



US 20230122425A1

(19) **United States**

(12) **Patent Application Publication**
CAMP et al.

(10) **Pub. No.: US 2023/0122425 A1**

(43) **Pub. Date: Apr. 20, 2023**

(54) **MODULAR STORAGE SYSTEM WITH STORAGE BOX CONNECTIVITY AND EXTERNAL BOX FEATURES AND ACCESSORIES**

63/355,461, filed on Jun. 24, 2022, provisional application No. 63/280,896, filed on Nov. 18, 2021, provisional application No. 63/256,490, filed on Oct. 15, 2021.

(71) Applicant: **Makita U.S.A., Inc.**, La Mirada, CA (US)

(72) Inventors: **Andrew CAMP**, La Mirada, CA (US); **Marc TAPPEINER**, Santa Barbara, CA (US); **Jeremy ALLAN**, Santa Barbara, CA (US); **Ethan W. FRANKLIN**, Santa Barbara, CA (US); **Cameron PUTNAM**, Santa Barbara, CA (US); **John GRANT**, Middletown, OH (US); **Amin DAHREHSOBH**, Santa Barbara, CA (US); **Kenneth HEFLEY**, La Mirada, CA (US); **Keisuke KATO**, La Mirada, CA (US); **Brent WITHEY**, La Mirada, CA (US); **Austin DONOGHUE**, La Mirada, CA (US); **Nathan SANTOS**, La Mirada, CA (US)

(73) Assignee: **Makita U.S.A., Inc.**, La Mirada, CA (US)

(21) Appl. No.: **17/966,496**

(22) Filed: **Oct. 14, 2022**

Related U.S. Application Data

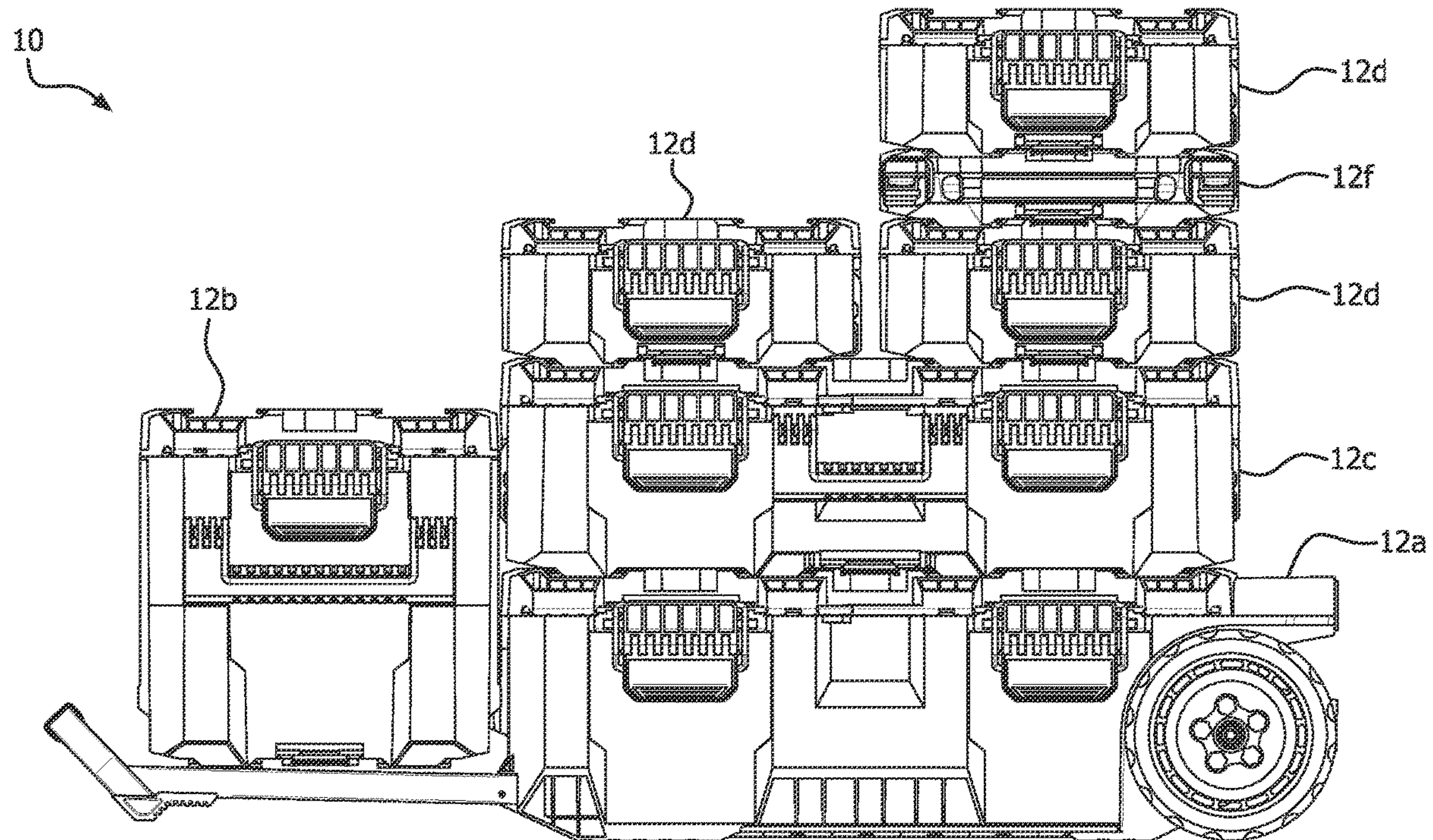
(60) Provisional application No. 63/356,031, filed on Jun. 27, 2022, provisional application No. 63/355,498, filed on Jun. 24, 2022, provisional application No.

Publication Classification

(51) **Int. Cl.**
B65D 21/02 (2006.01)
B25H 3/02 (2006.01)
(52) **U.S. Cl.**
CPC **B65D 21/0213** (2013.01); **B65D 21/023** (2013.01); **B25H 3/021** (2013.01); **B65D 2543/00027** (2013.01)

(57) **ABSTRACT**

A modular storage system of connectable, heavy-duty storage boxes, crates, rolling carts and/or dollies, work surfaces, organizers, trays, accessories is provided for internal and external item storage and organization and convenient access for use and transport, that is expandable, customizable and readily adaptable. Storage boxes have different sizes by length, width and/or height and have universal box-to-box connection system for stacking and connection to mounting accessories. Boxes have removable, customizable organization inserts (e.g., dividers, storage trays, bins, alignment trays for bins, and bins of different sizes). Box lid rib grid with bosses and undercuts expands internal organization, including cooperation with dual purpose dividers and accessories. Boxes have external mounting accessories to expand external organization. Different housing modes are provided including wall mount systems for wall or side of a truck or van, and different transport modes are provided (e.g., base box with wheels, or on a dolly or a cart).



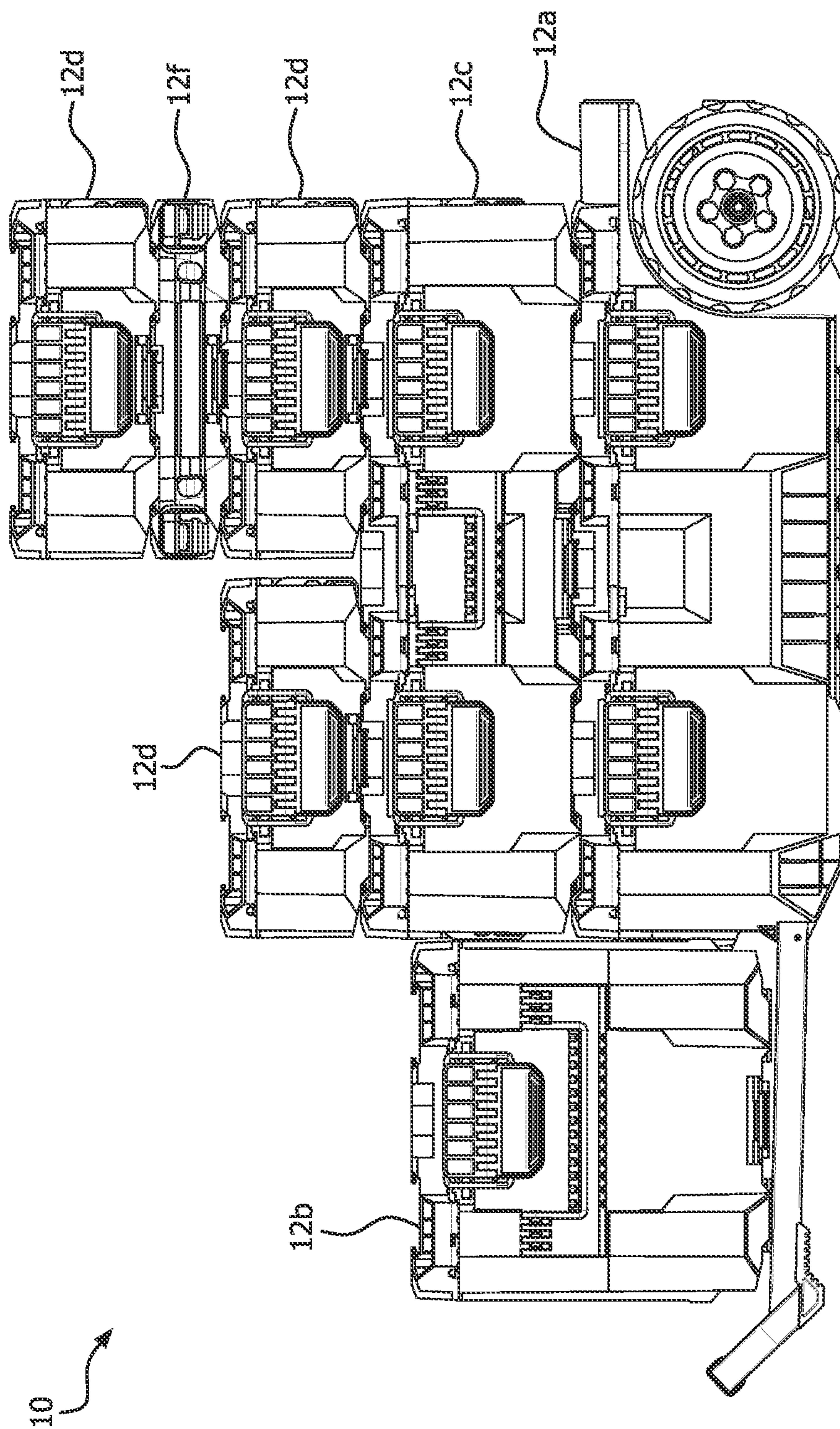


FIG. 1A

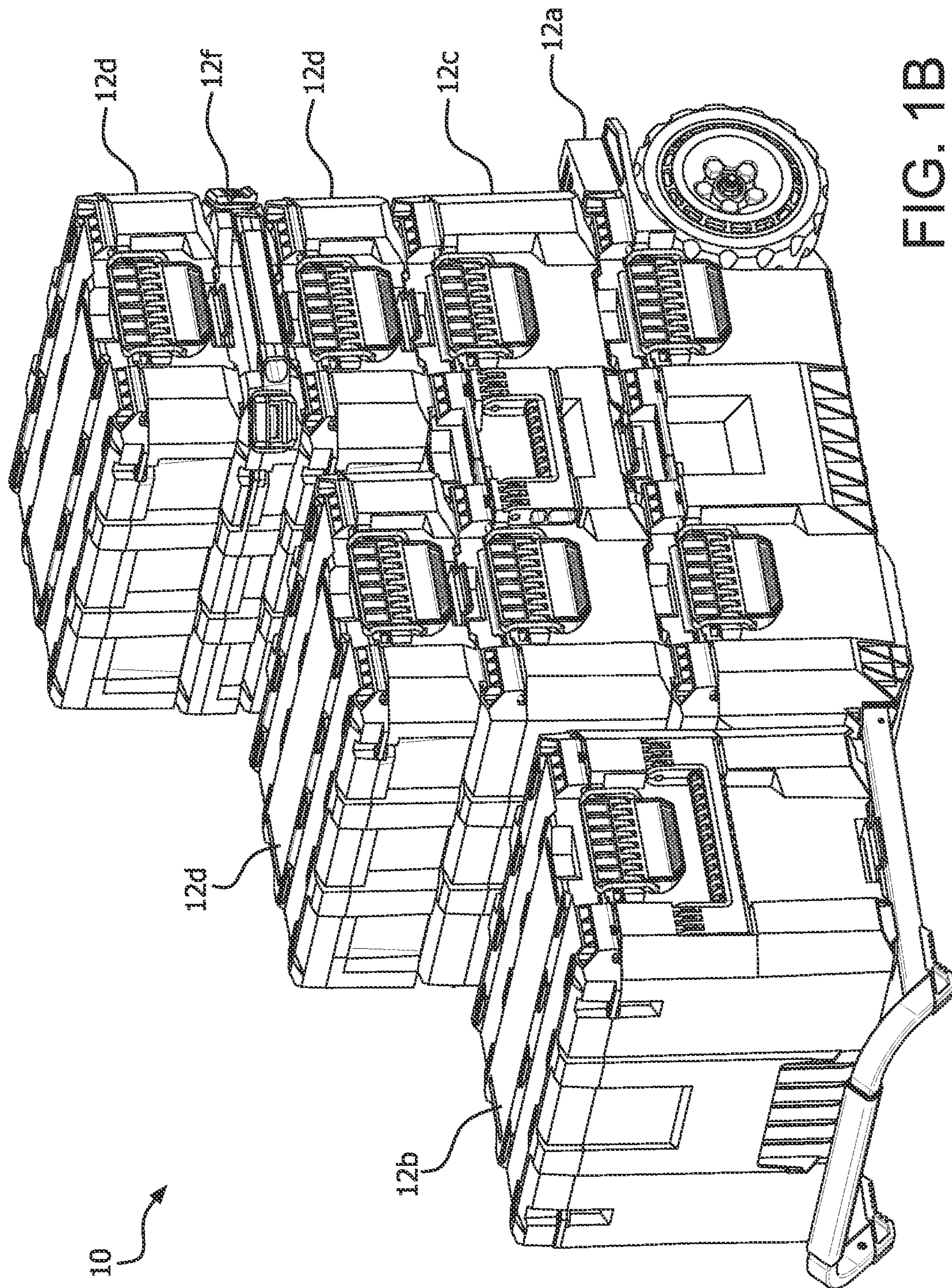


FIG. 1B

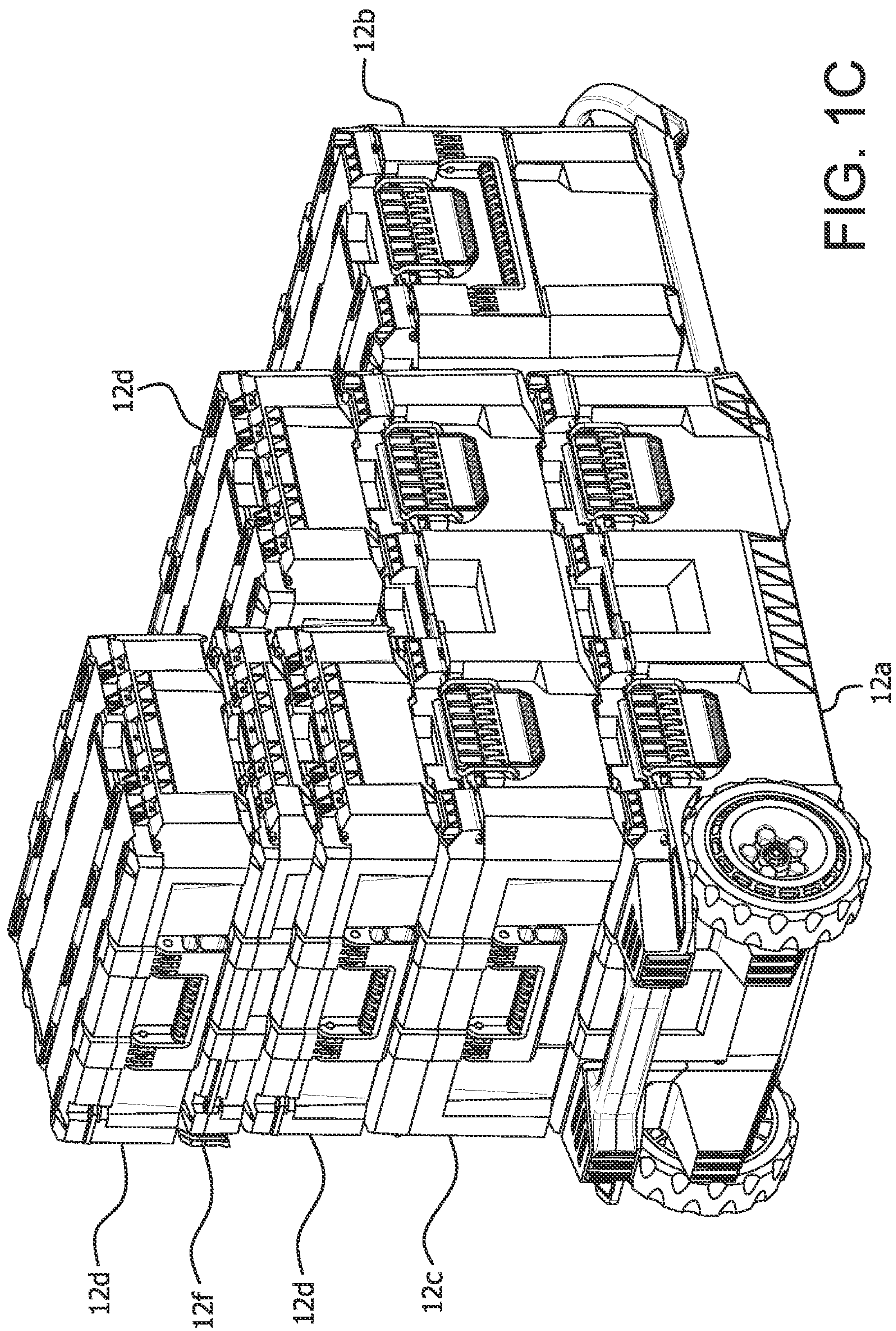
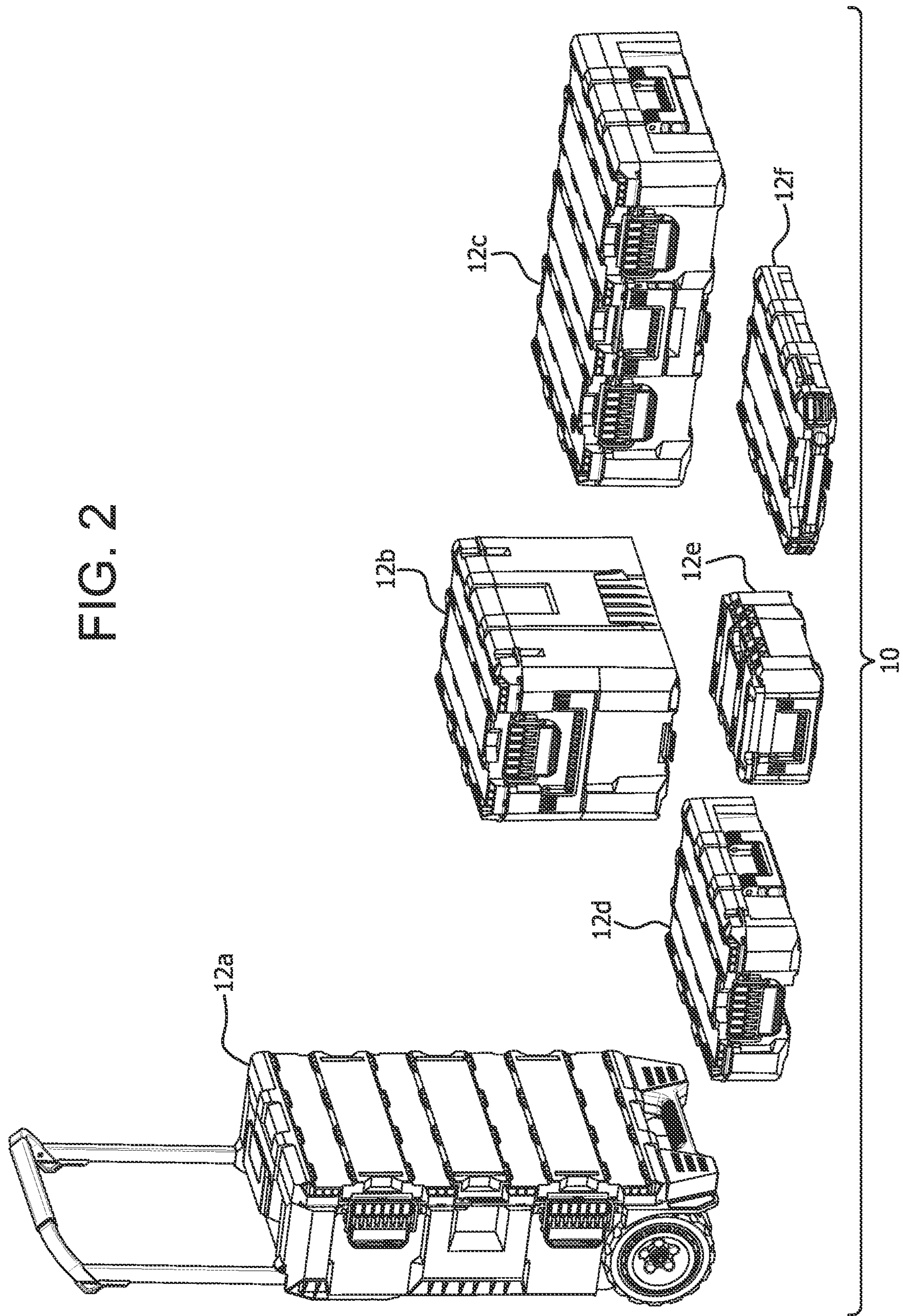


FIG. 1C



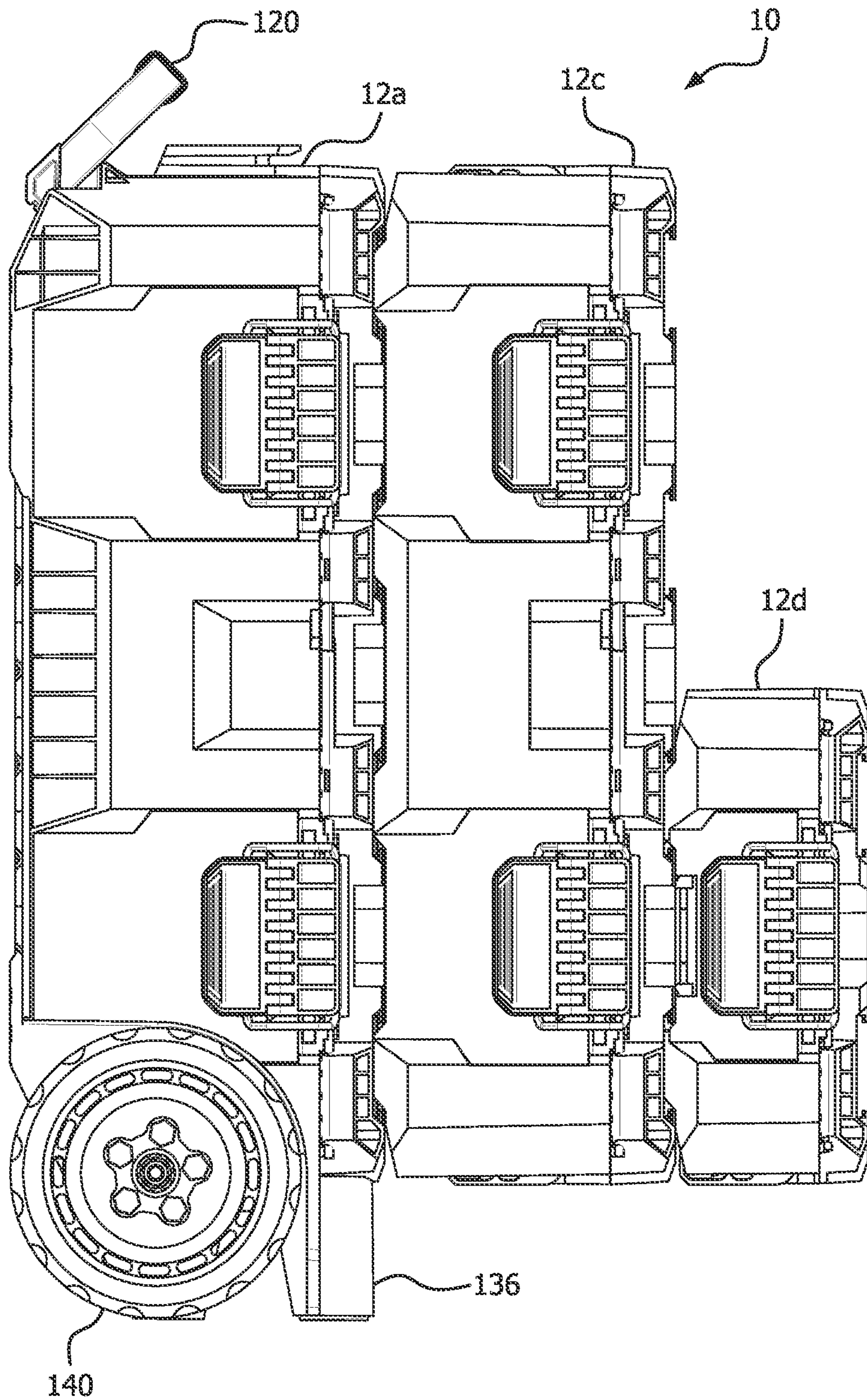
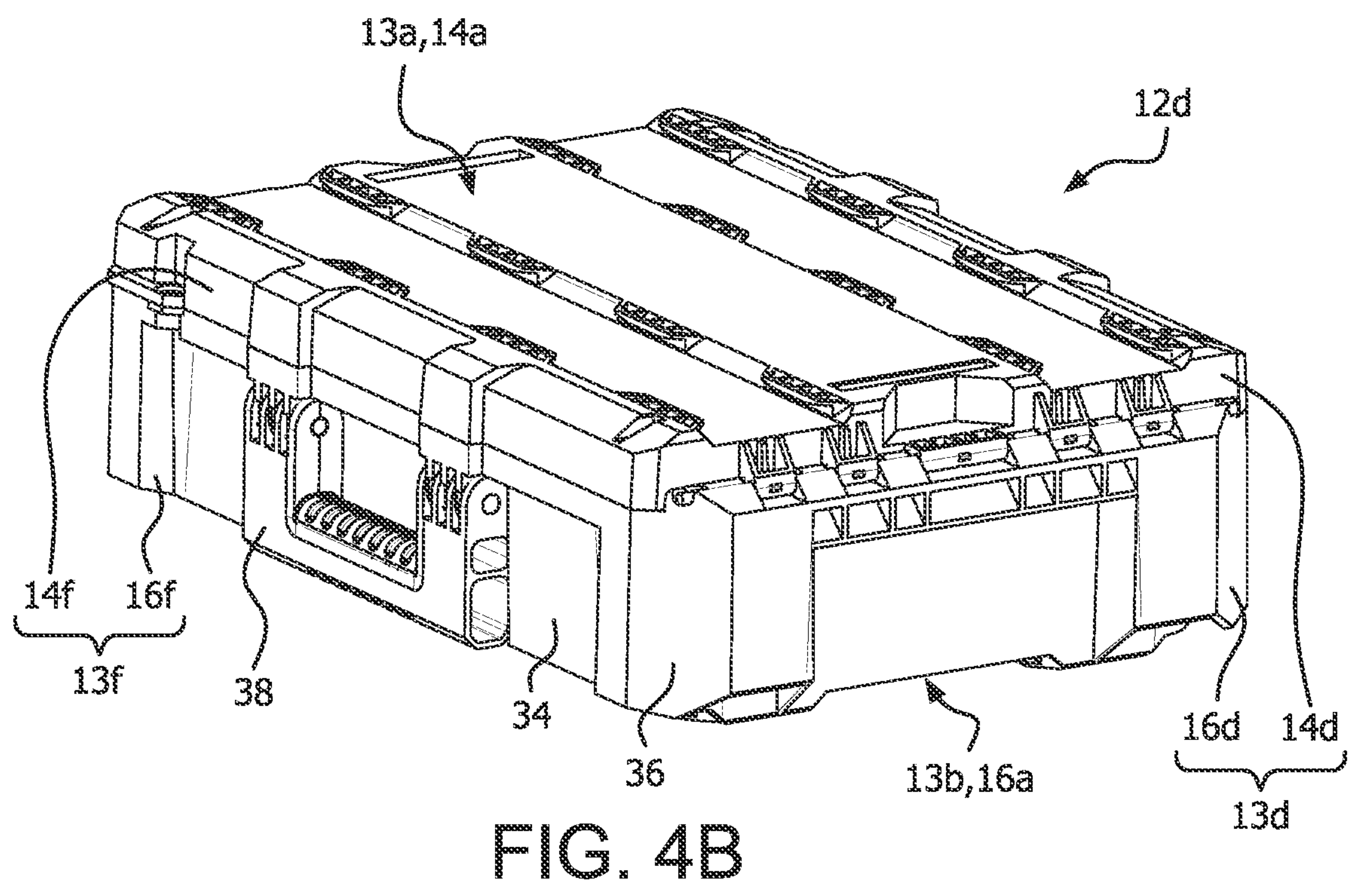
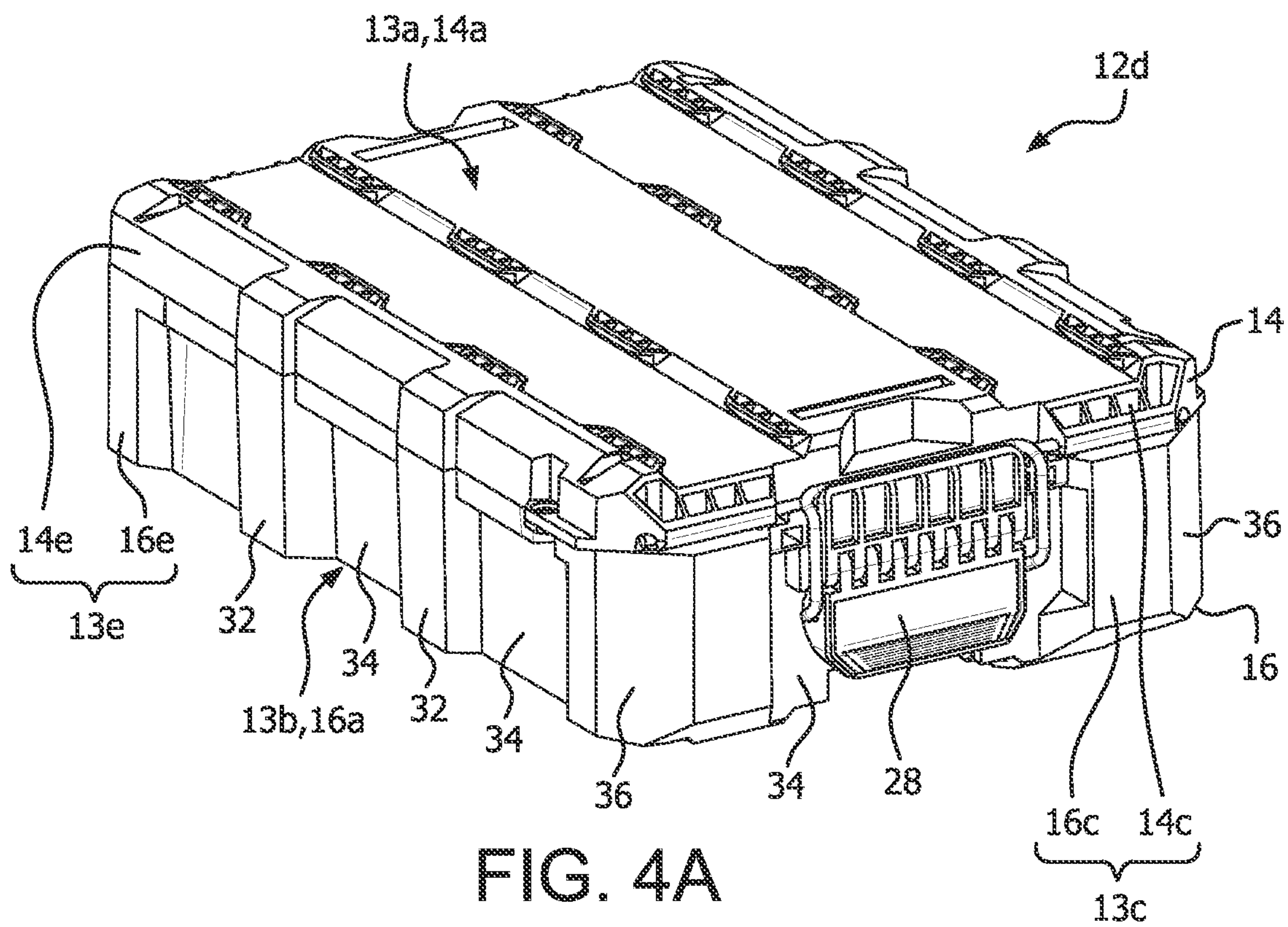


FIG. 3



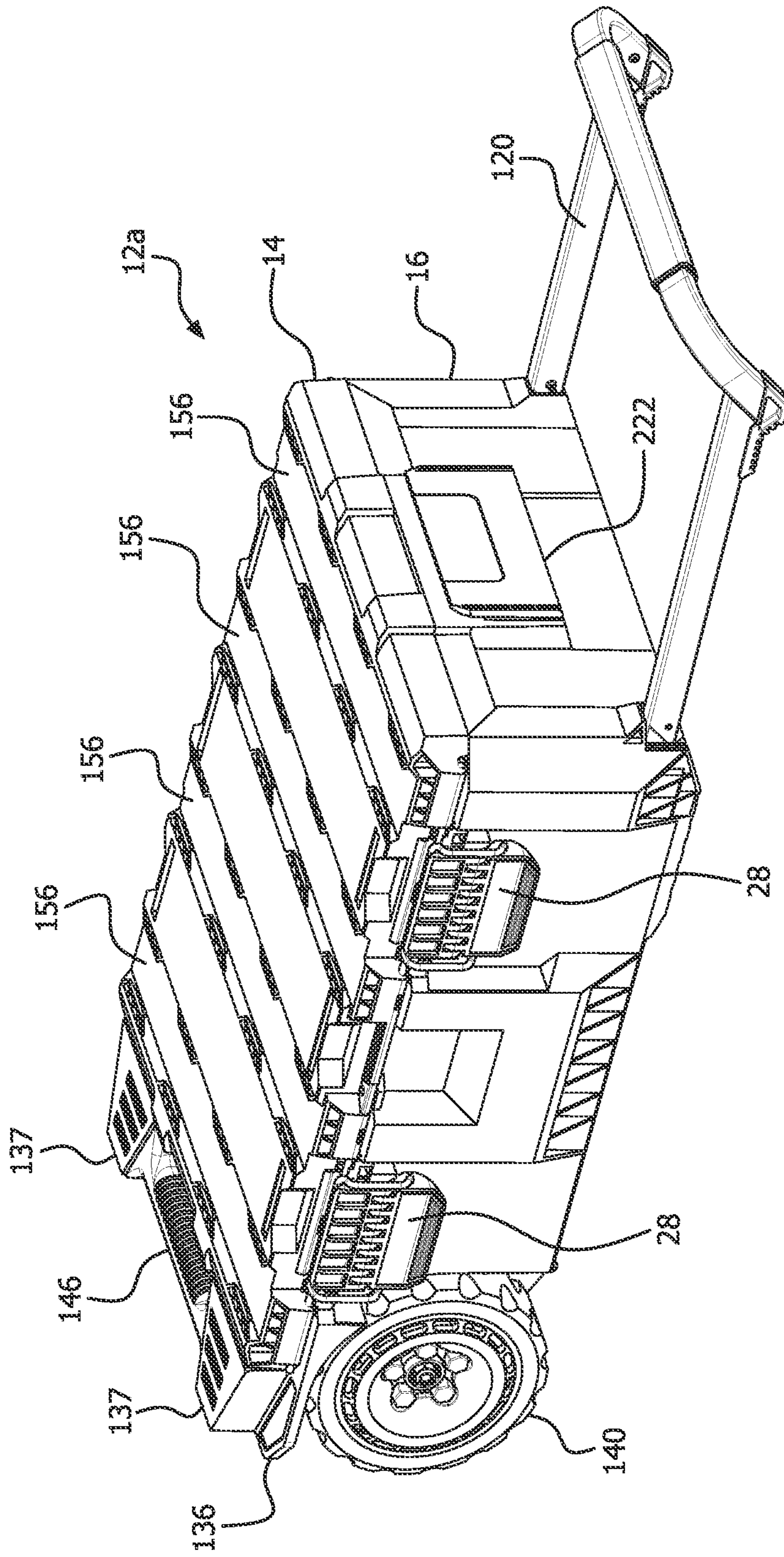


FIG. 5A

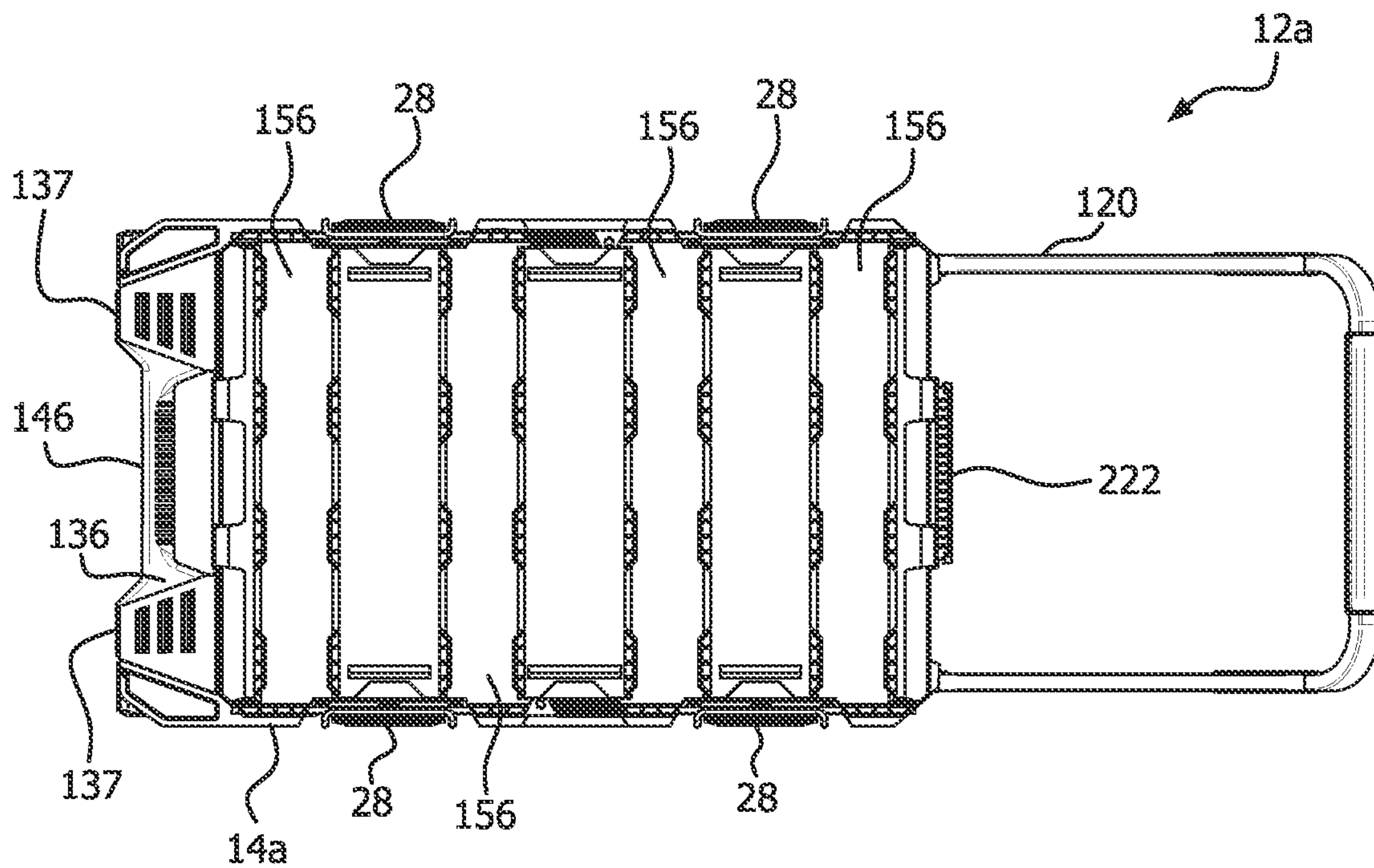


FIG. 5B

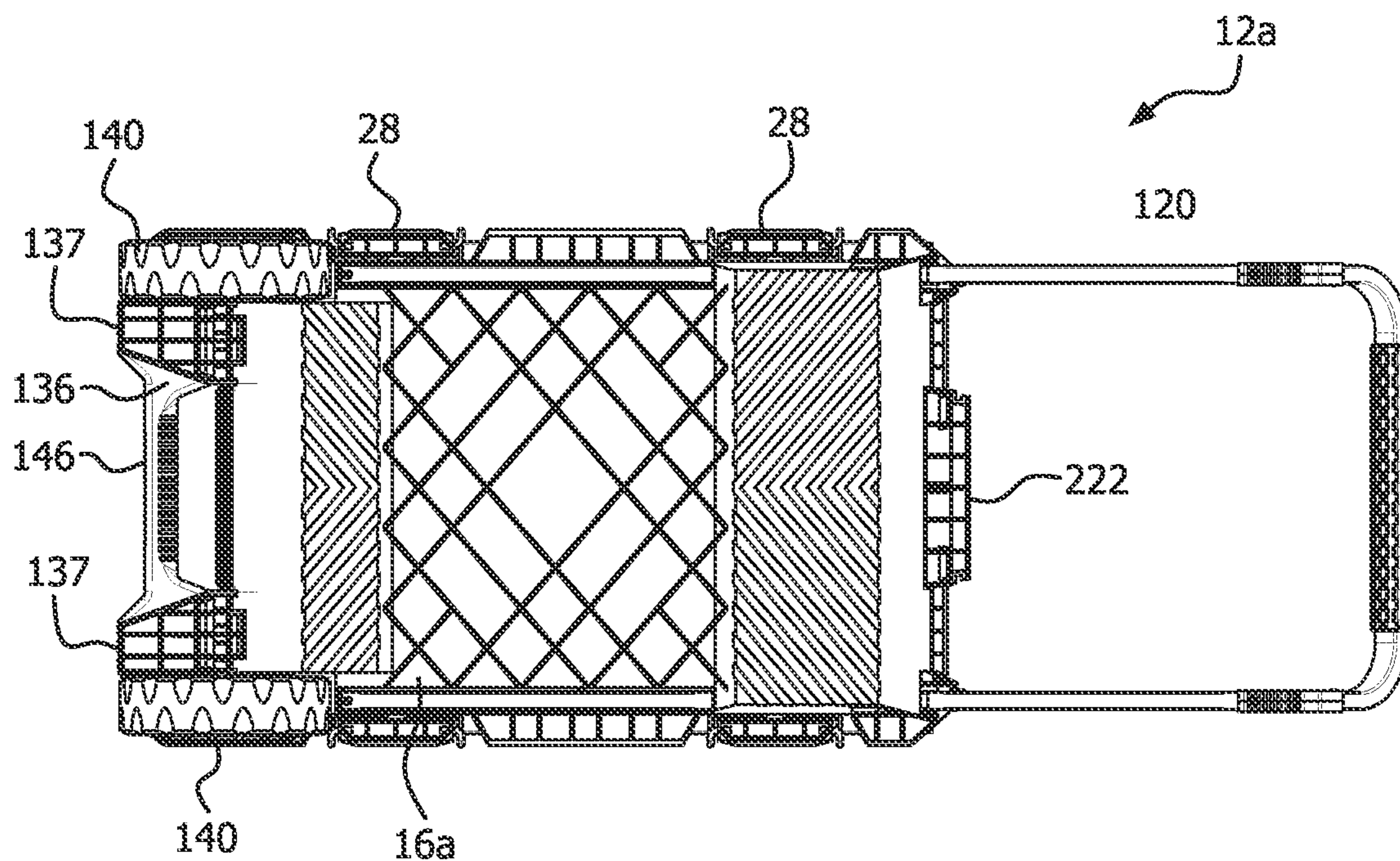


FIG. 5C

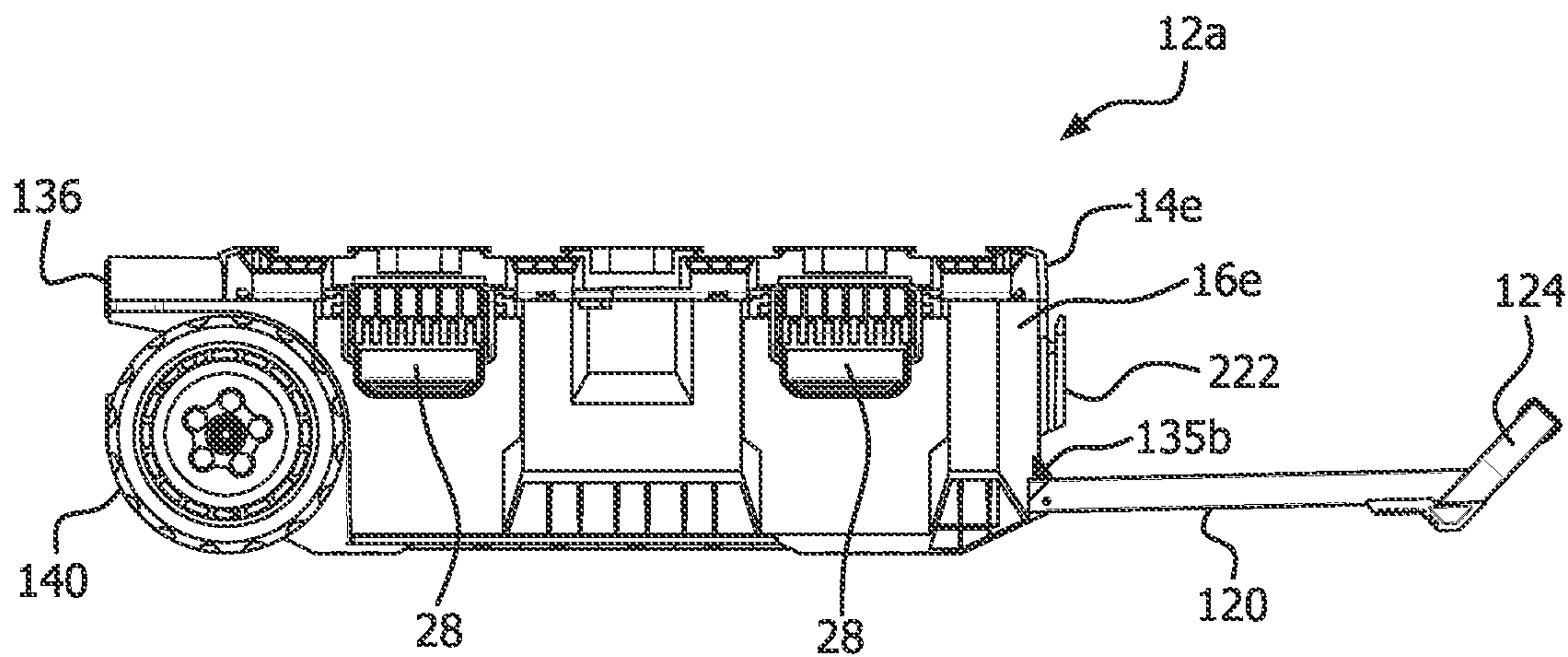


FIG. 5D

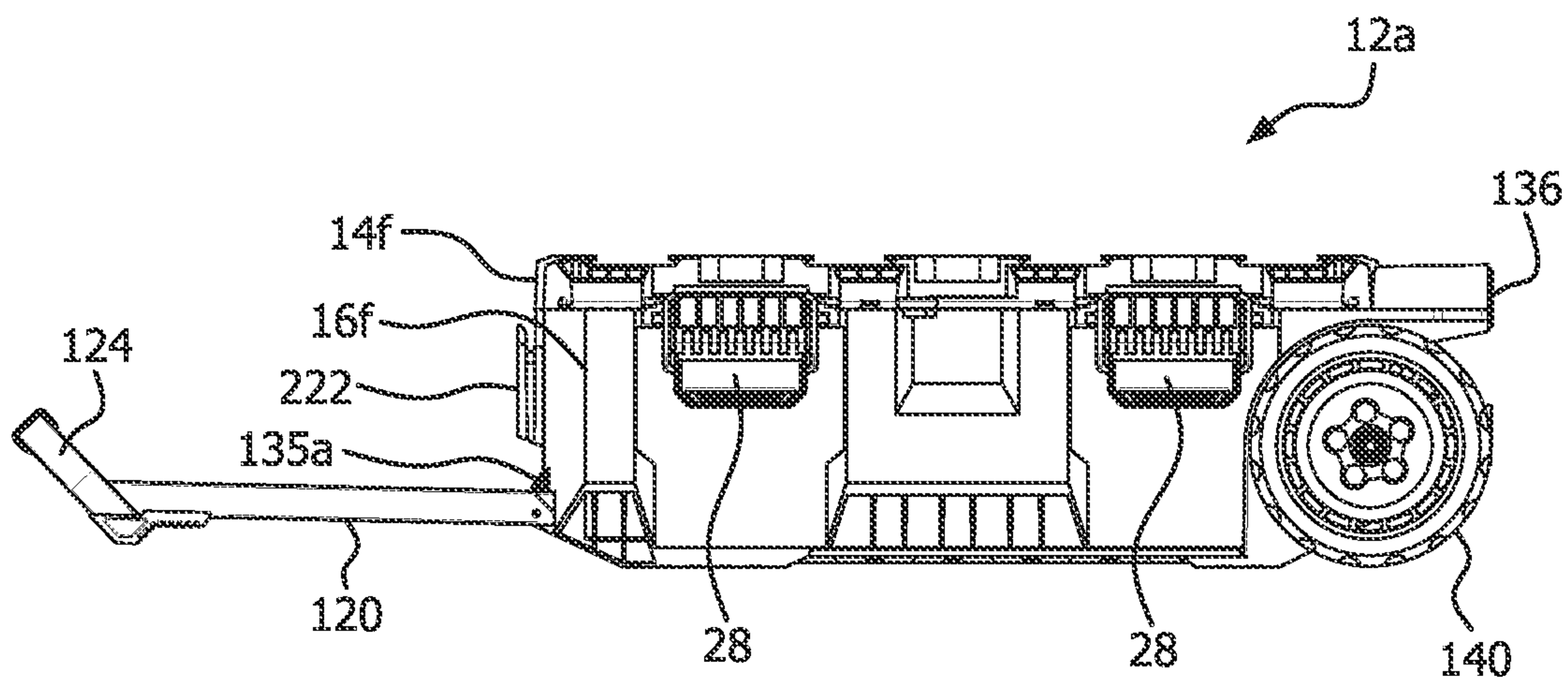


FIG. 5E

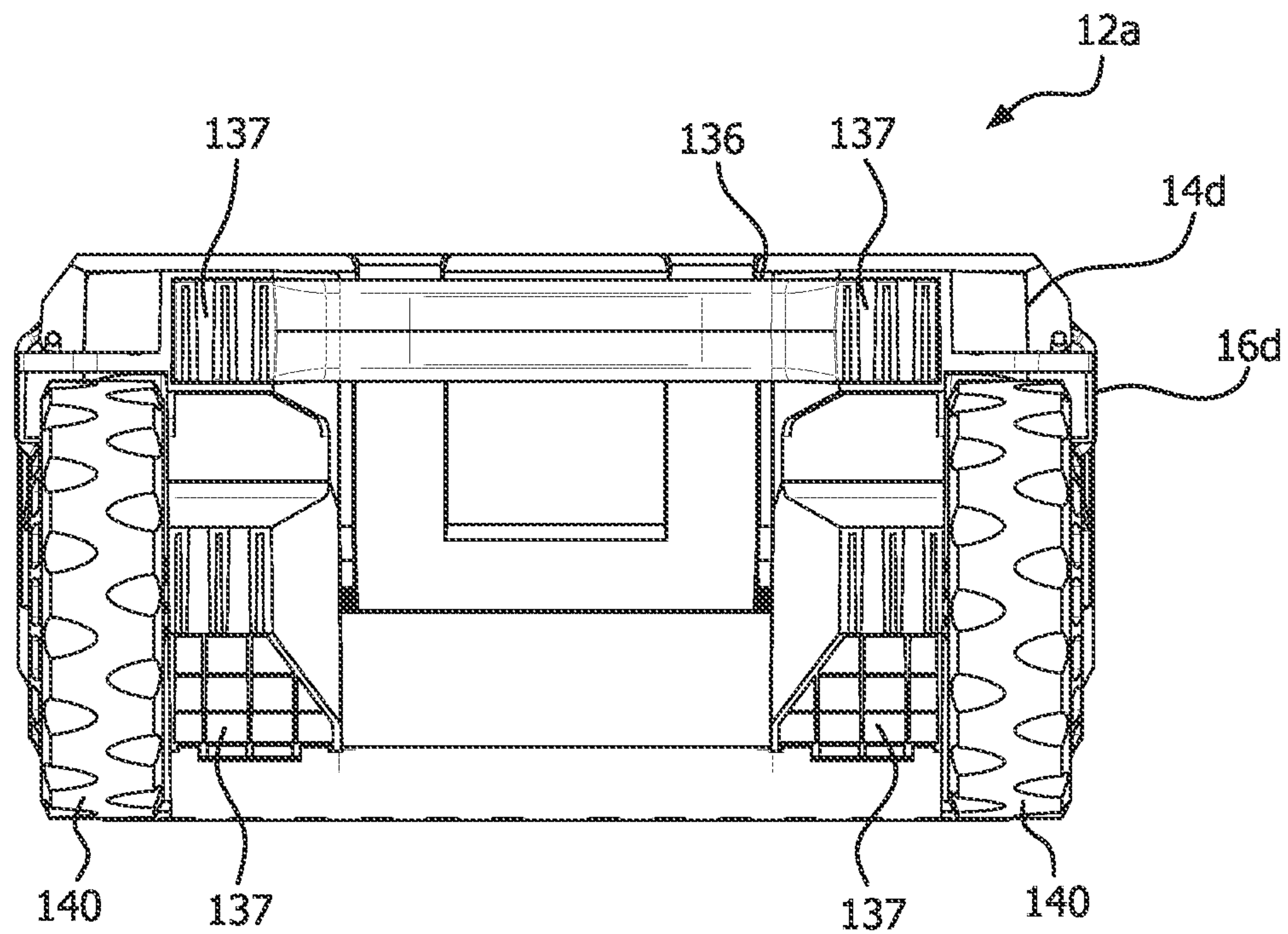


FIG. 5F

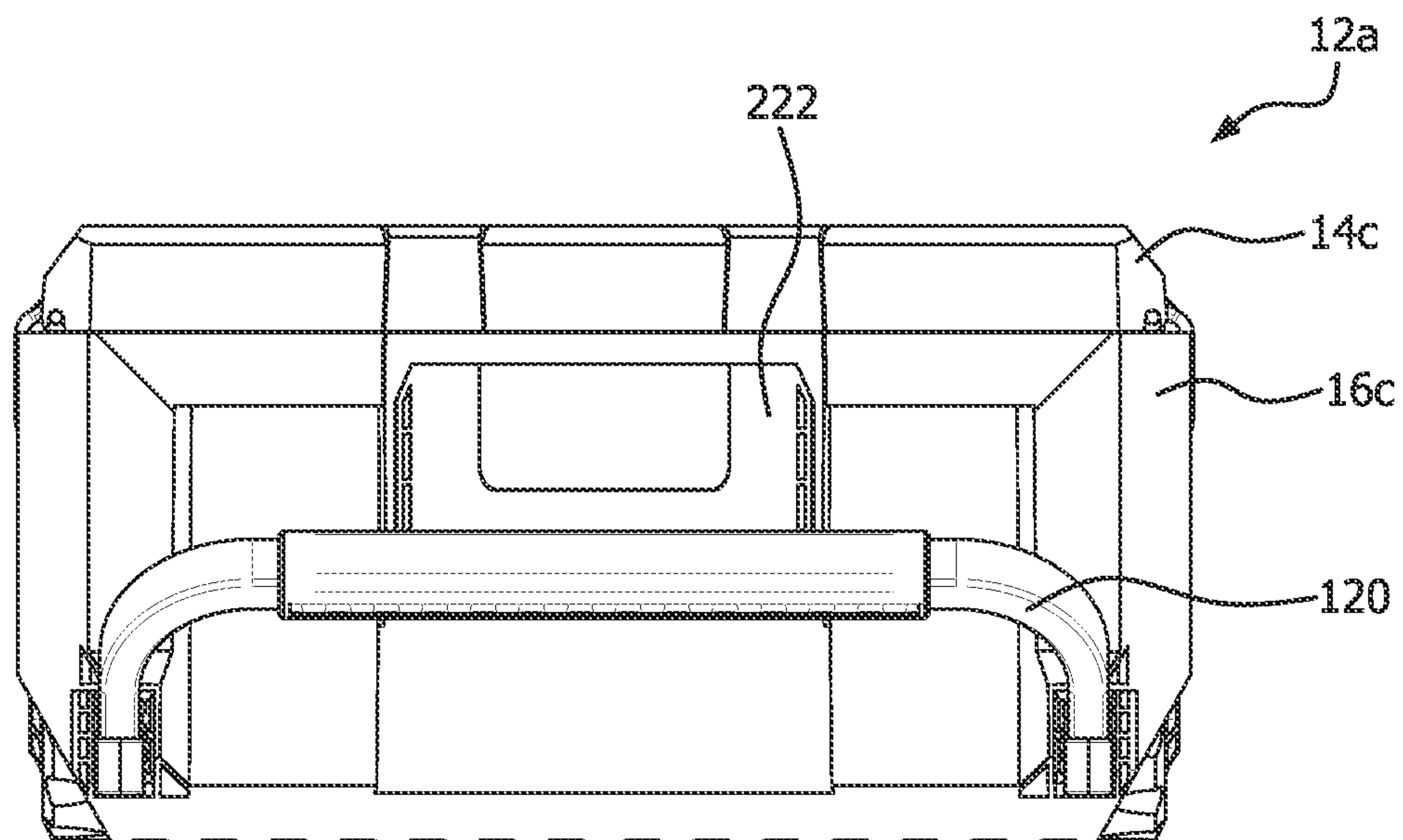


FIG. 5G

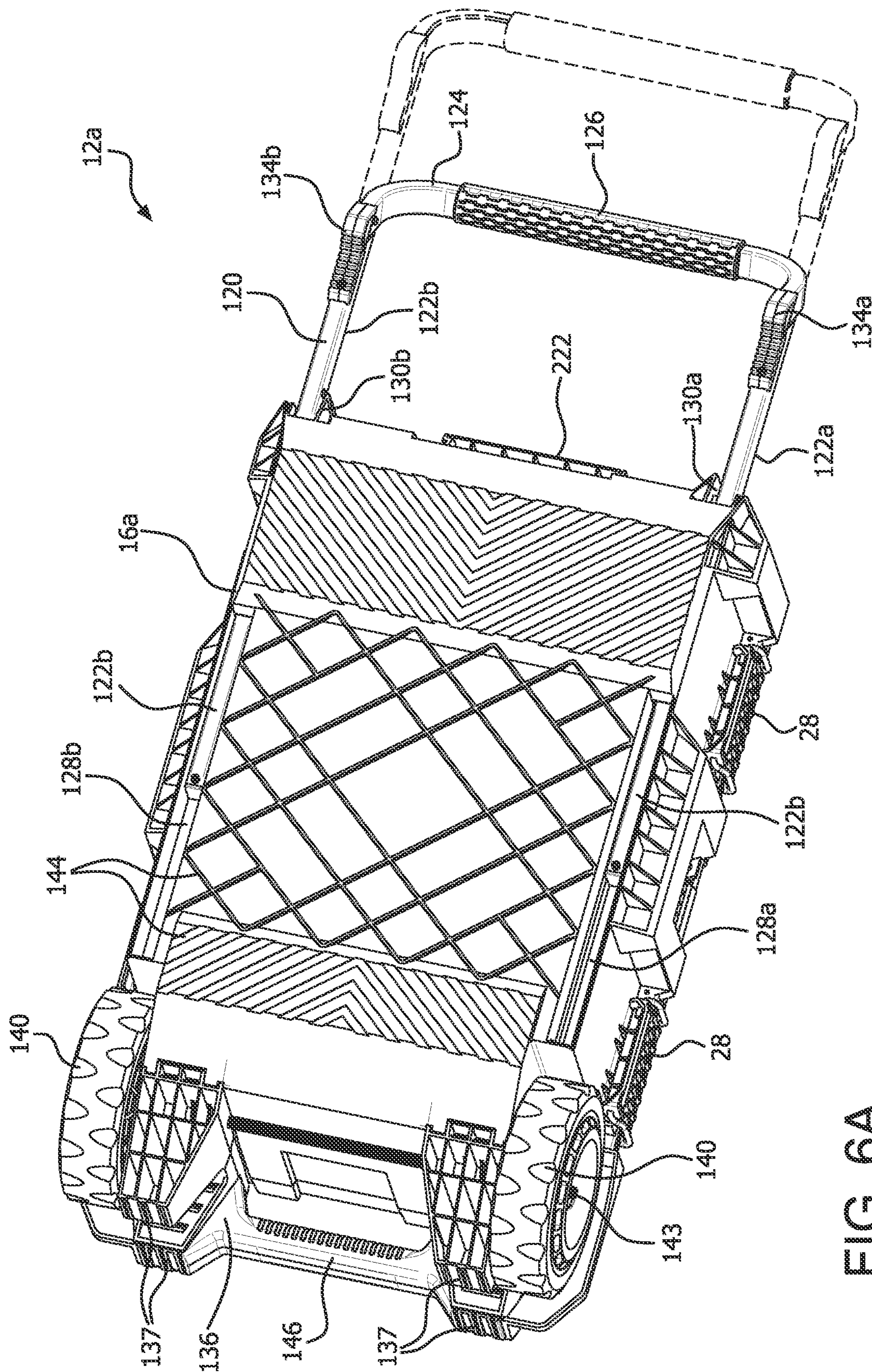


FIG. 6A

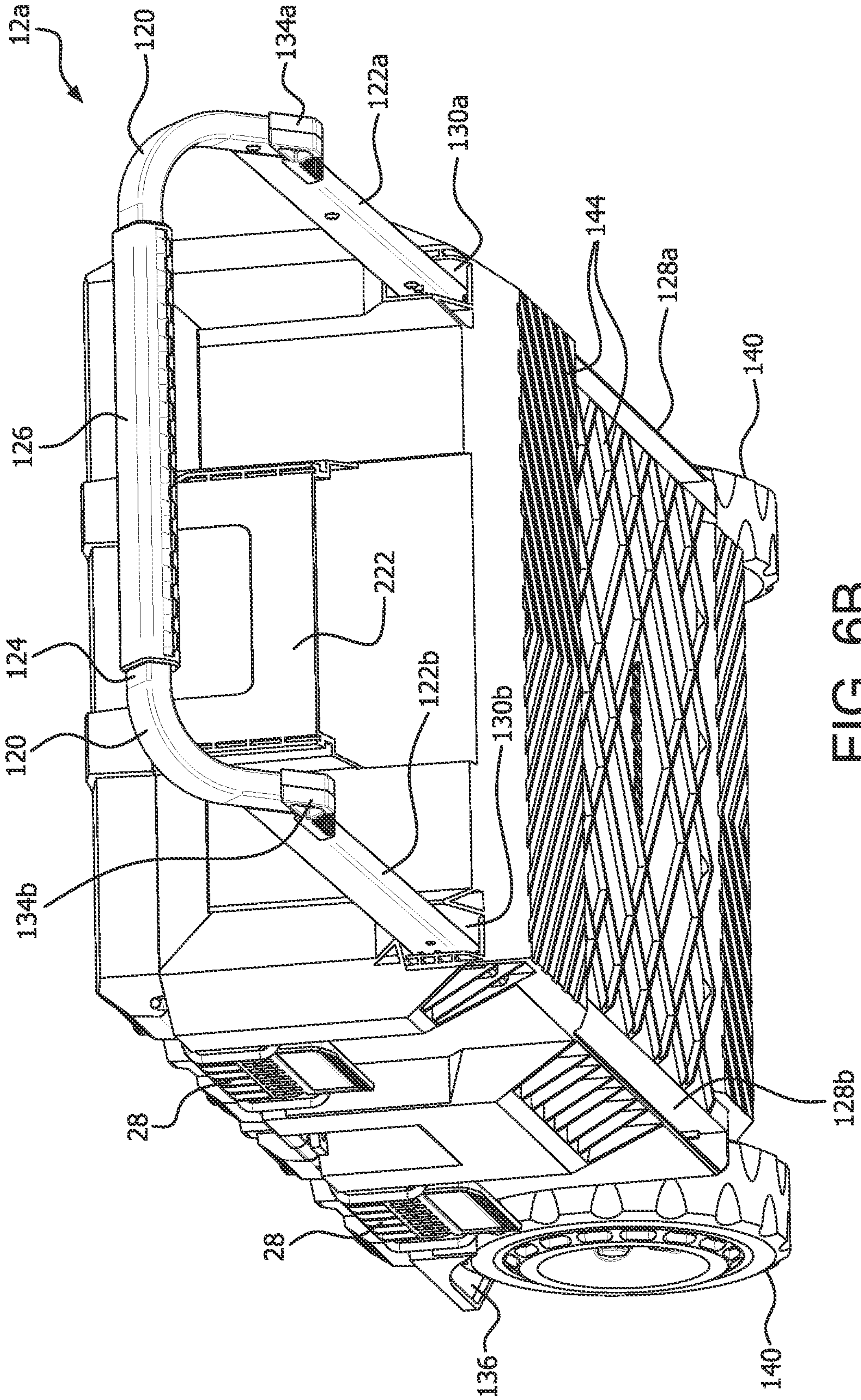


FIG. 6B

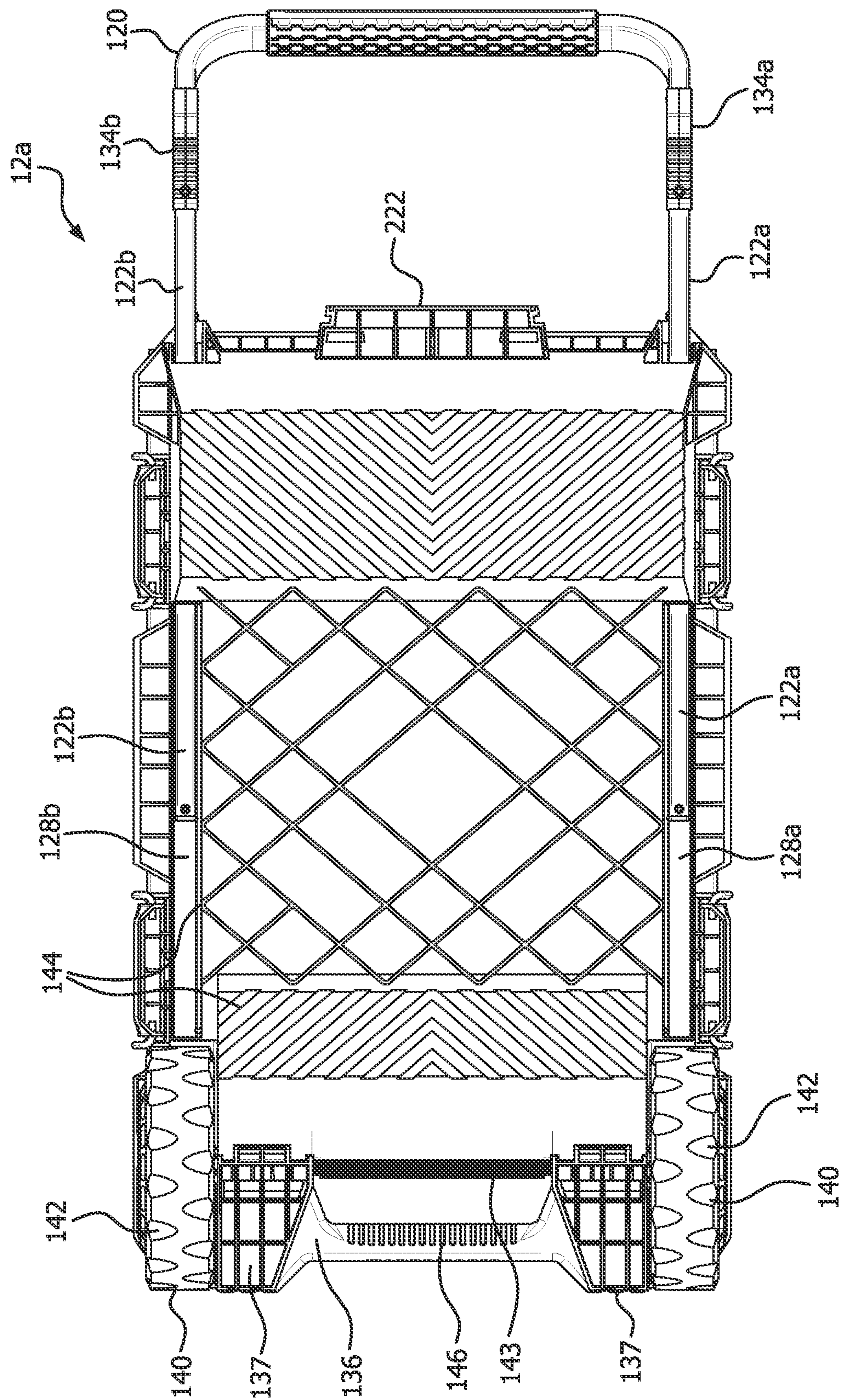


FIG. 6C

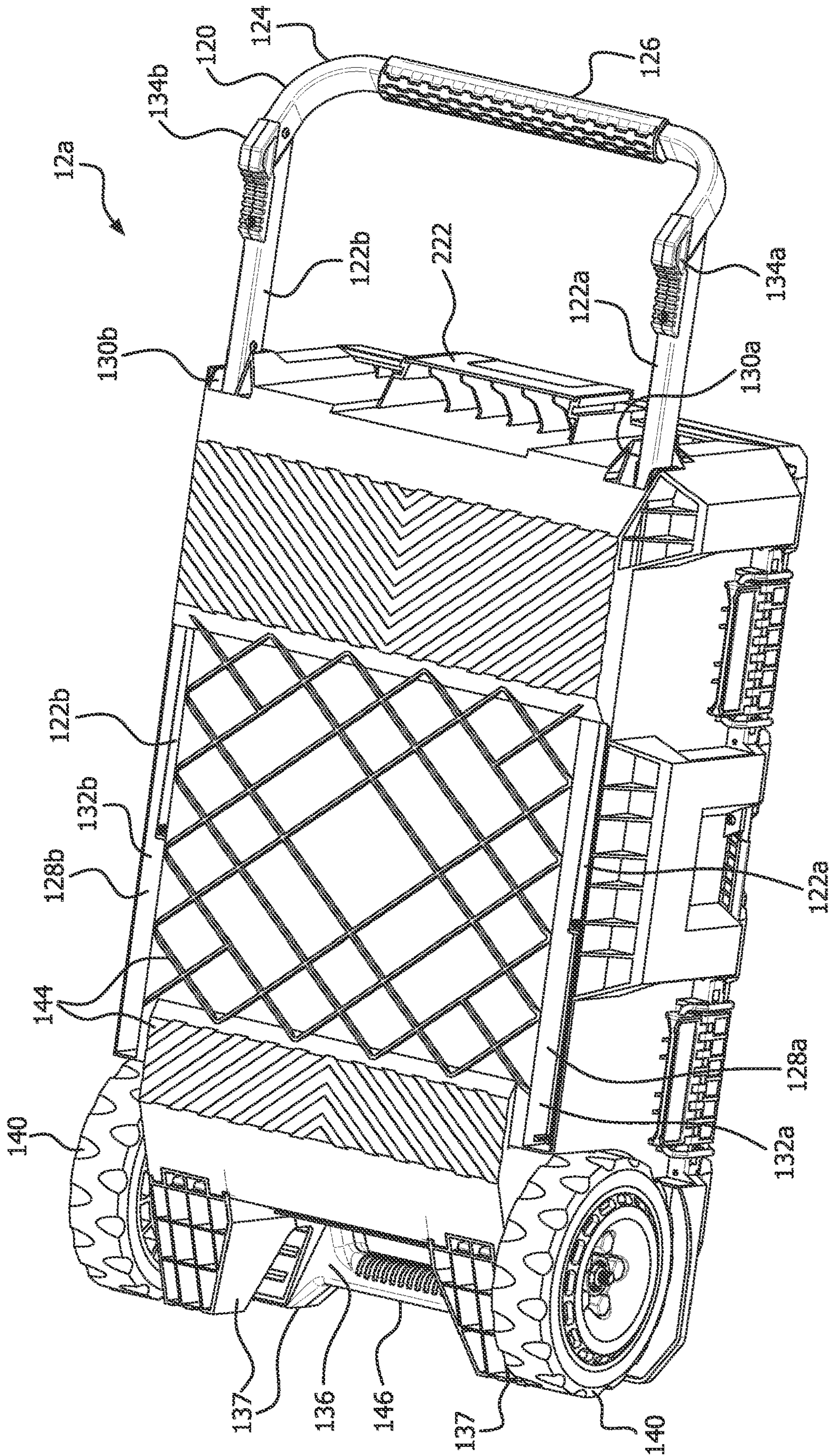


FIG. 6D

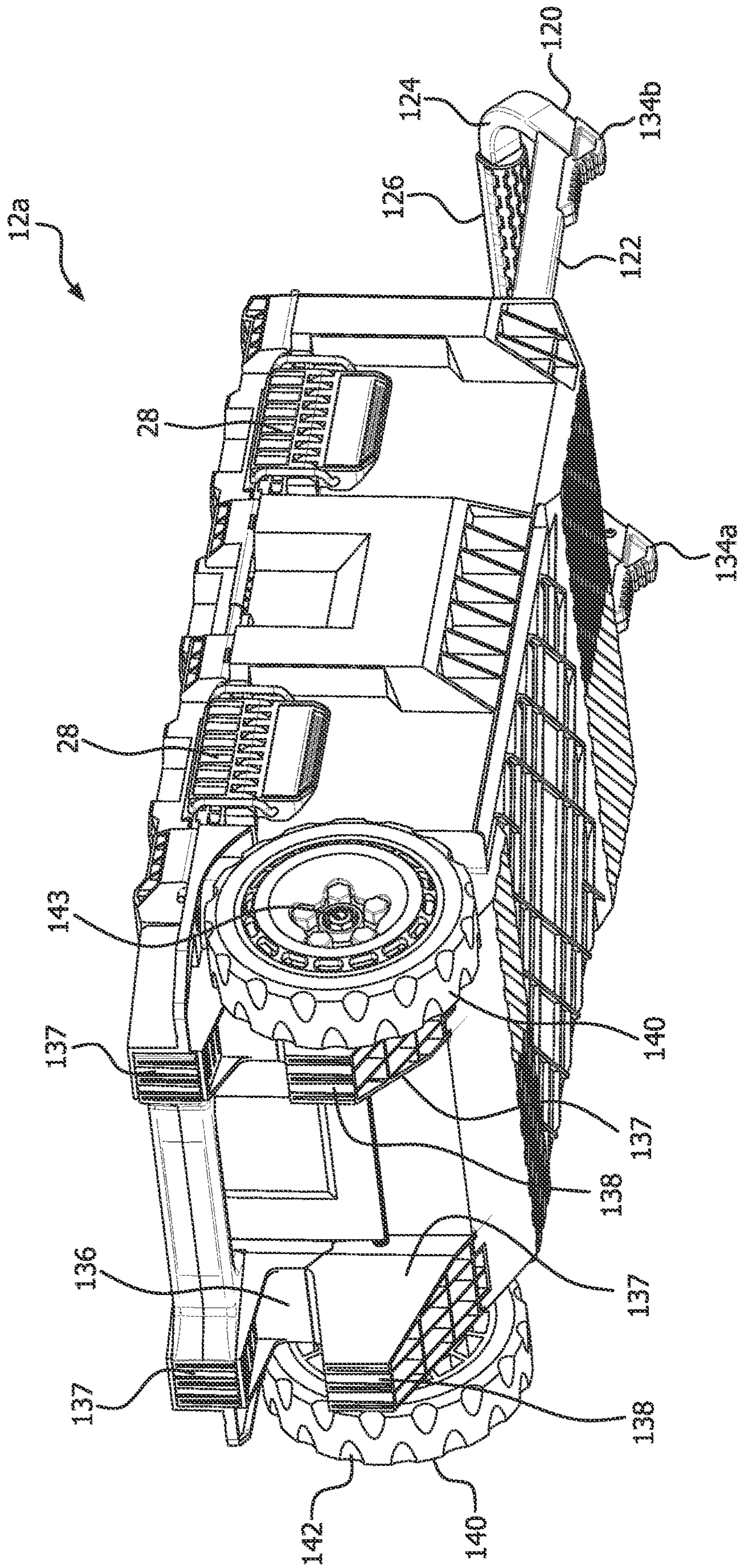


FIG. 6E

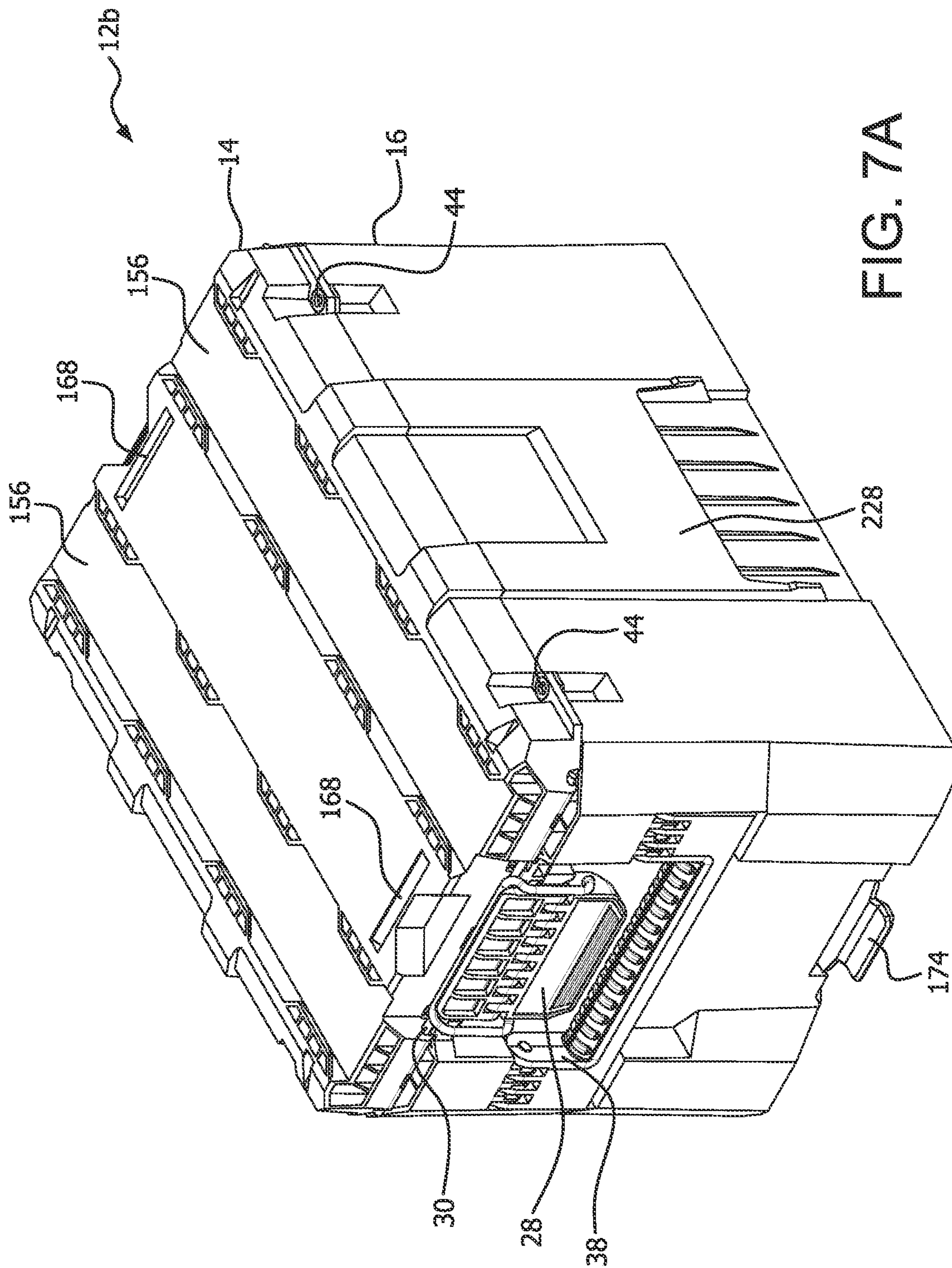


FIG. 7A

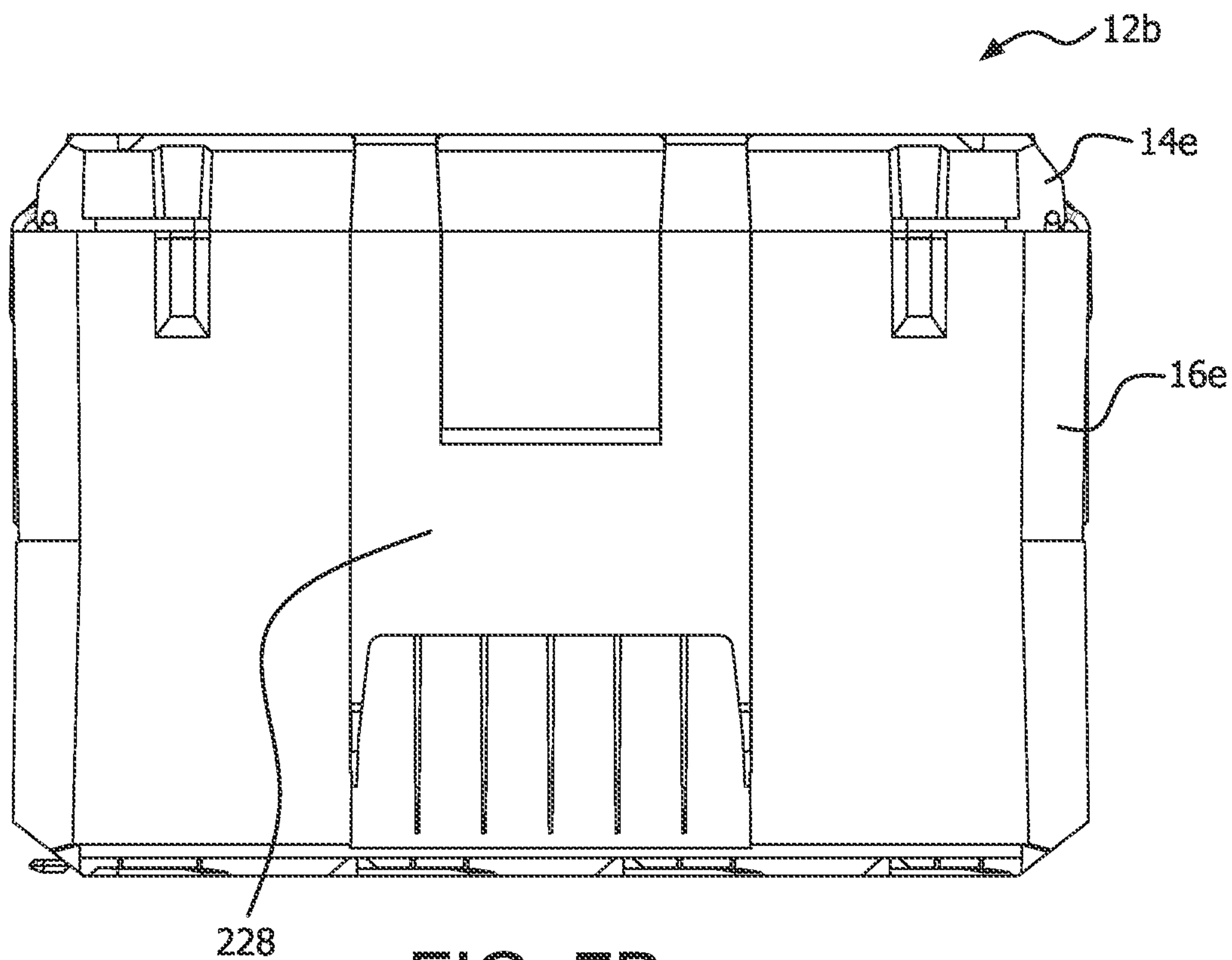


FIG. 7B

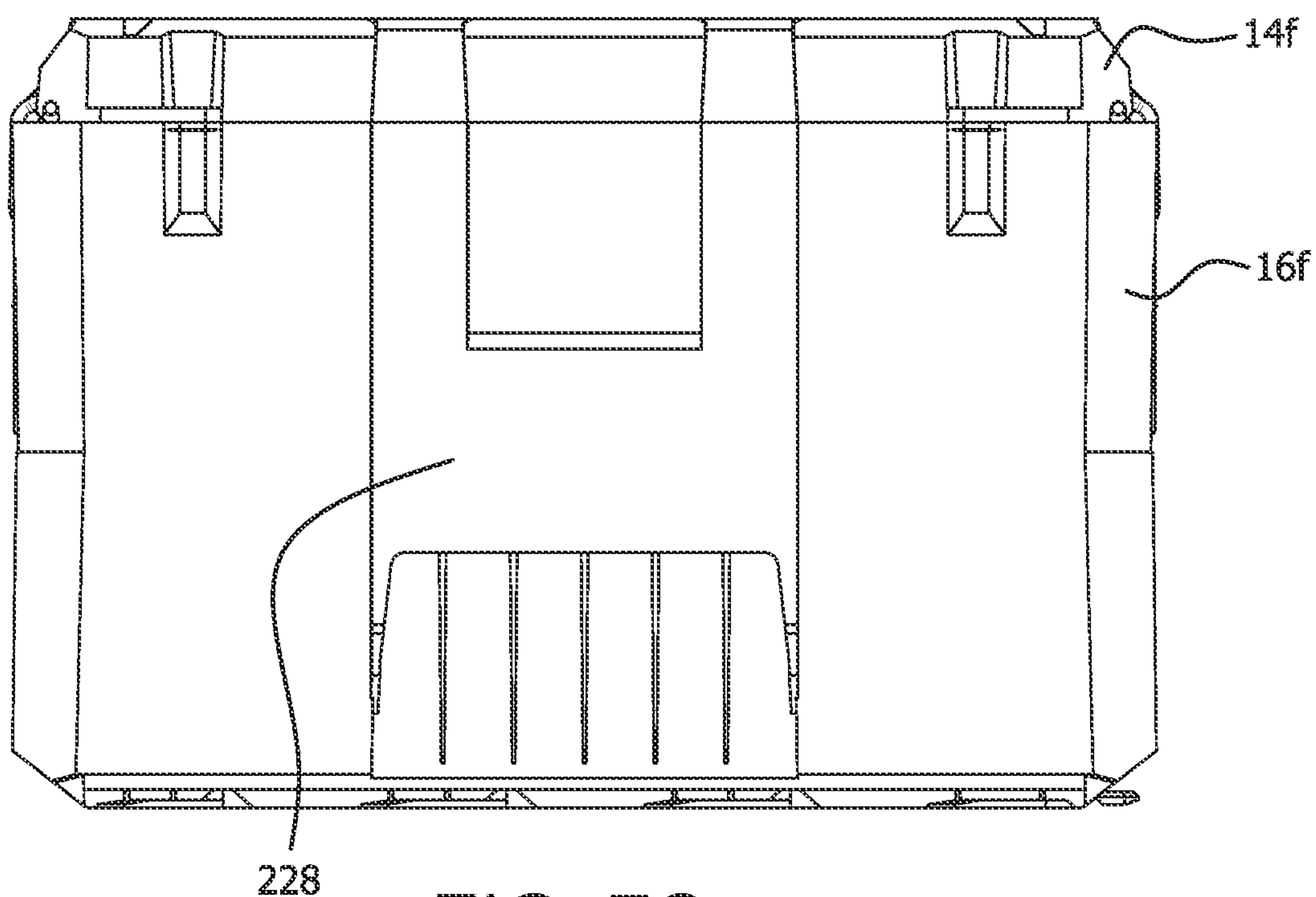


FIG. 7C

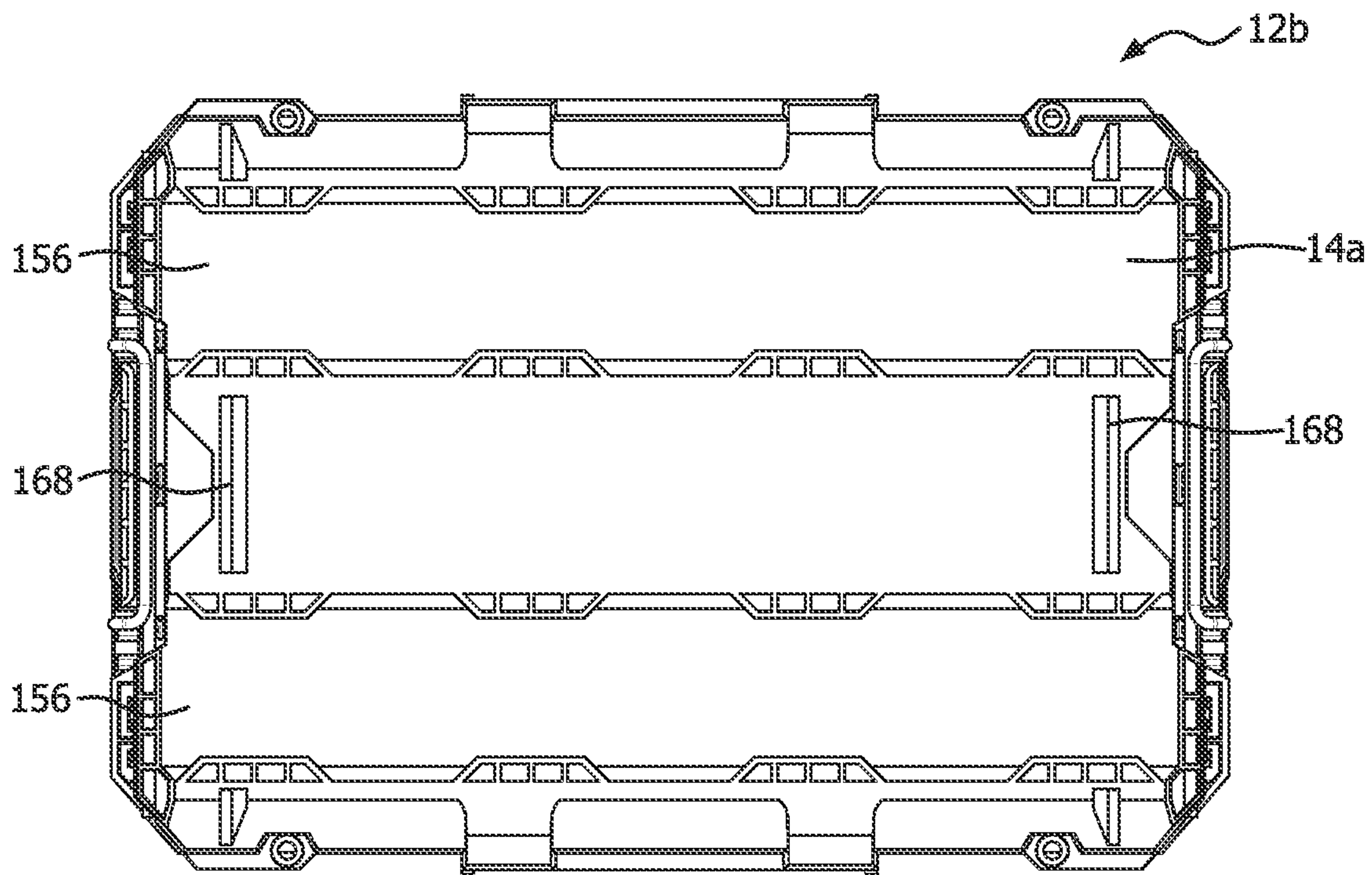


FIG. 7D

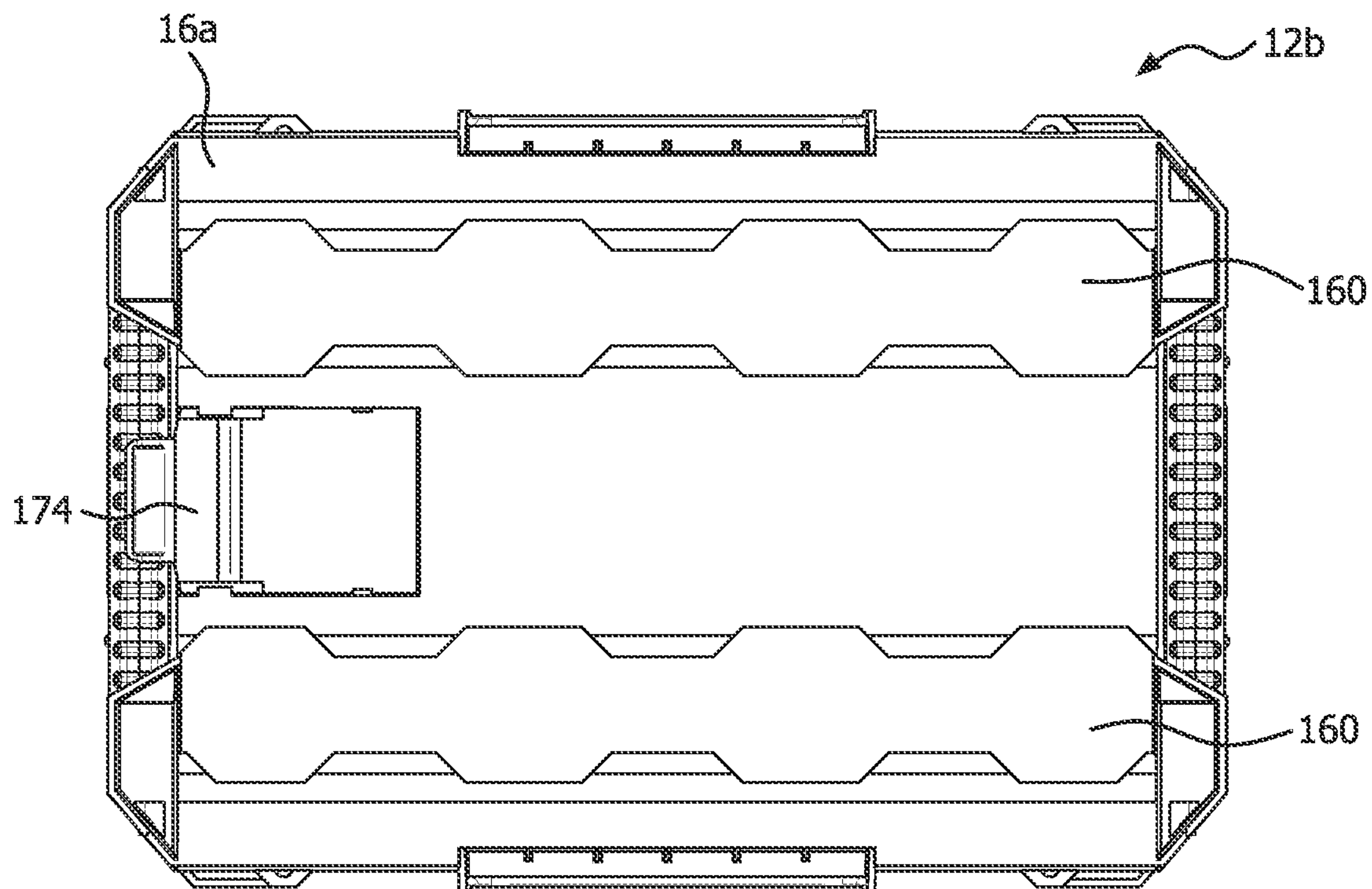


FIG. 7E

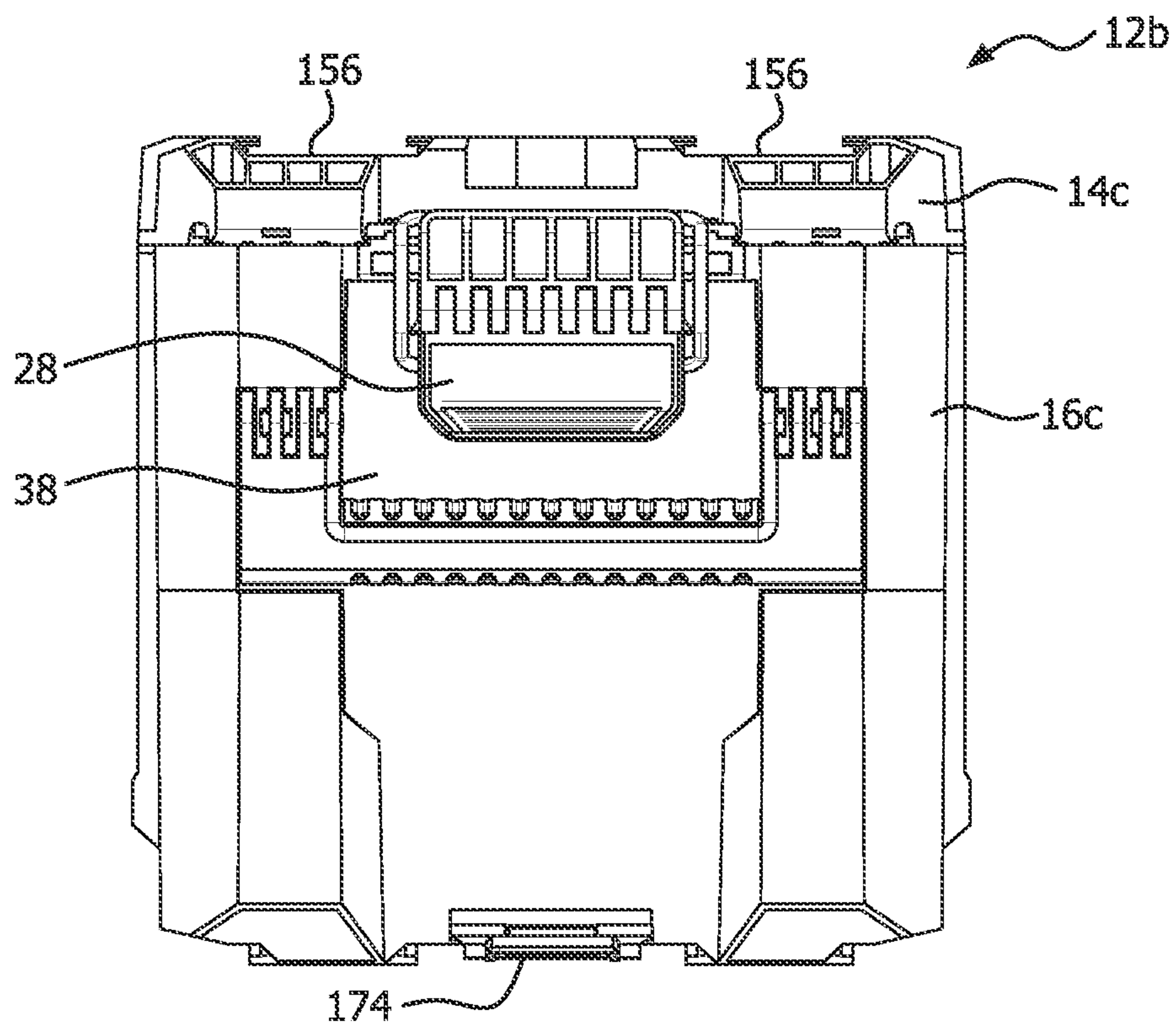


FIG. 7F

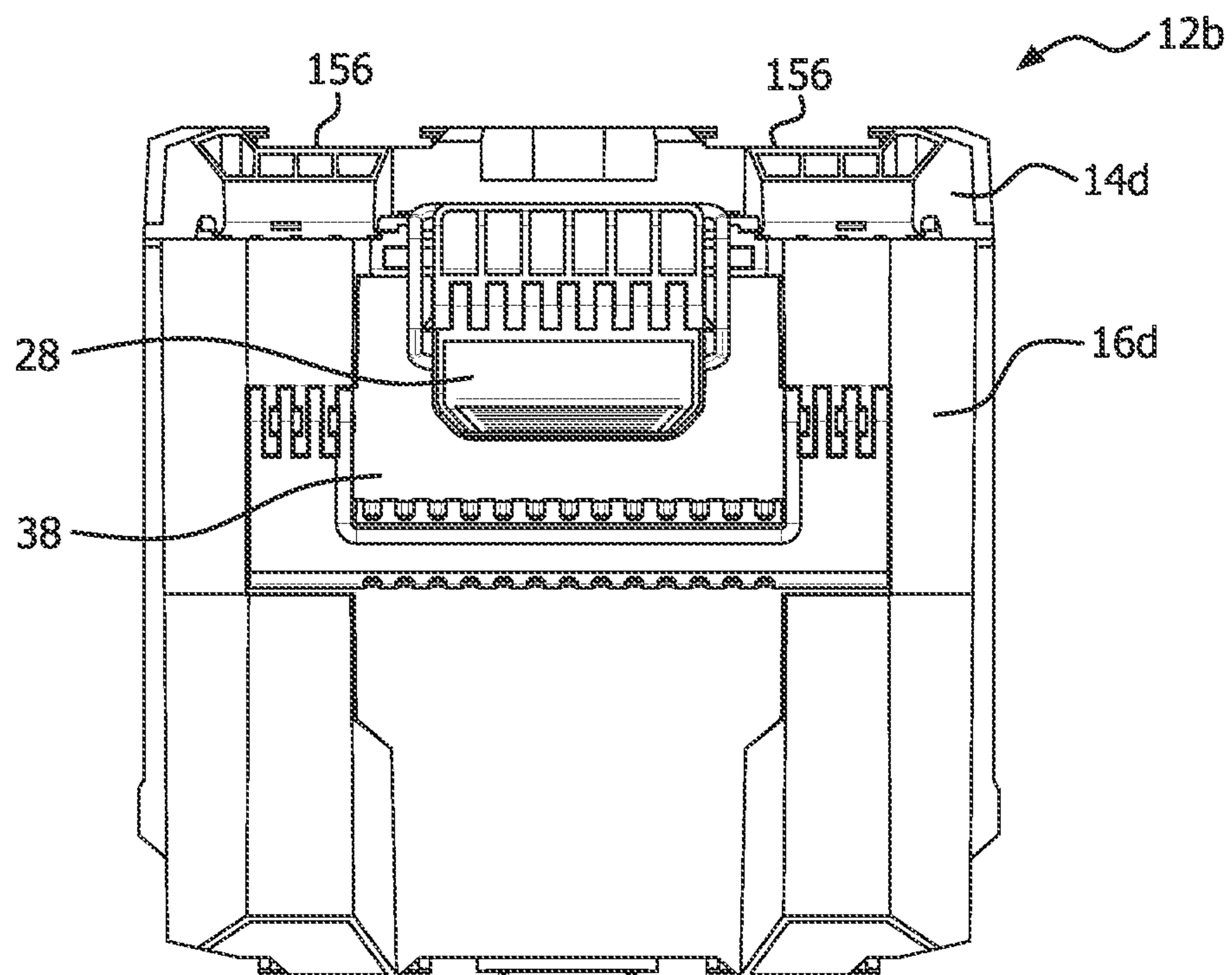


FIG. 7G

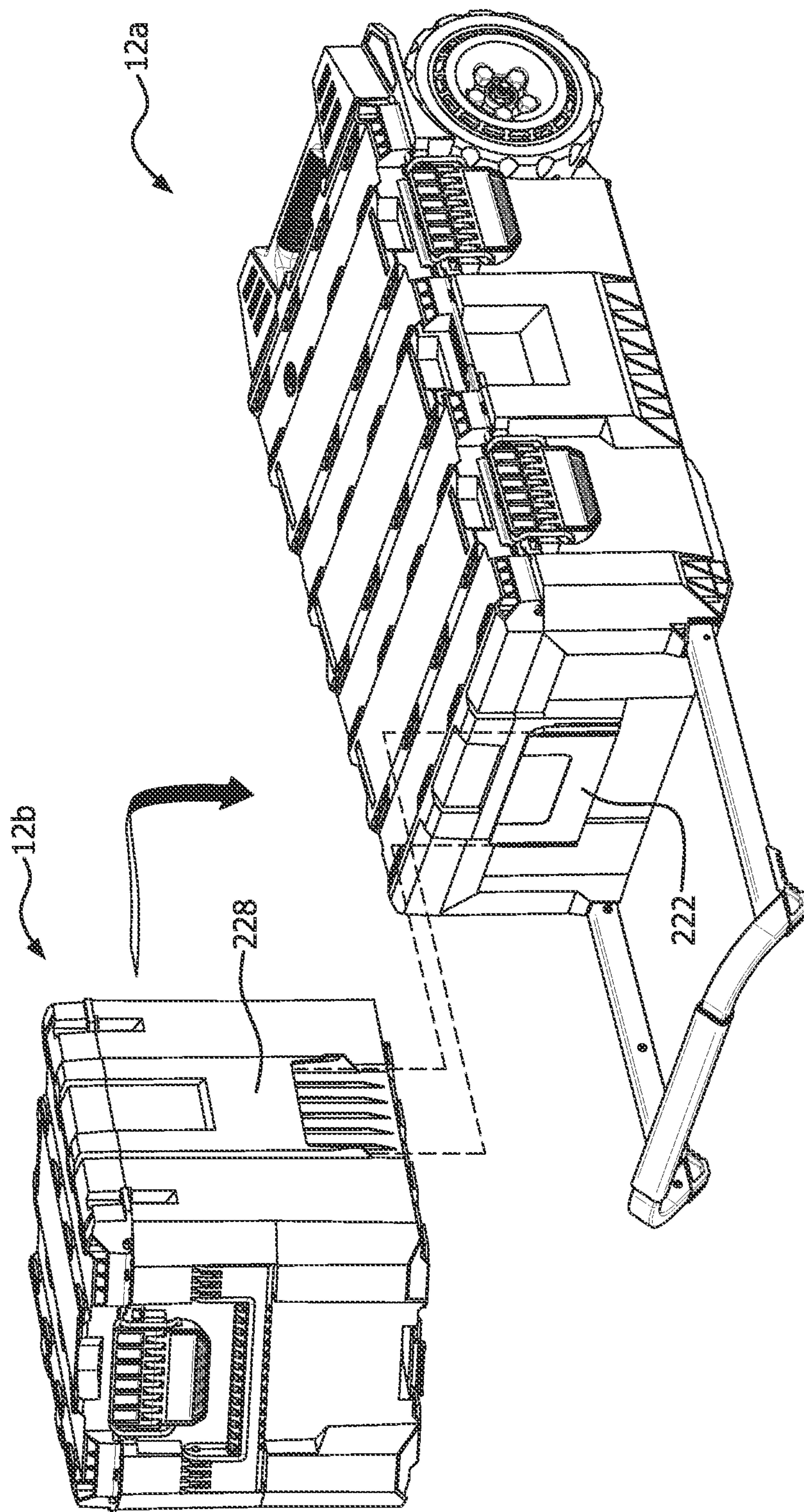


FIG. 8

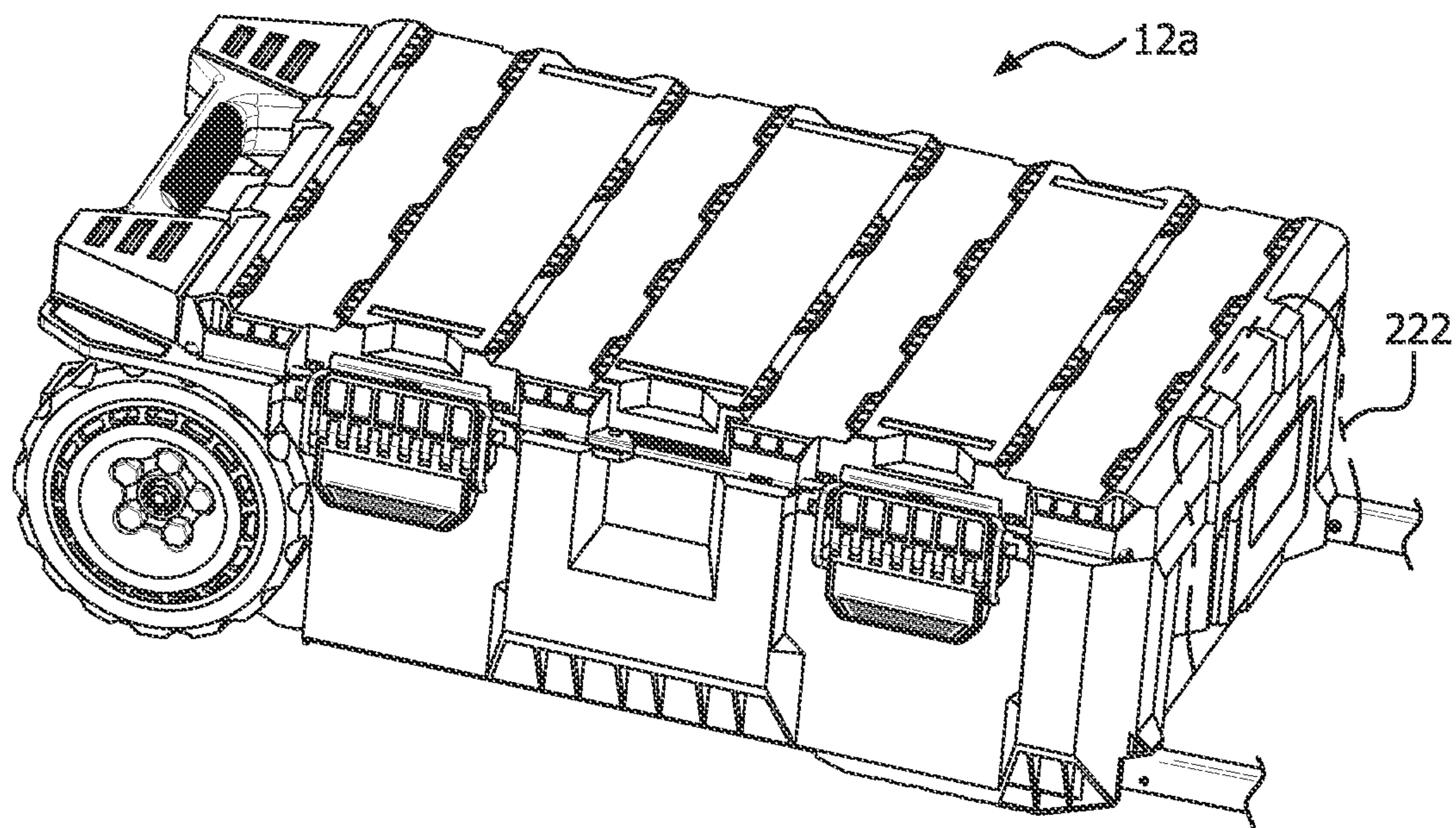


FIG. 9A

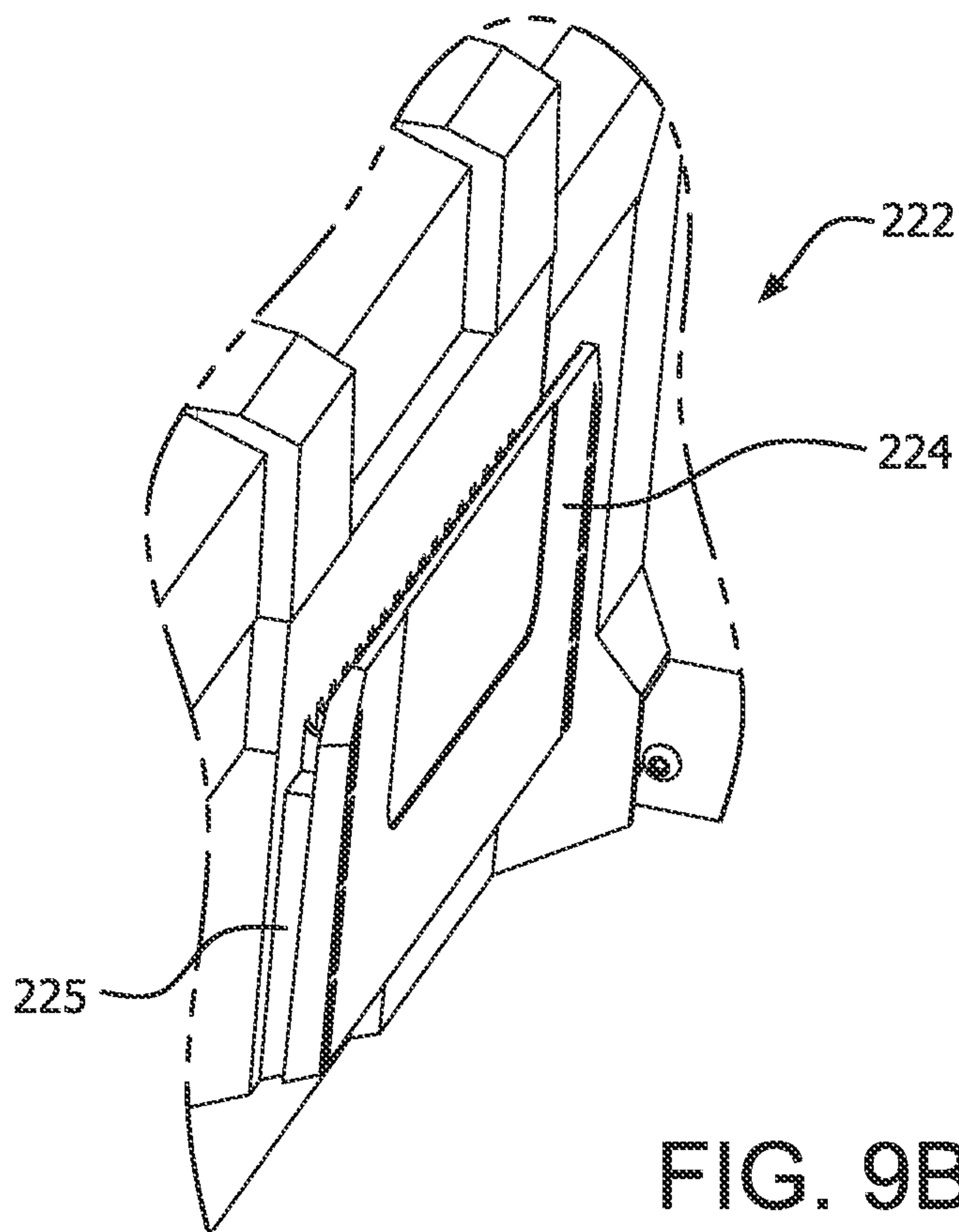
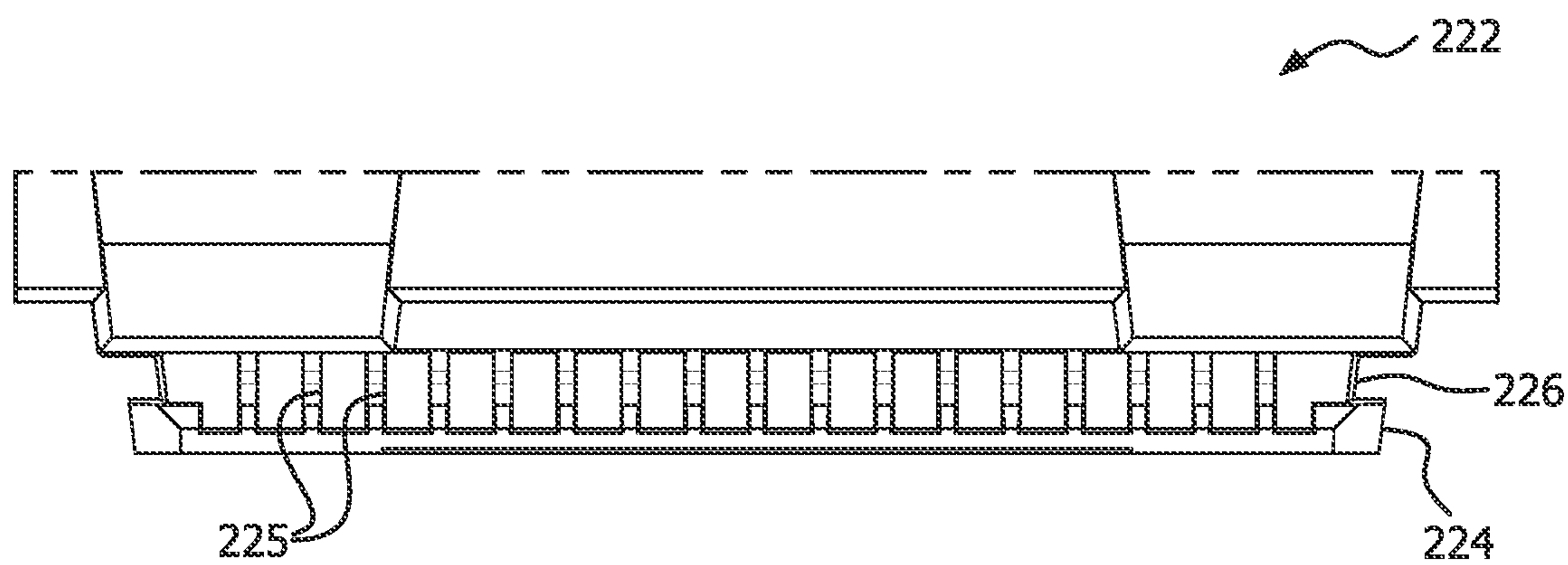
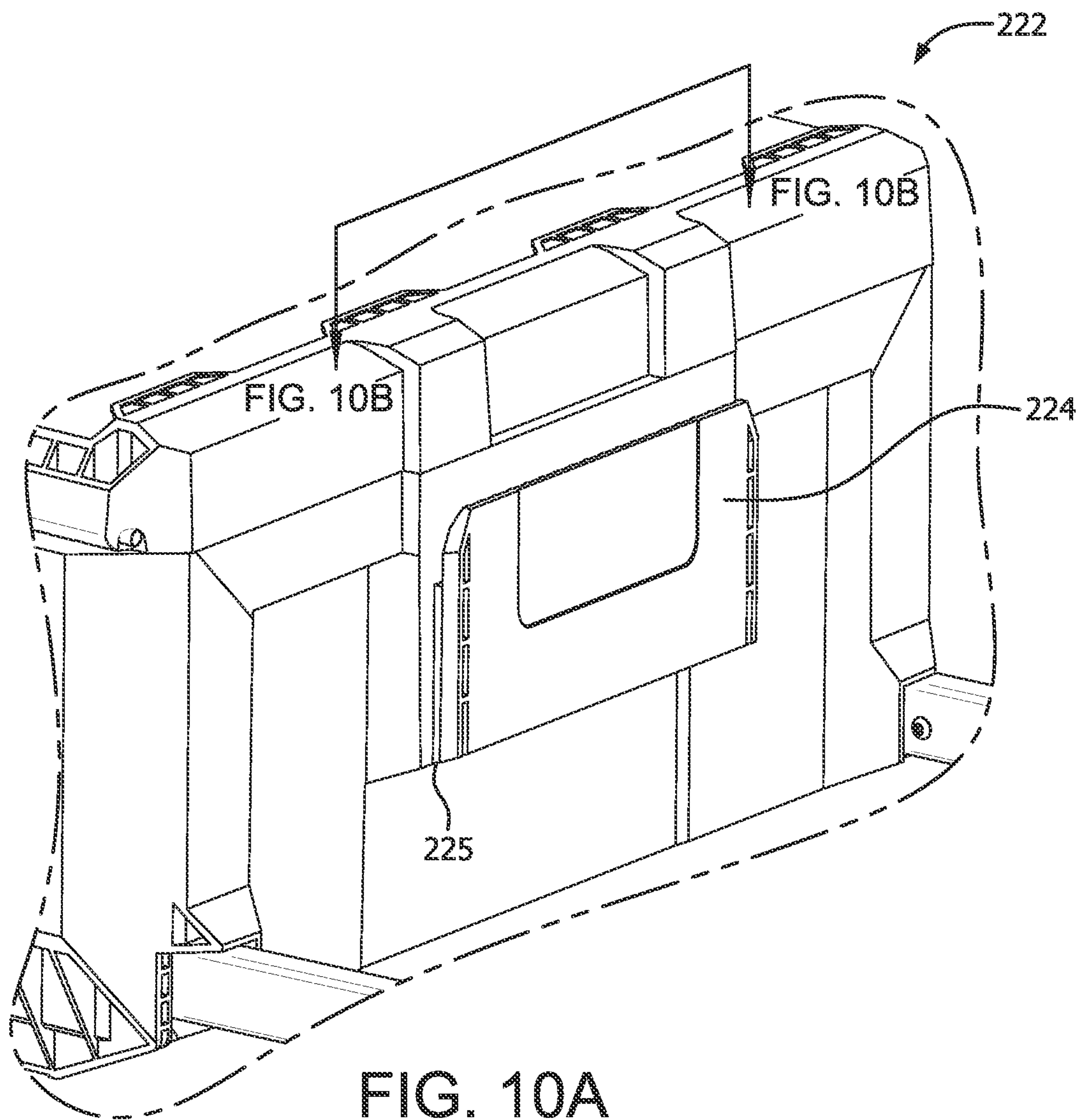


