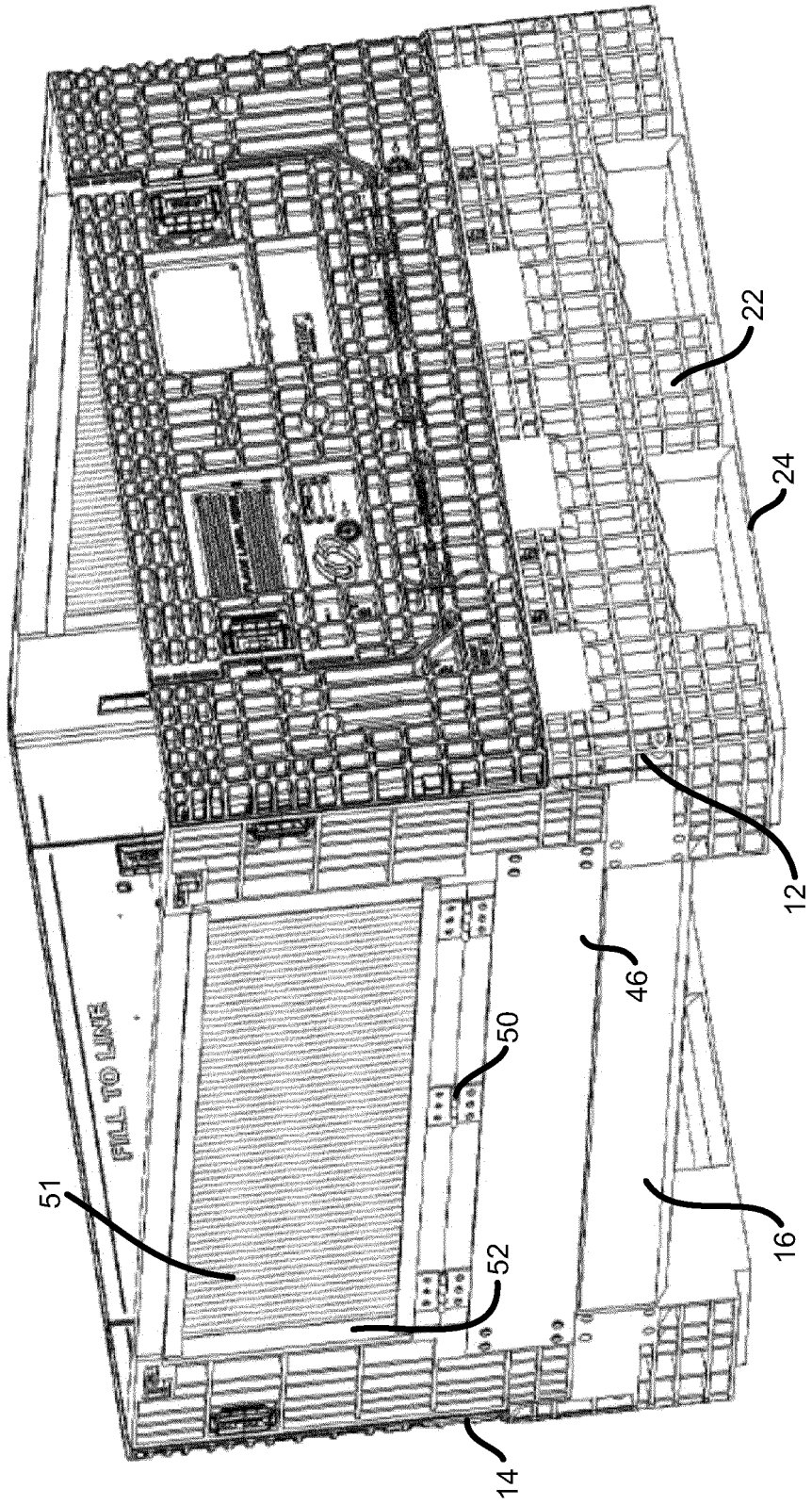

FIG. 12

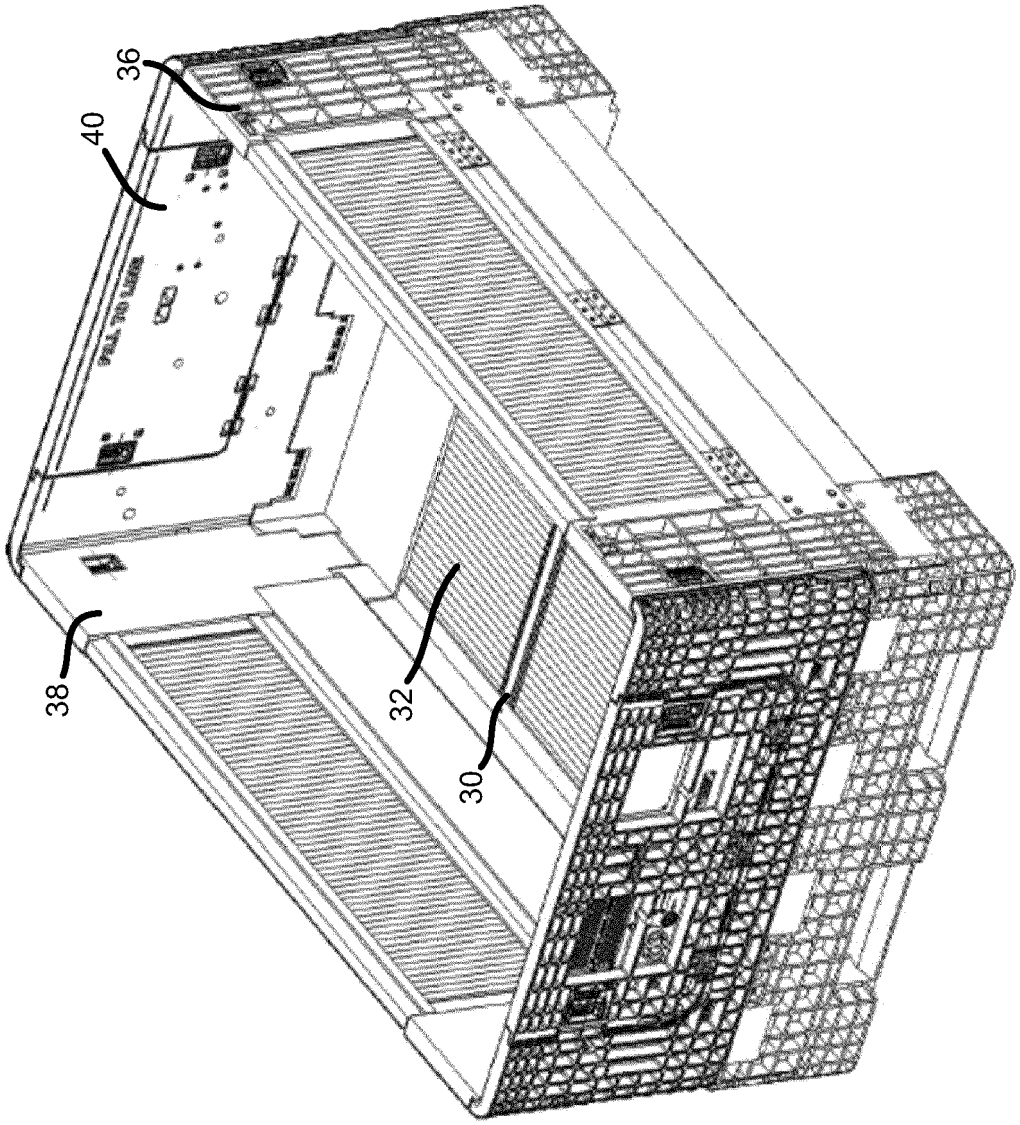

FIG. 13

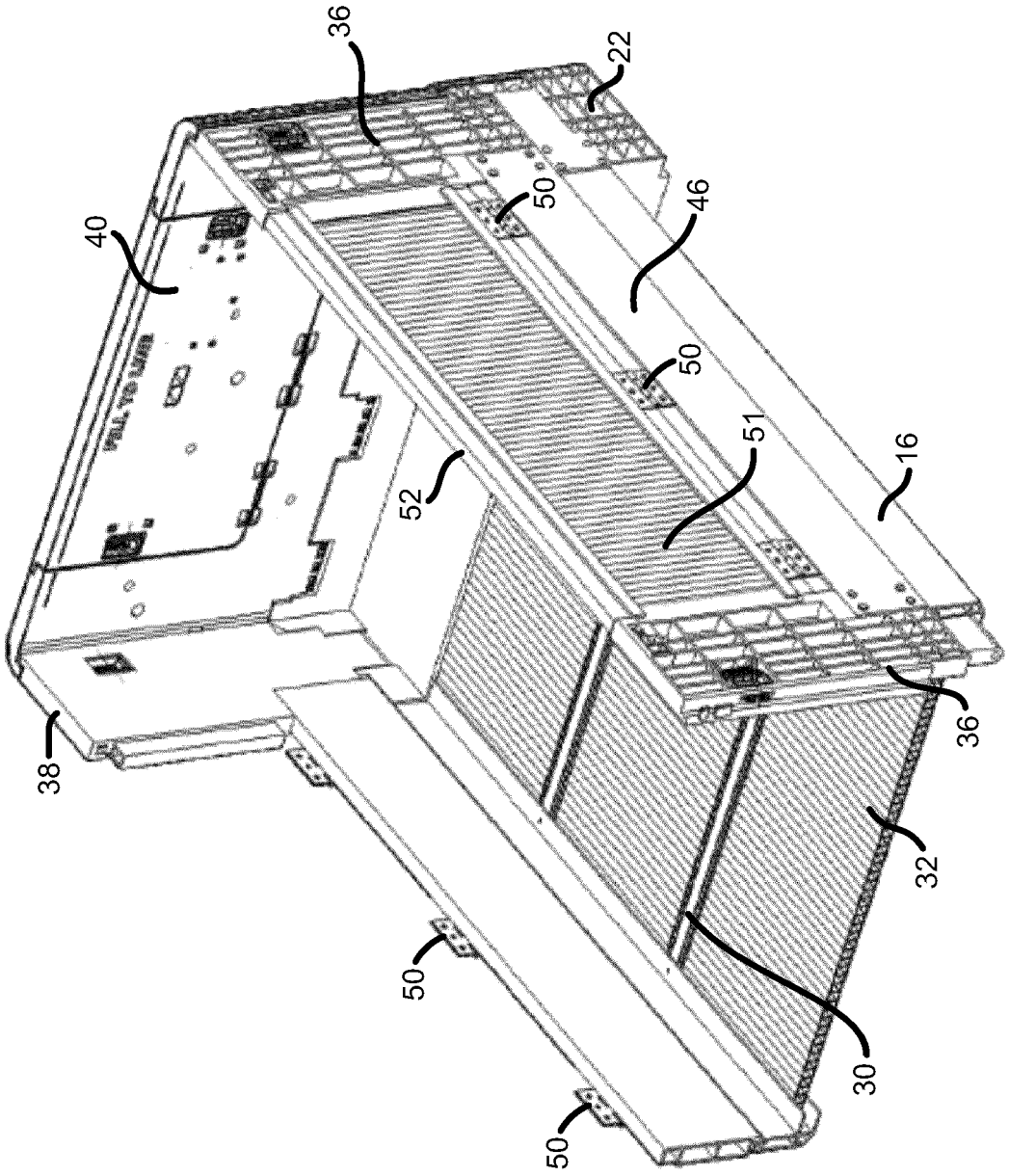

FIG. 14