FIG. 9B



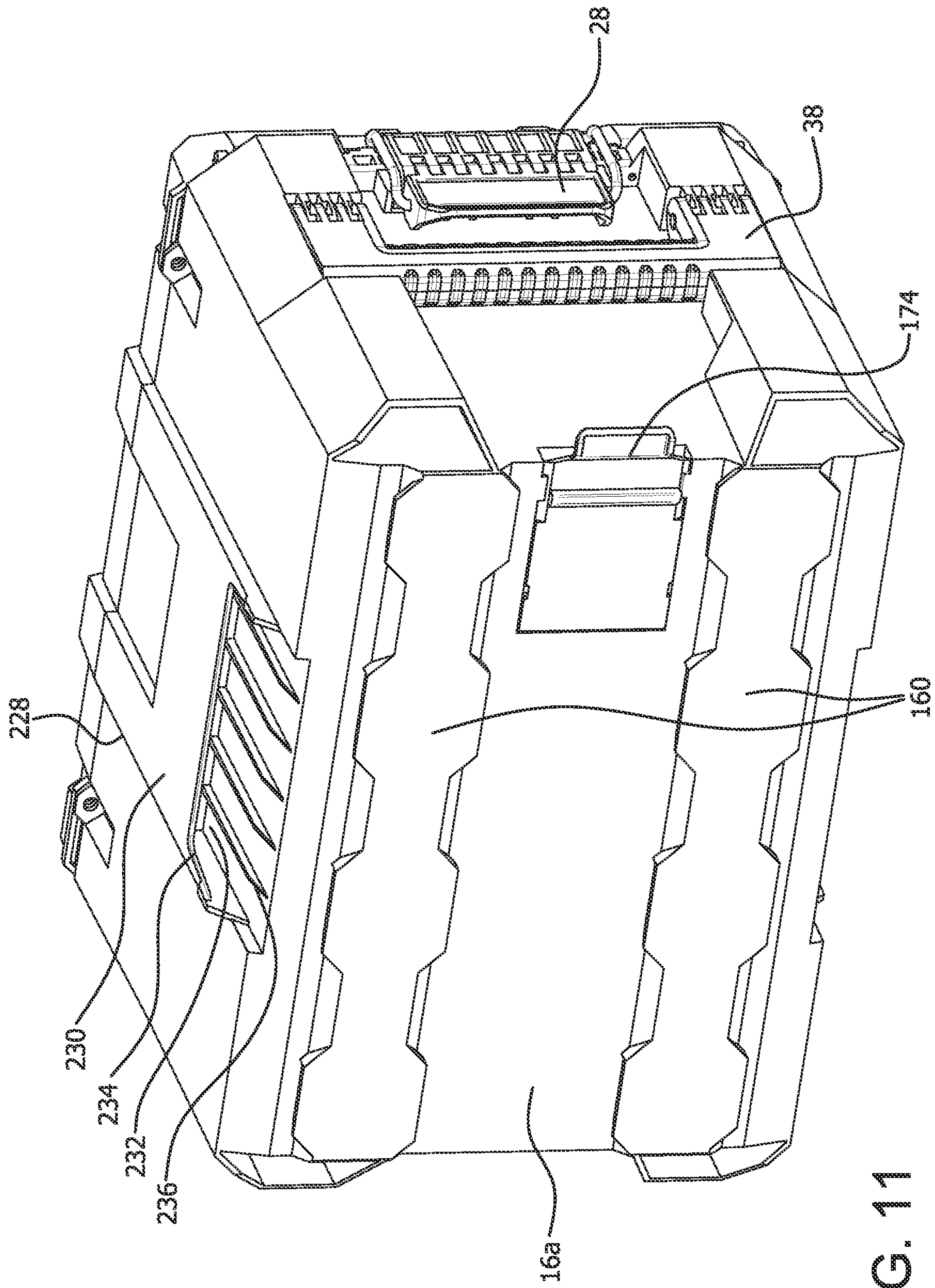


FIG. 11

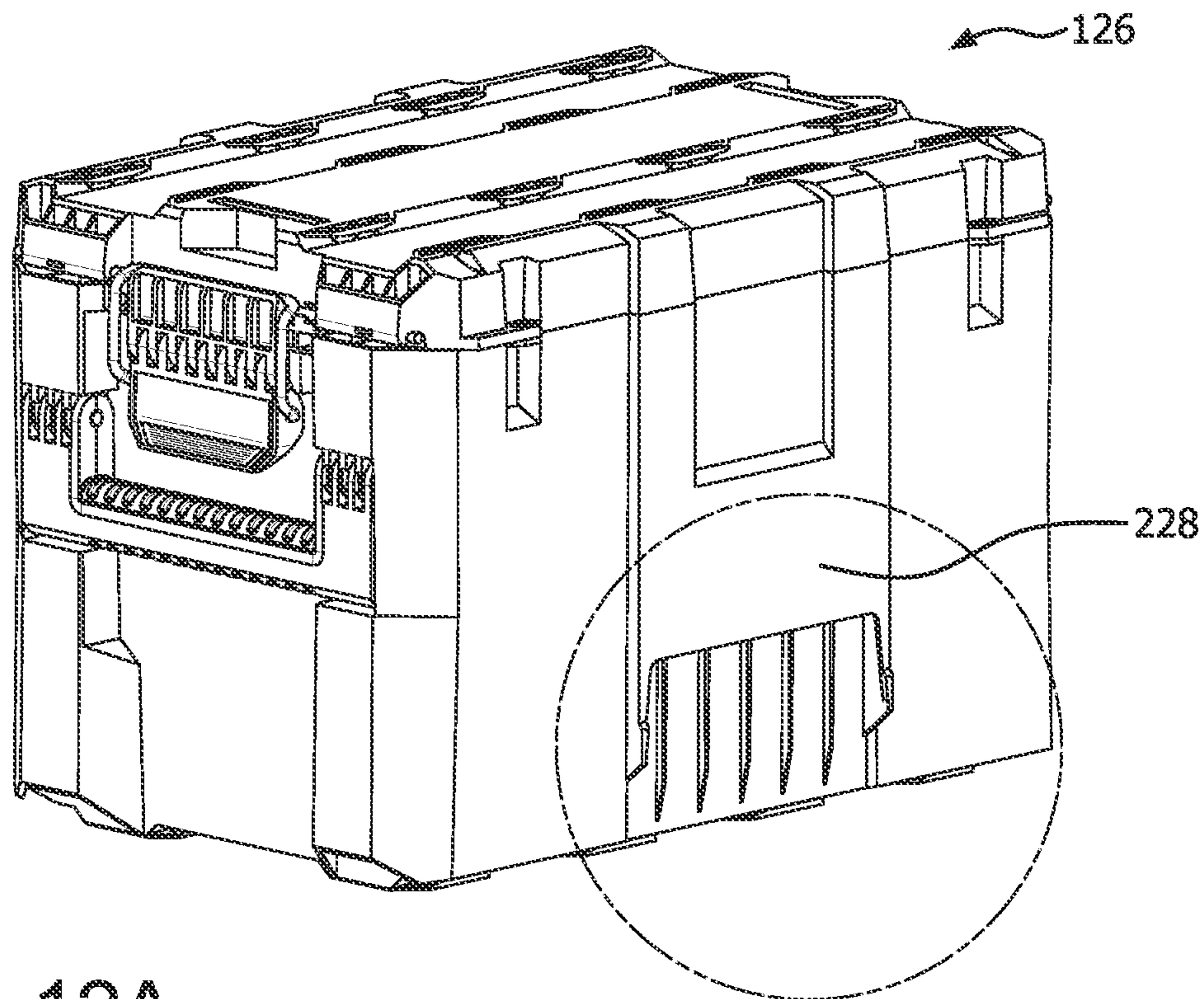


FIG. 12A

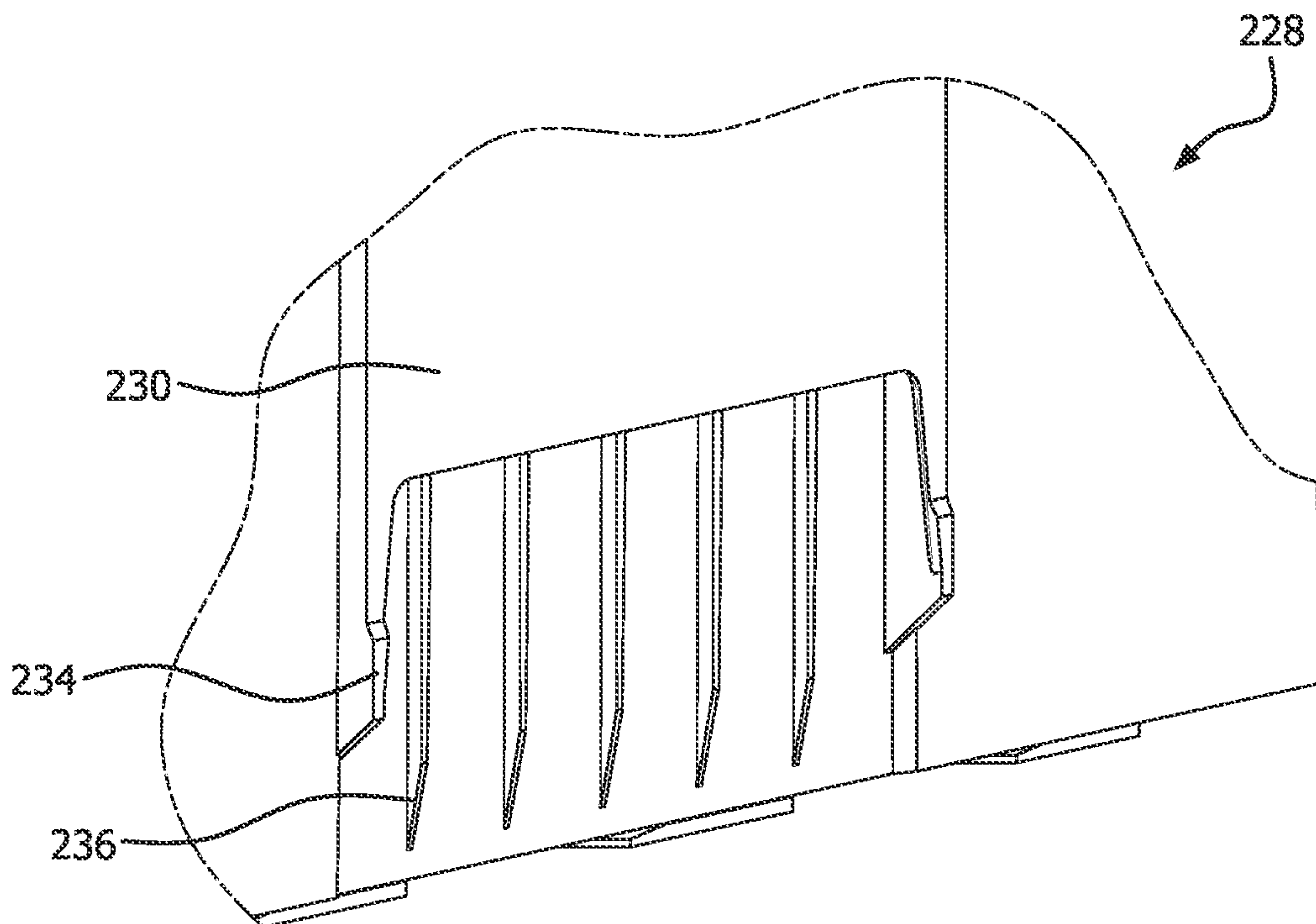


FIG. 12B

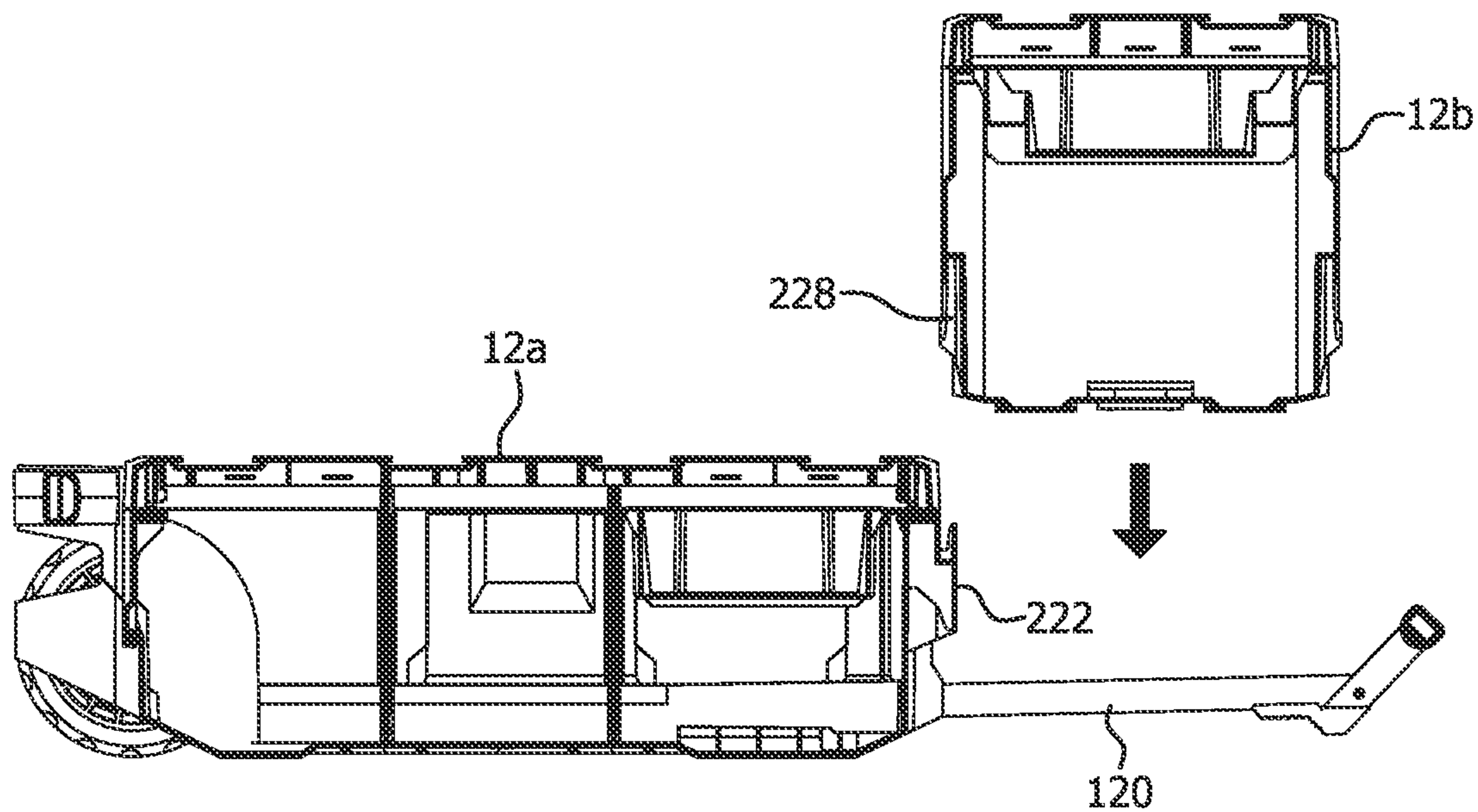


FIG. 13A

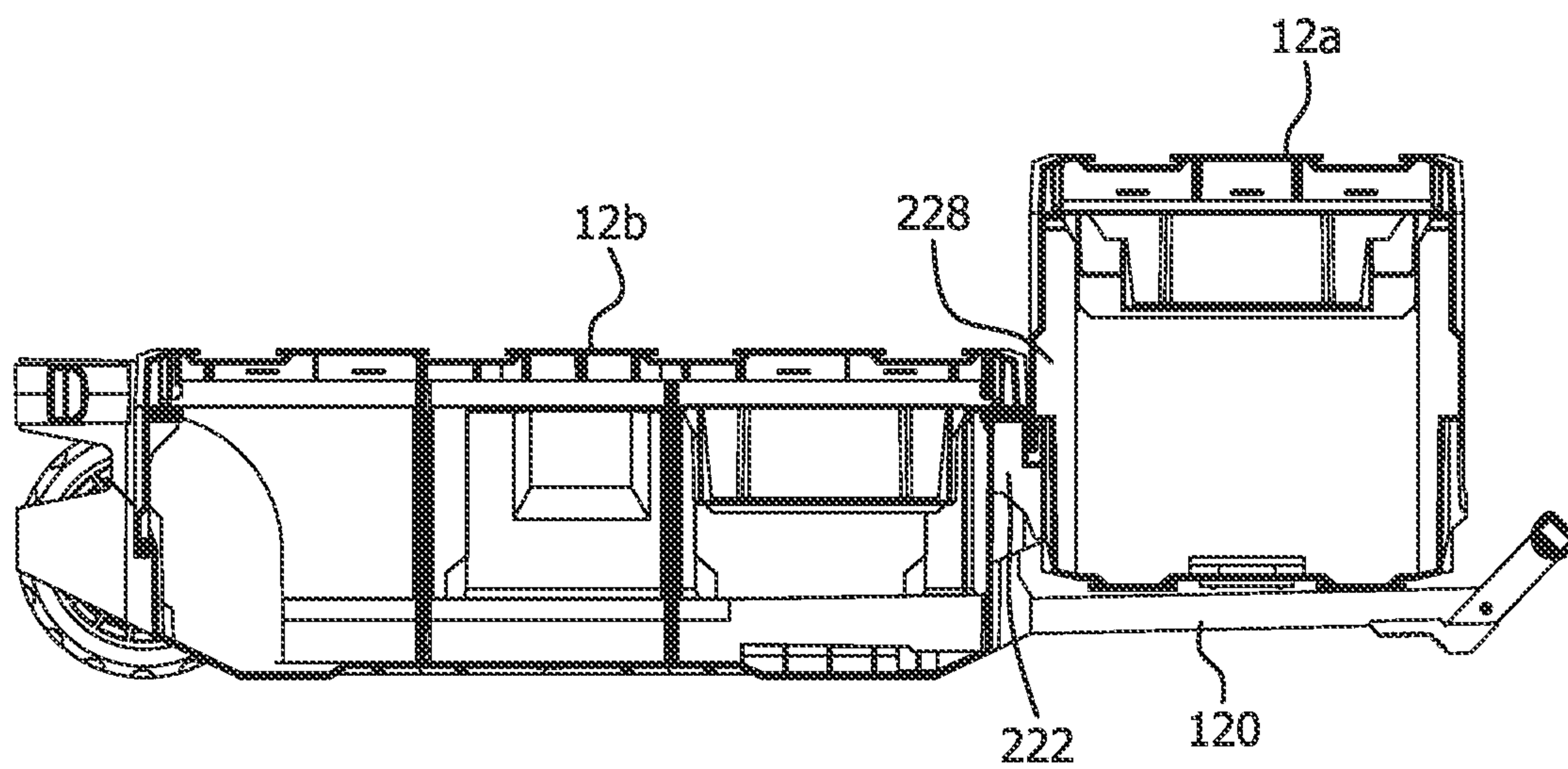


FIG. 13B

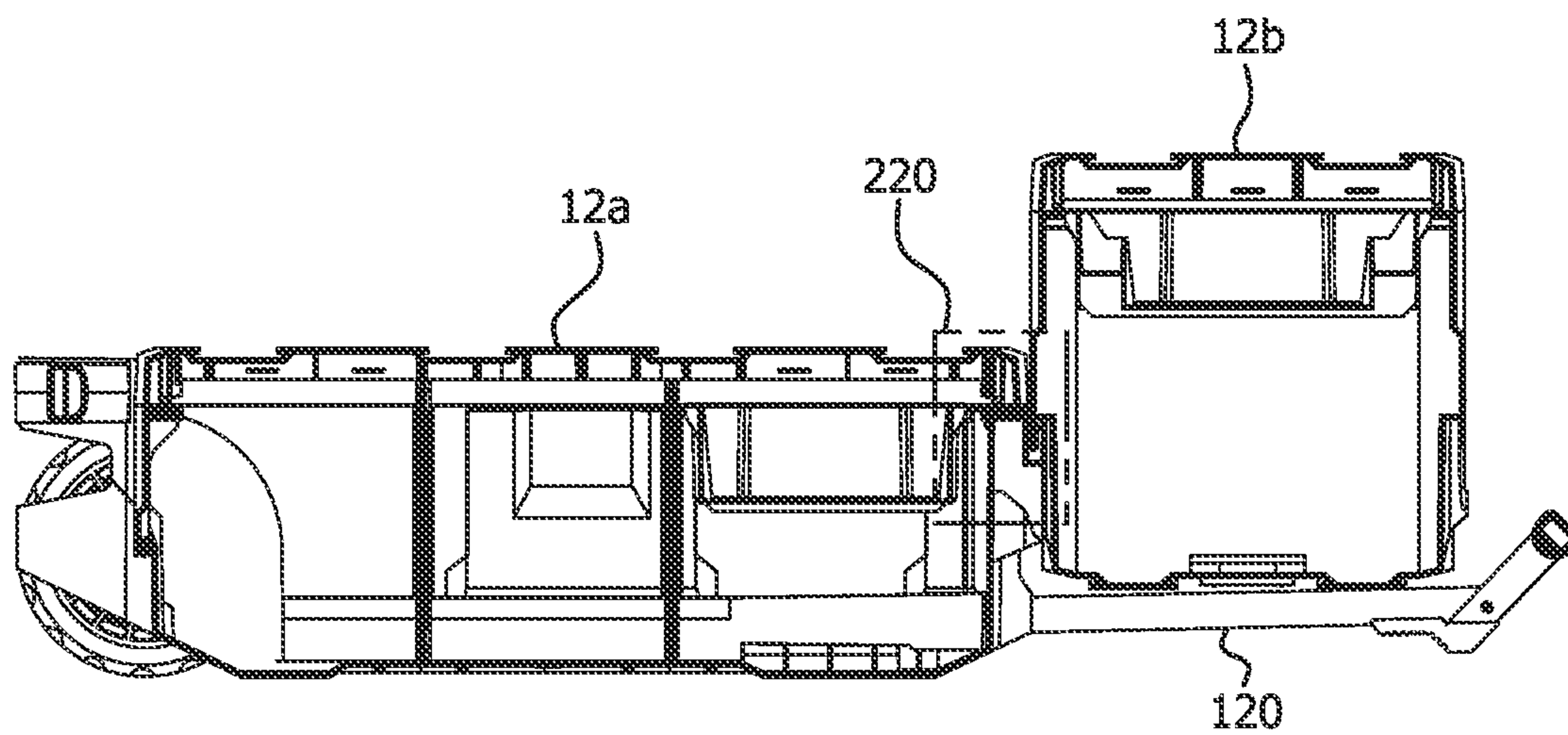


FIG. 14A

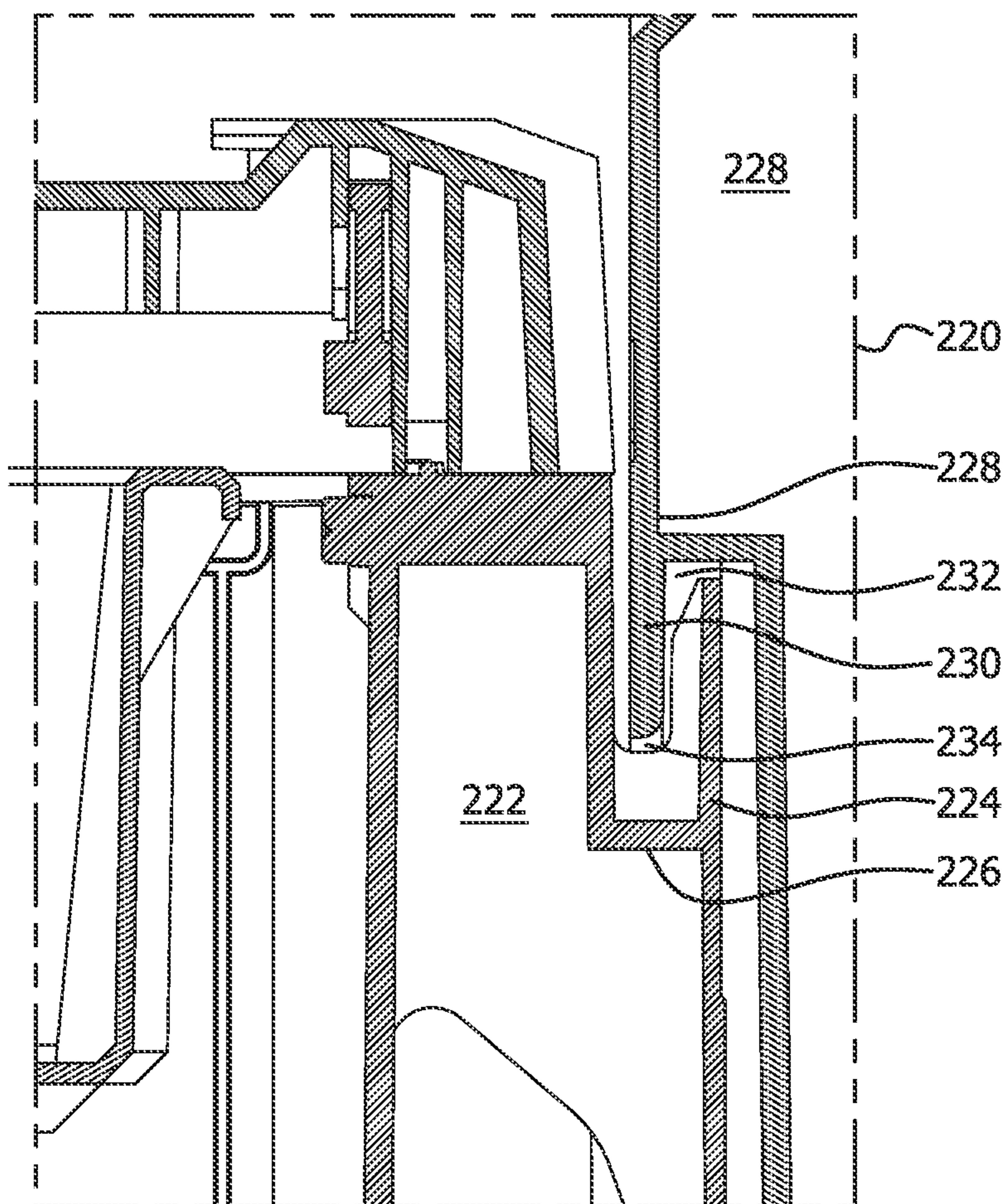


FIG. 14B

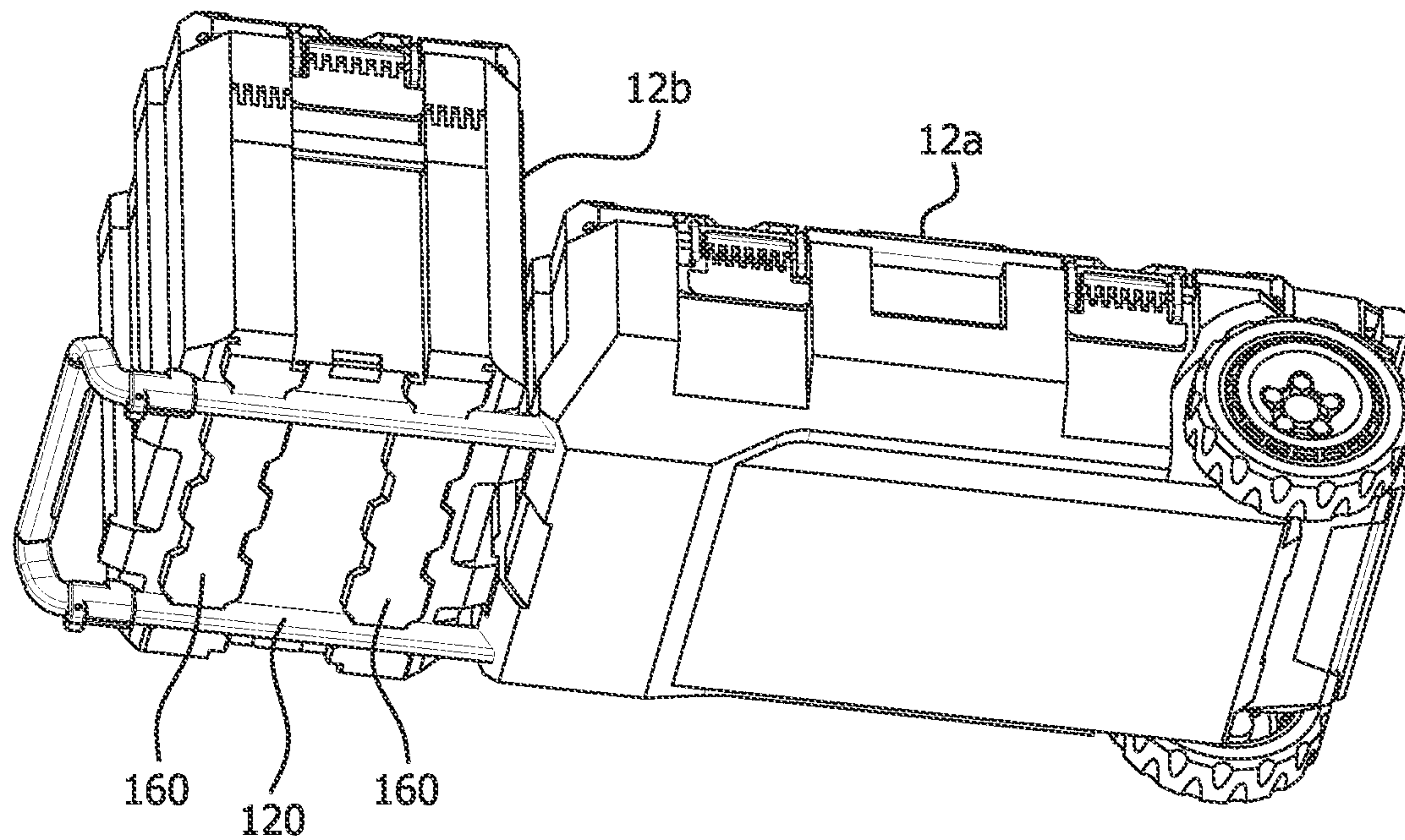


FIG. 15A

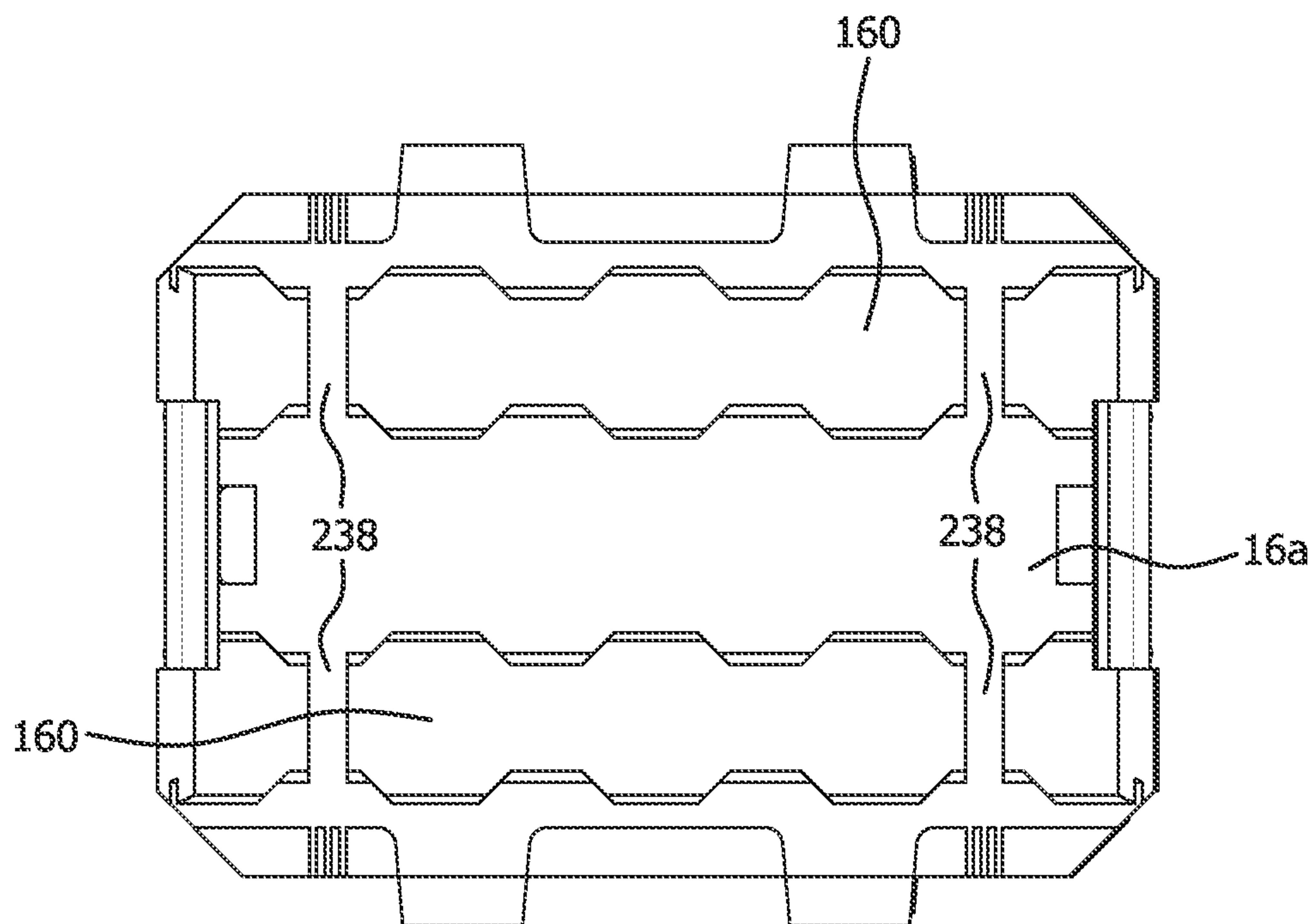


FIG. 15B

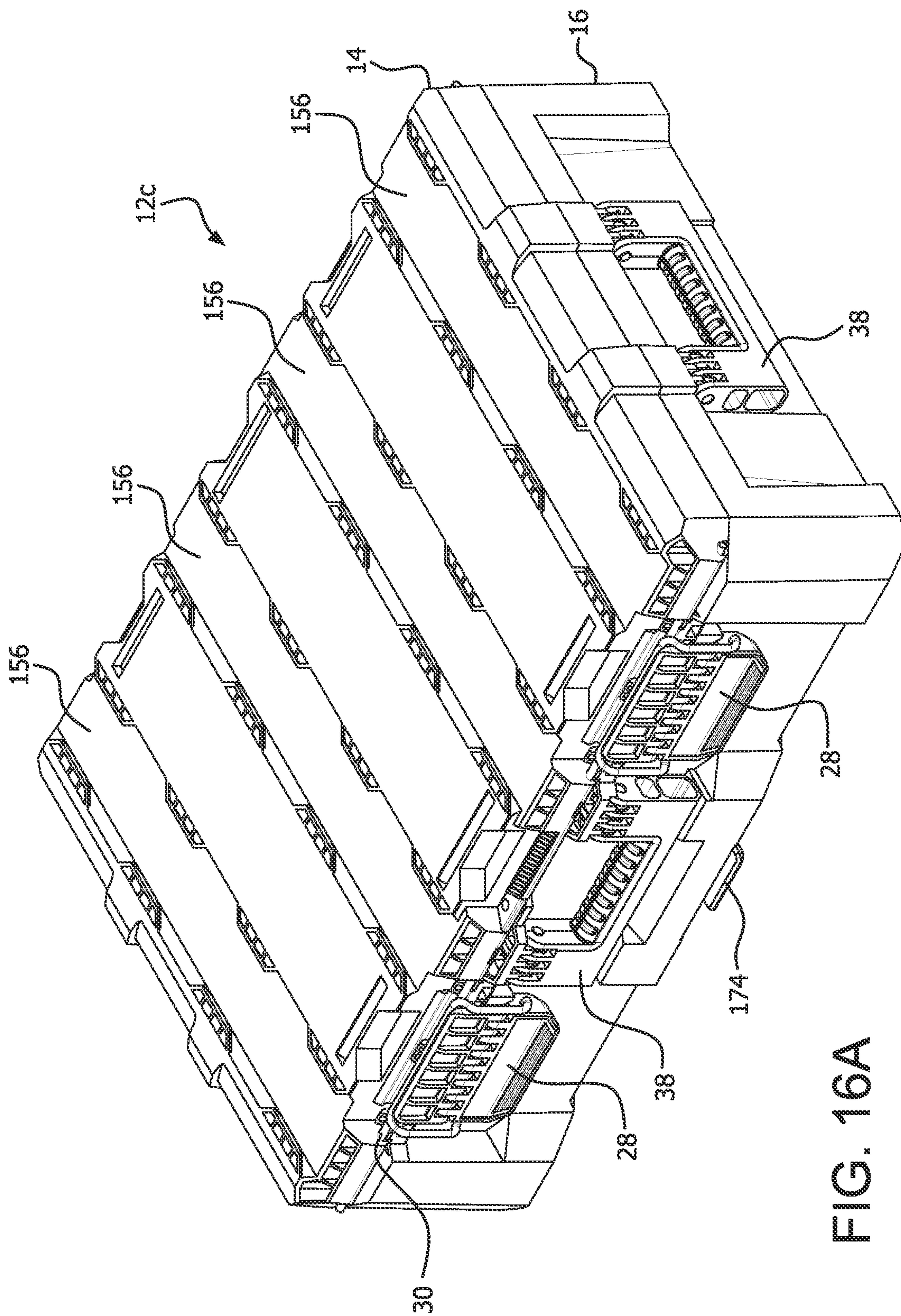


FIG. 16A

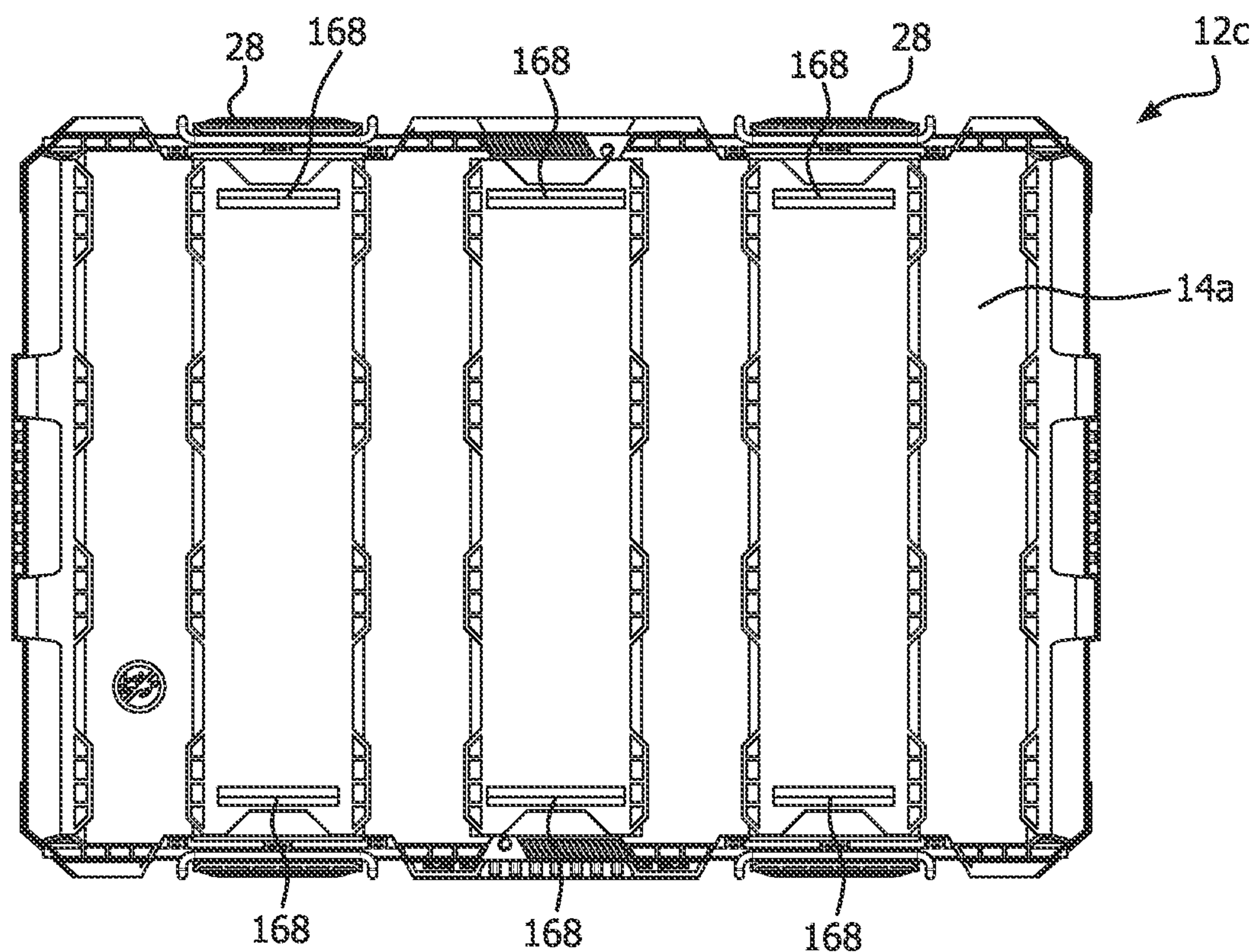


FIG. 16B

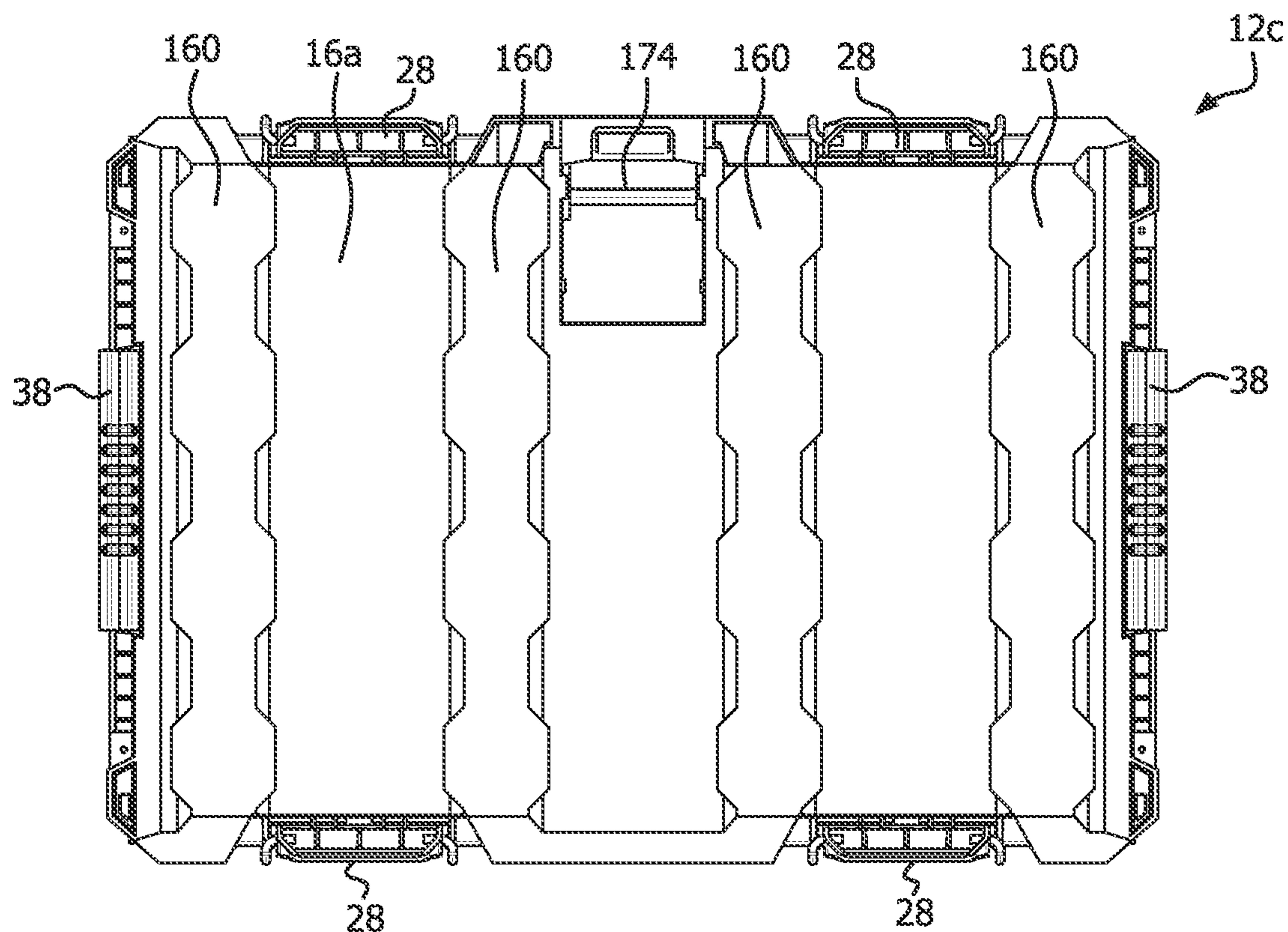


FIG. 16C

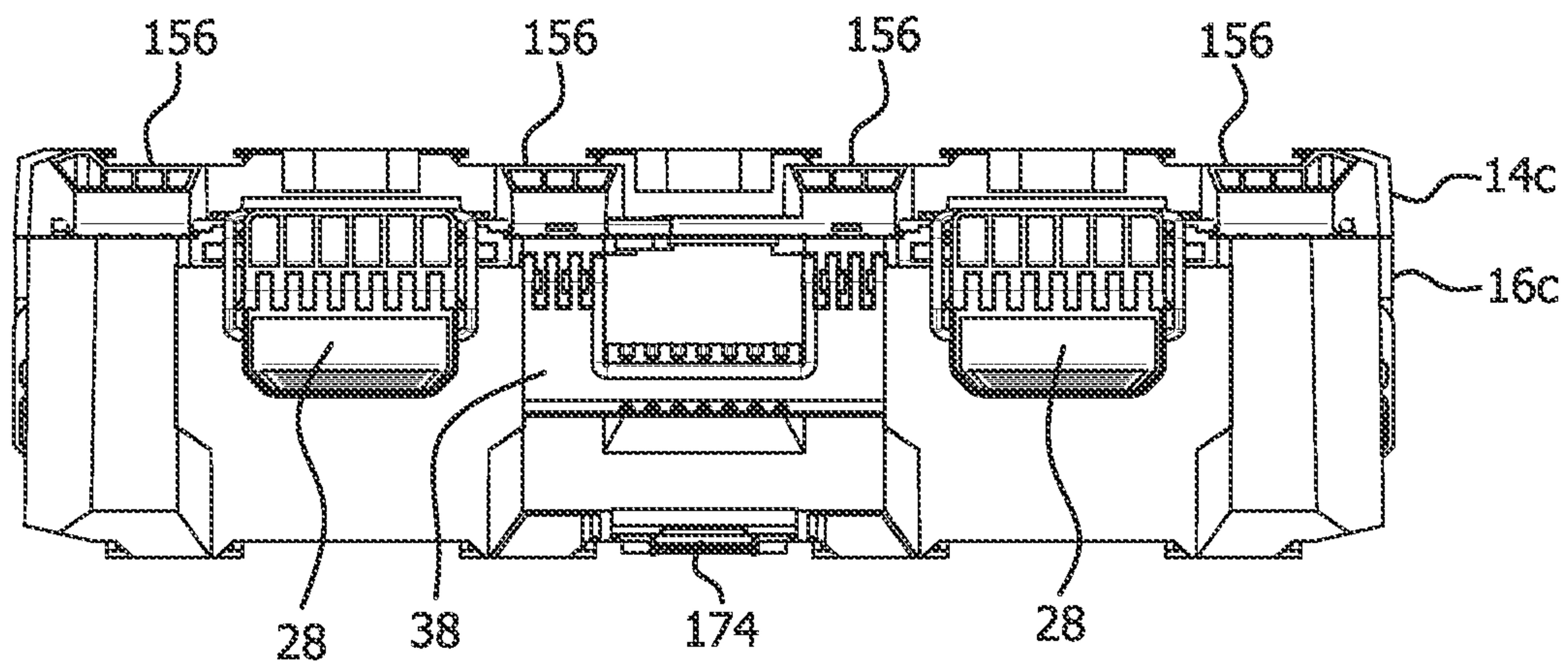


FIG. 16D

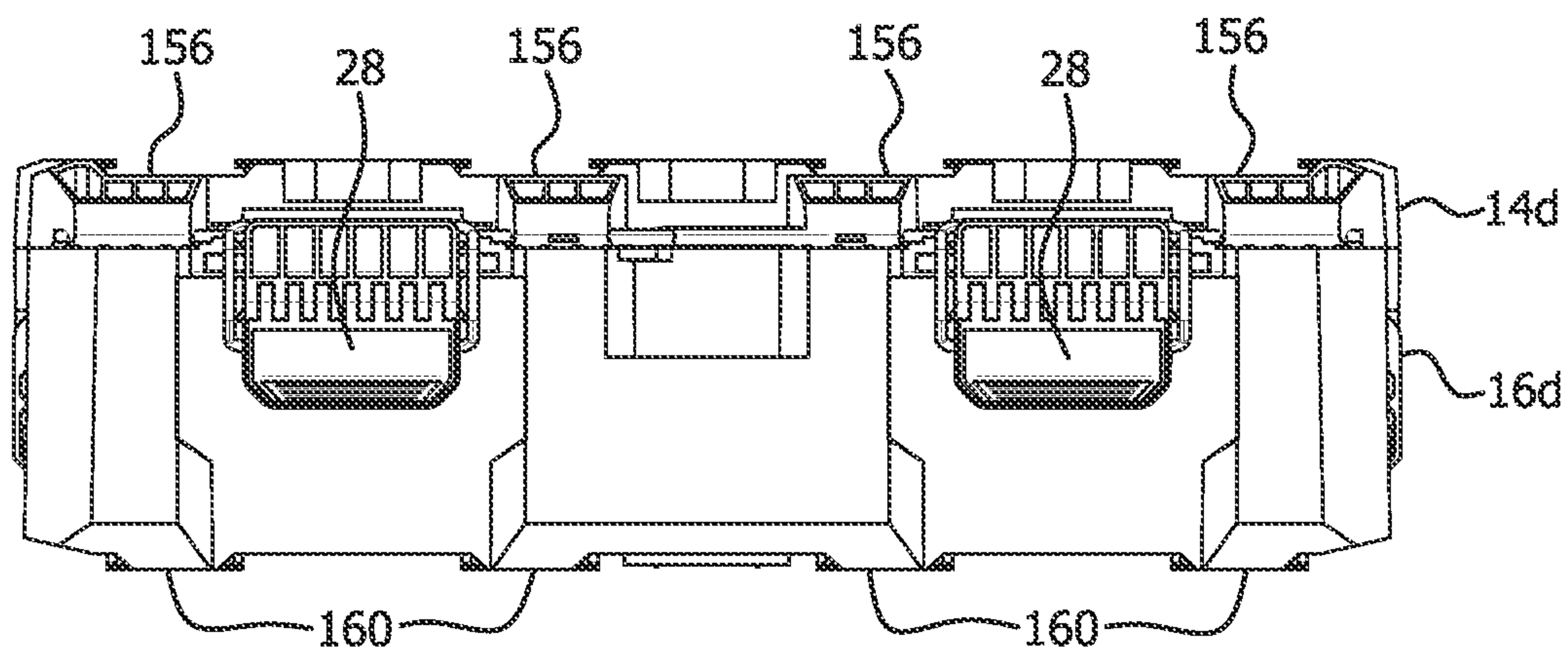


FIG. 16E

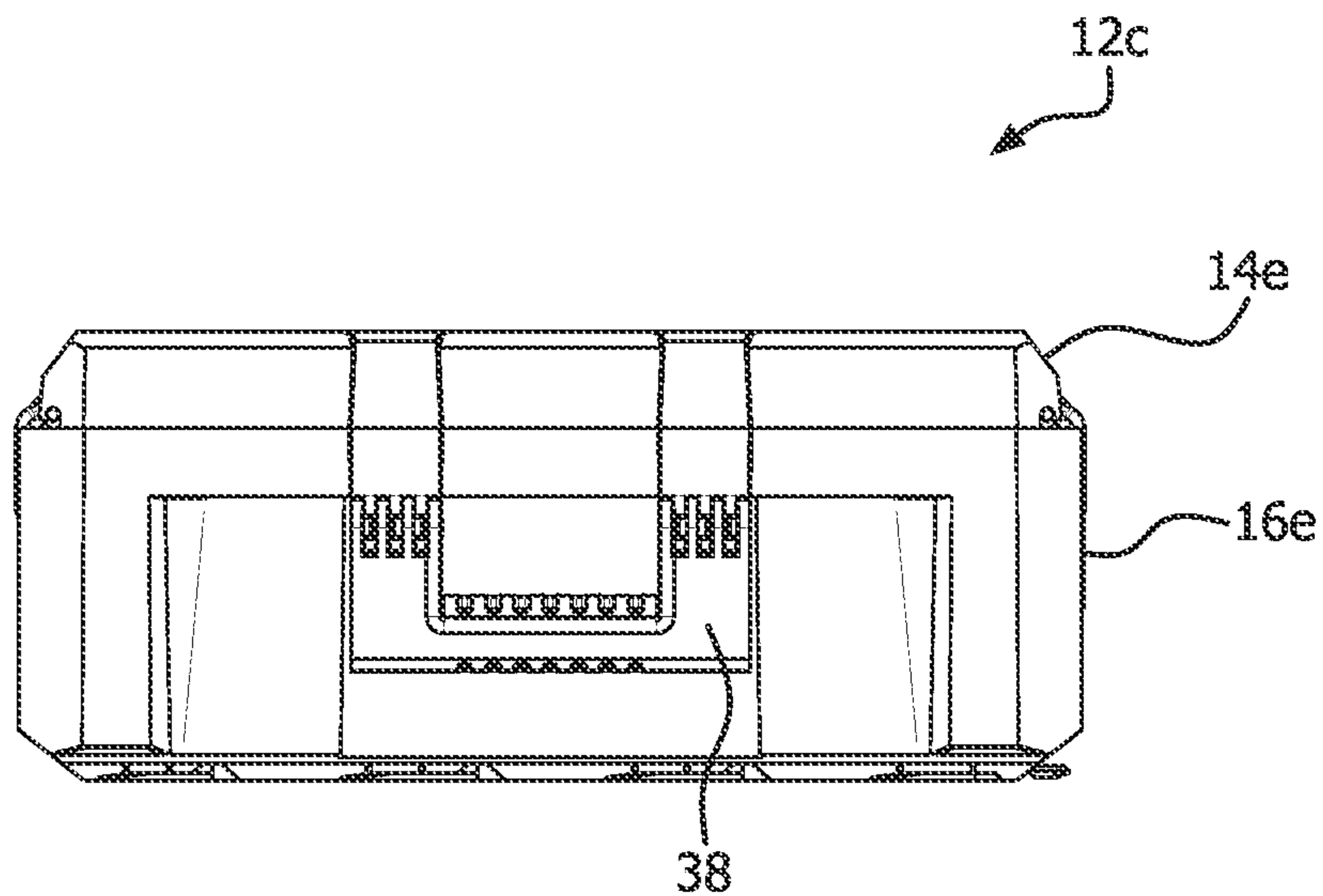


FIG. 16F

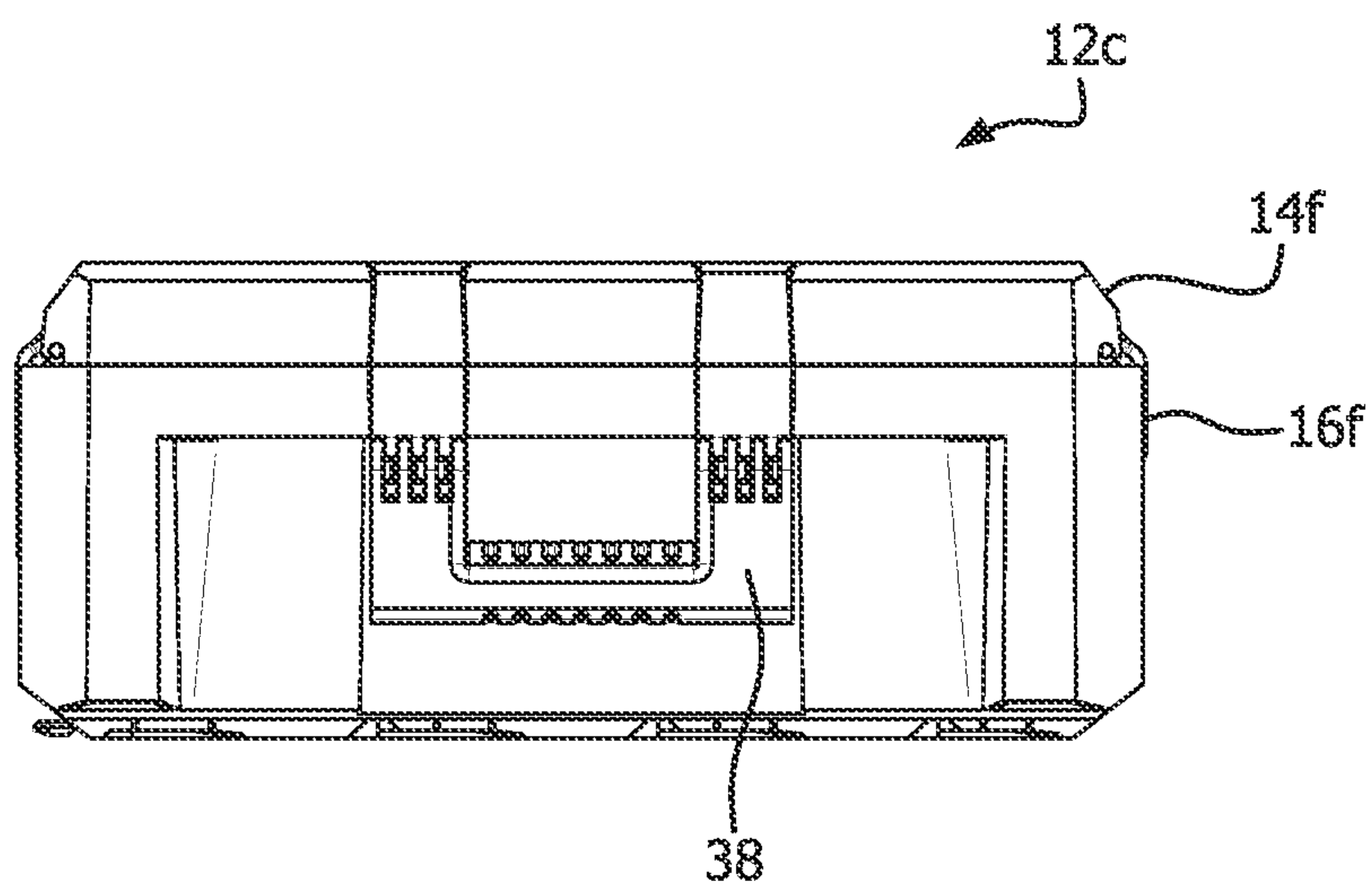


FIG. 16G

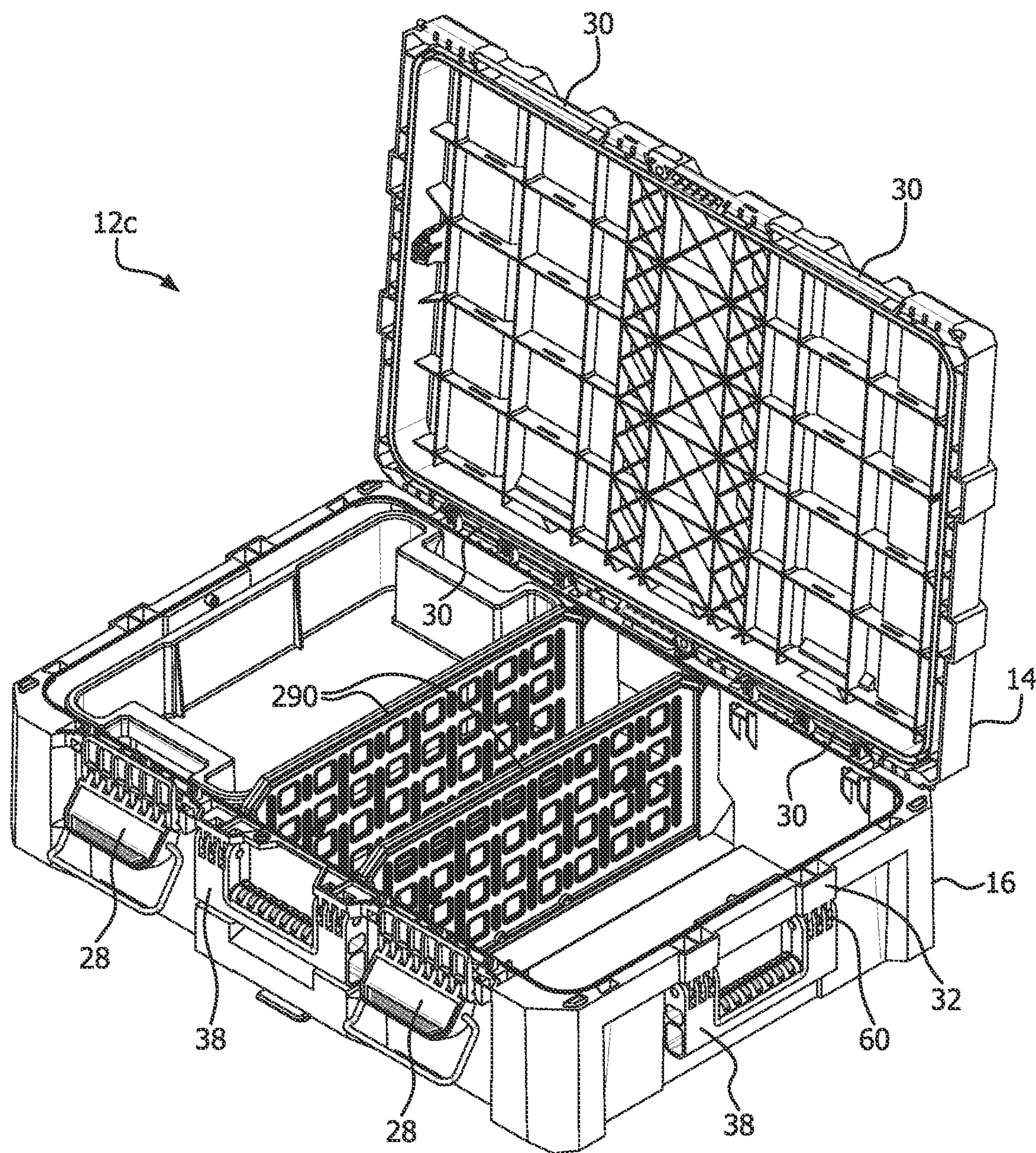


FIG. 17A

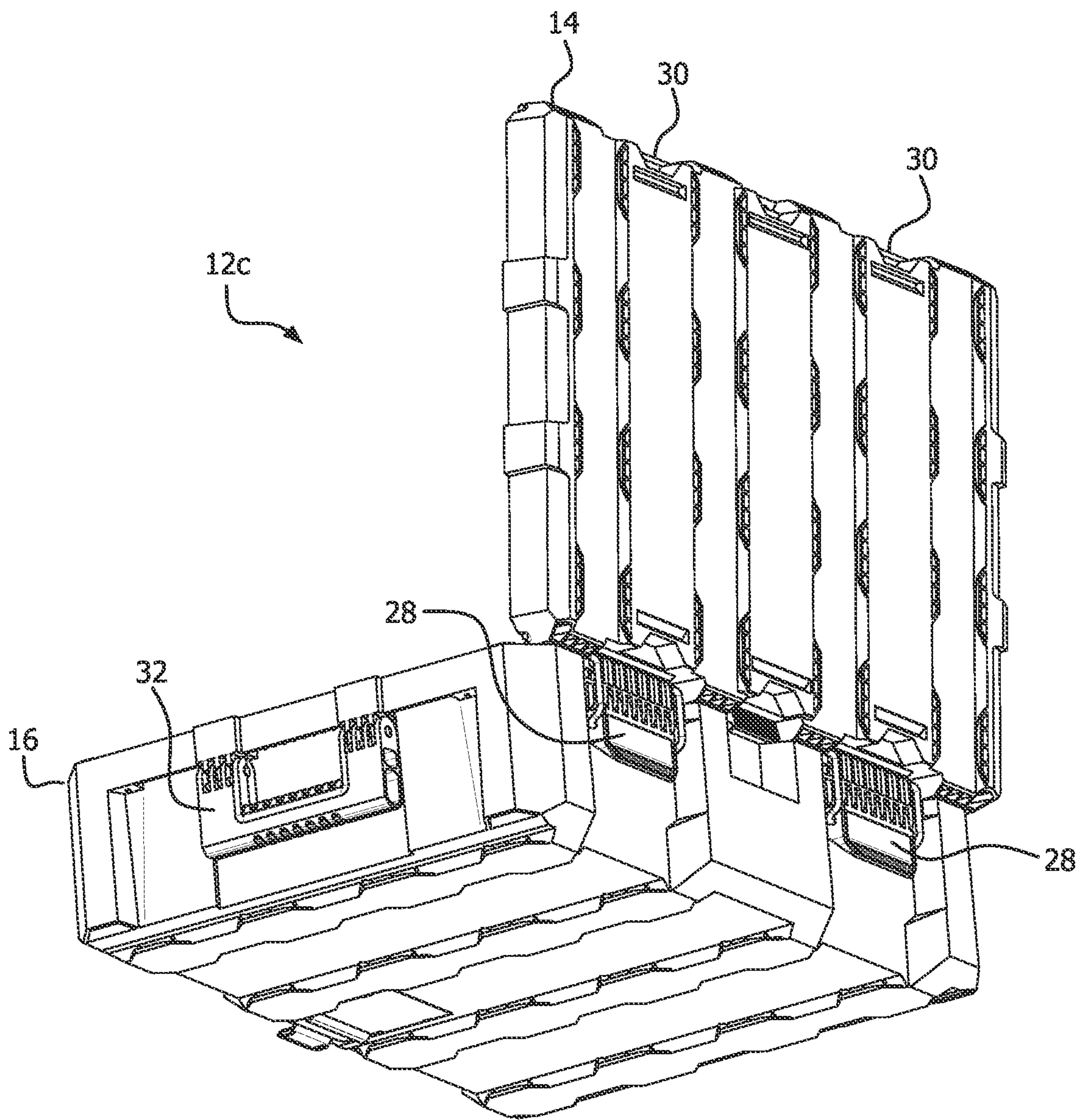


FIG. 17B

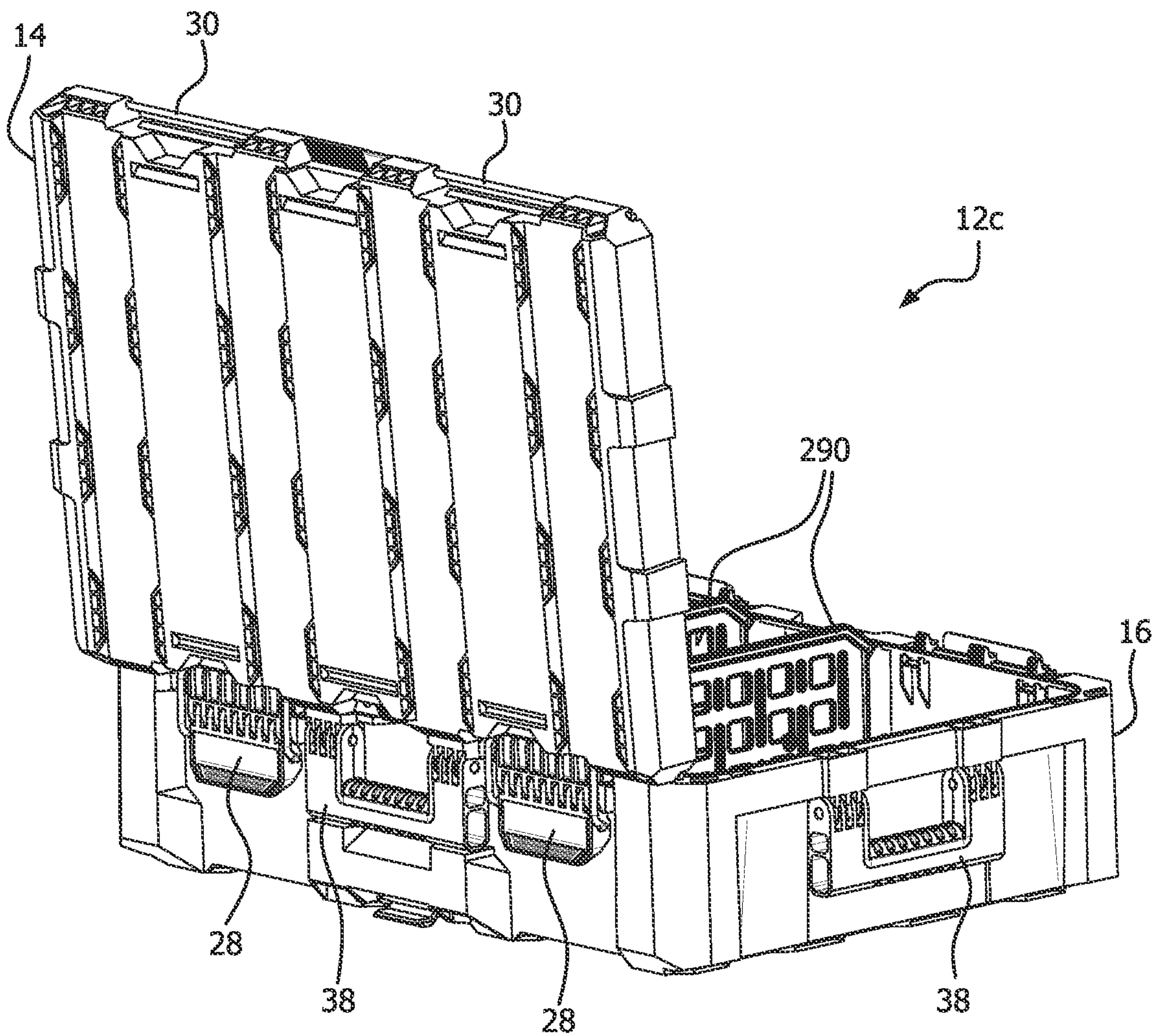


FIG. 17C

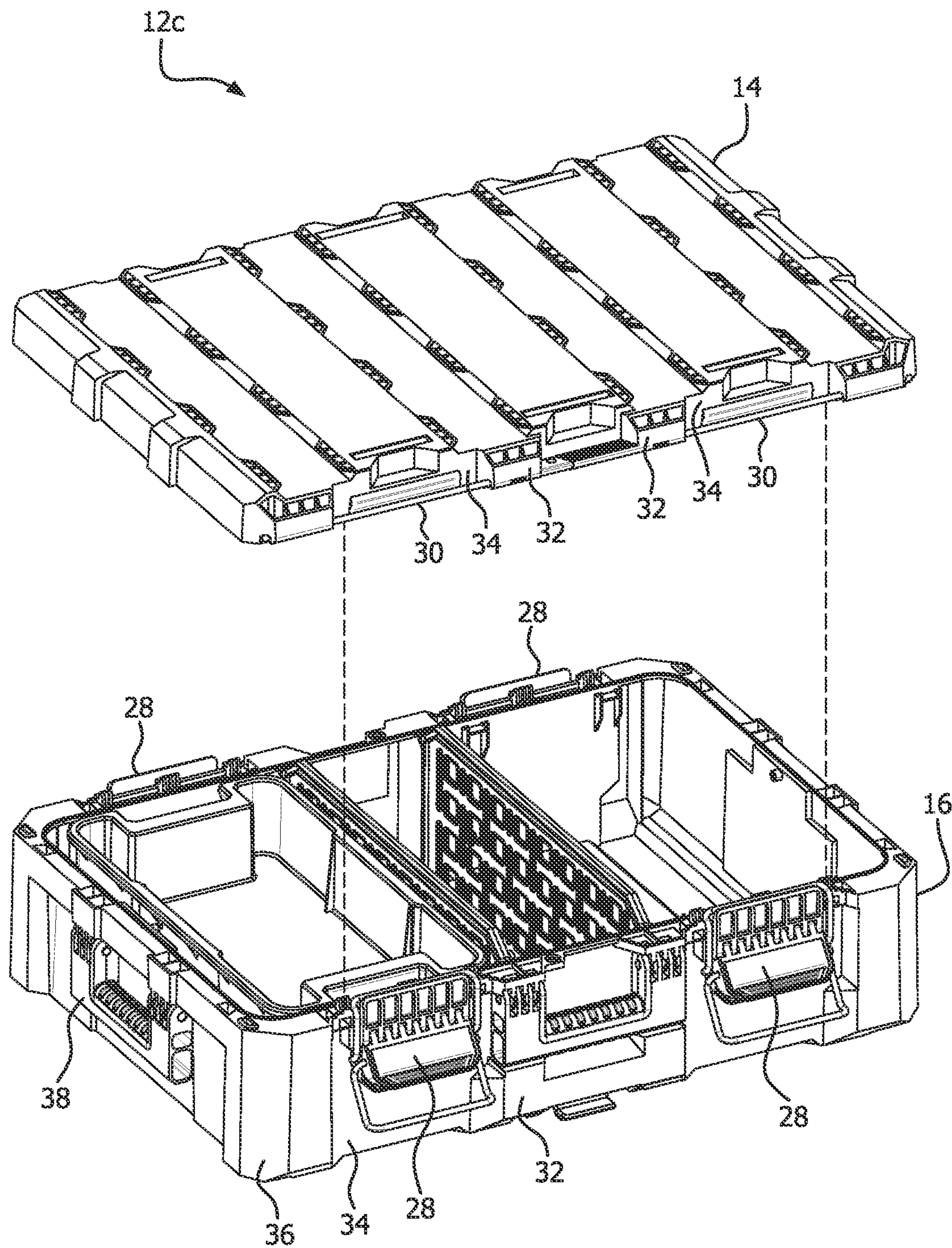


FIG. 17D

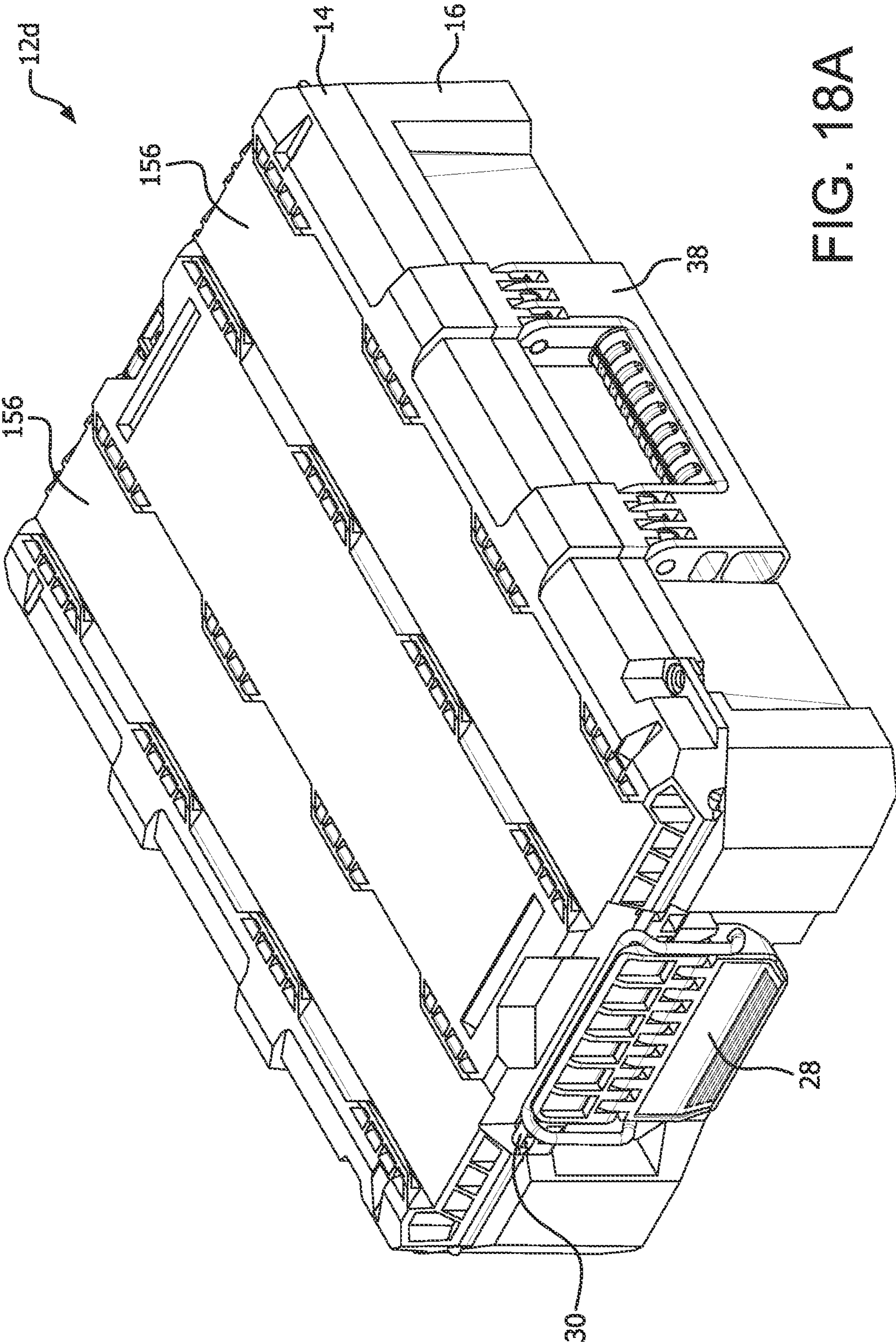


FIG. 18A

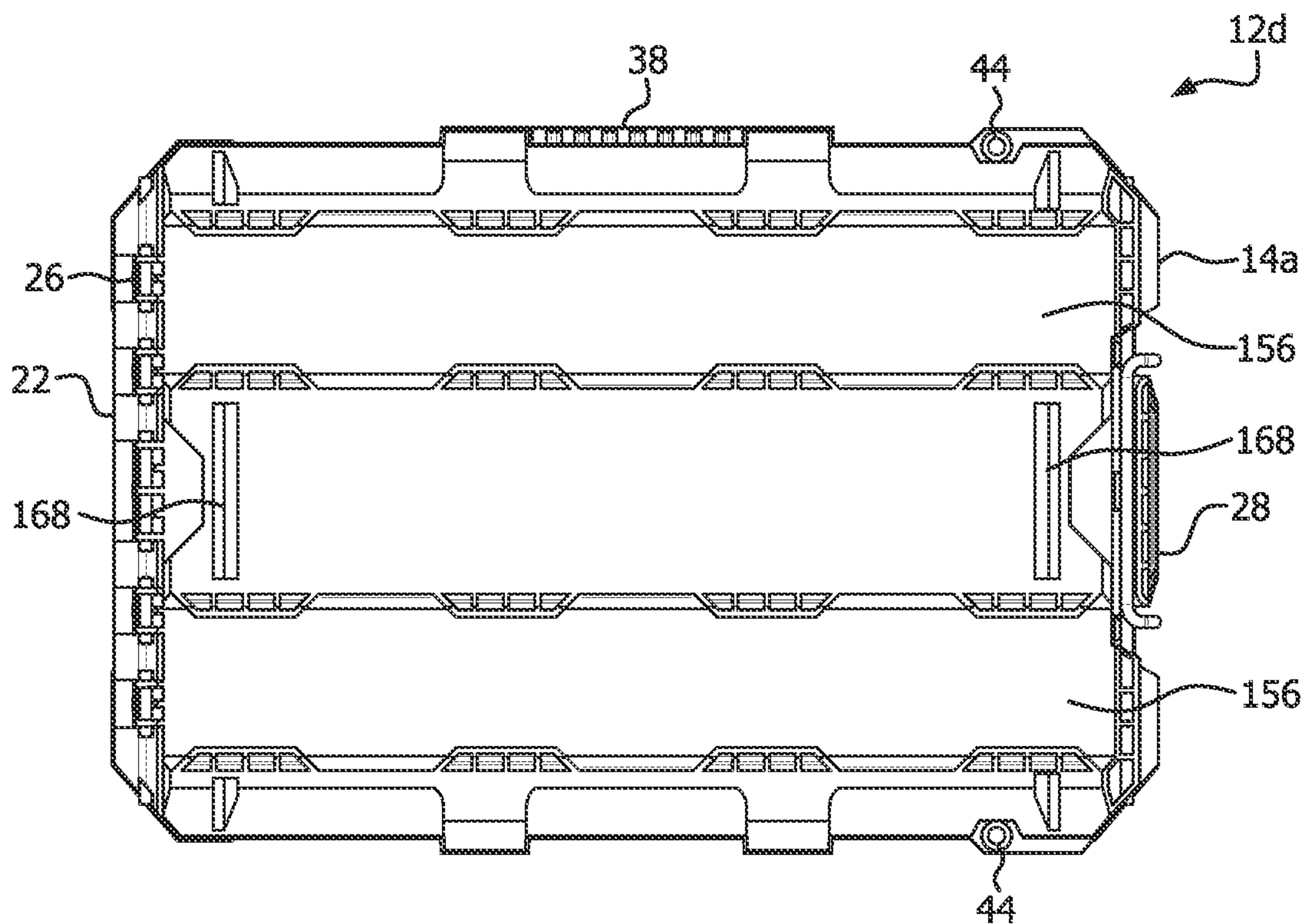


FIG. 18B

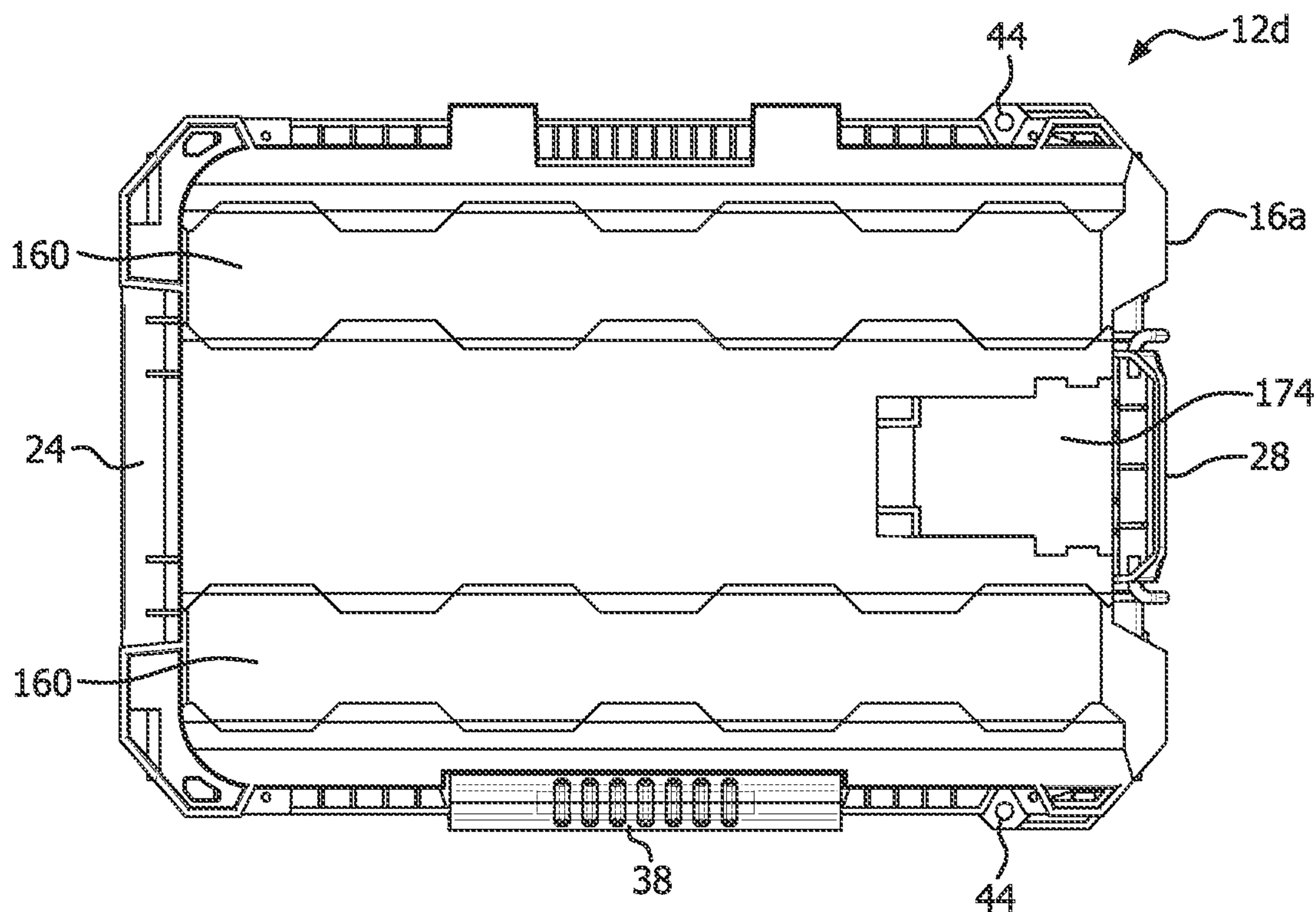


FIG. 18C

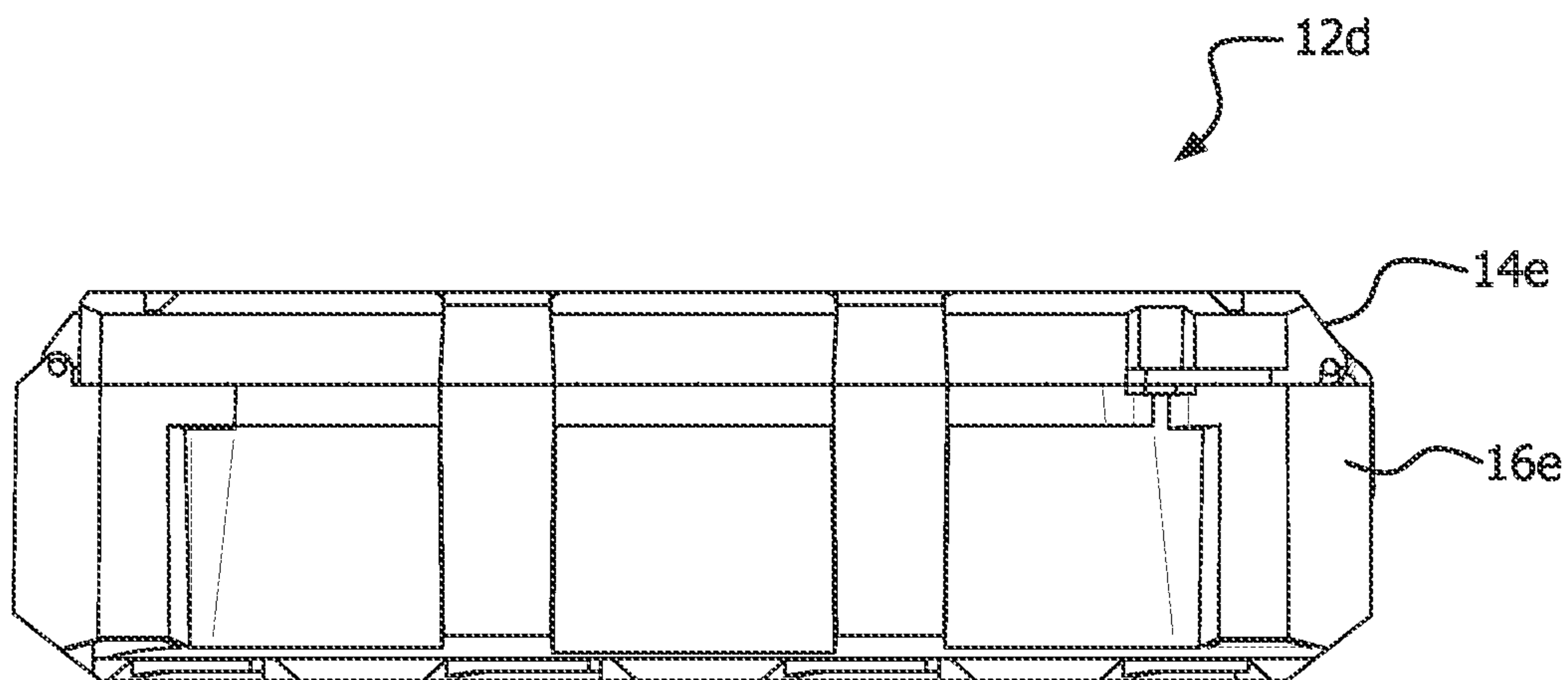


FIG. 18D

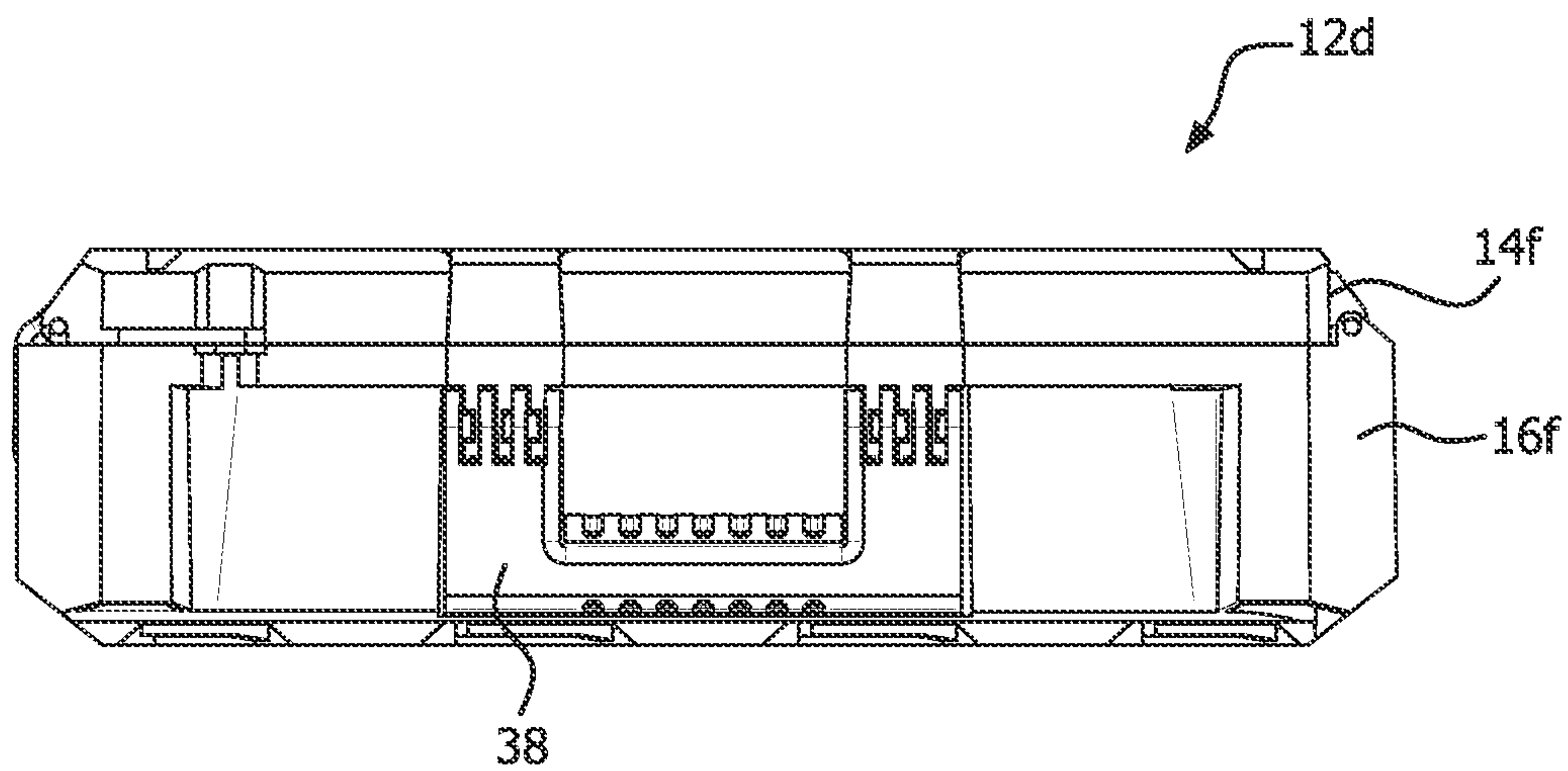


FIG. 18E

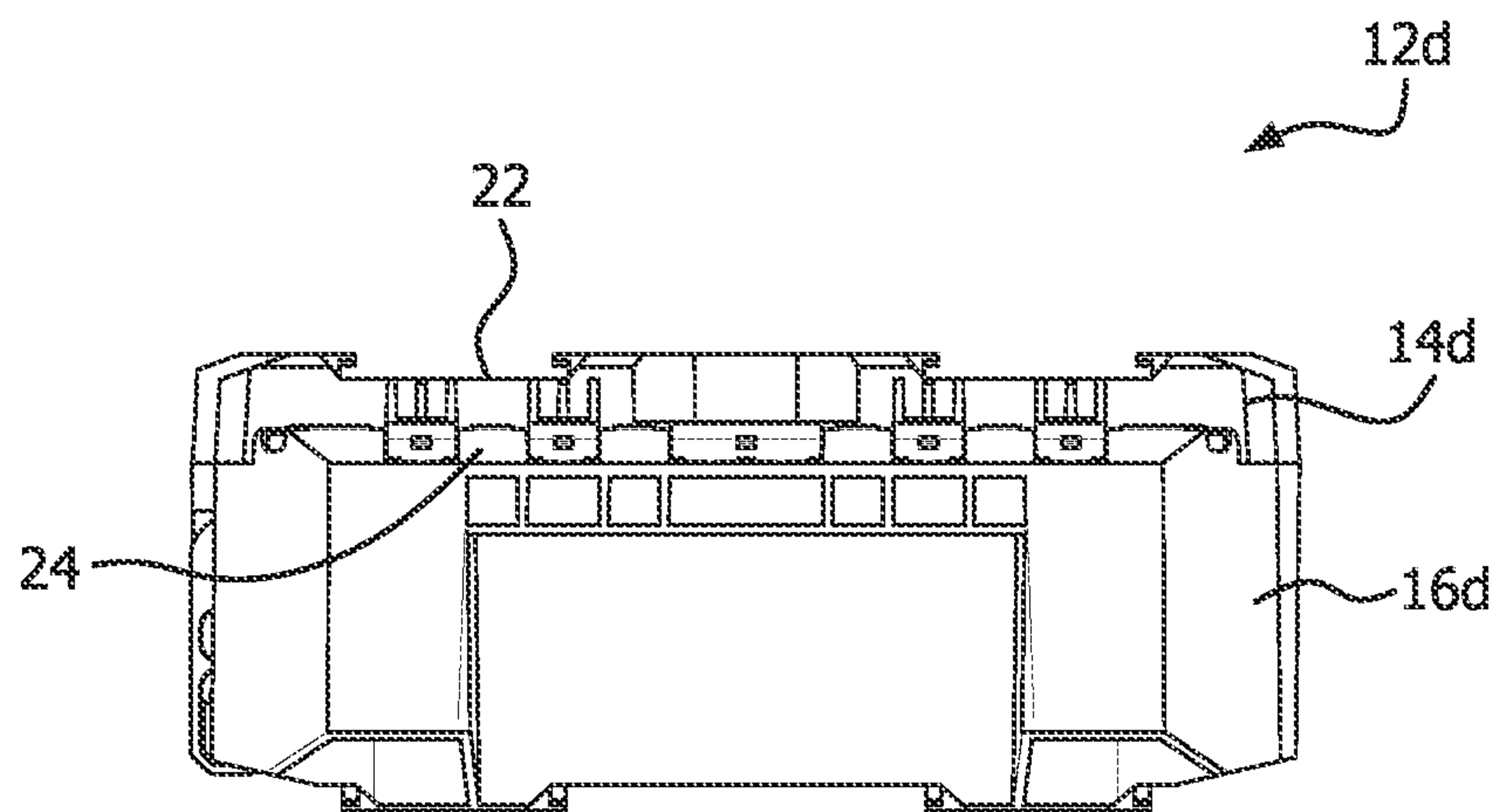


FIG. 18F

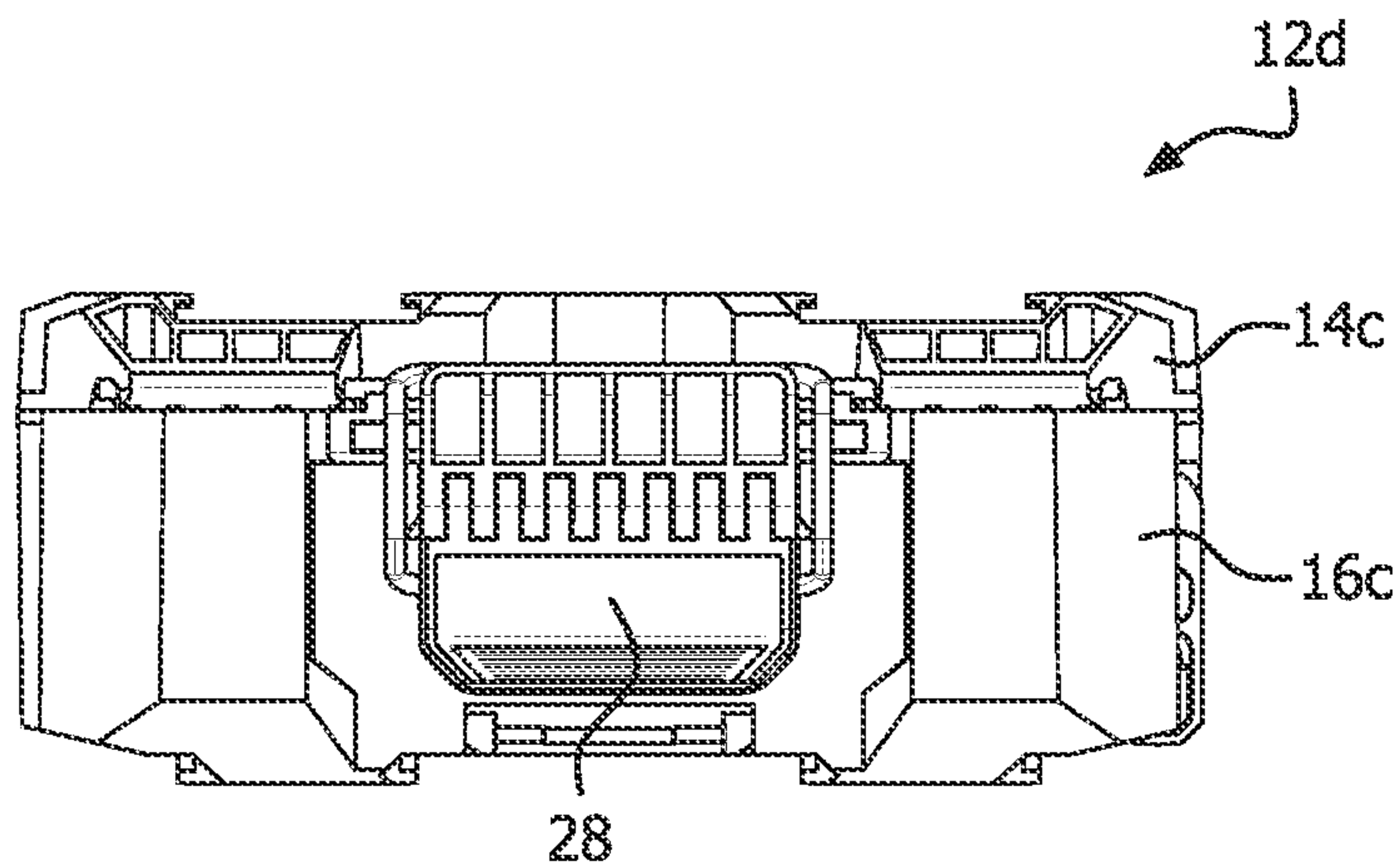


FIG. 18G

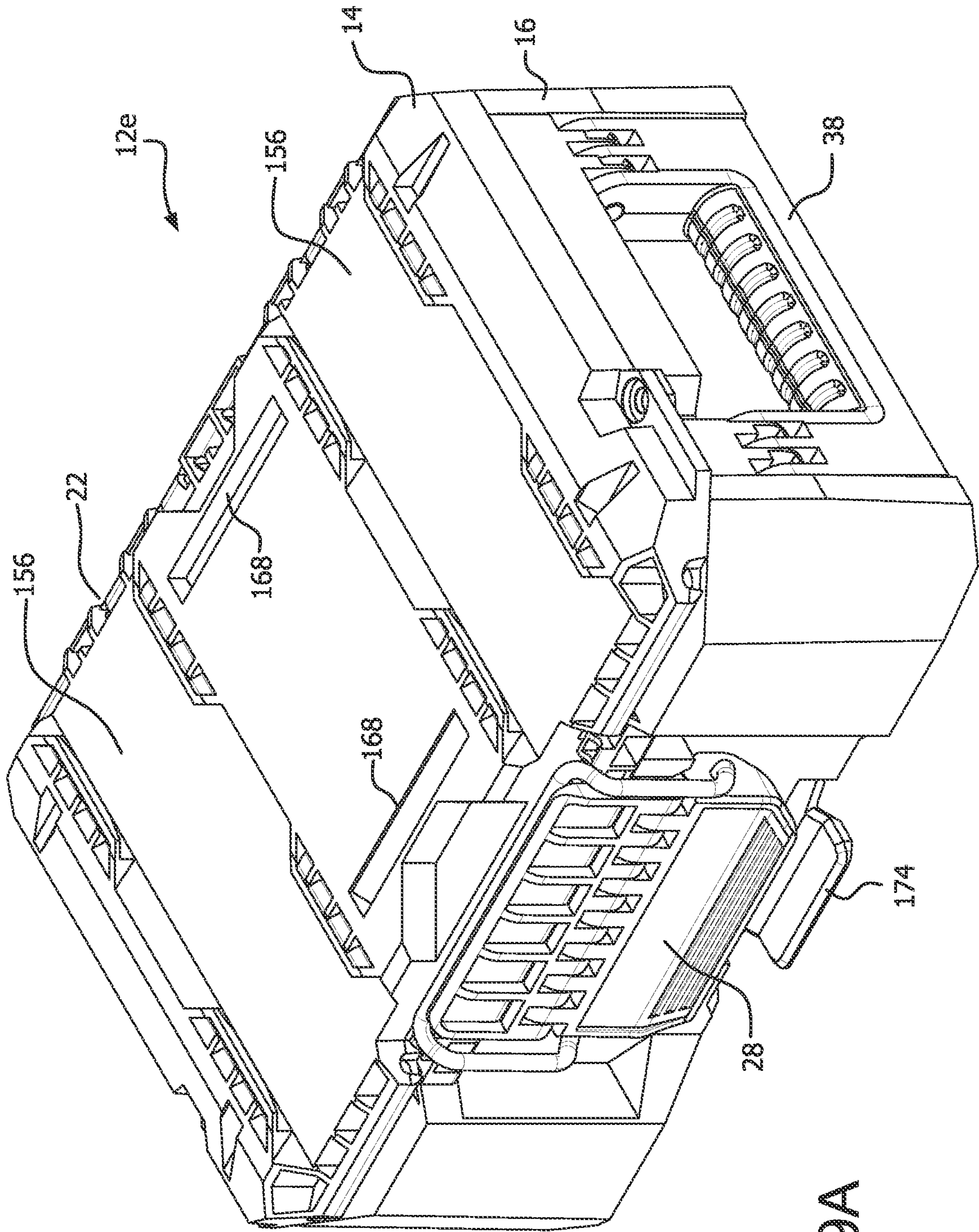


FIG. 19A

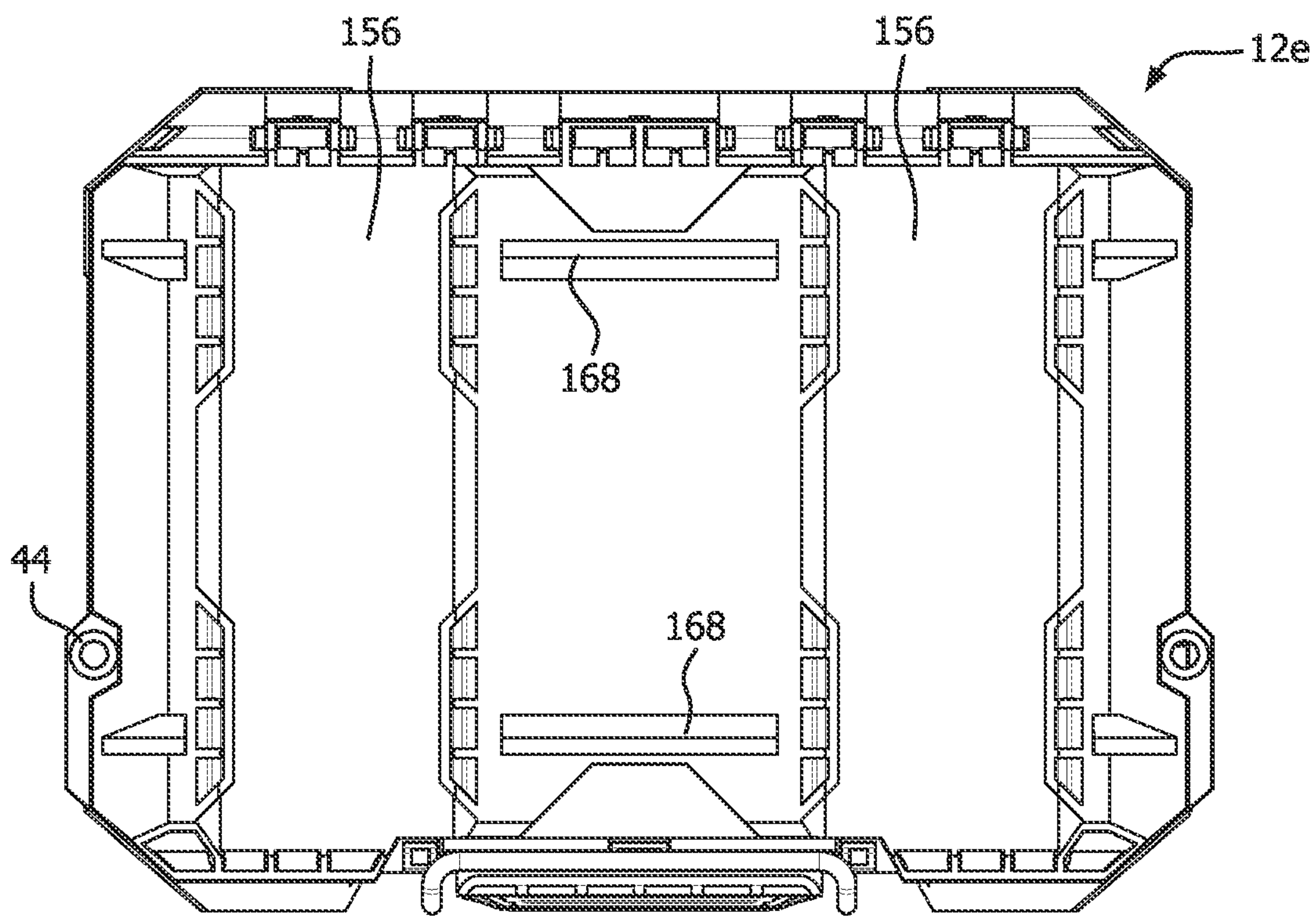


FIG. 19B

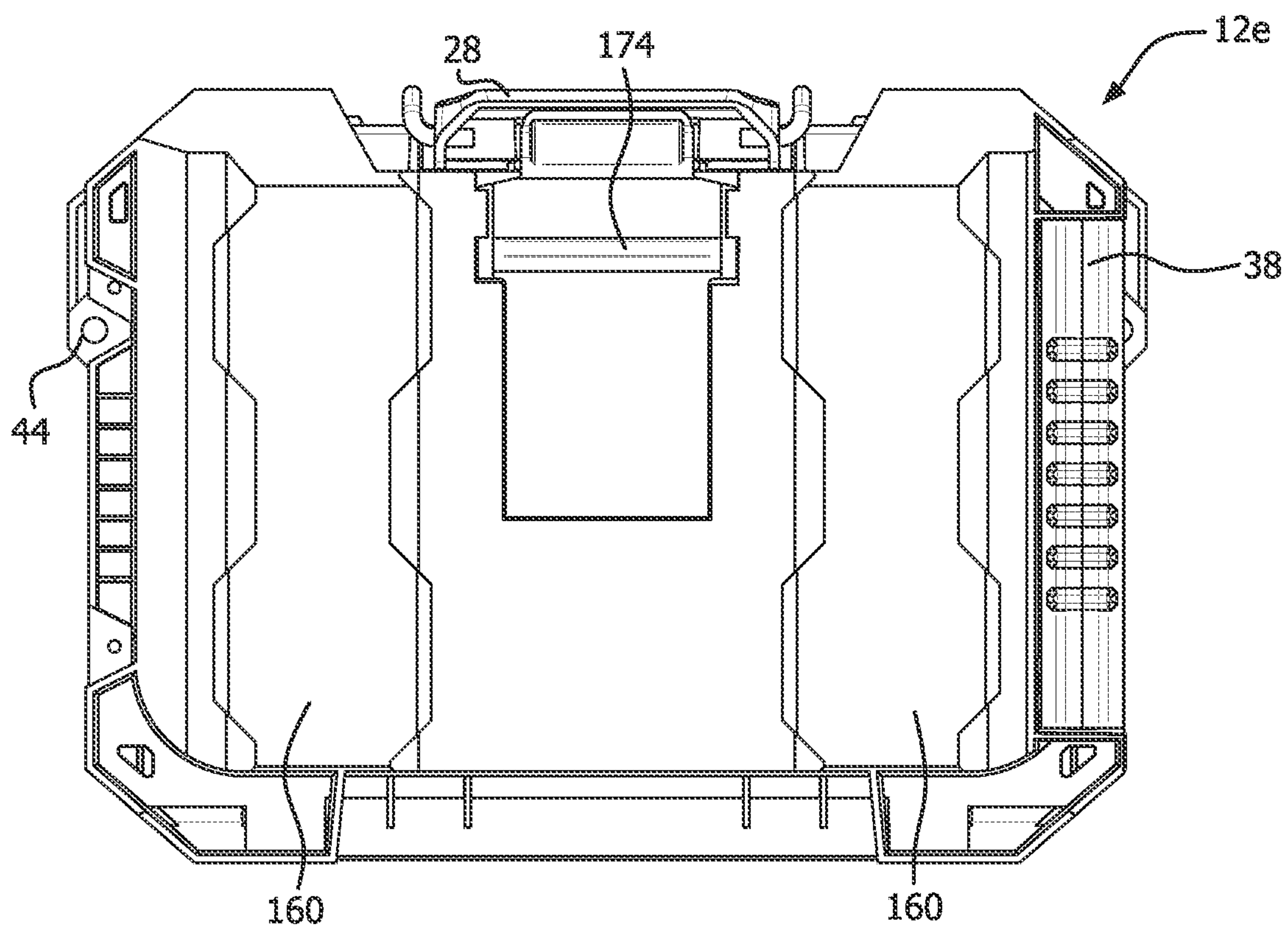


FIG. 19C

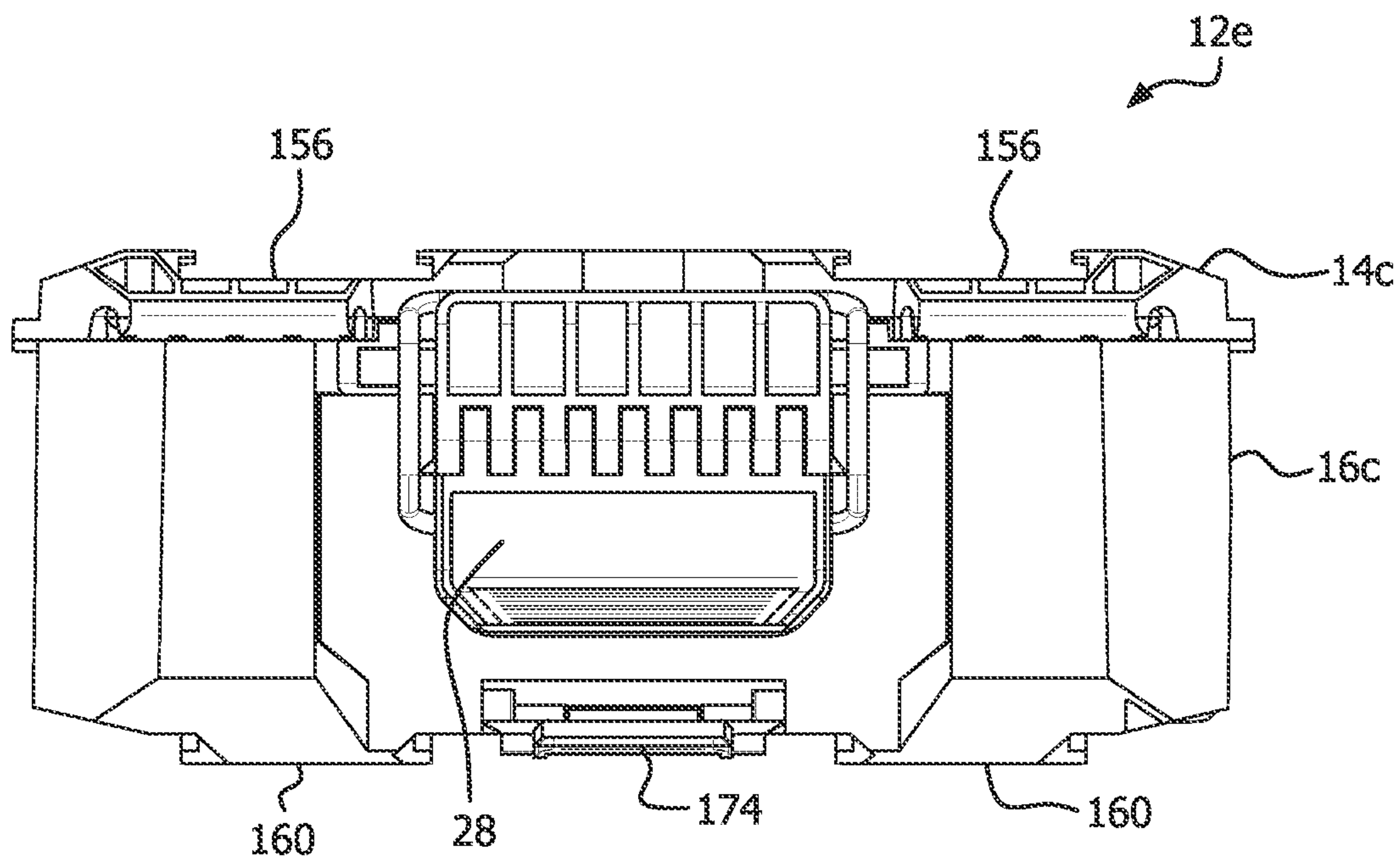


FIG. 19D

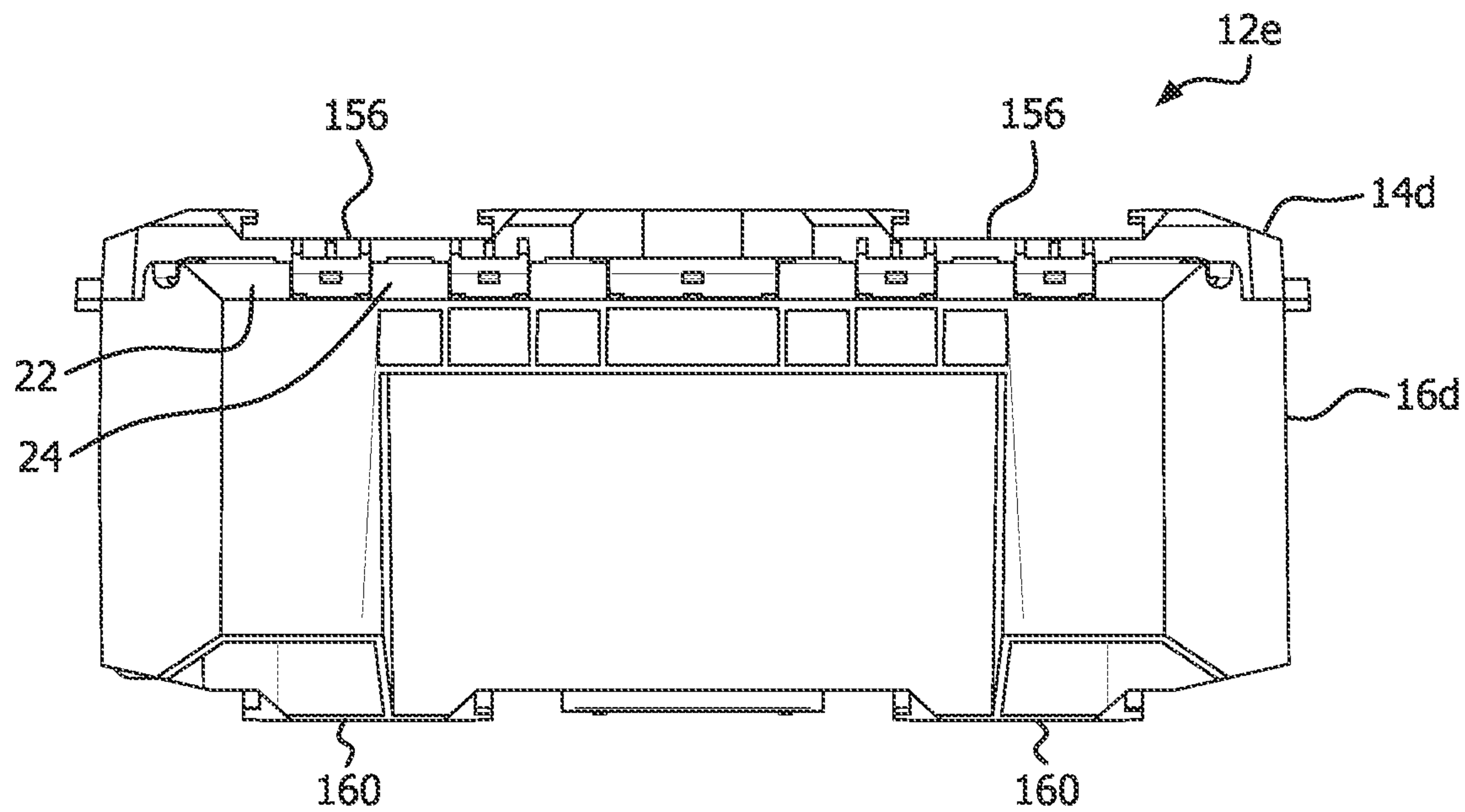


FIG. 19E

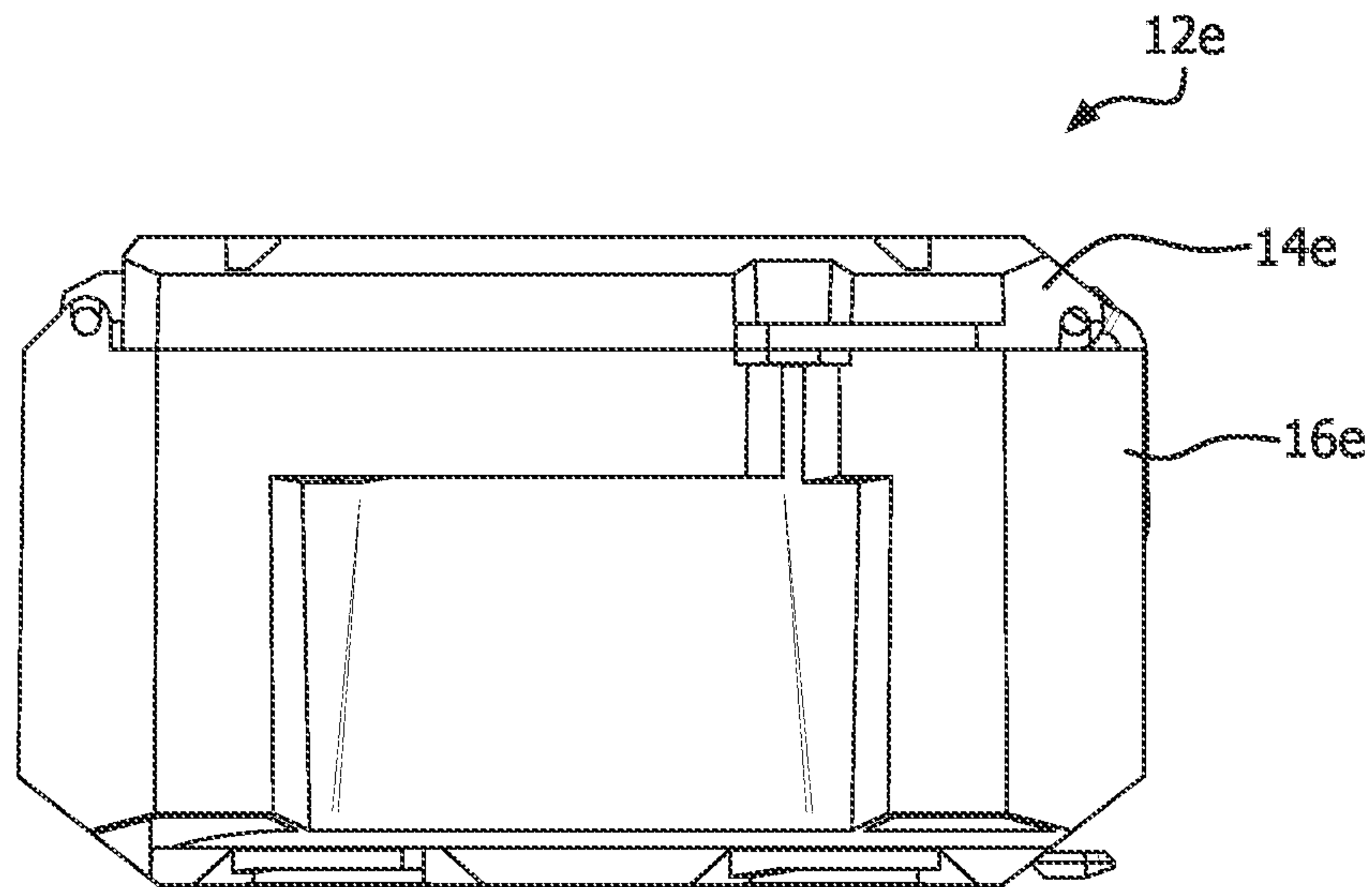


FIG. 19F

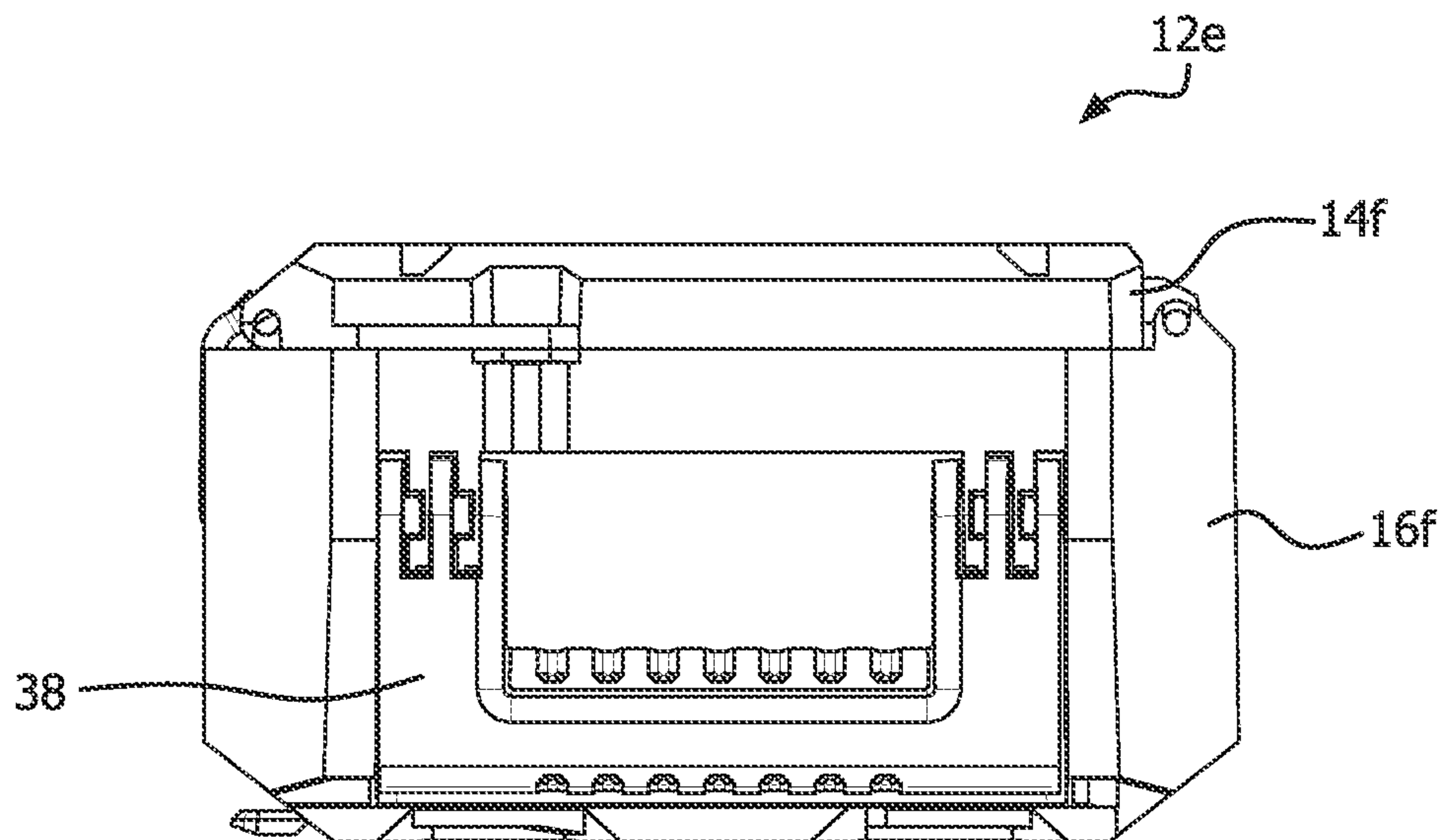


FIG. 19G

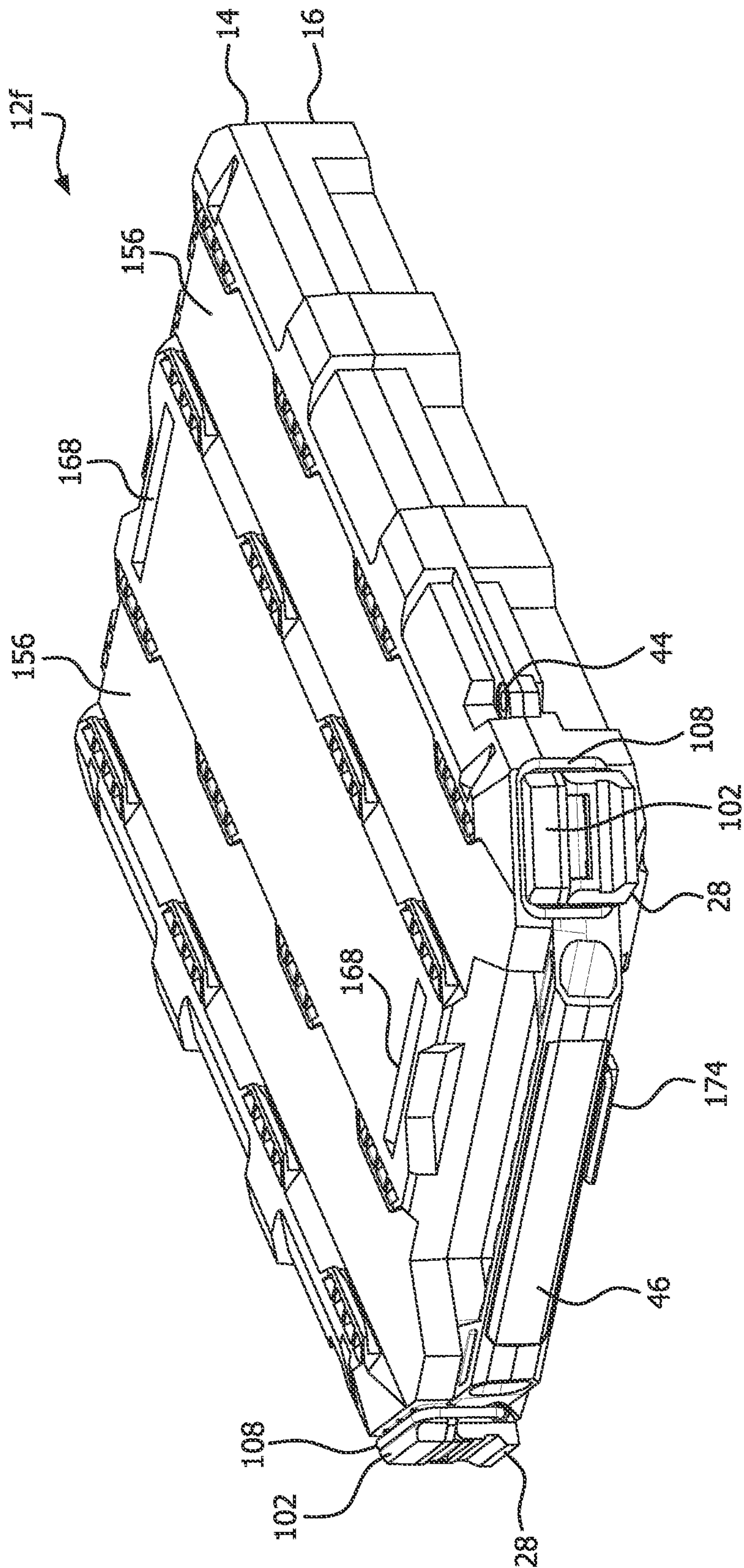


FIG. 20A

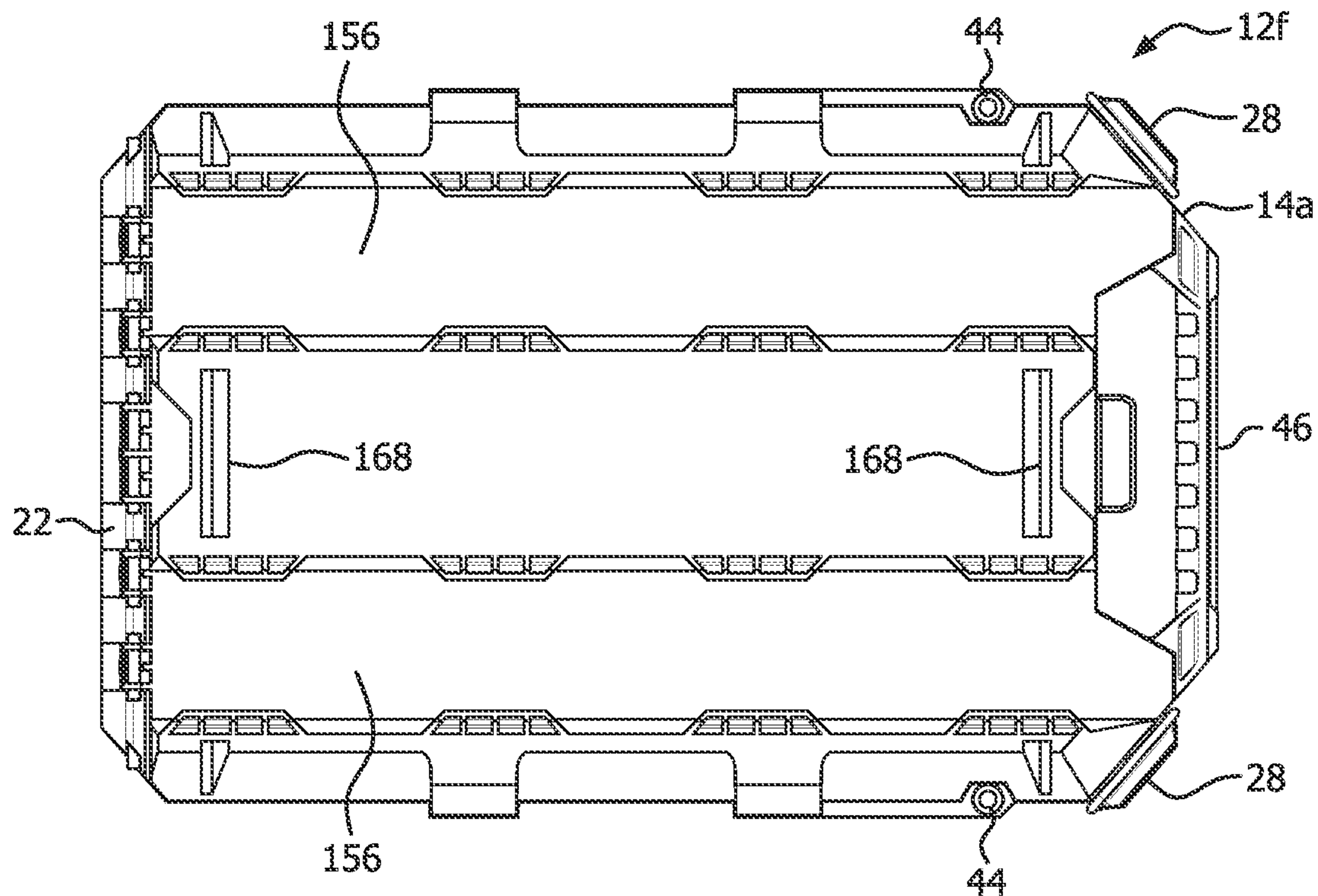


FIG. 20B

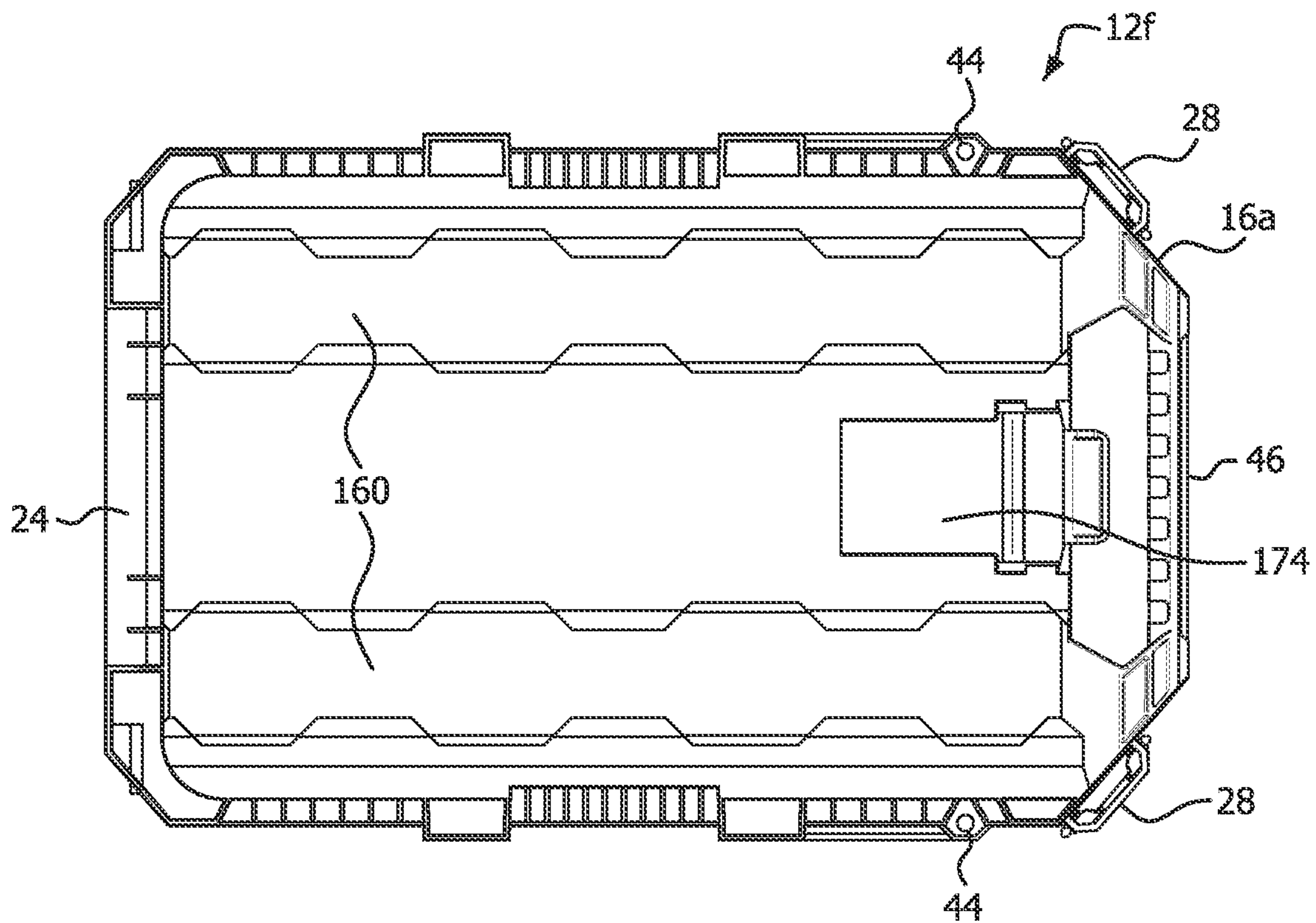


FIG. 20C

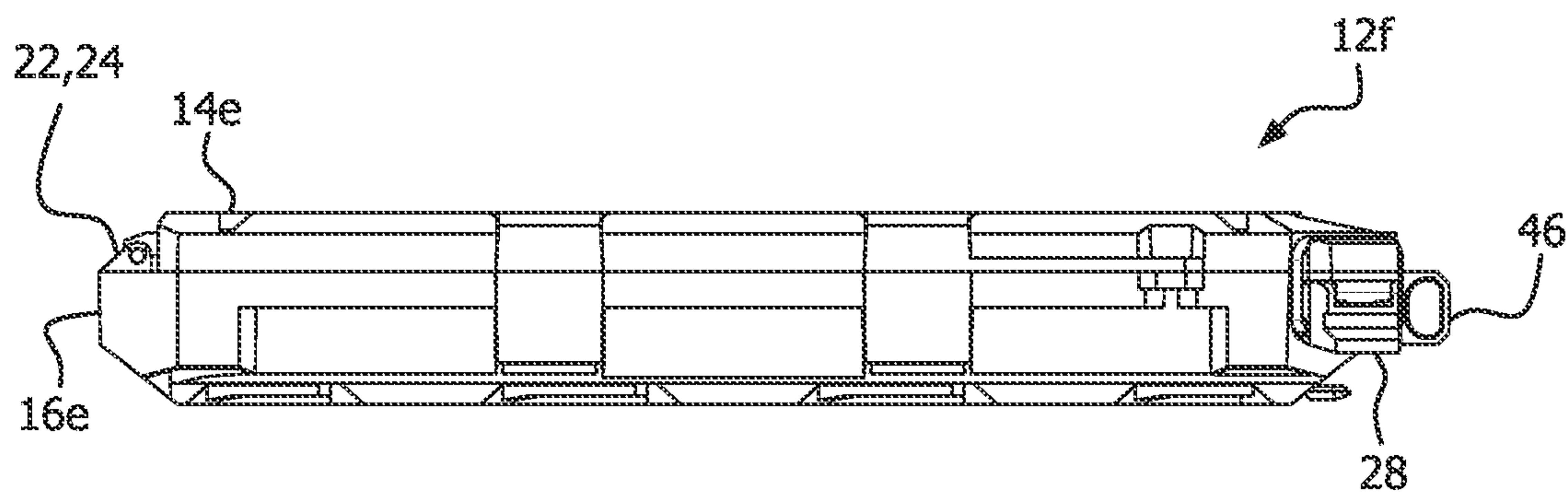


FIG. 20D

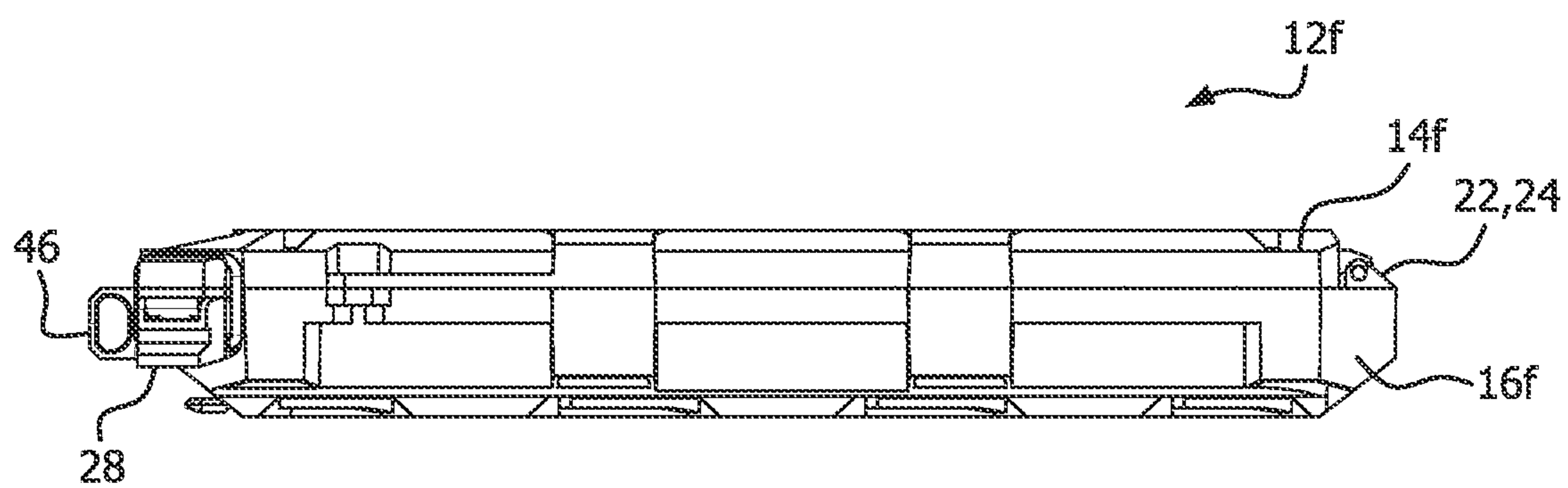


FIG. 20E

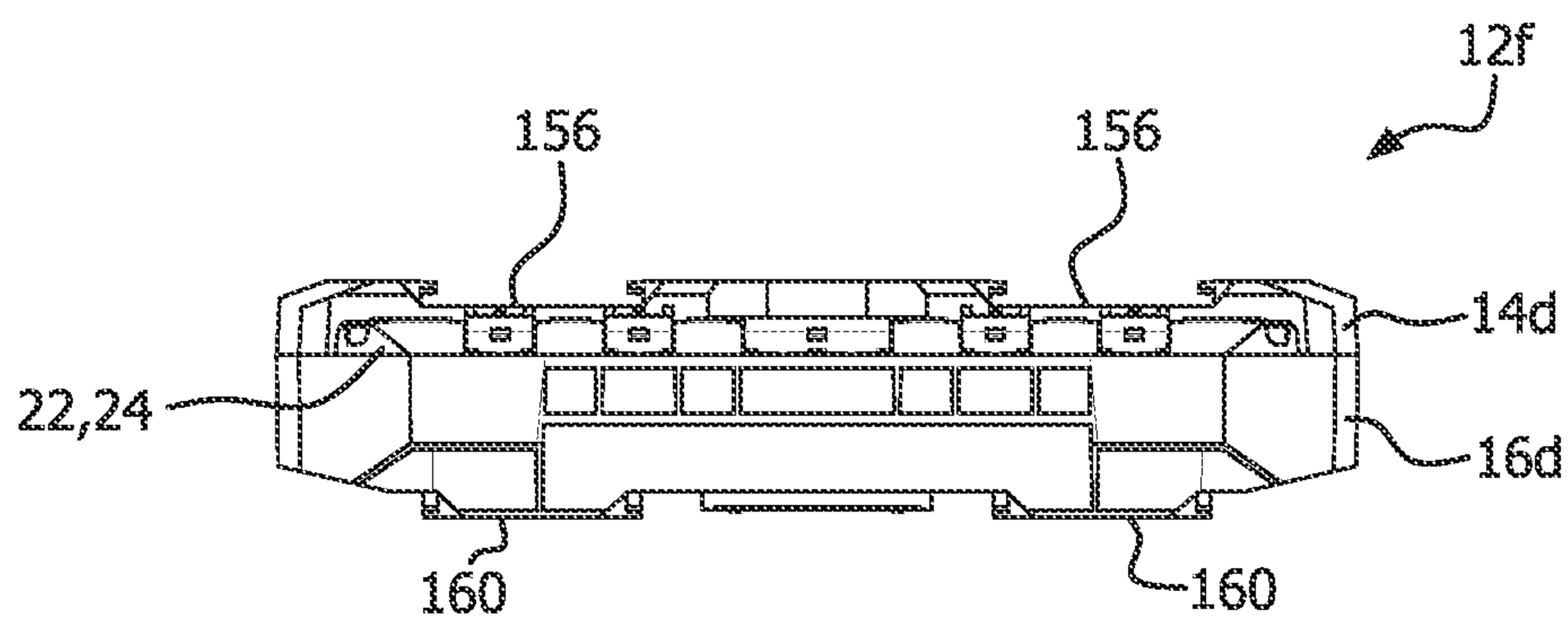


FIG. 20F

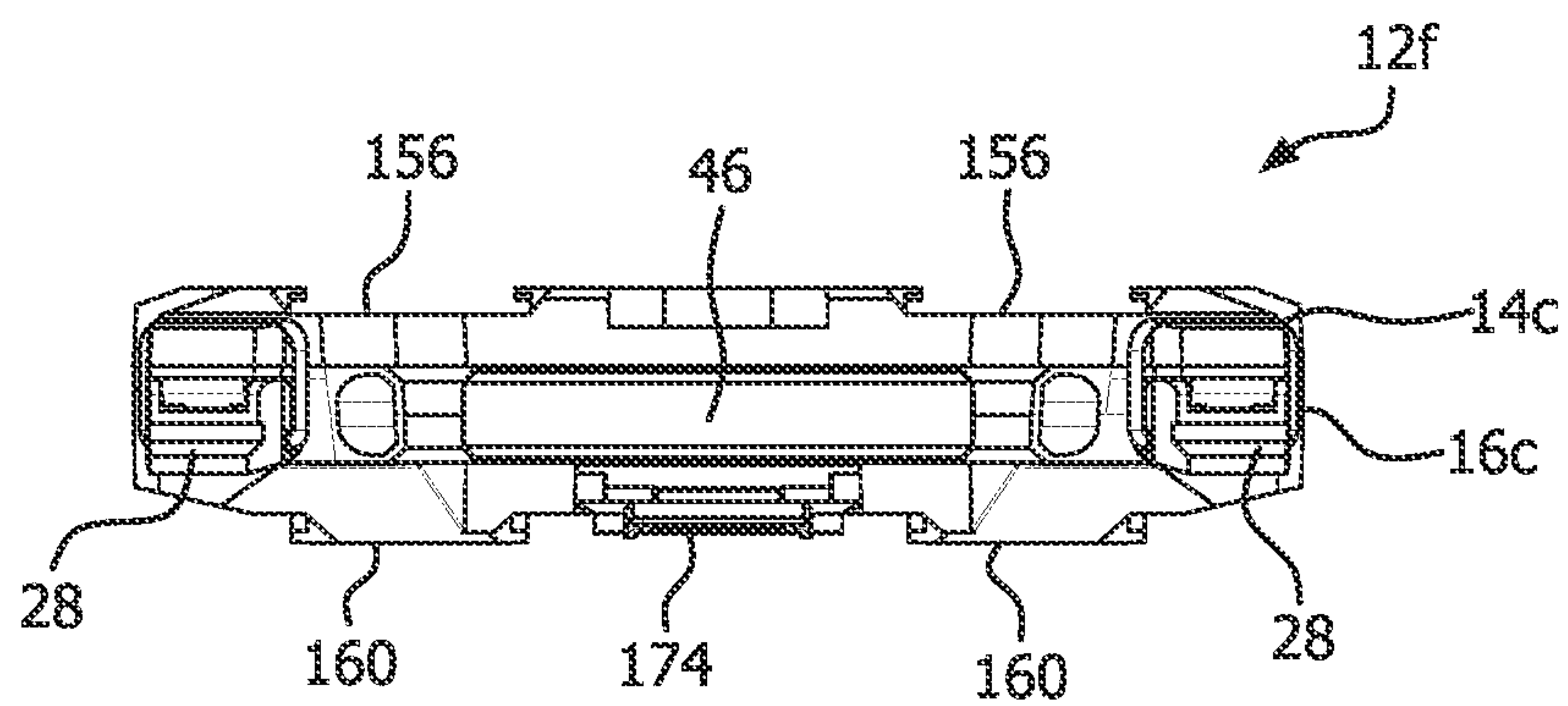


FIG. 20G

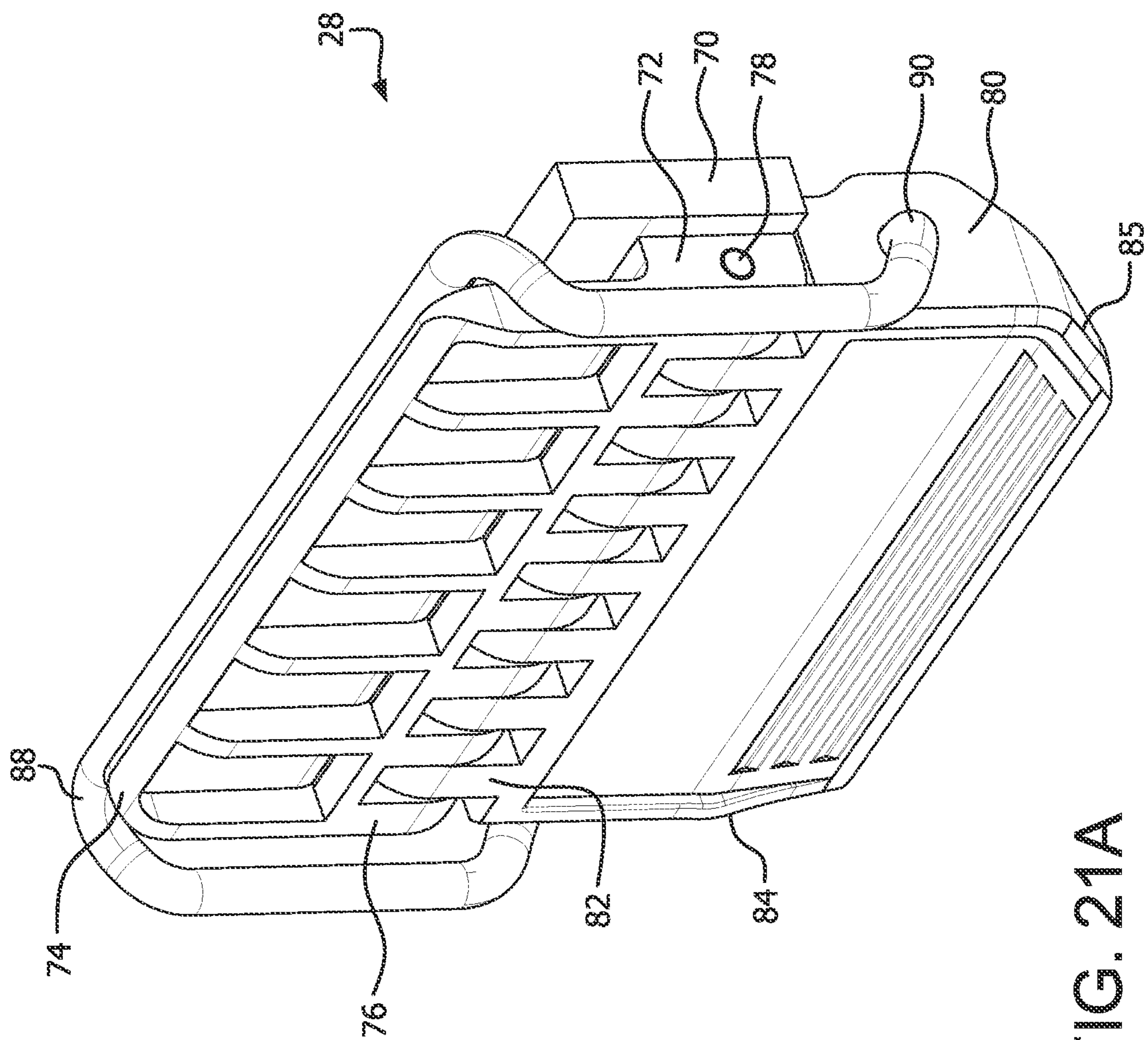


FIG. 21A

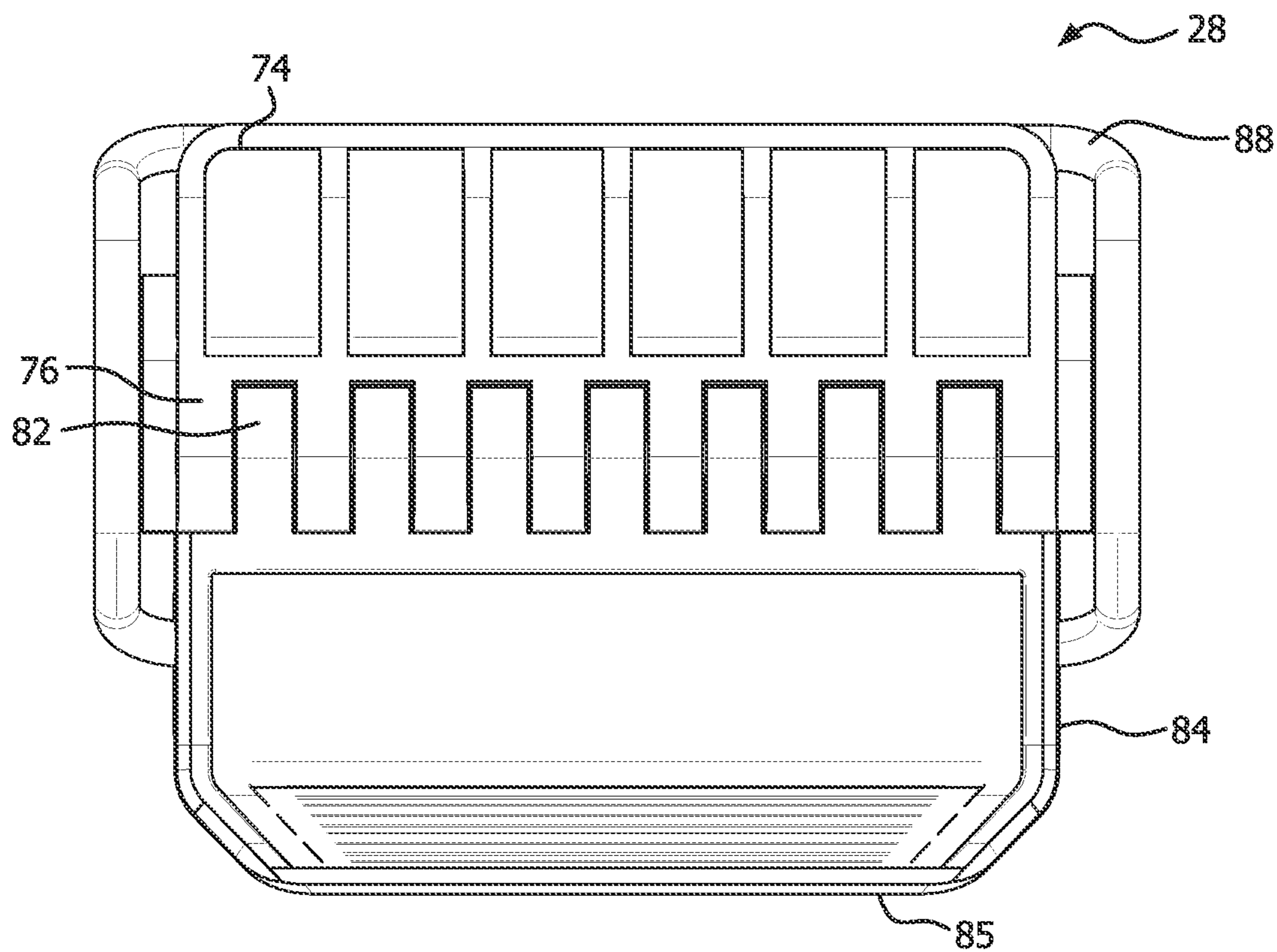


FIG. 21B

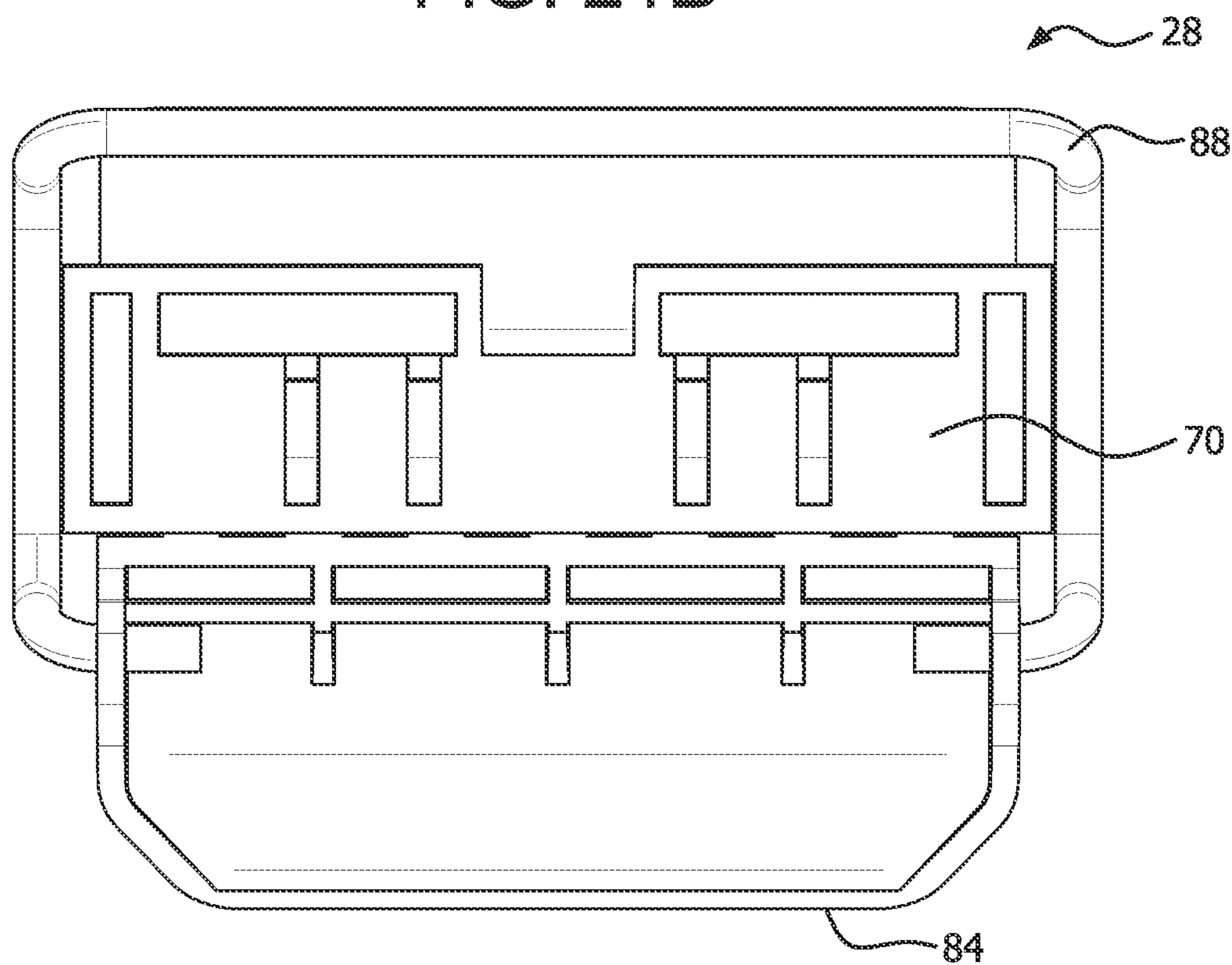


FIG. 21C

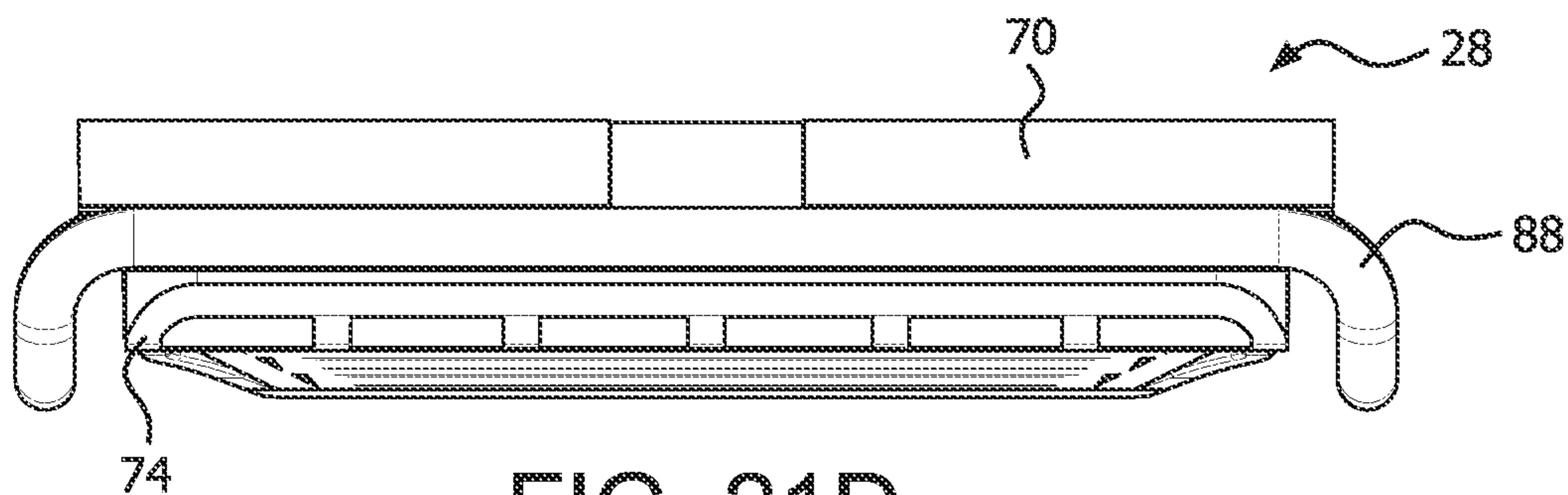


FIG. 21D

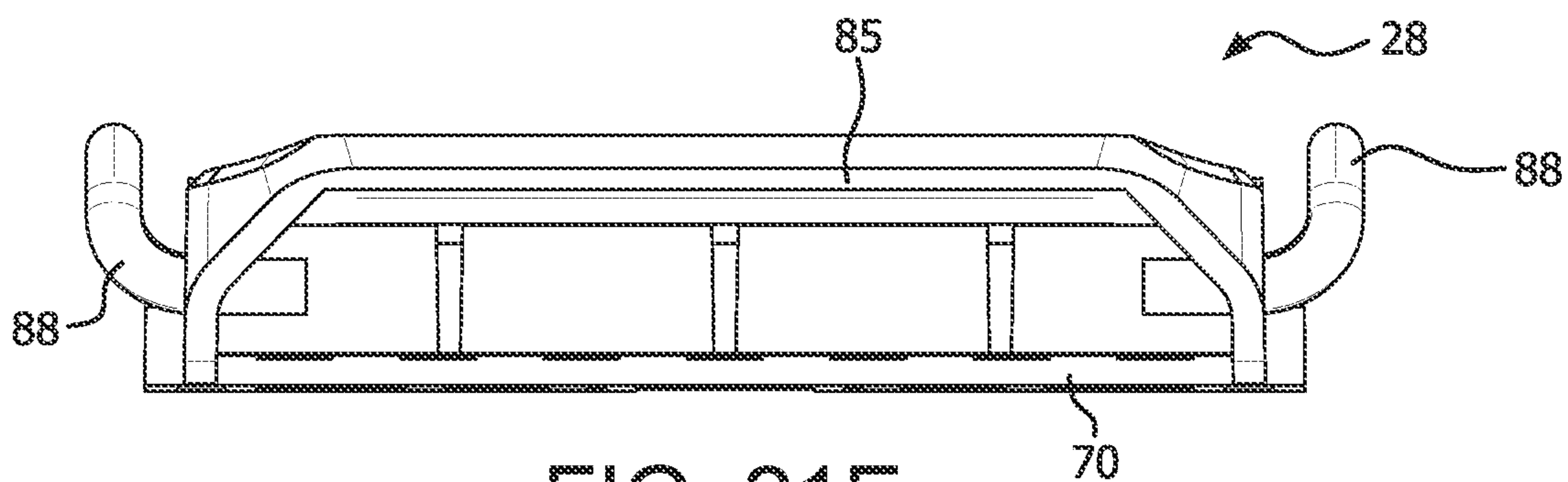


FIG. 21E

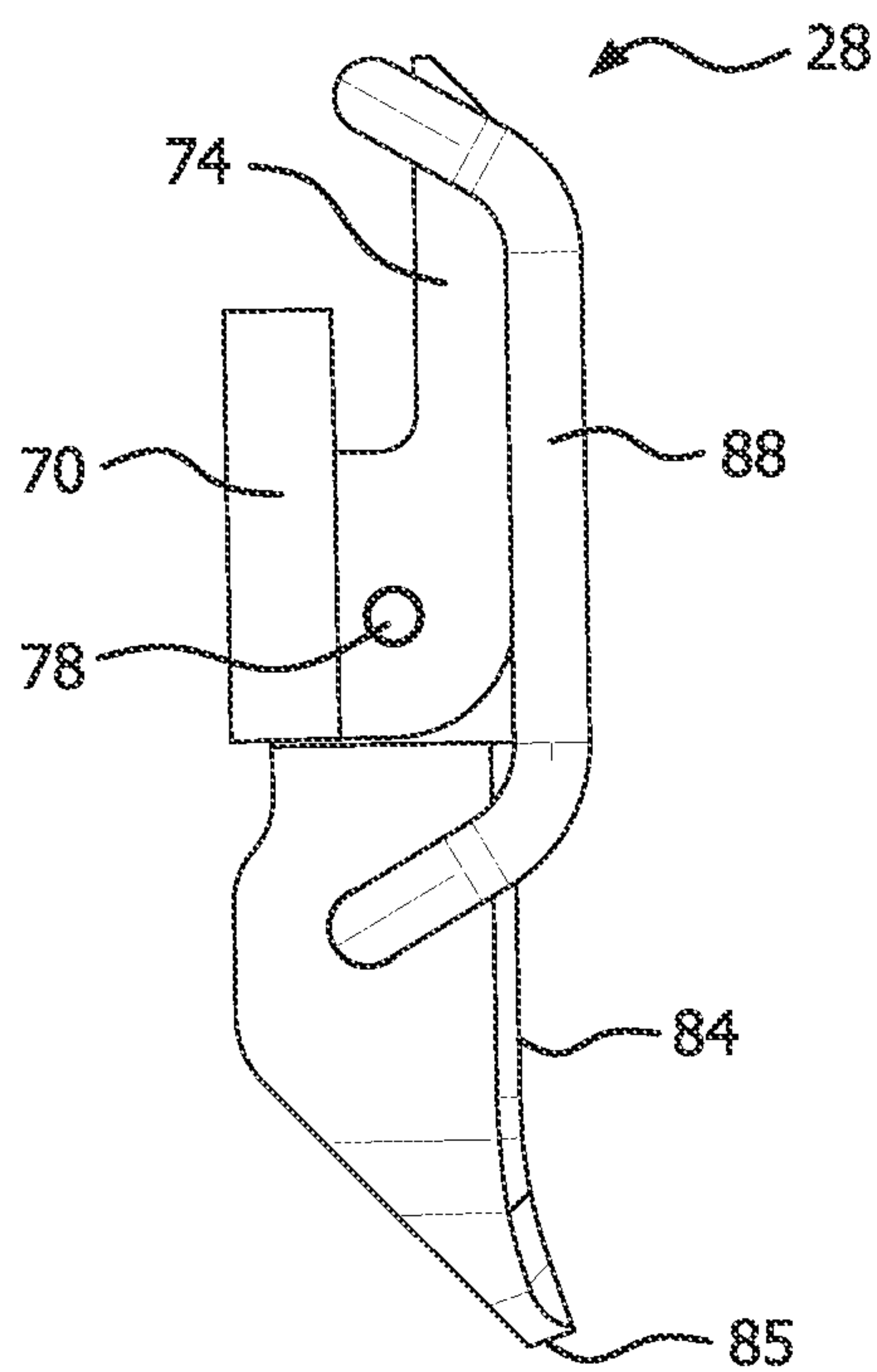


FIG. 21F

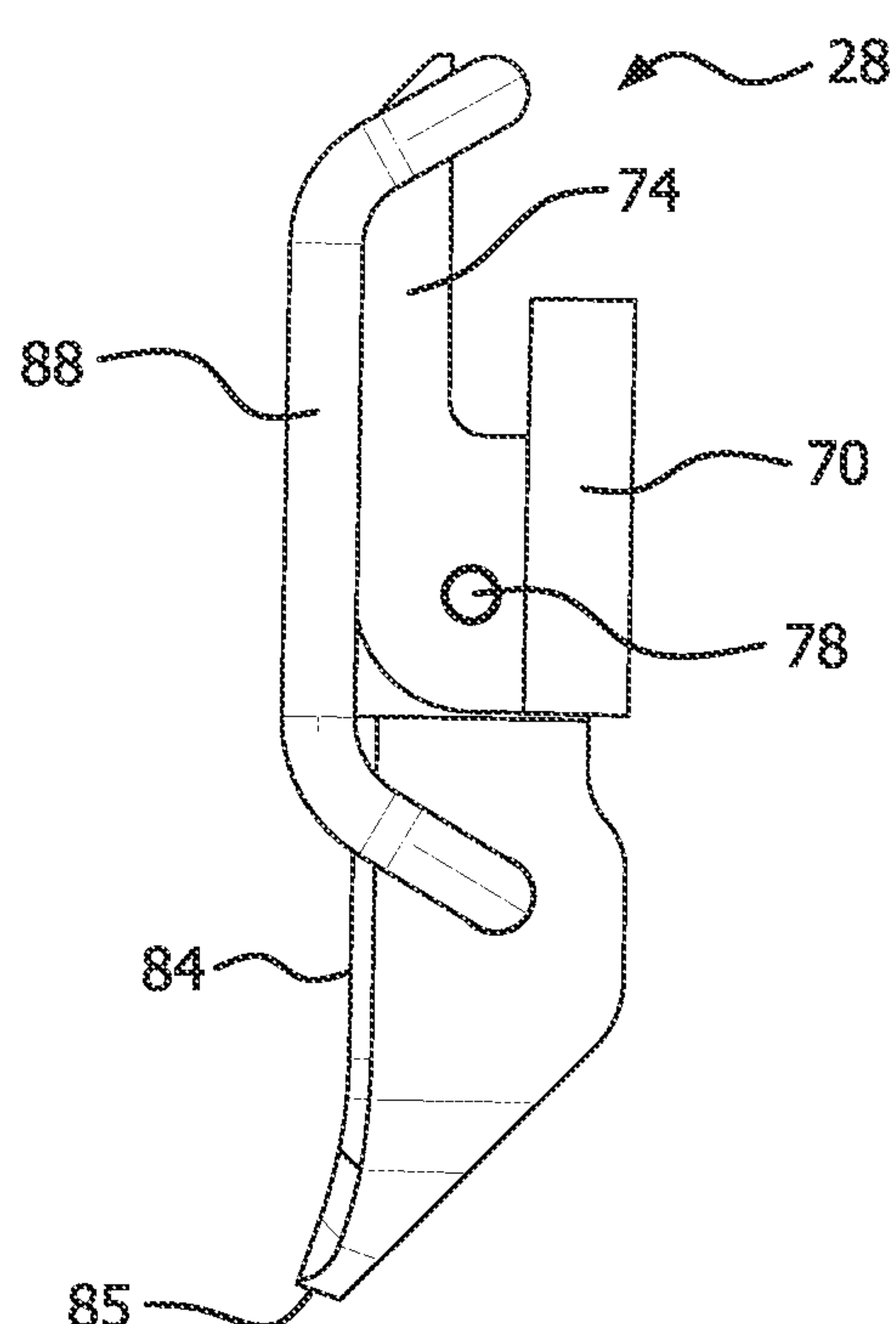


FIG. 21G

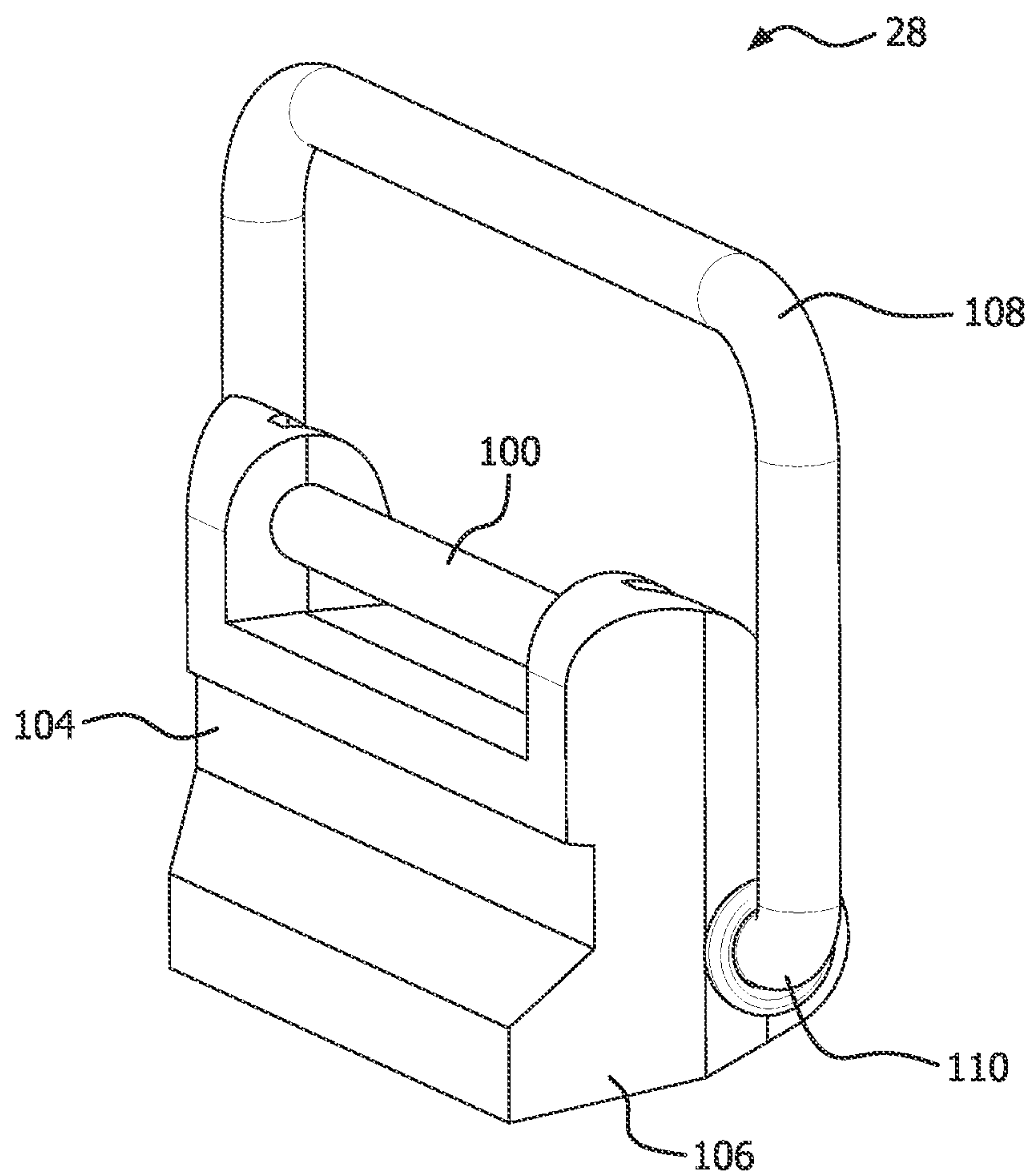


FIG. 22A

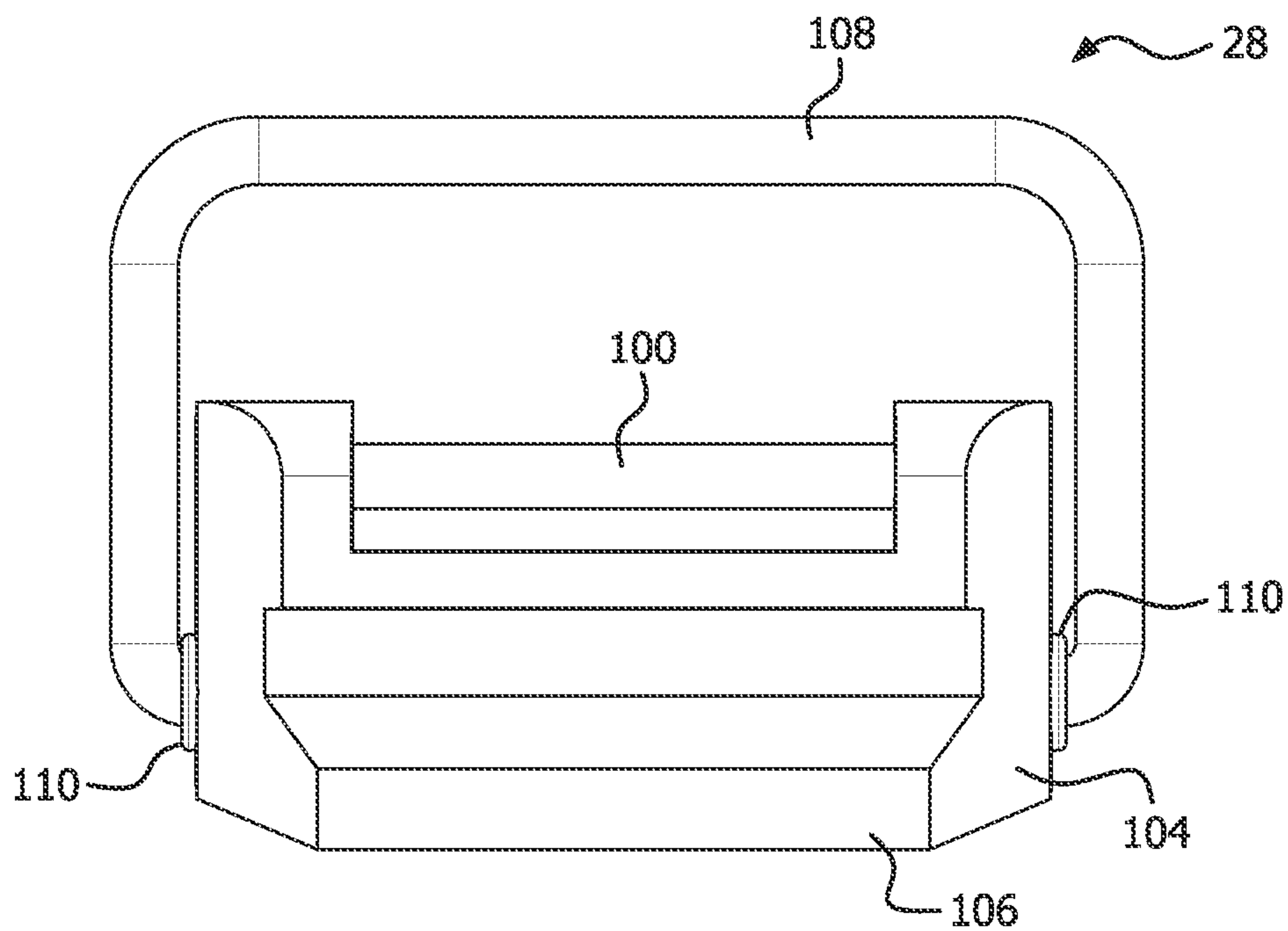


FIG. 22B

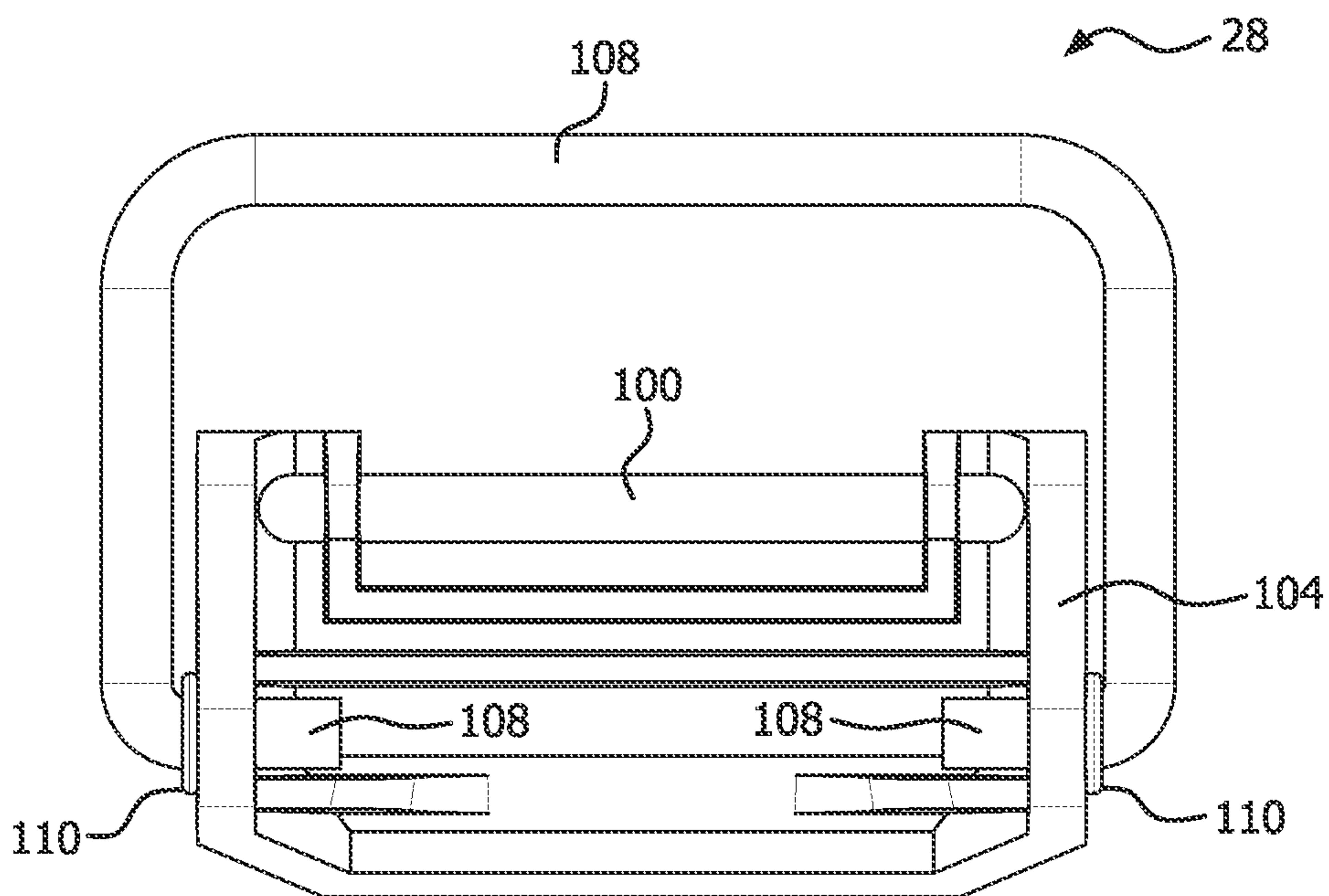


FIG. 22C

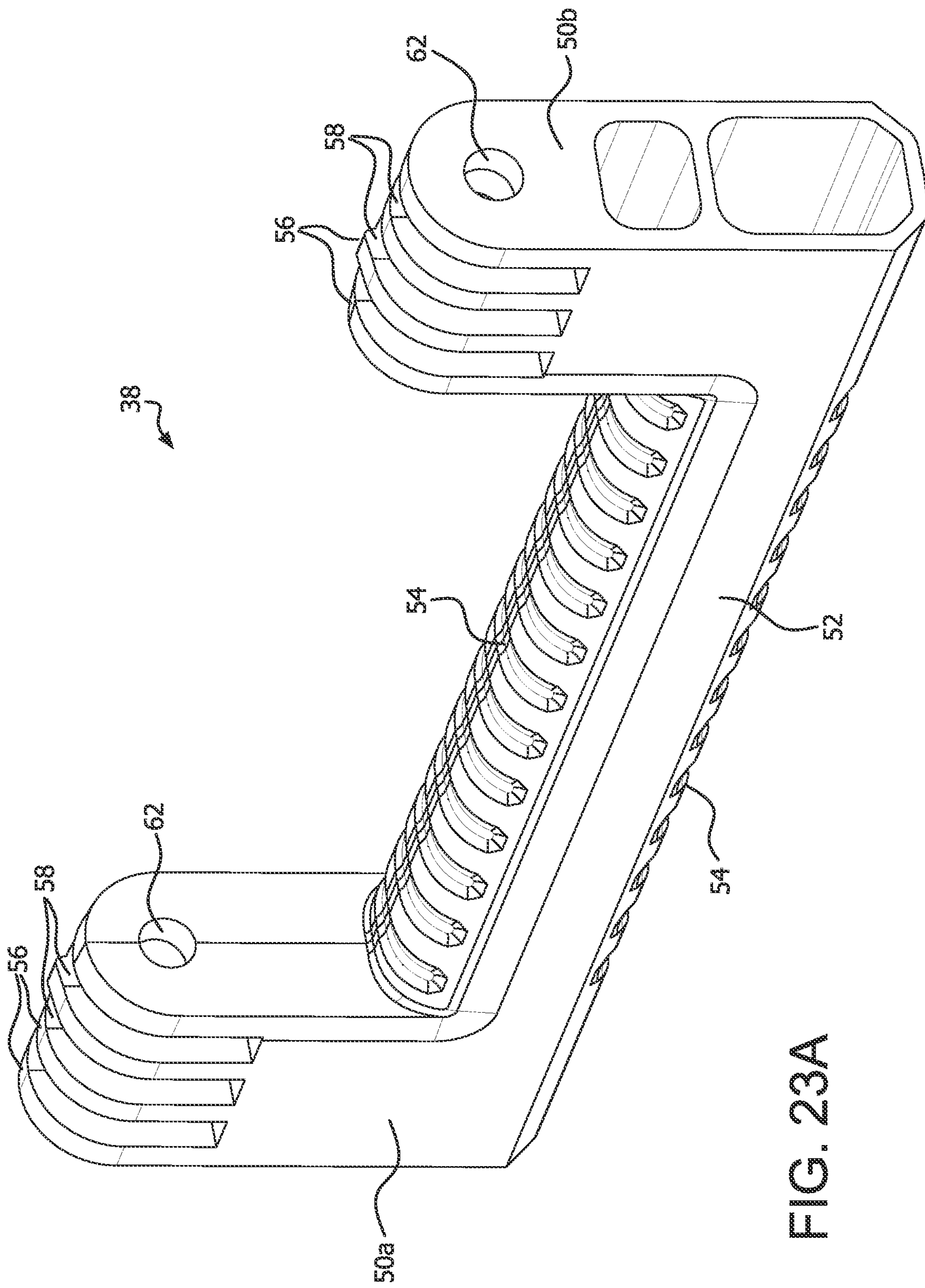


FIG. 23A

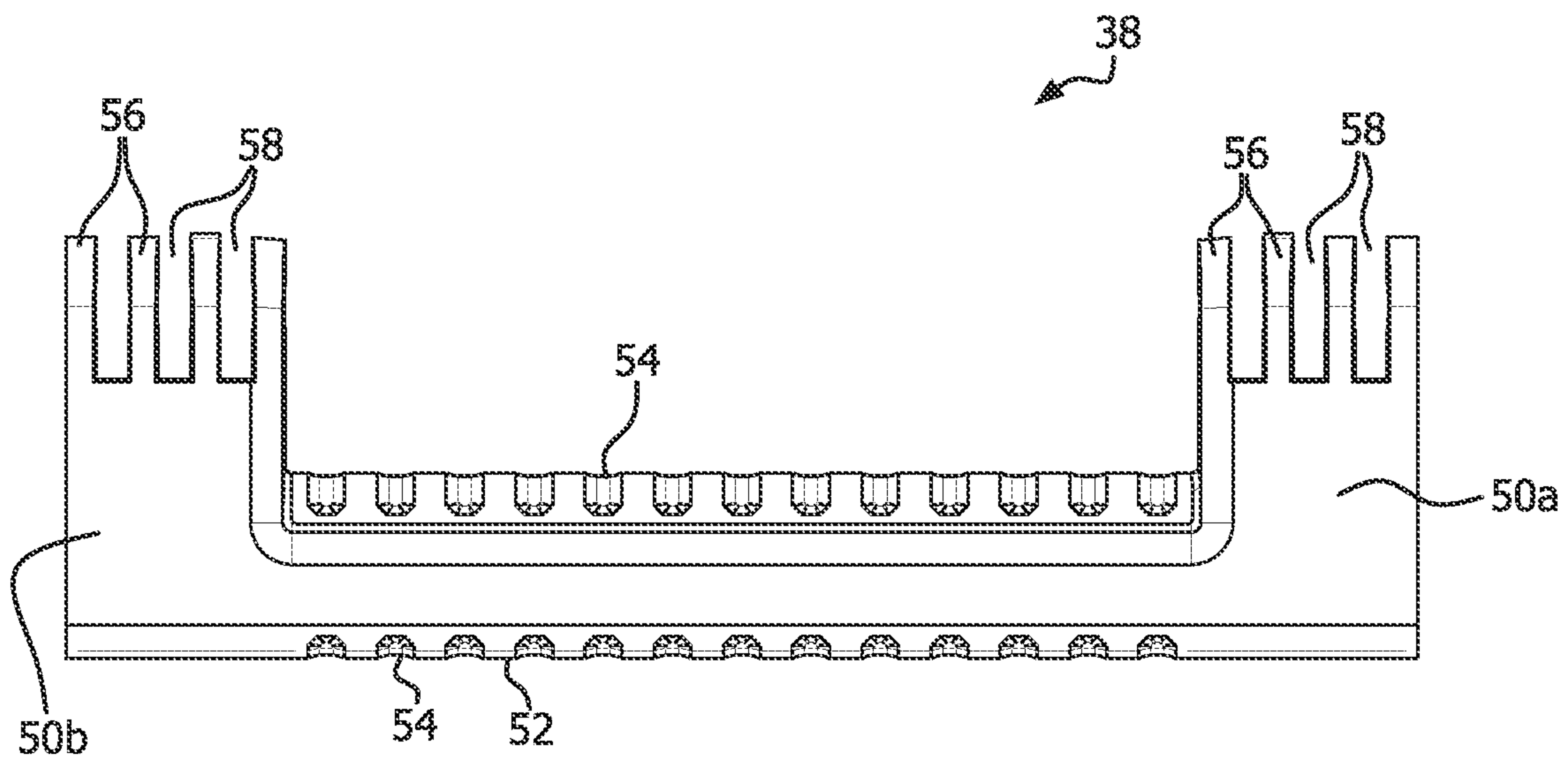


FIG. 23B

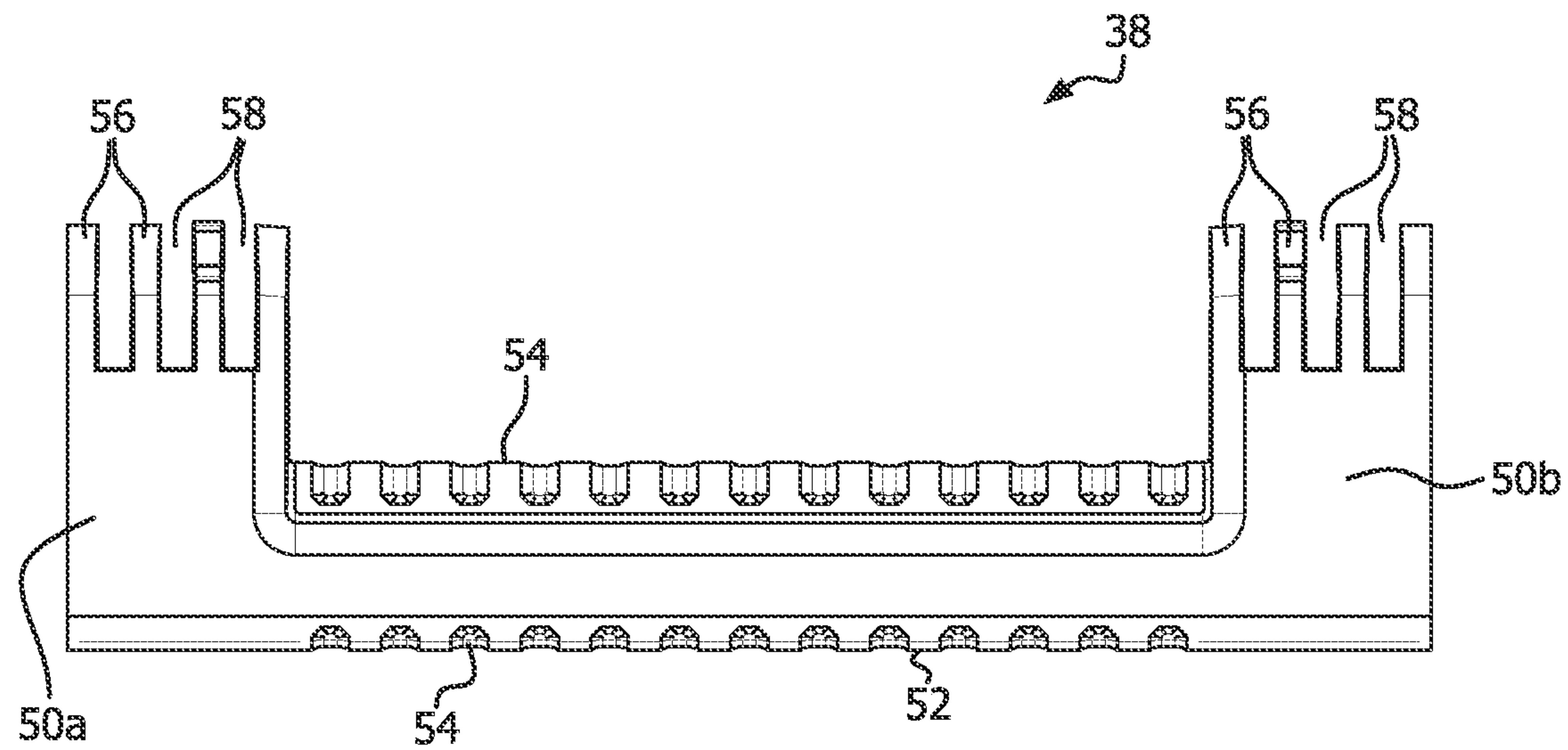


FIG. 23C

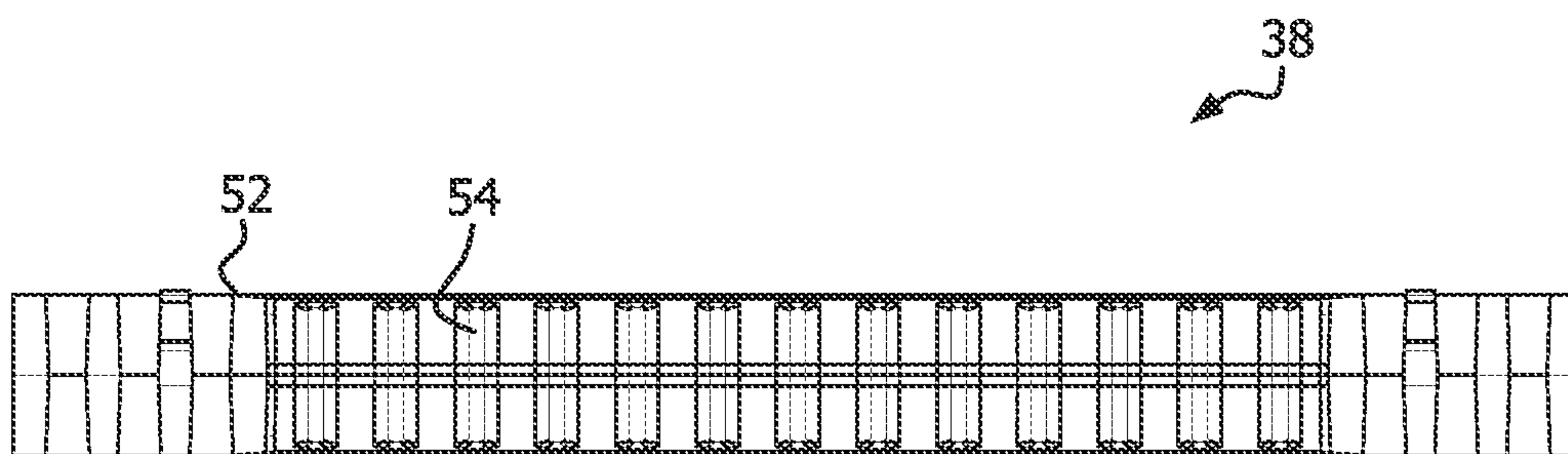


FIG. 23D

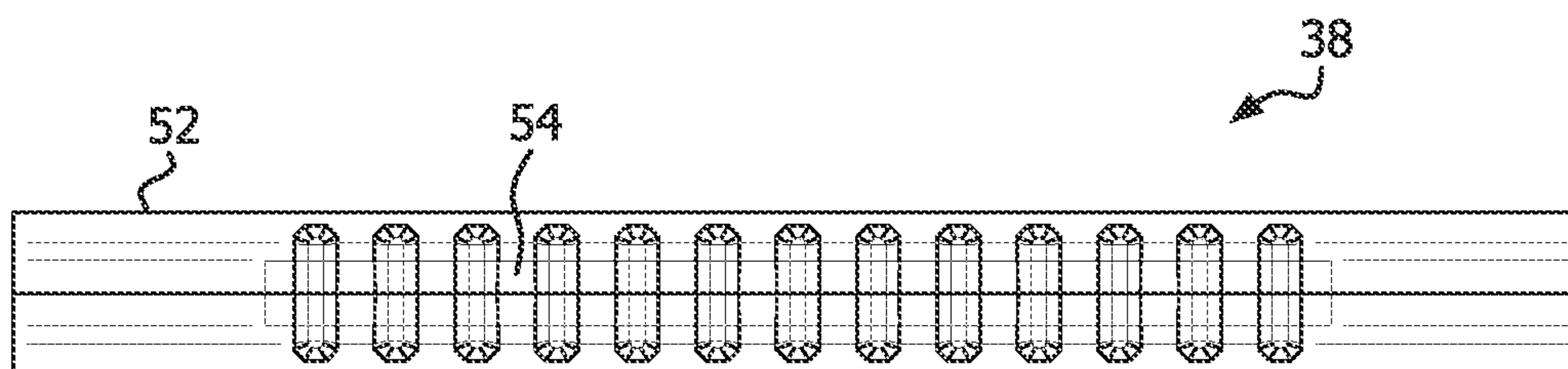


FIG. 23E

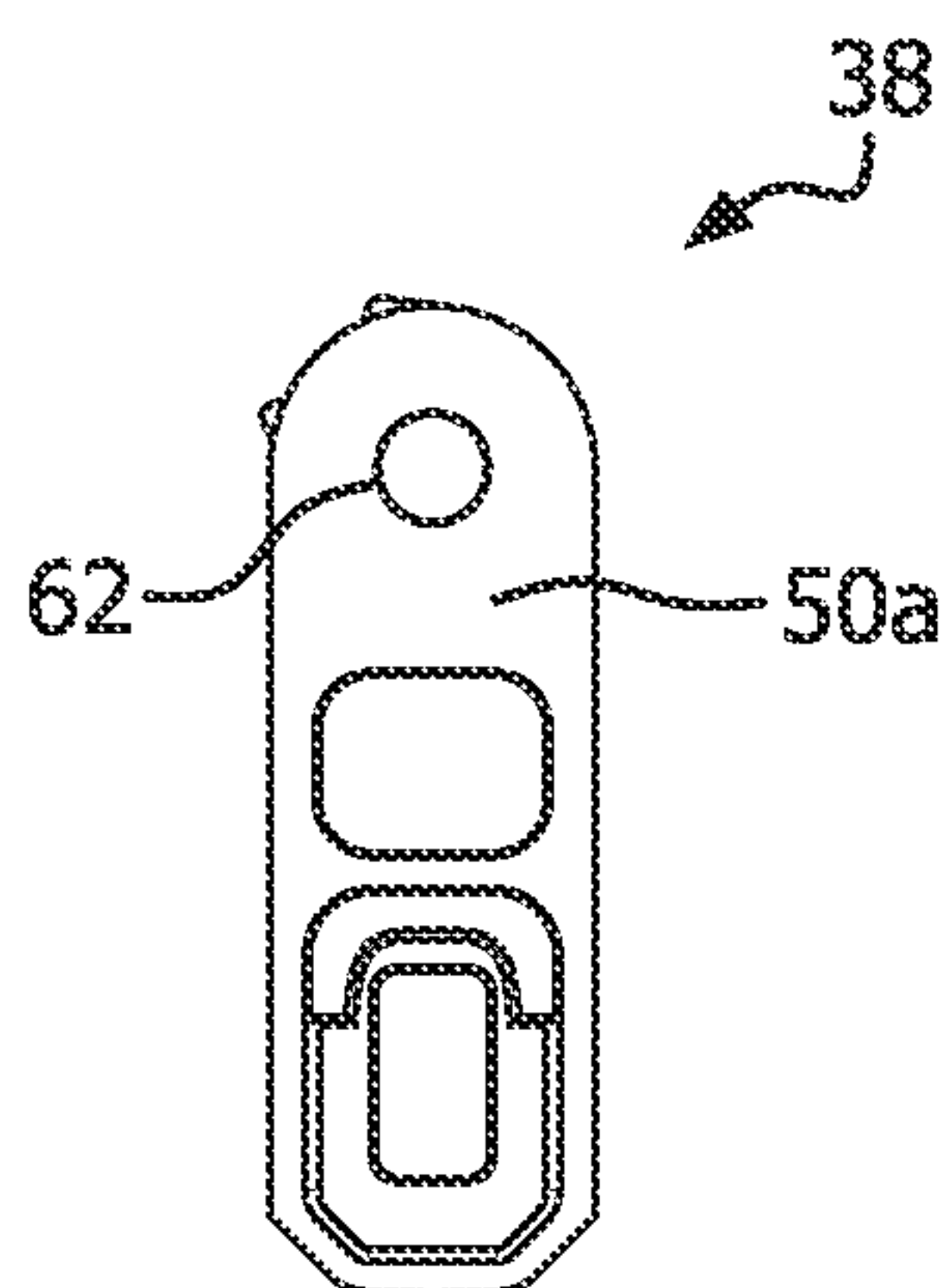


FIG. 23F

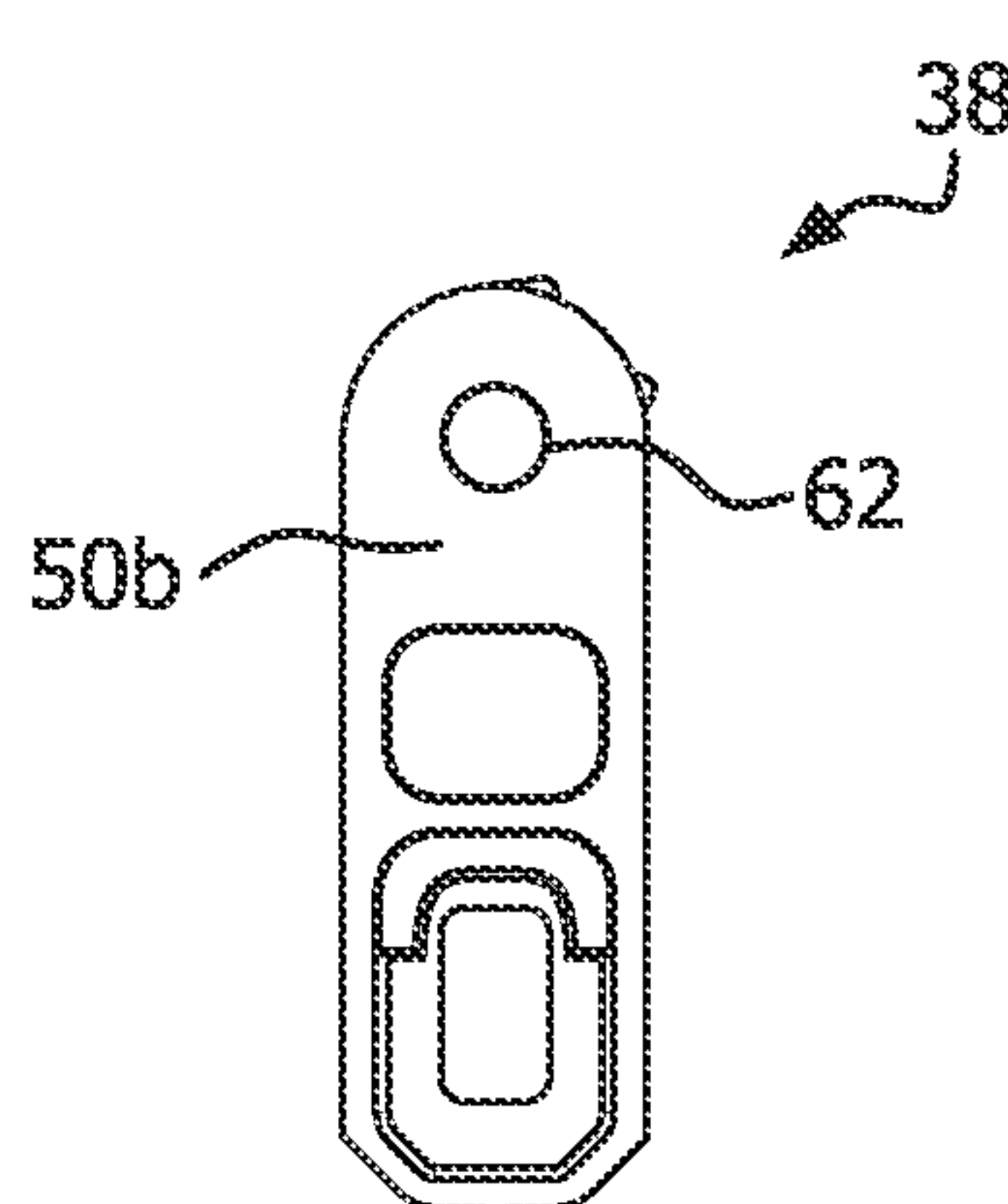


FIG. 23G

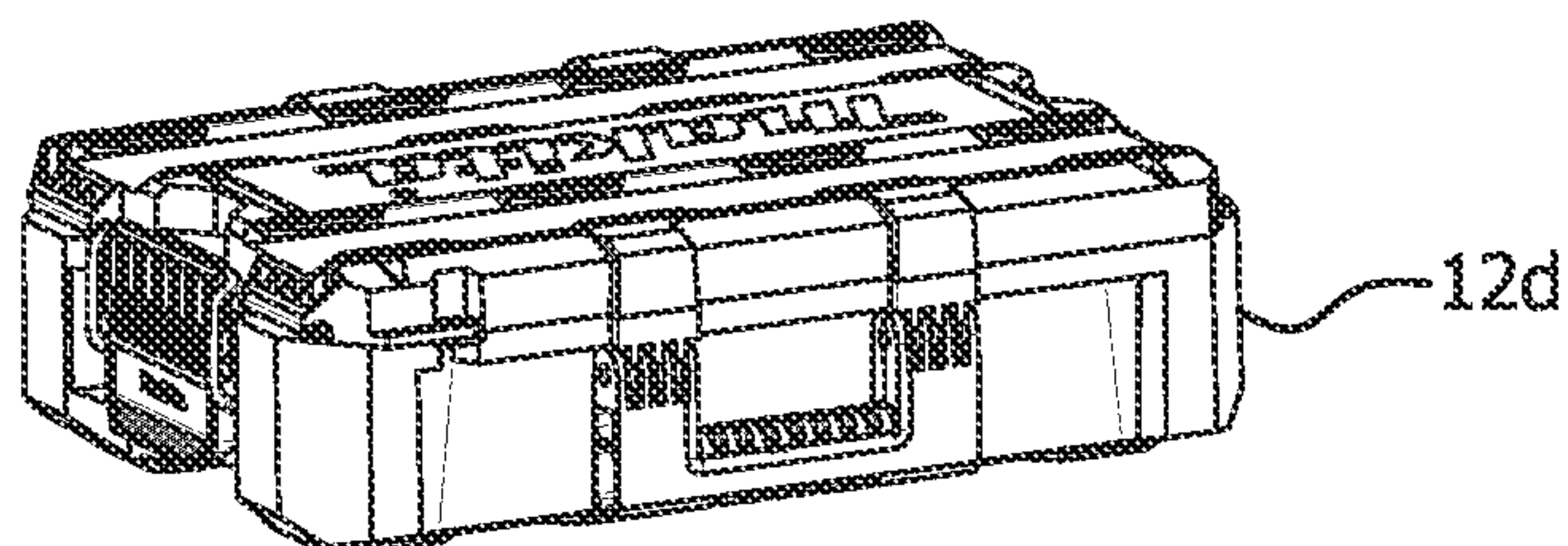


FIG. 24A

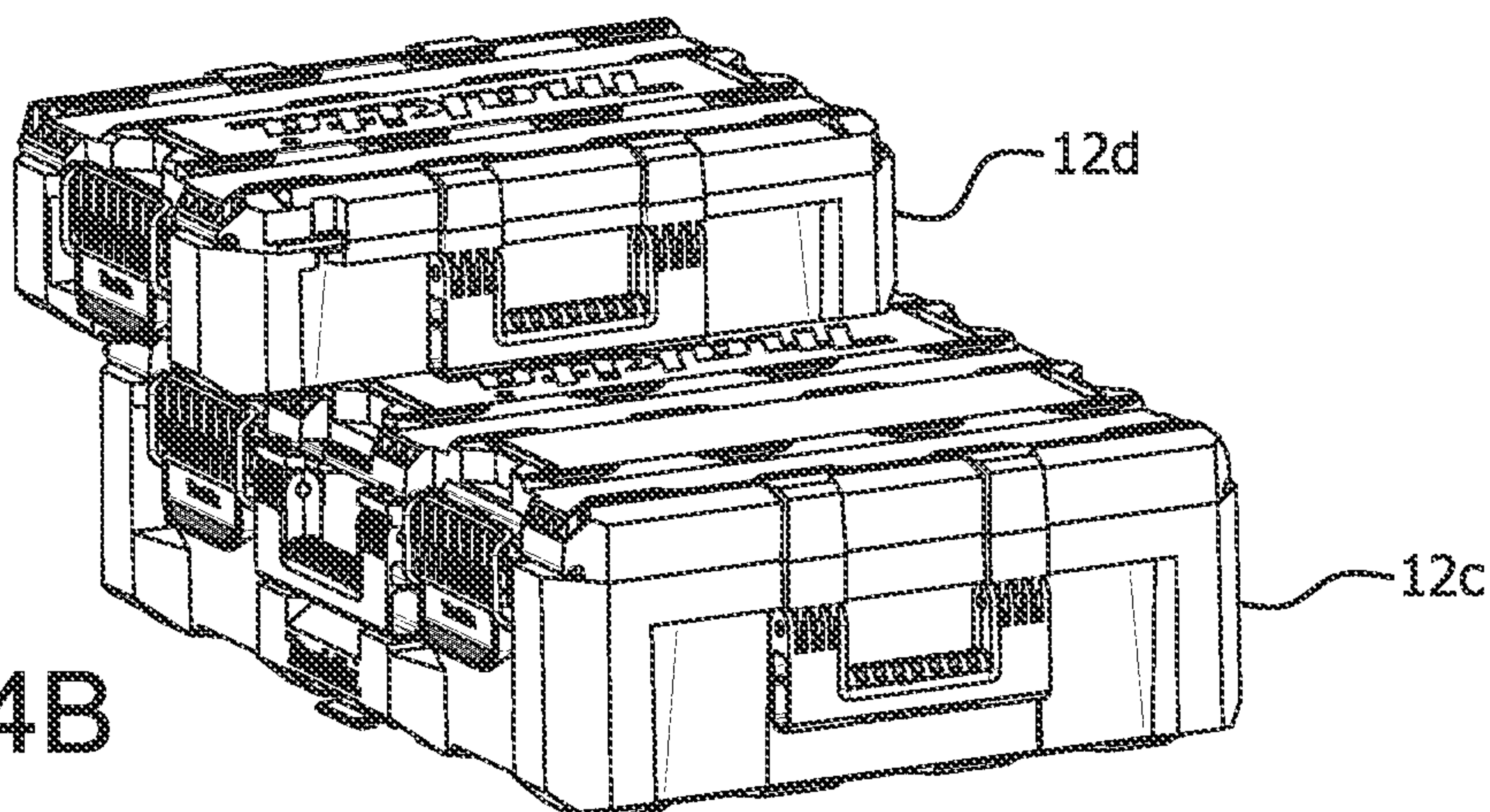
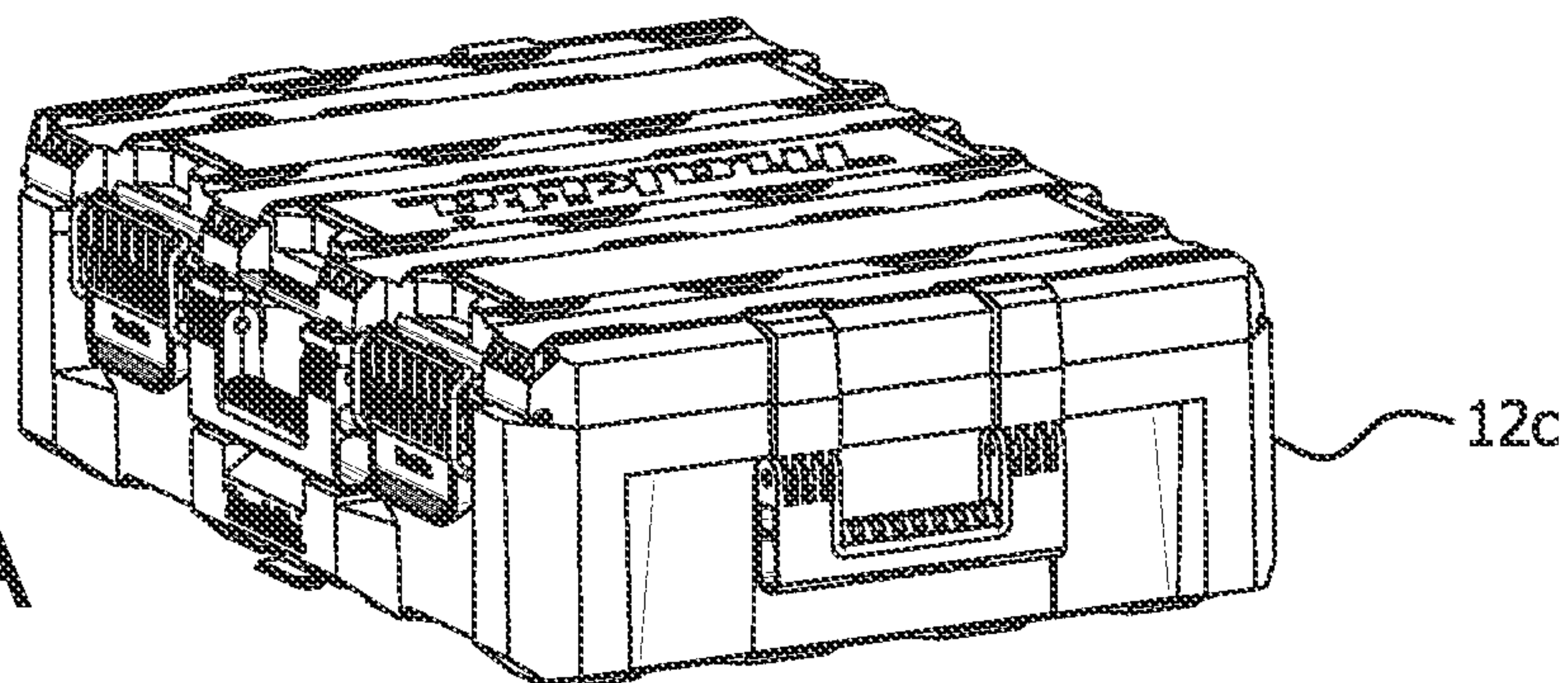
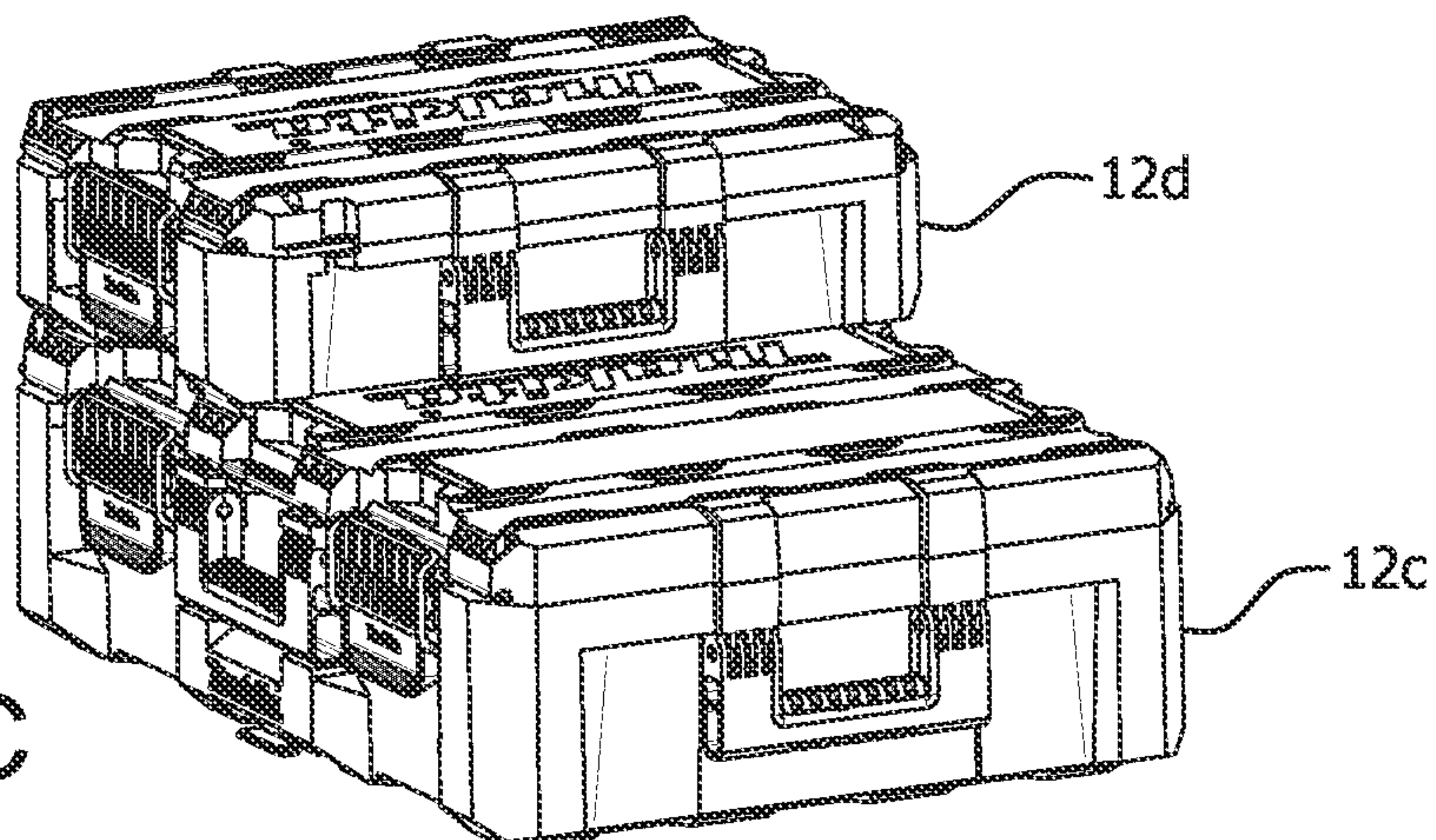
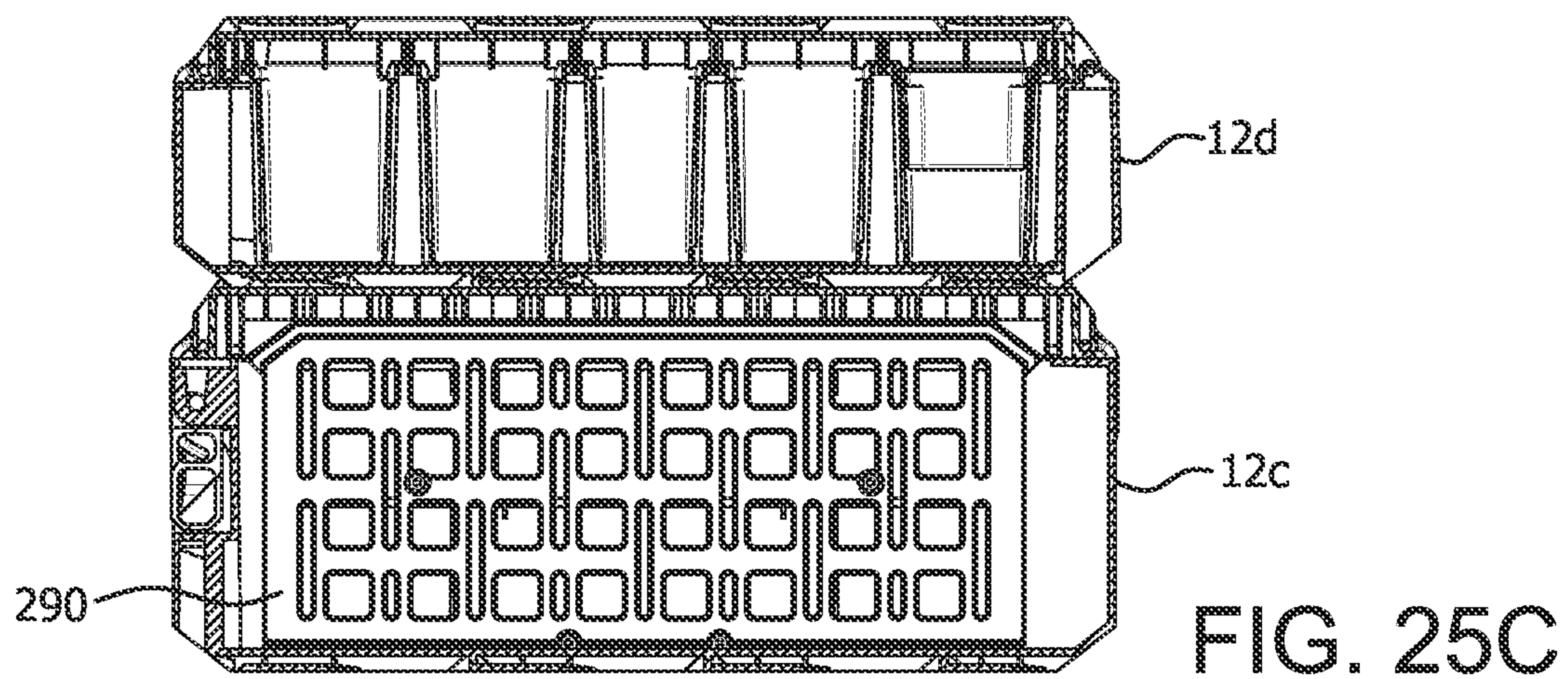
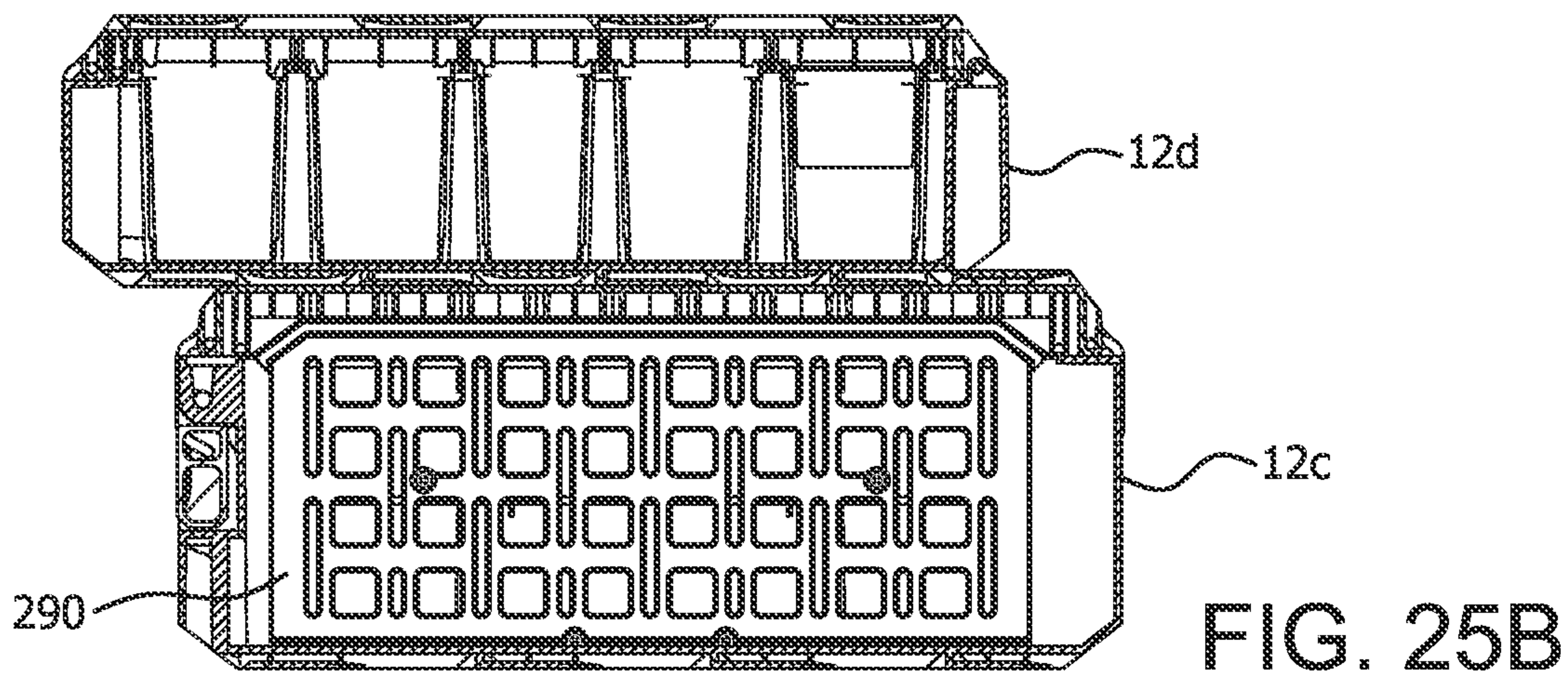
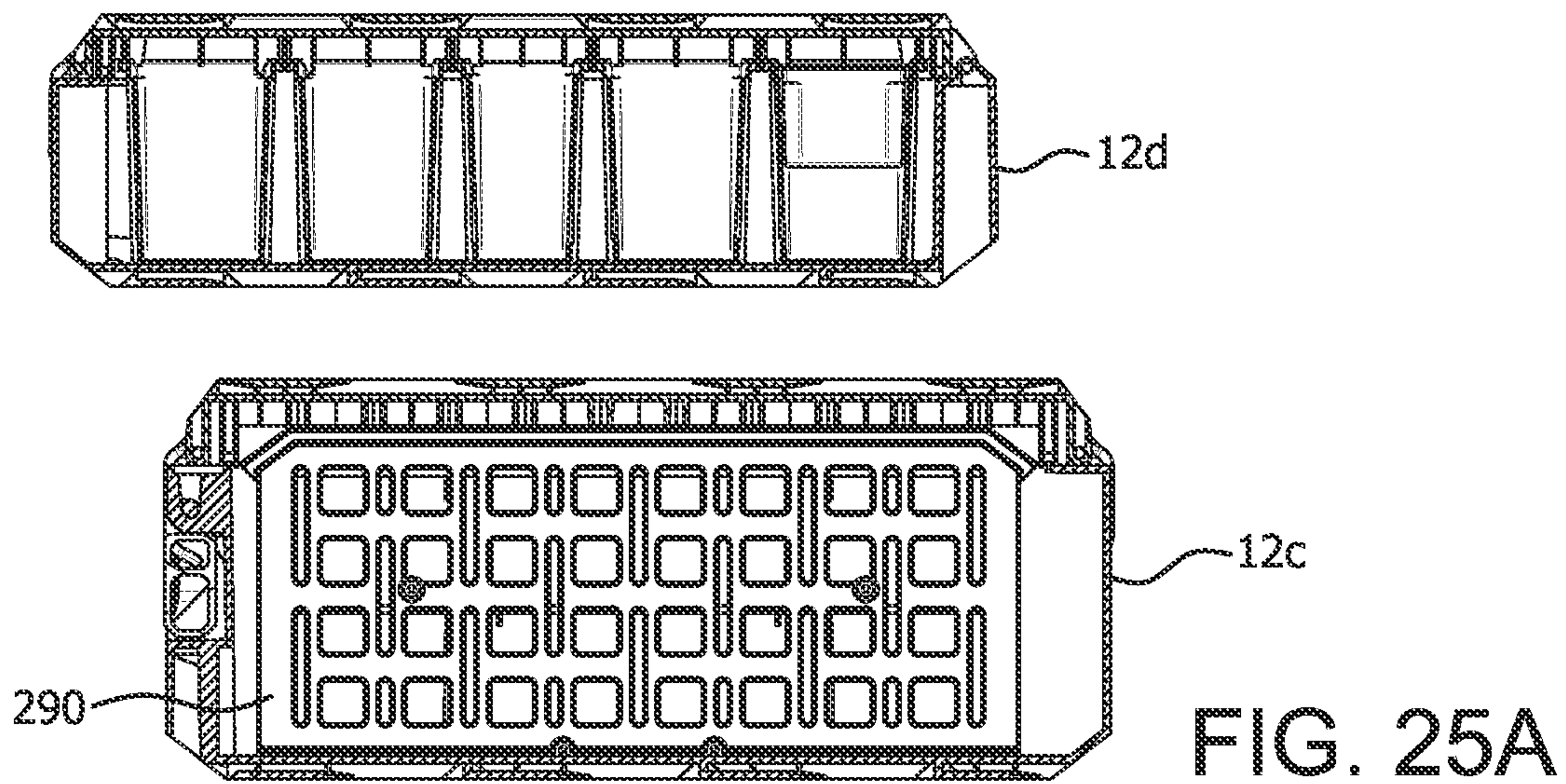
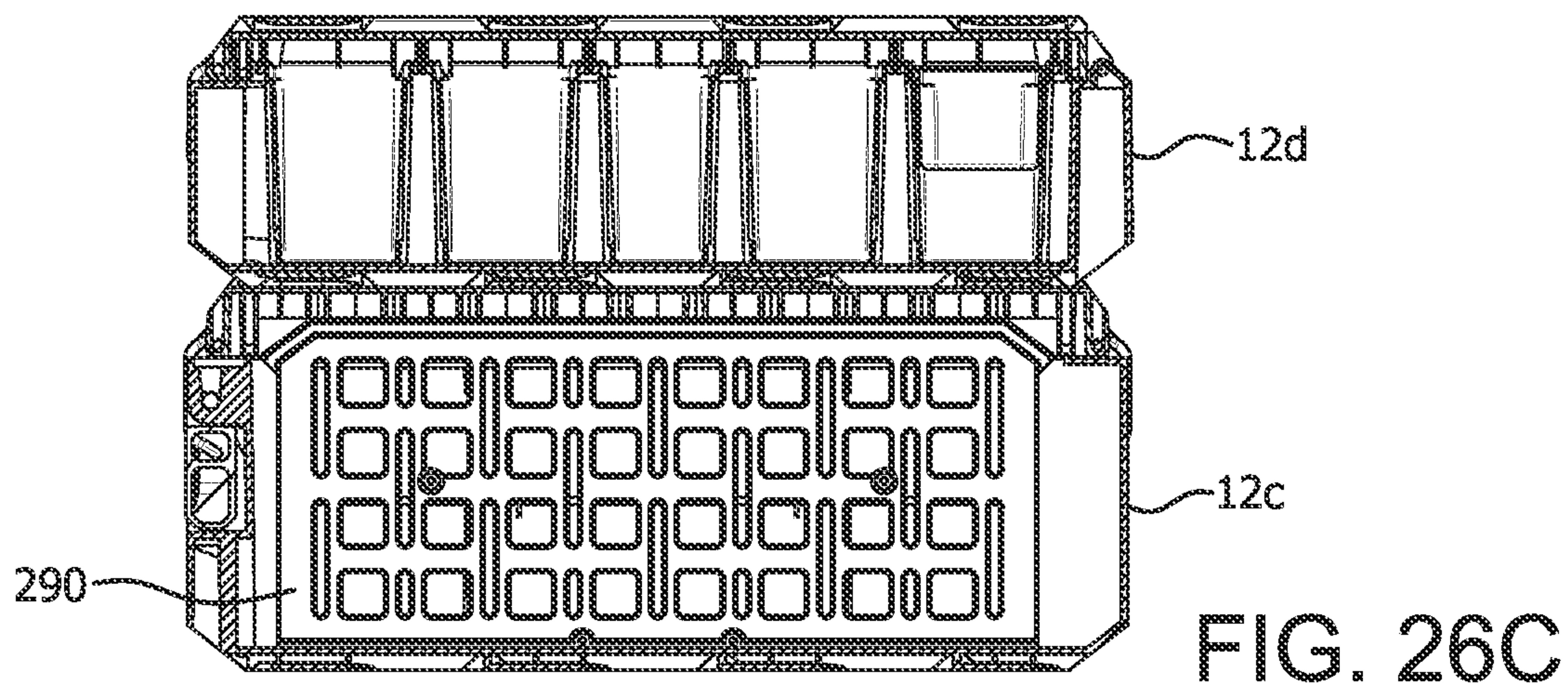
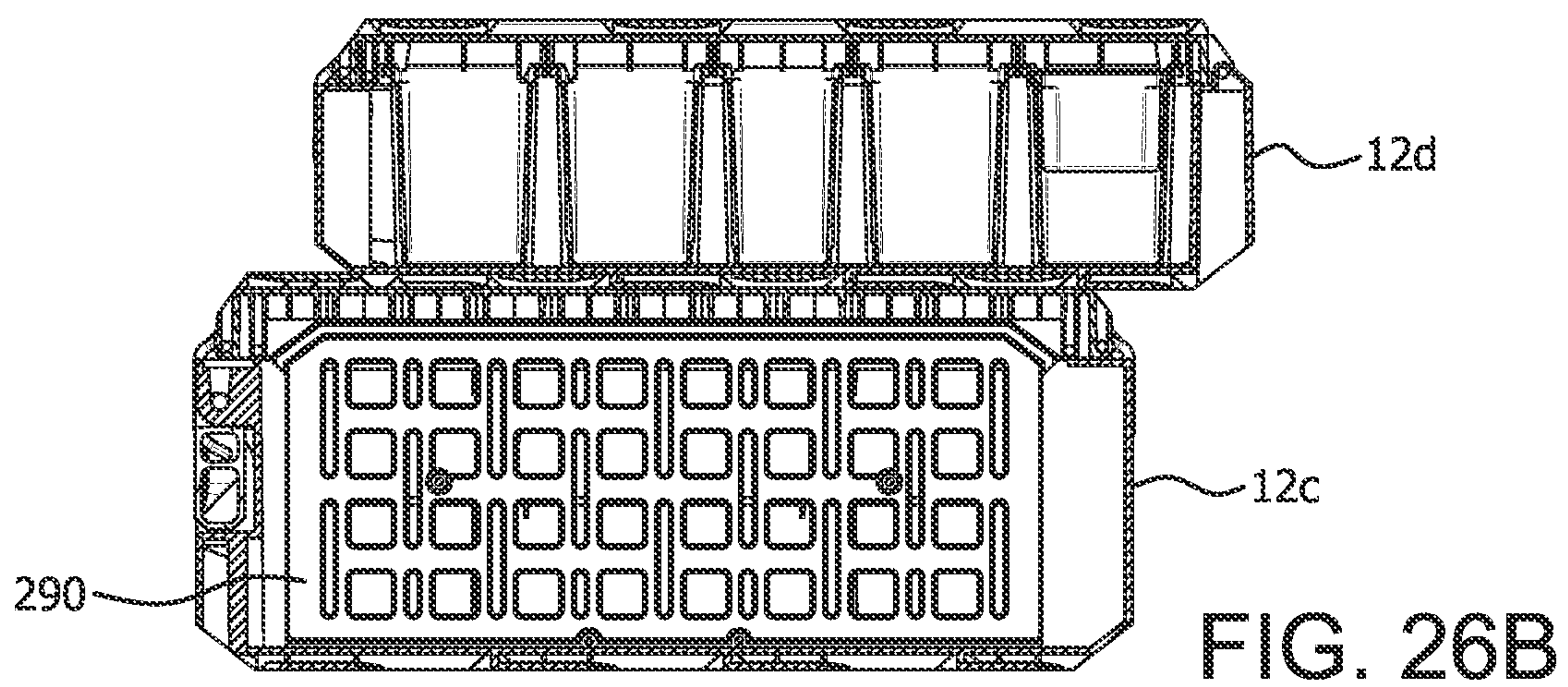
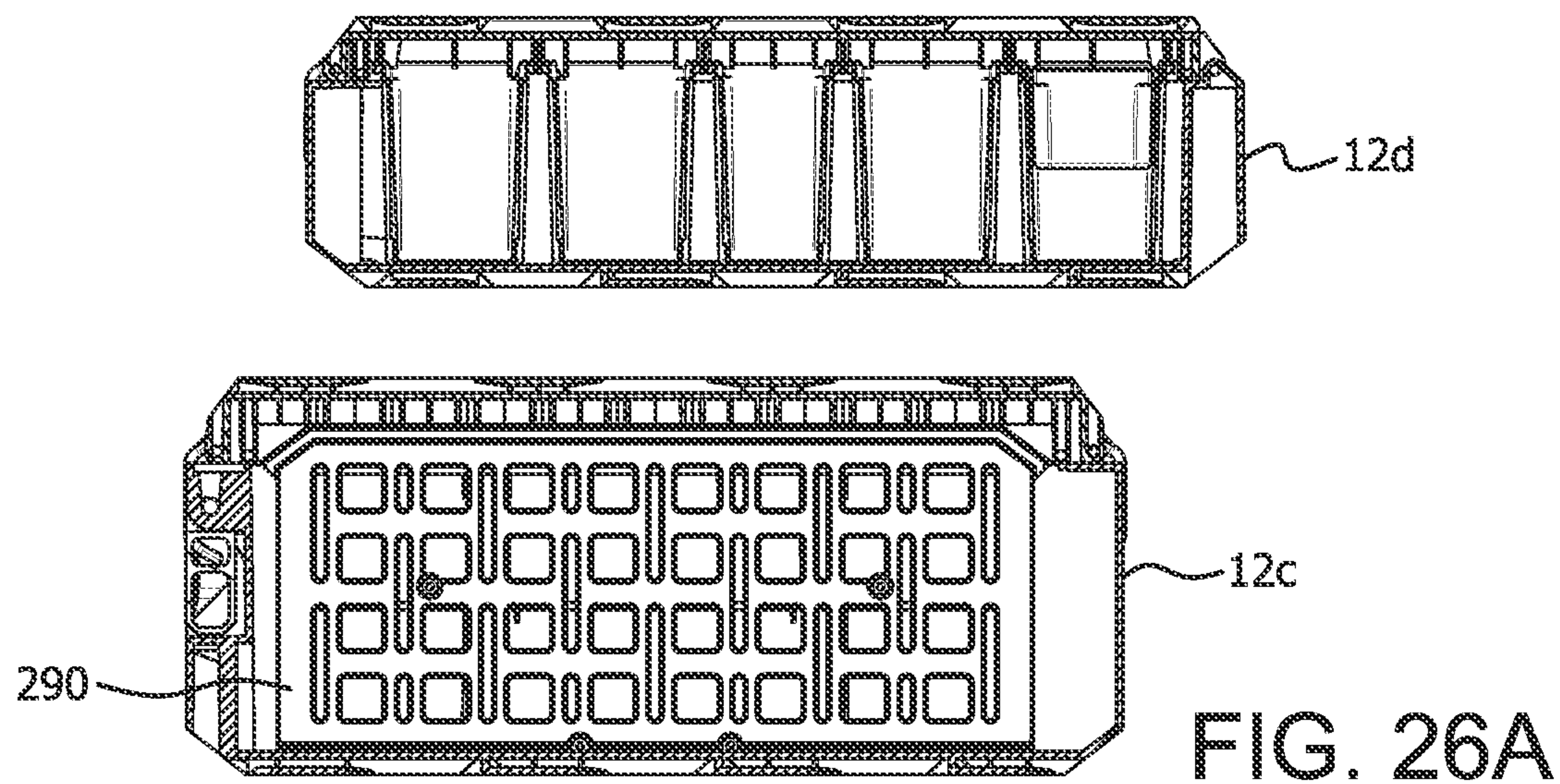