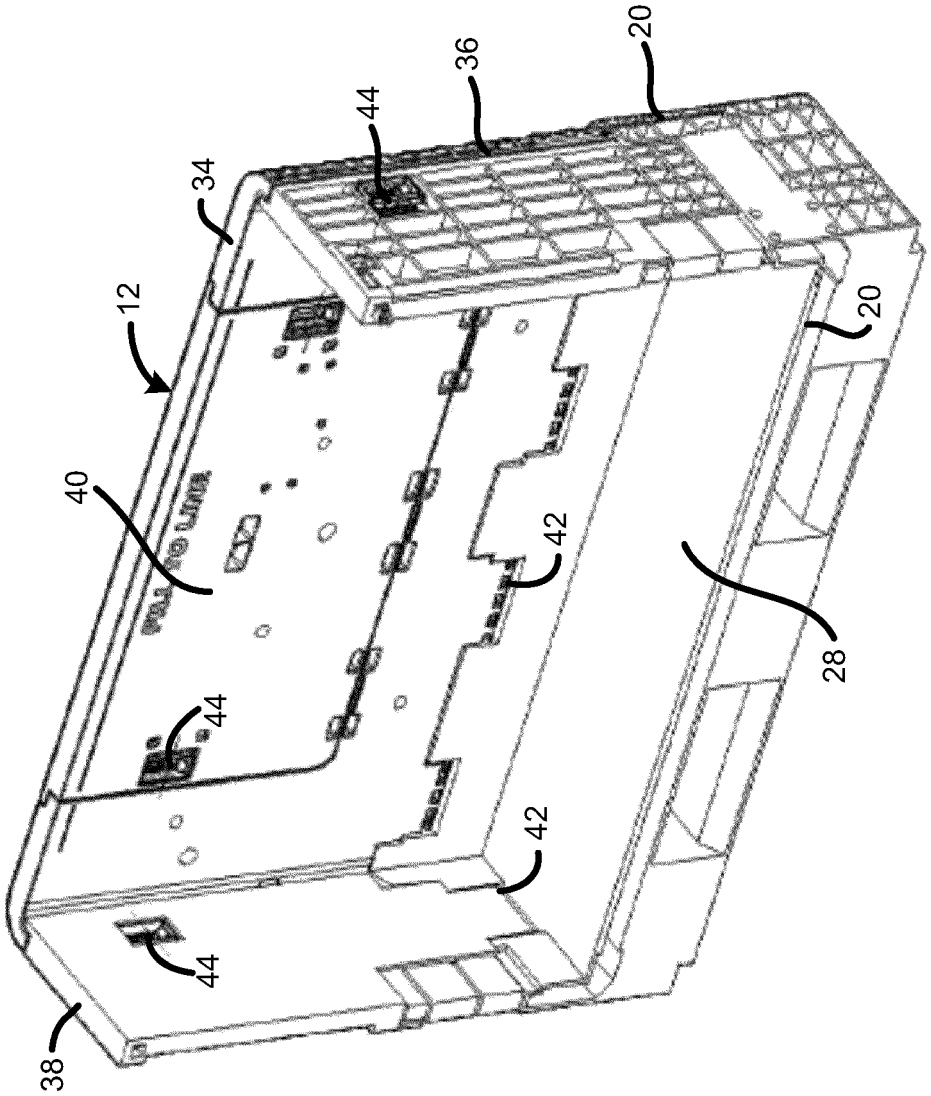

FIG. 15

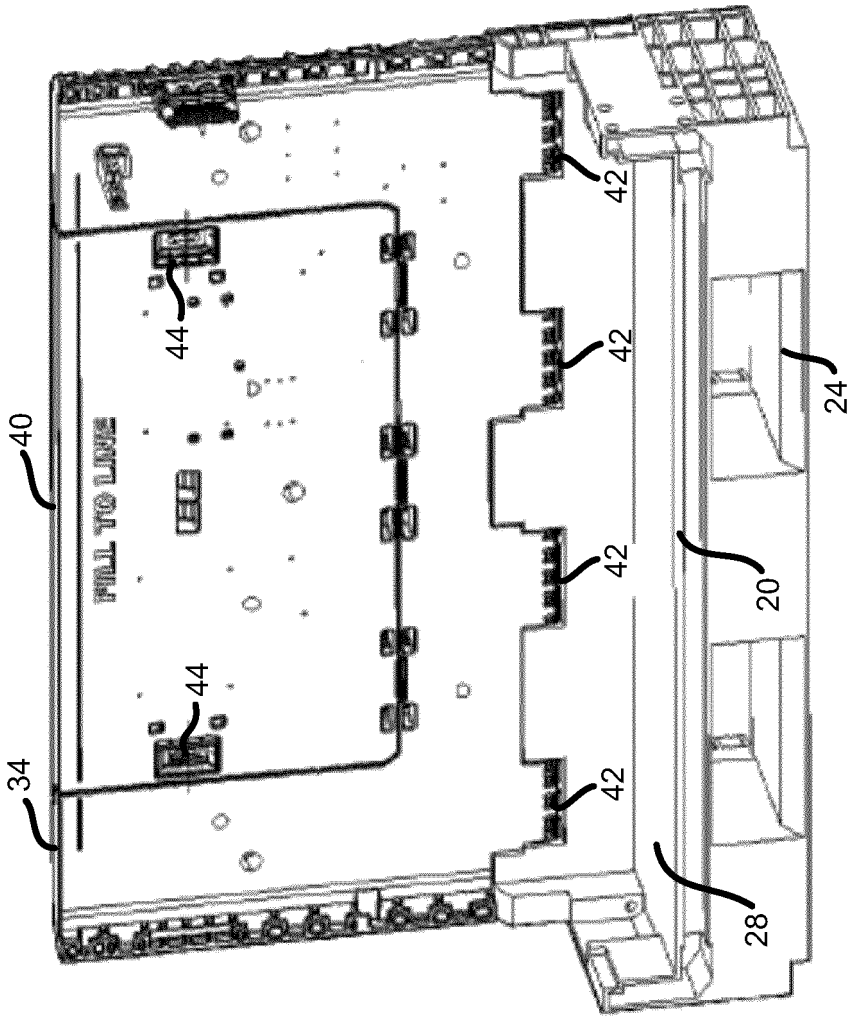

FIG. 16

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EUROPEAN SEARCH REPORT

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EP 21 19 6143

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Place of search	Date of completion of the search	Examiner
Munich	7 January 2022	Fitterer, Johann

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