FIG. 24B

FIG. 24C







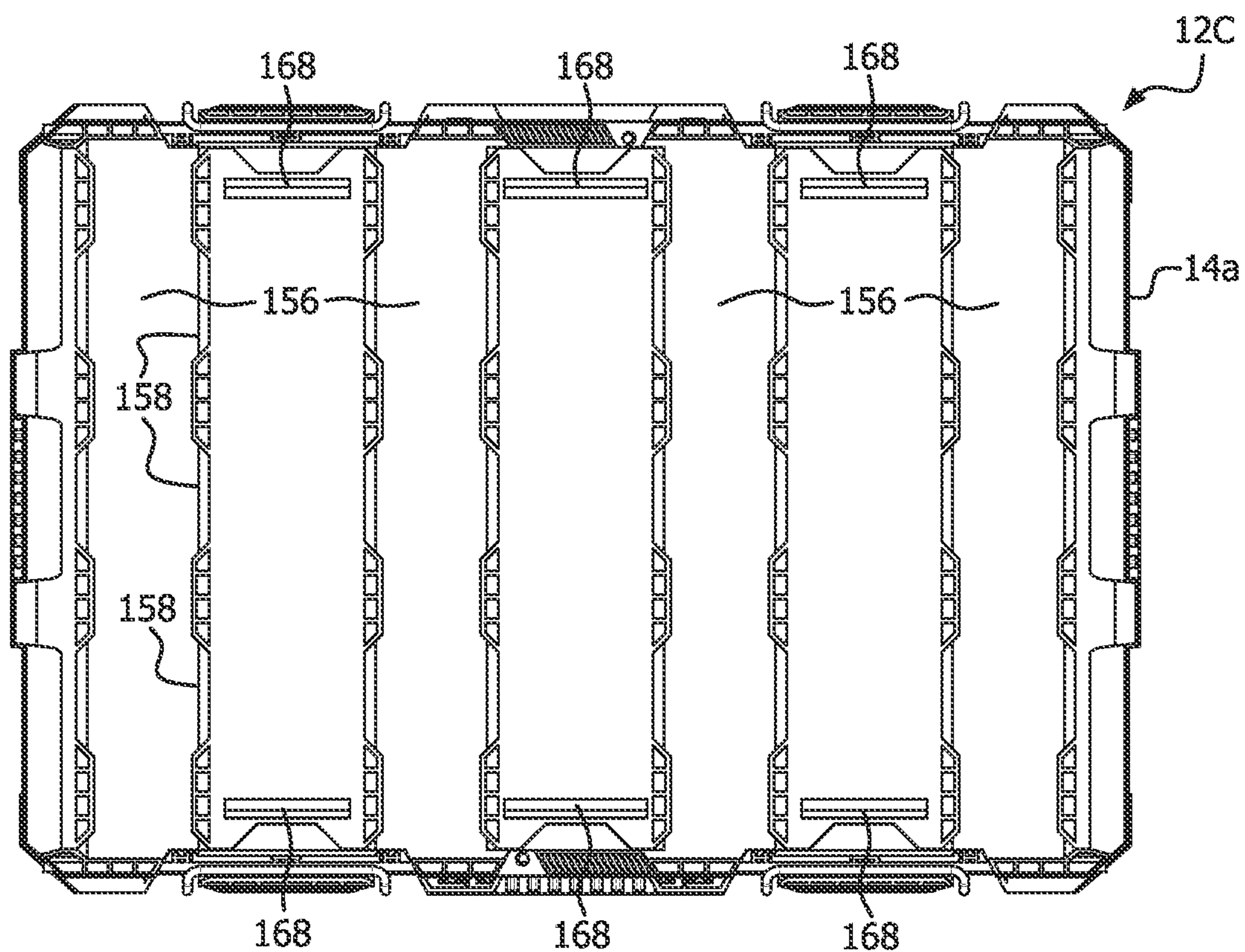


FIG. 27A

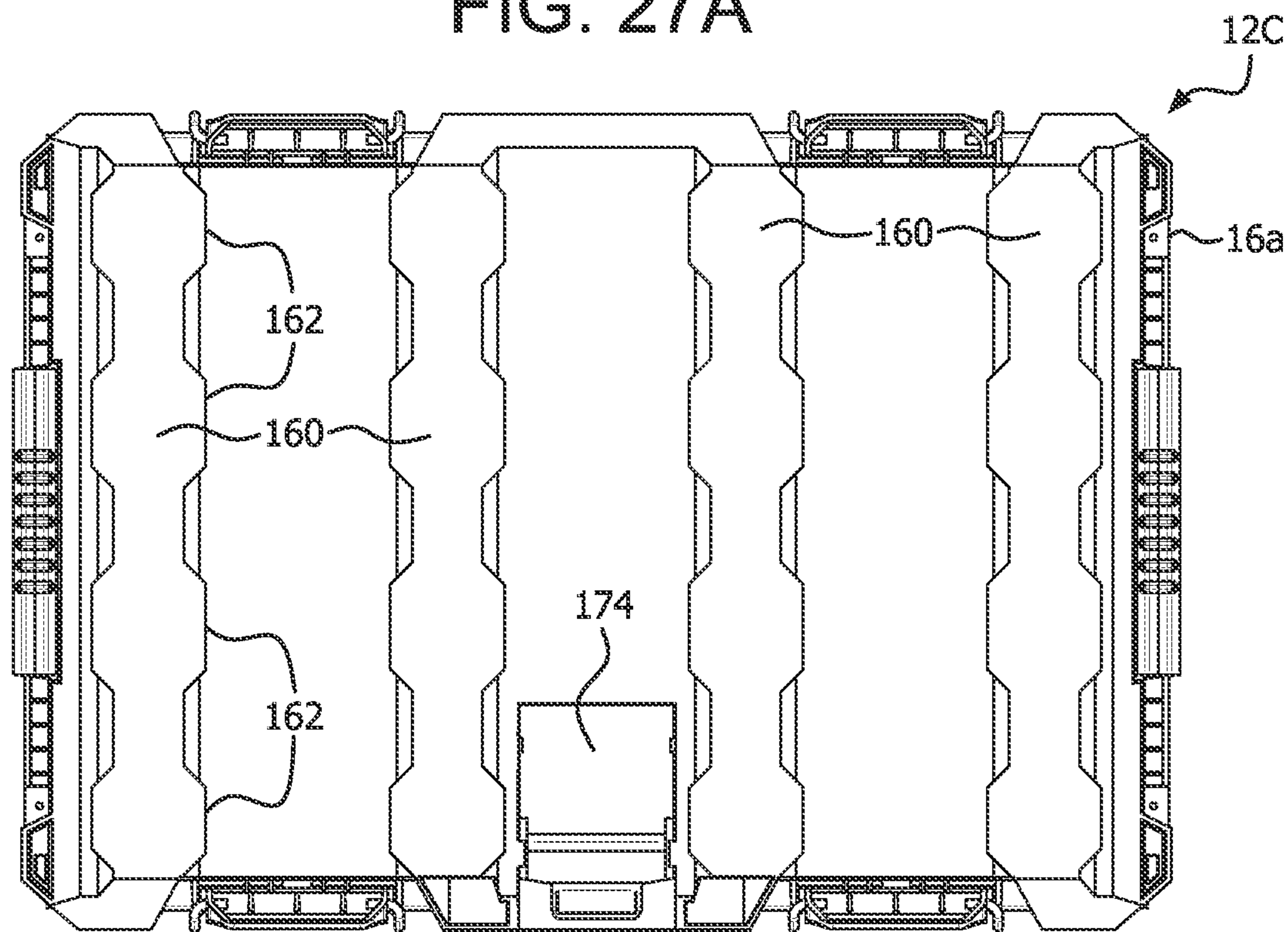


FIG. 27B

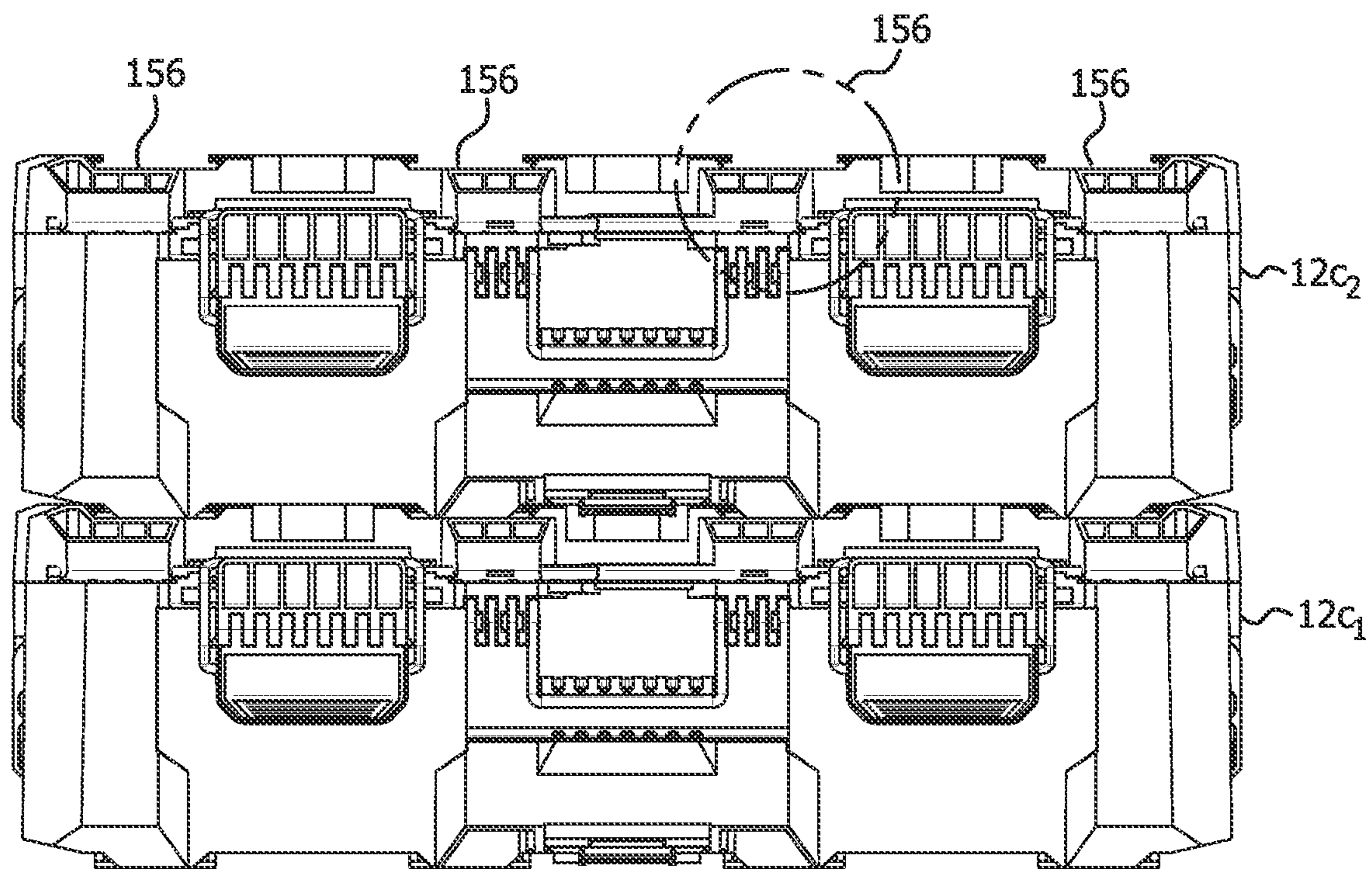


FIG. 27C

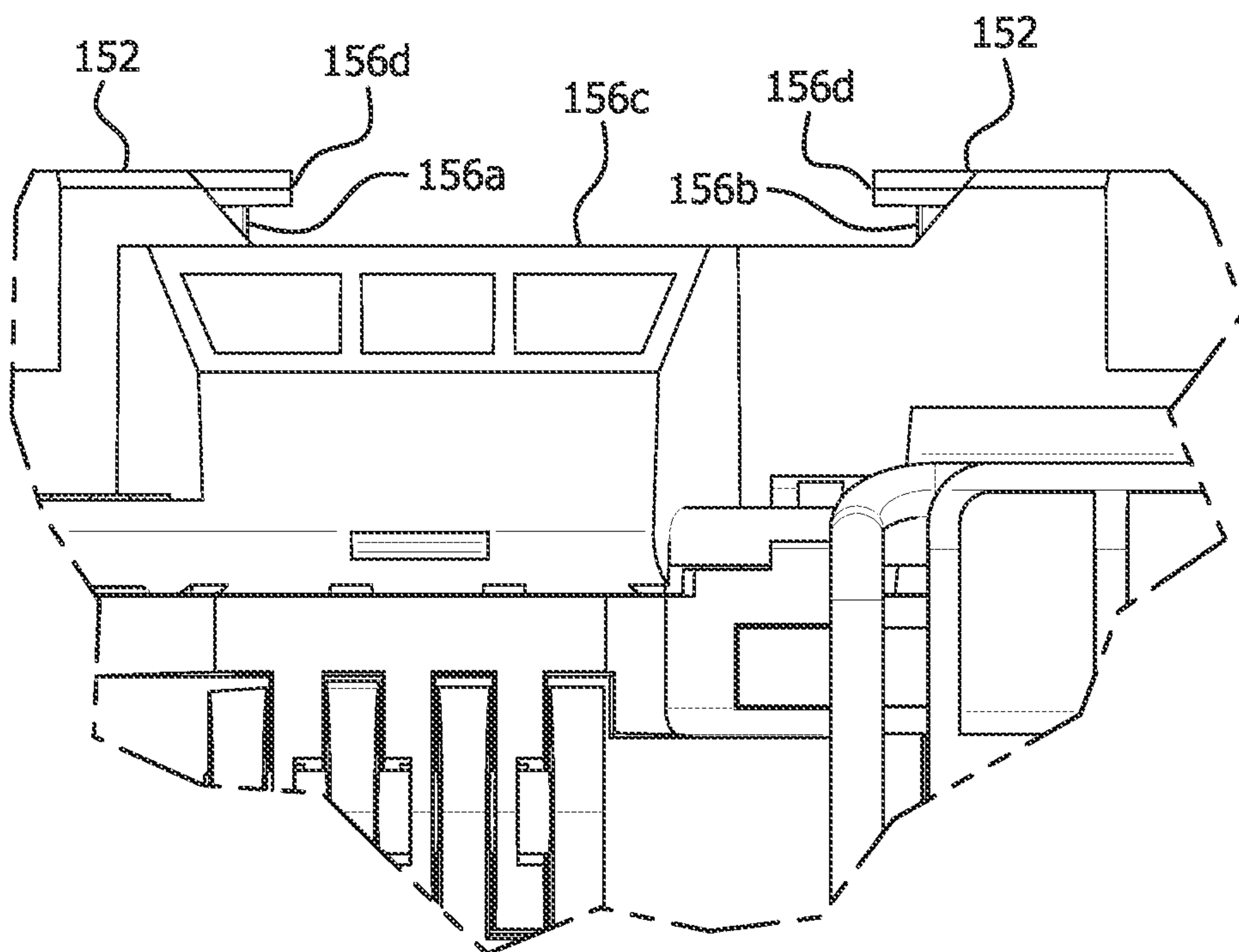


FIG. 27D

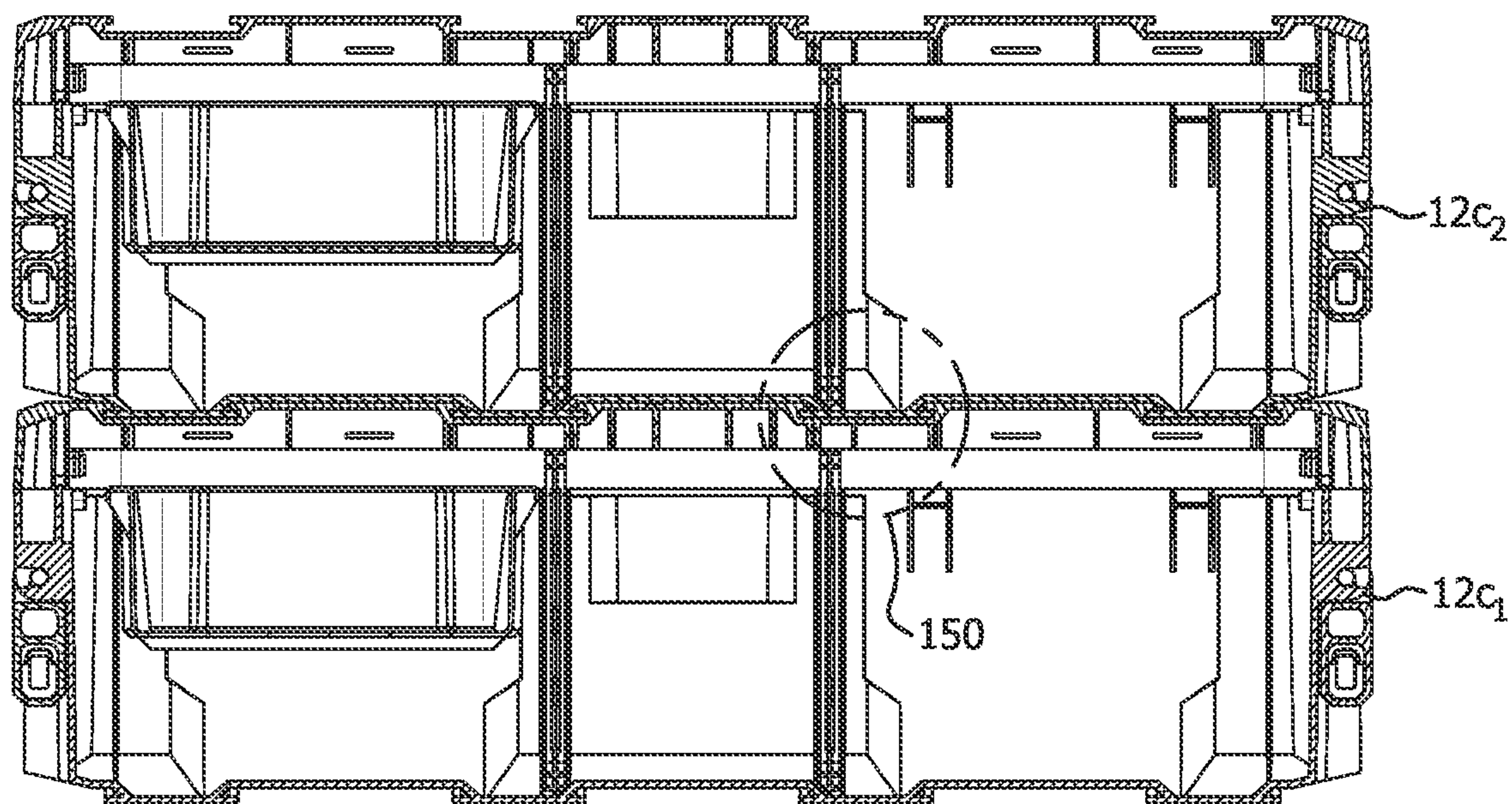


FIG. 27E

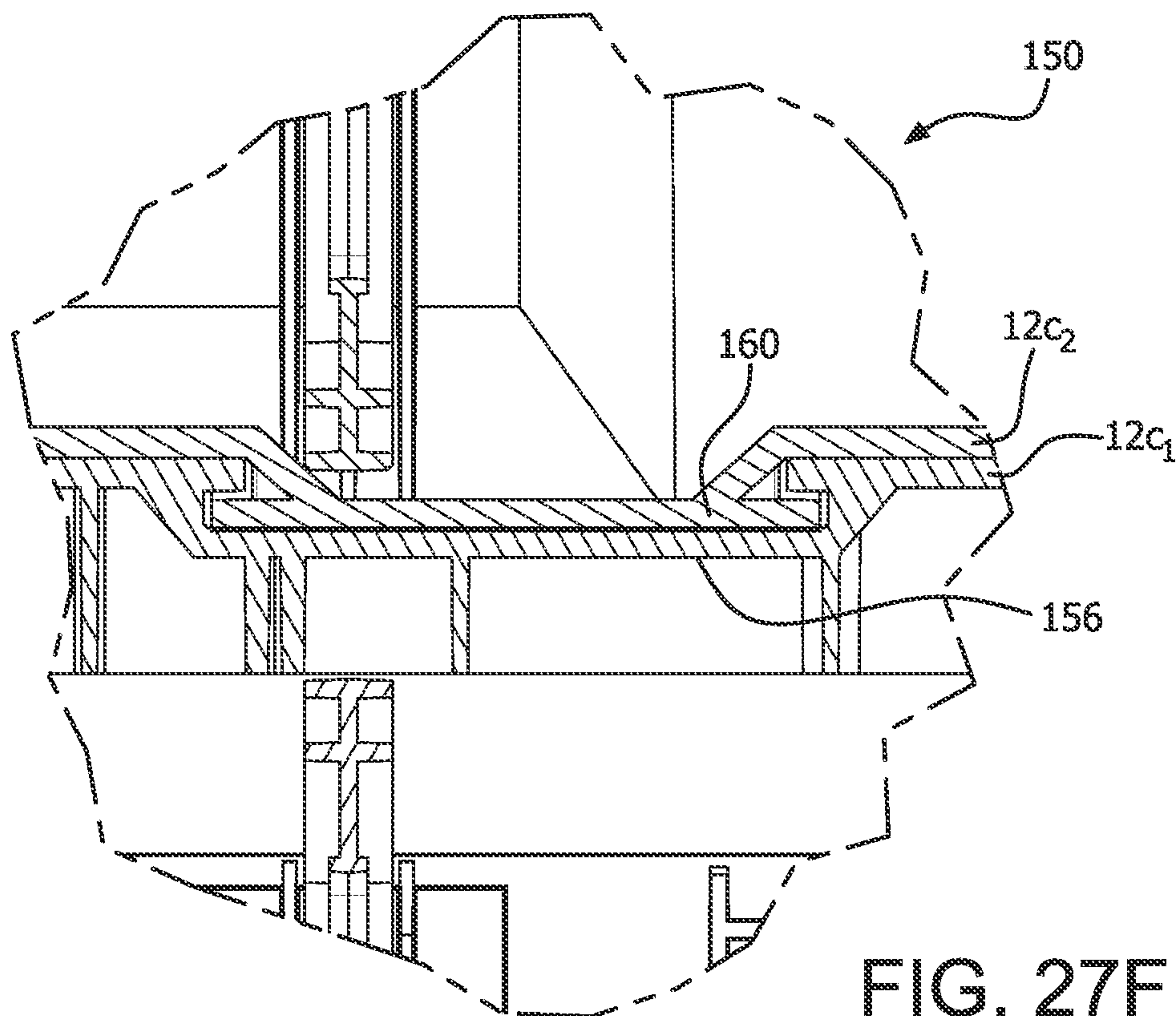


FIG. 27F

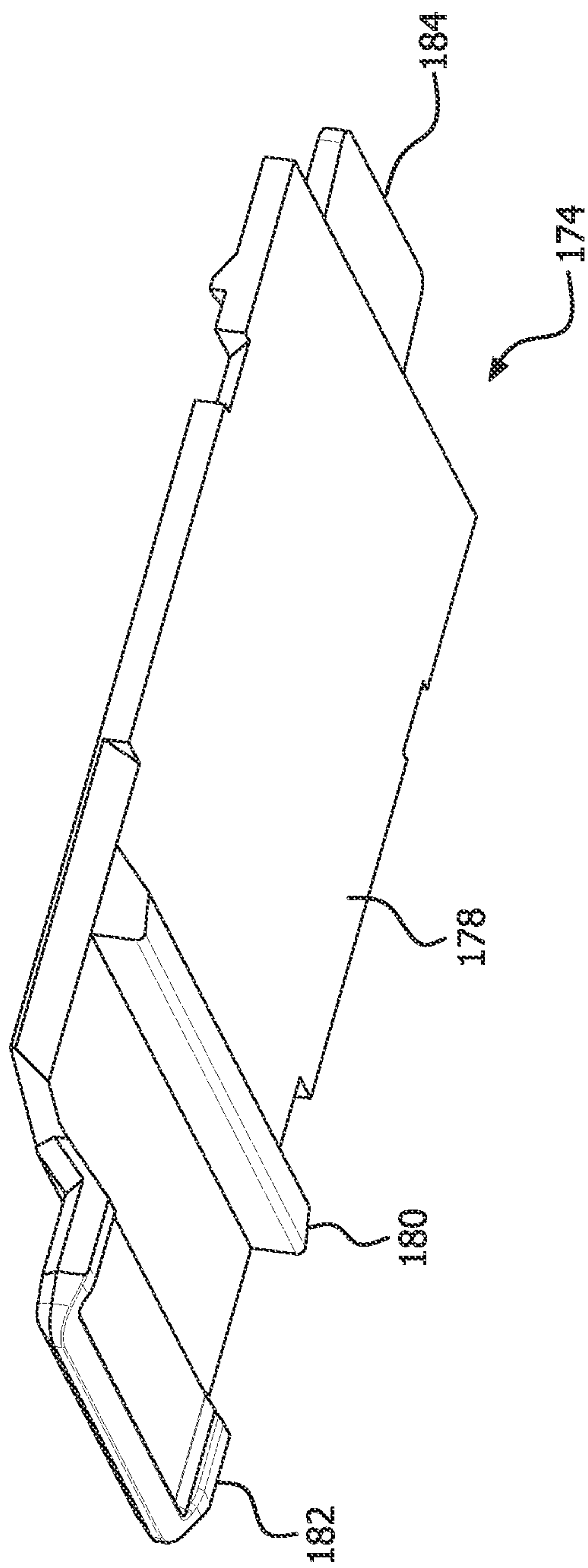


FIG. 28A

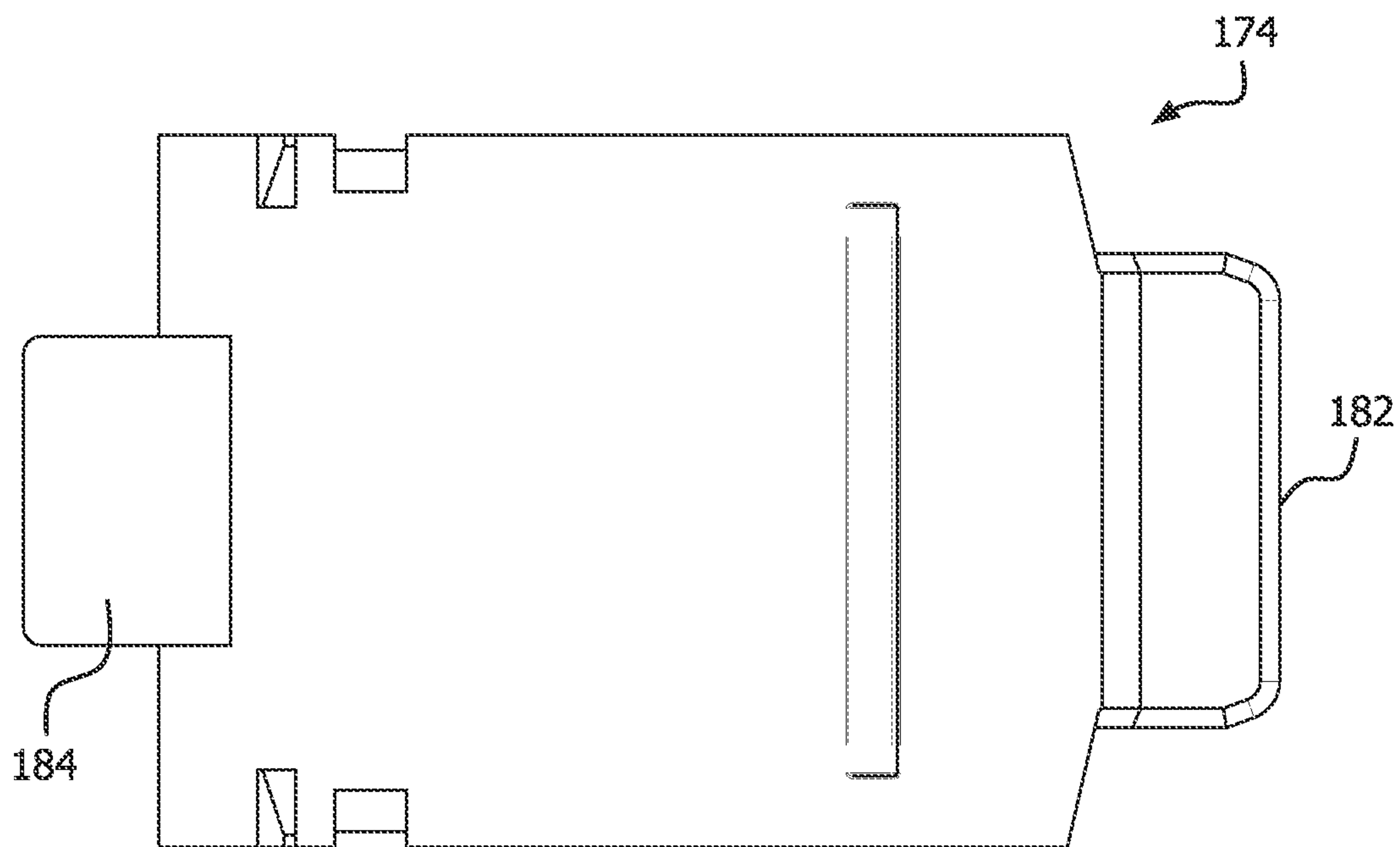


FIG. 28B

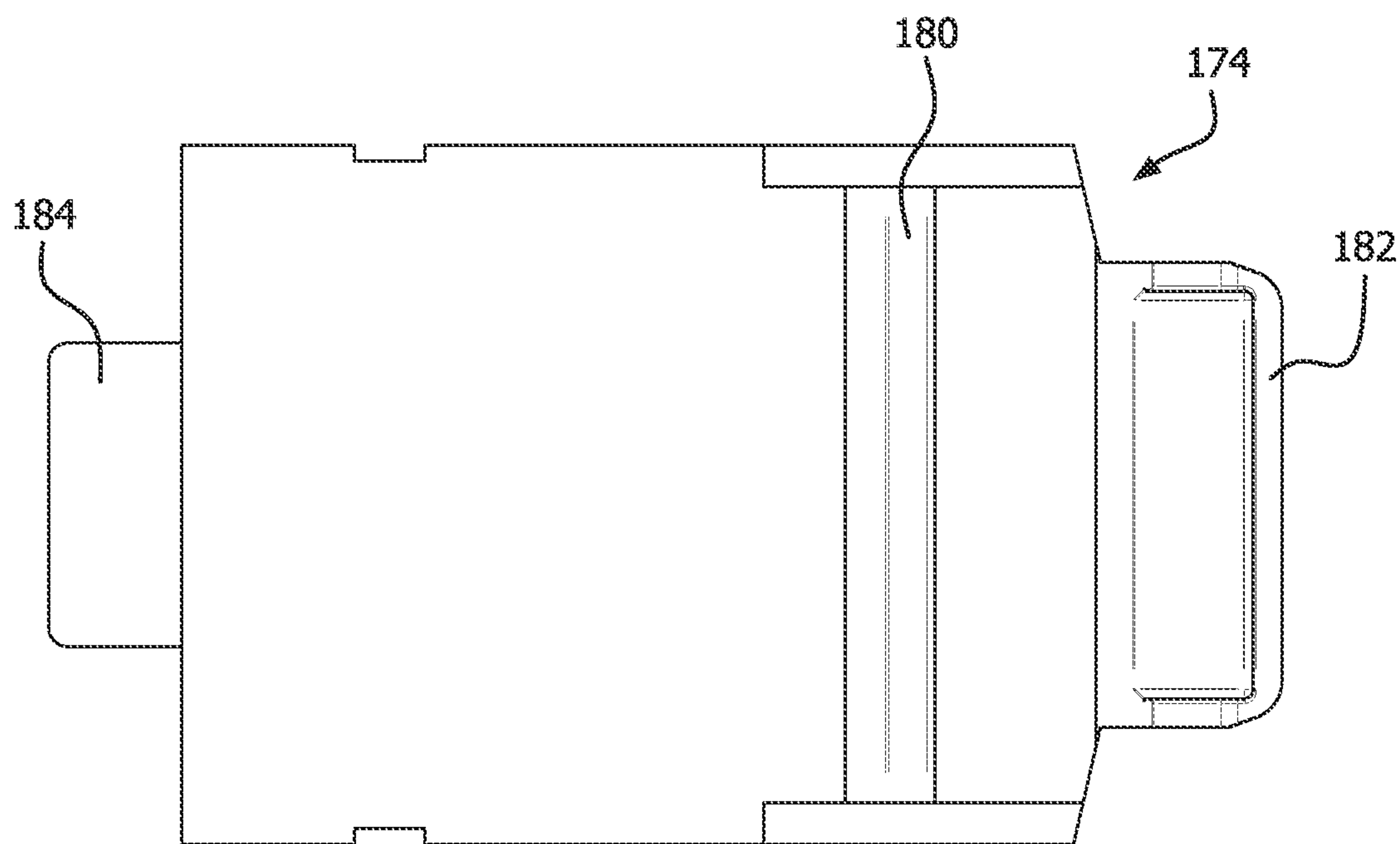


FIG. 28C

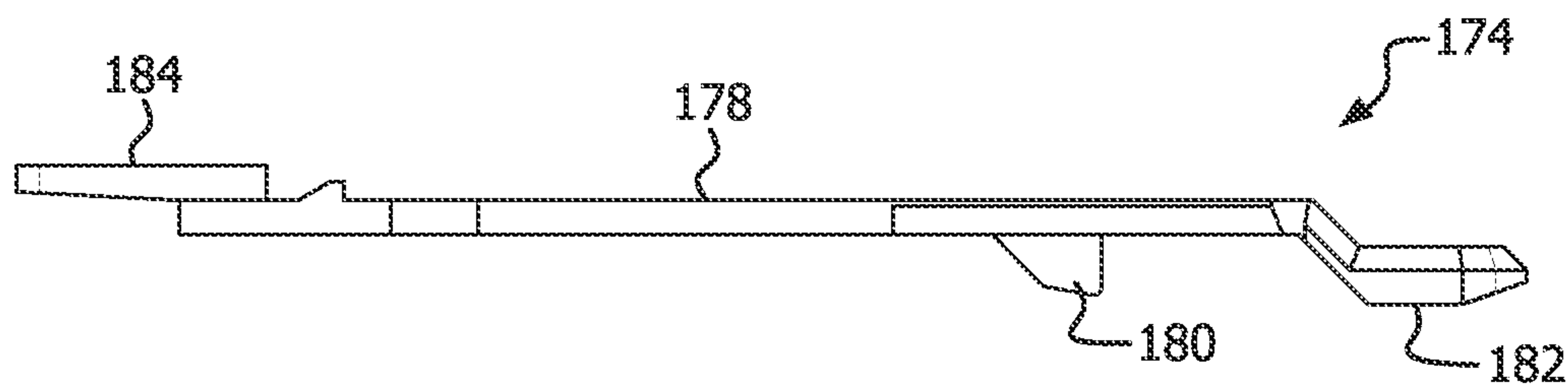


FIG. 28D

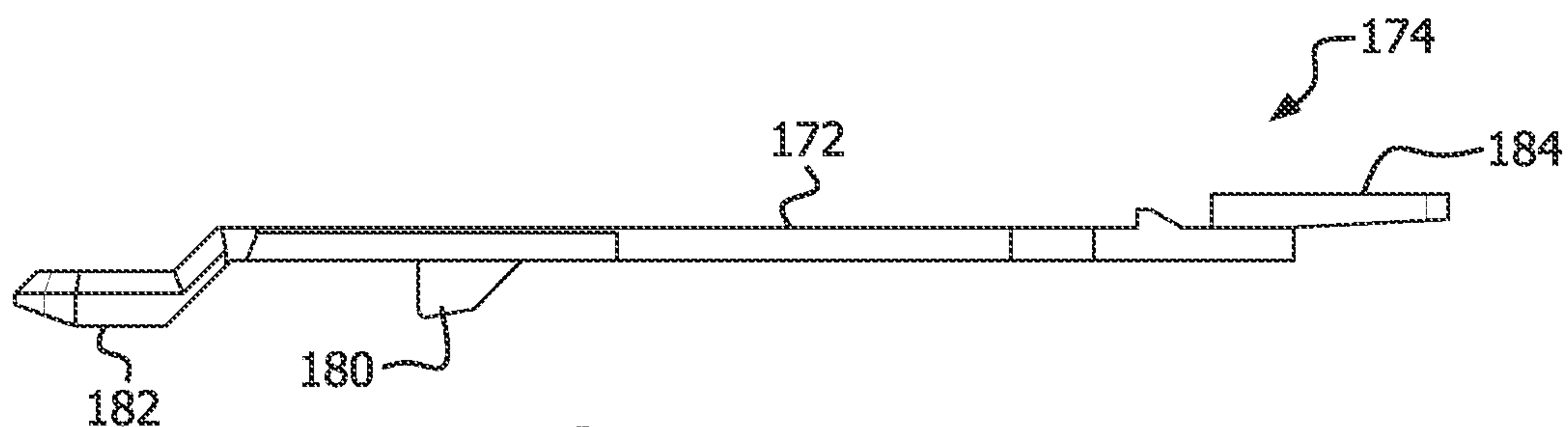


FIG. 28E

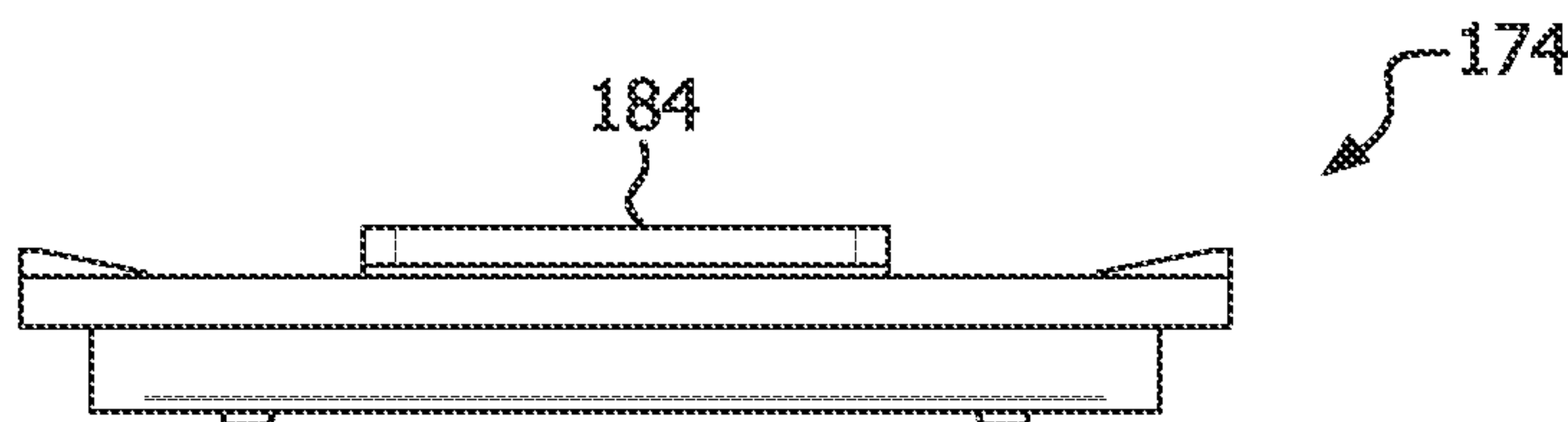


FIG. 28F

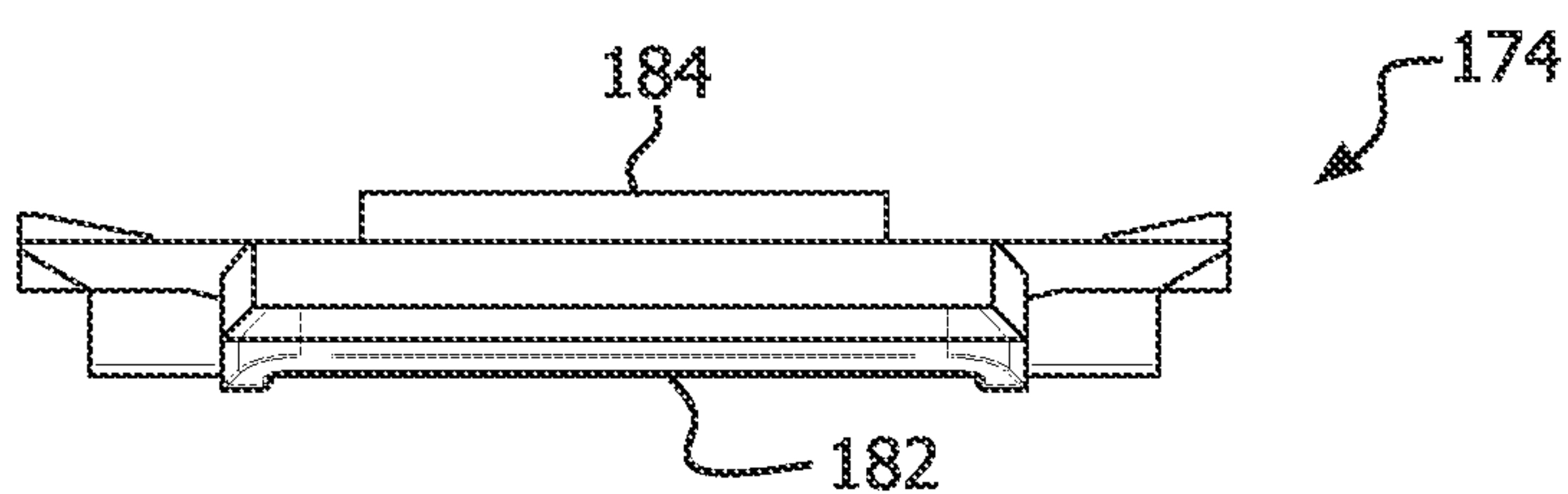


FIG. 28G

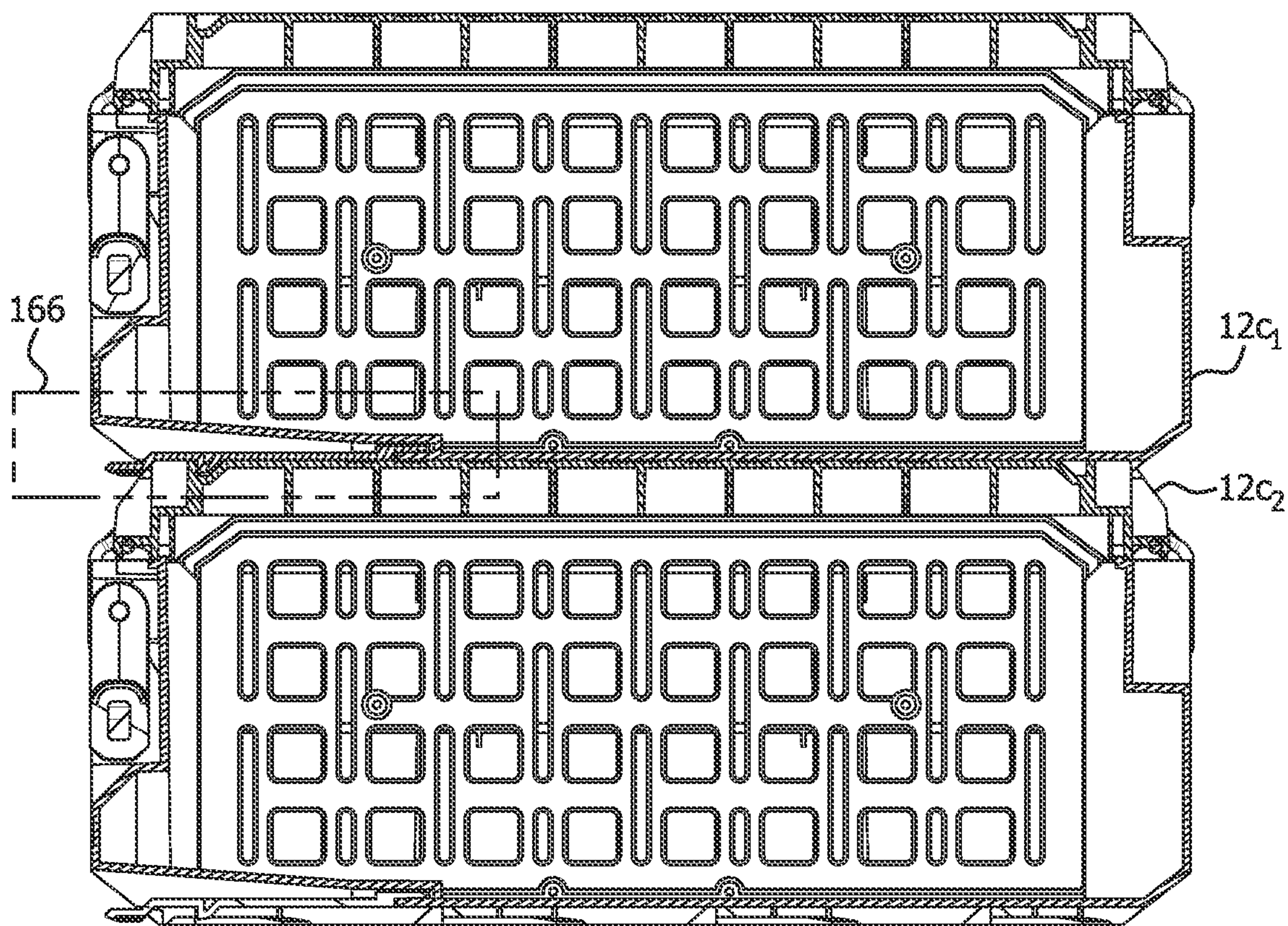


FIG. 29A

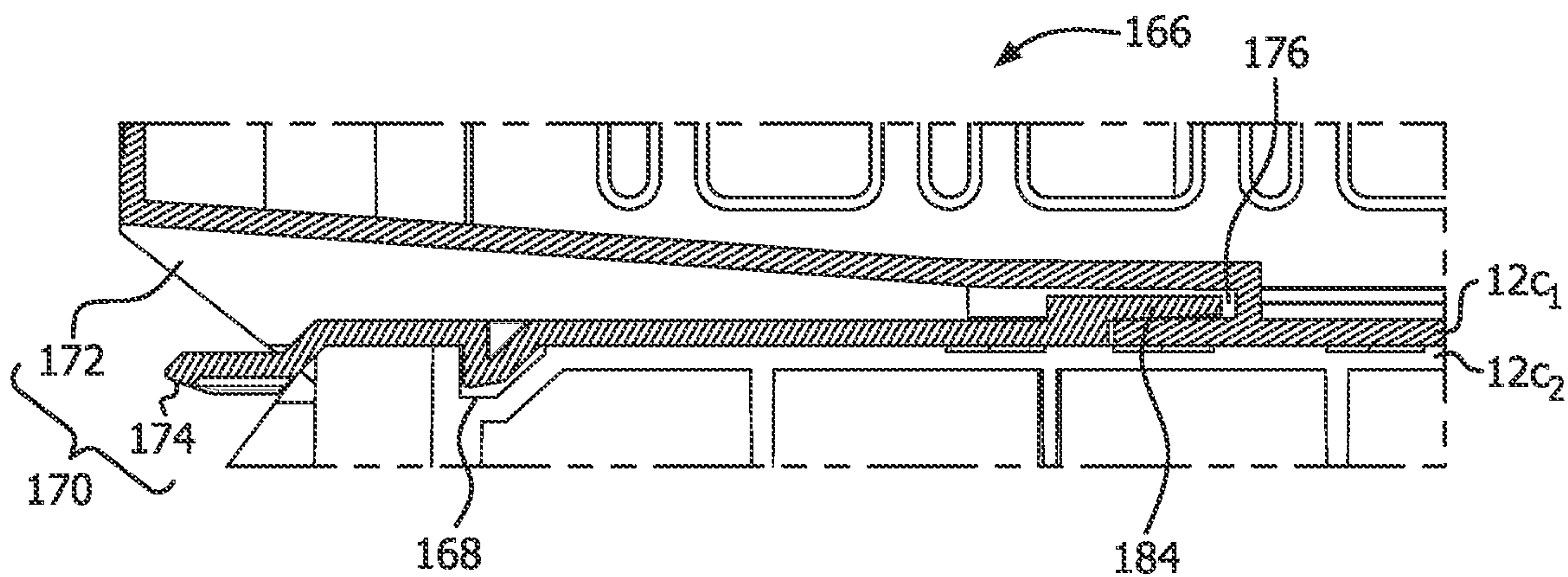


FIG. 29B

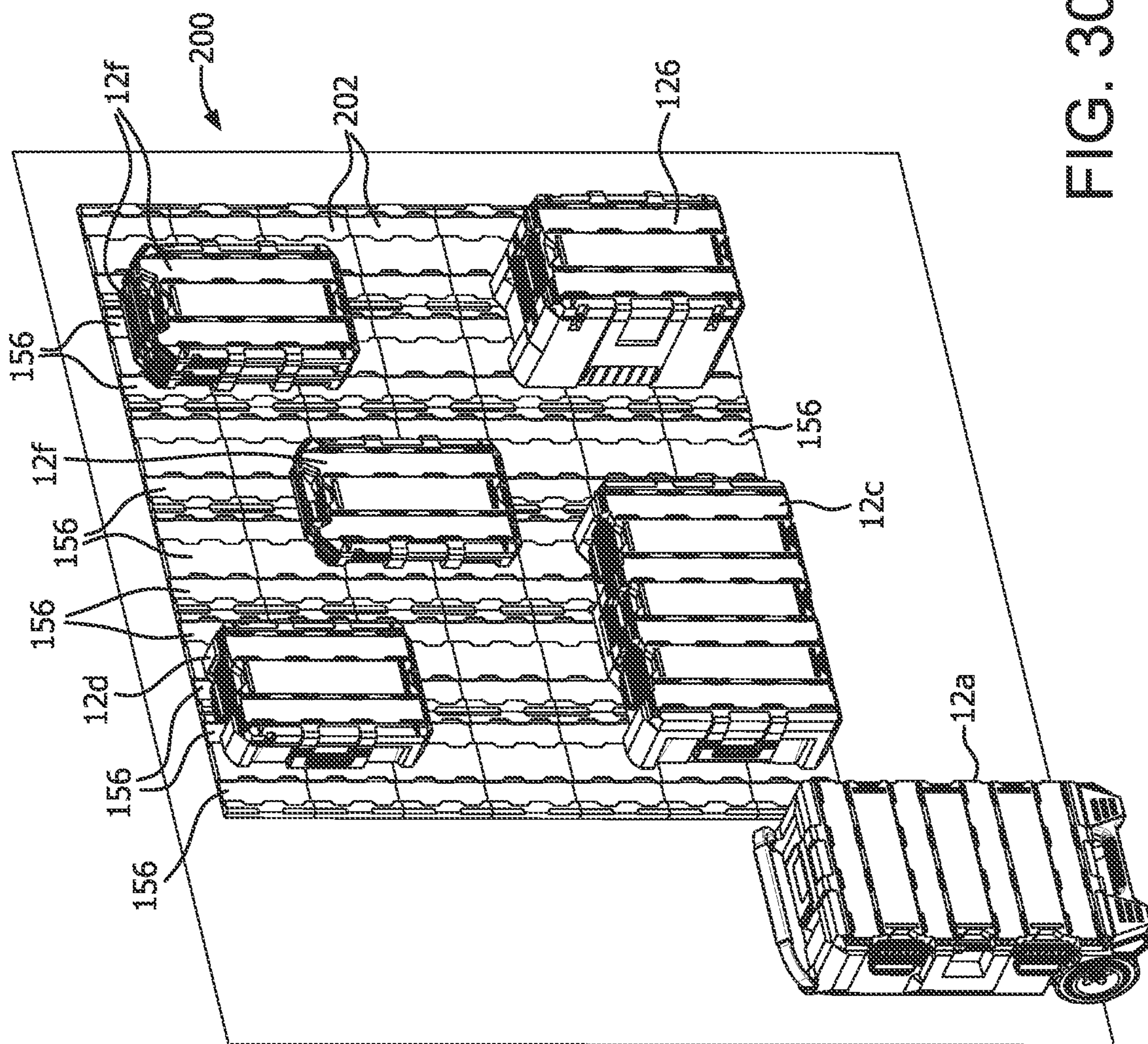


FIG. 30

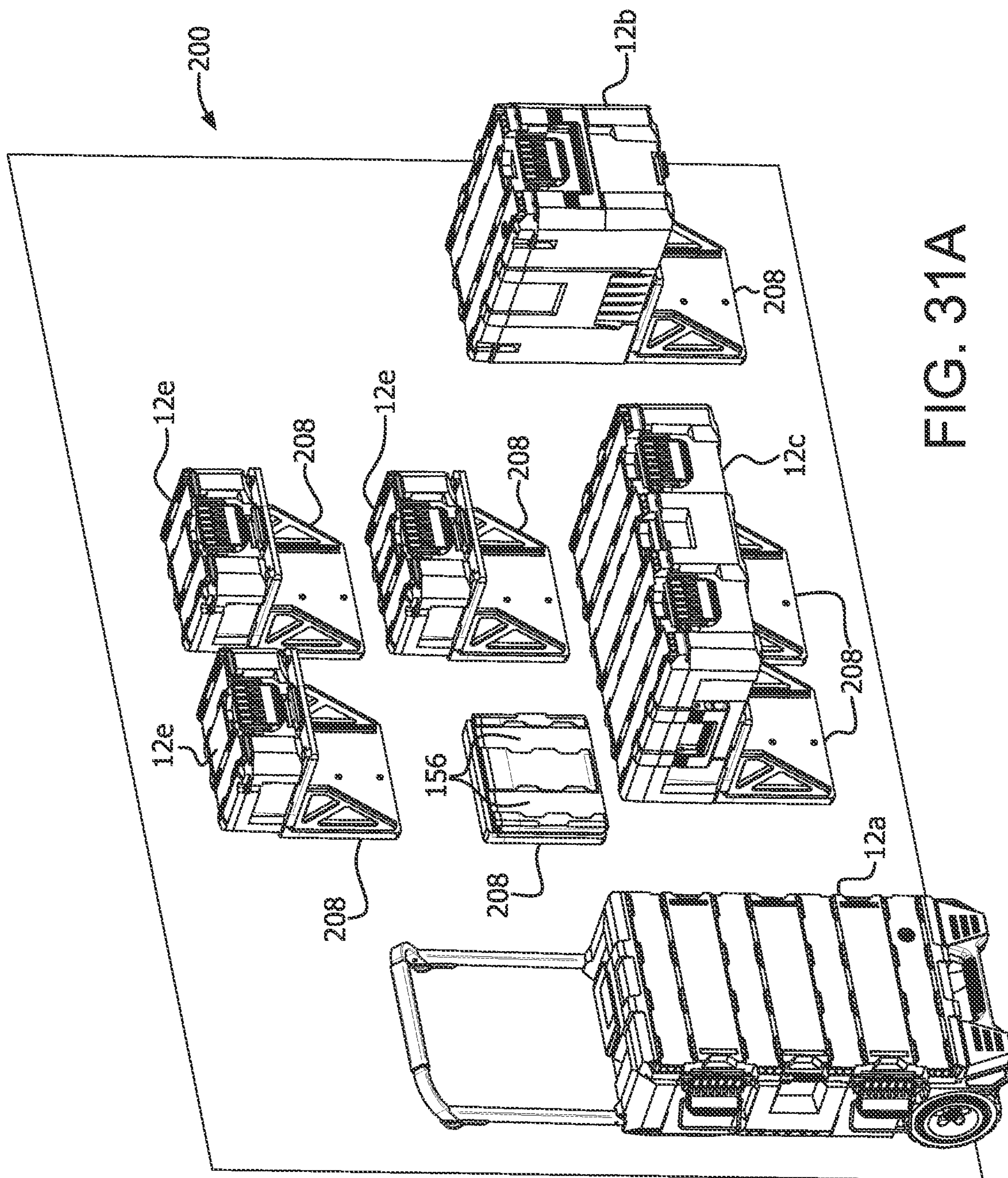


FIG. 31A

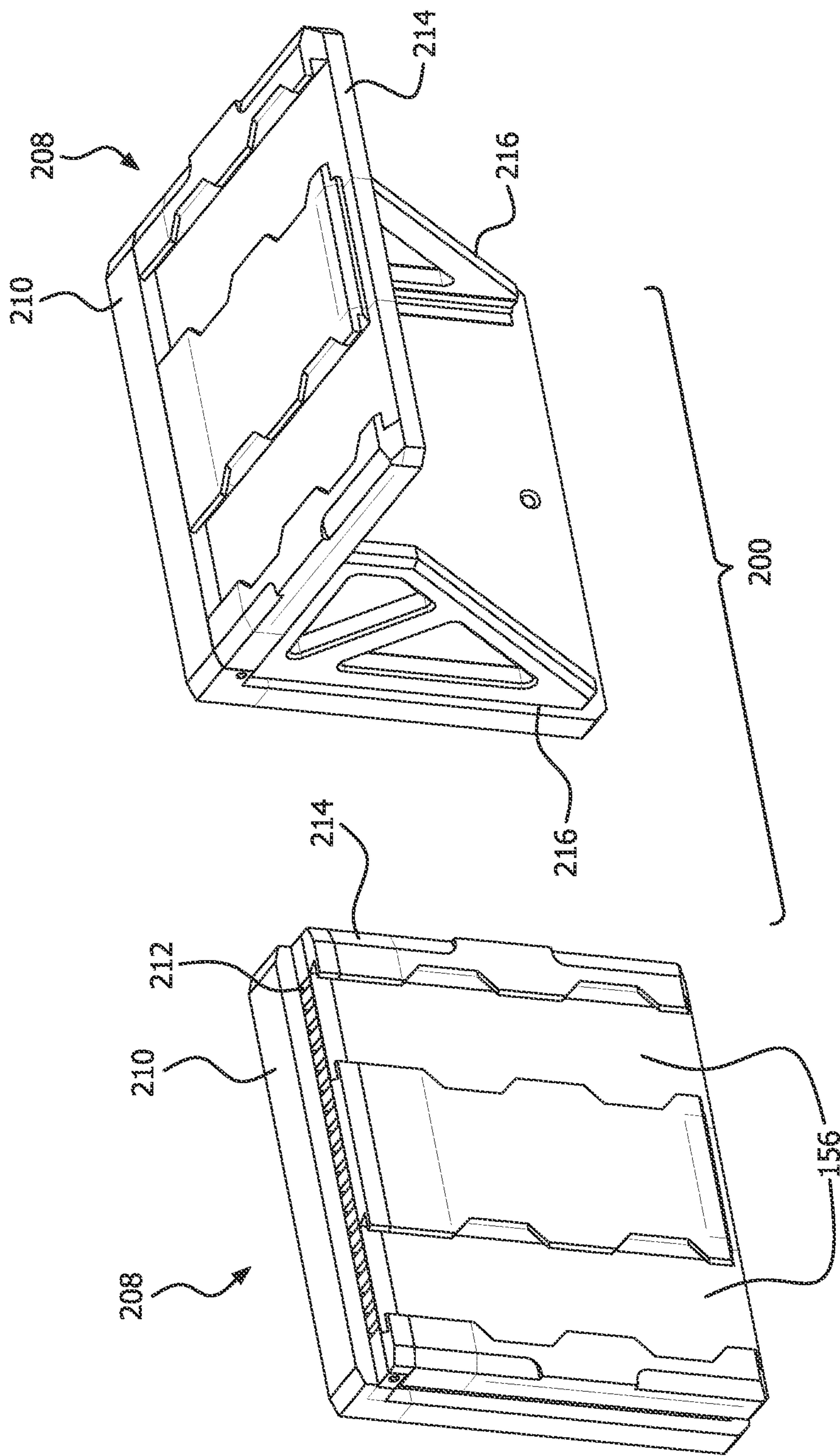


FIG. 31B

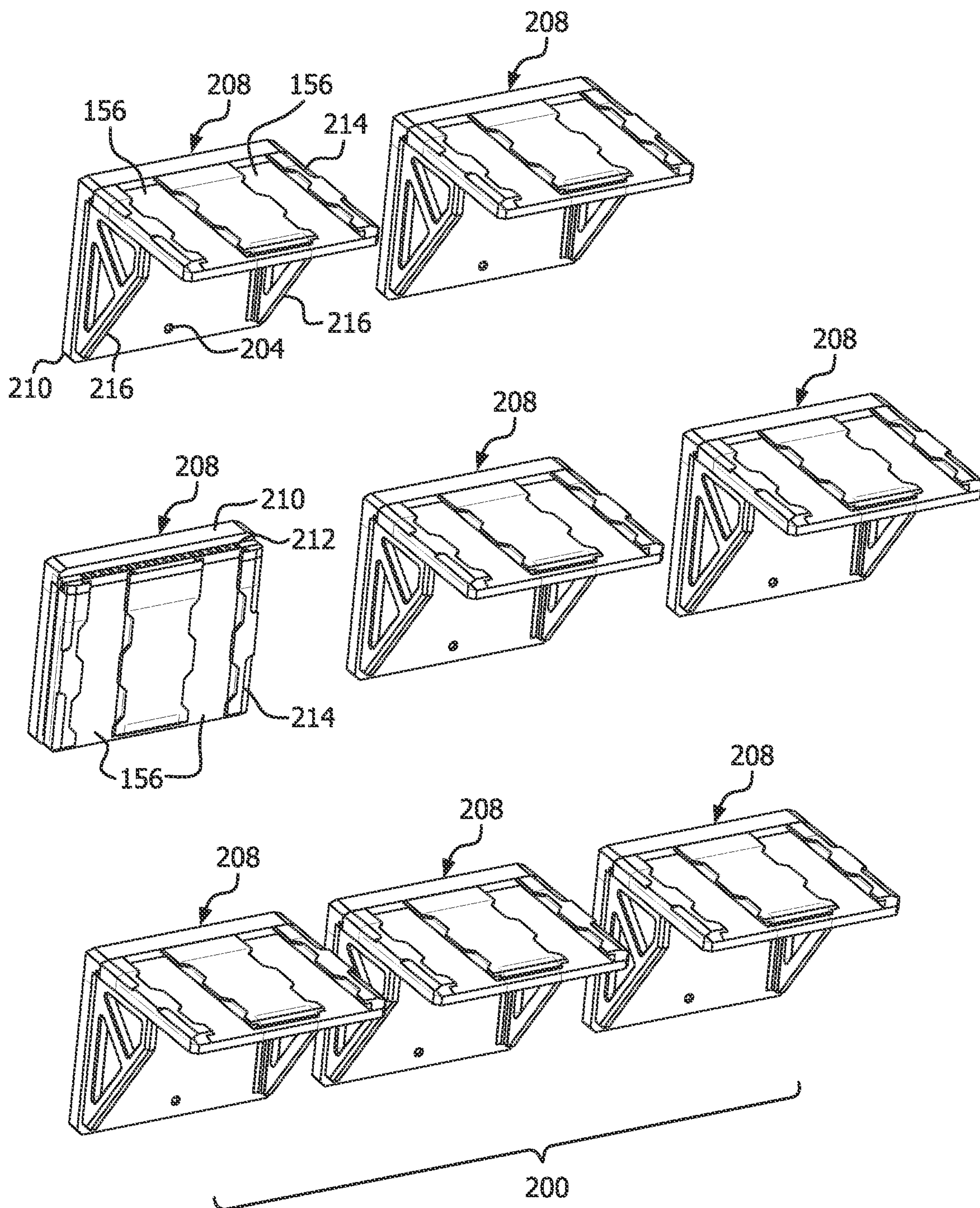


FIG. 31C

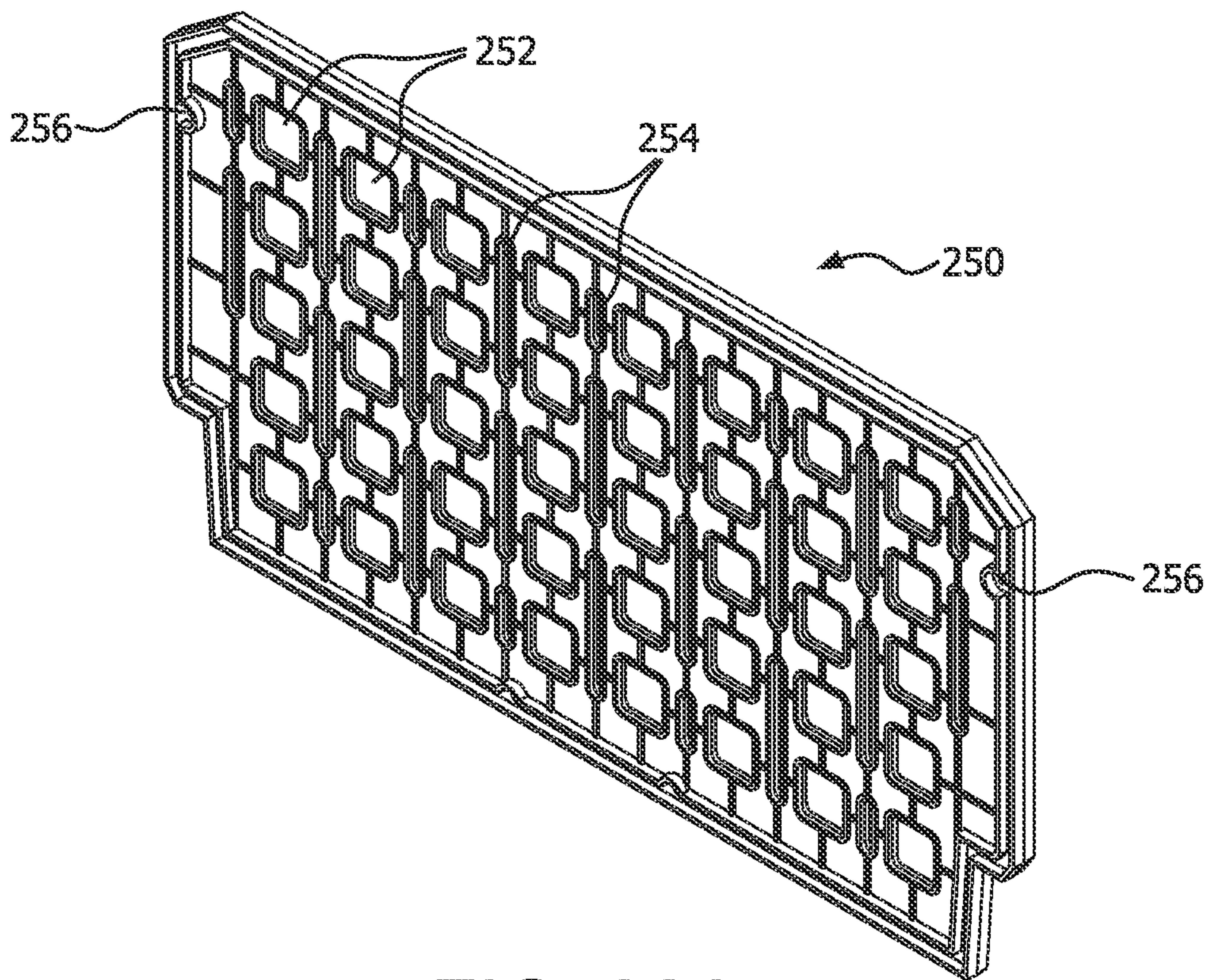


FIG. 32A

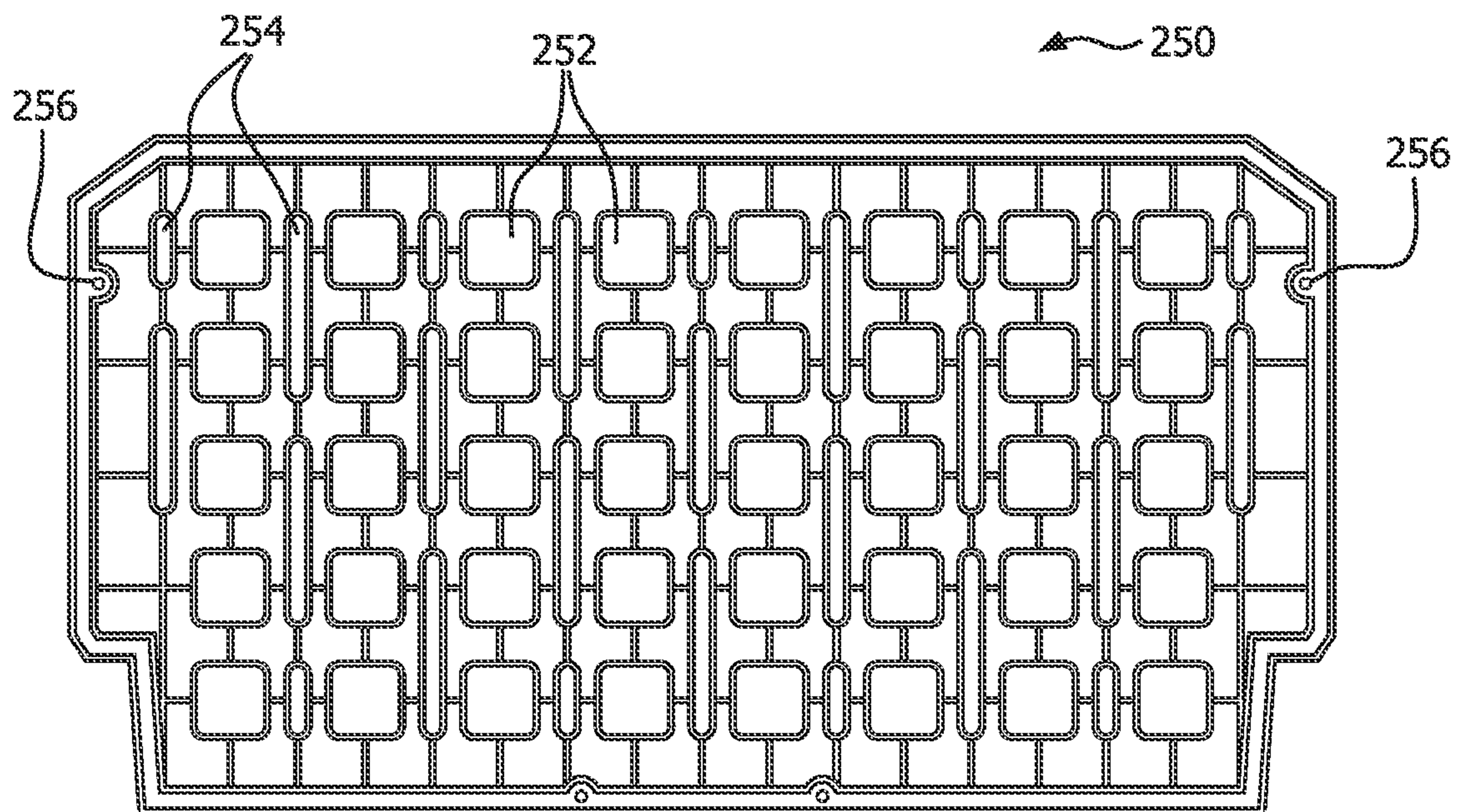


FIG. 32B

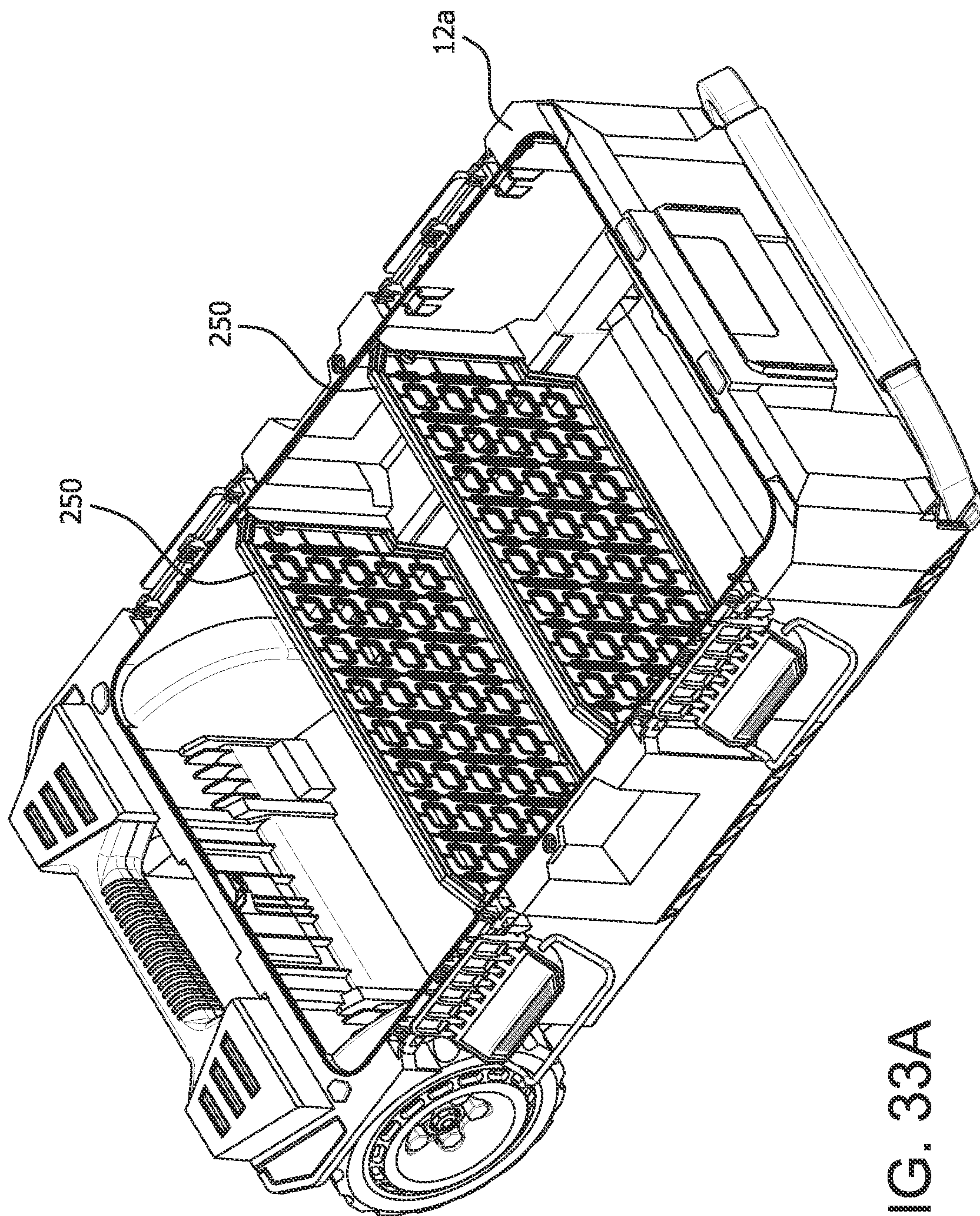


FIG. 33A

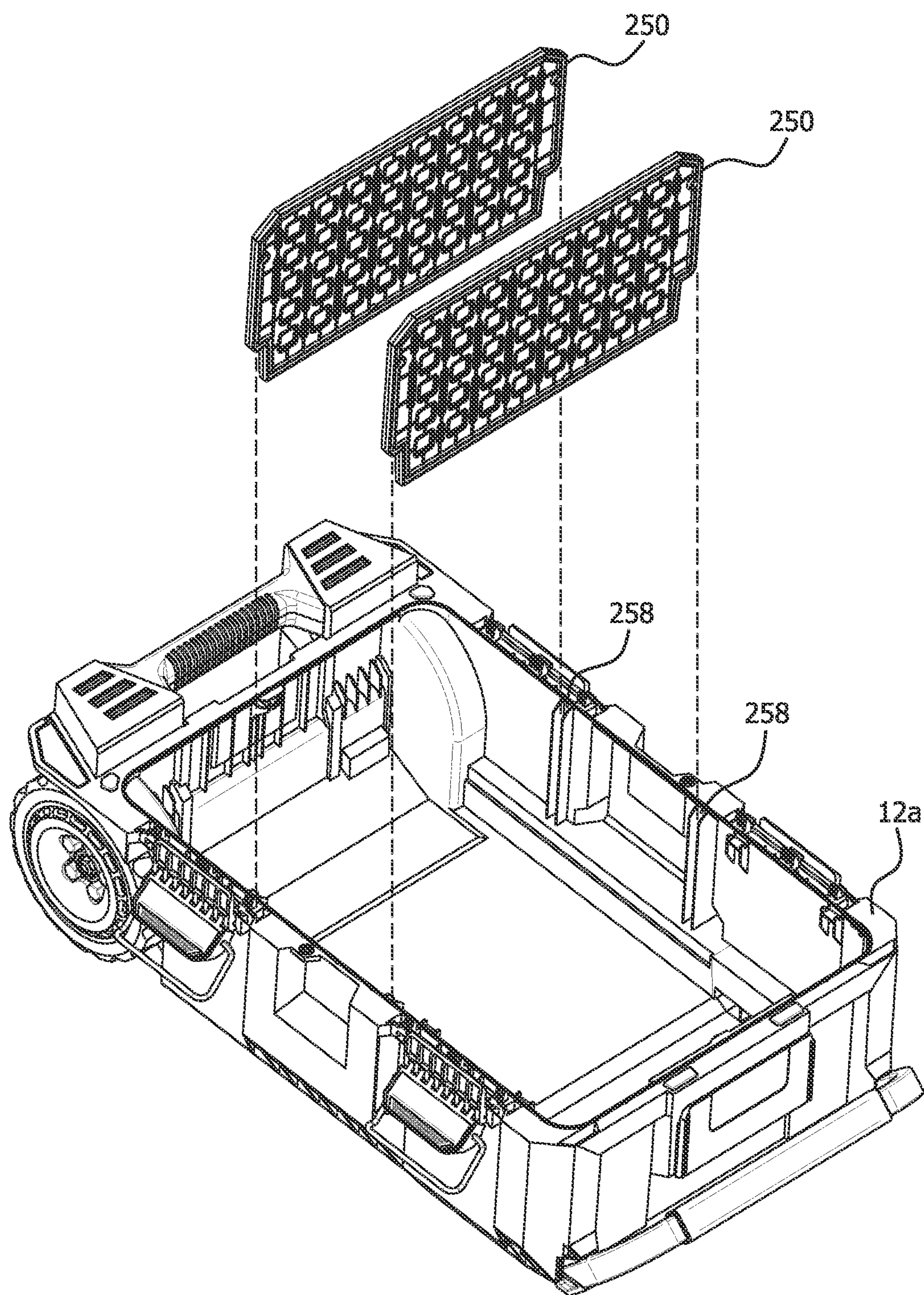


FIG. 33B

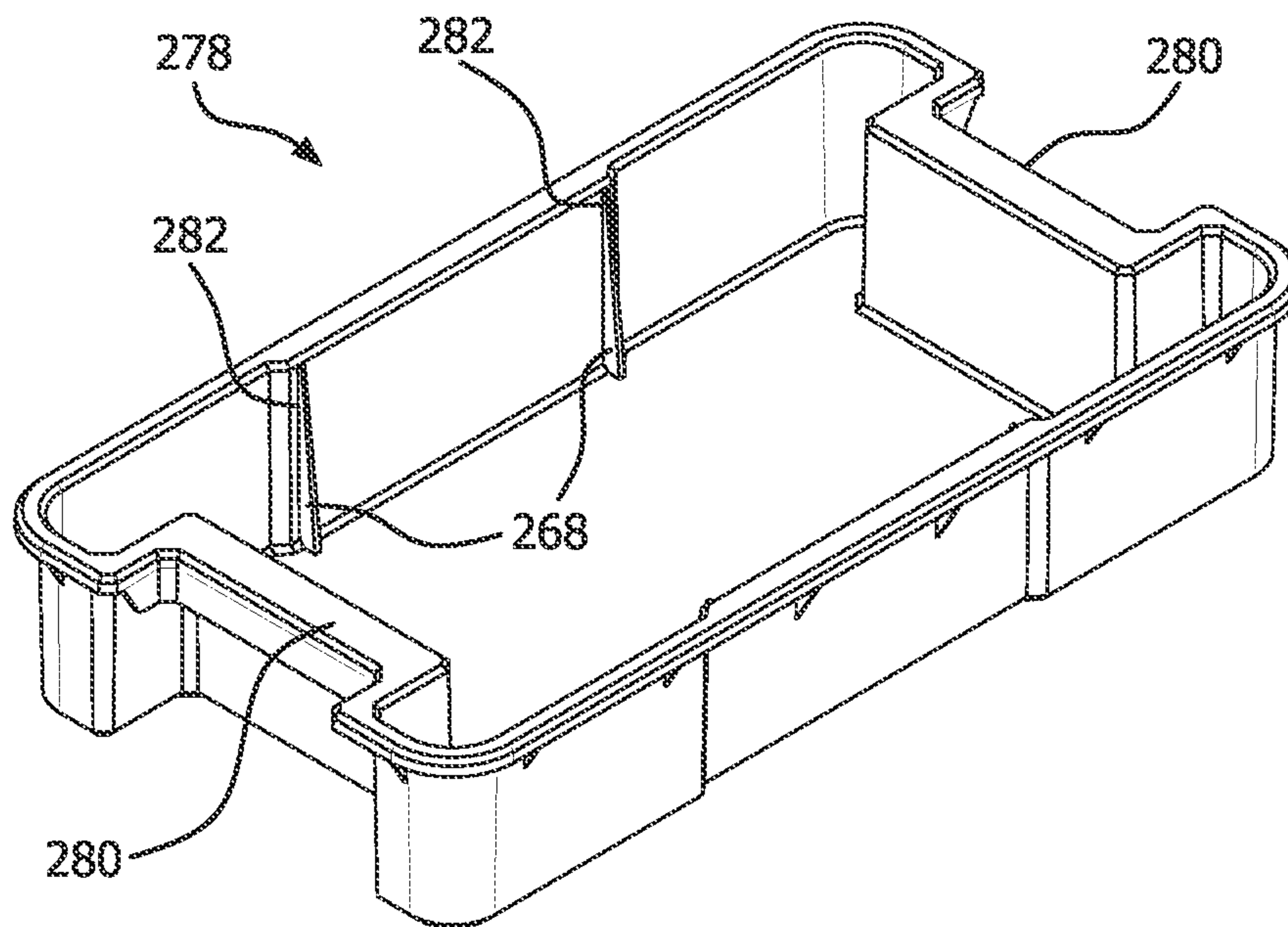


FIG. 34A

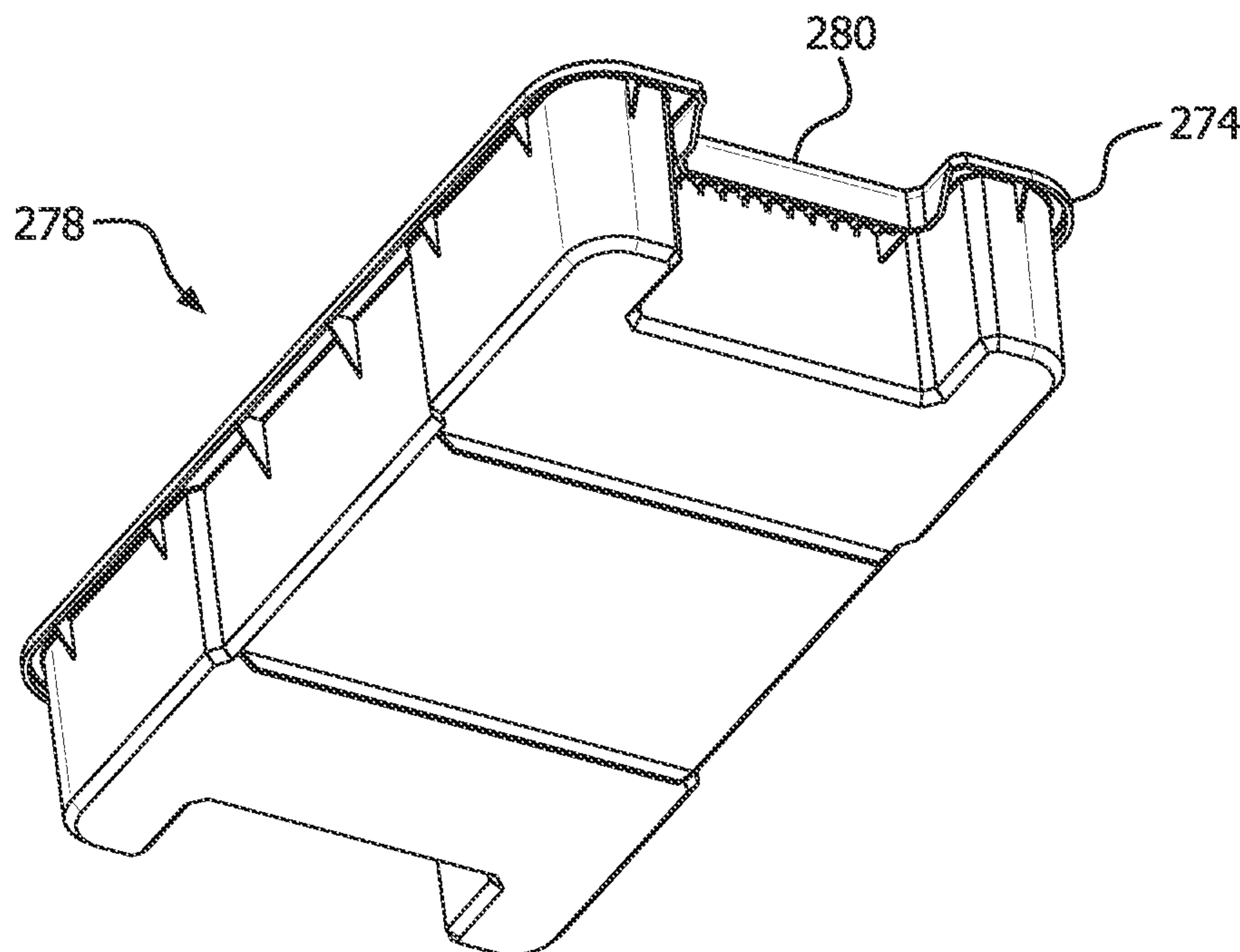


FIG. 34B

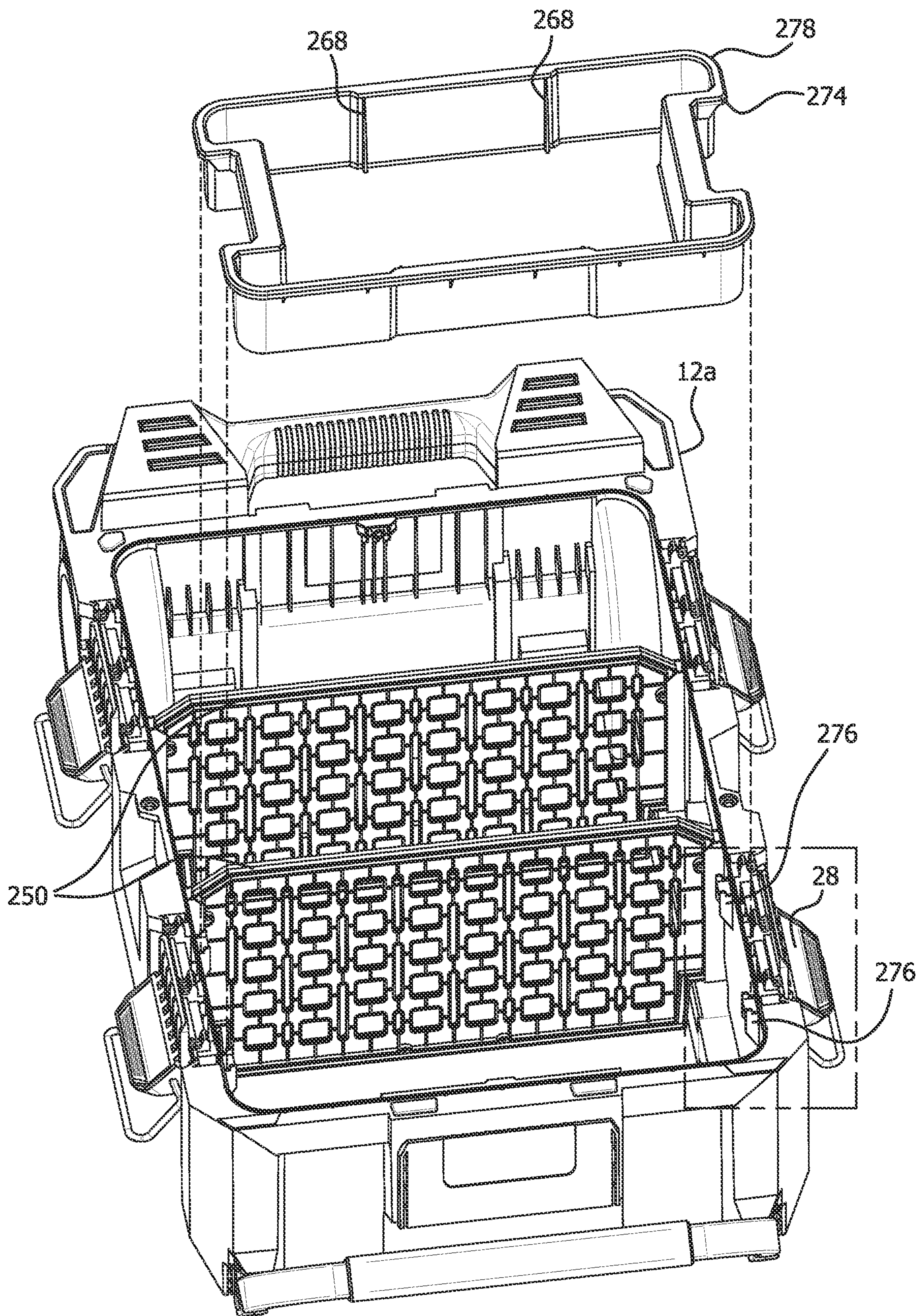


FIG. 35B

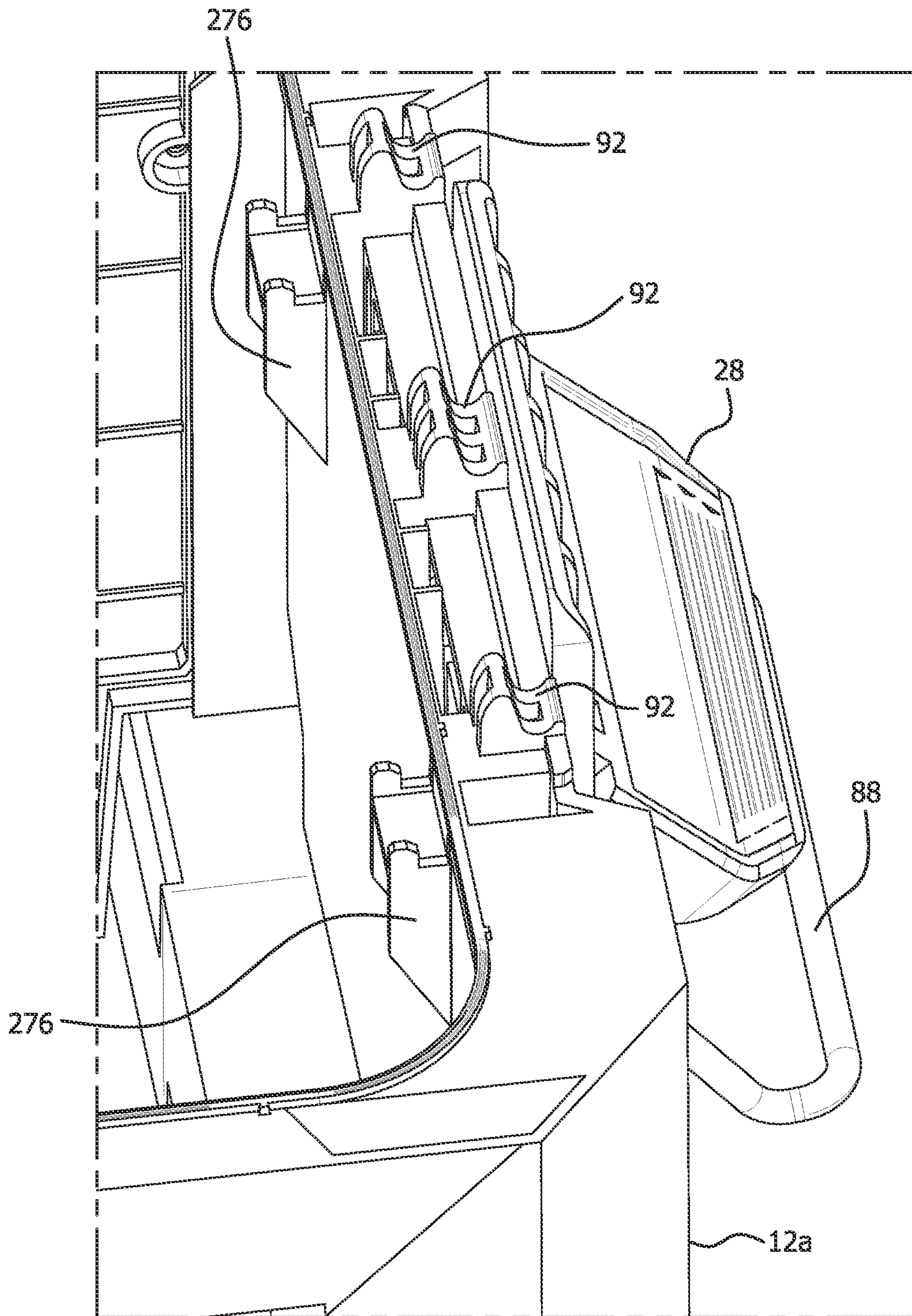


FIG. 35C

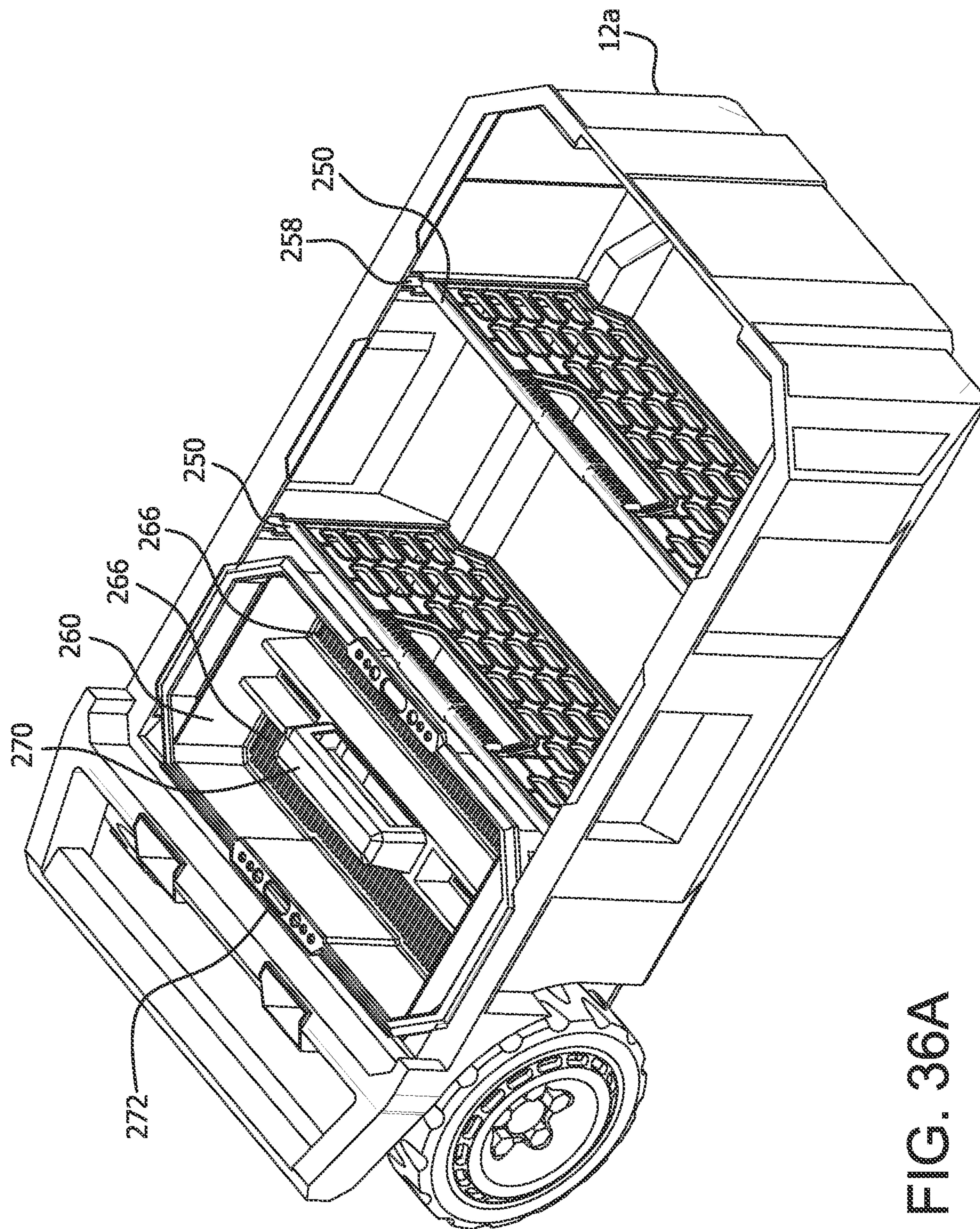


FIG. 36A

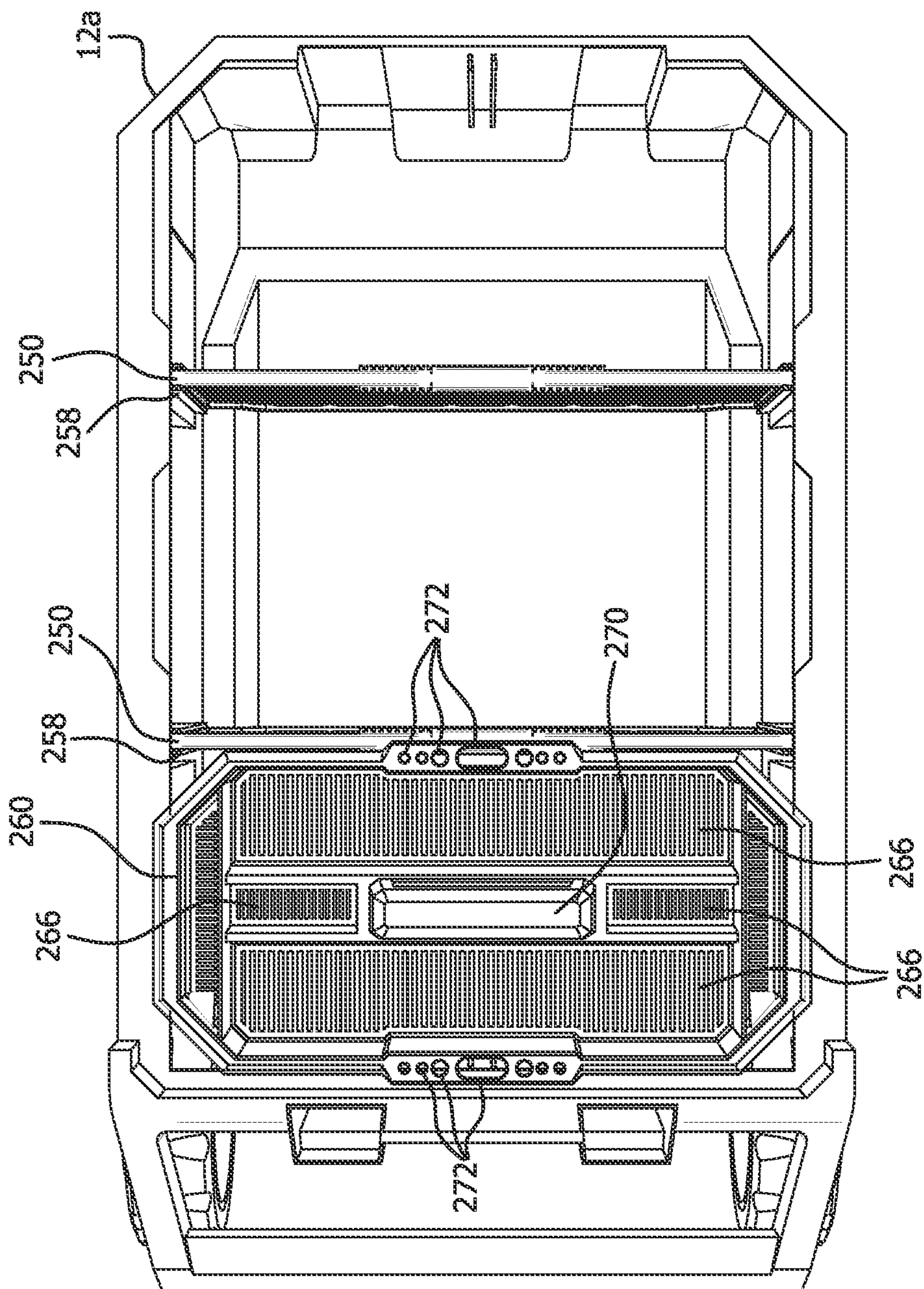


FIG. 36B

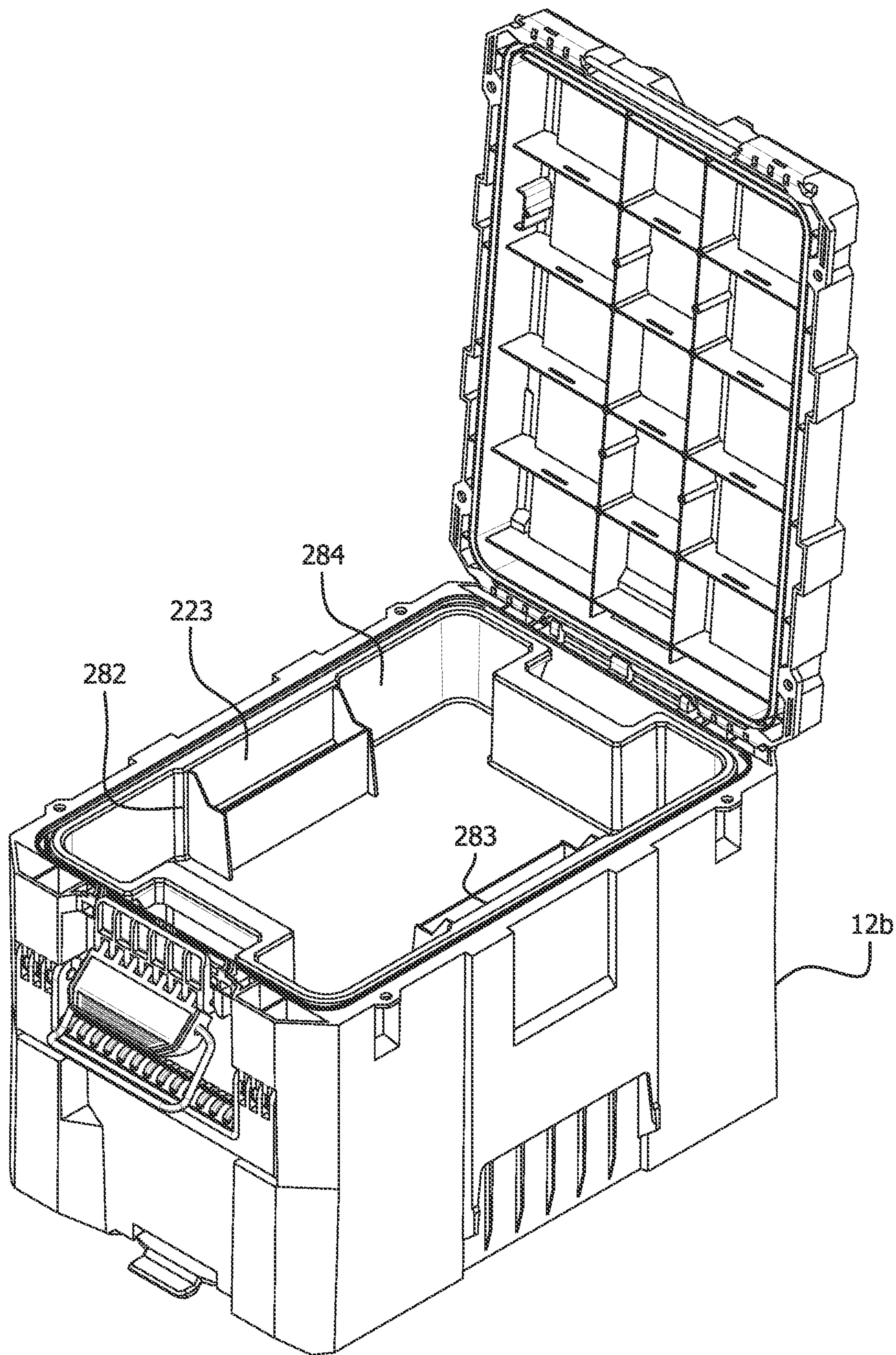


FIG. 37A

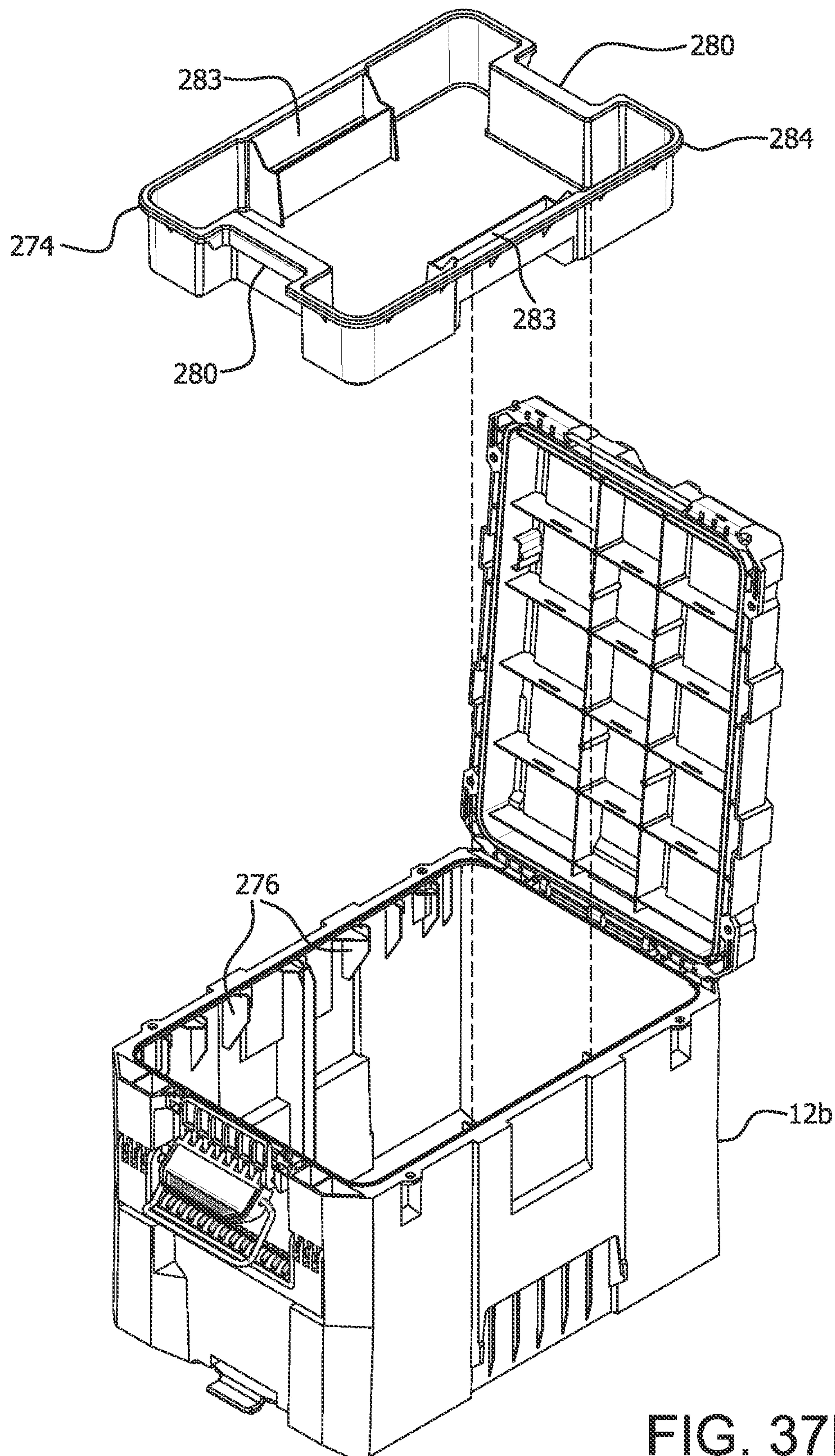


FIG. 37B

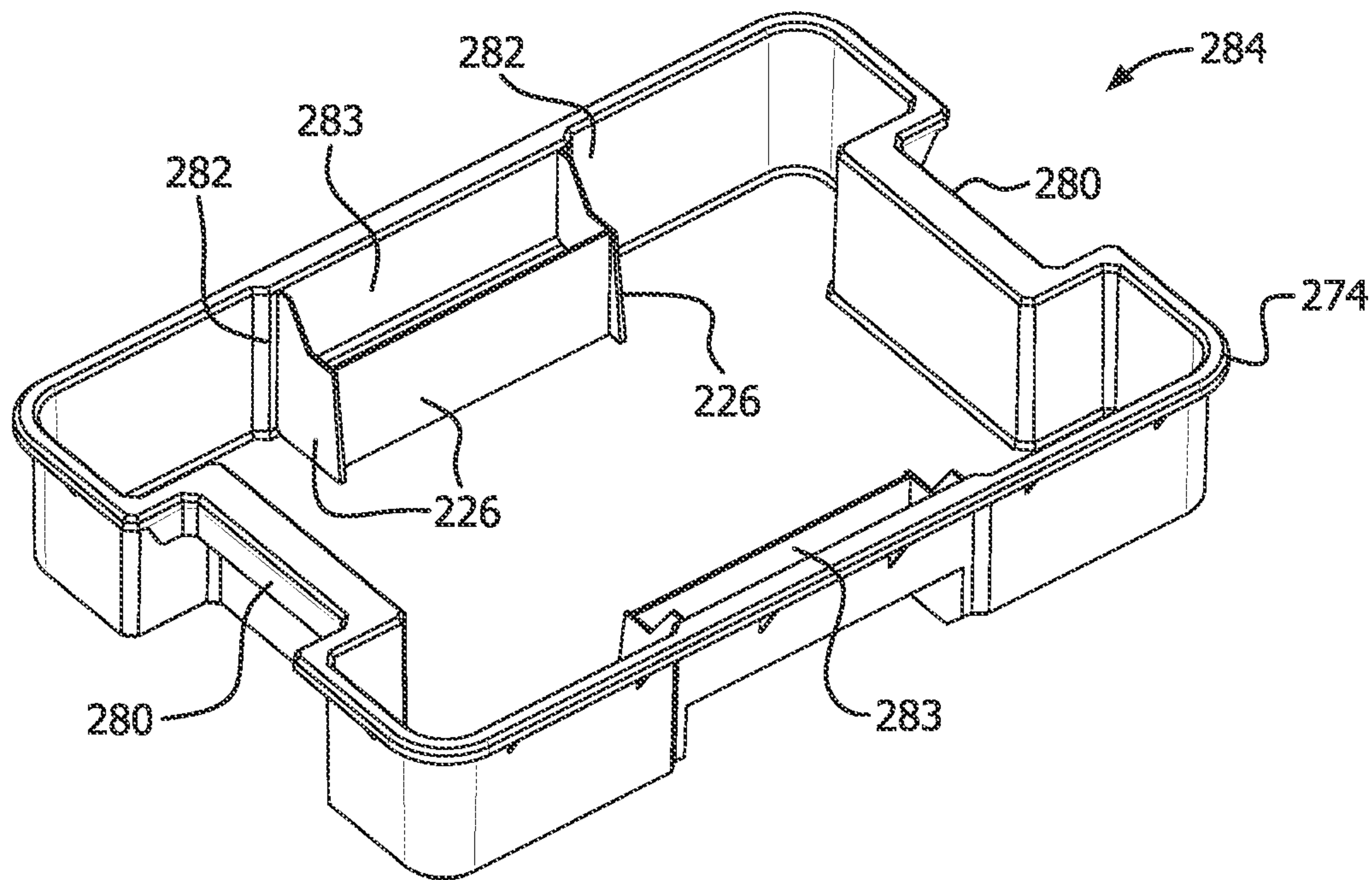


FIG. 38A

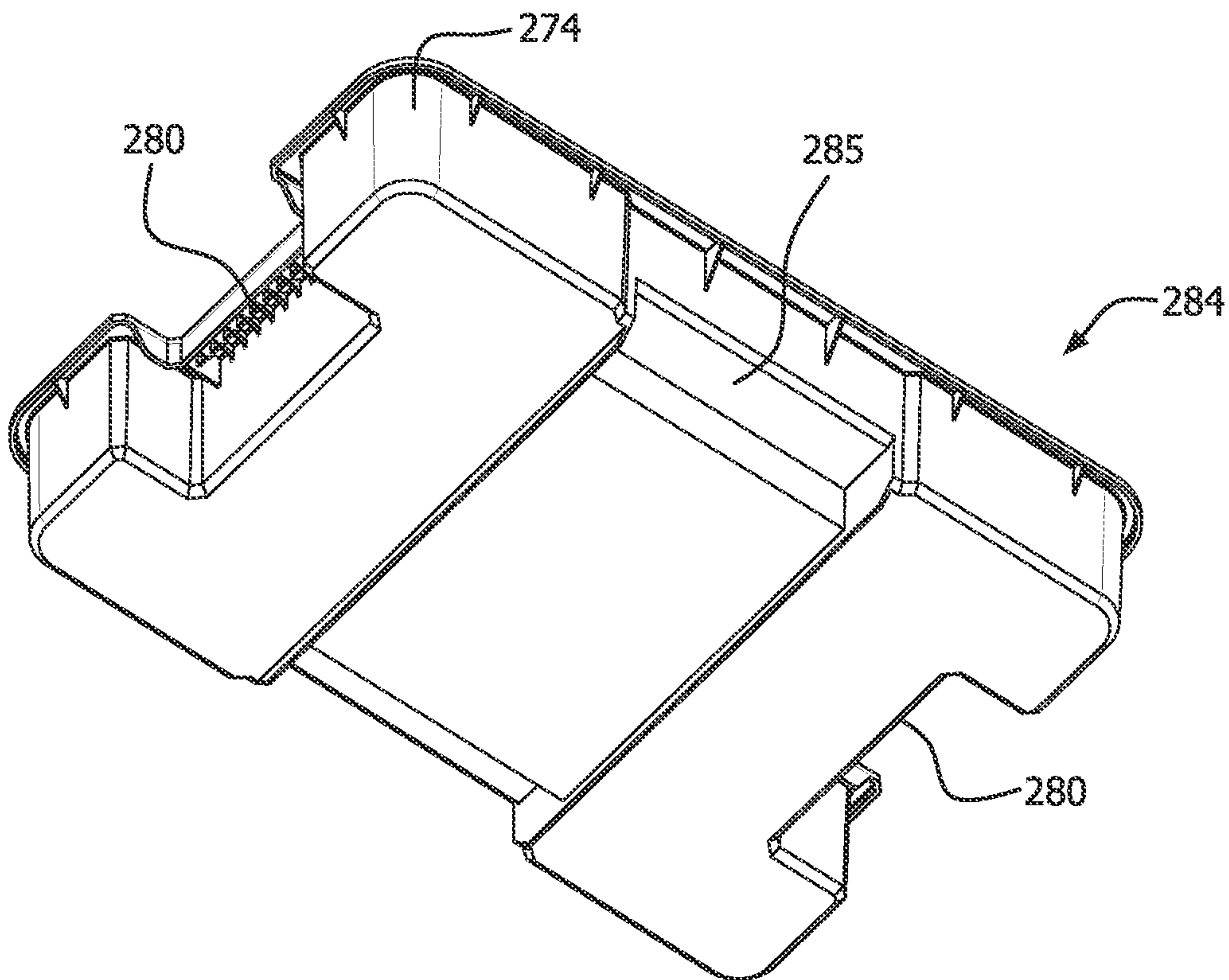


FIG. 38B

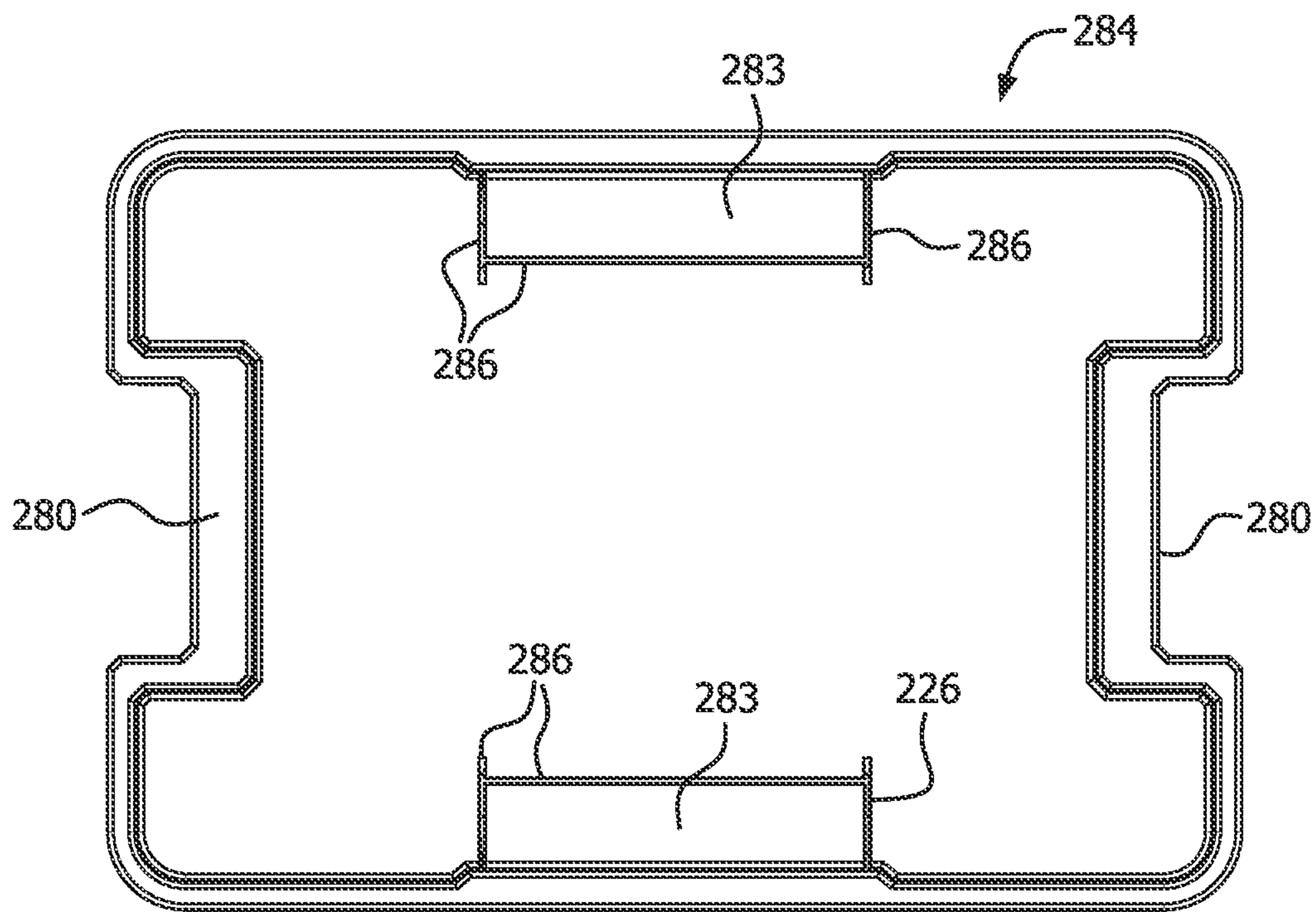


FIG. 38C

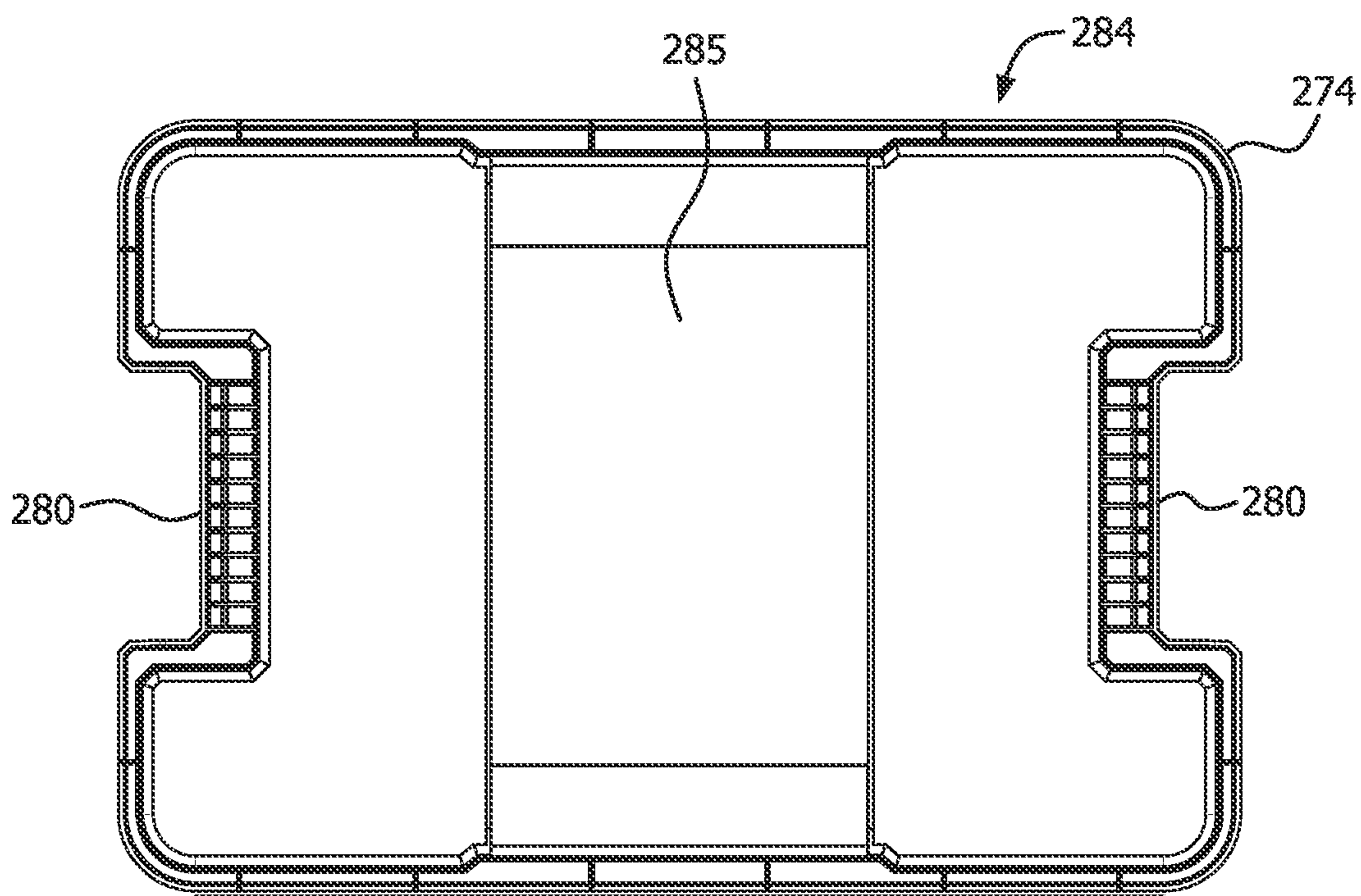


FIG. 38D

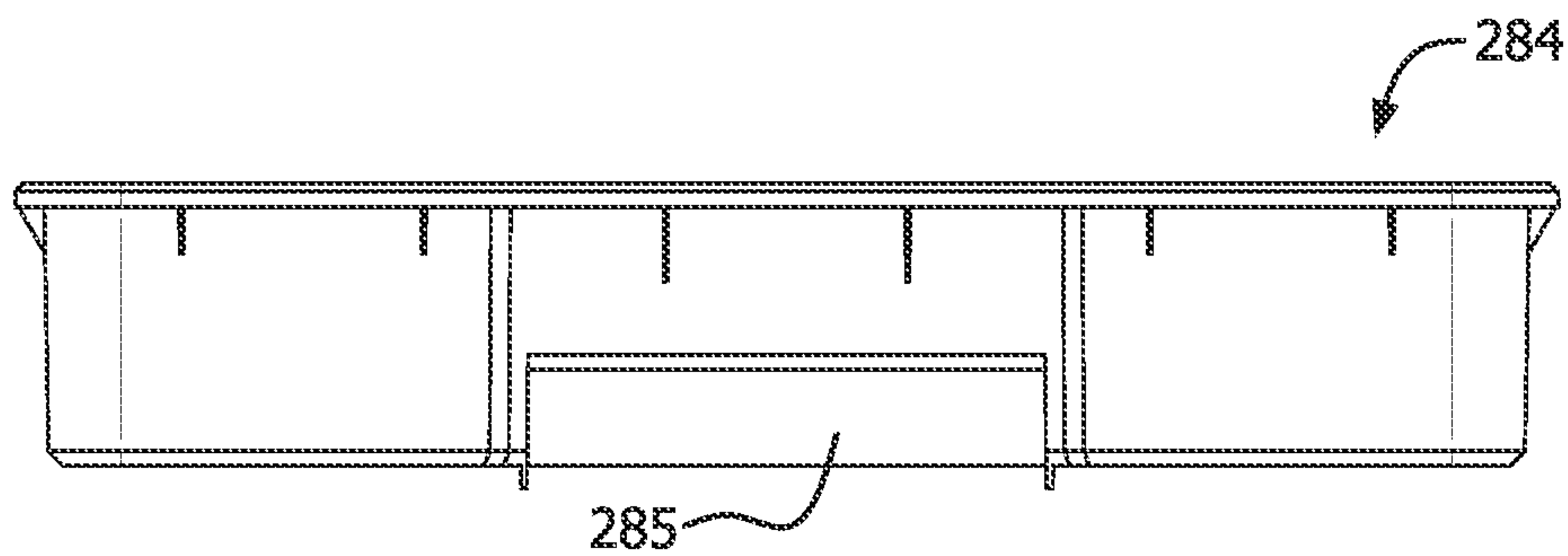


FIG. 38E

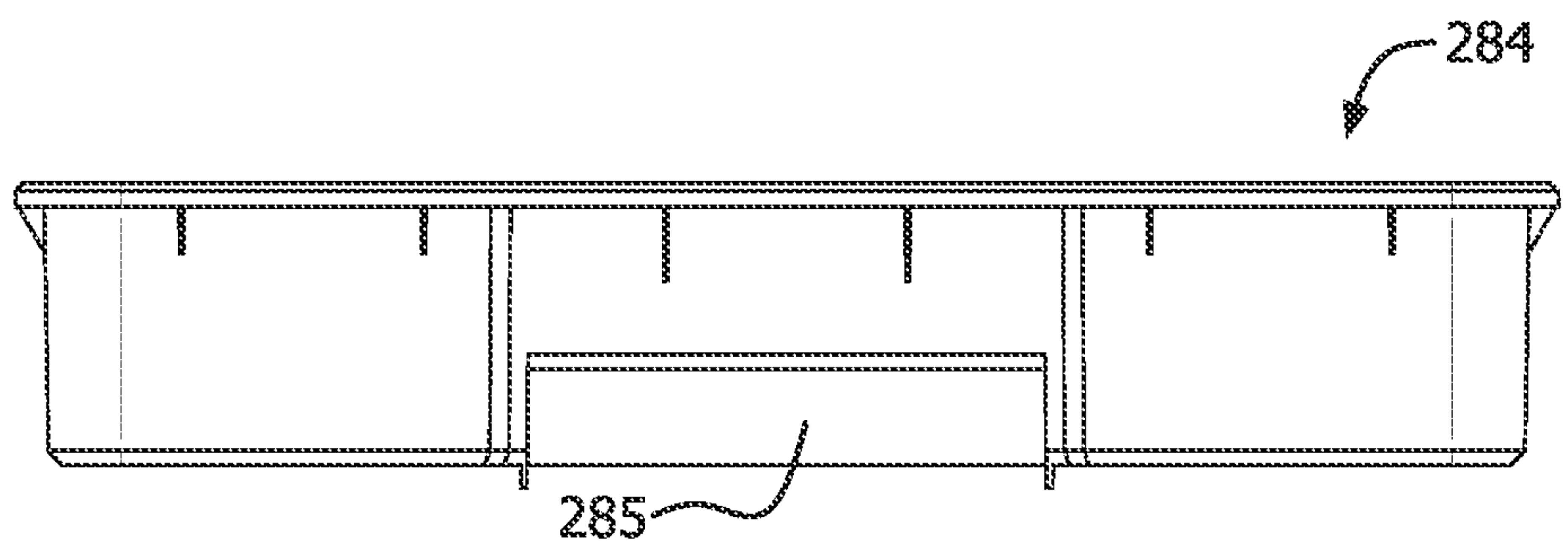


FIG. 38F

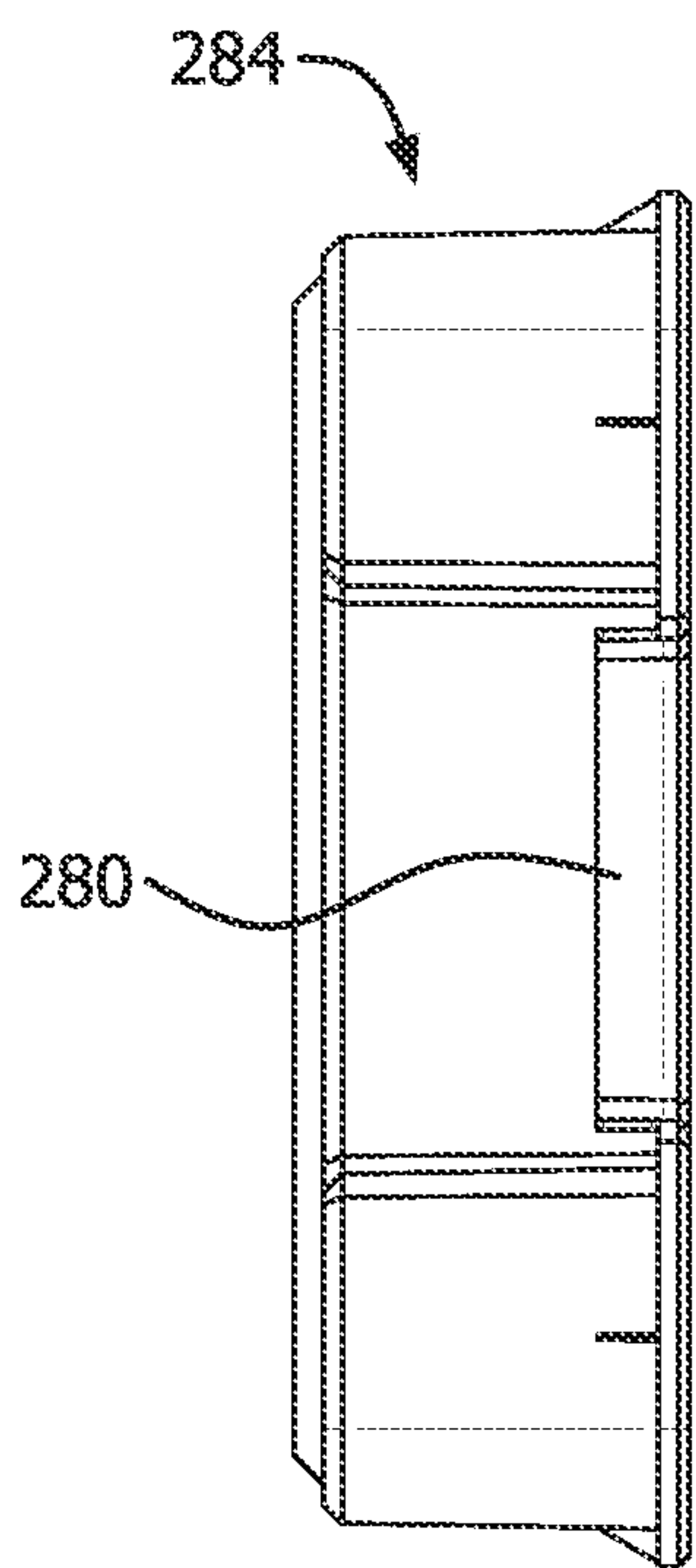


FIG. 38G

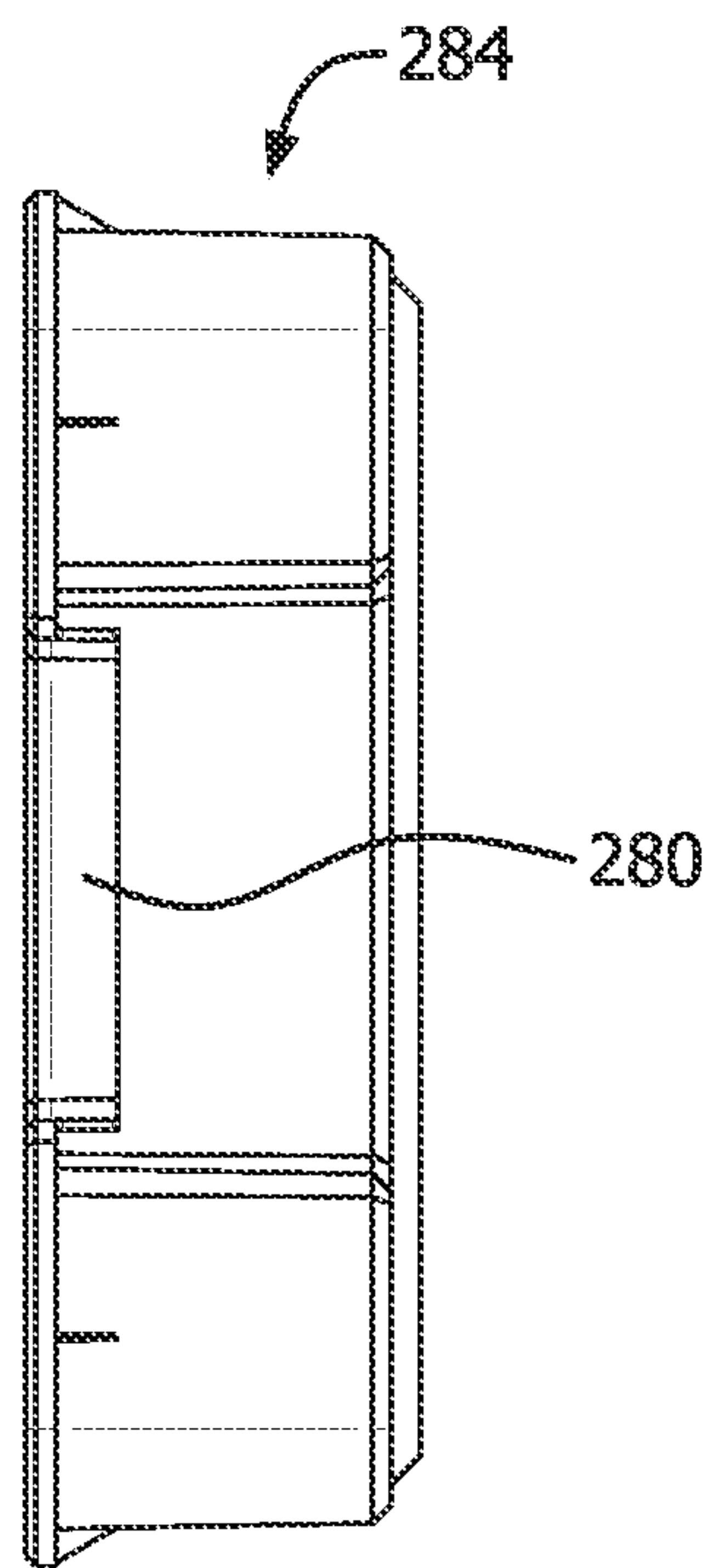


FIG. 38H

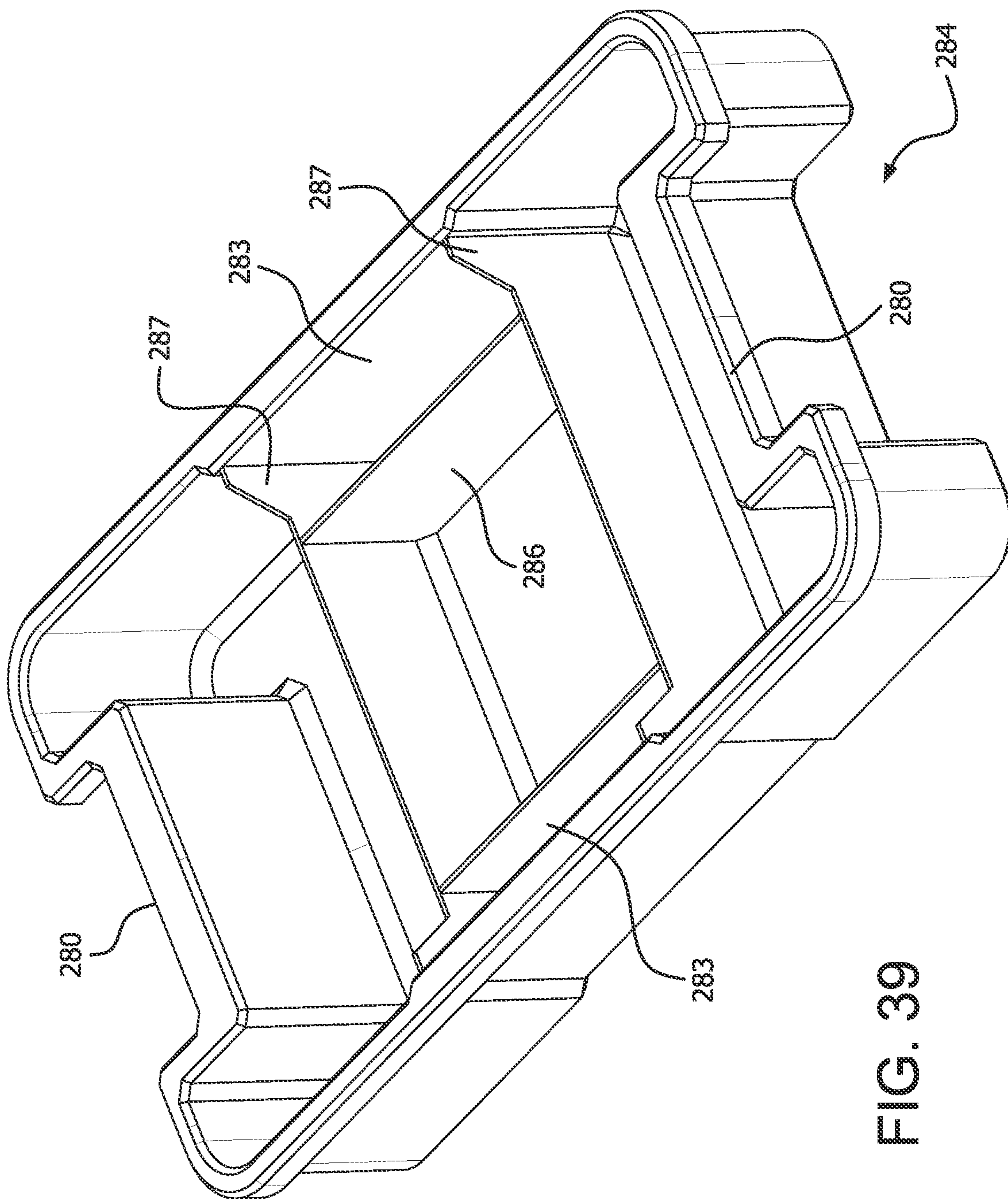


FIG. 39

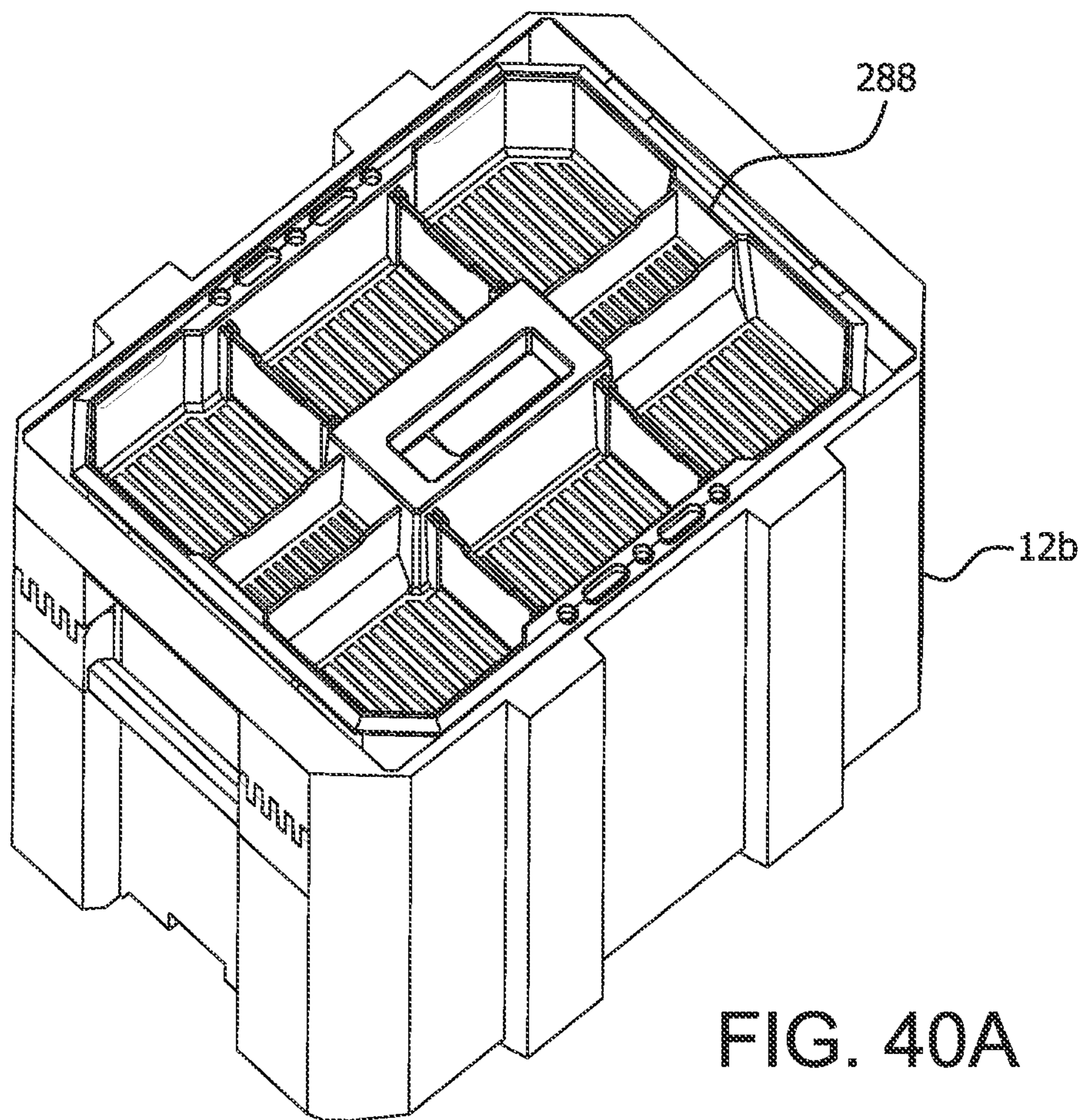


FIG. 40A

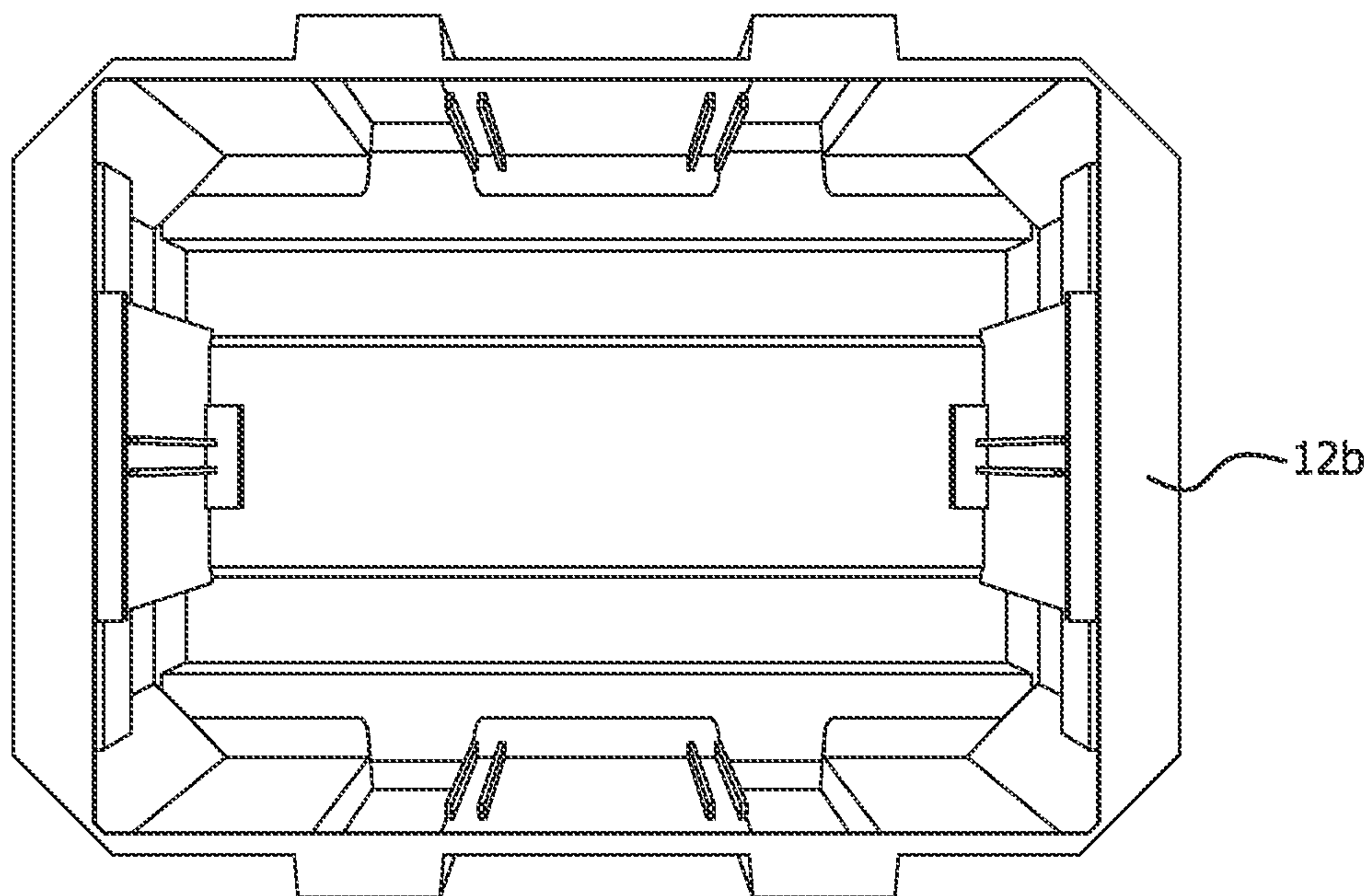


FIG. 40B

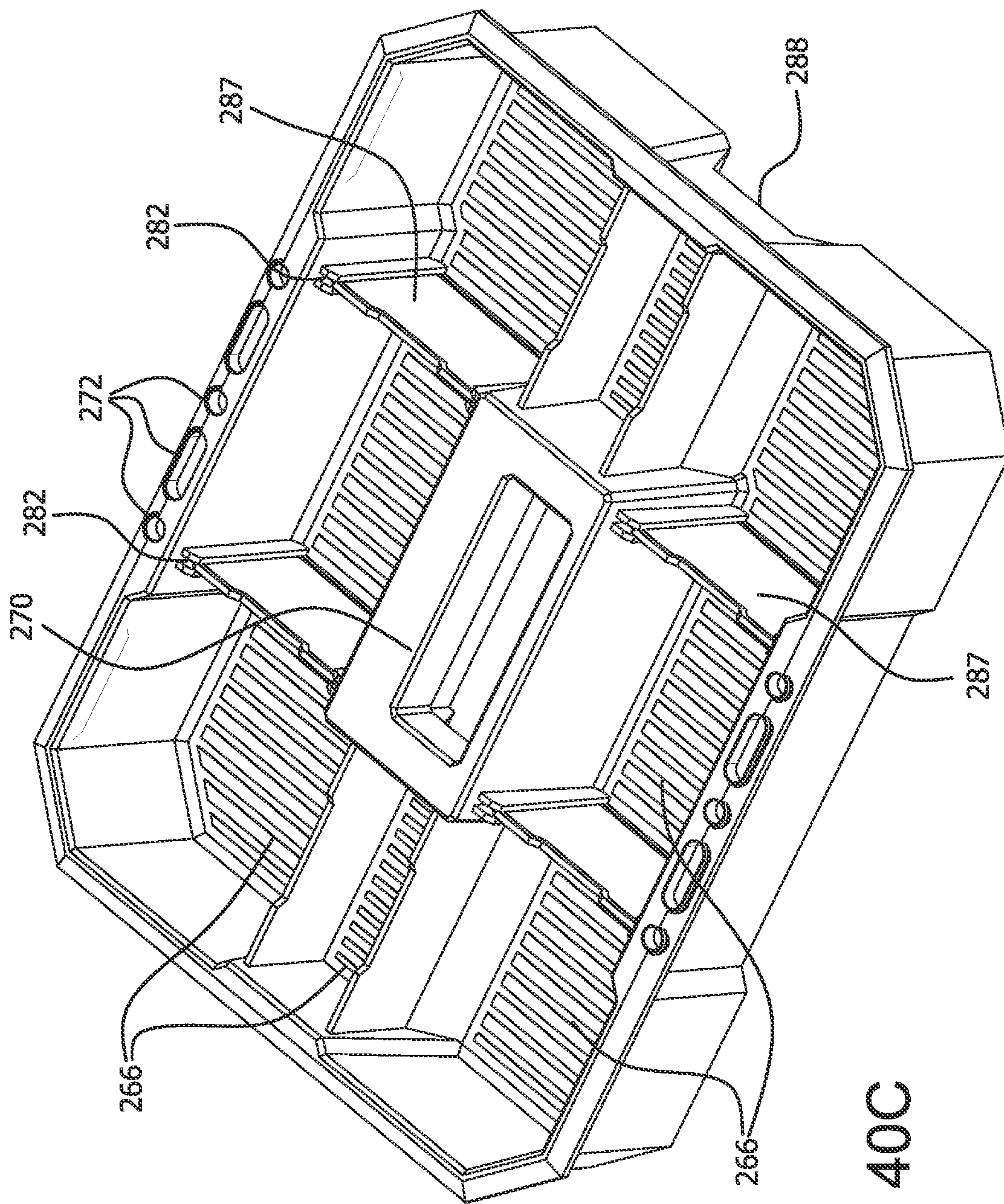


FIG. 40C

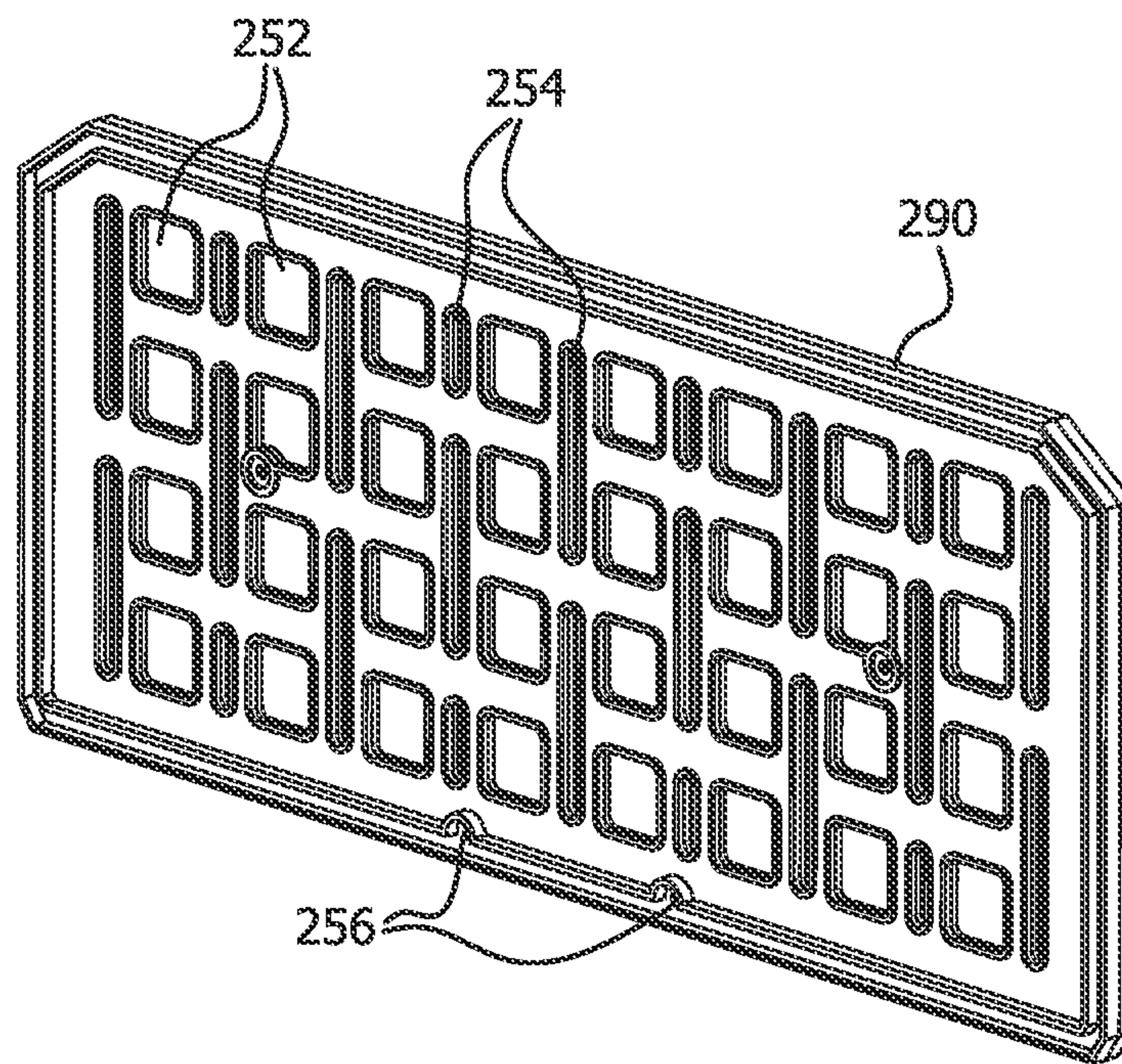


FIG. 41A

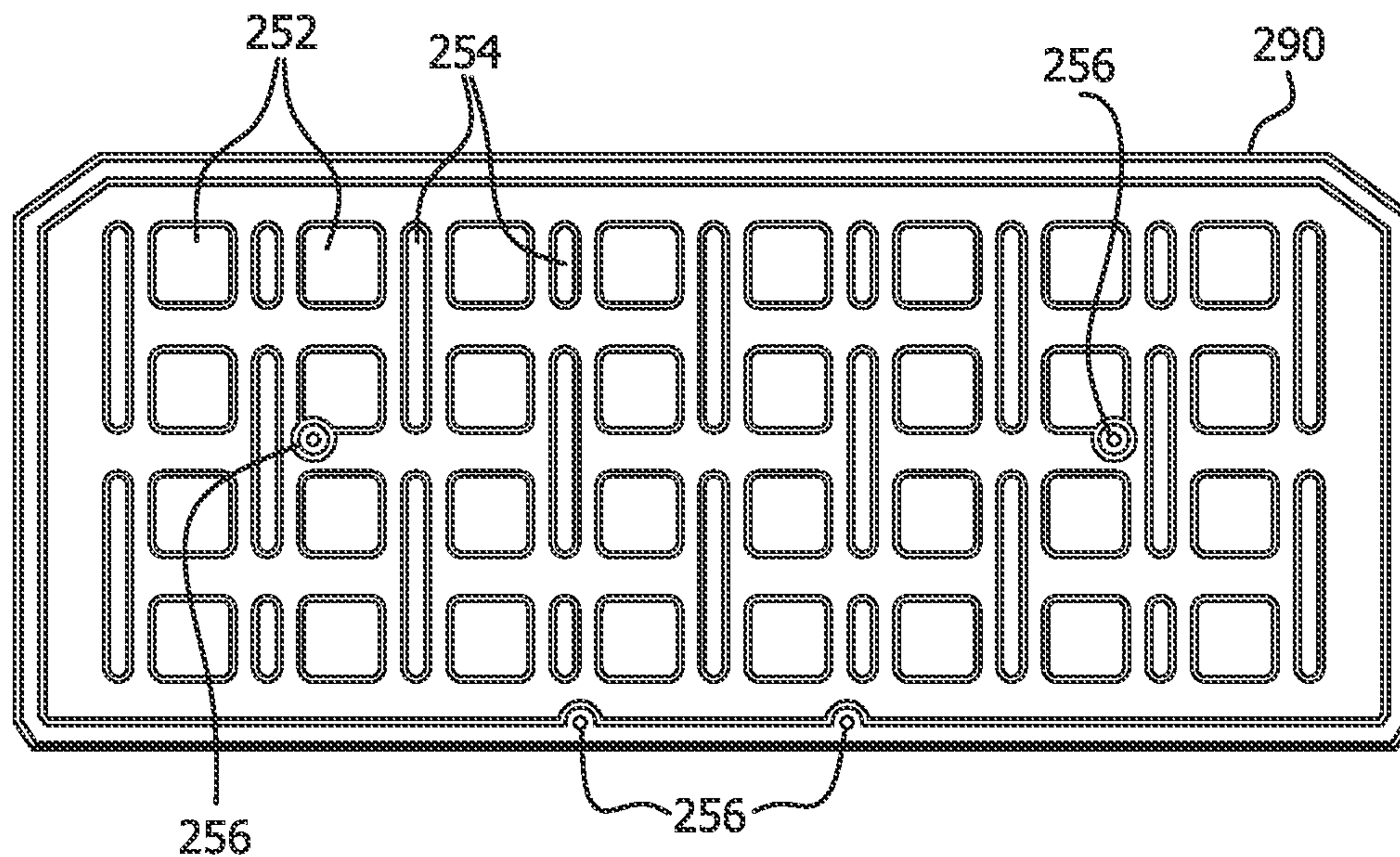


FIG. 41B

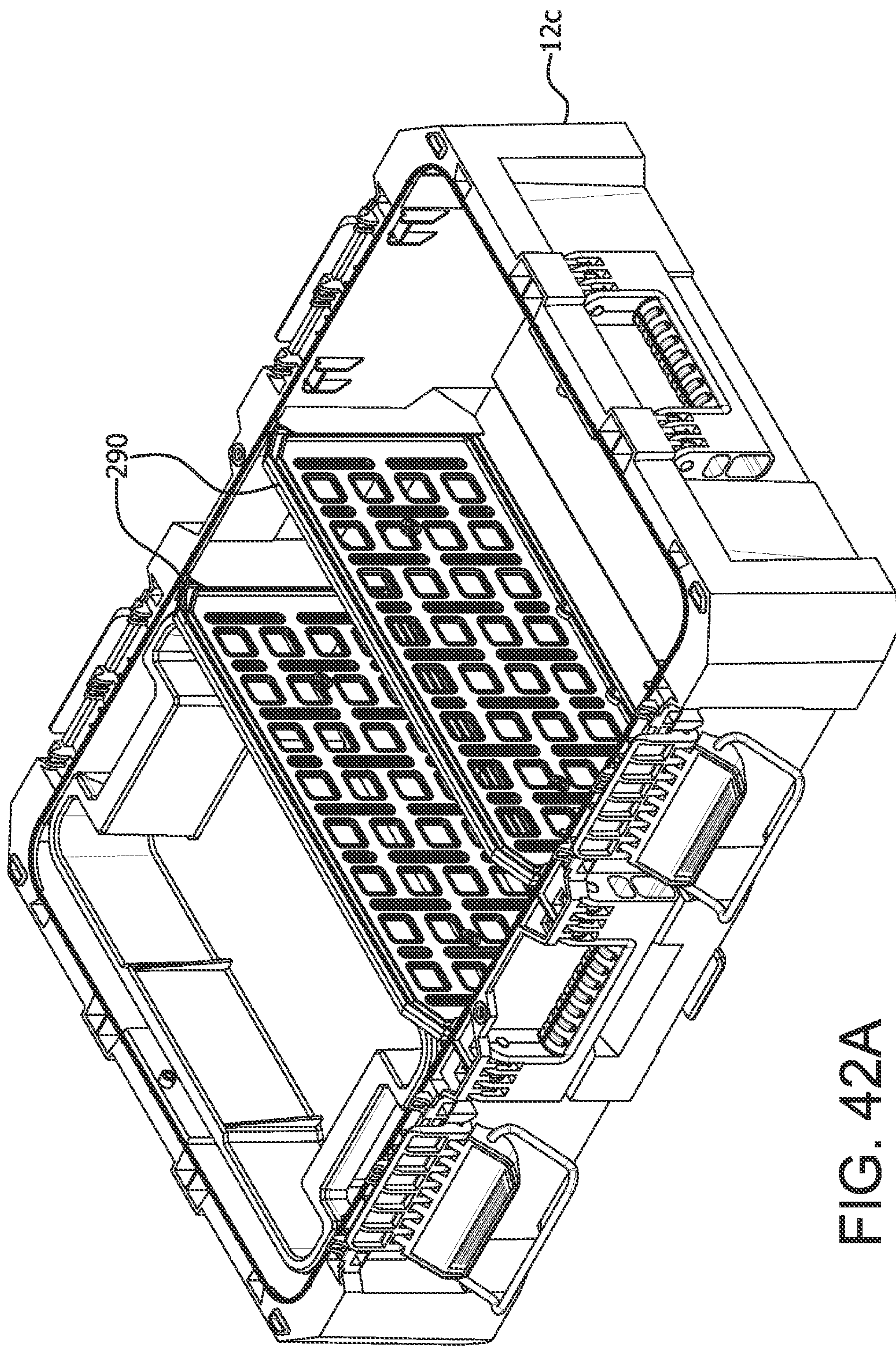


FIG. 42A

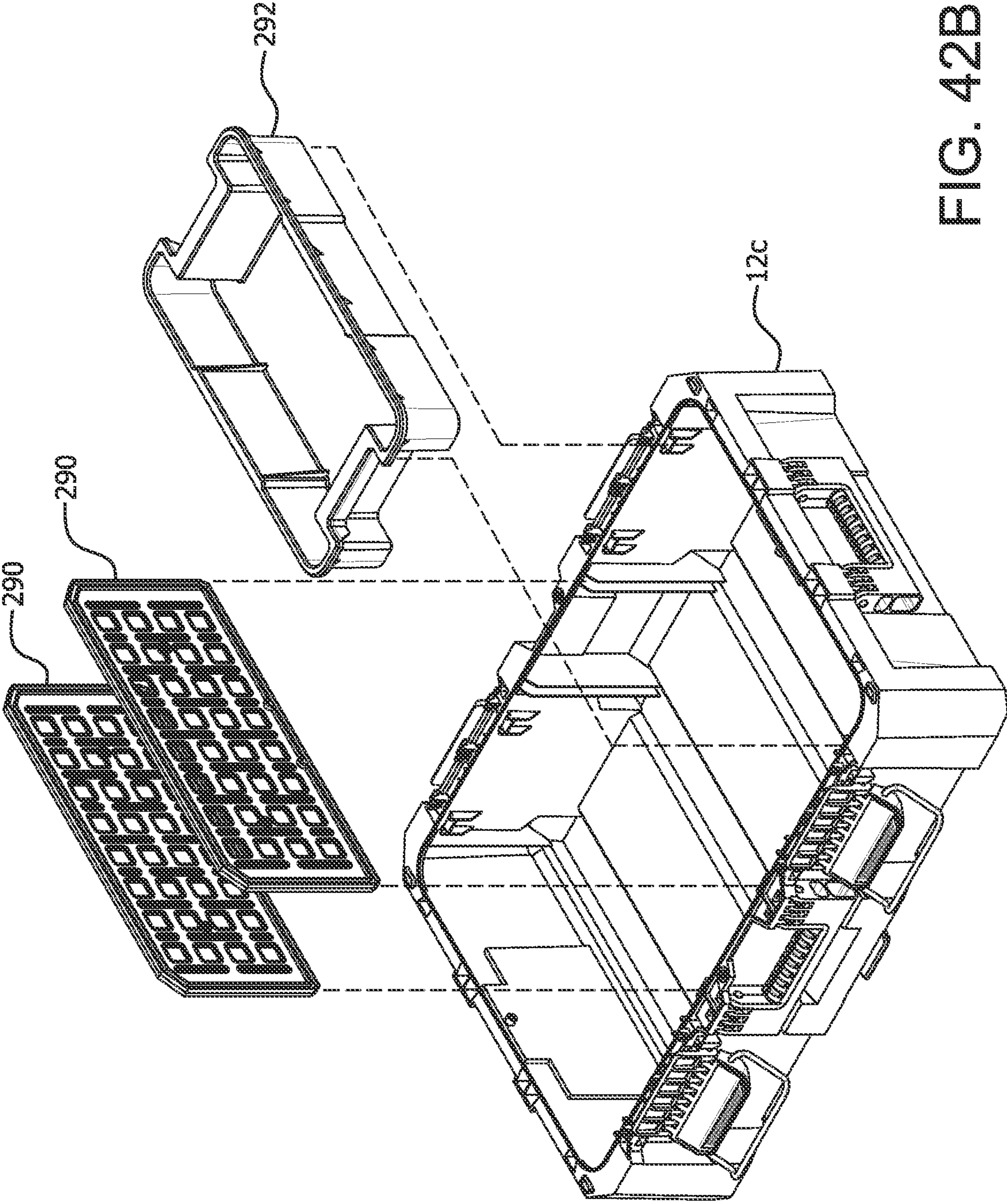


FIG. 42B

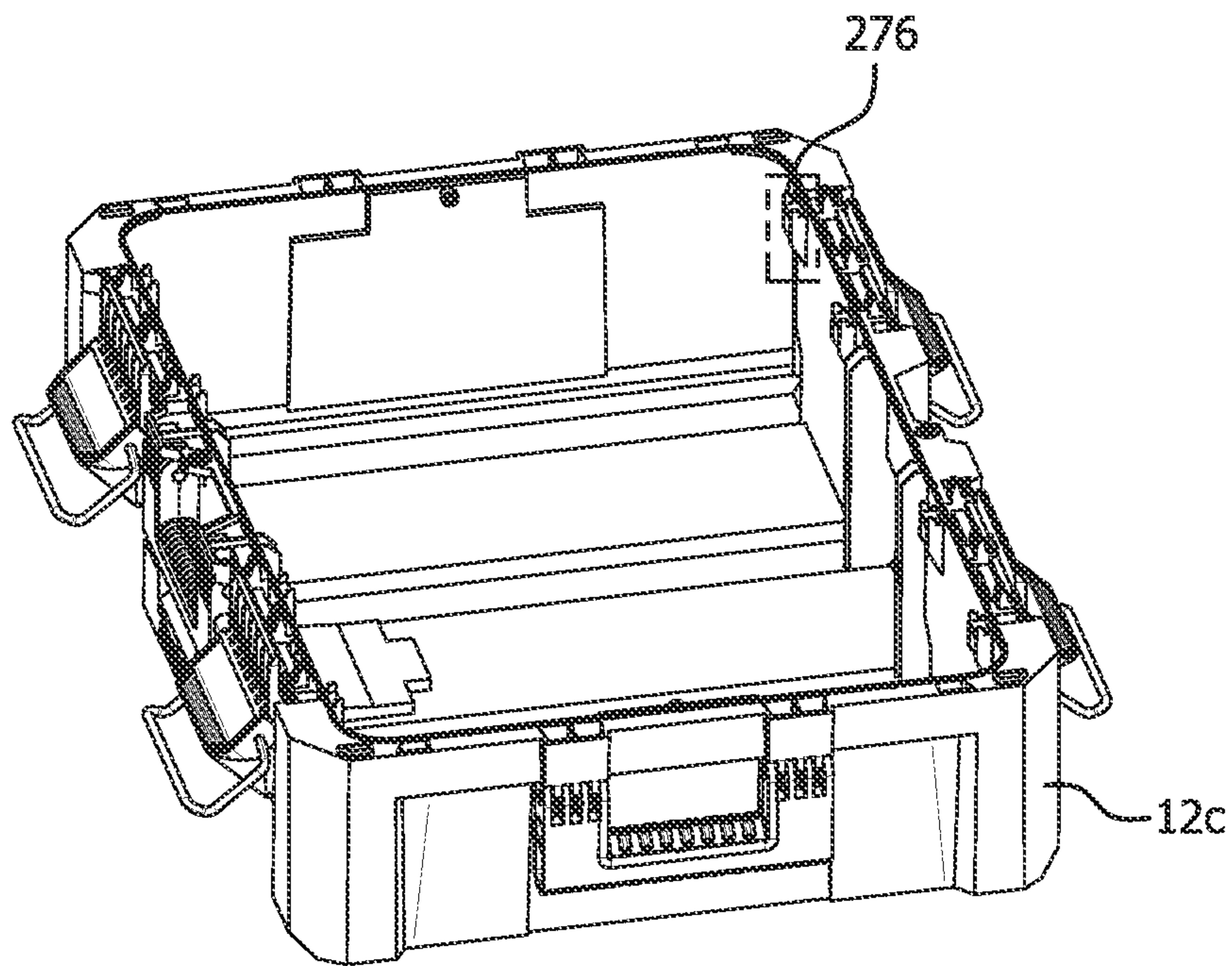


FIG. 43A

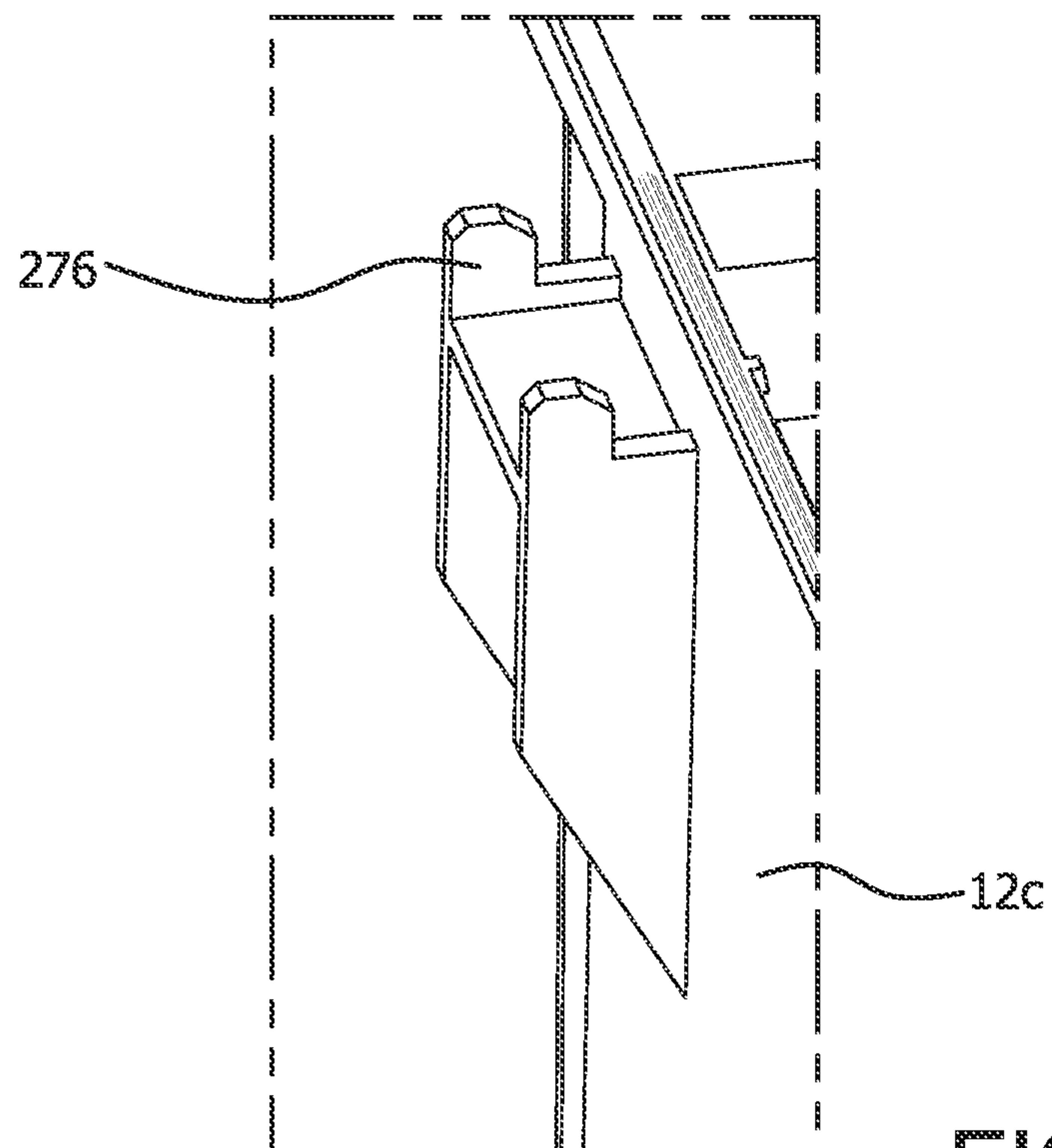


FIG. 43B

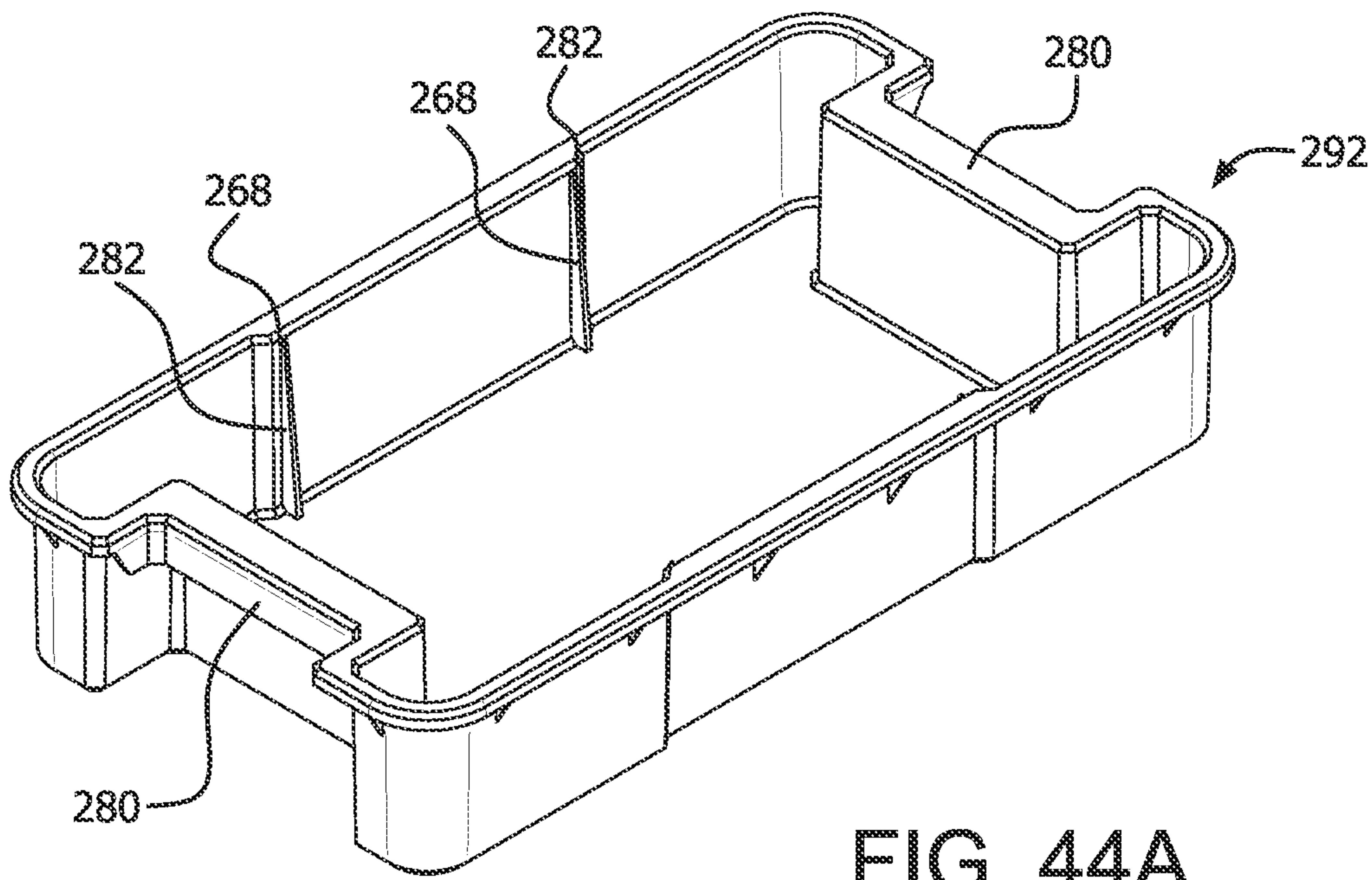


FIG. 44A

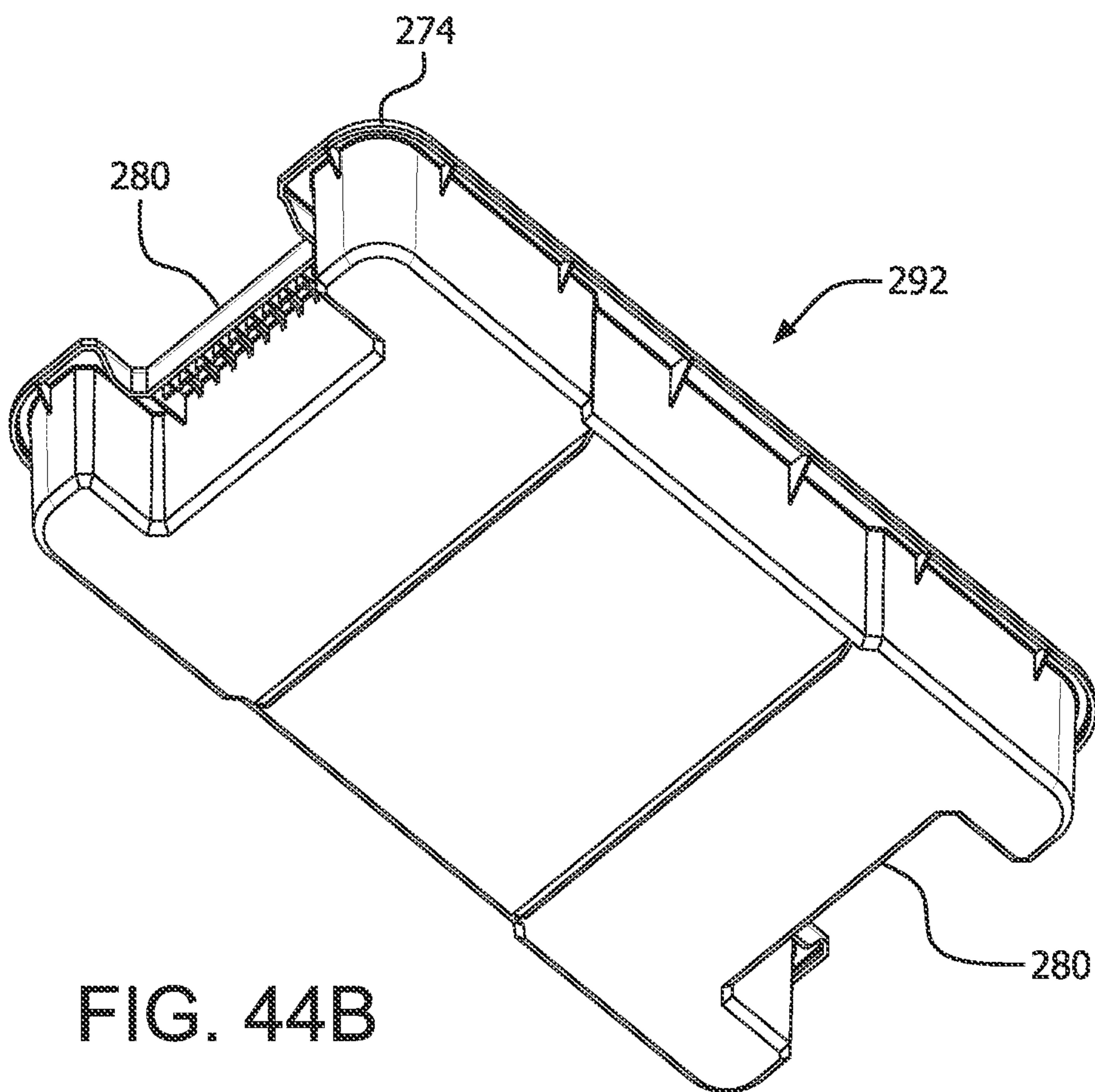


FIG. 44B

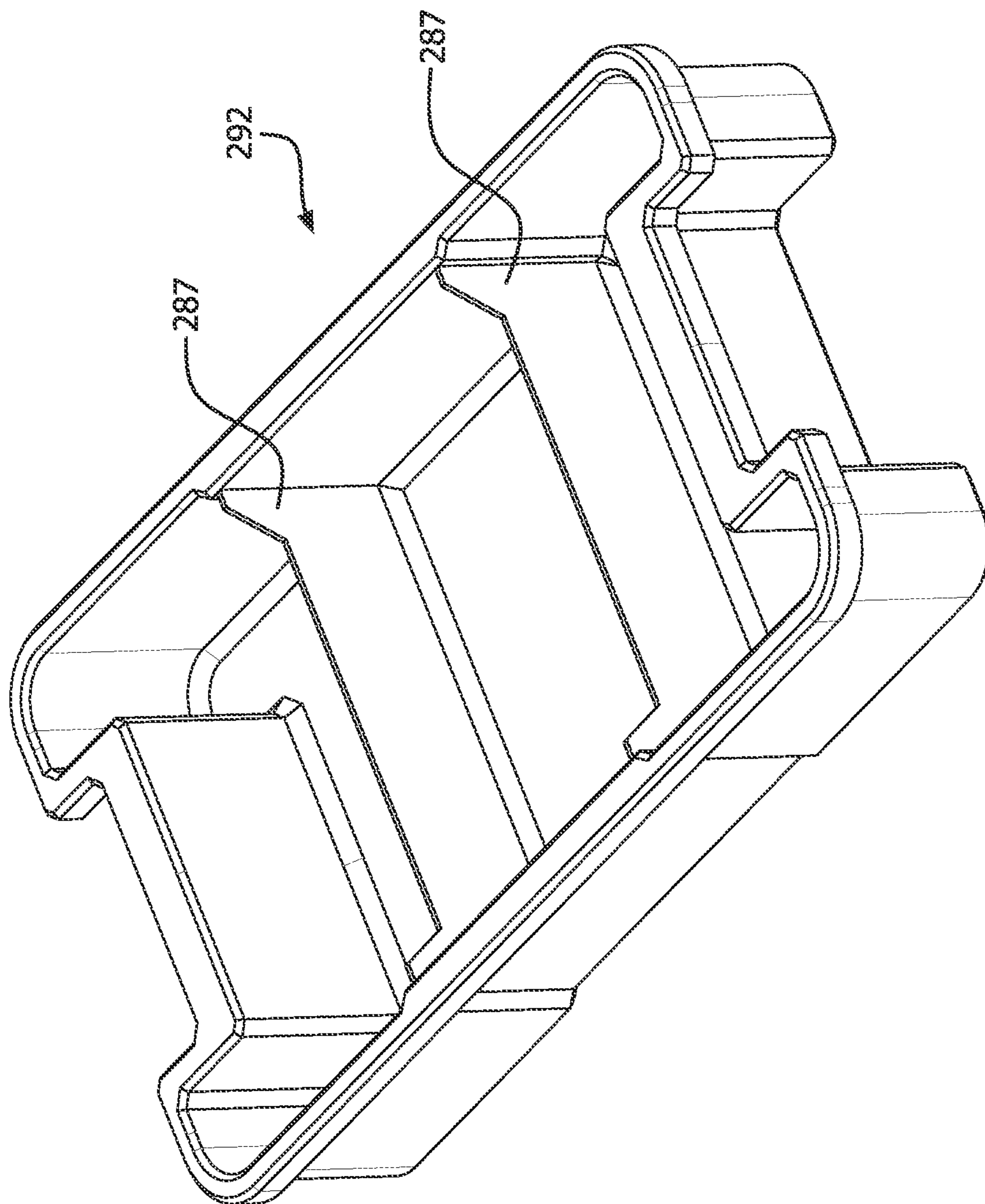
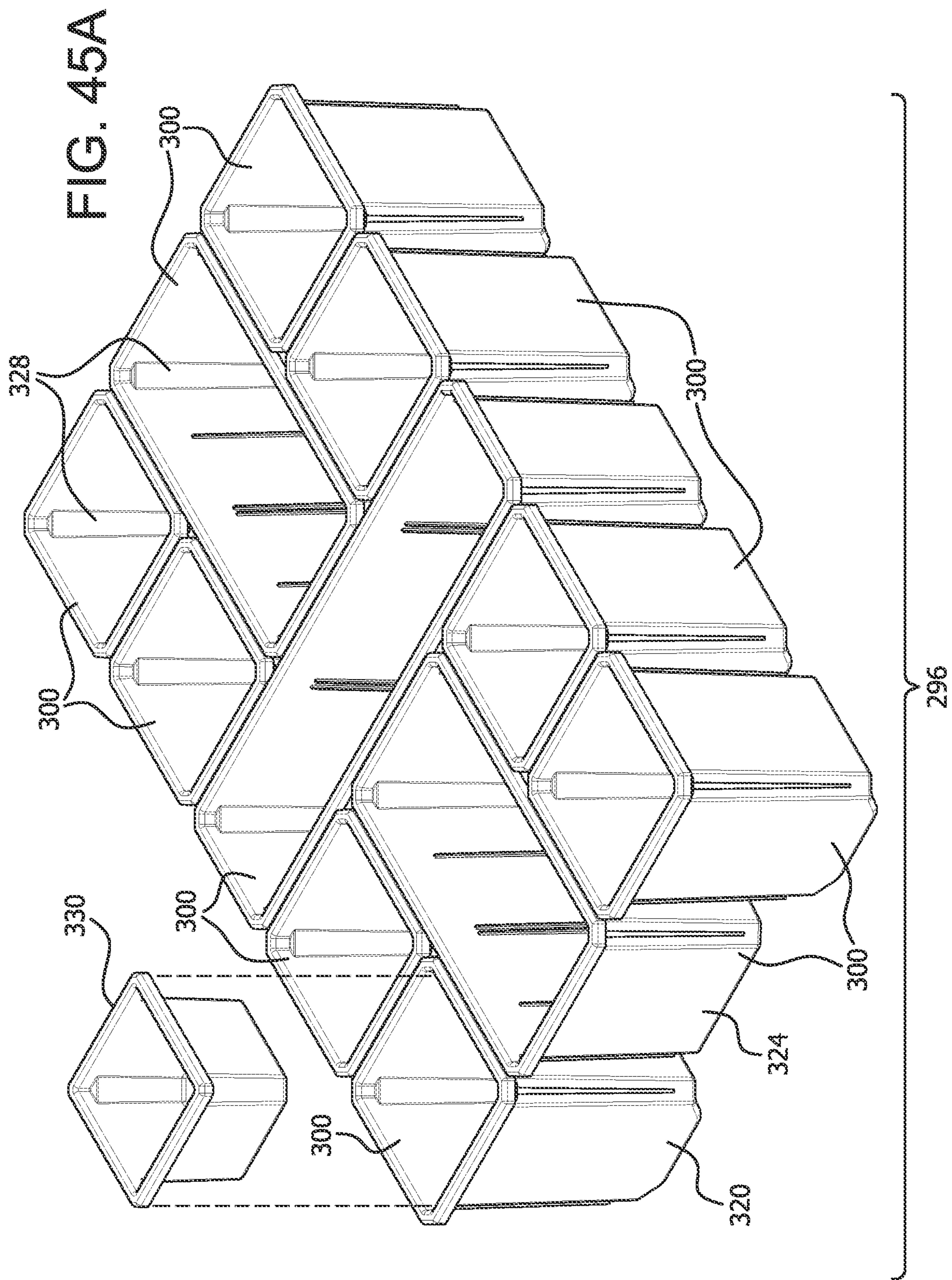


FIG. 44C



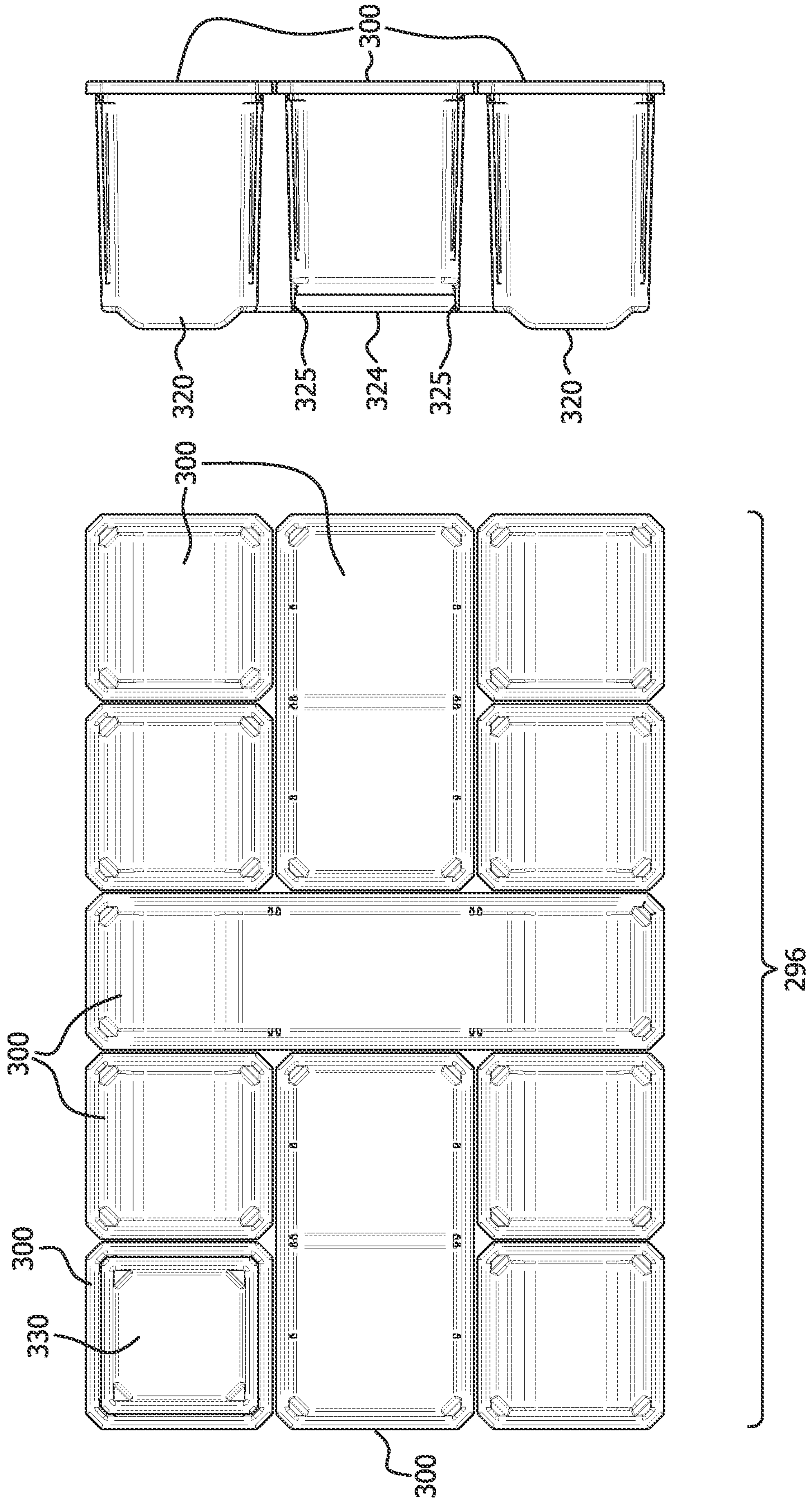
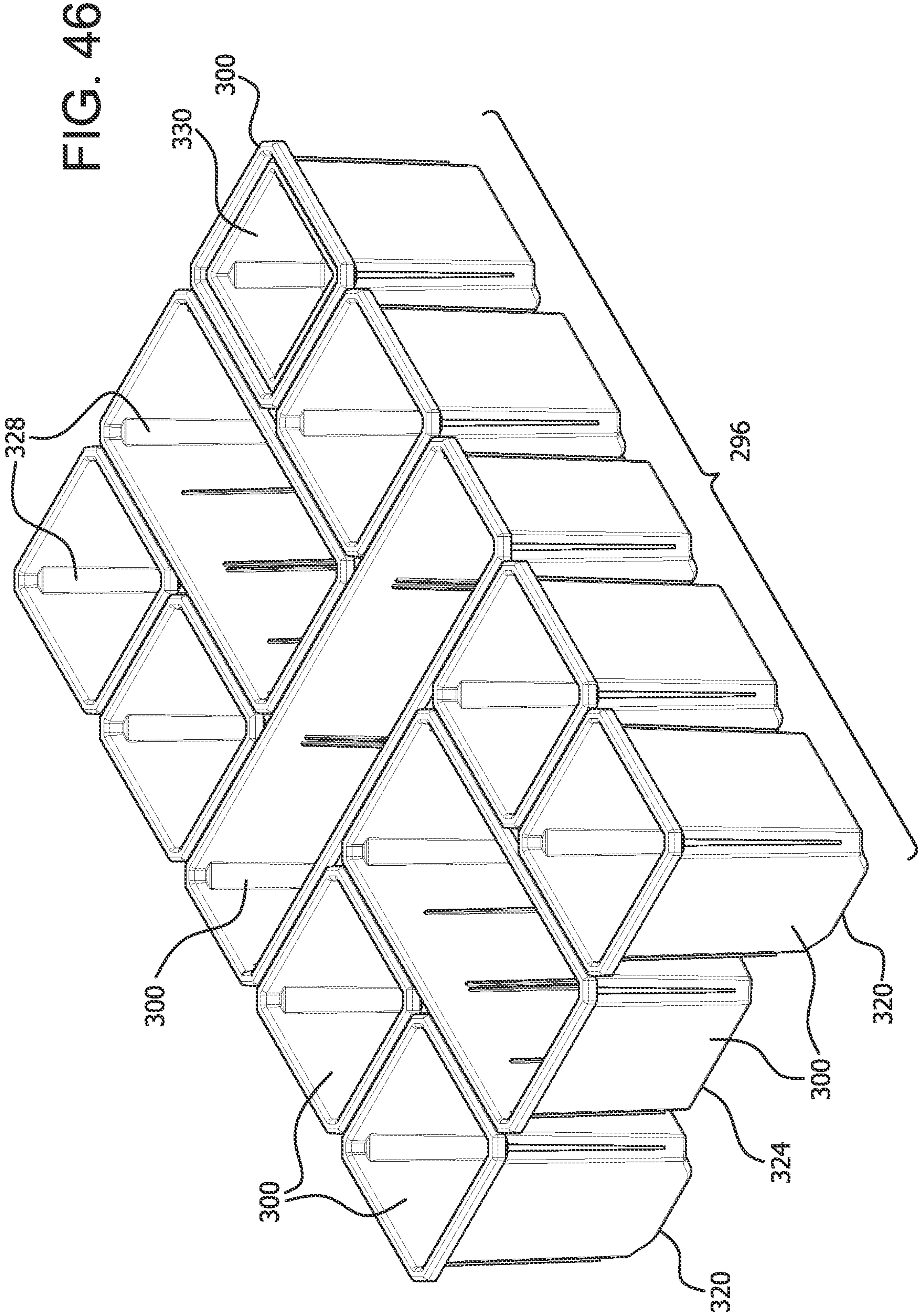


FIG. 45C

FIG. 45B



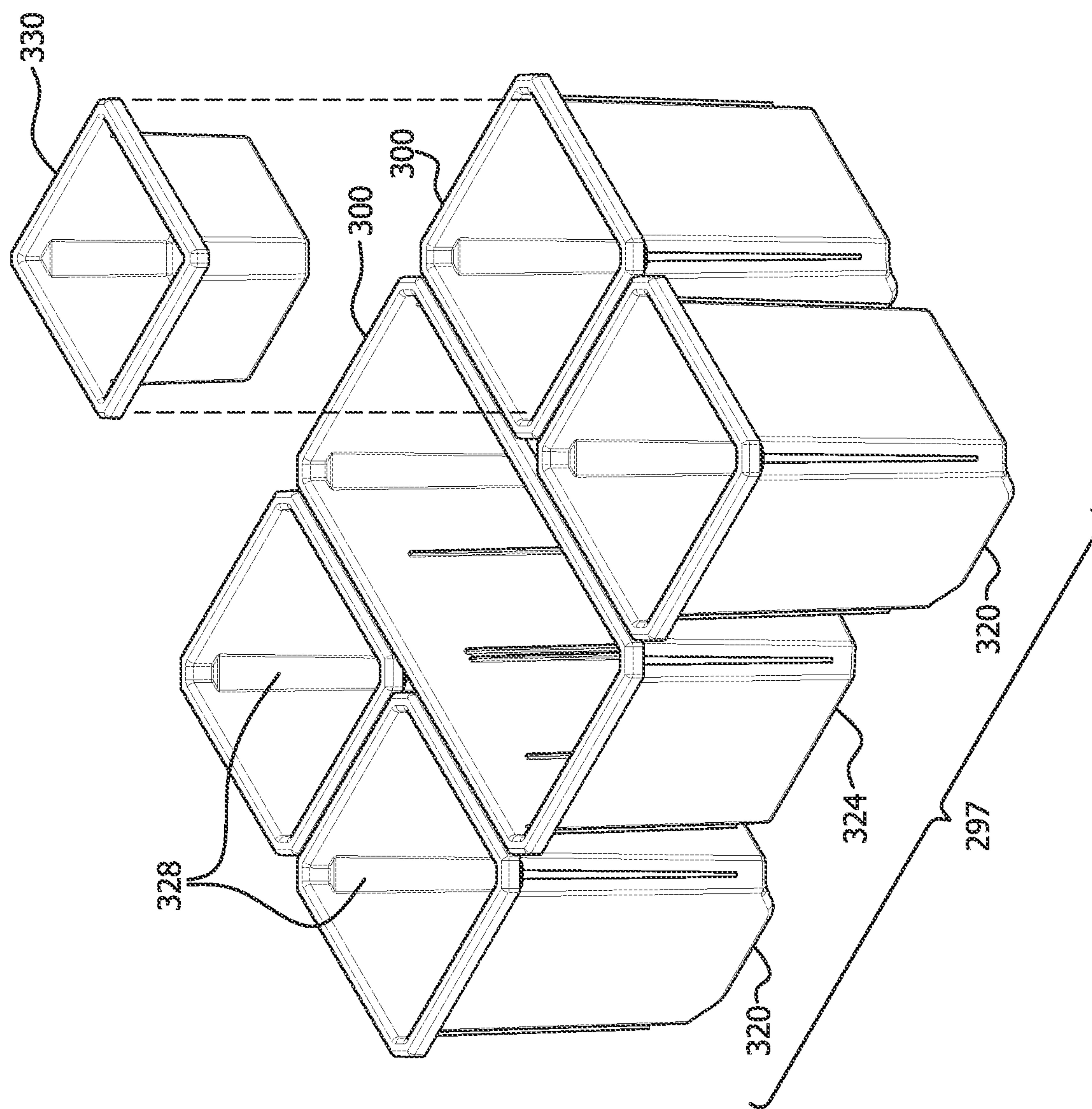


FIG. 47A

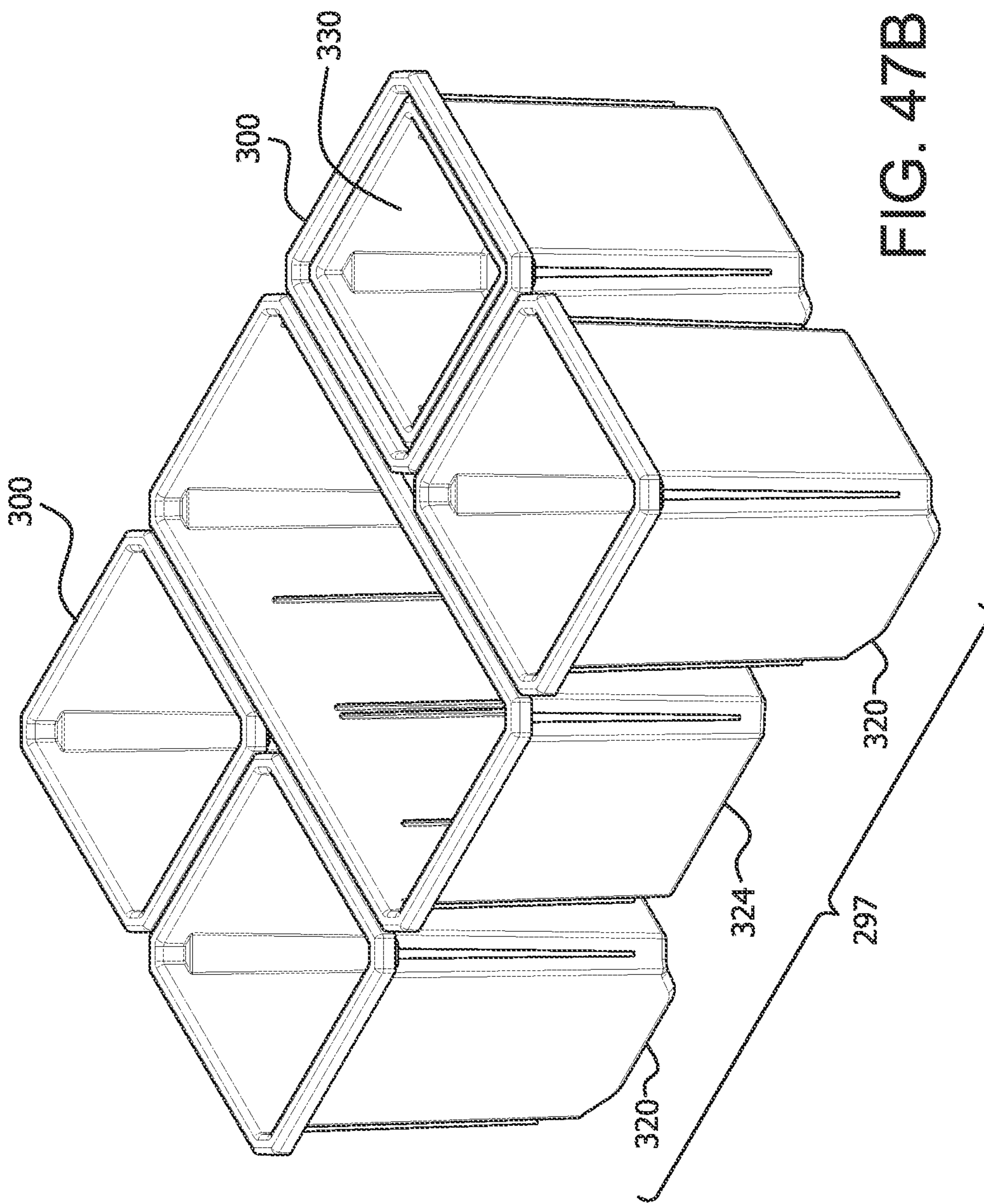


FIG. 47B

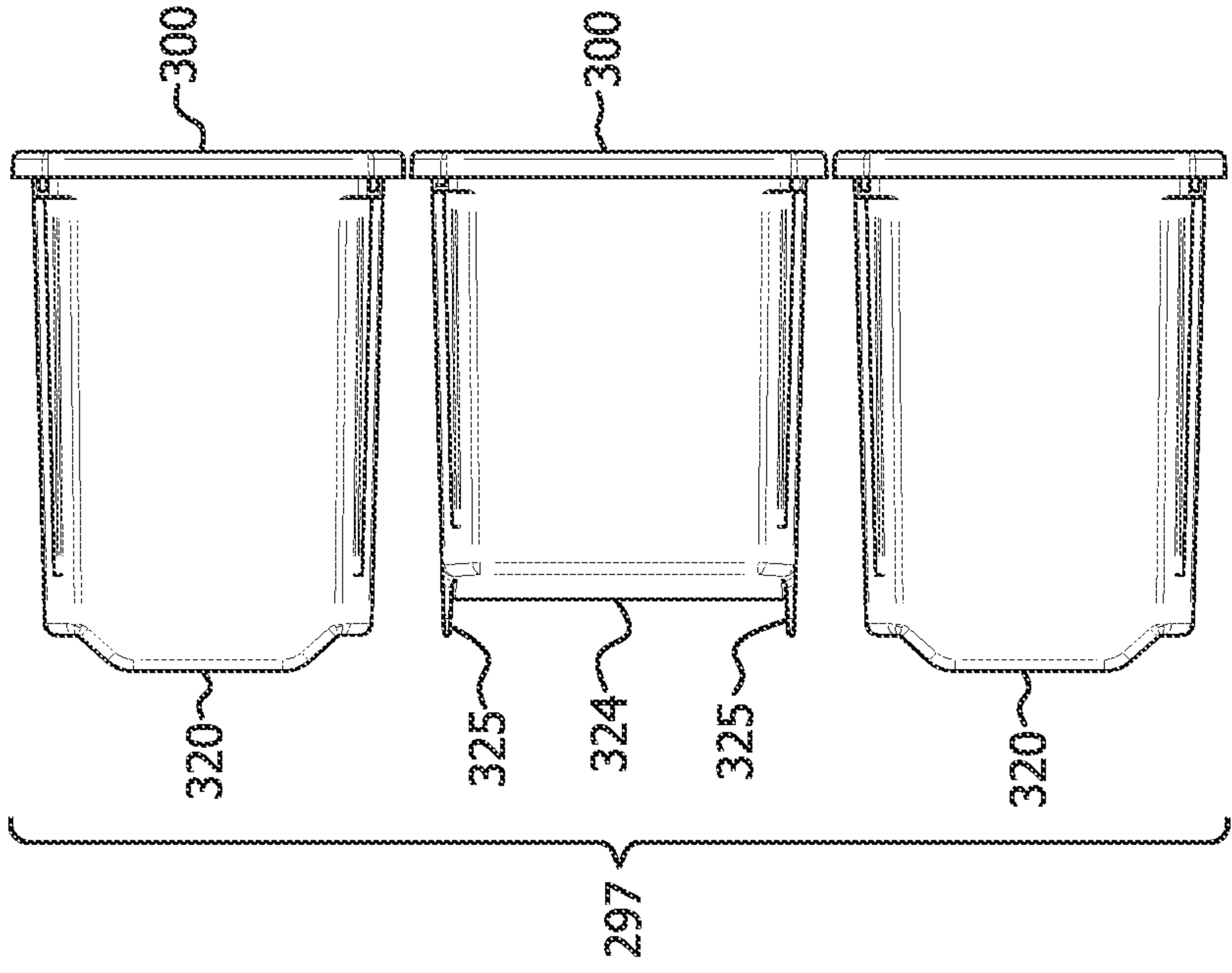


FIG. 47D

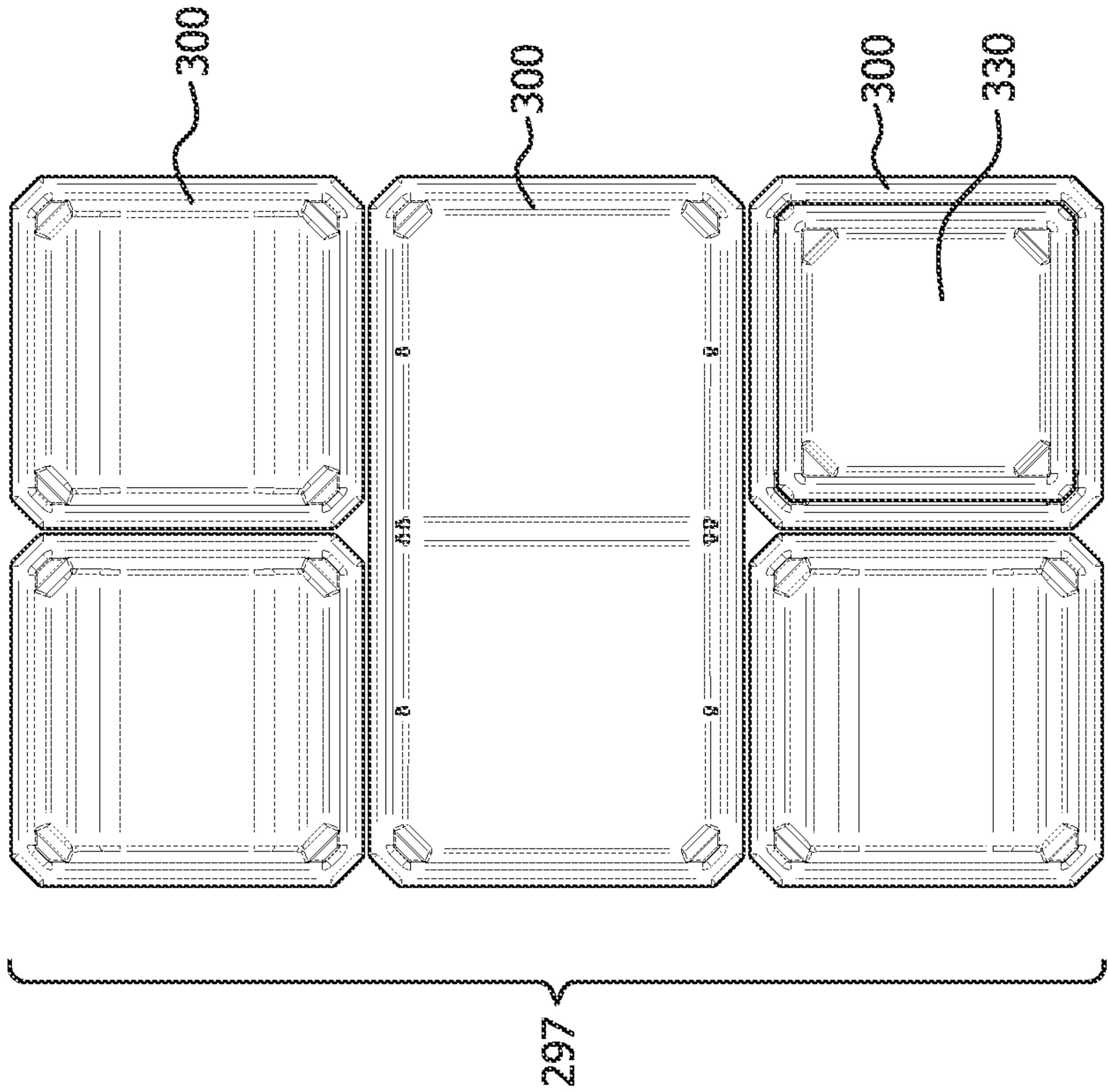


FIG. 47C

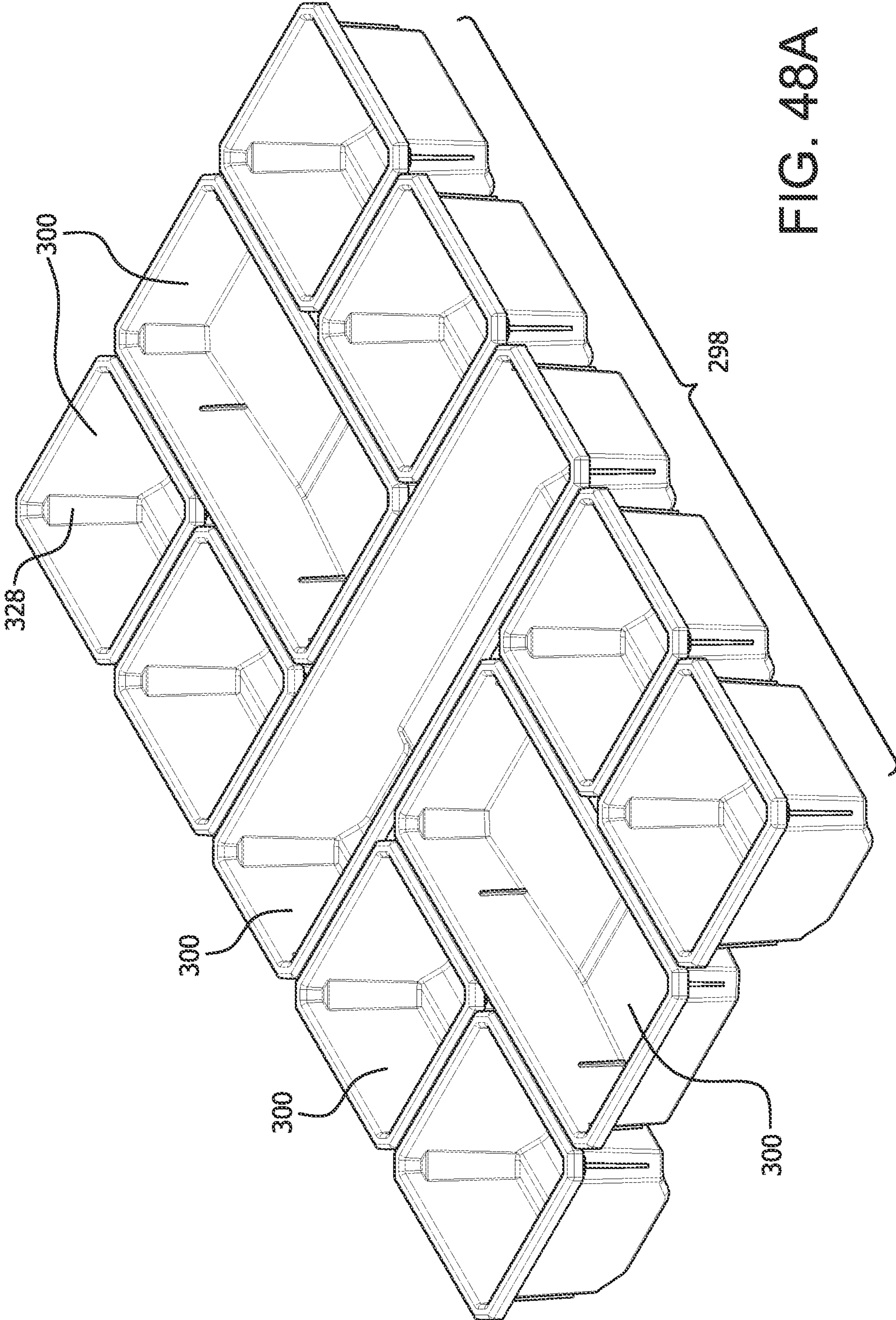


FIG. 48A

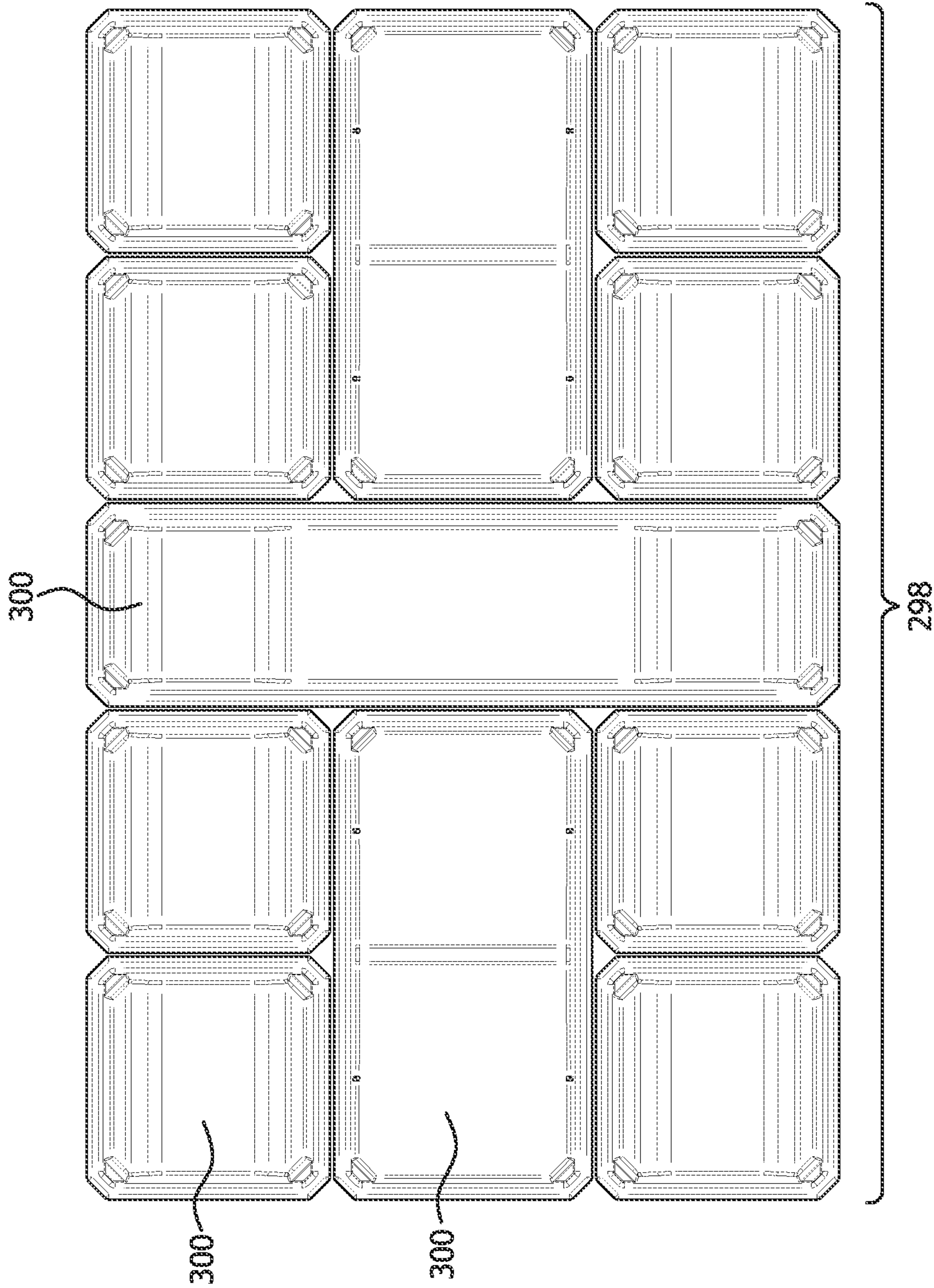


FIG. 48B

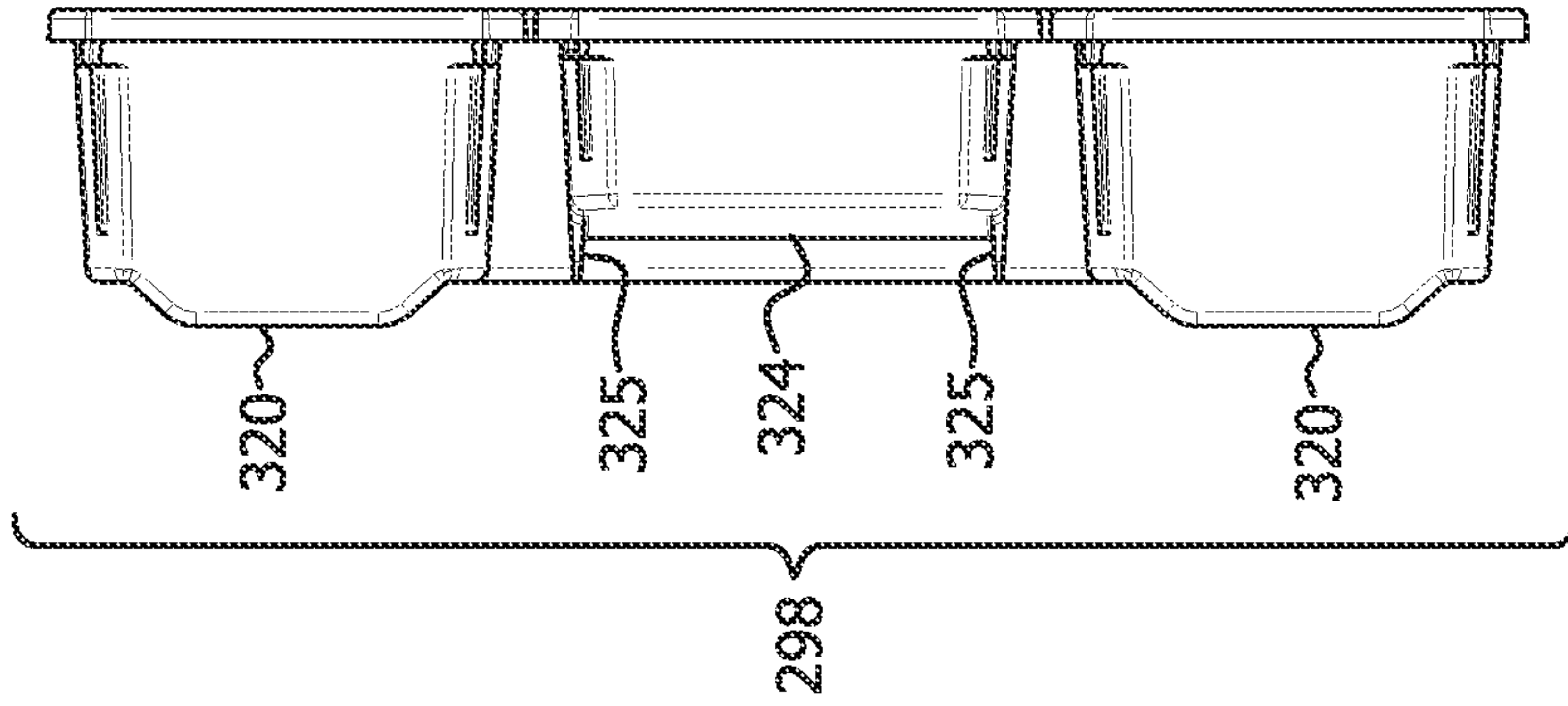


FIG. 48C

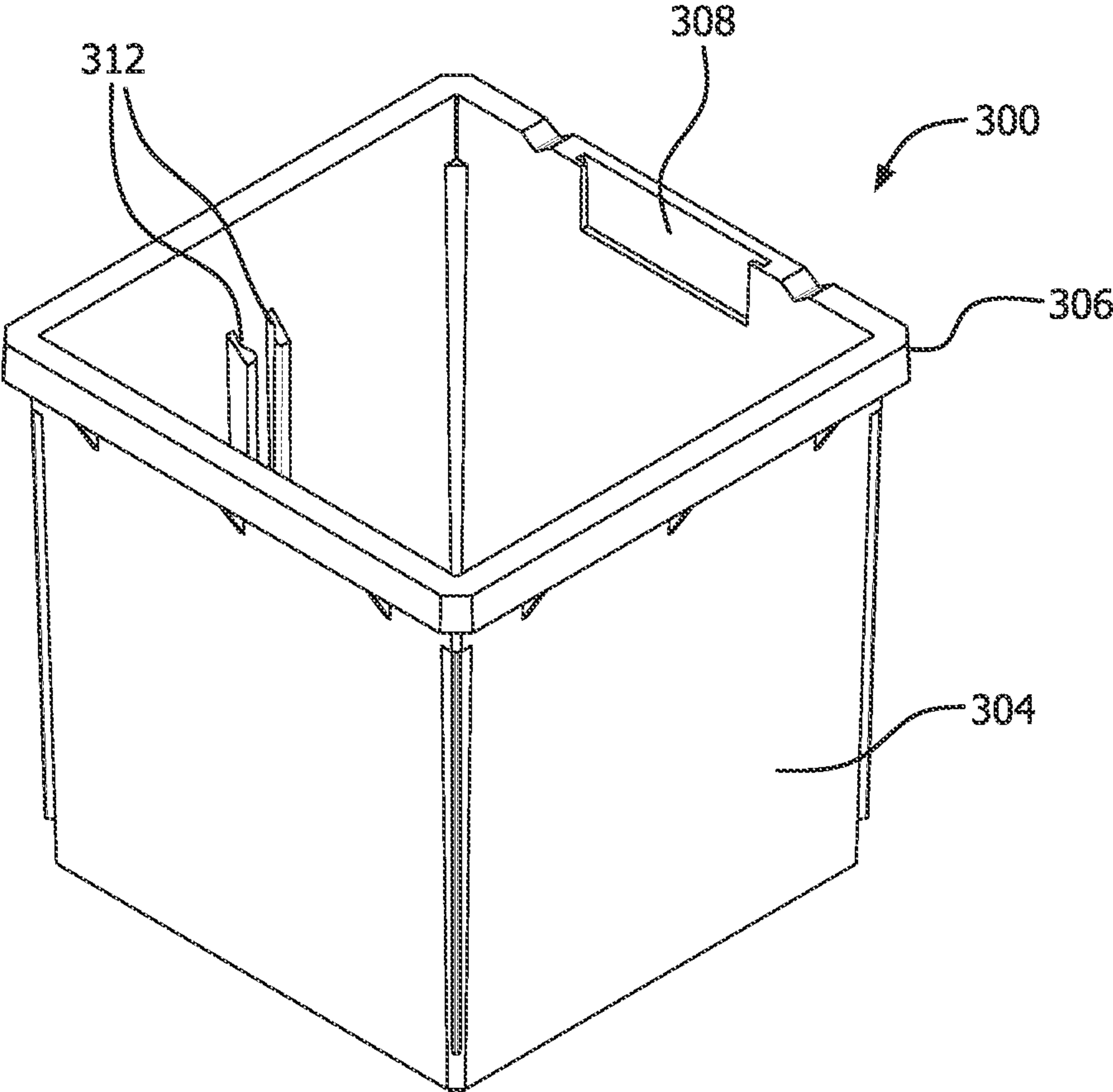


FIG. 49A

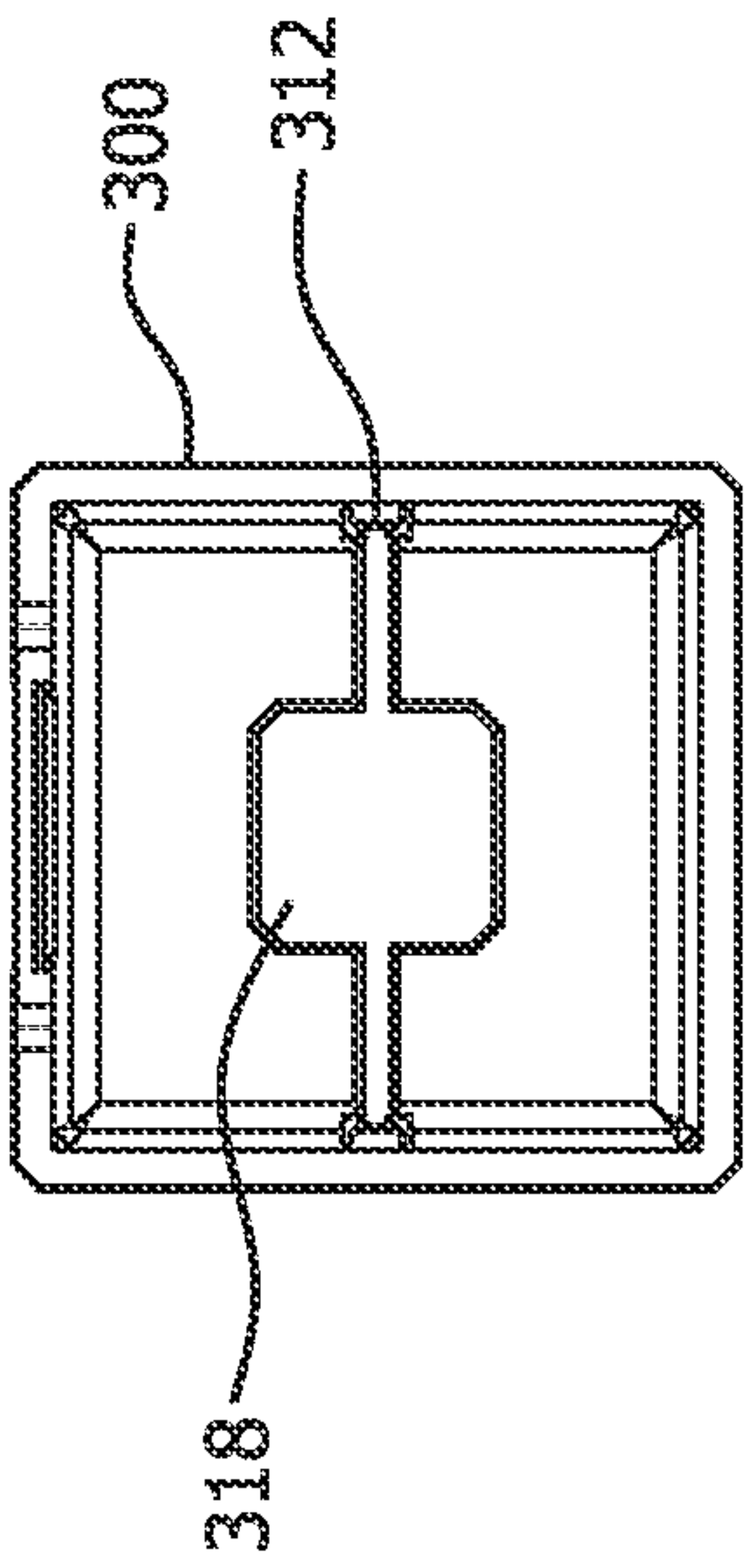


FIG. 49B

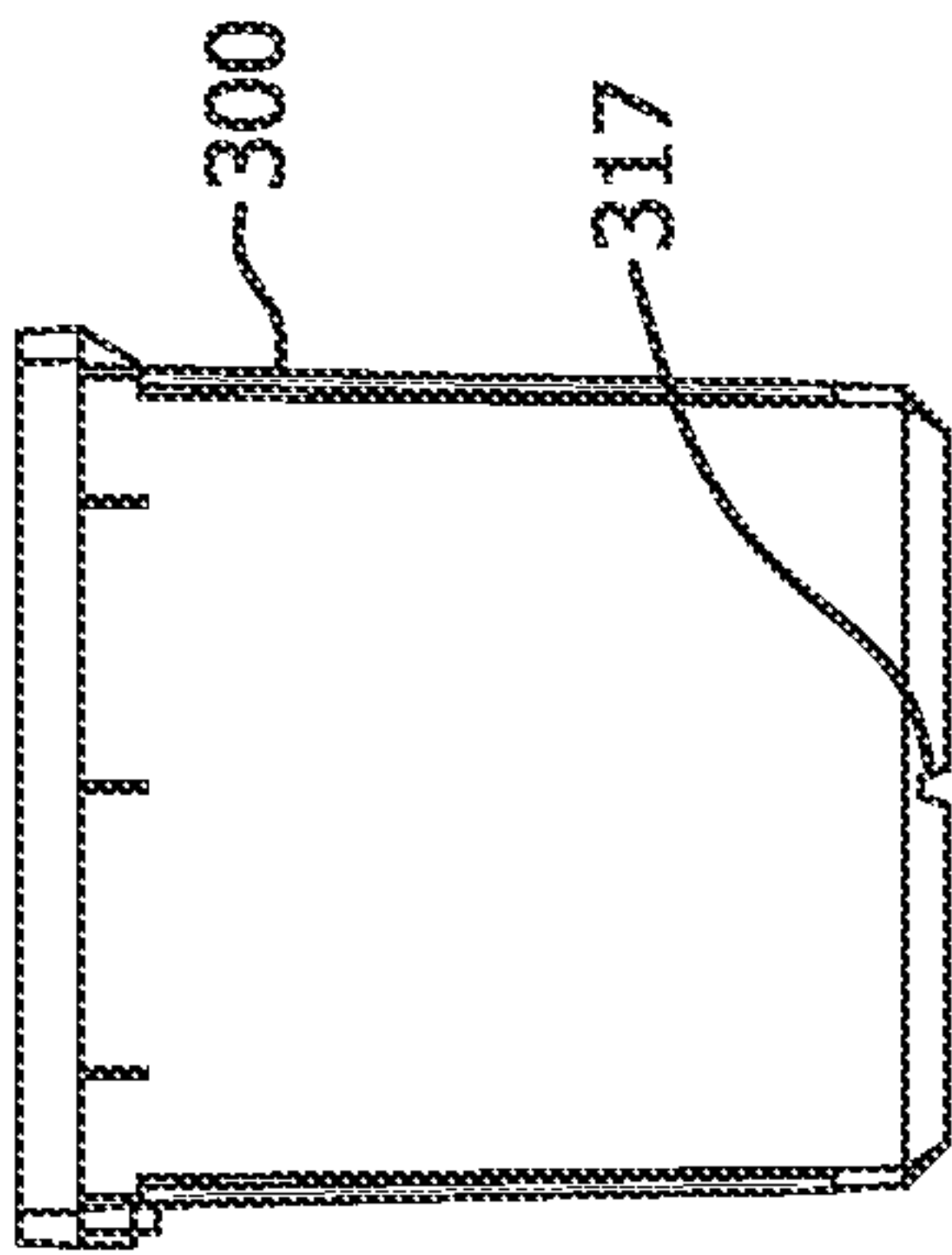


FIG. 49F

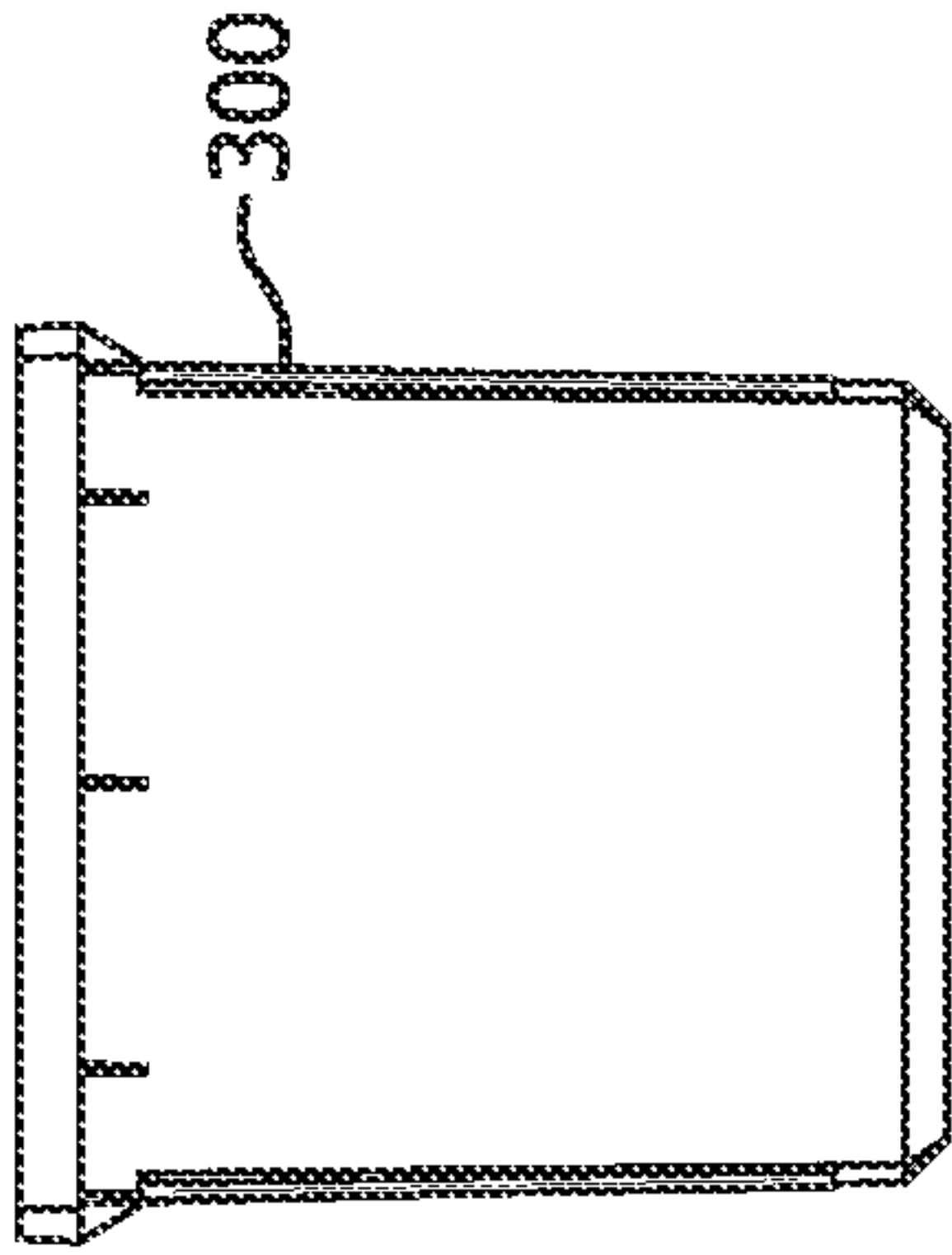


FIG. 49D

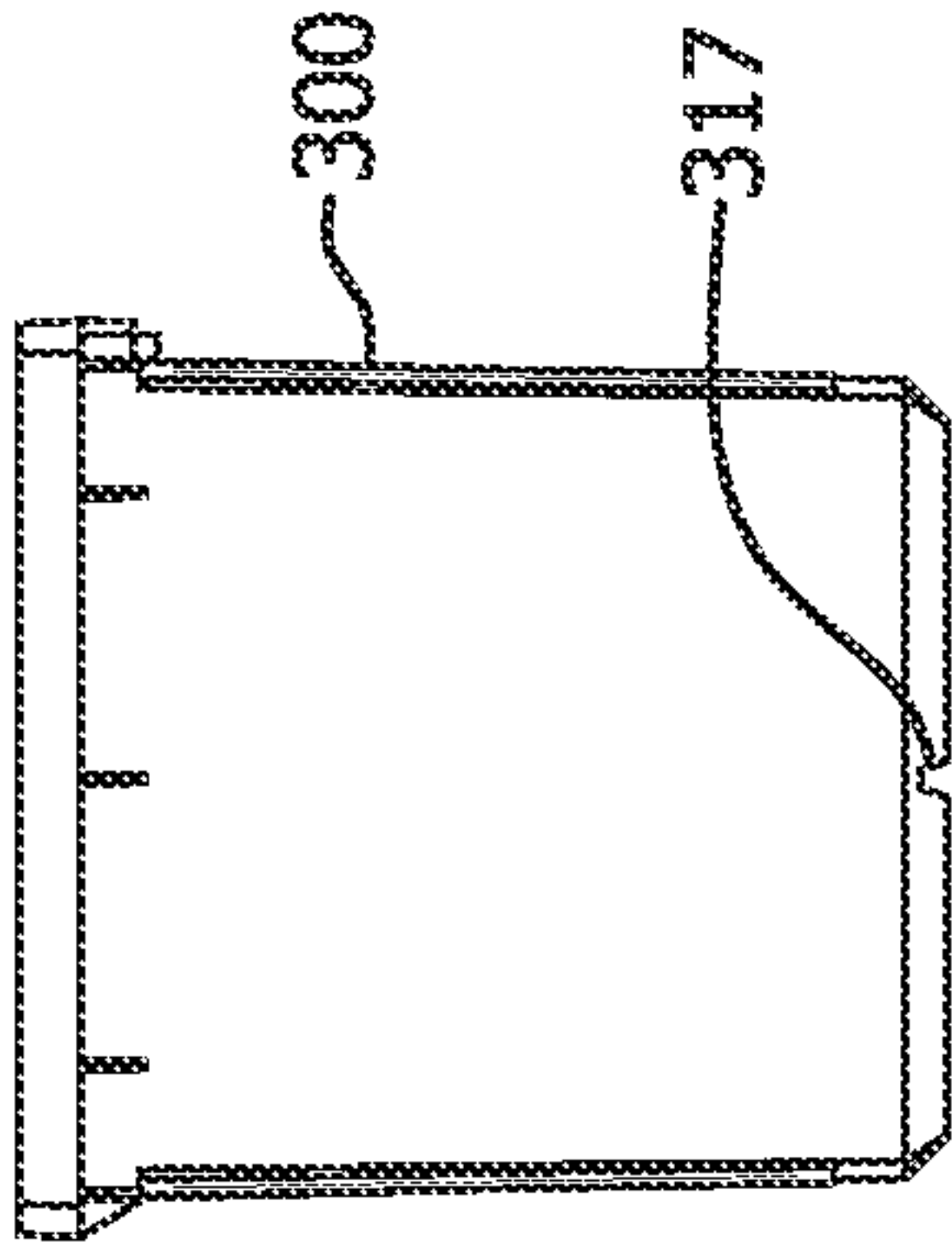


FIG. 49G

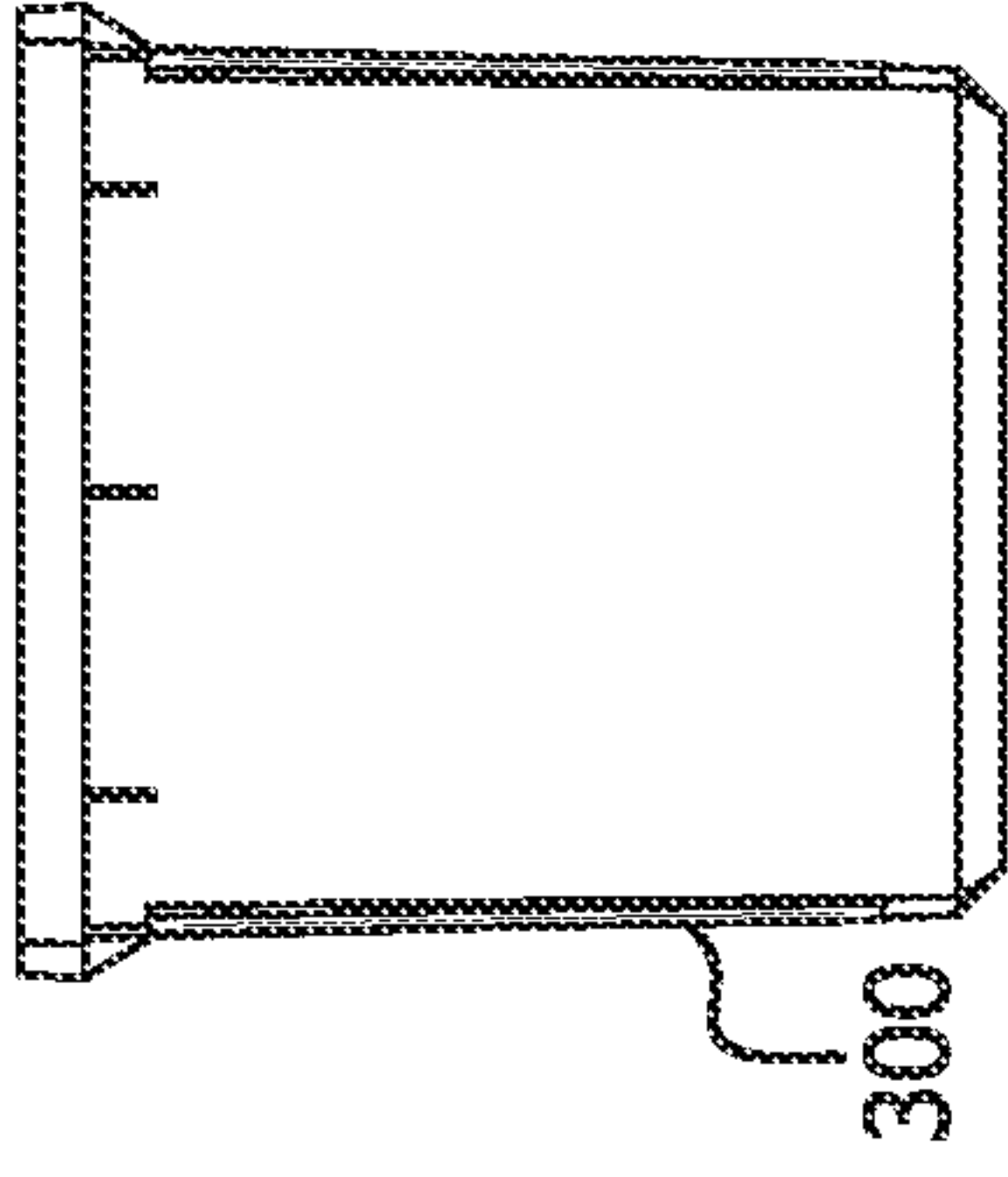


FIG. 49E

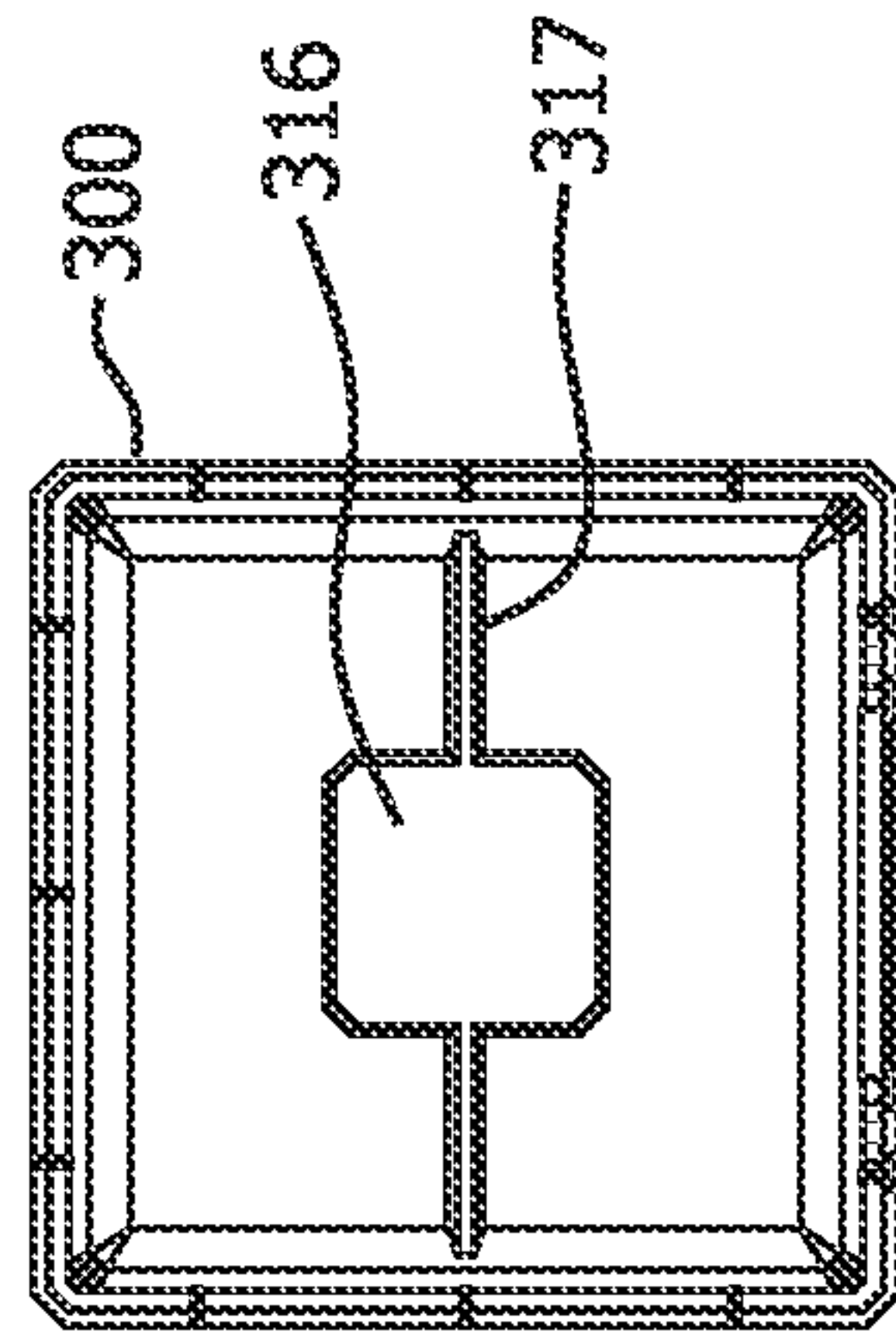


FIG. 49C

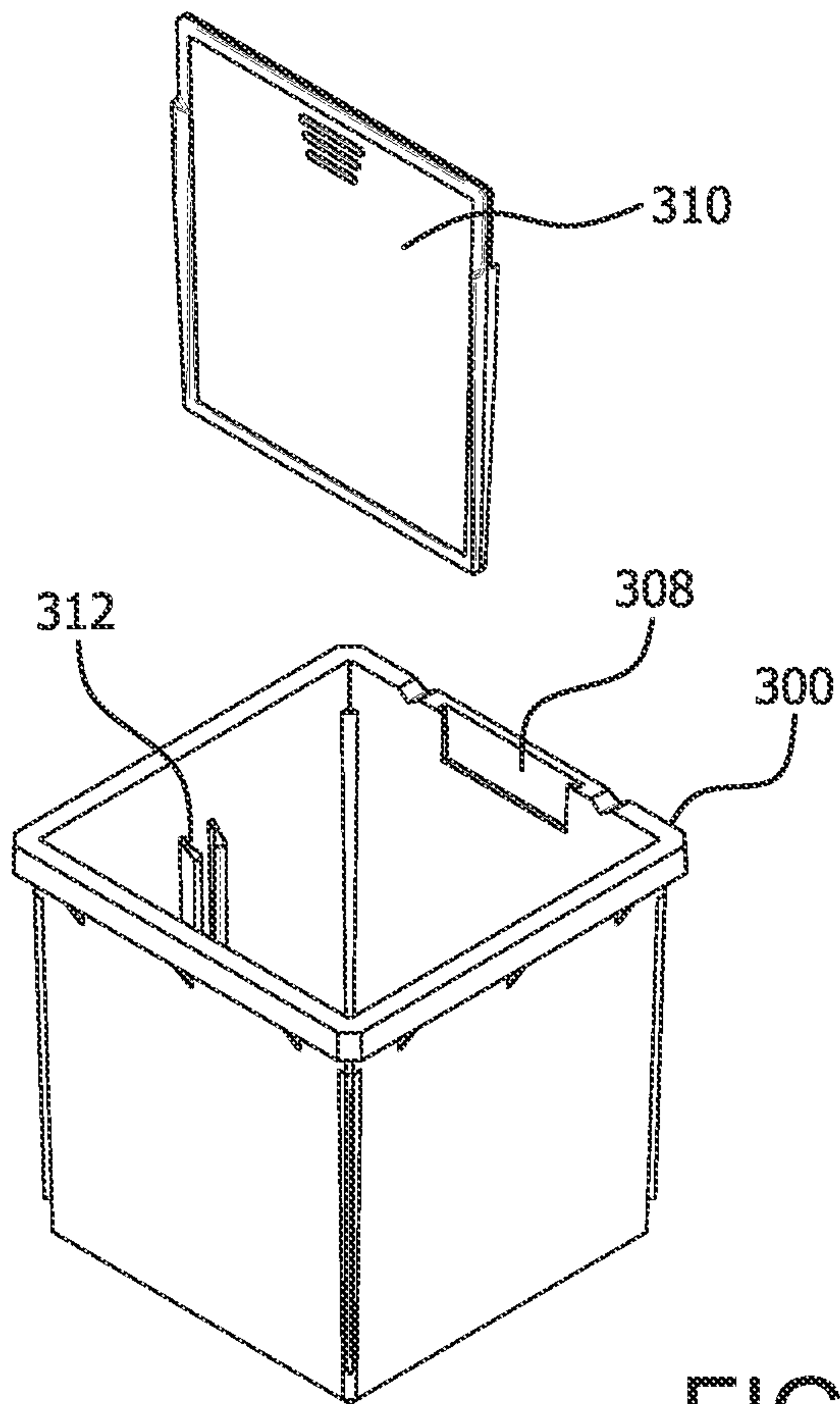


FIG. 50A

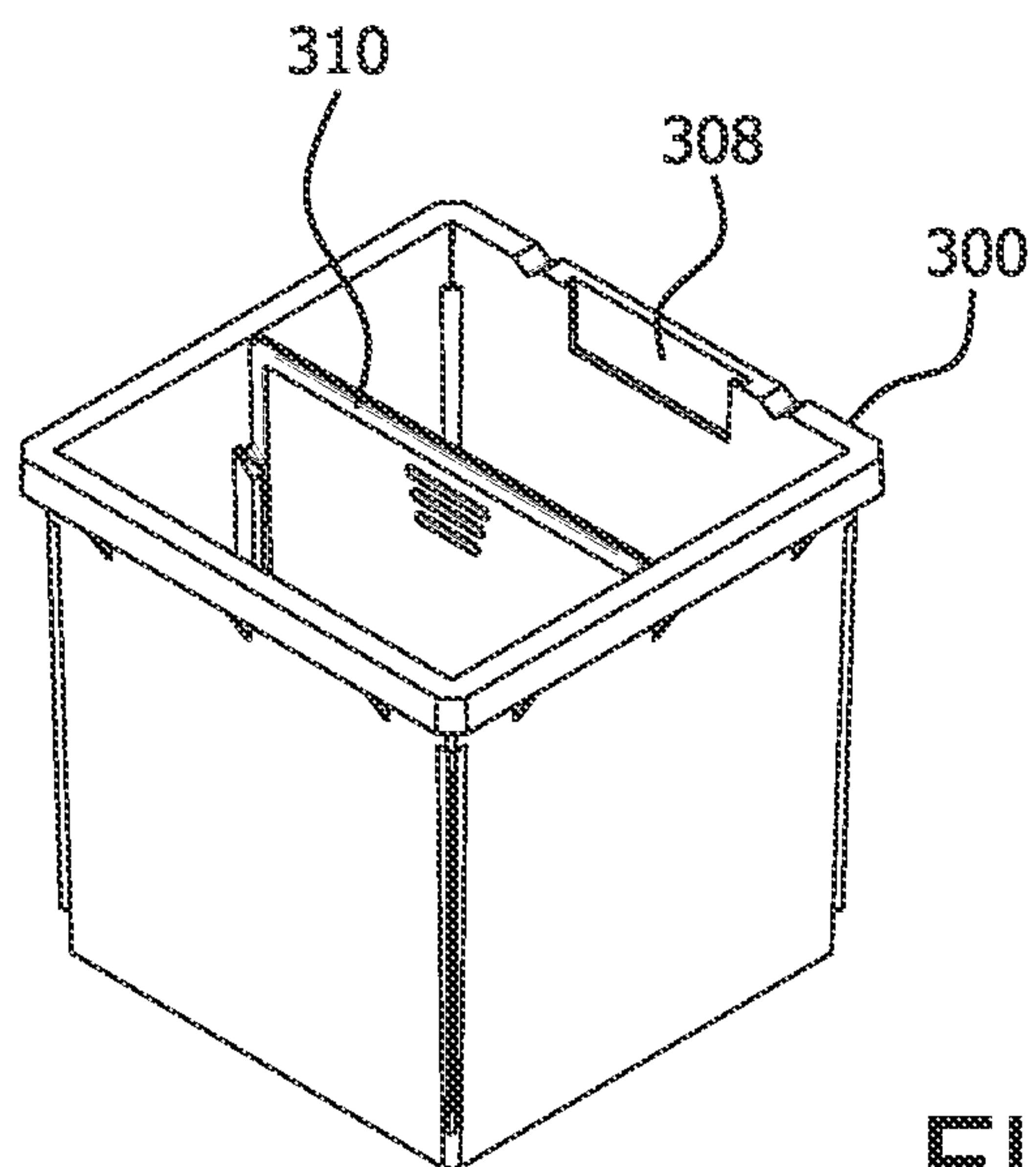


FIG. 50B

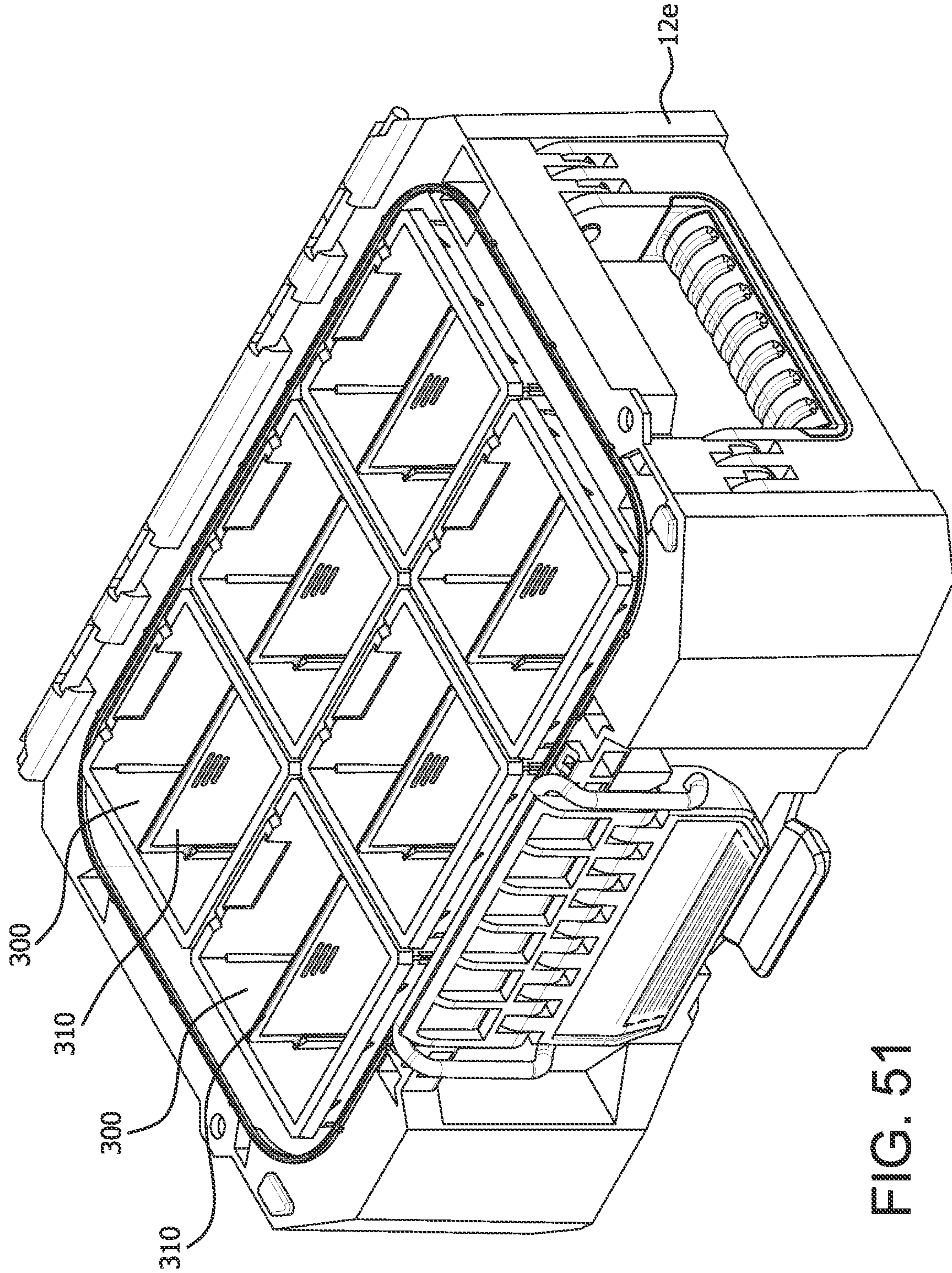


FIG. 51

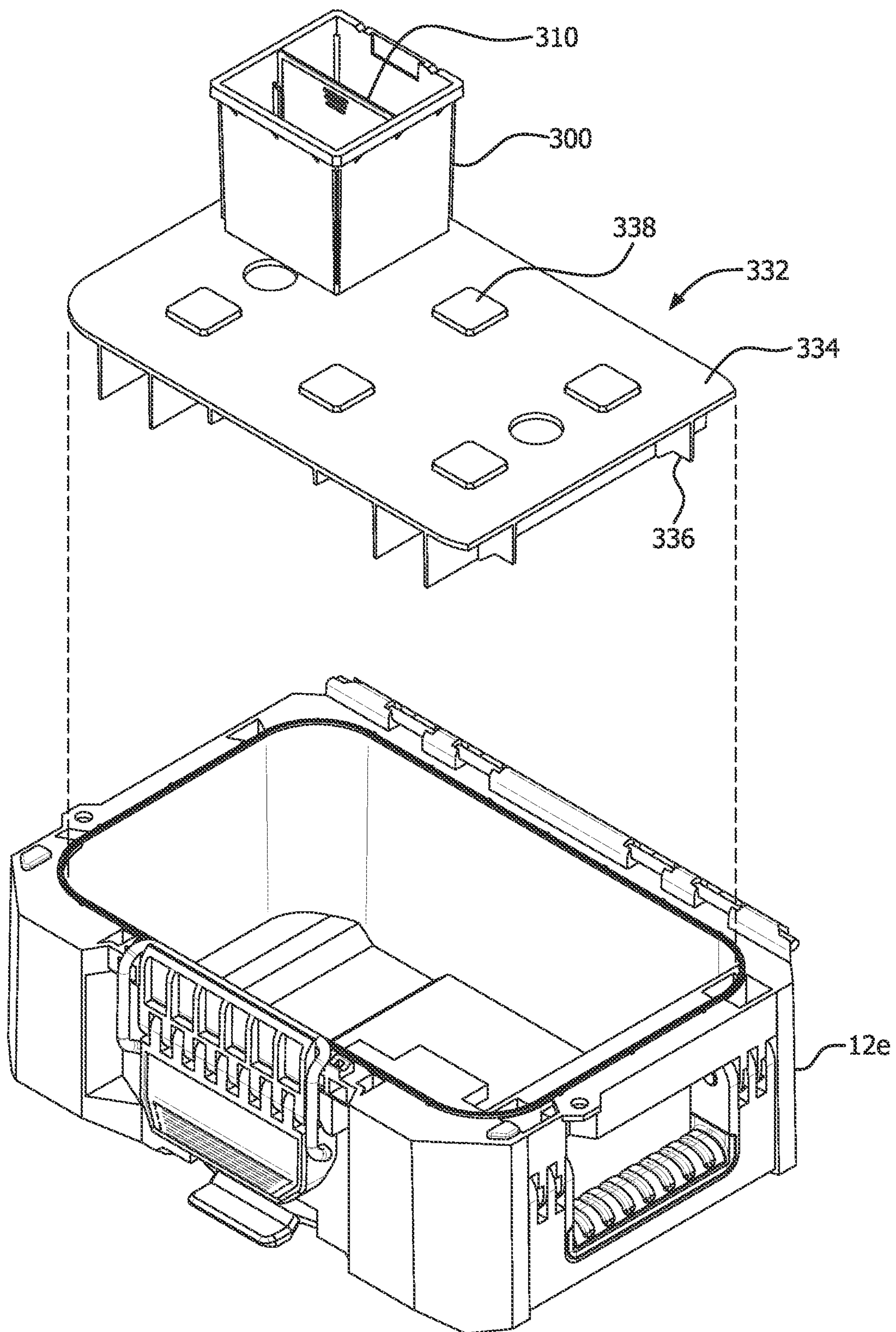


FIG. 52

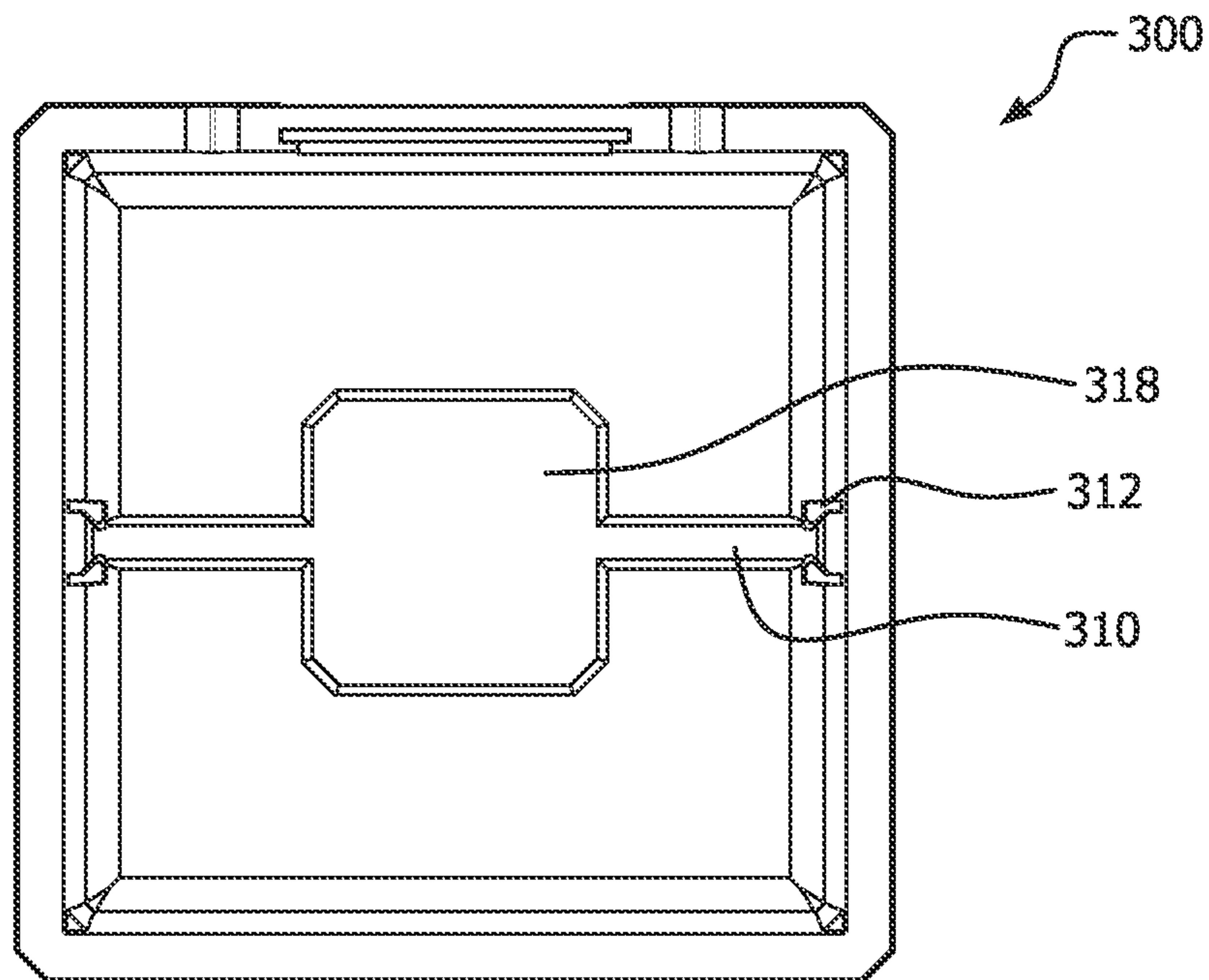


FIG. 53A

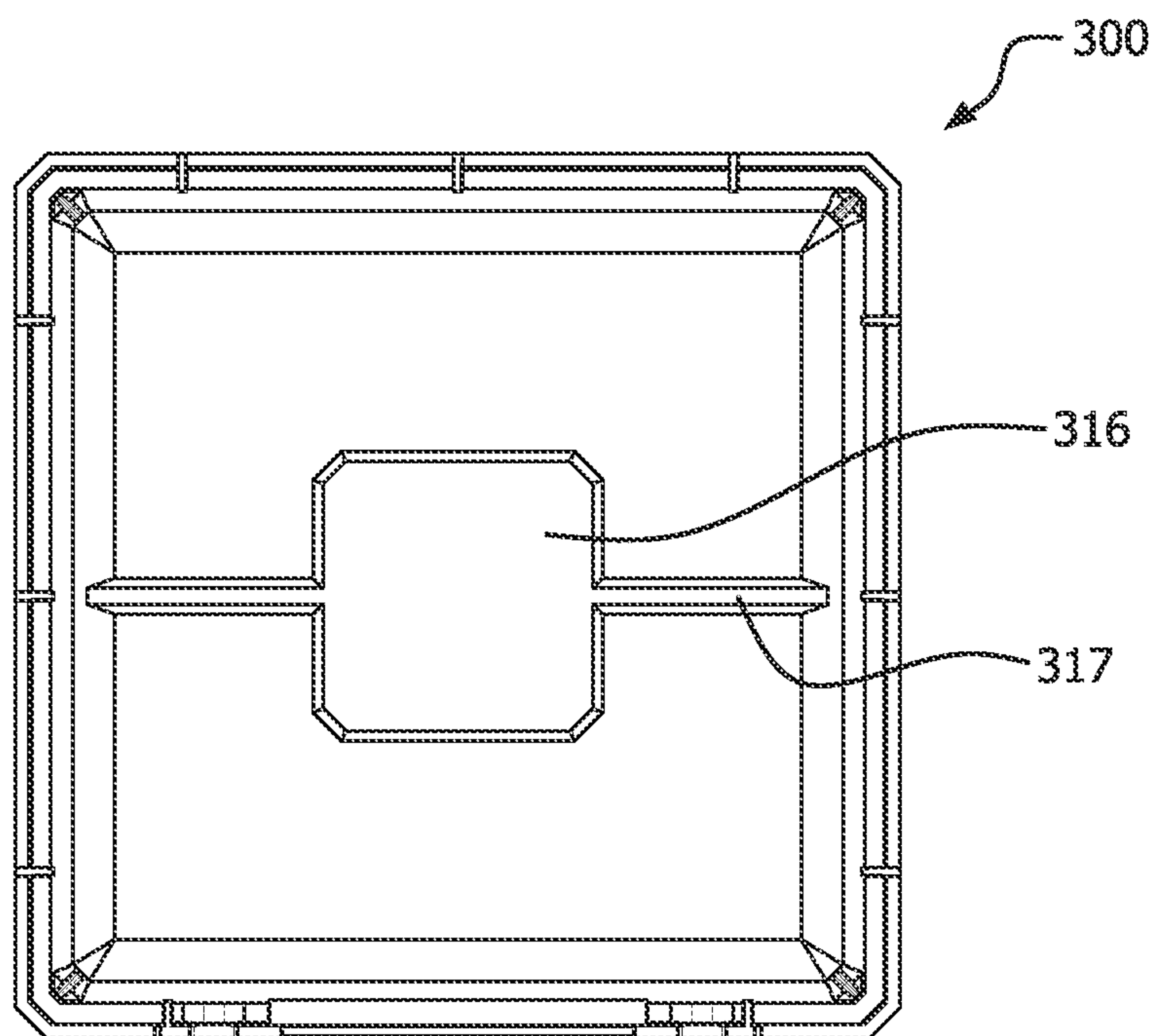


FIG. 53B

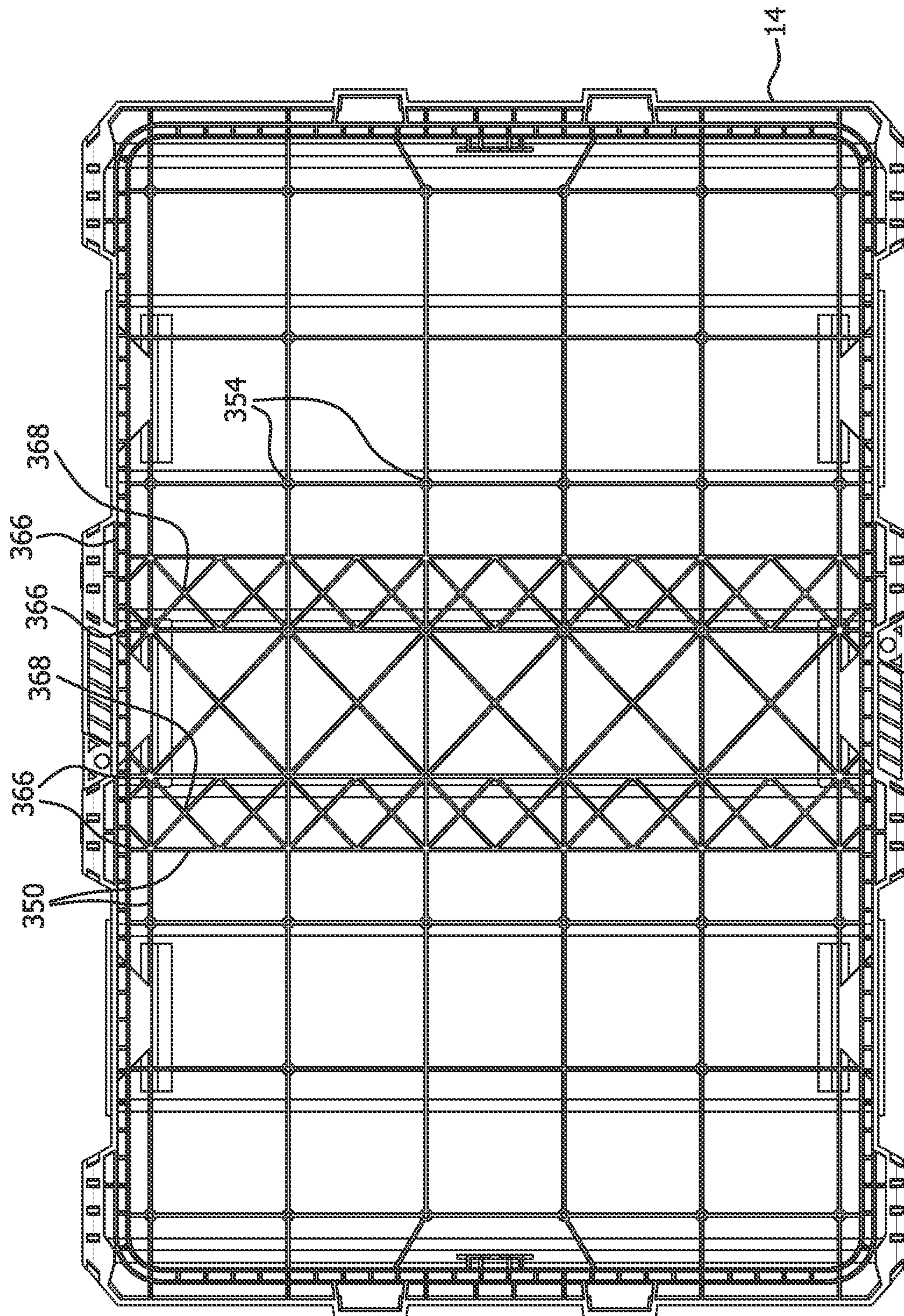


FIG. 54A

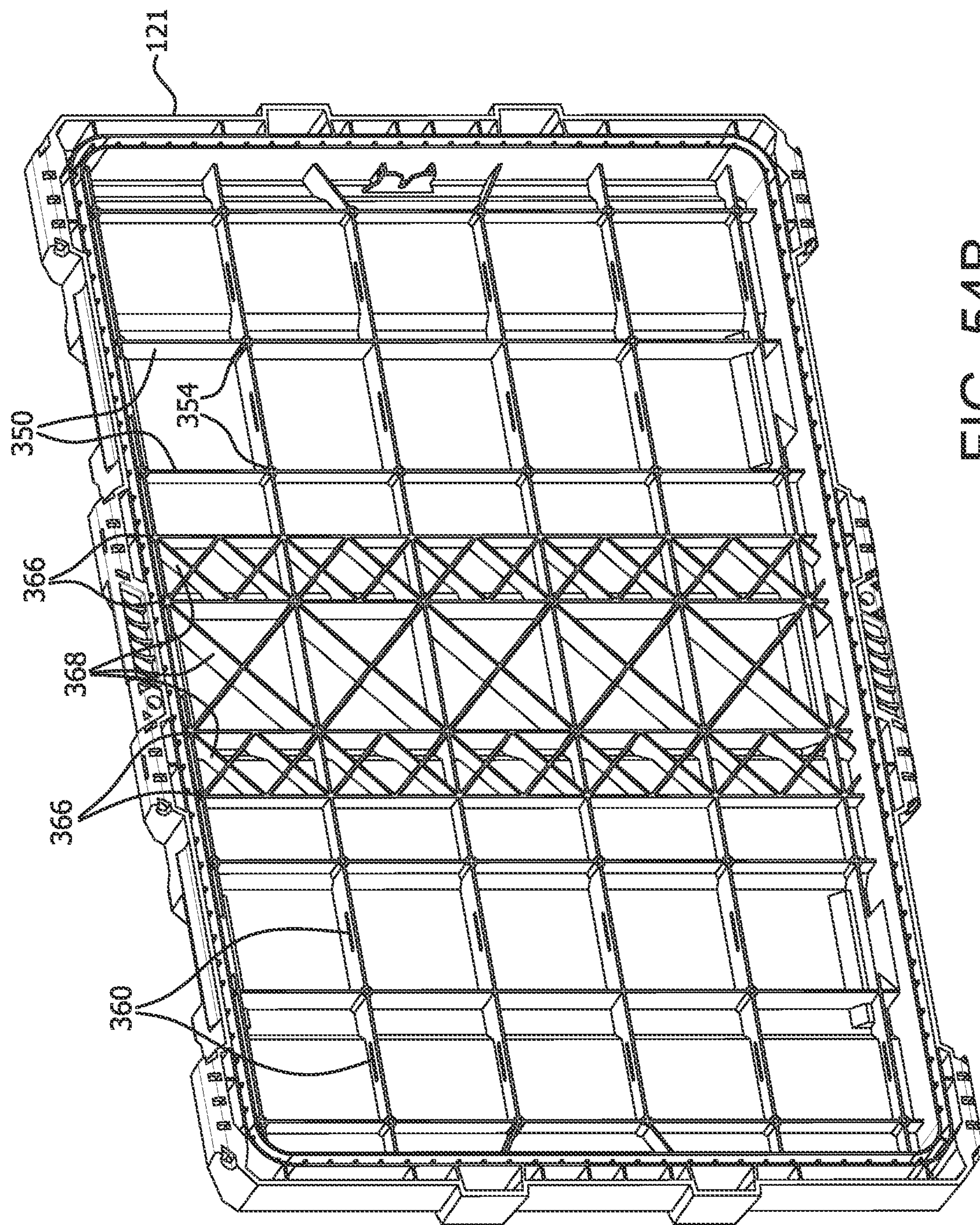


FIG. 54B

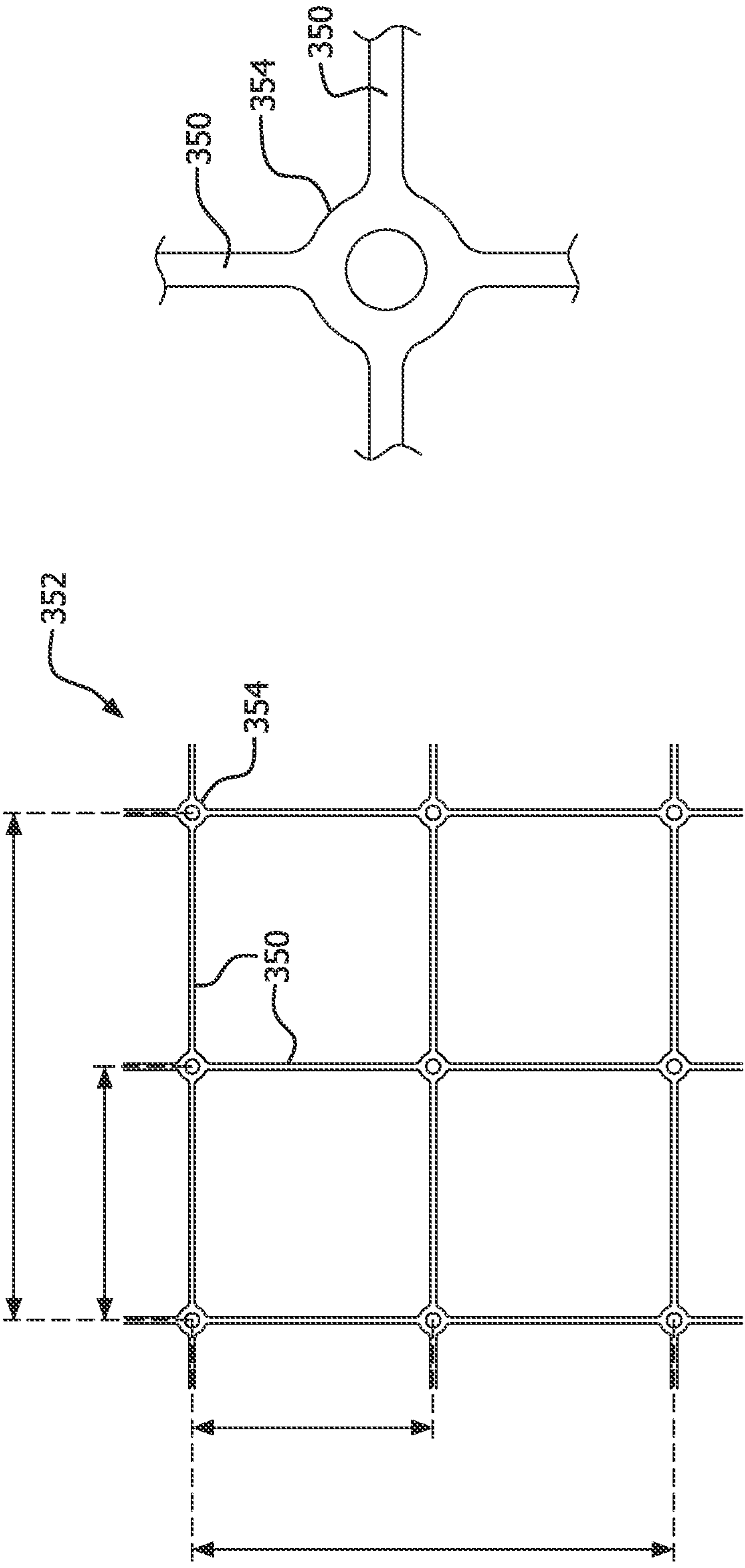


FIG. 55

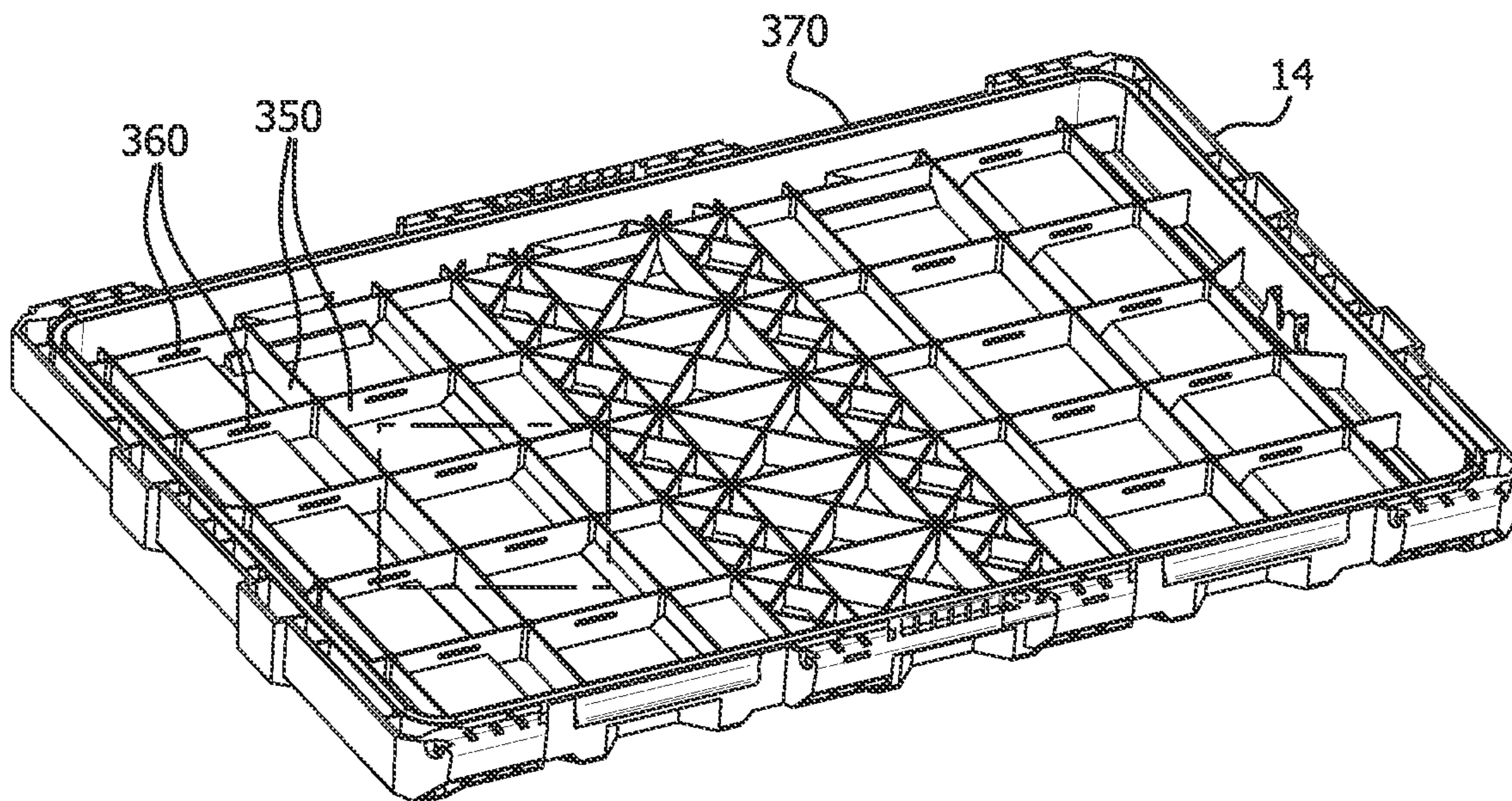


FIG. 56A

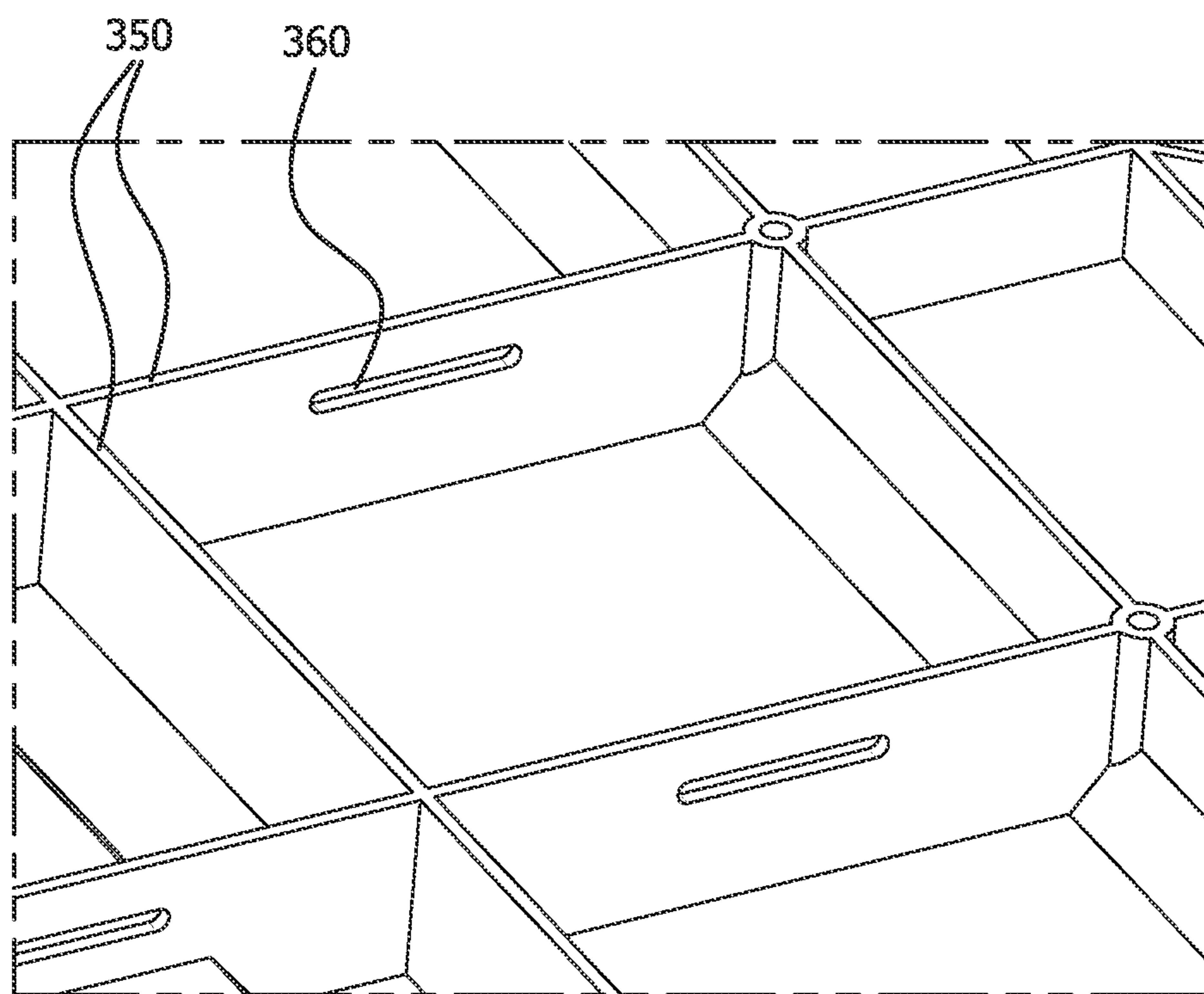


FIG. 56B

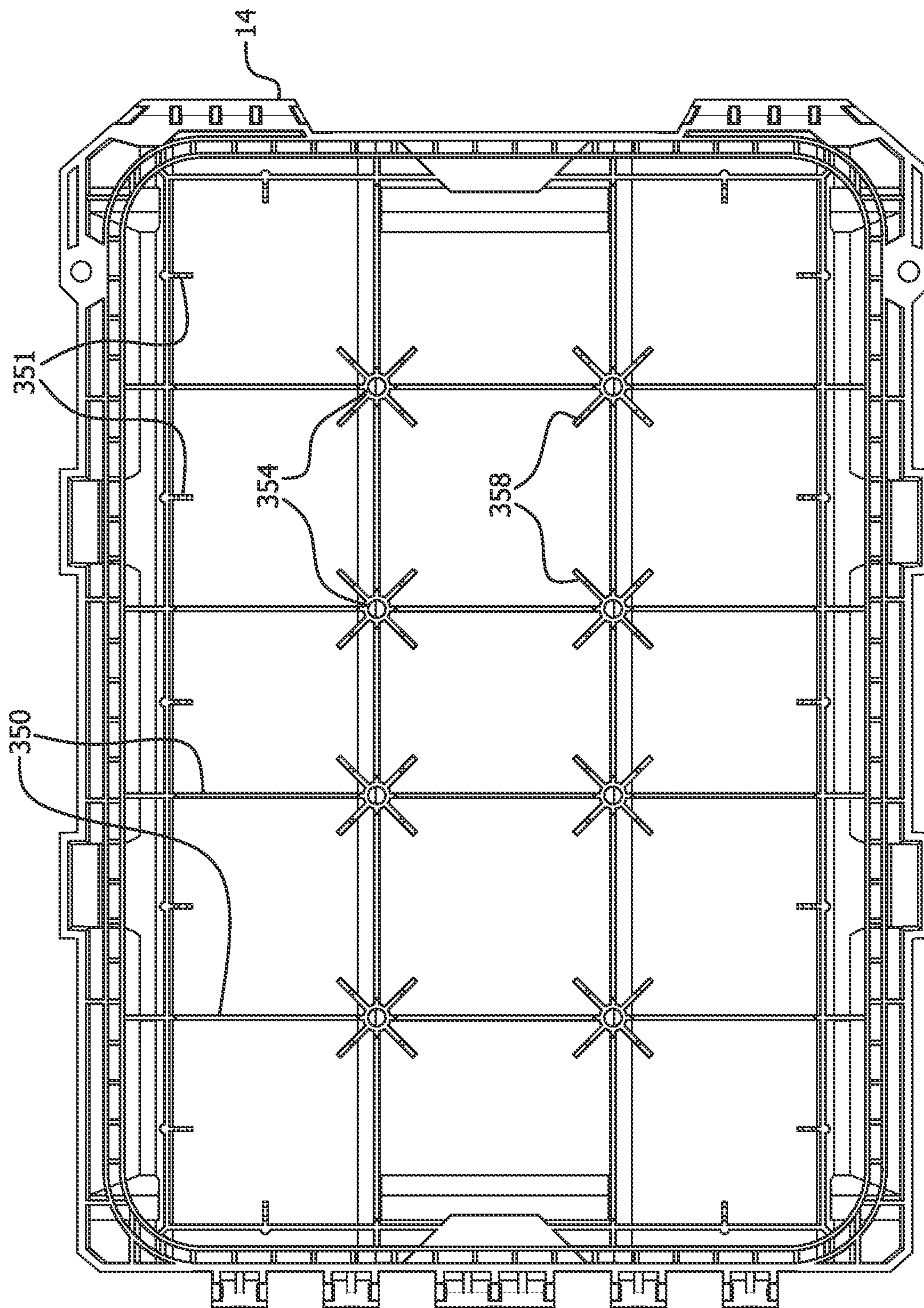


FIG. 57A

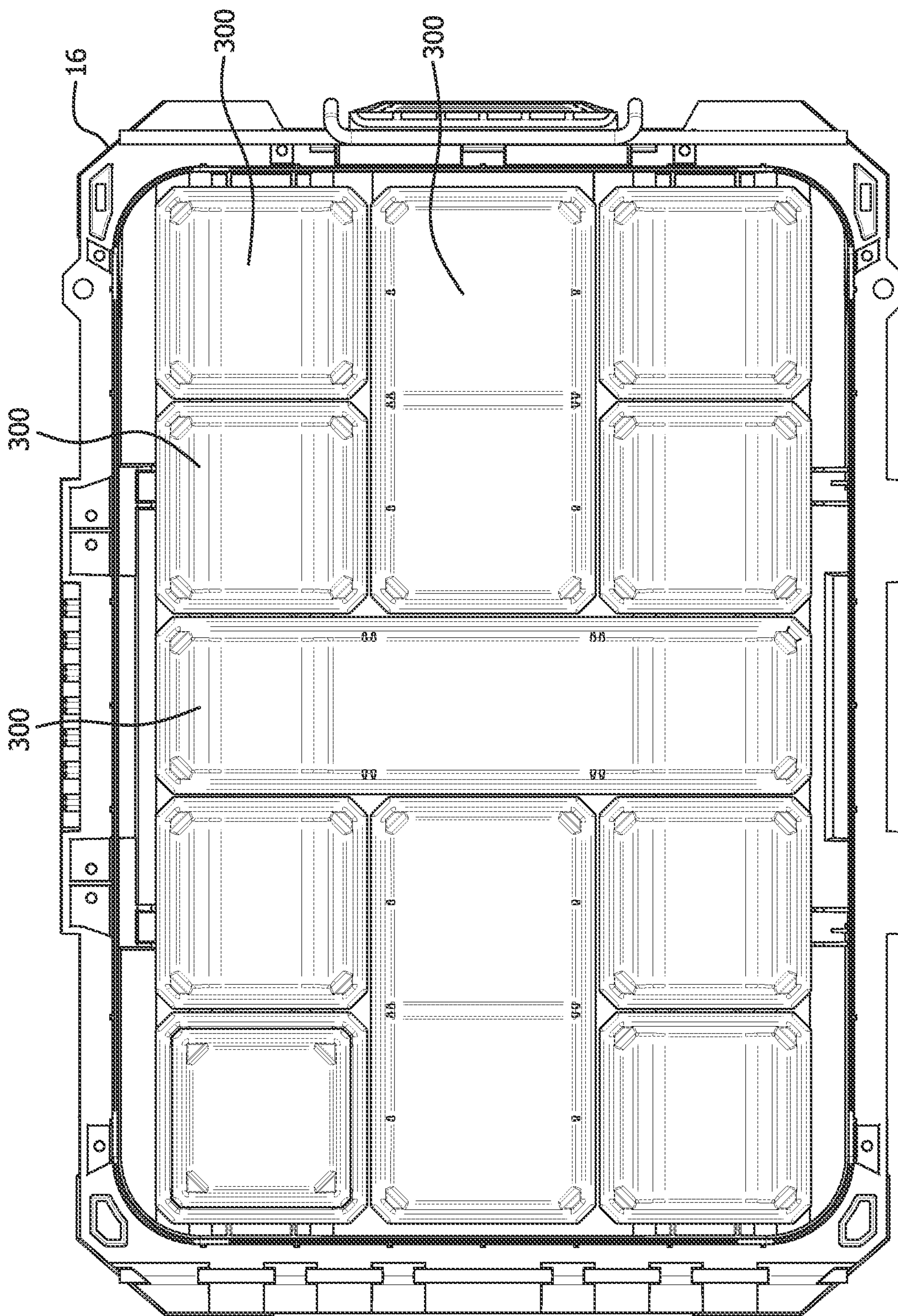


FIG. 57B

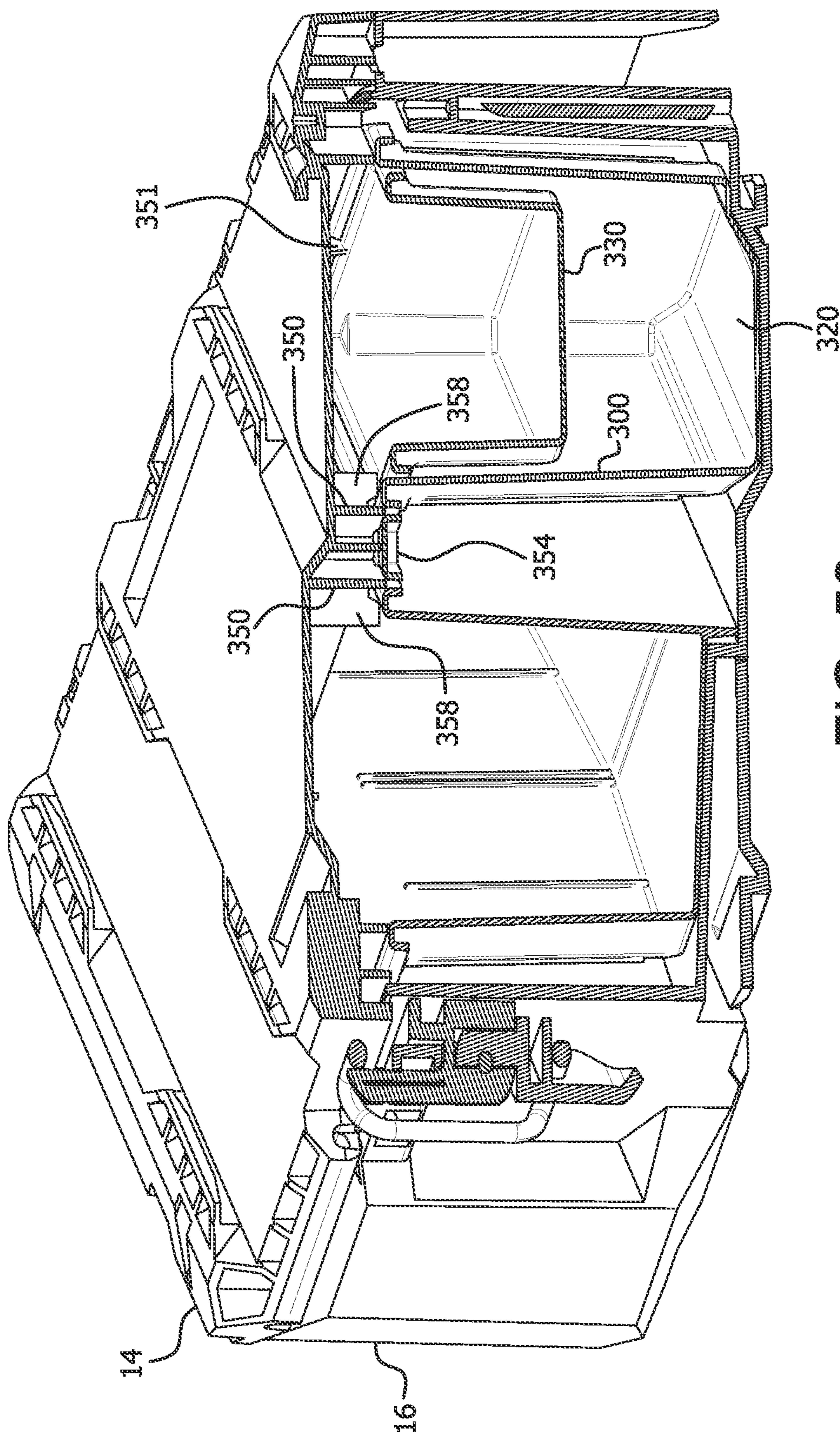


FIG. 58

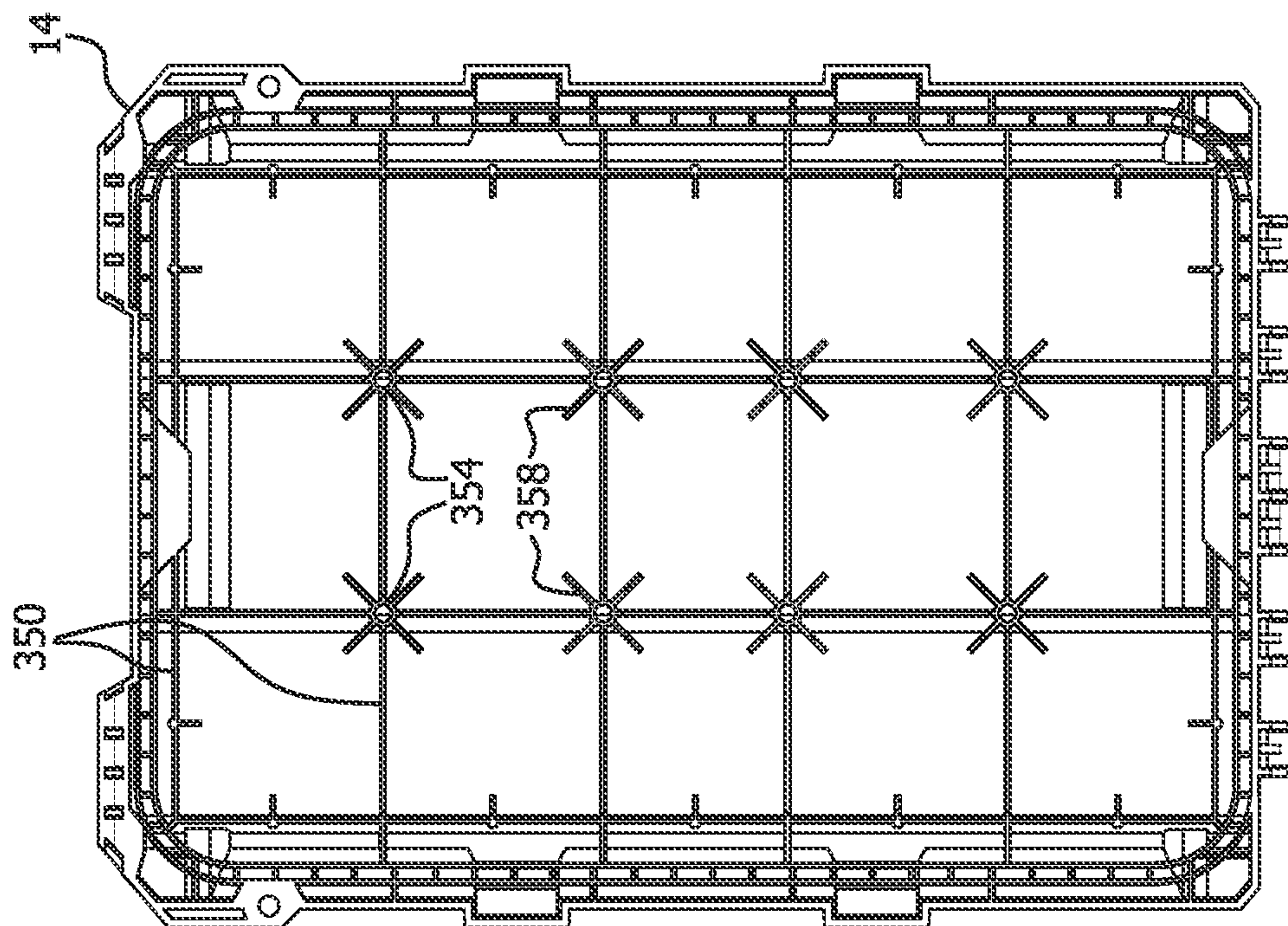


FIG. 59B

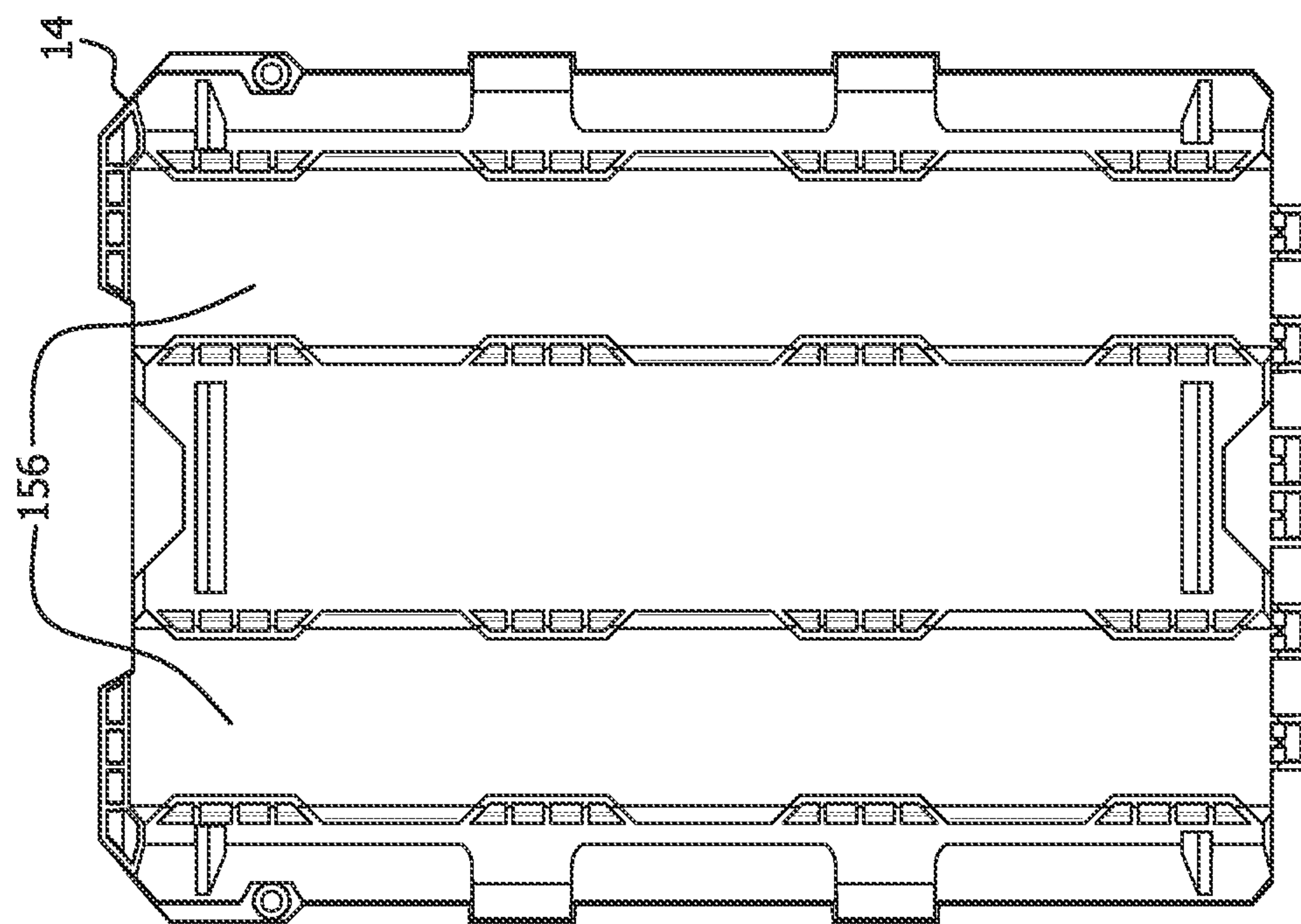


FIG. 59A

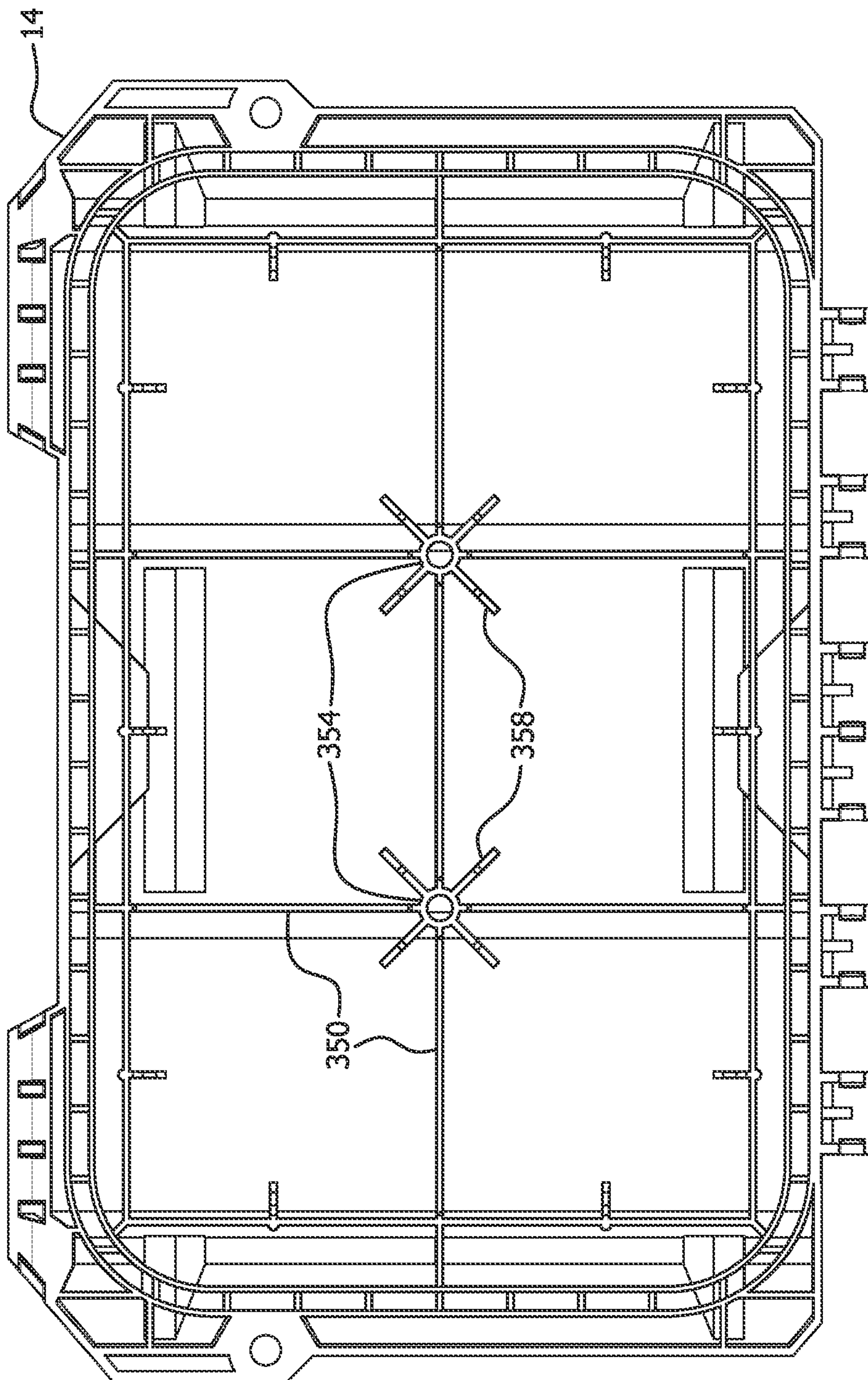


FIG. 60

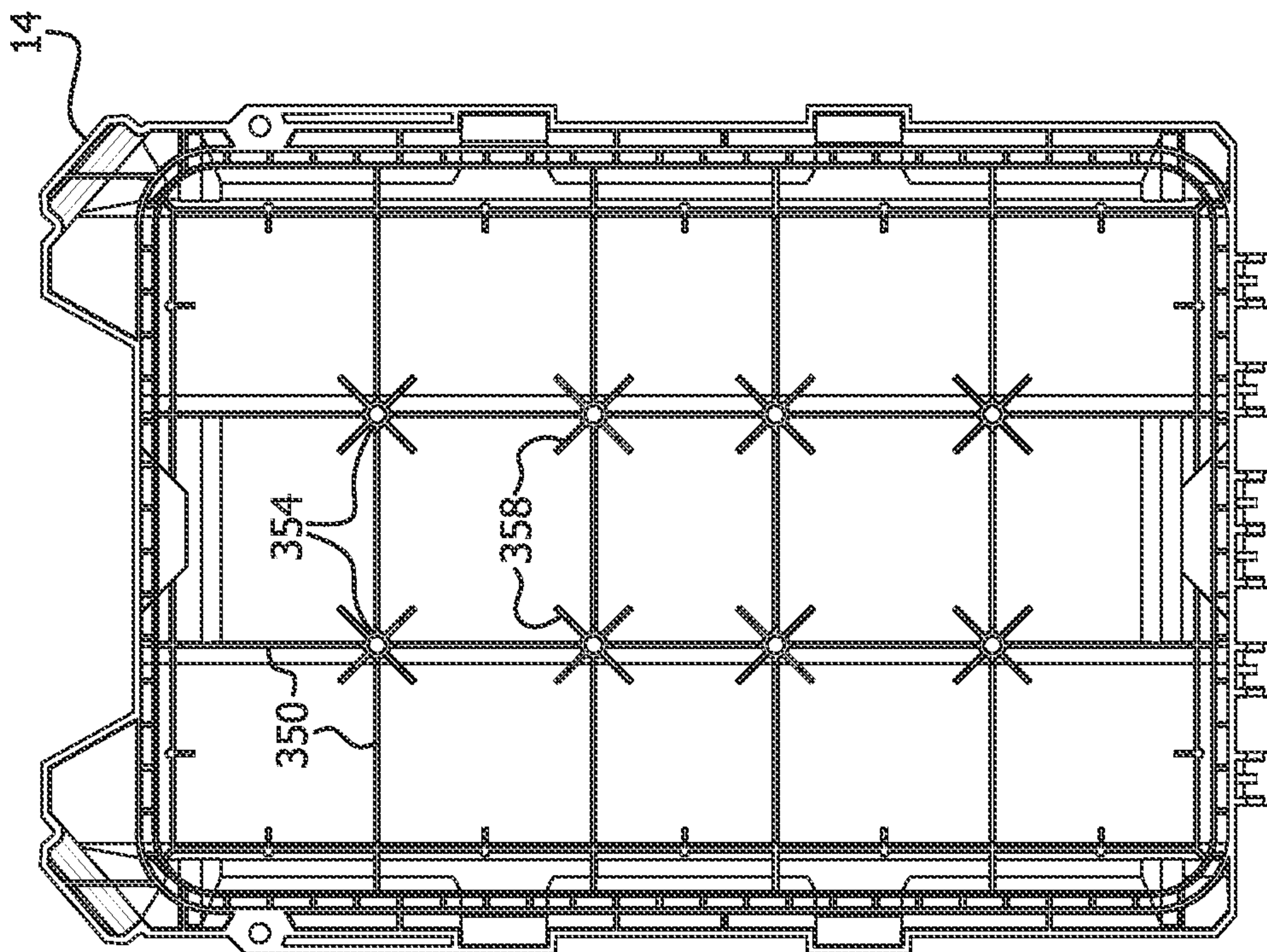


FIG. 61B

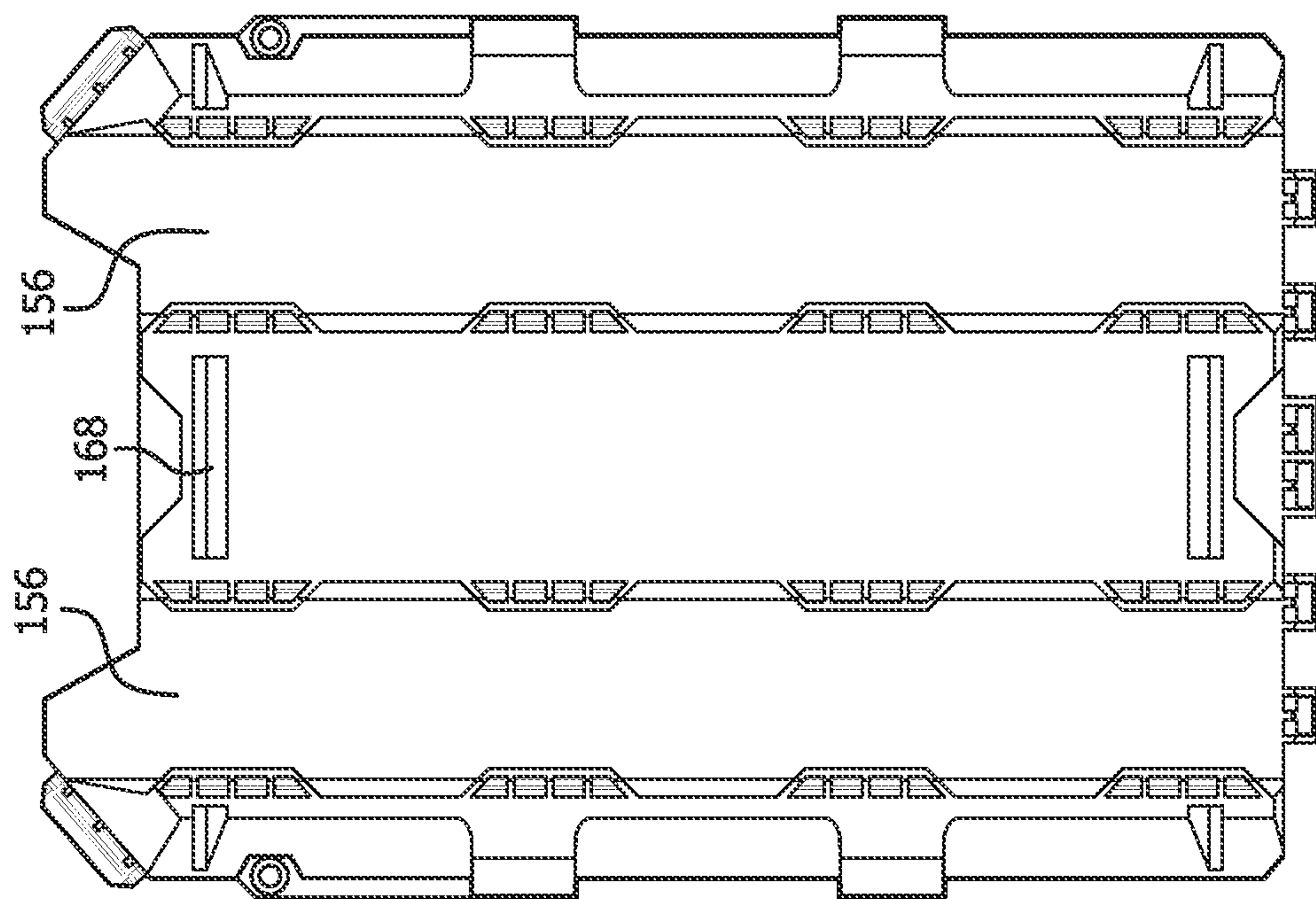


FIG. 61A

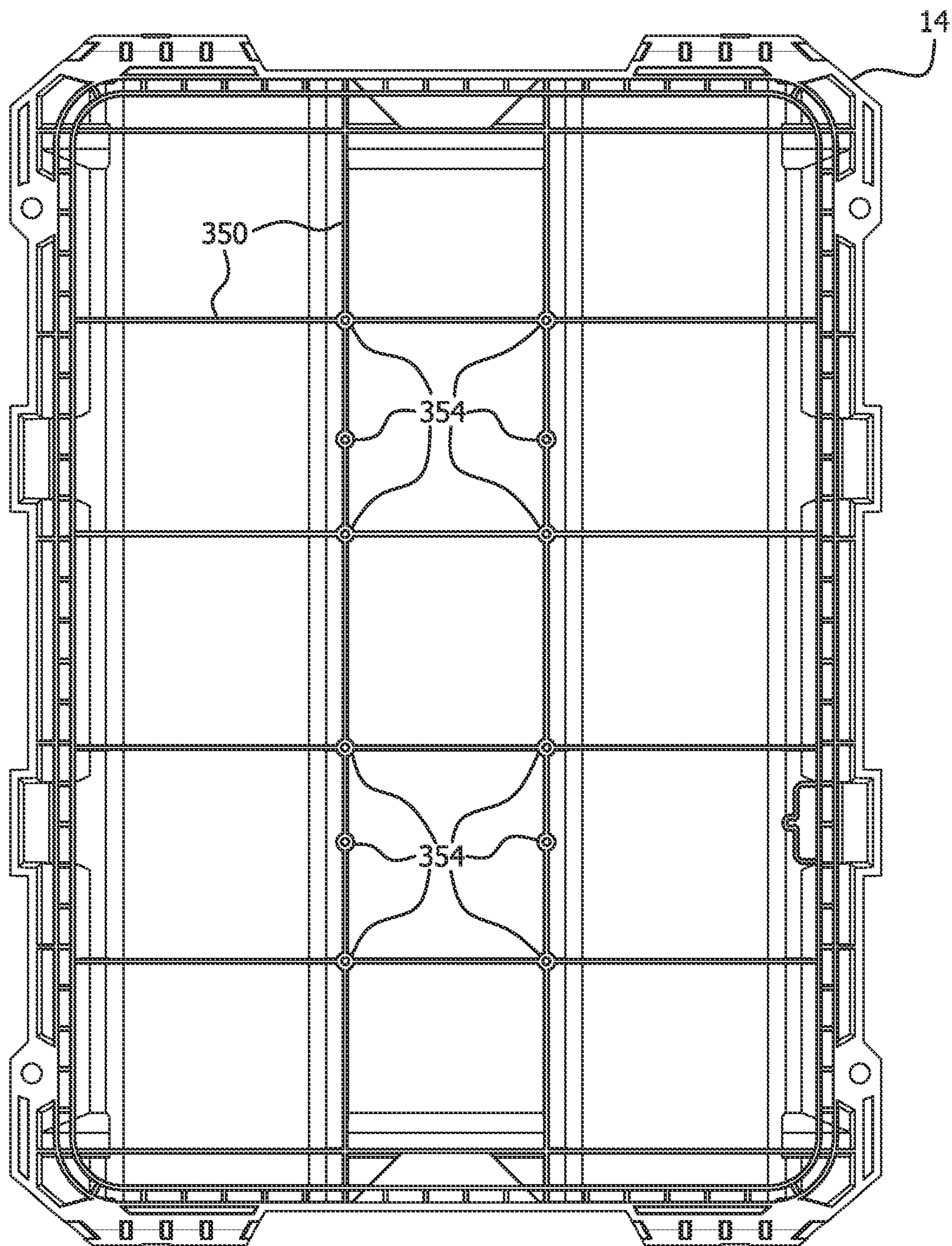


FIG. 62

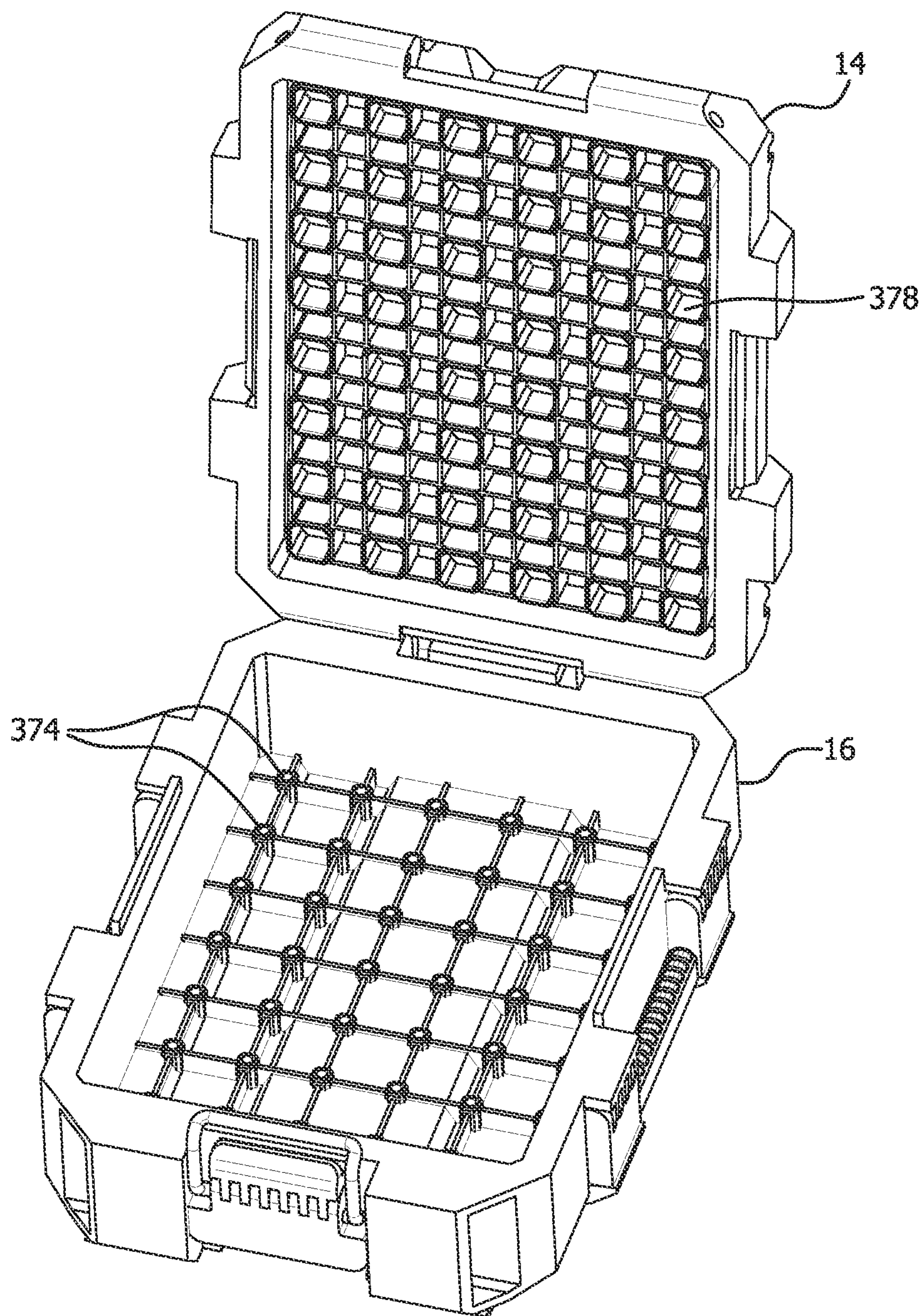


FIG. 63

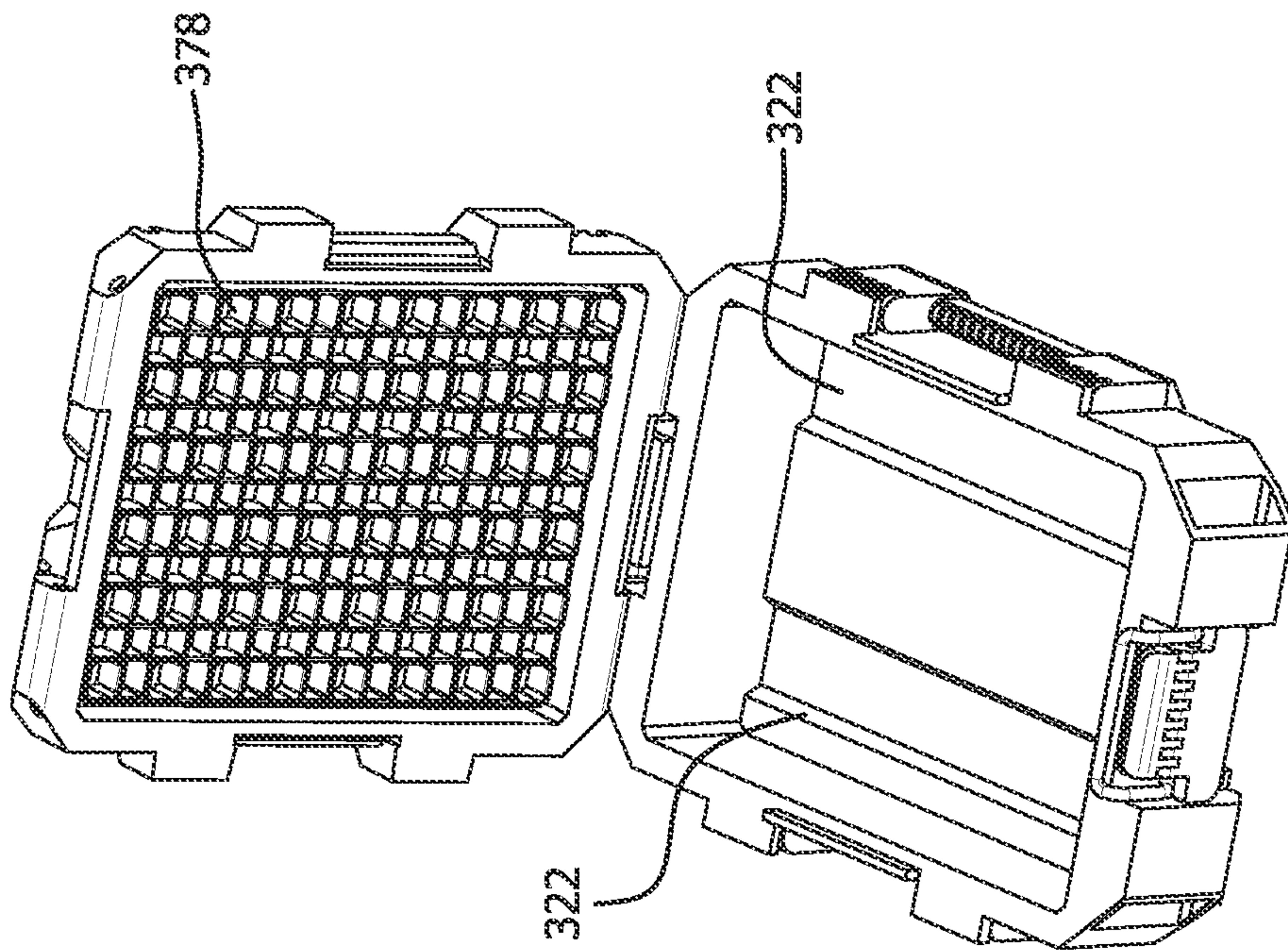


FIG. 64A

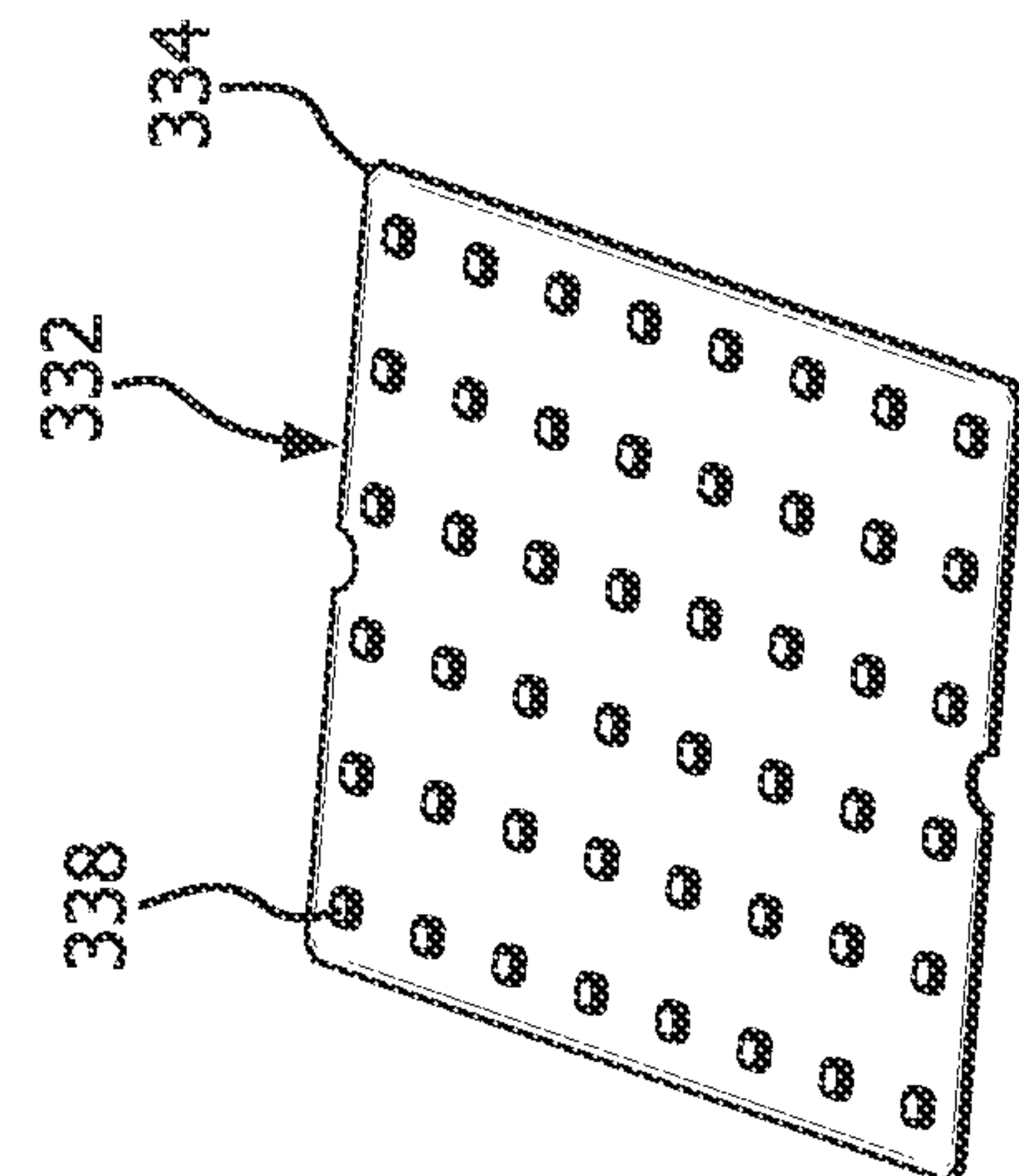


FIG. 64B

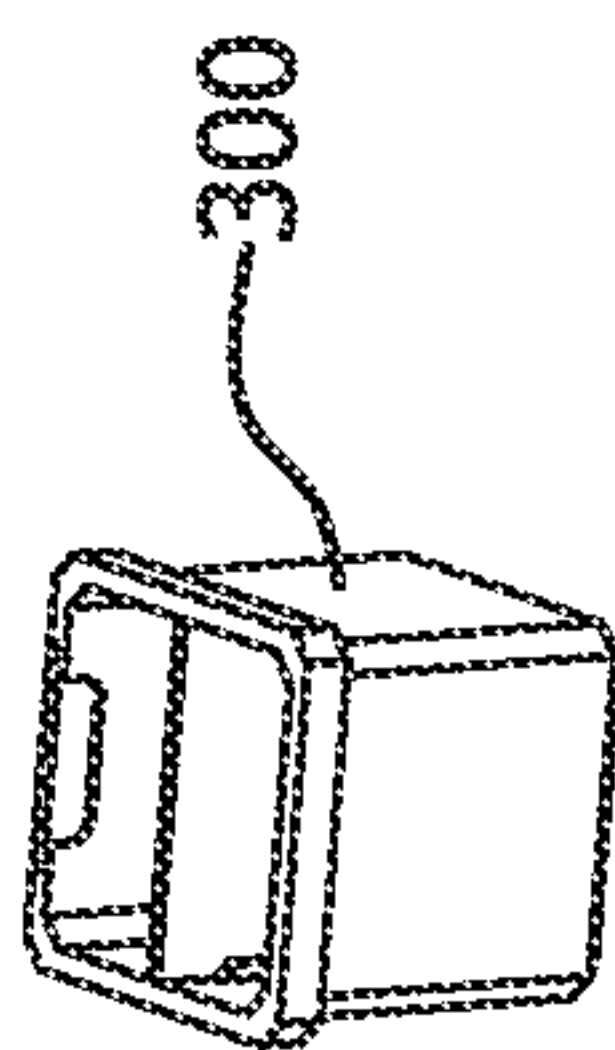


FIG. 64C

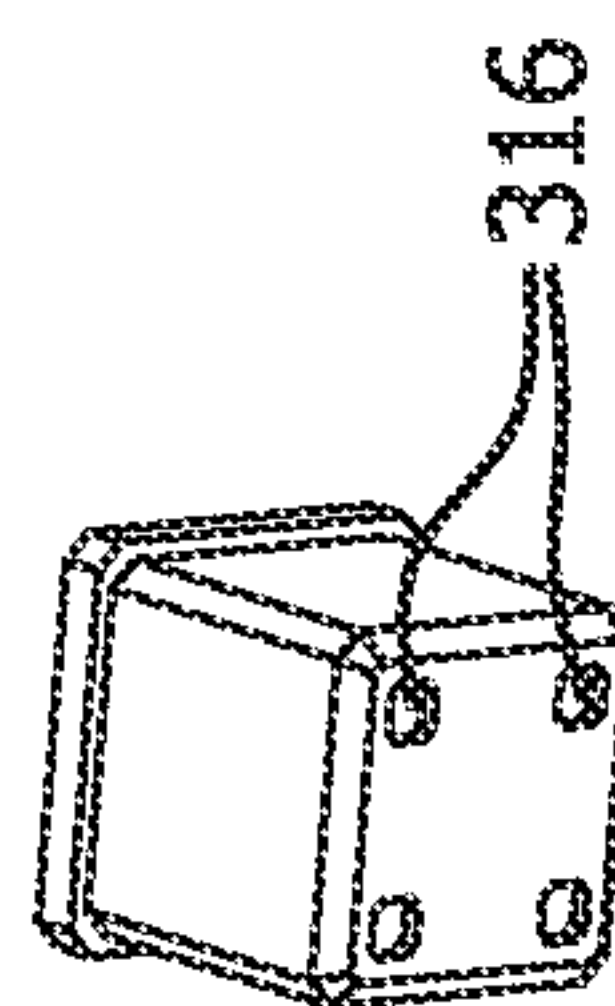


FIG. 64D

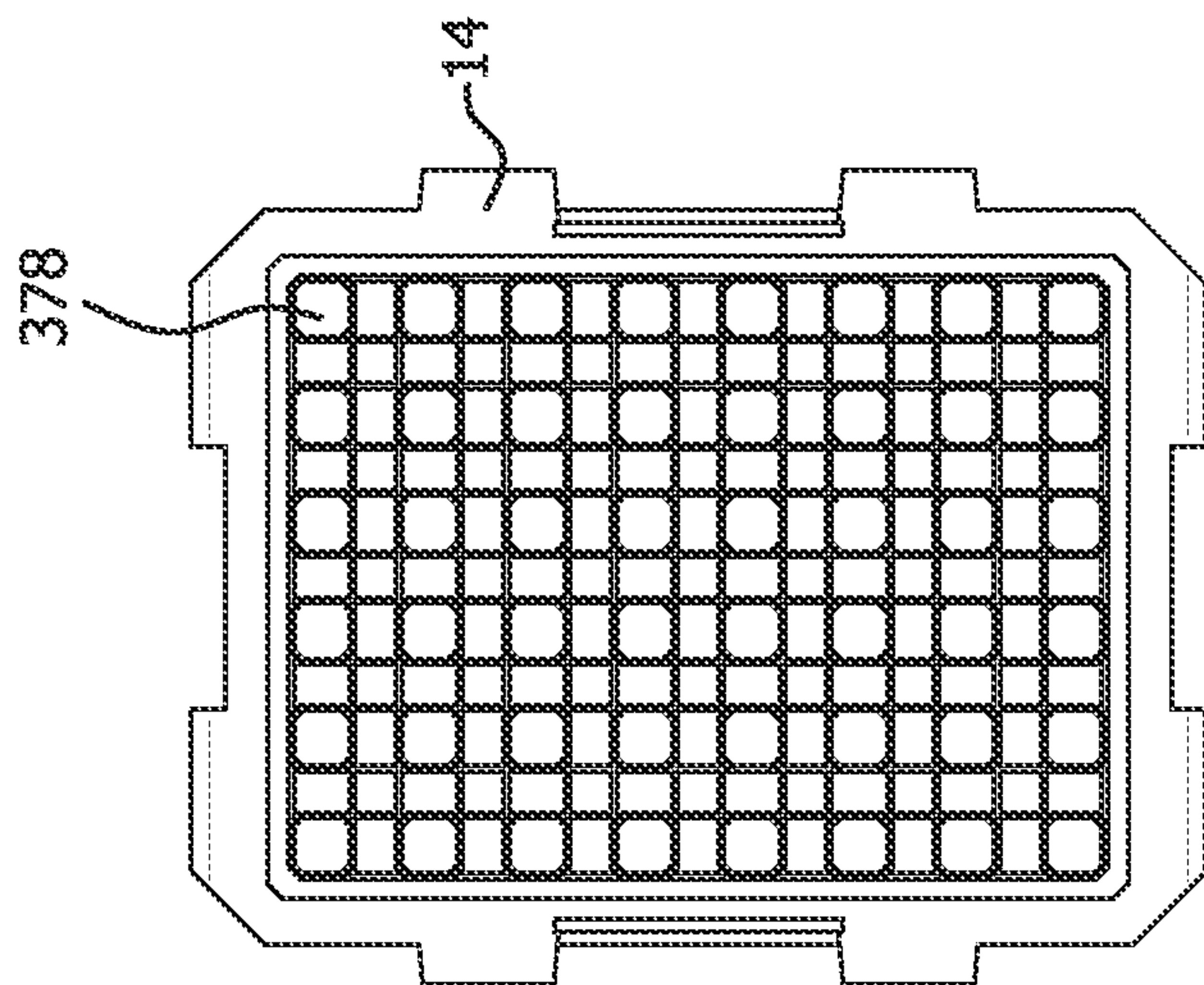


FIG. 65A

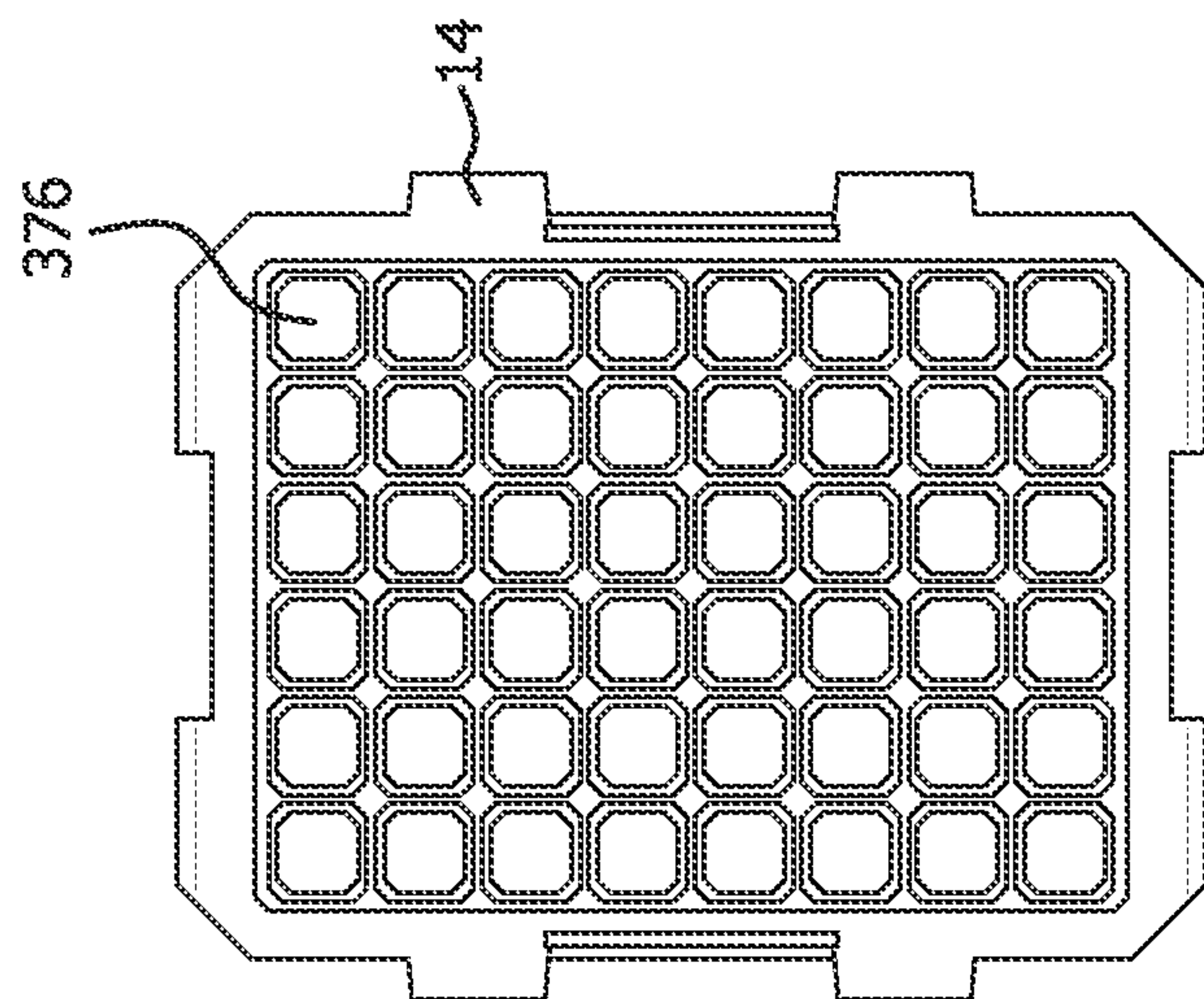


FIG. 65B

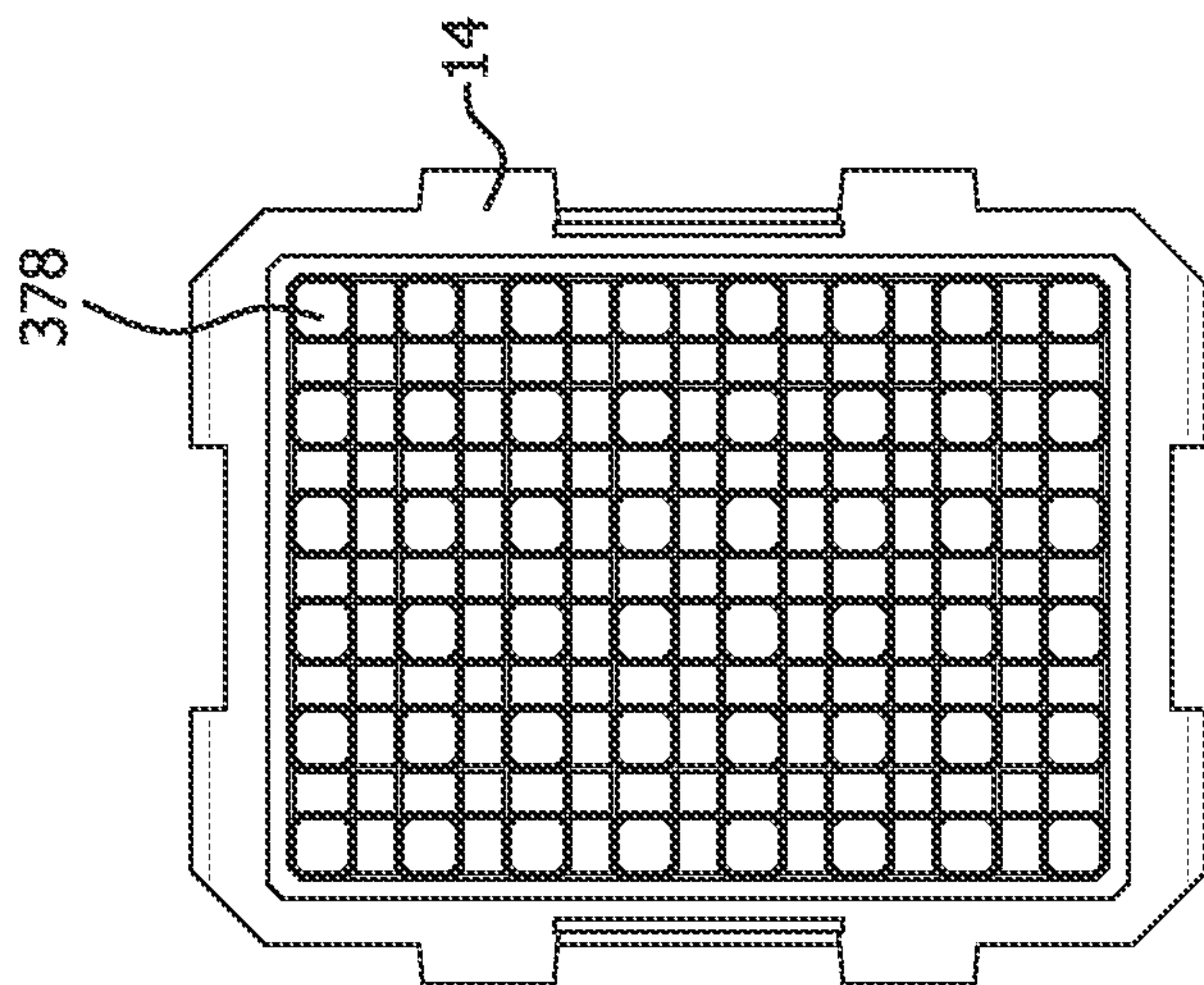


FIG. 65C

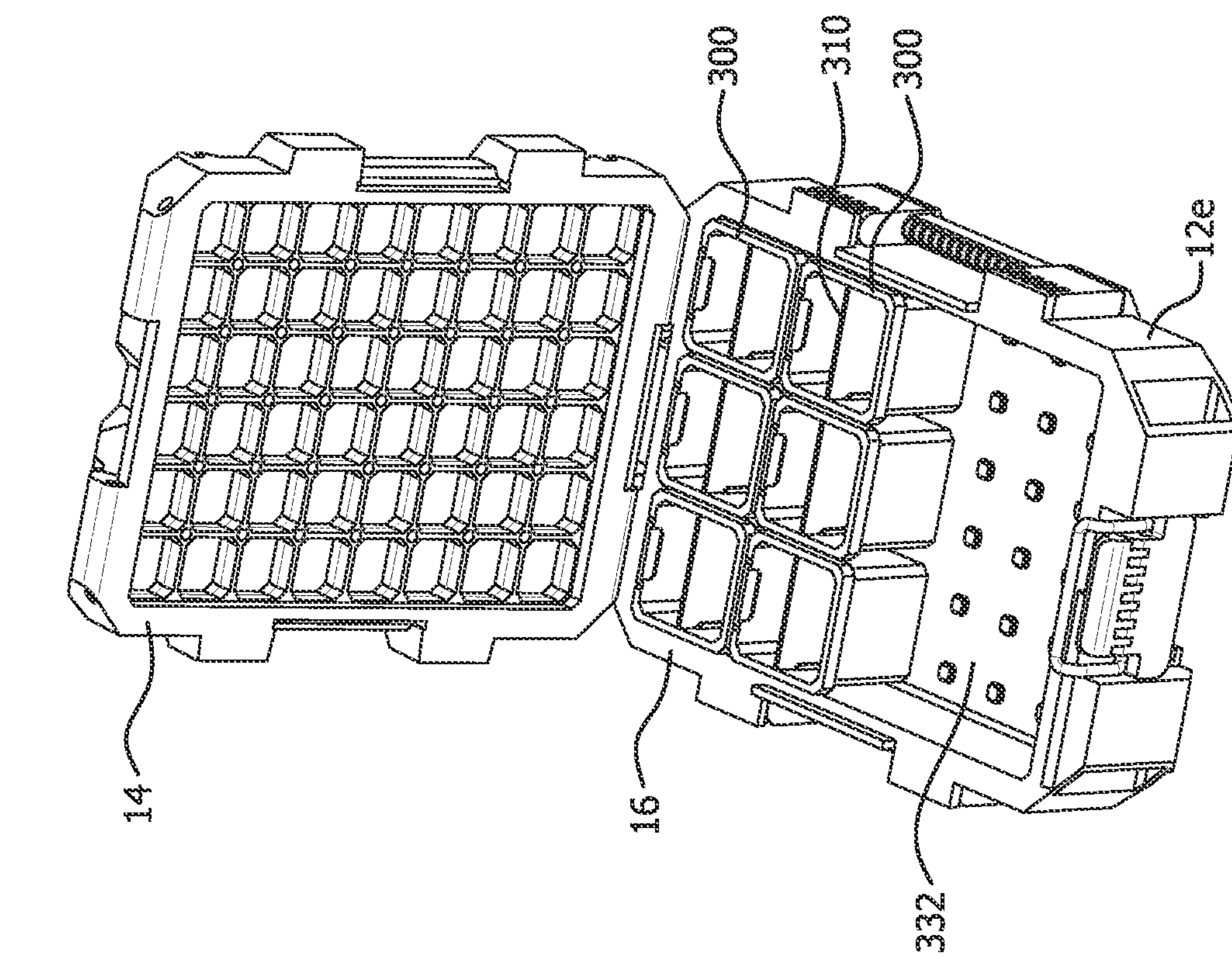


FIG. 66A

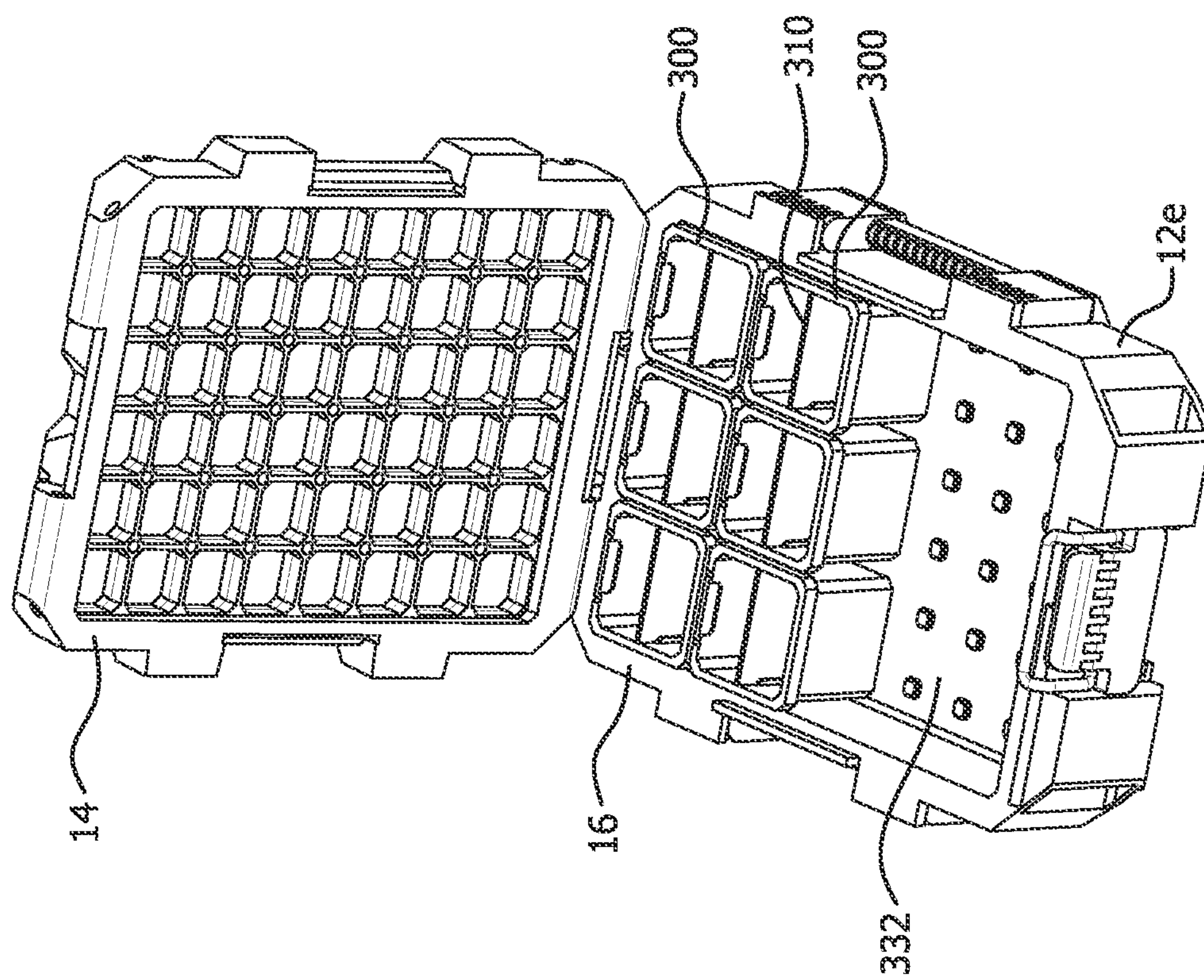


FIG. 66B

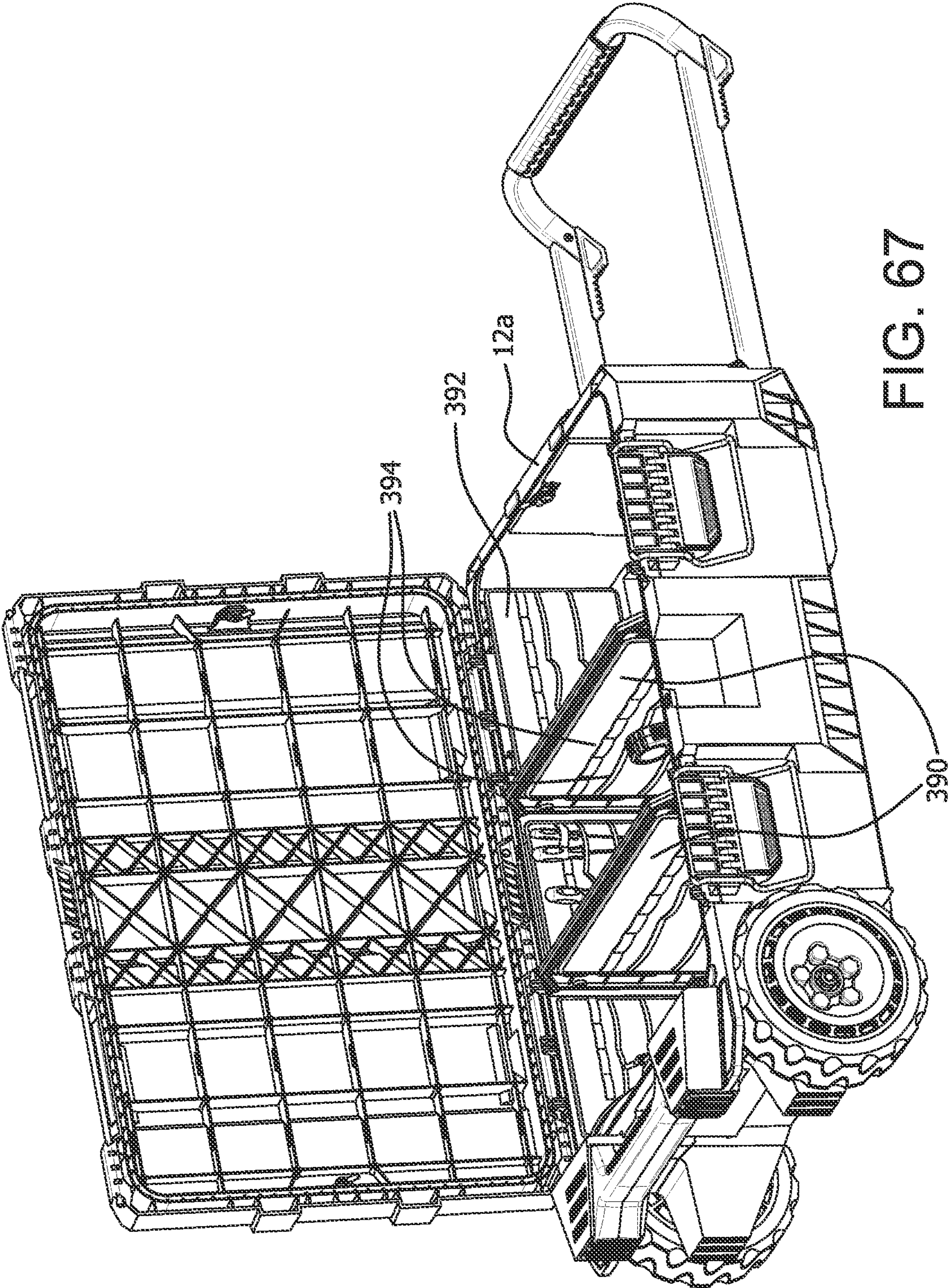


FIG. 67

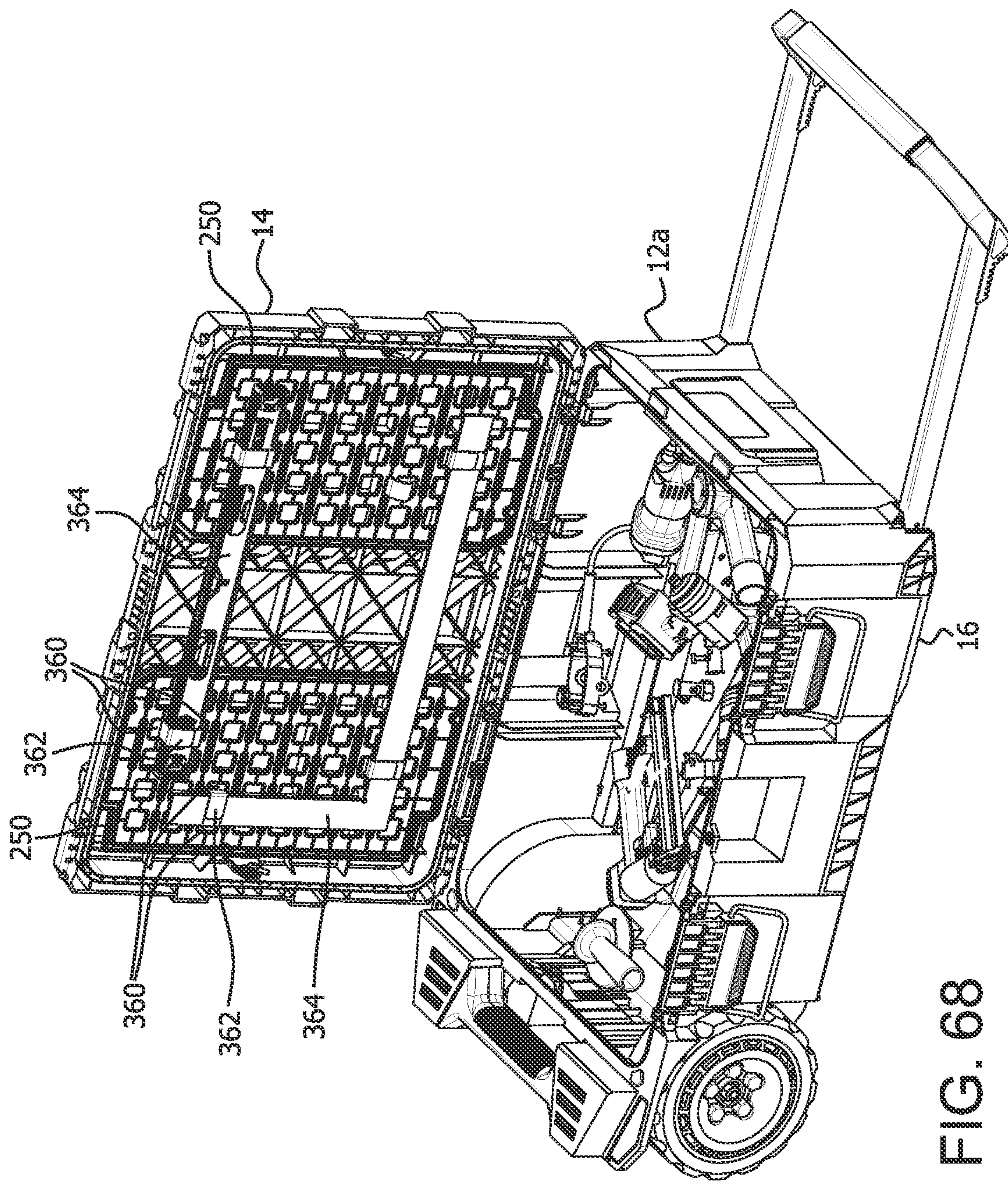


FIG. 68

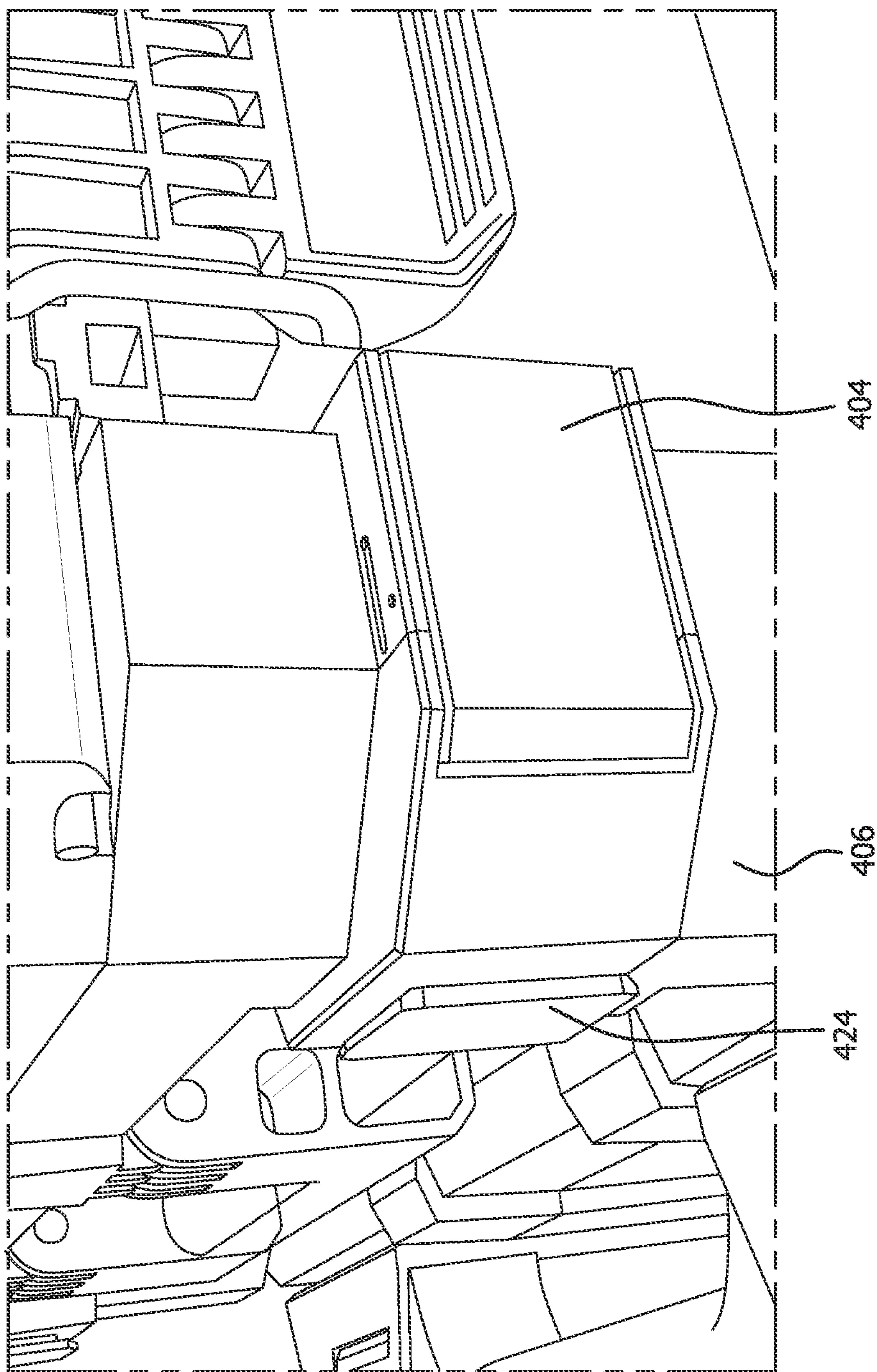


FIG. 69

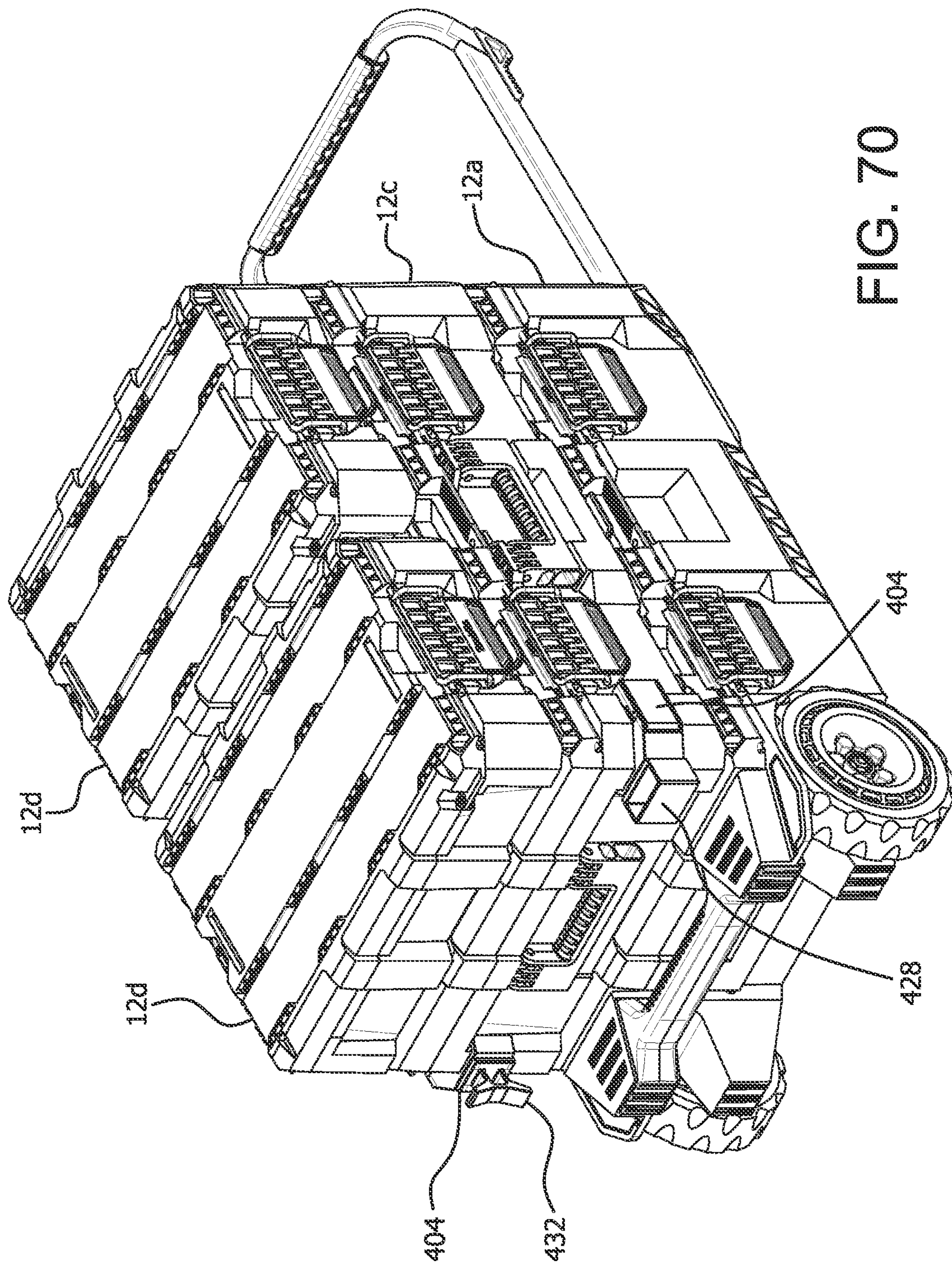


FIG. 70

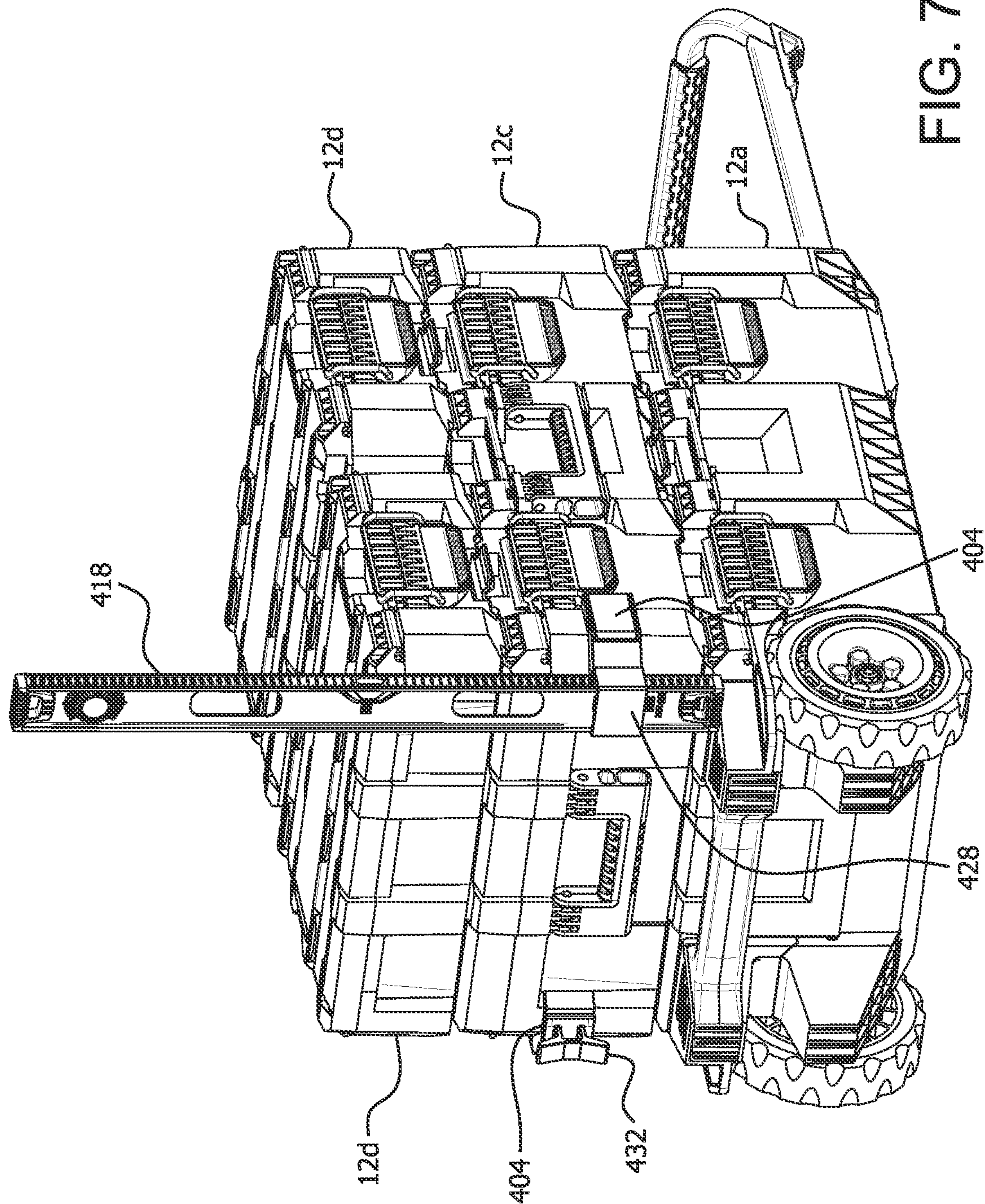


FIG. 71

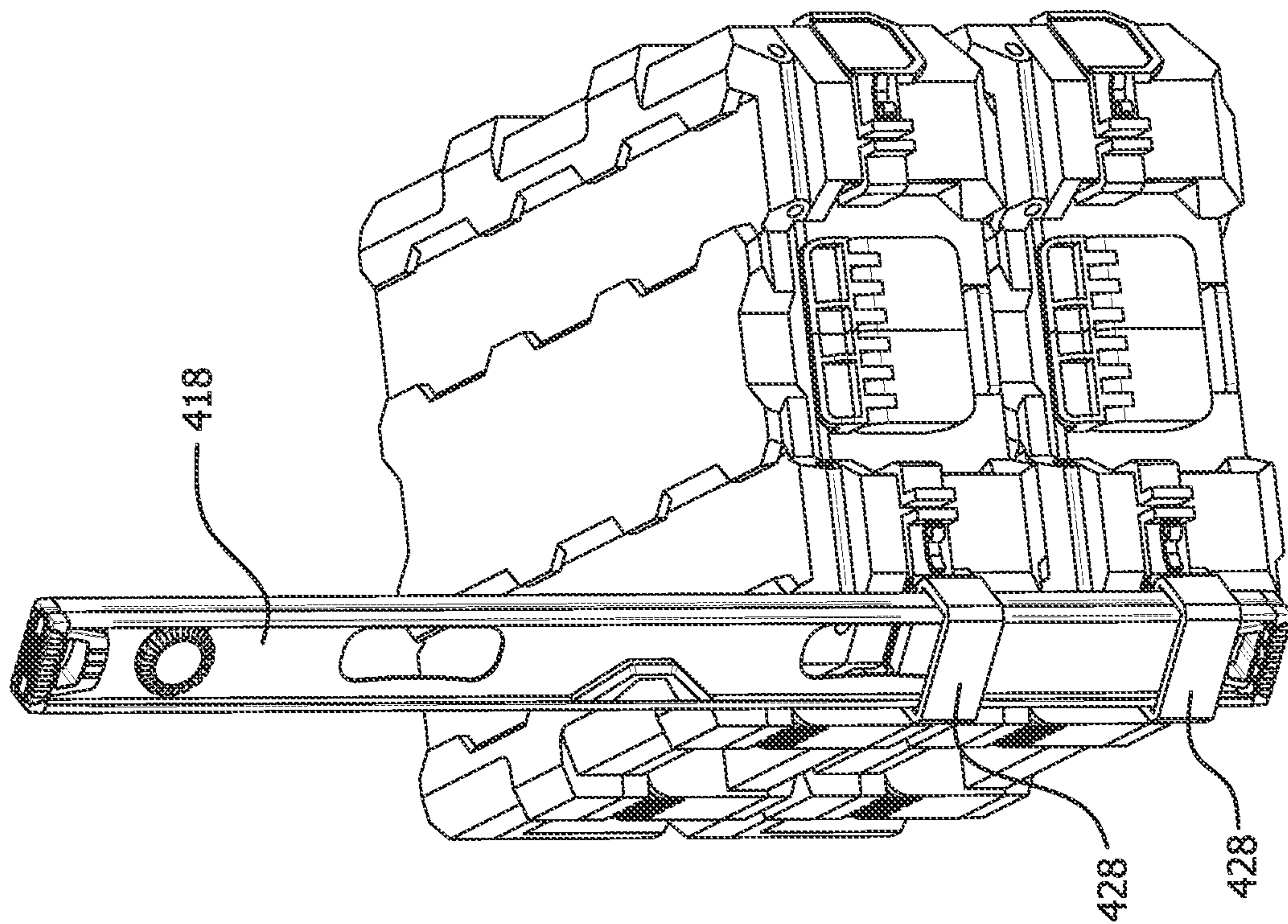


FIG. 72B

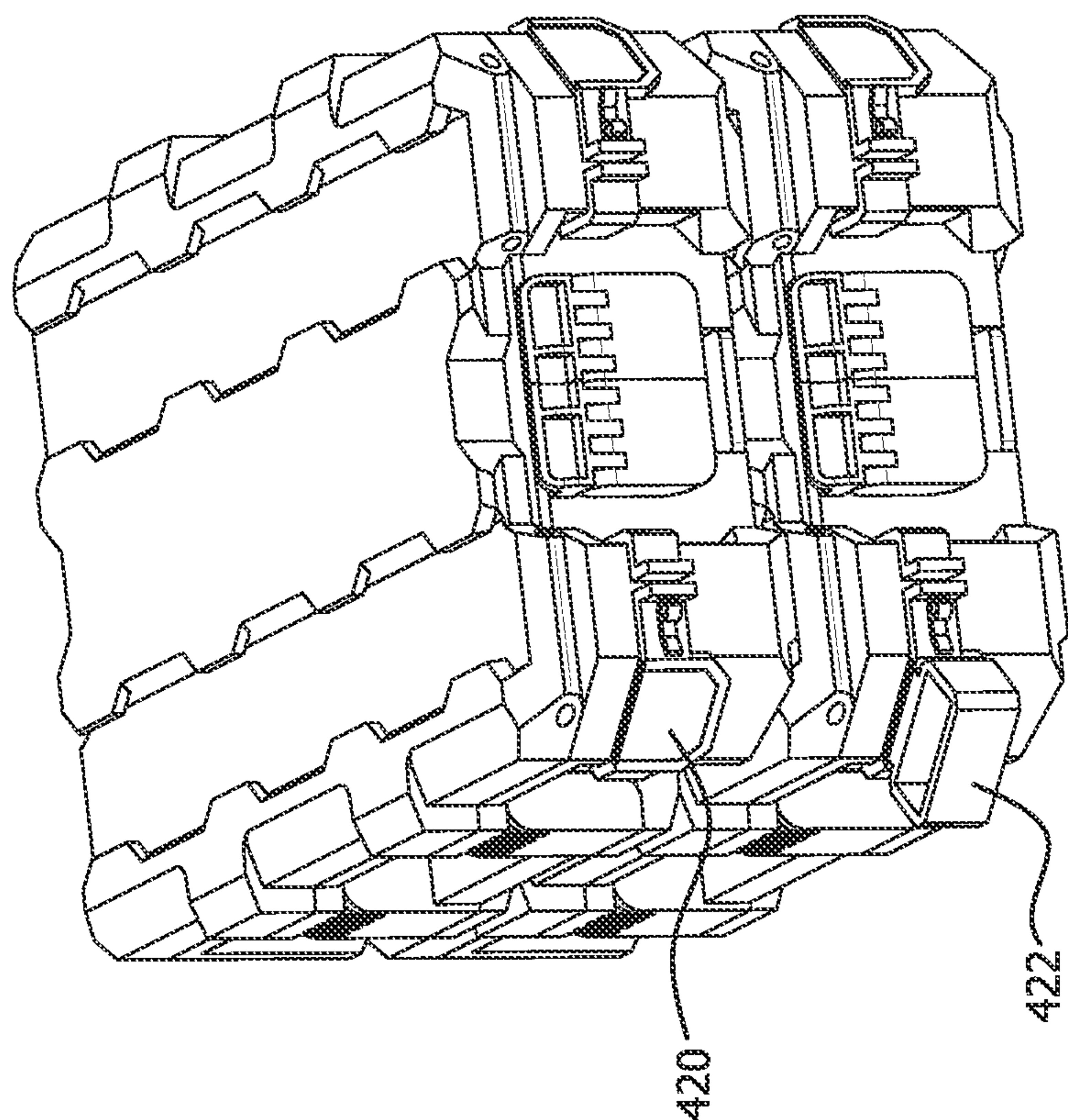


FIG. 72A

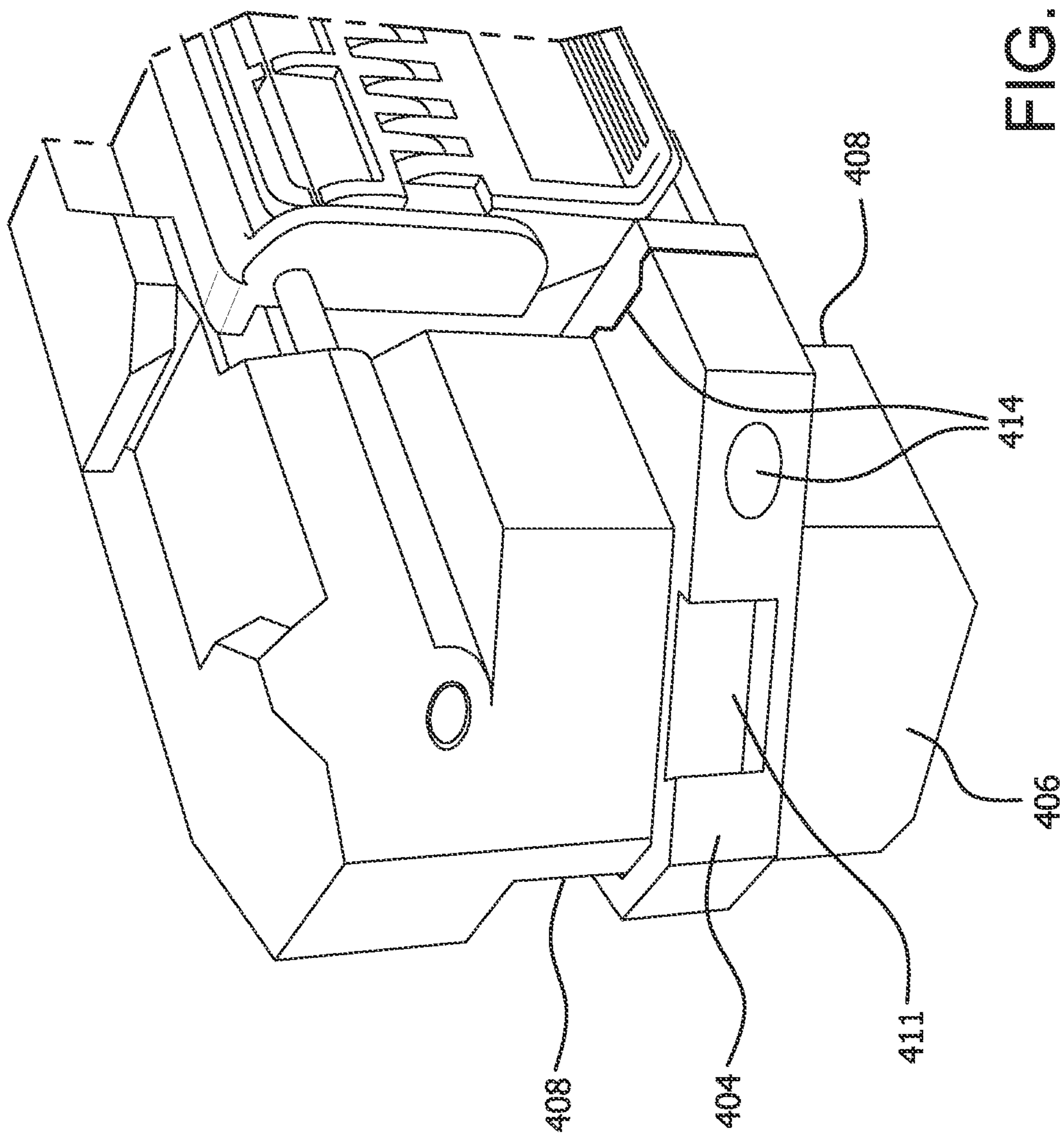


FIG. 73

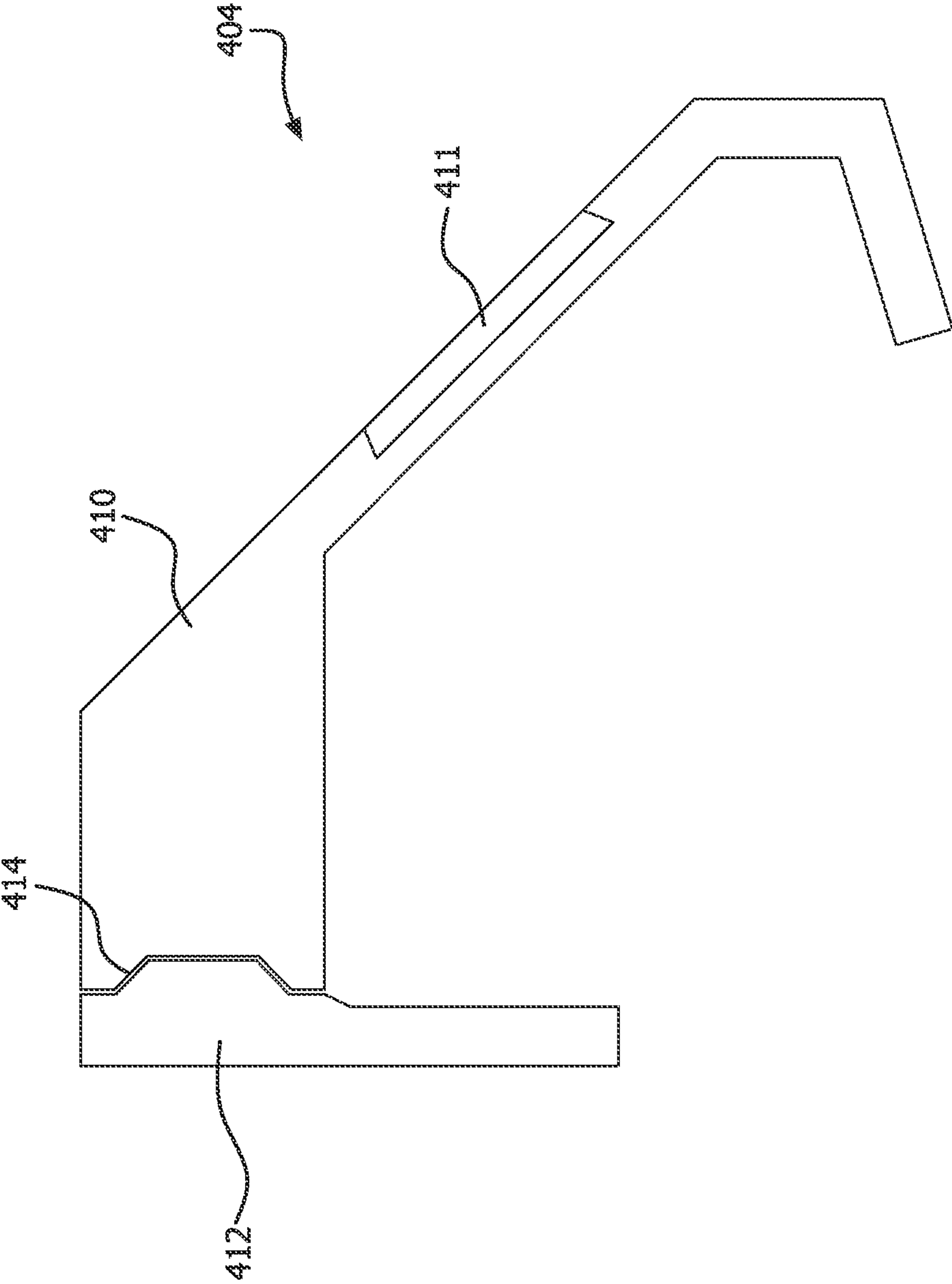


FIG. 74A

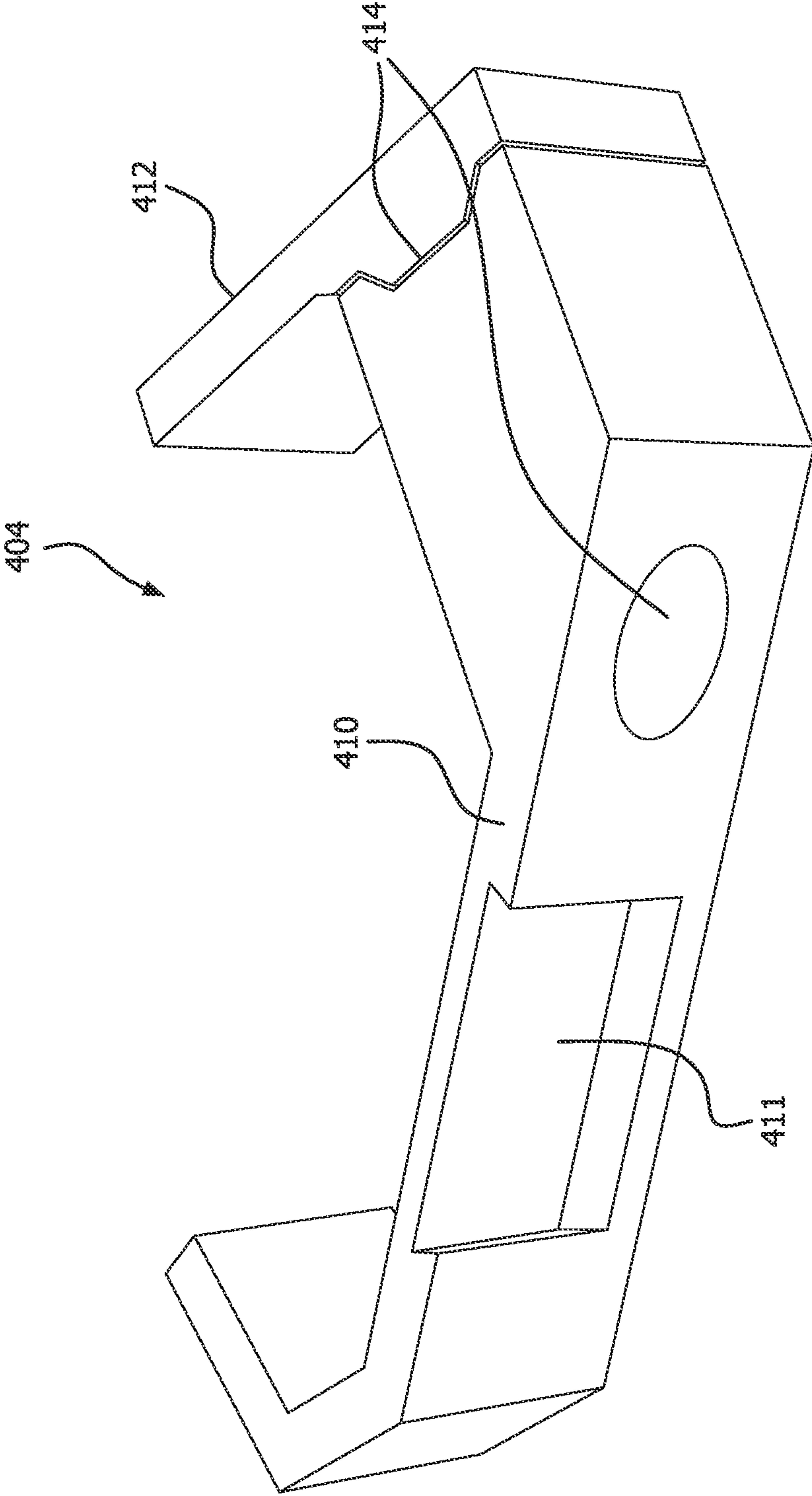


FIG. 74B

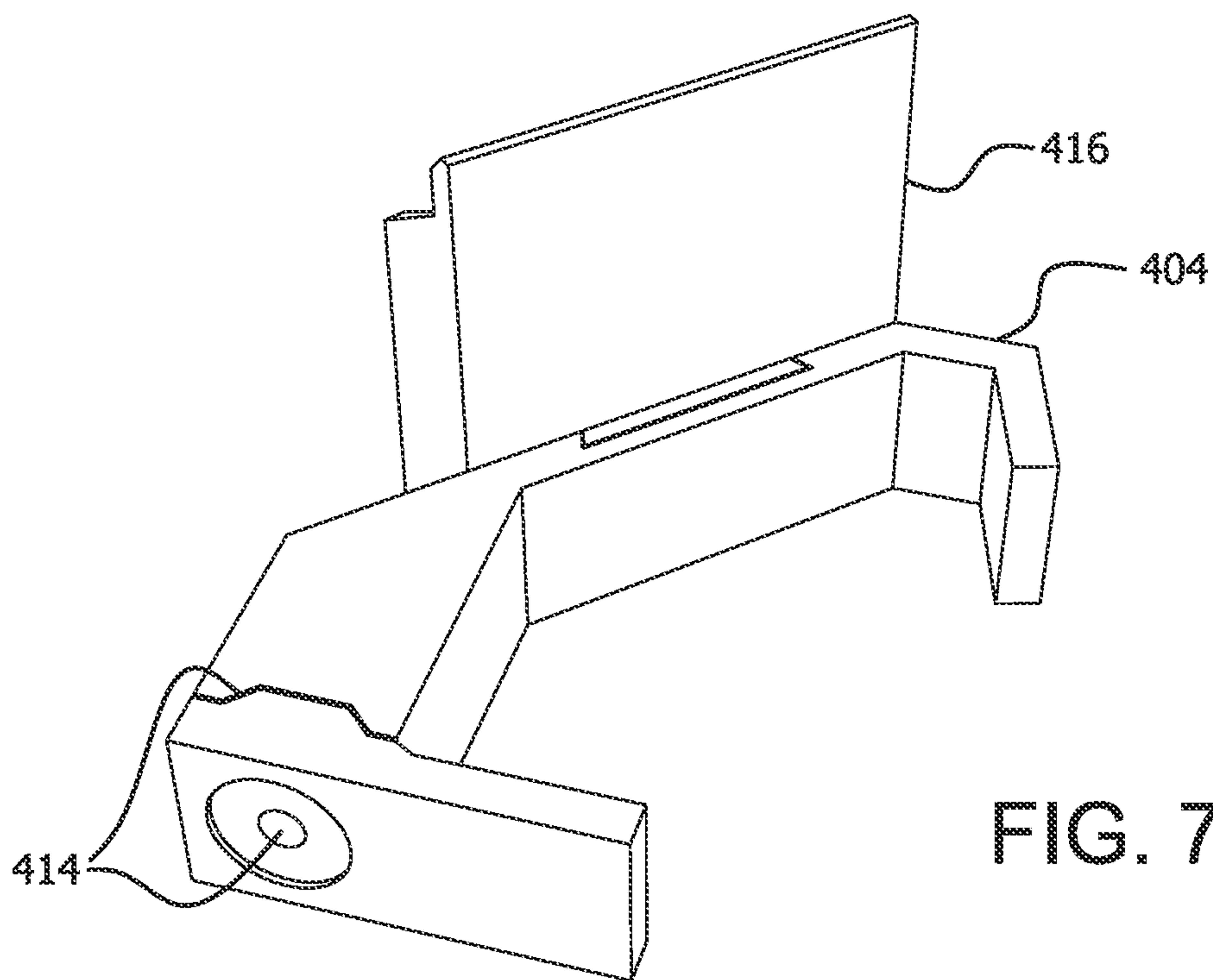


FIG. 74C

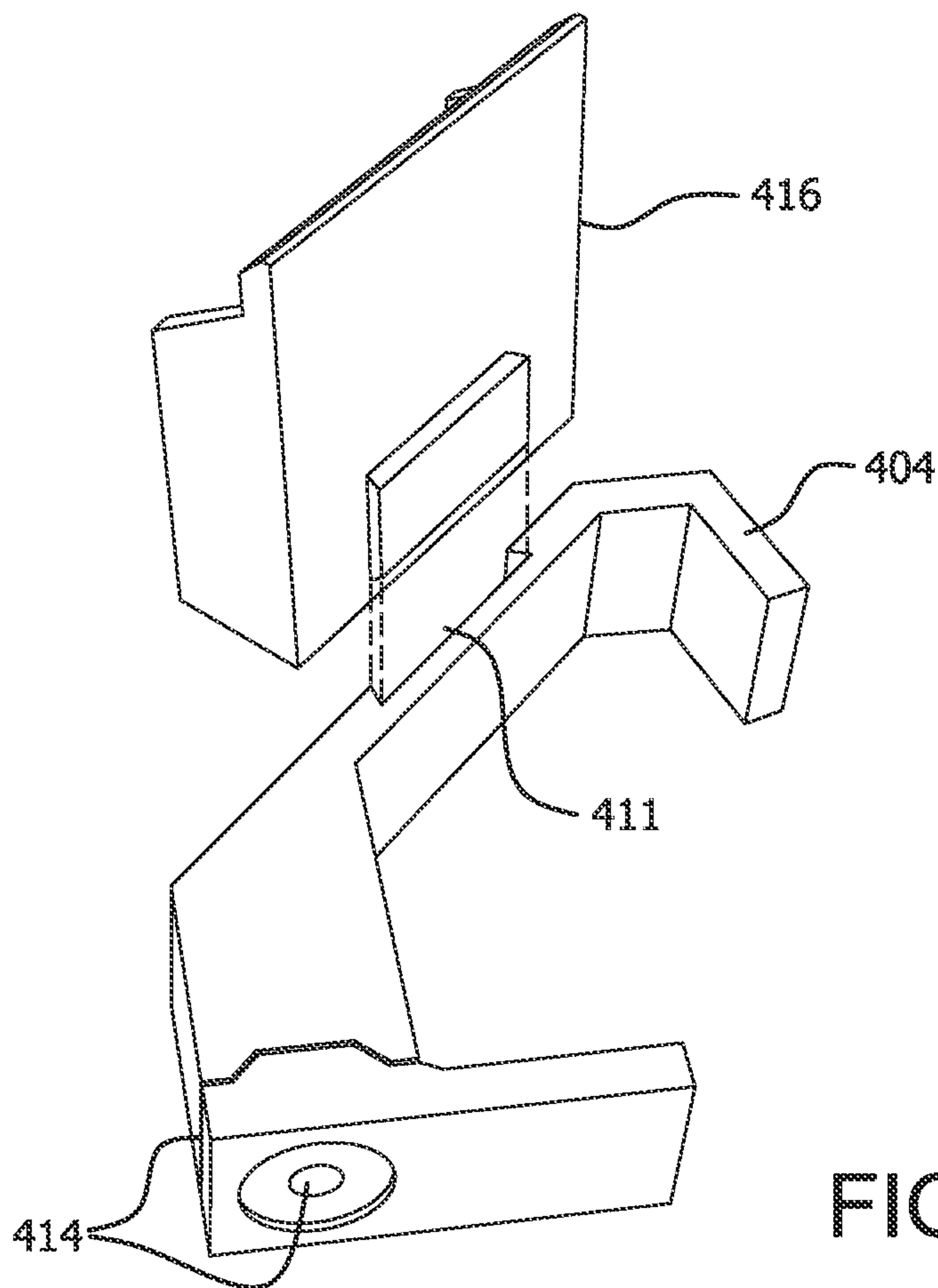


FIG. 74D

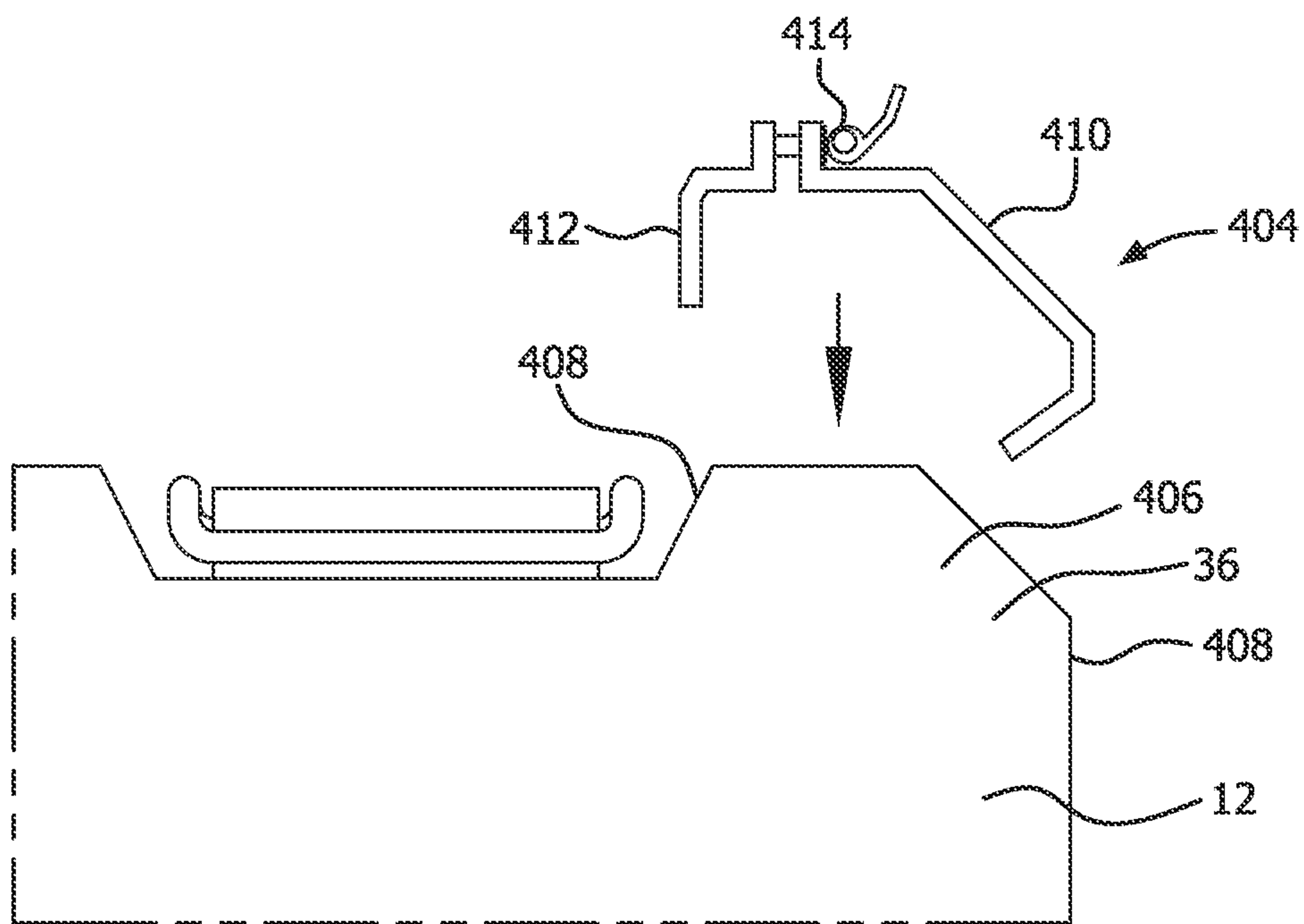


FIG. 75A

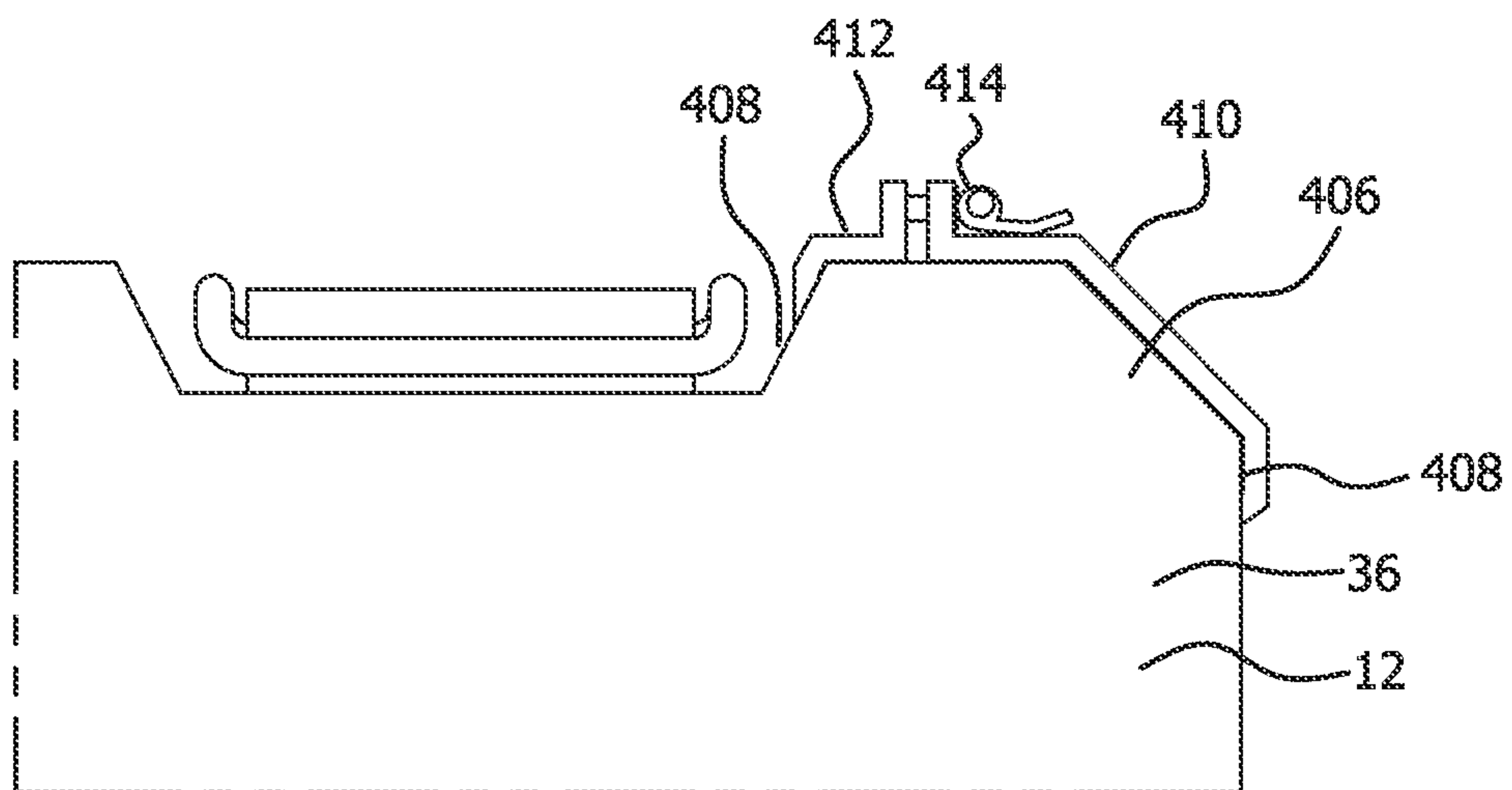


FIG. 75B

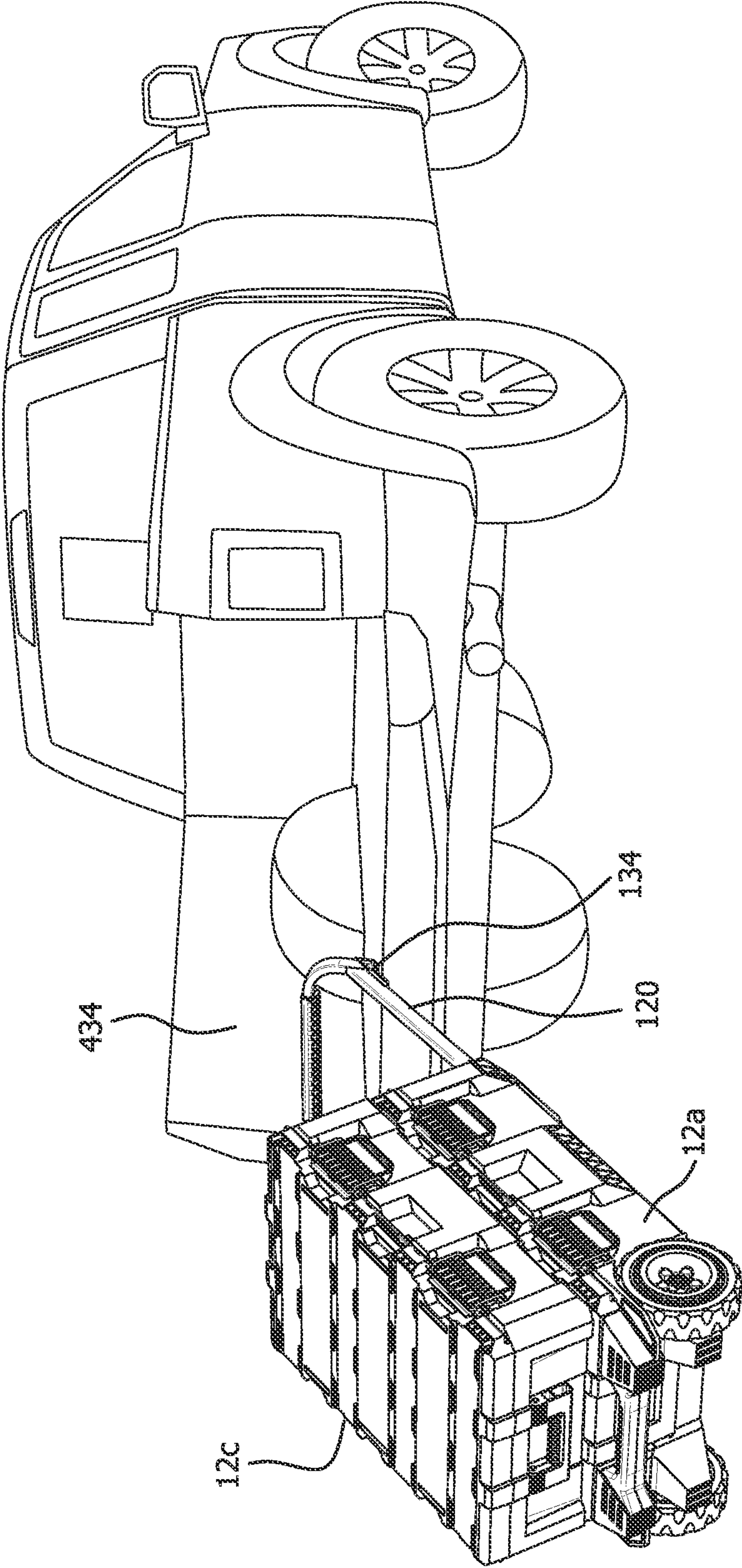


FIG. 76A

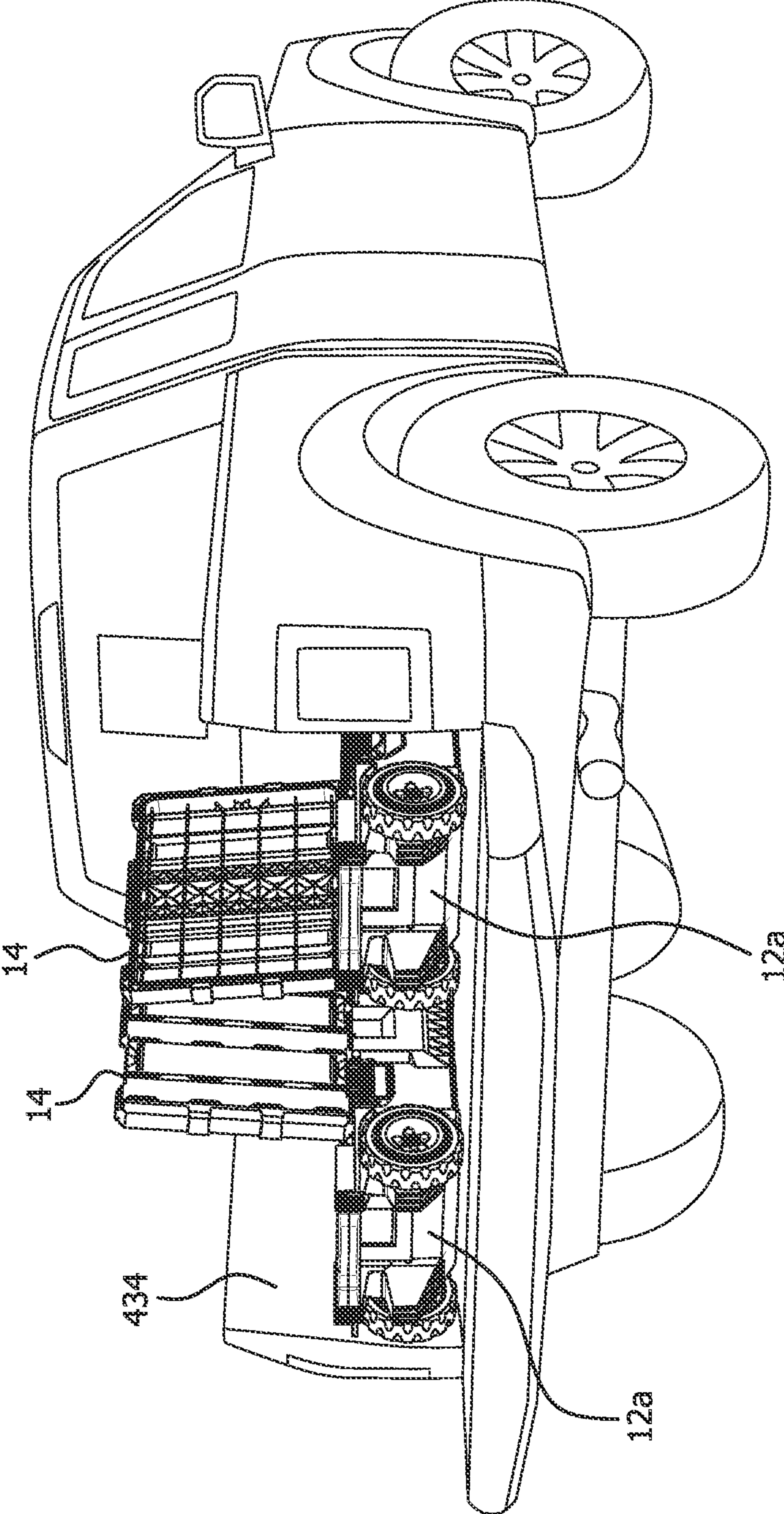


FIG. 76B

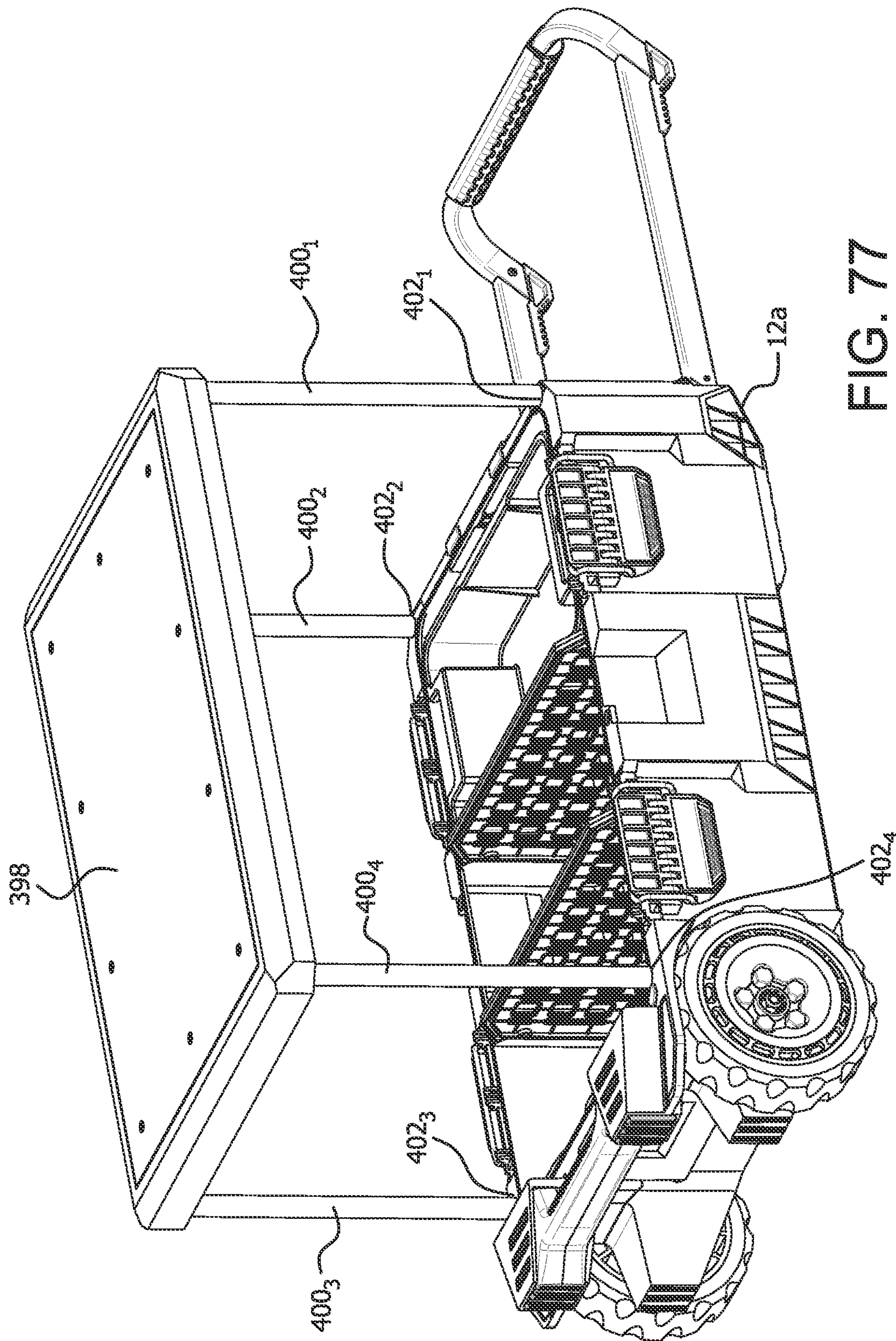
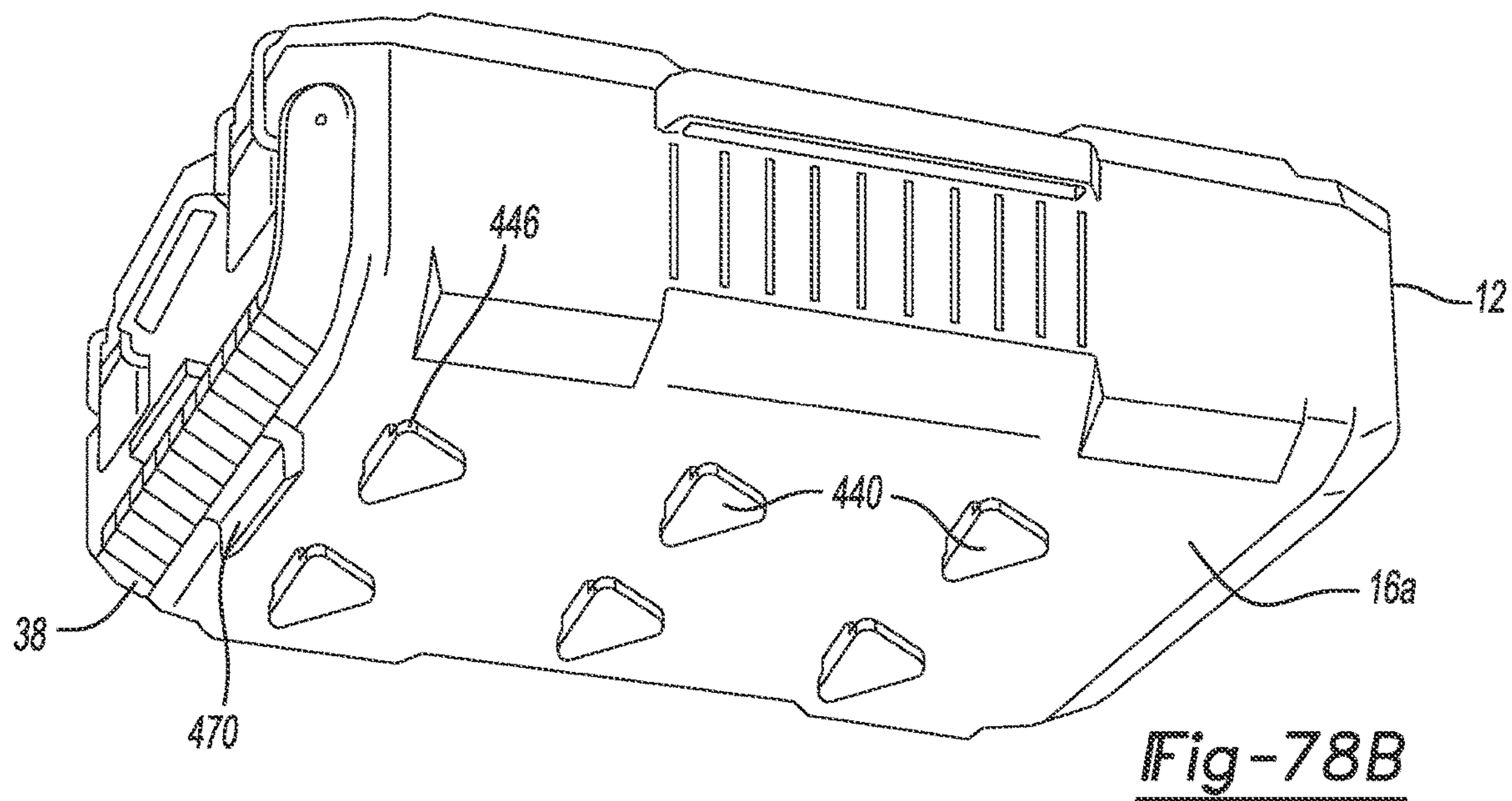
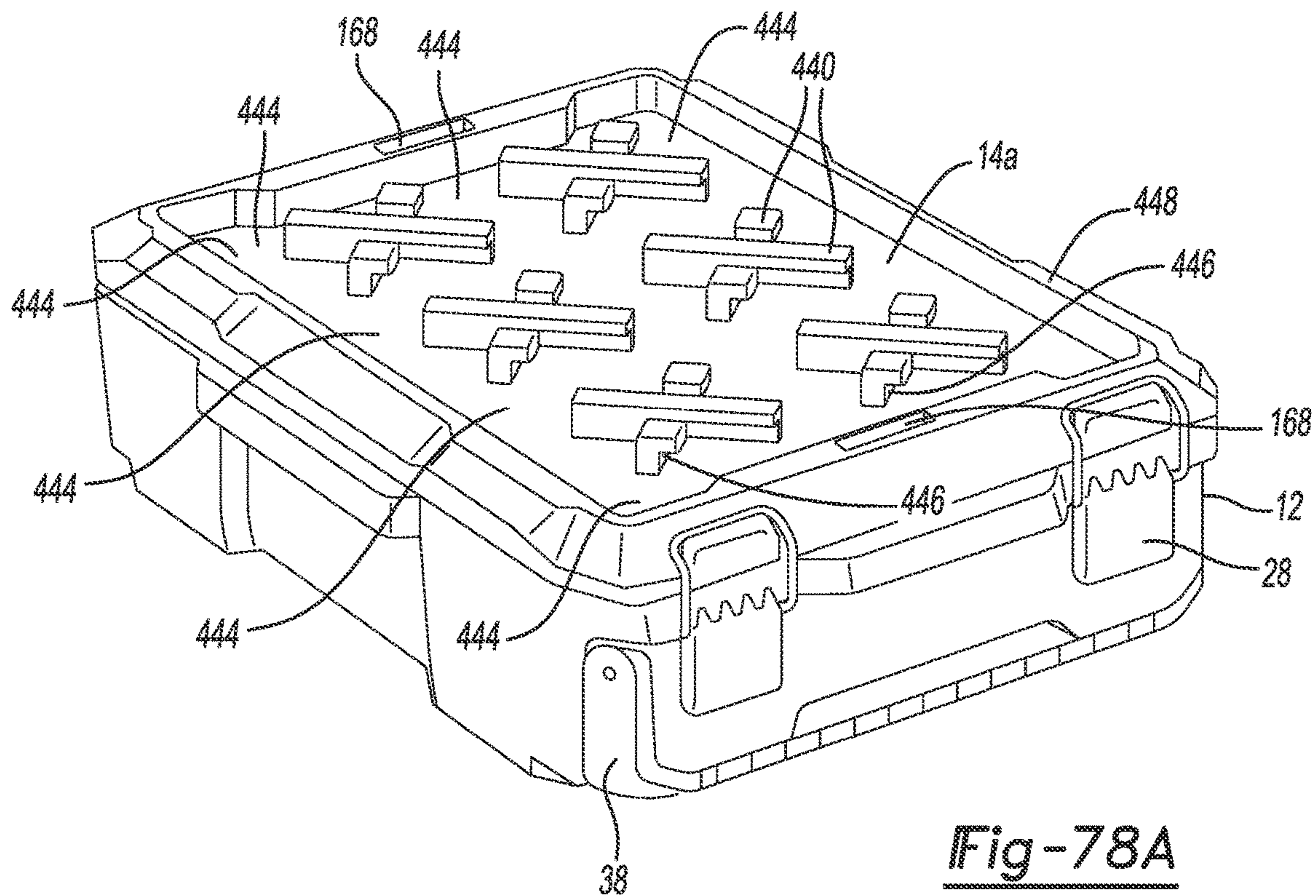
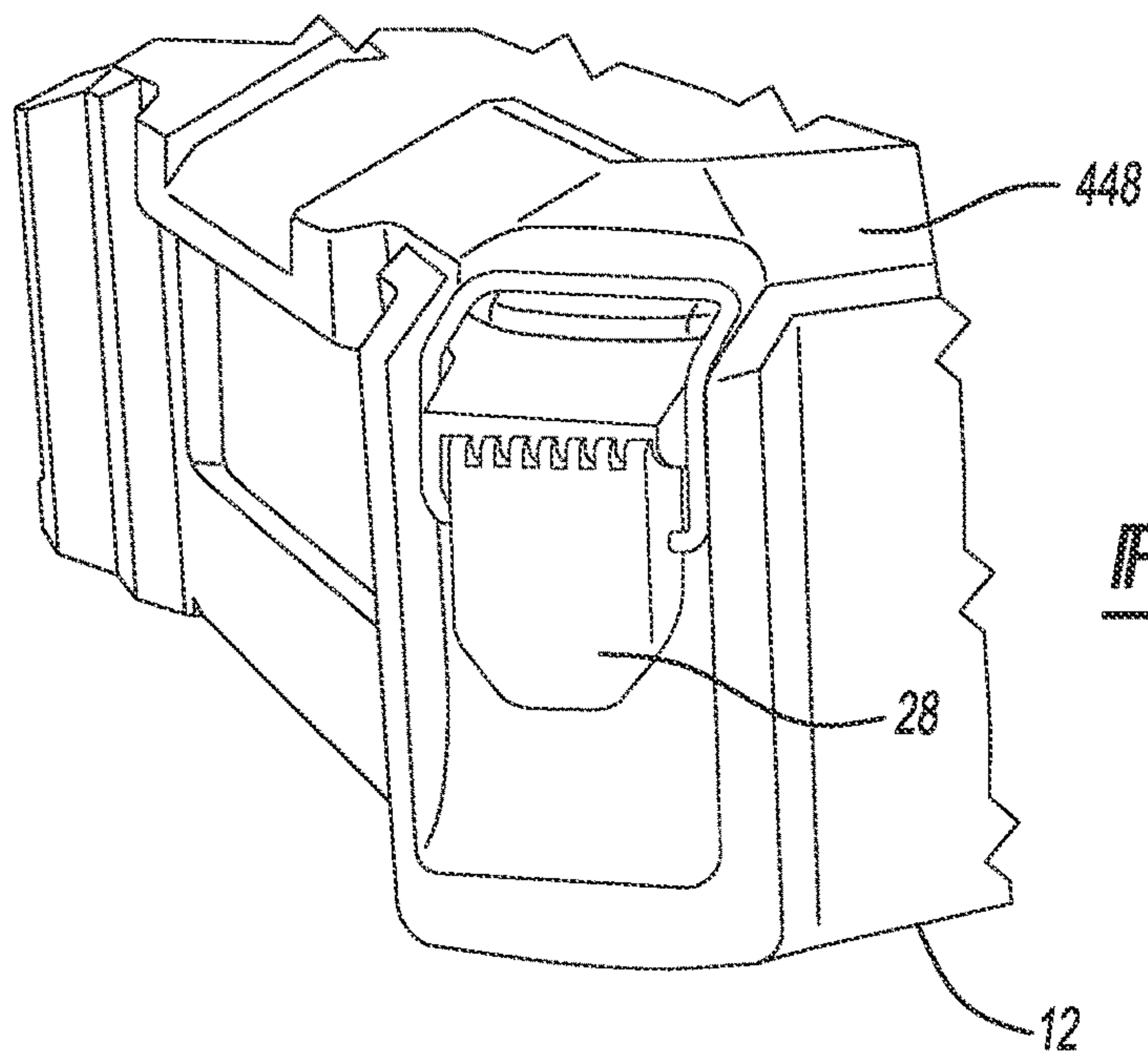
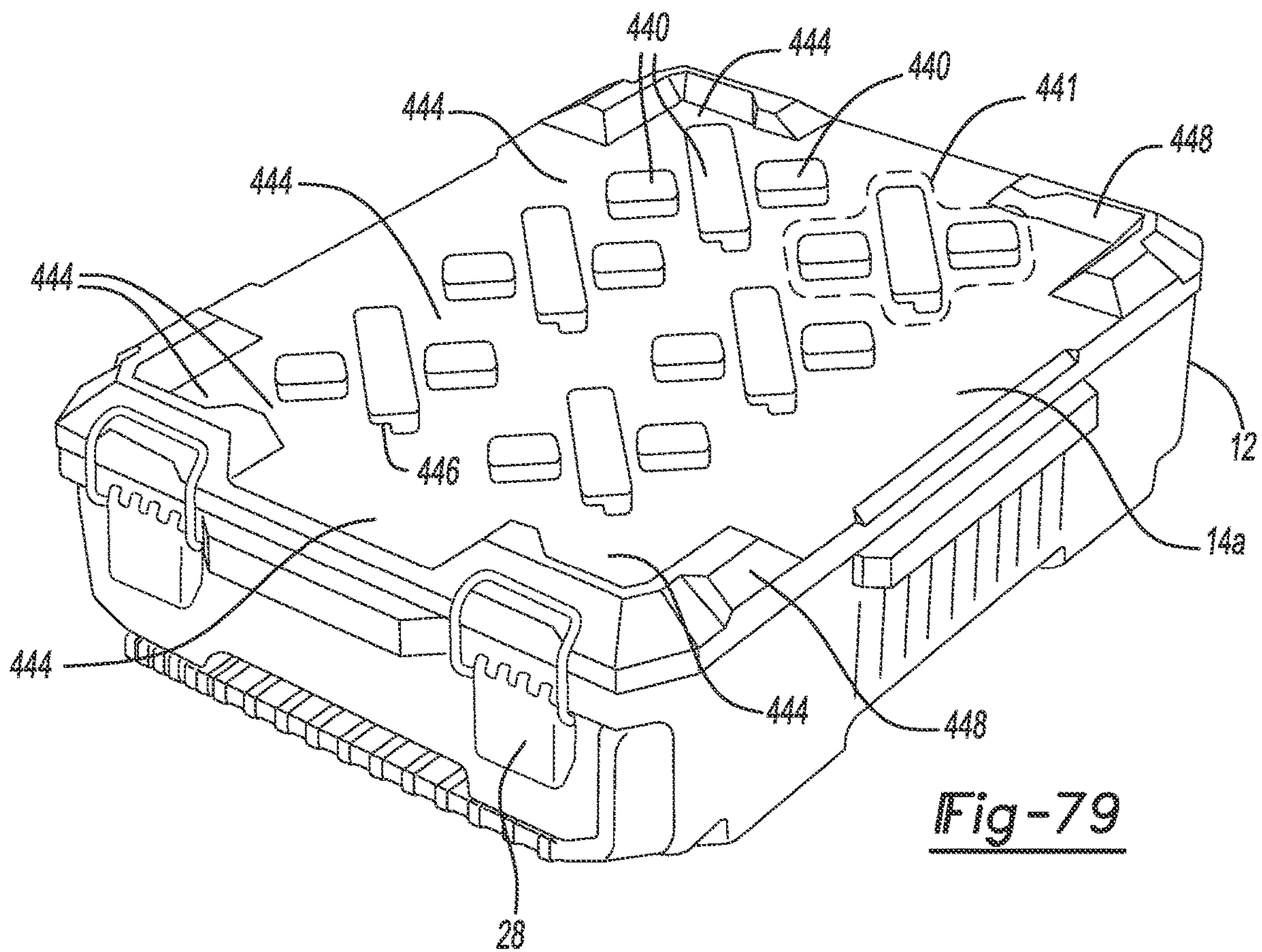


FIG. 77





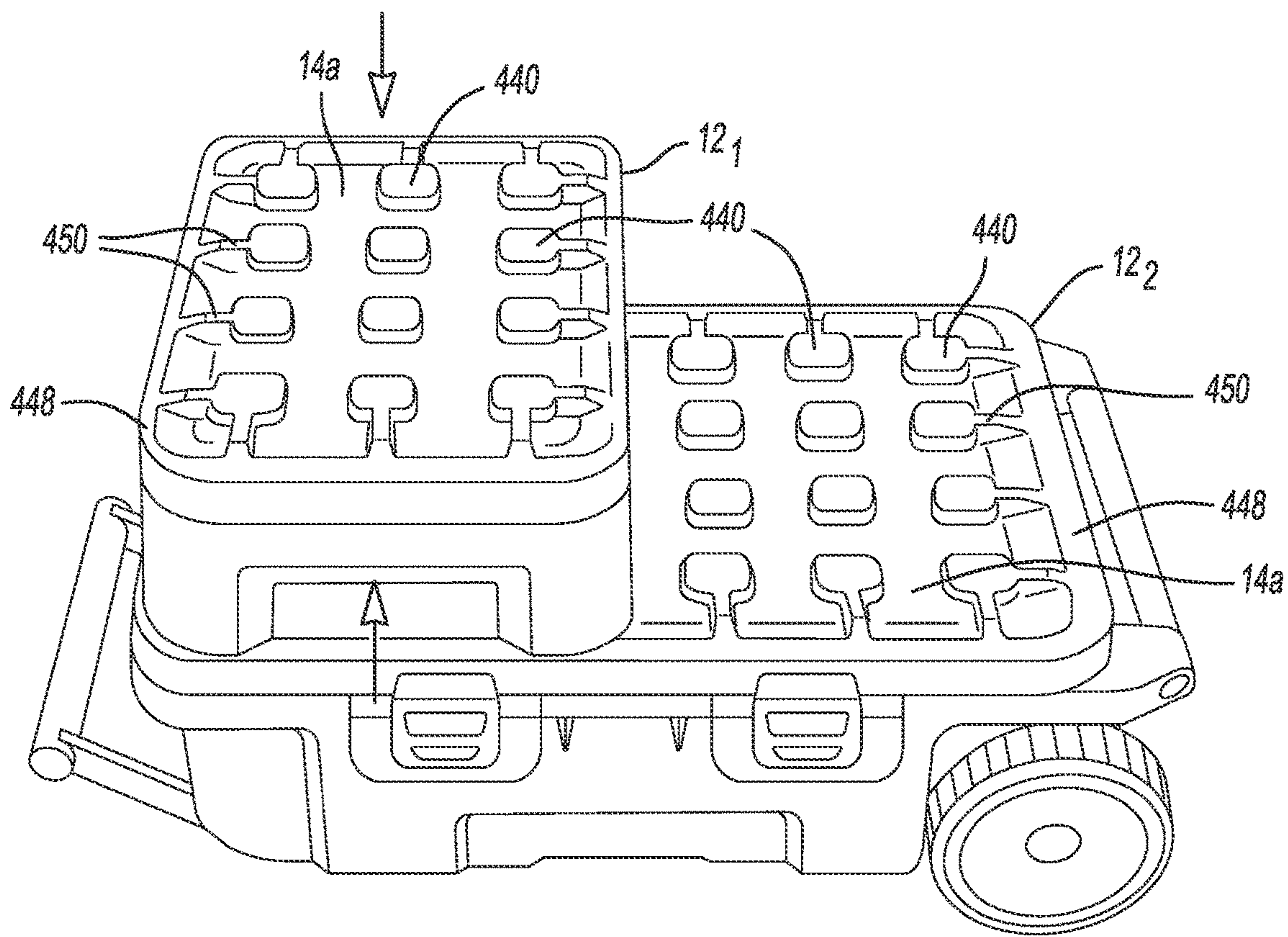


Fig-81A

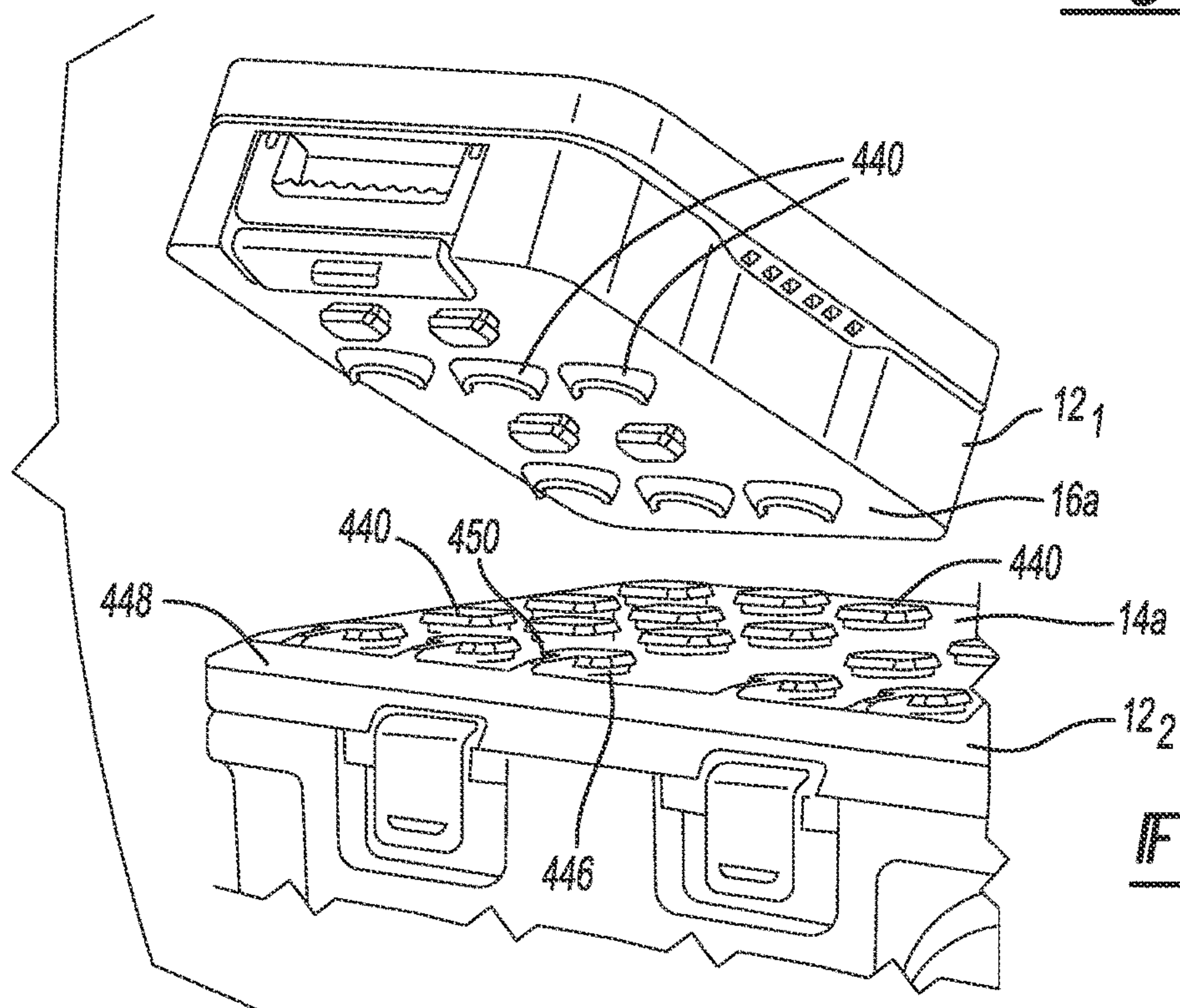


Fig-81B

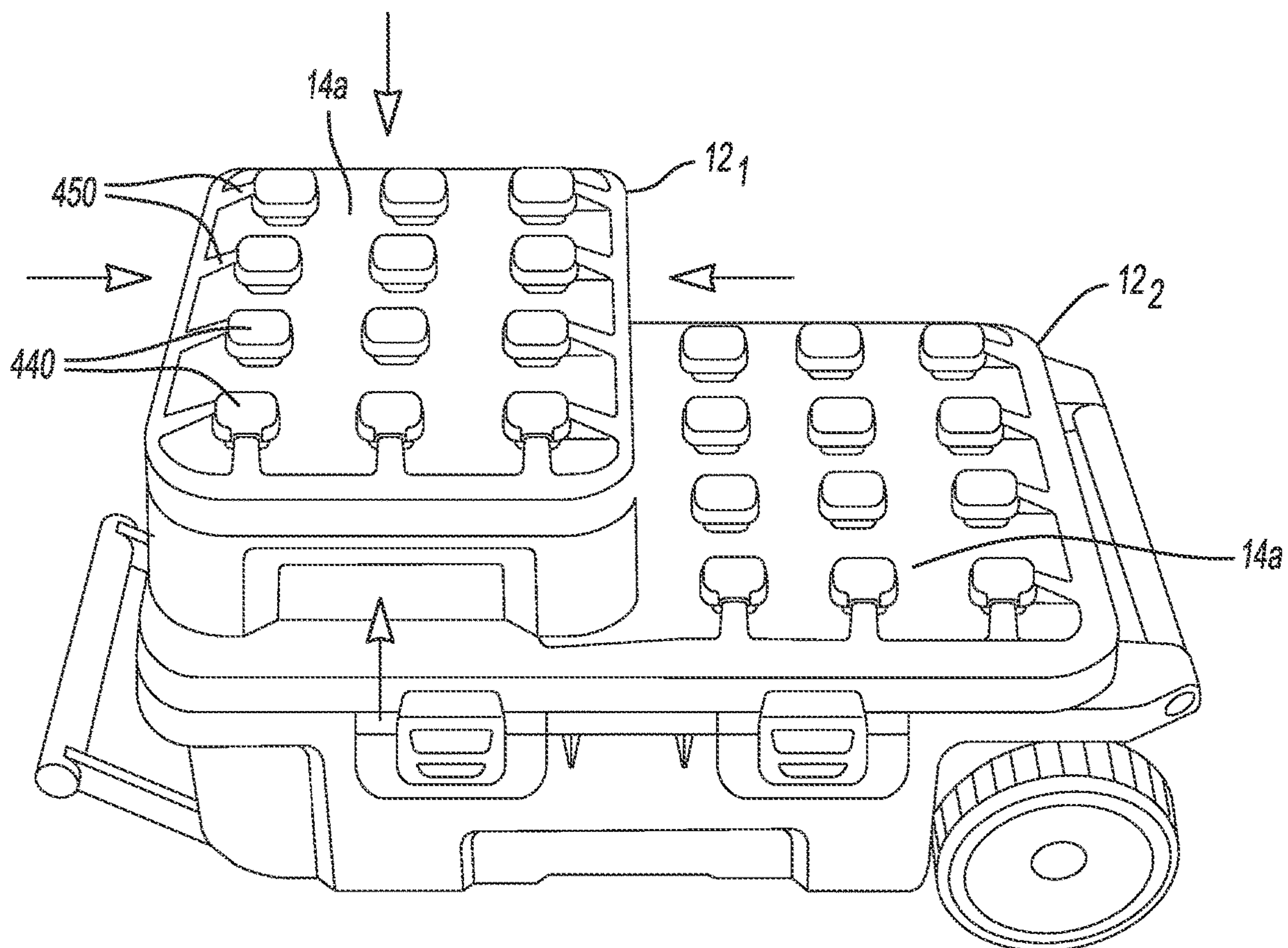


Fig-82A

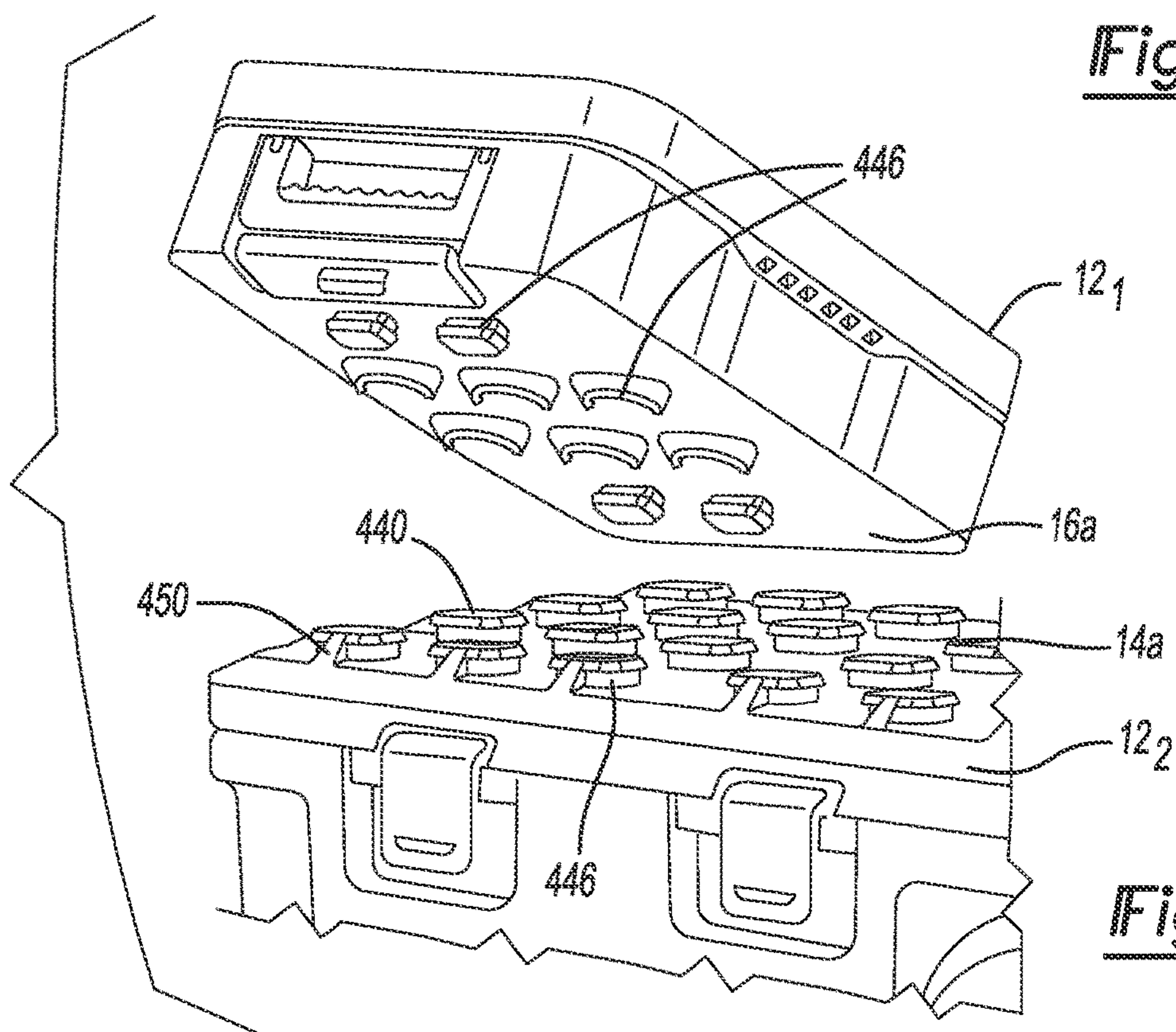


Fig-82B

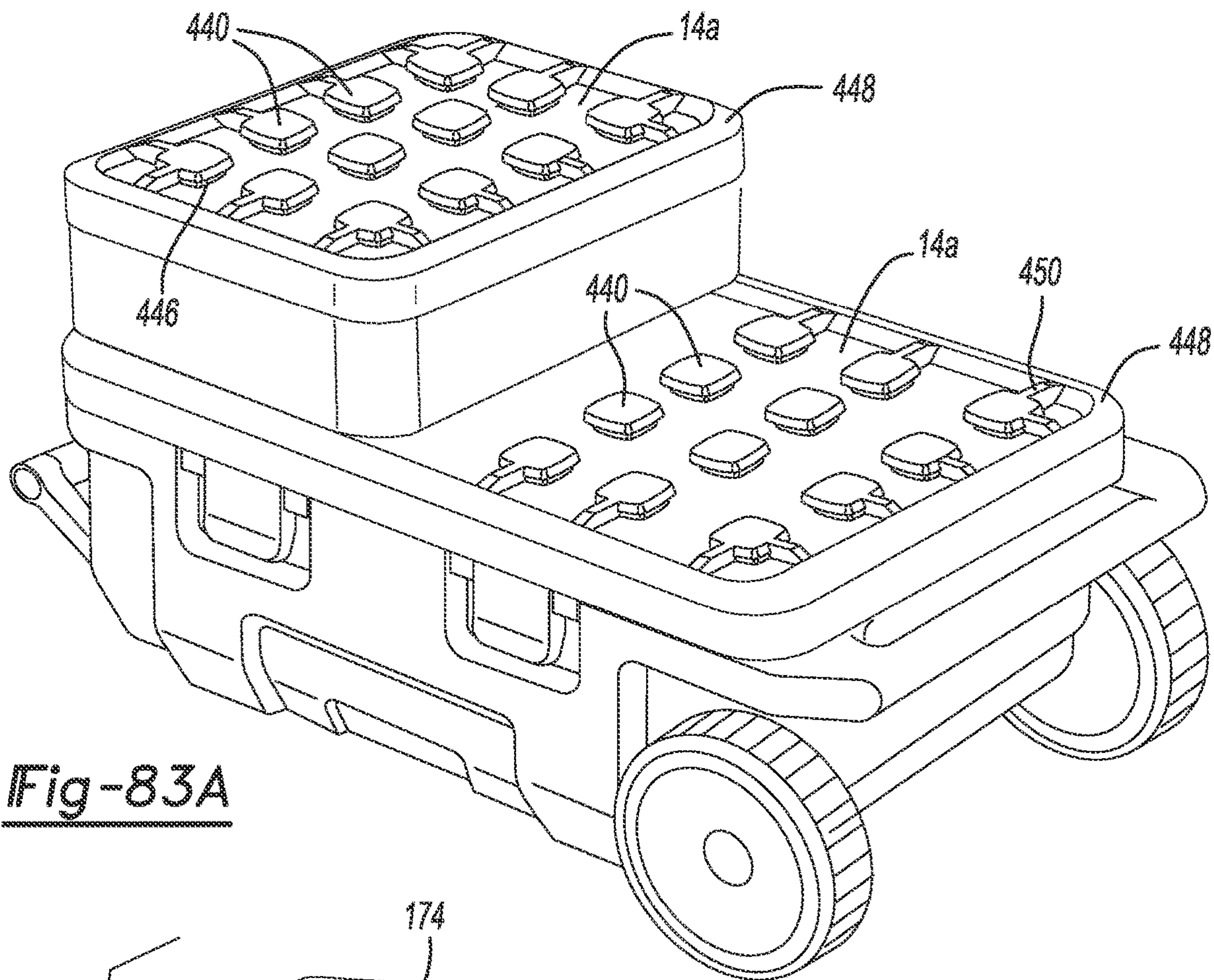


Fig-83A

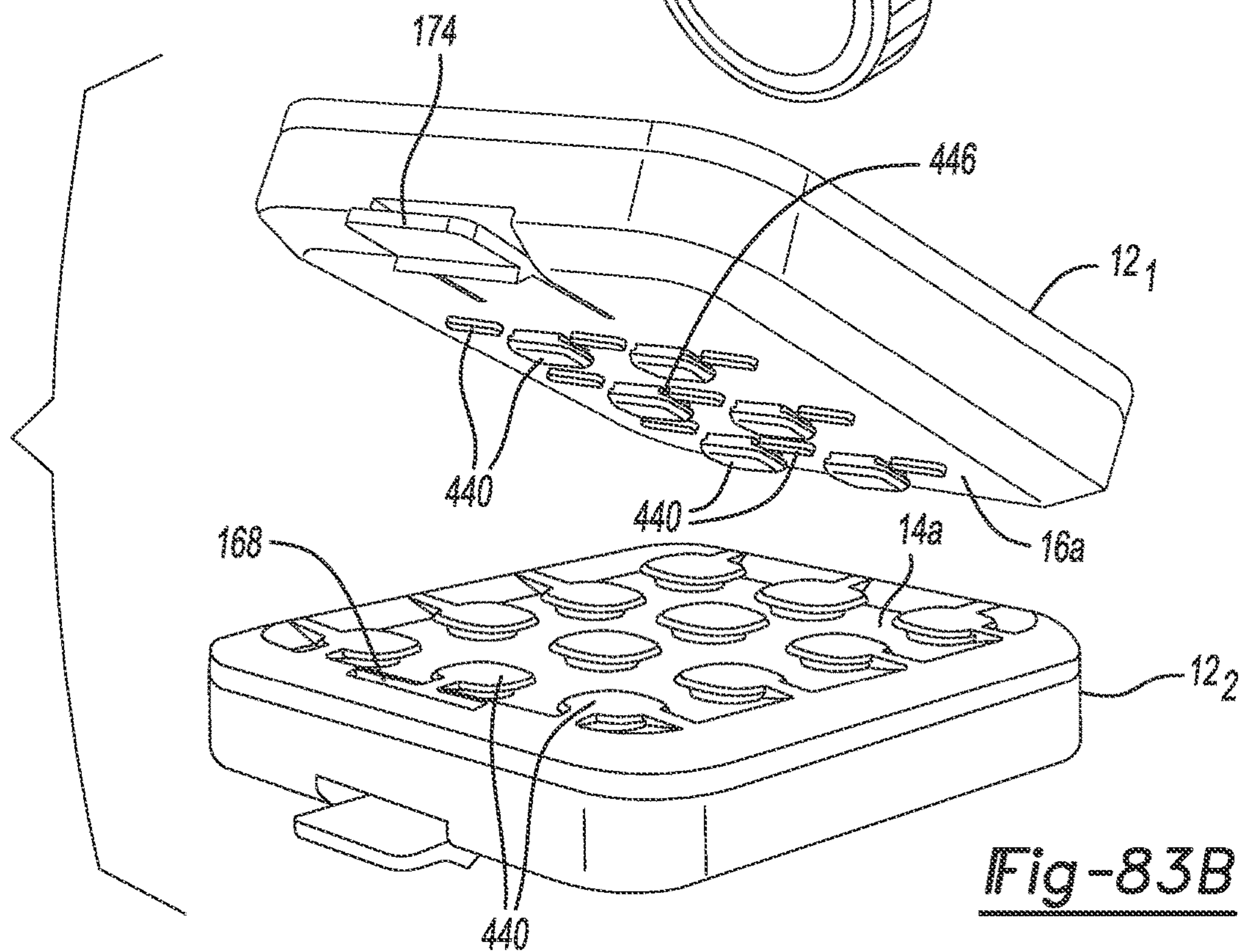


Fig-83B

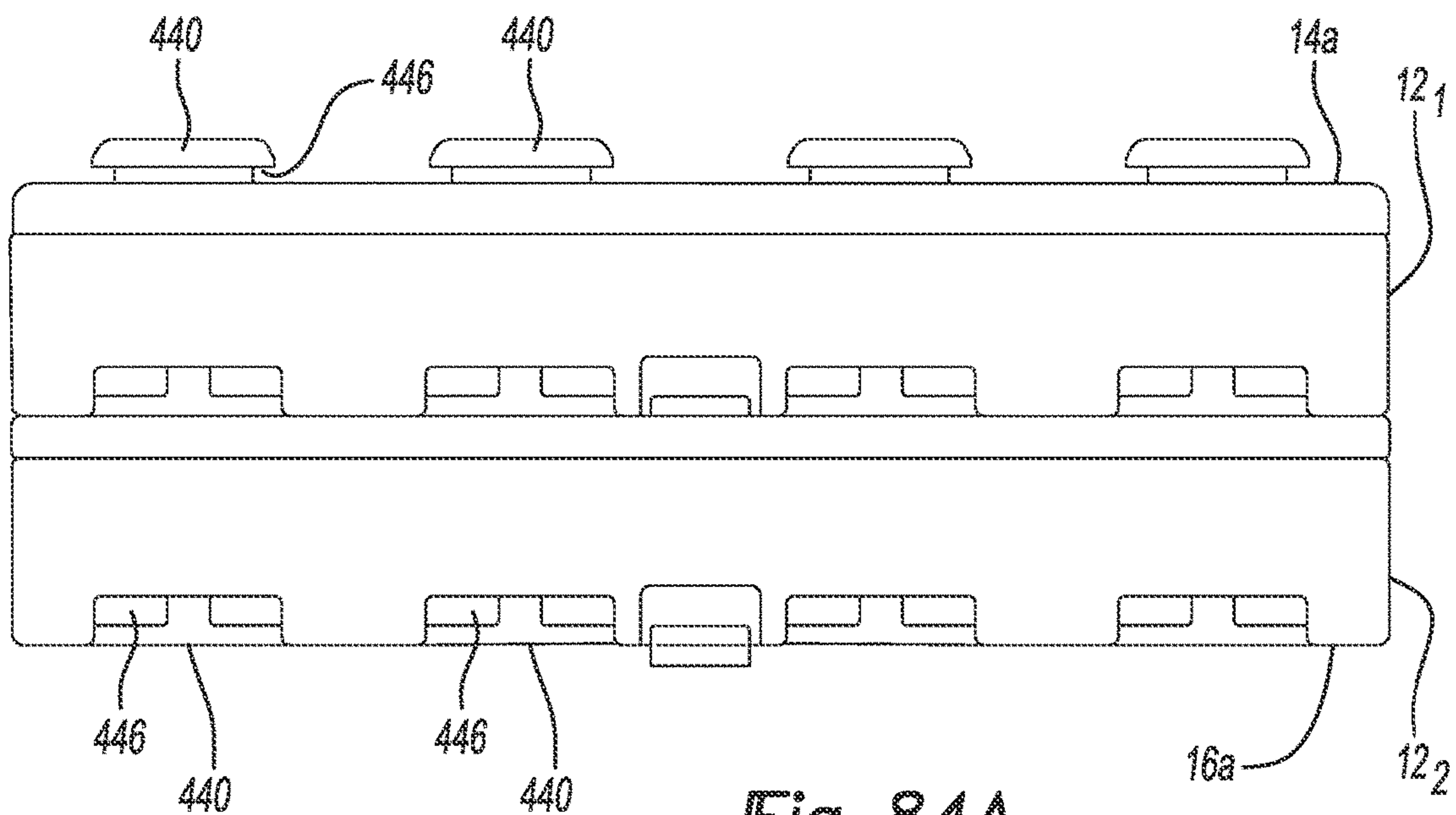


Fig-84A

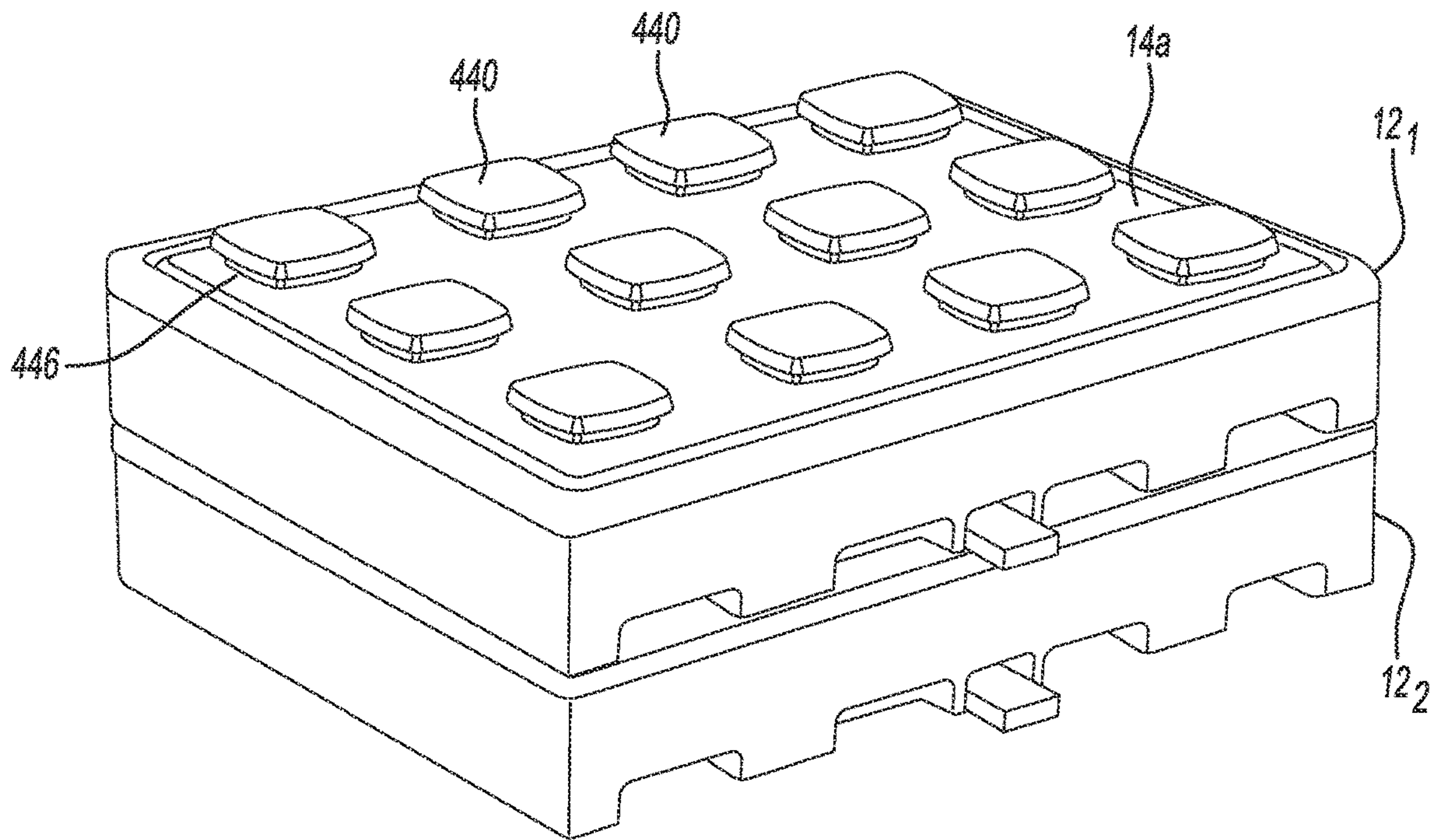


Fig-84B

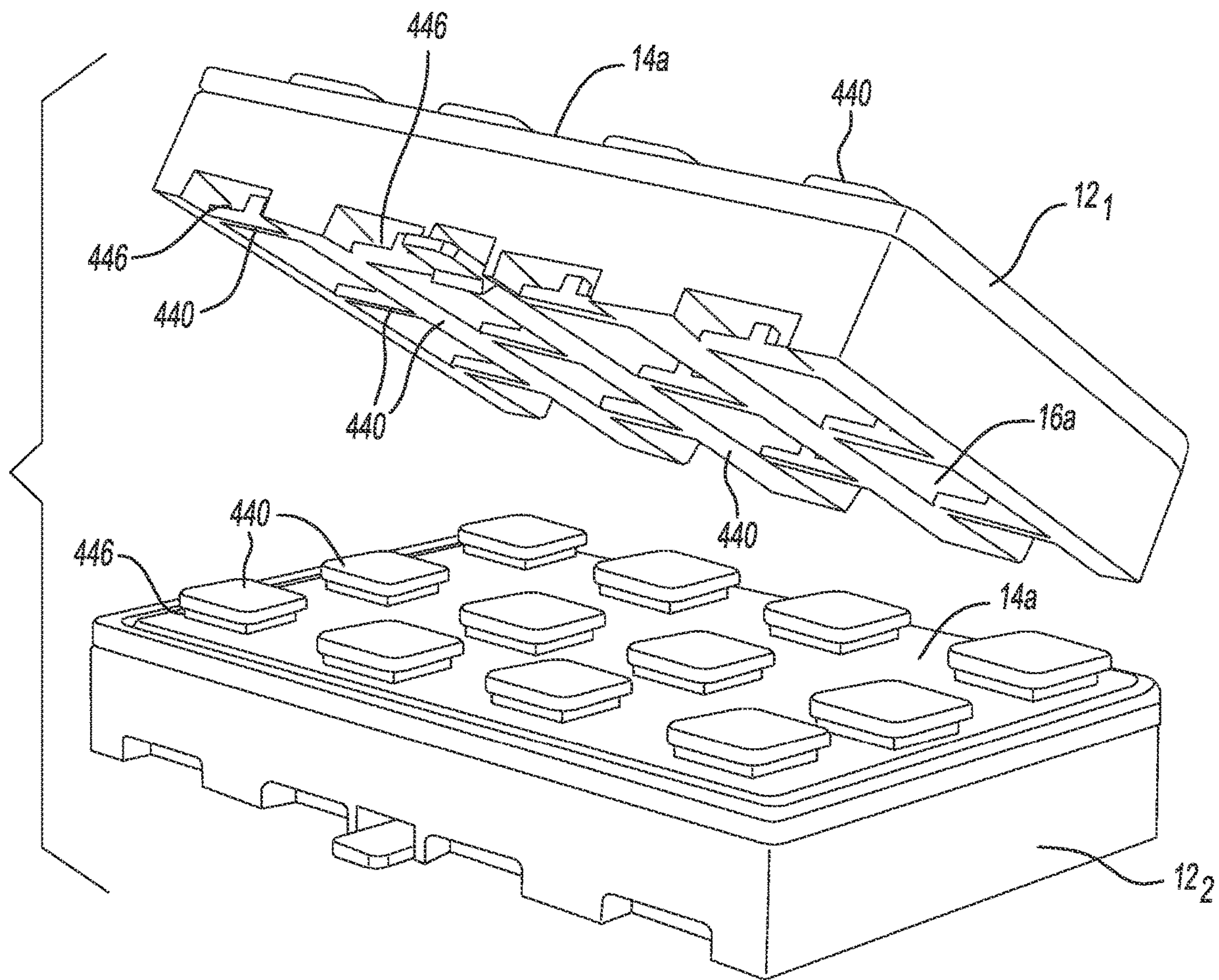


Fig-84C

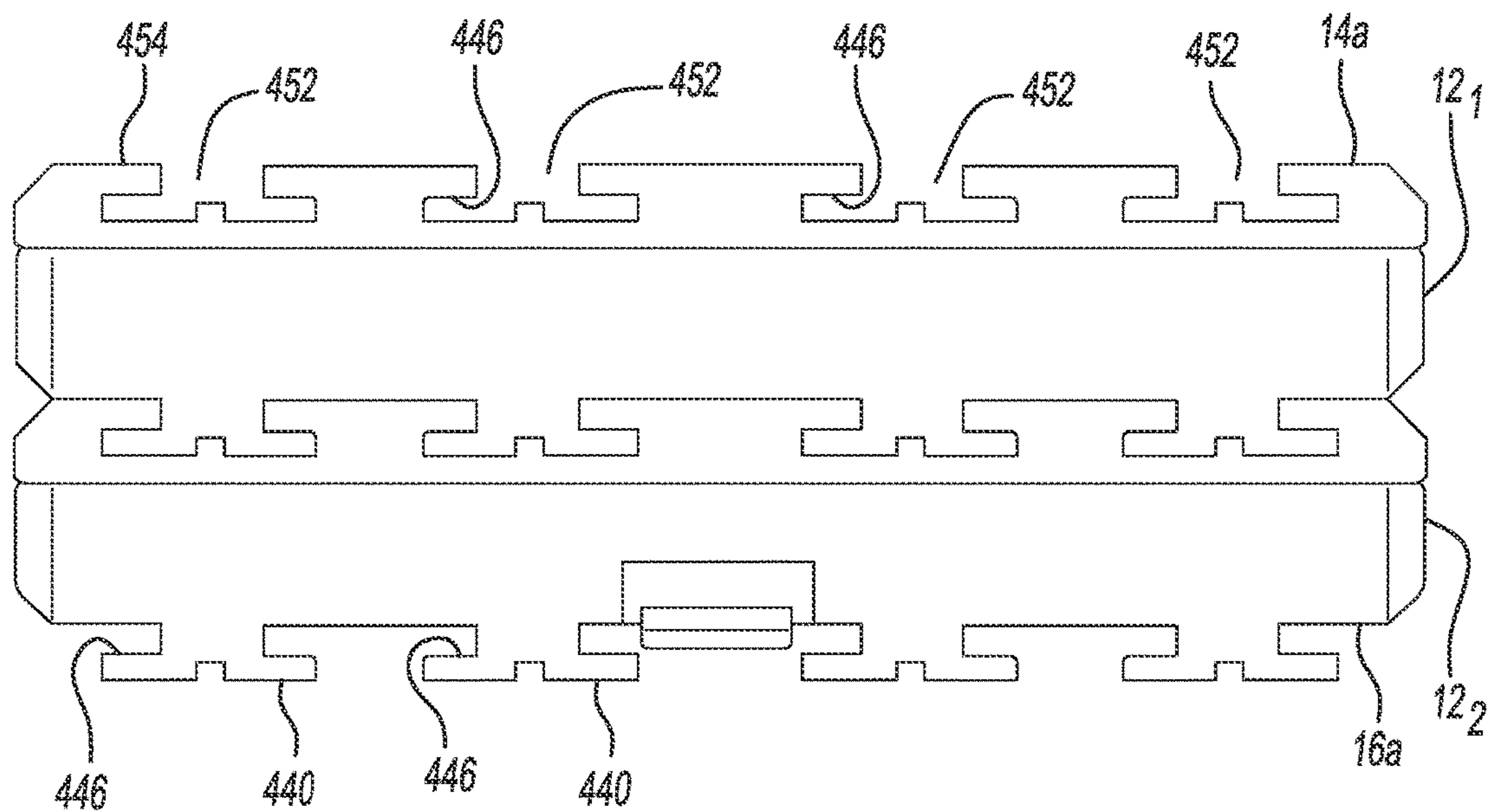


Fig-85A

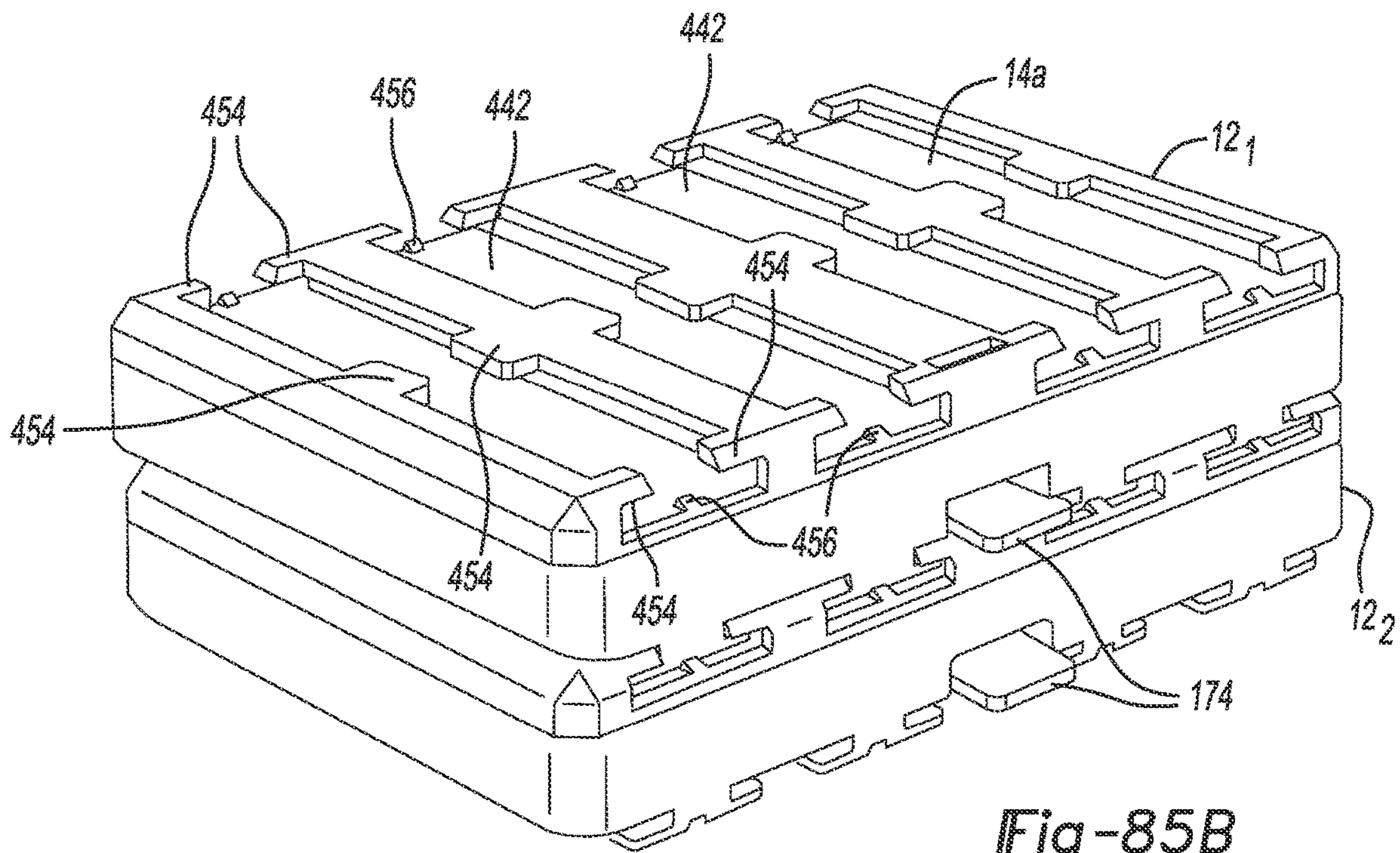


Fig-85B

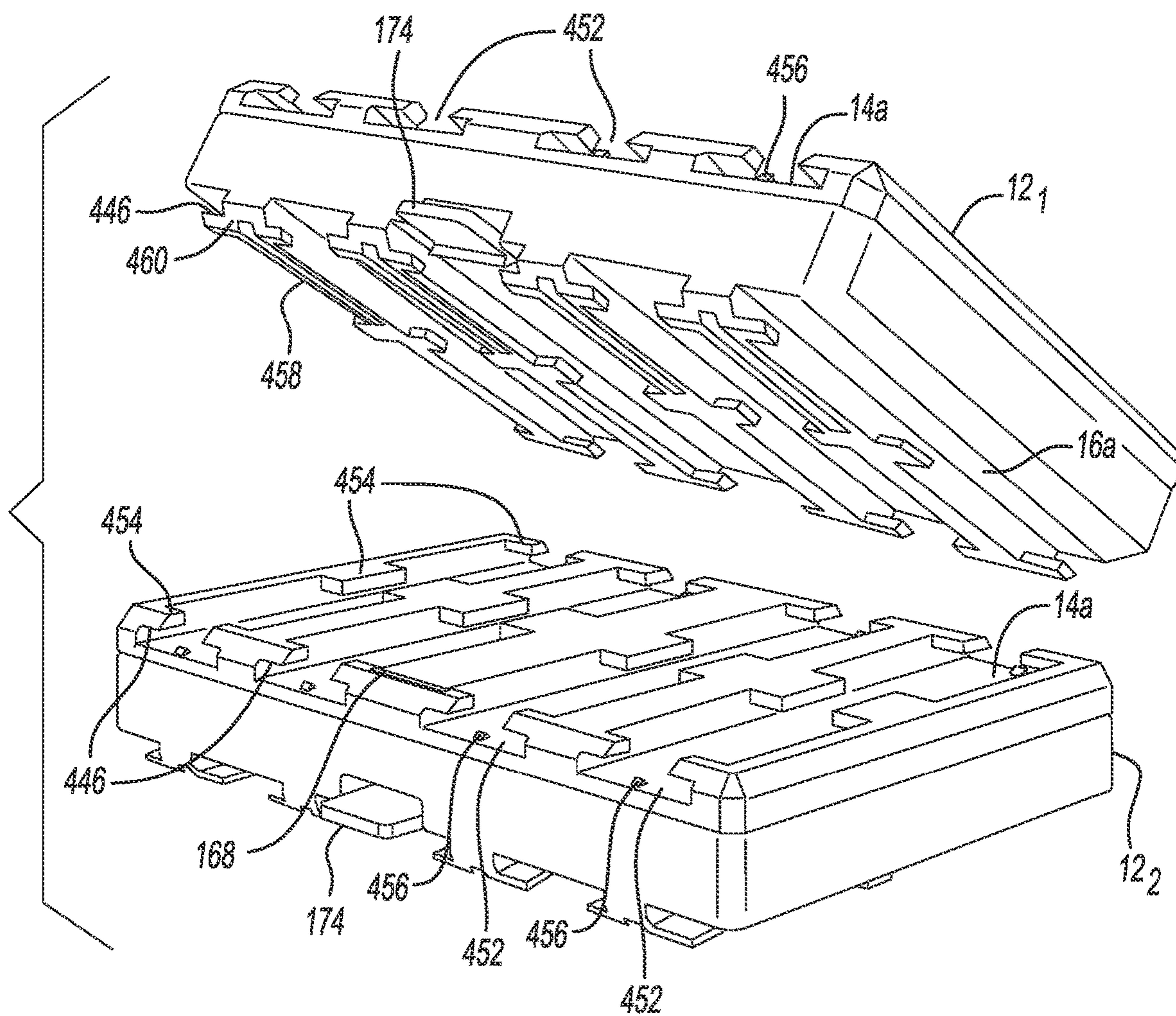


Fig-85C

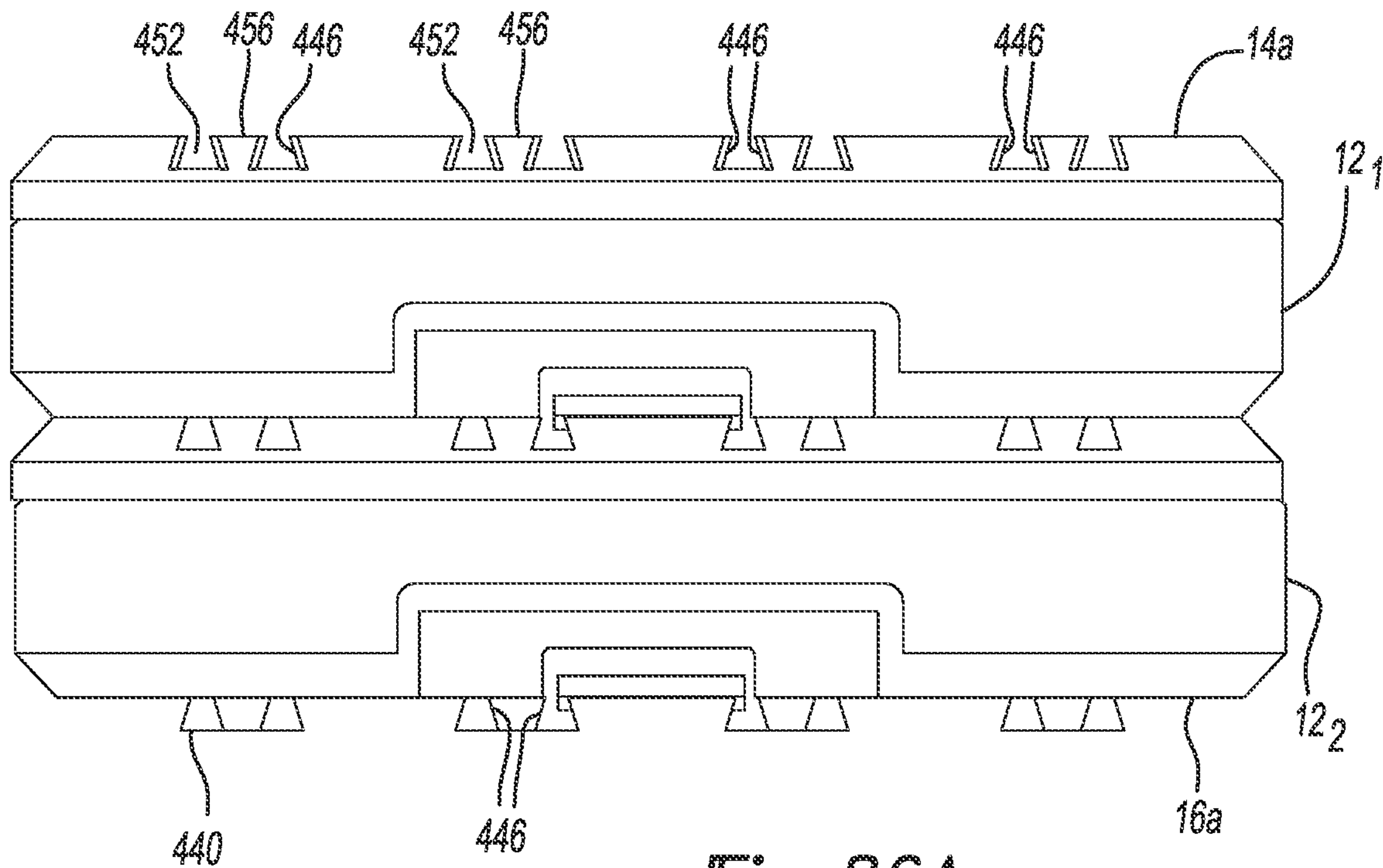


Fig-86A

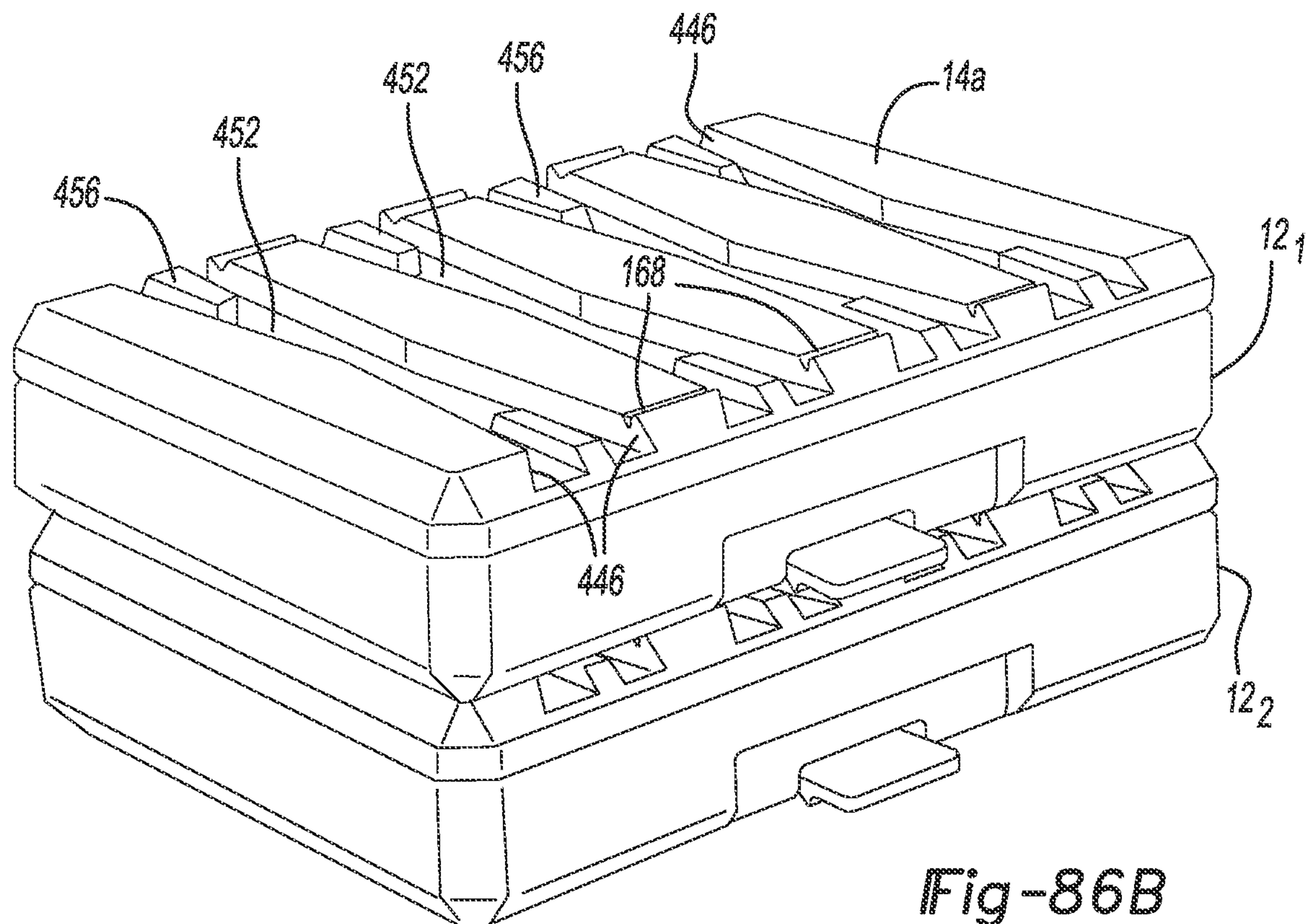


Fig-86B

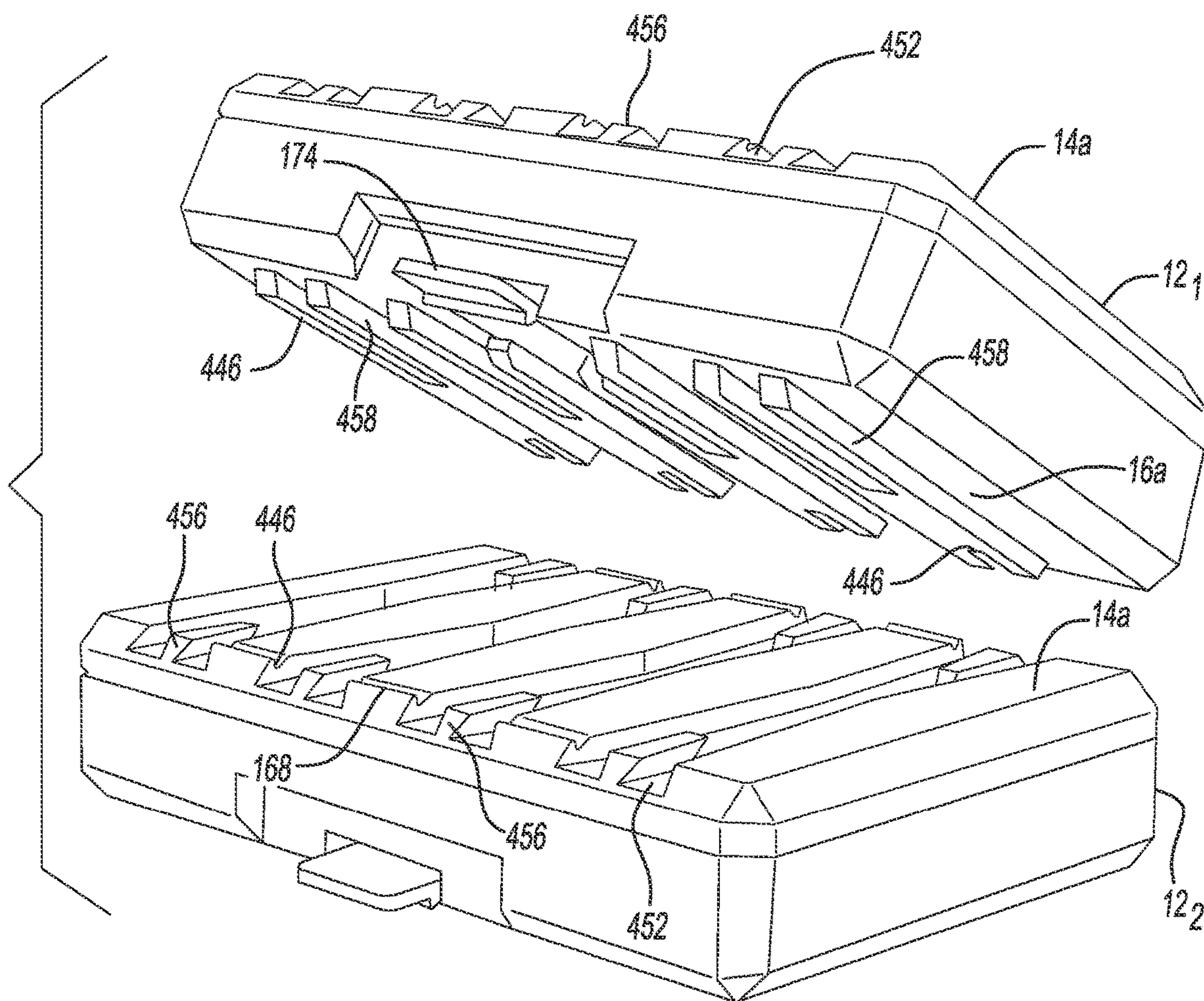
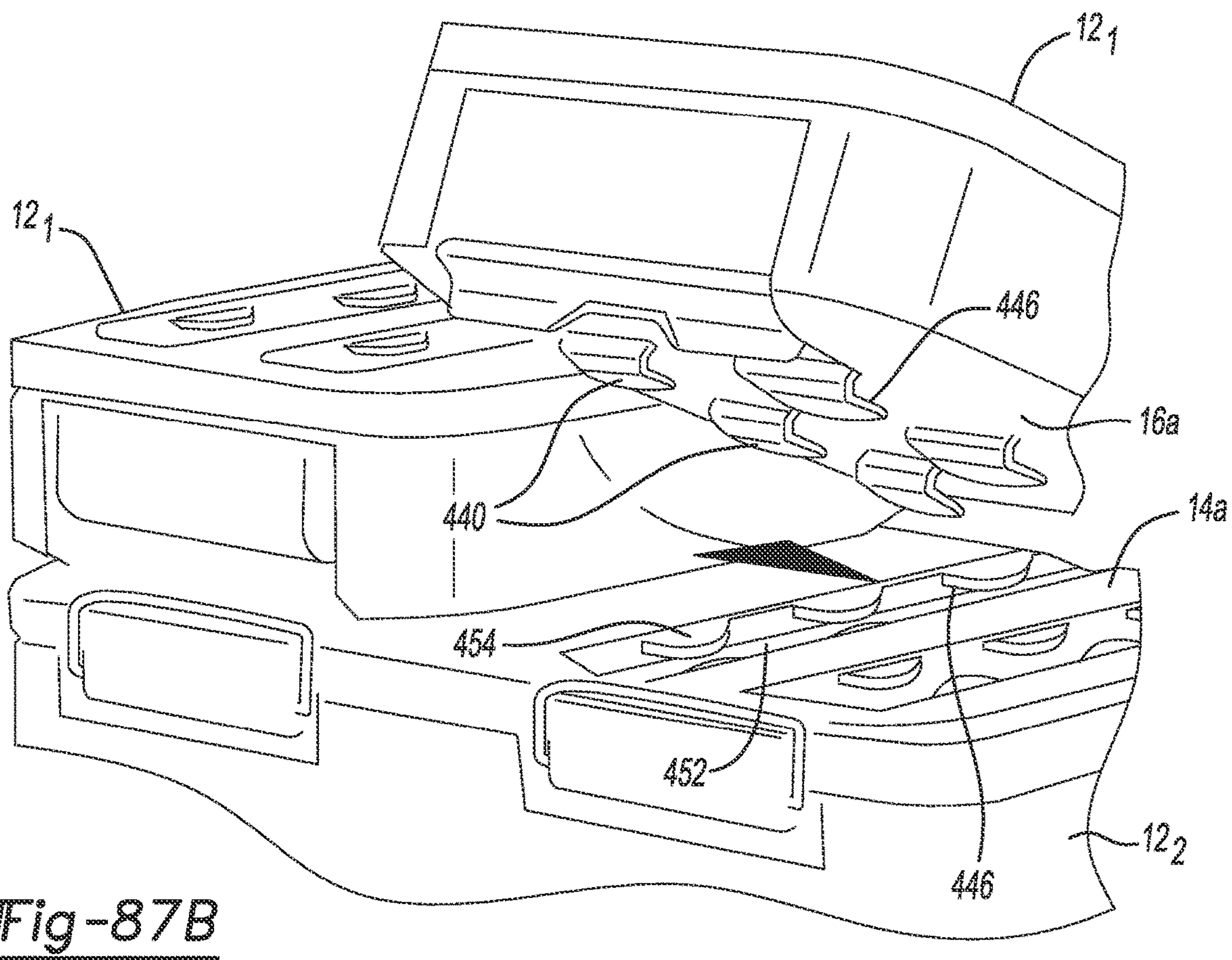
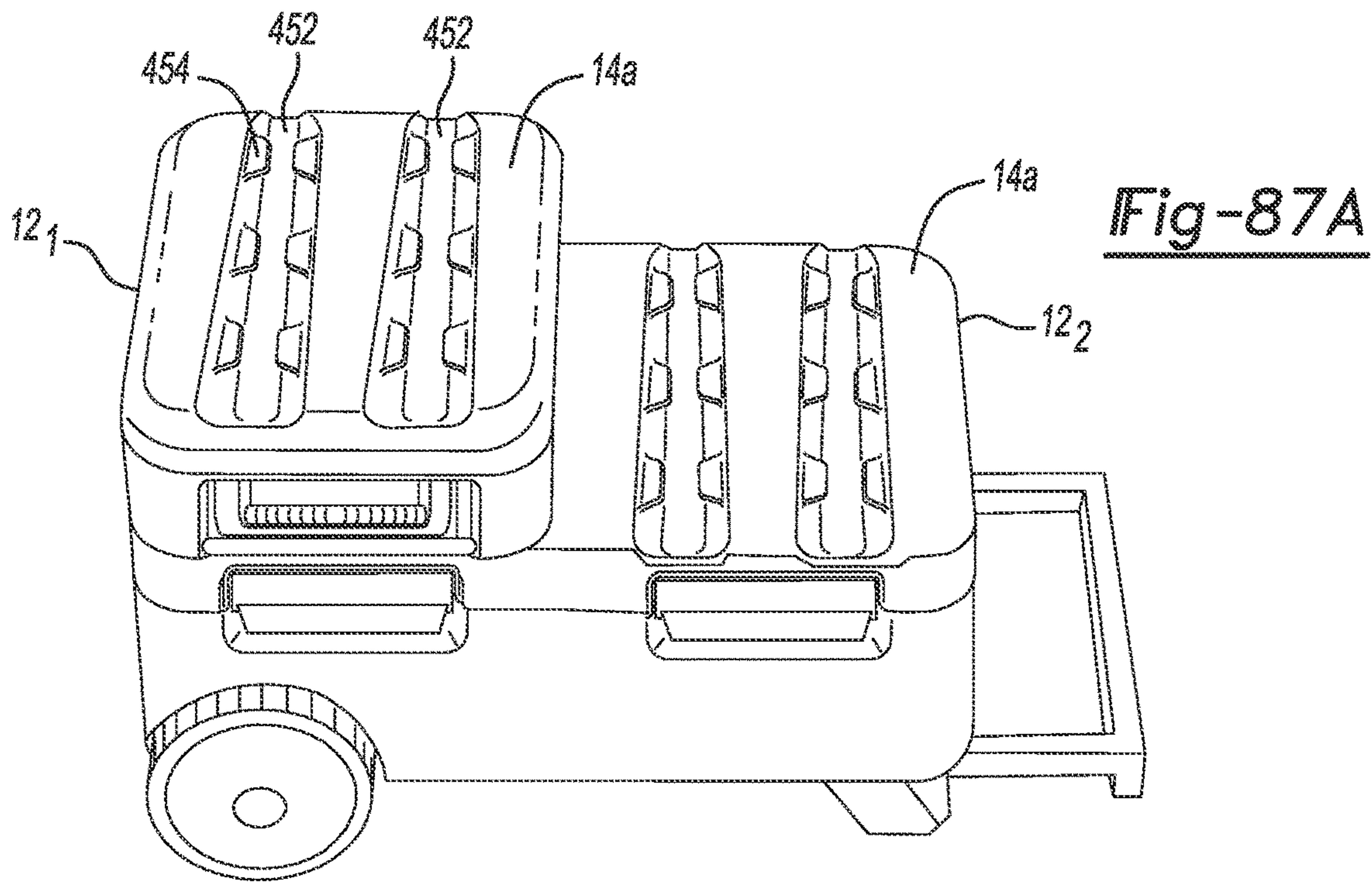
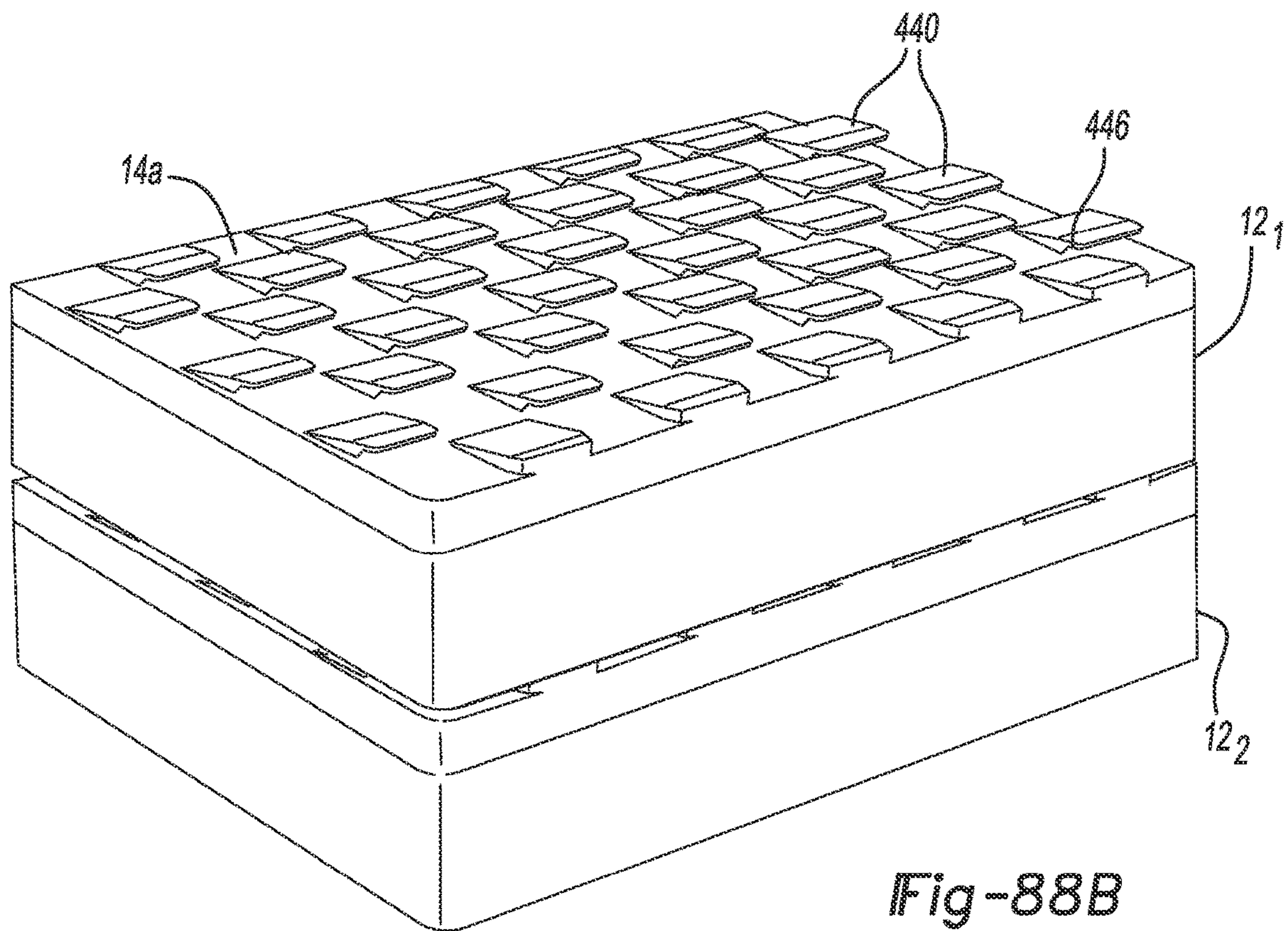
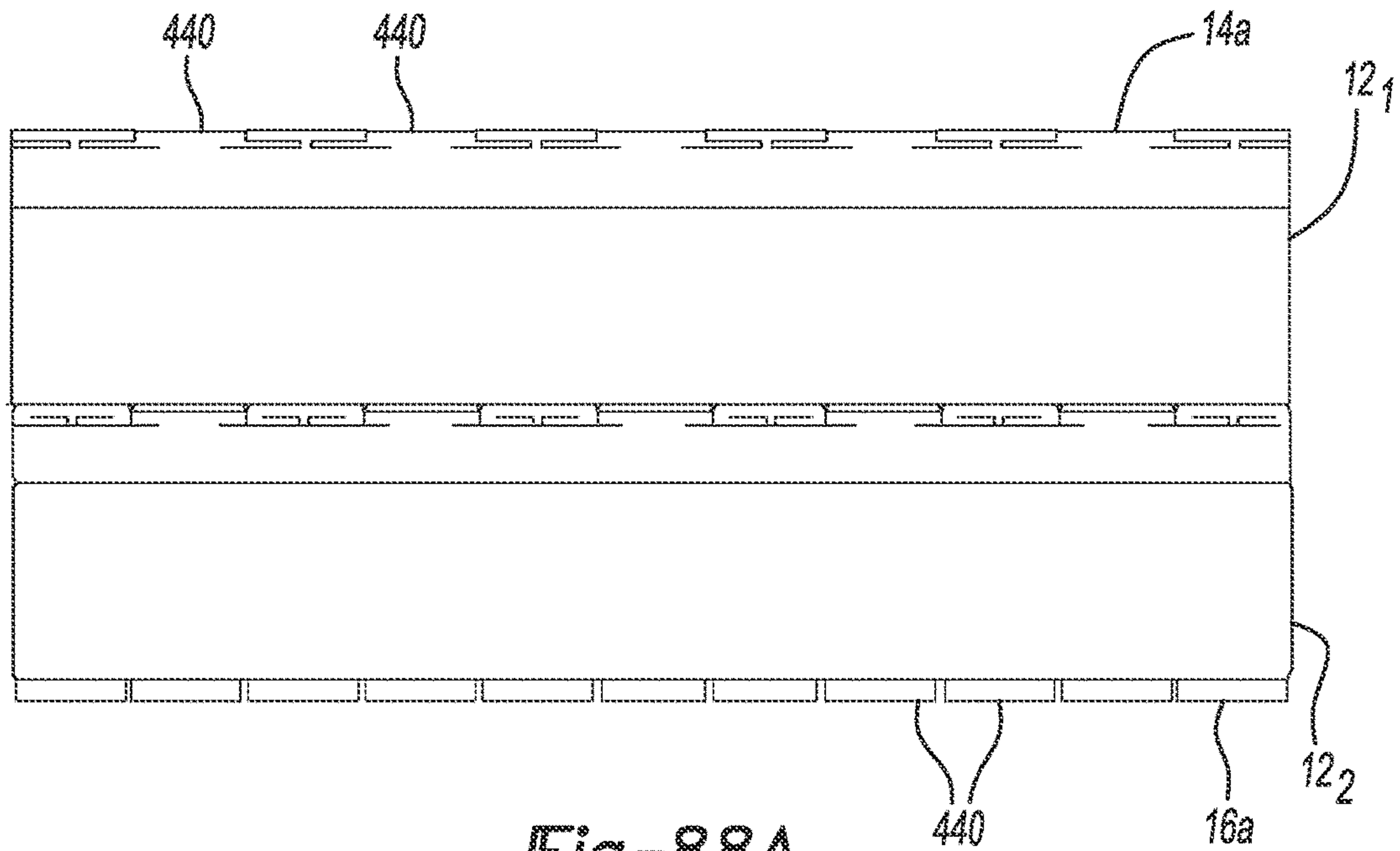


Fig-86C





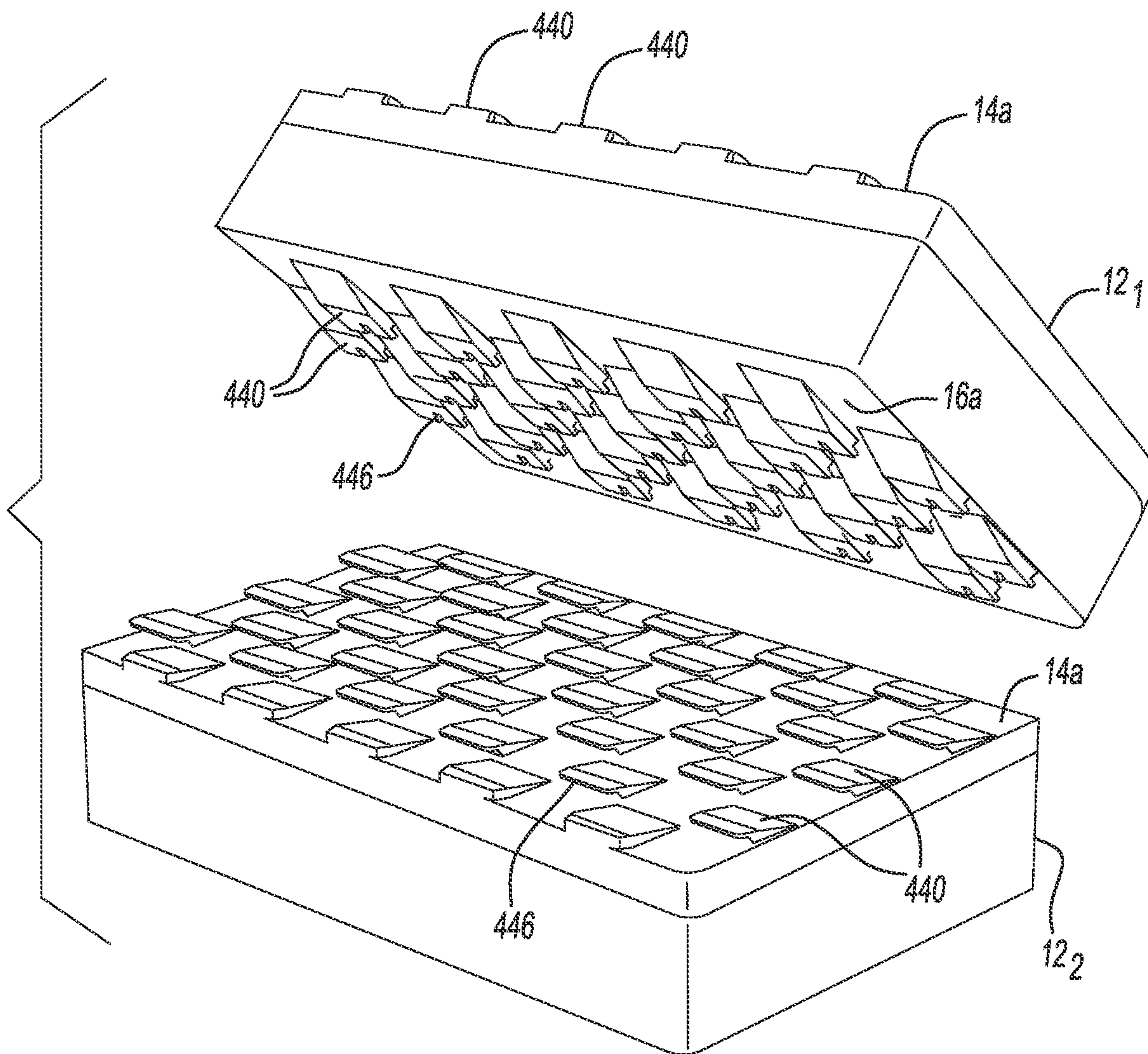


Fig-88C

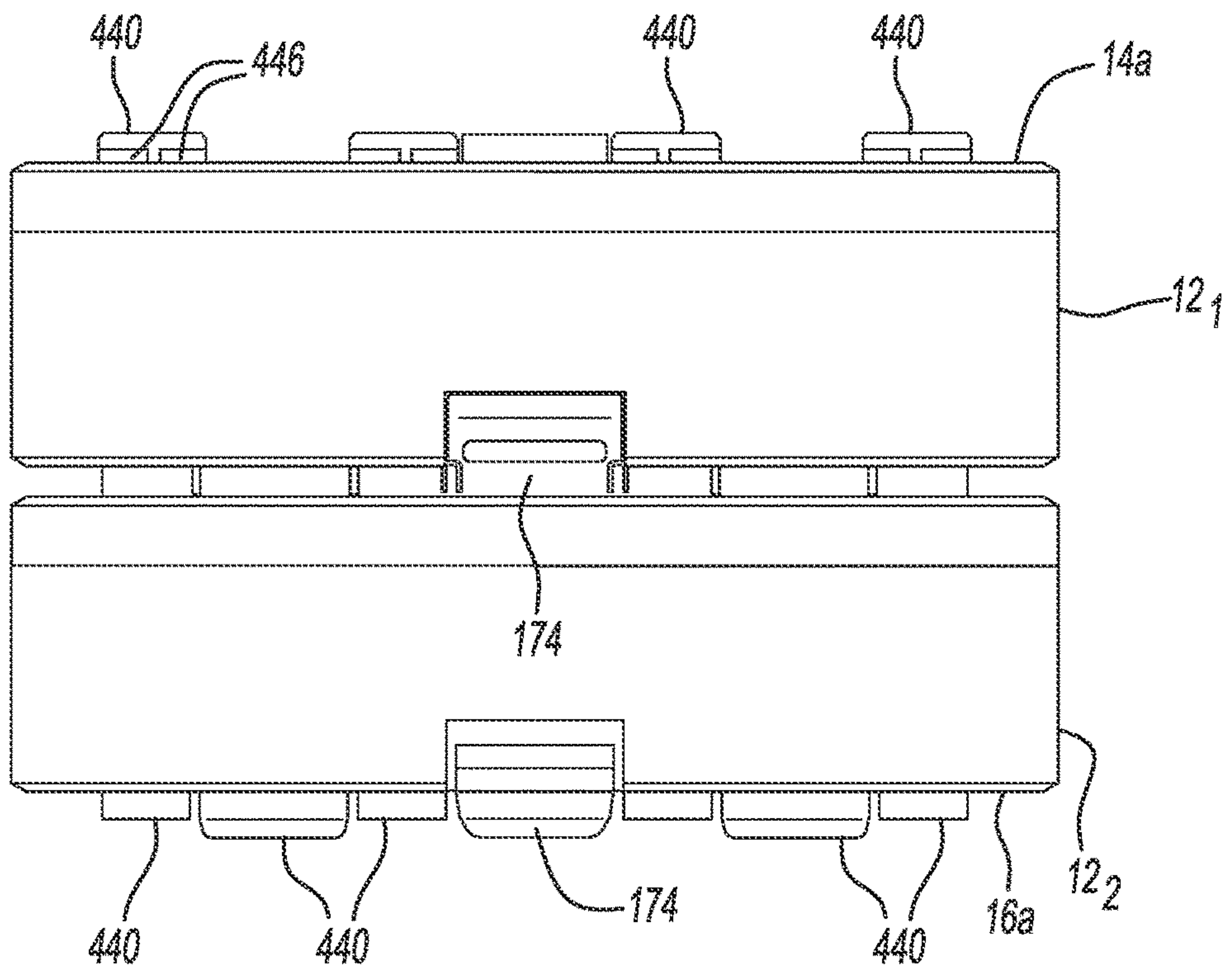


Fig-89A

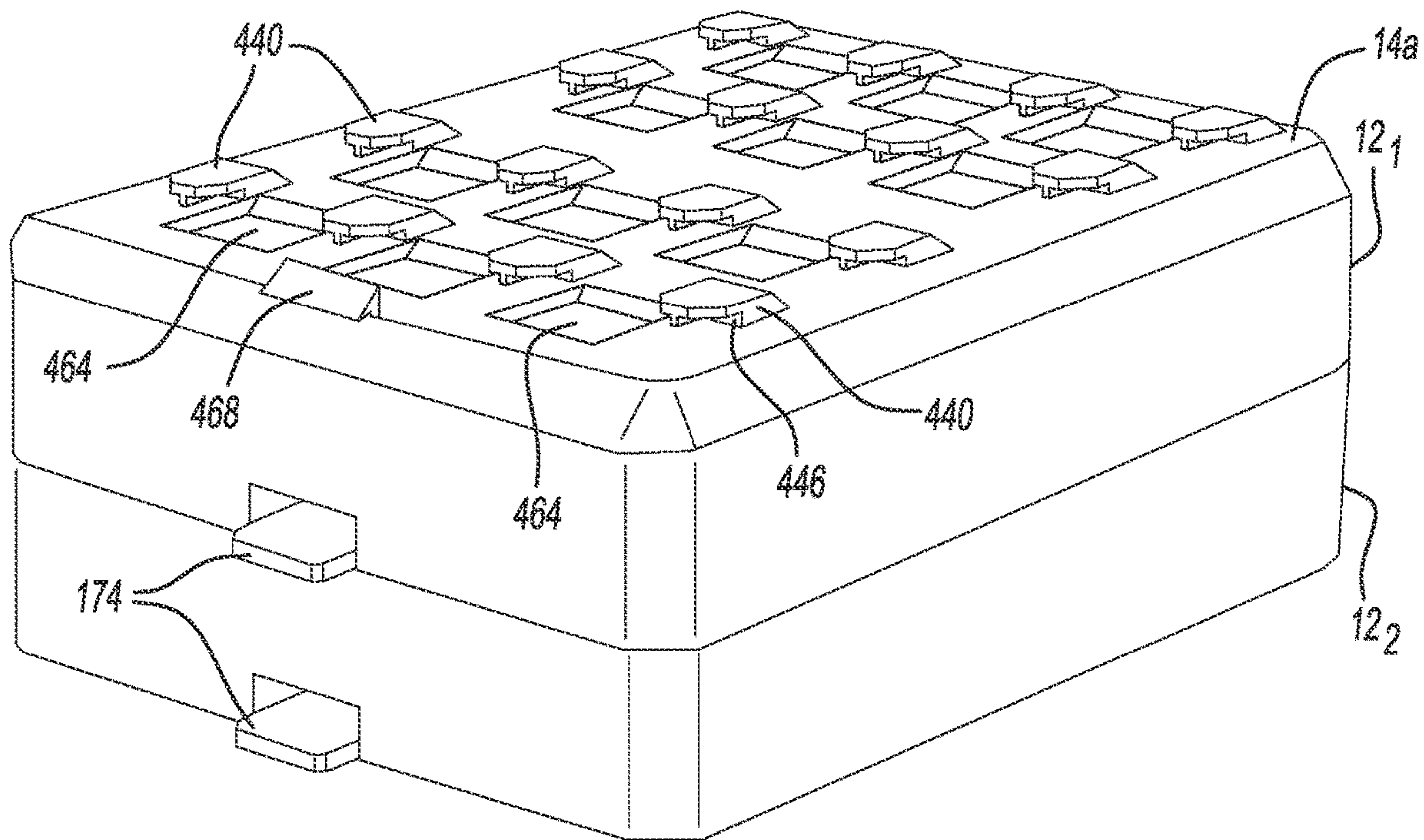


Fig-89B

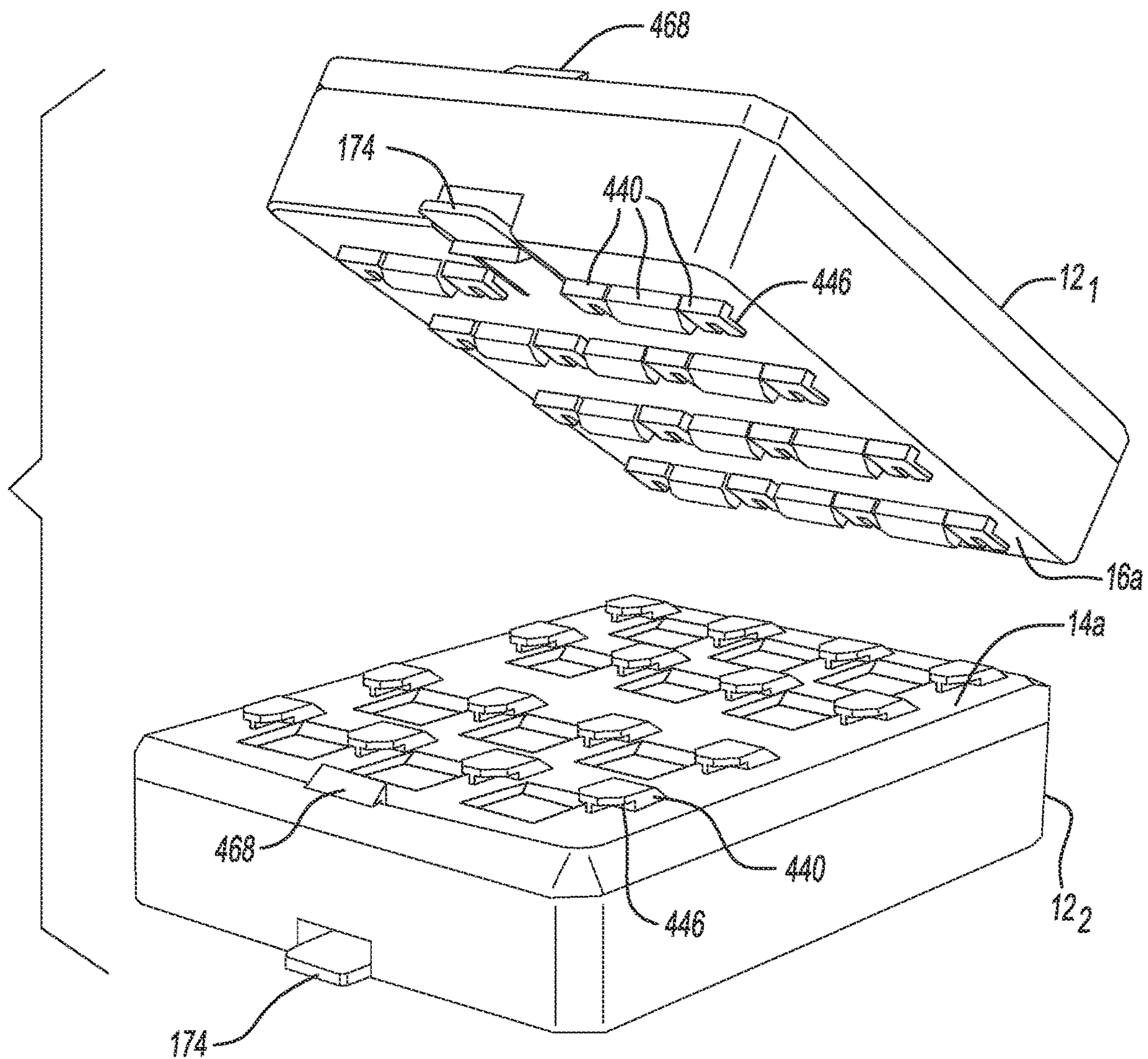


Fig-89C

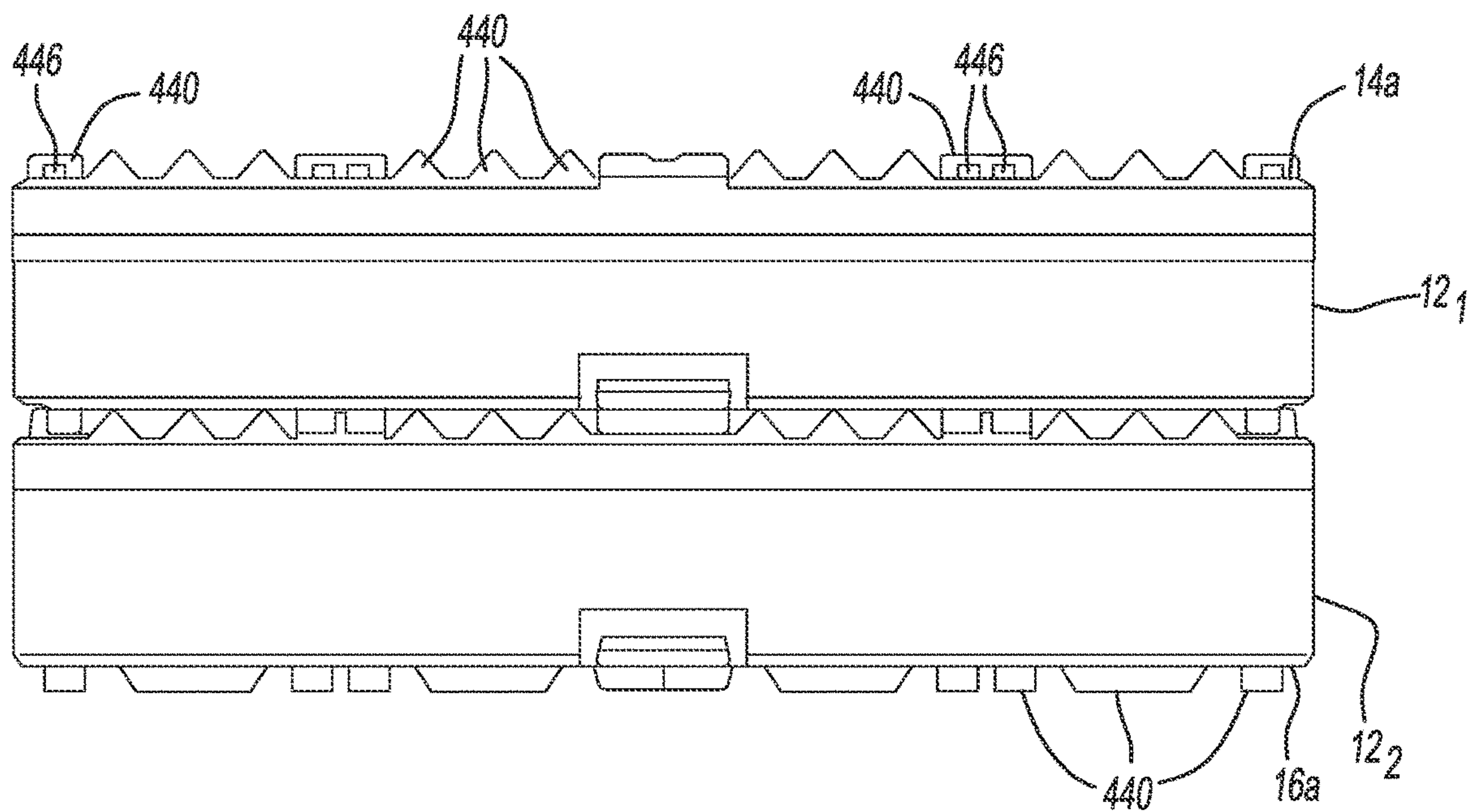


Fig-90A

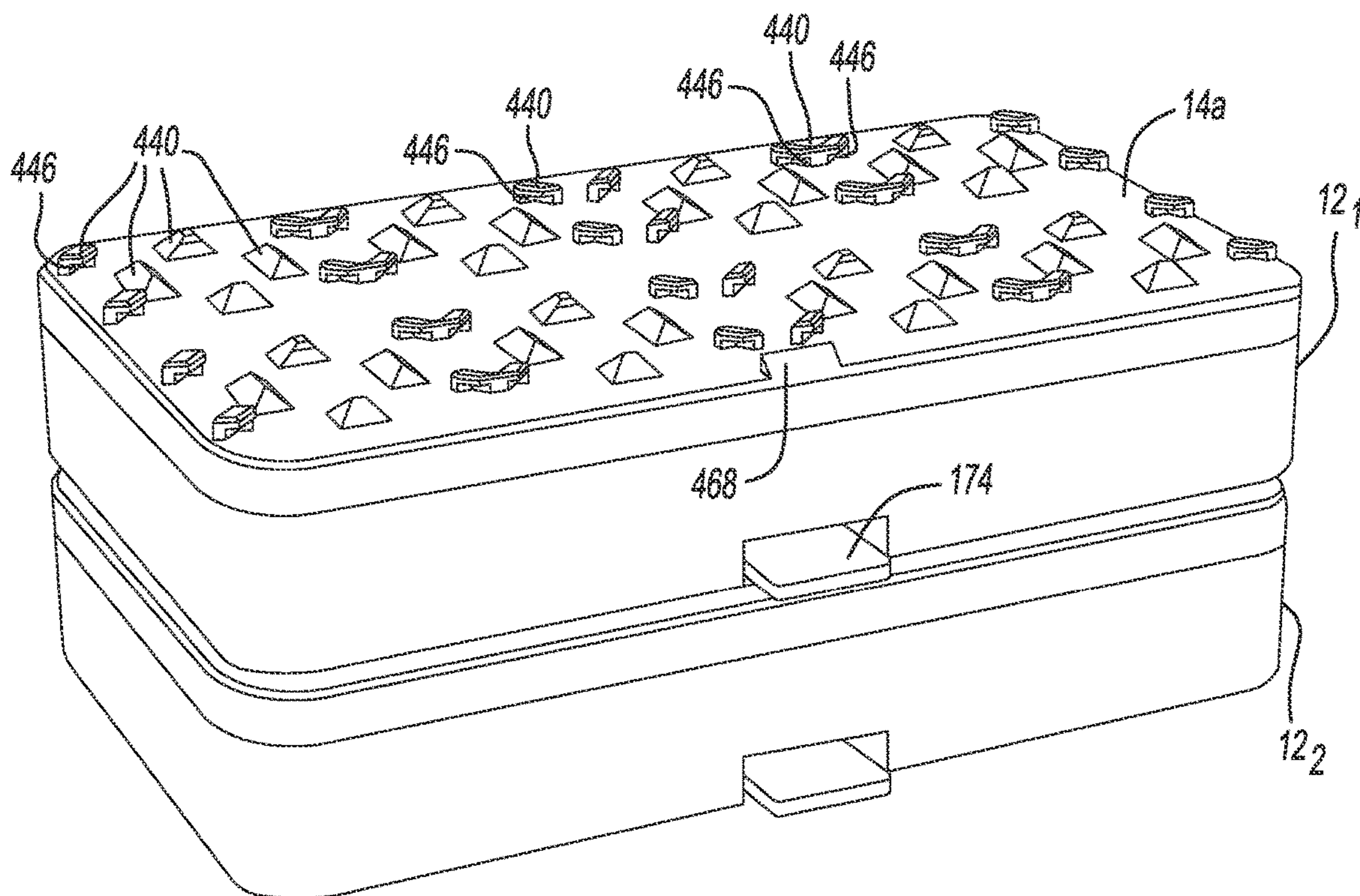


Fig-90B

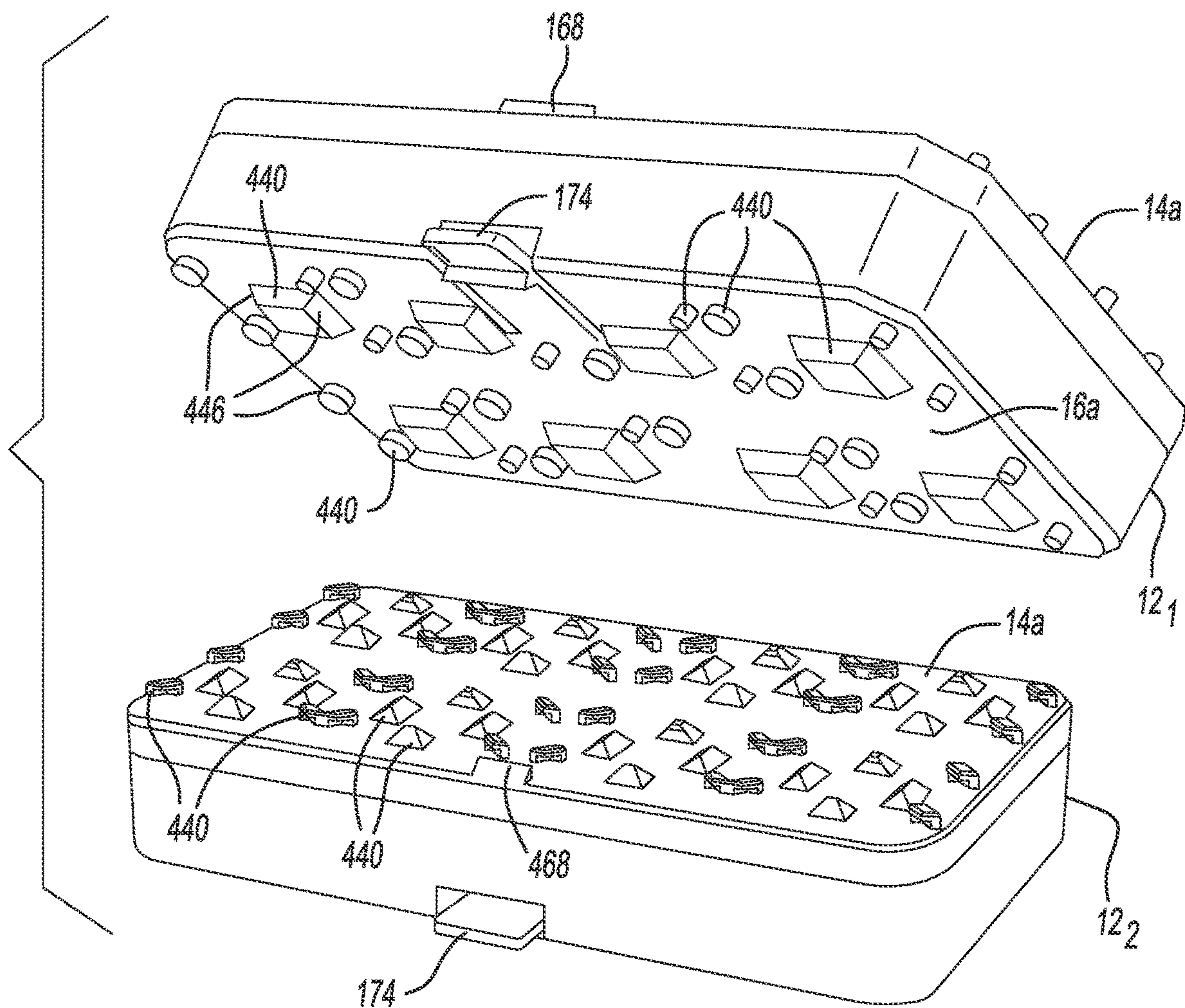
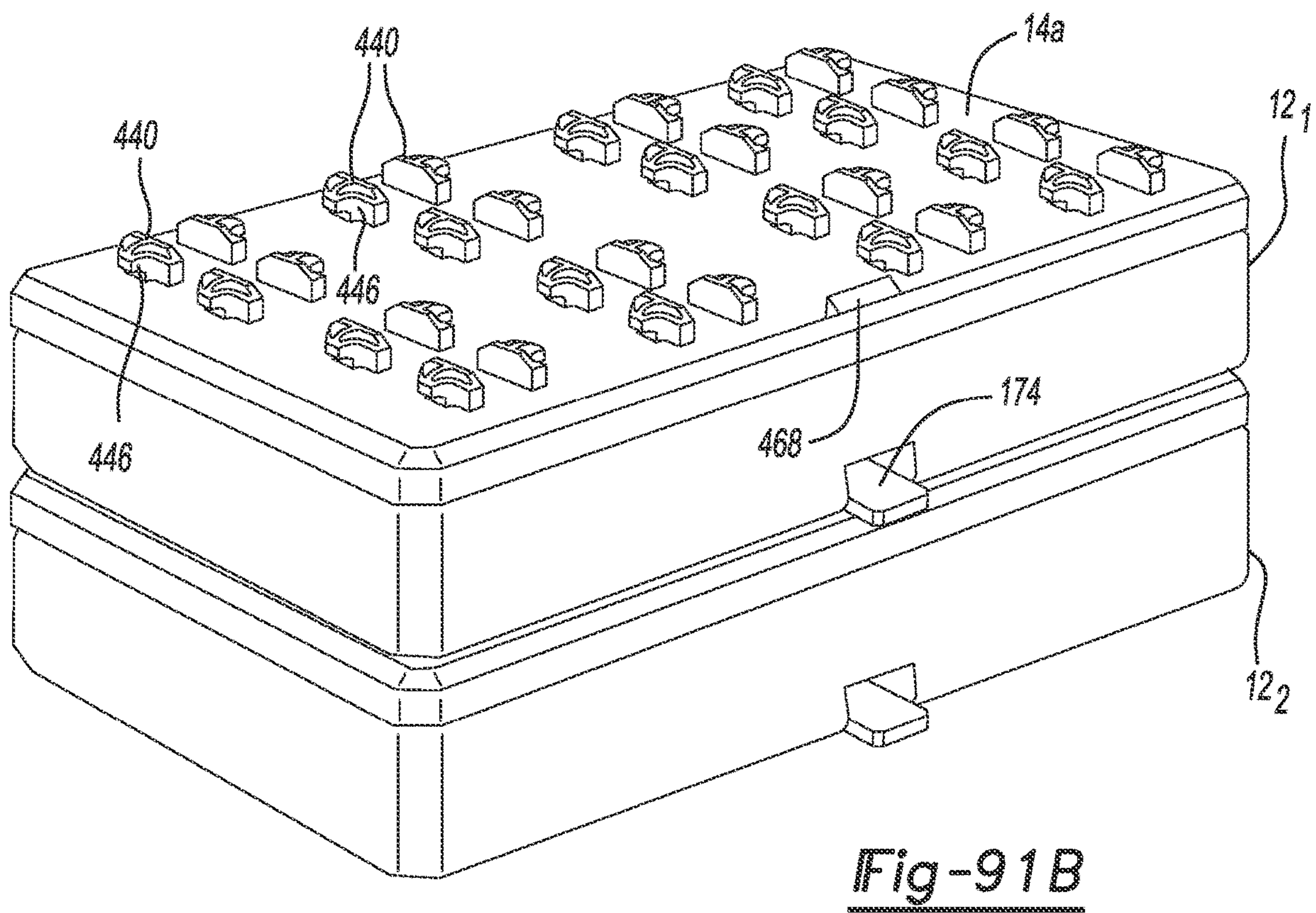
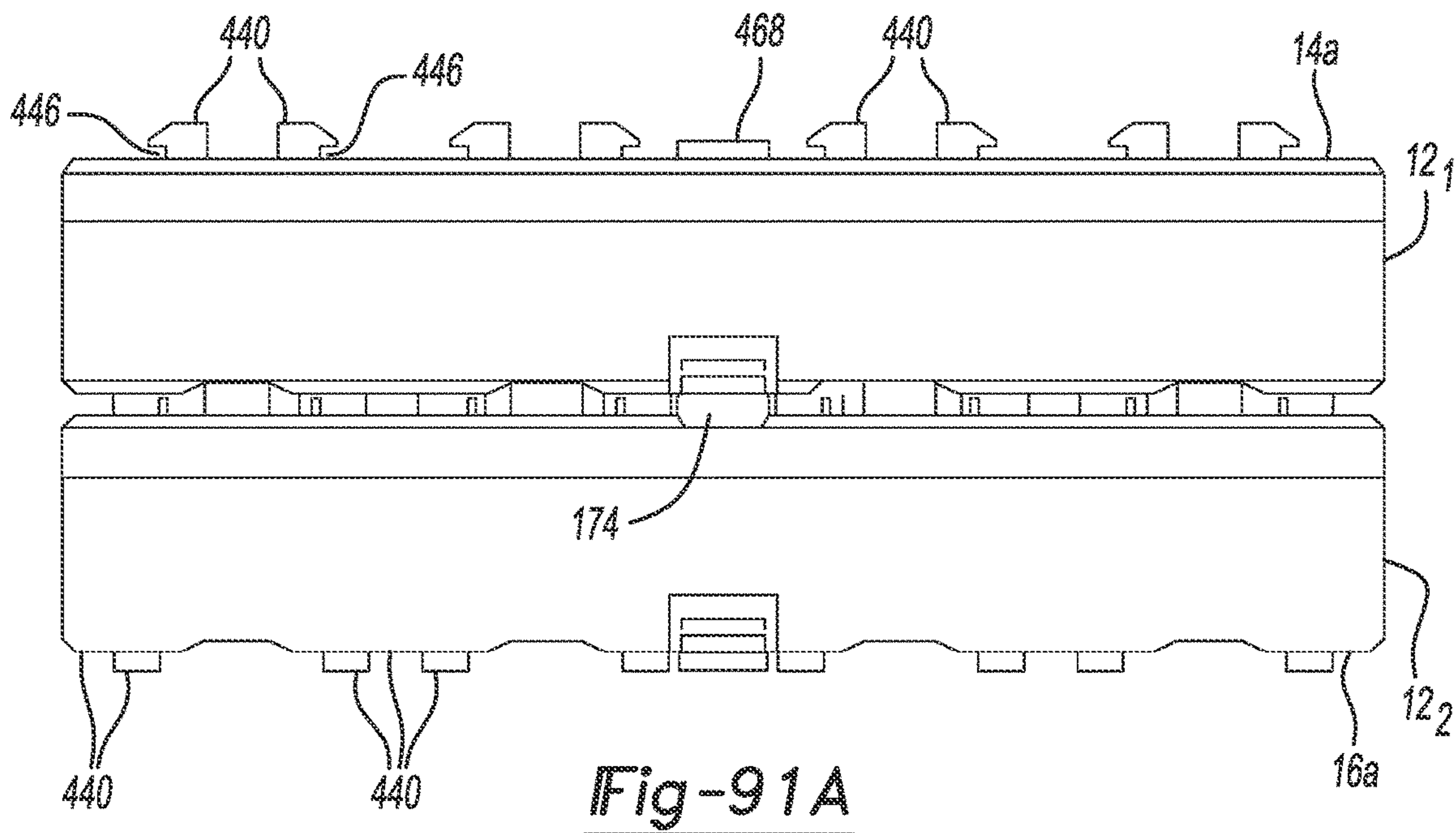


Fig-90C



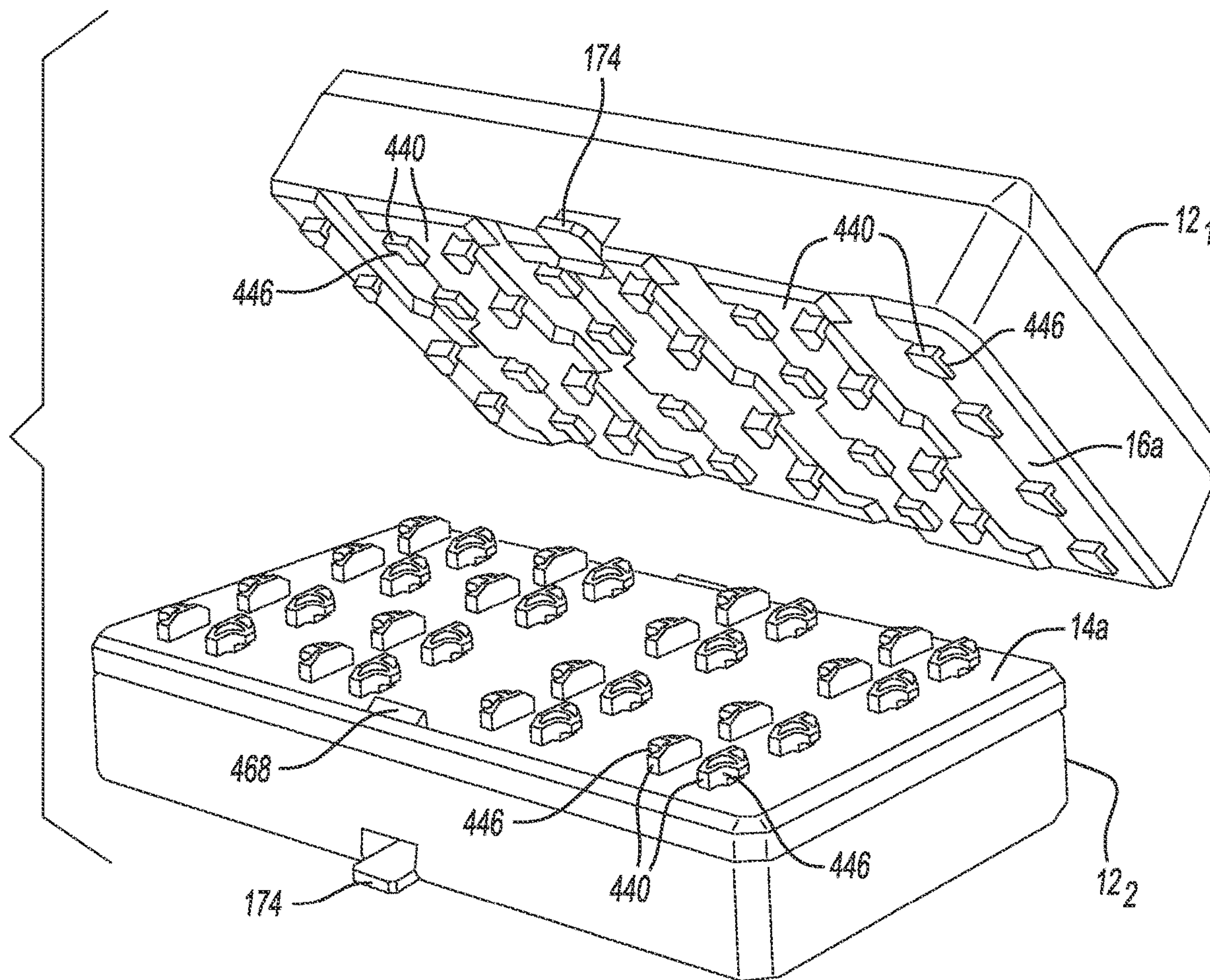
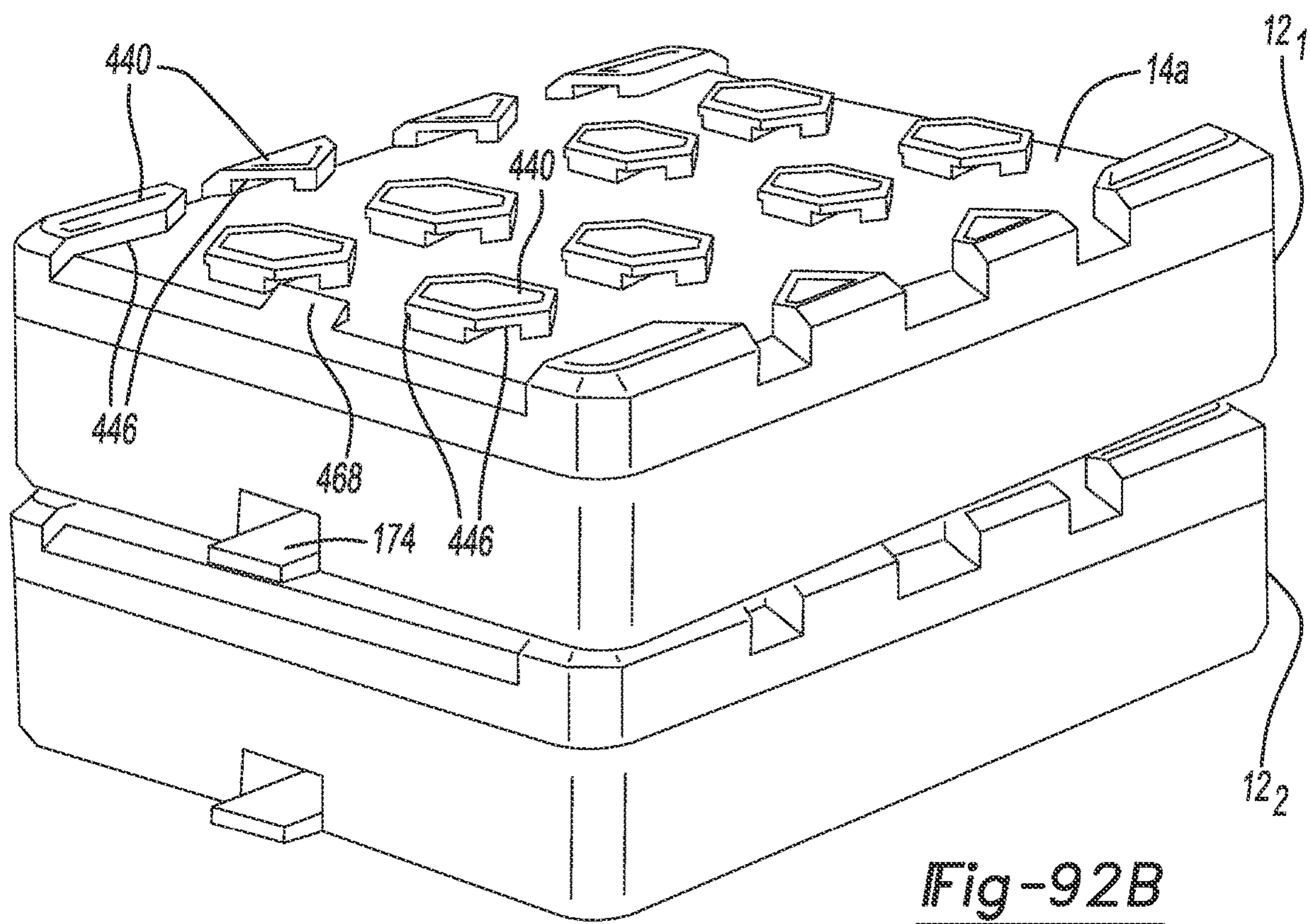
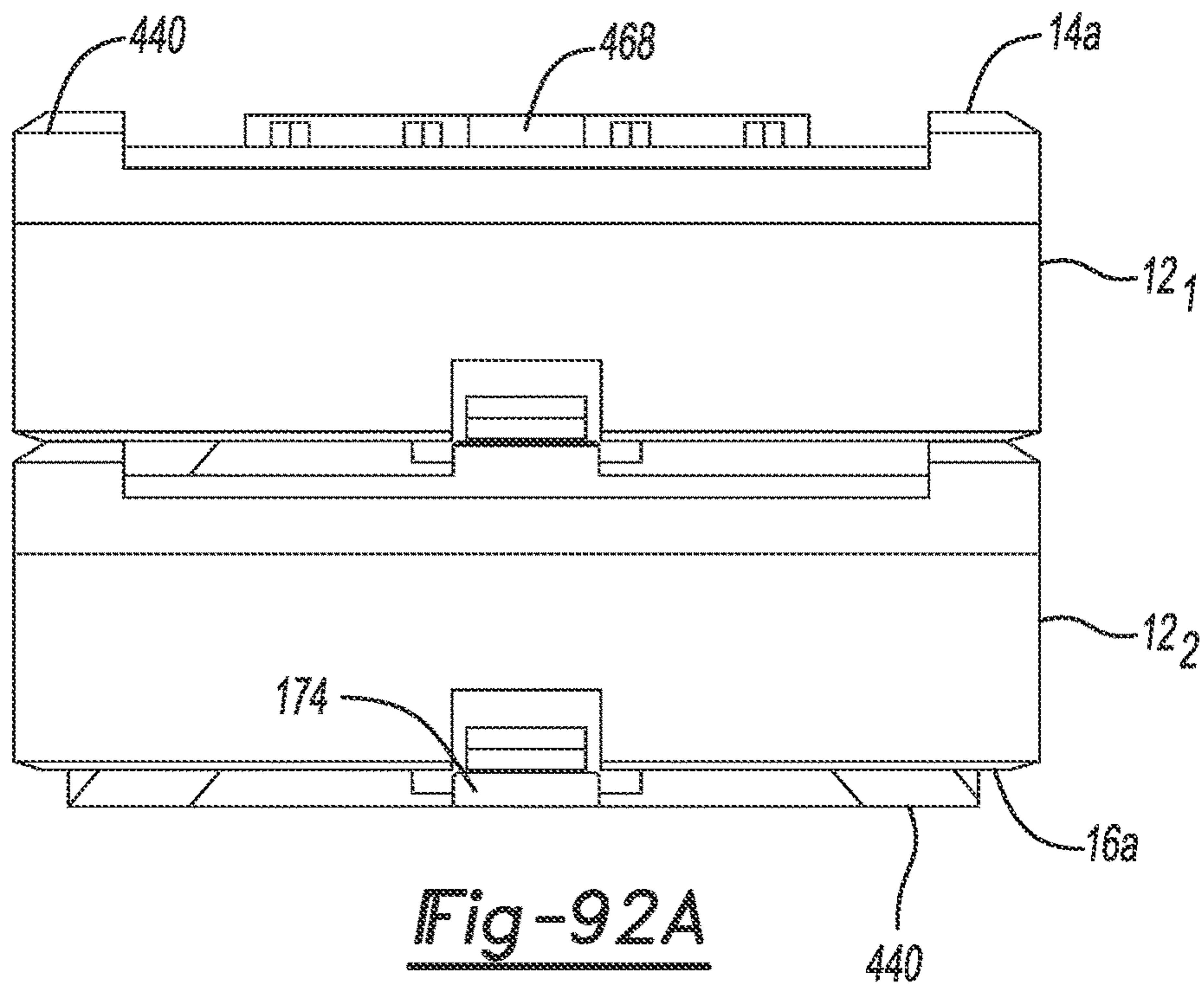


Fig-91C



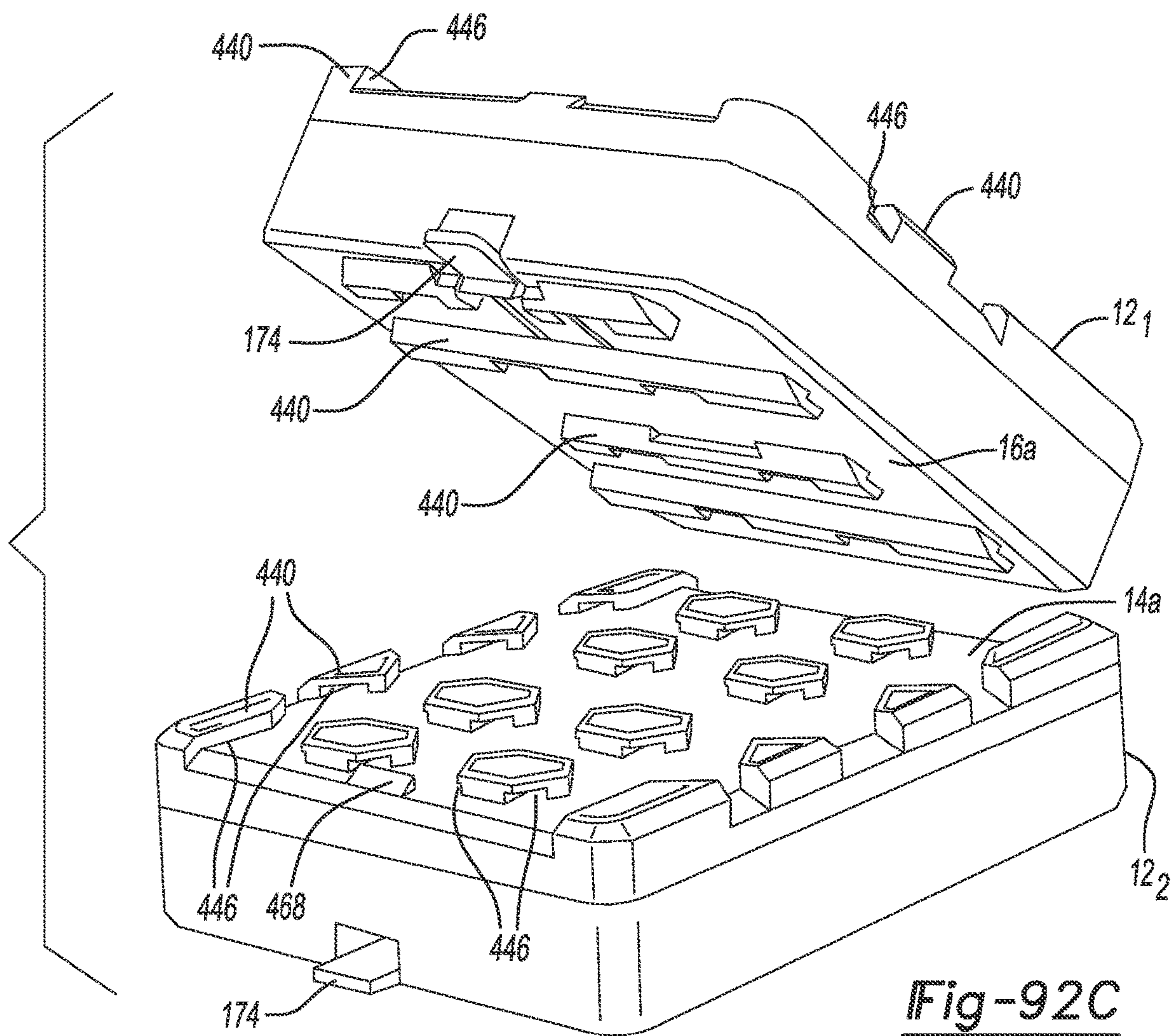


Fig-92C

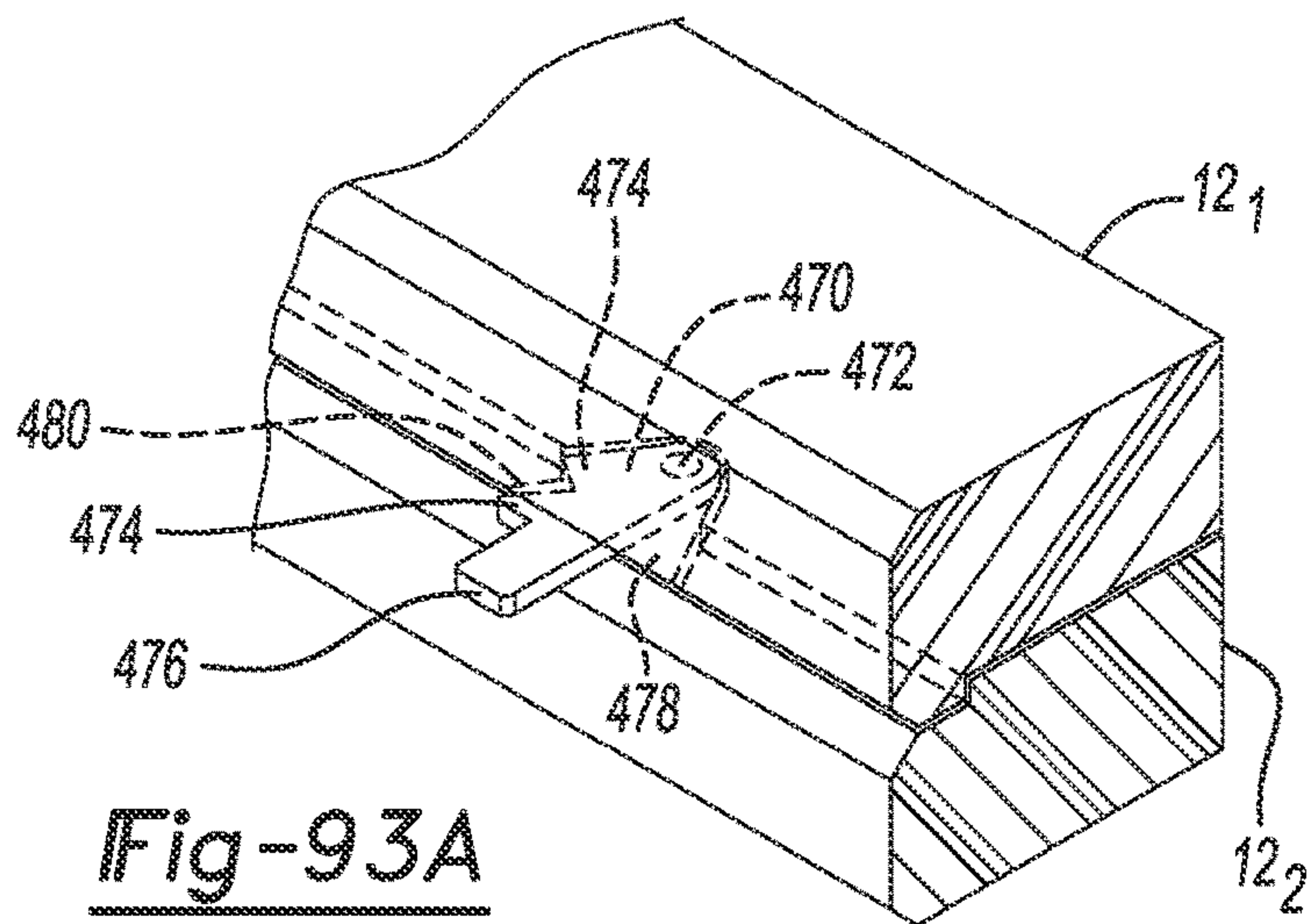


Fig-93A

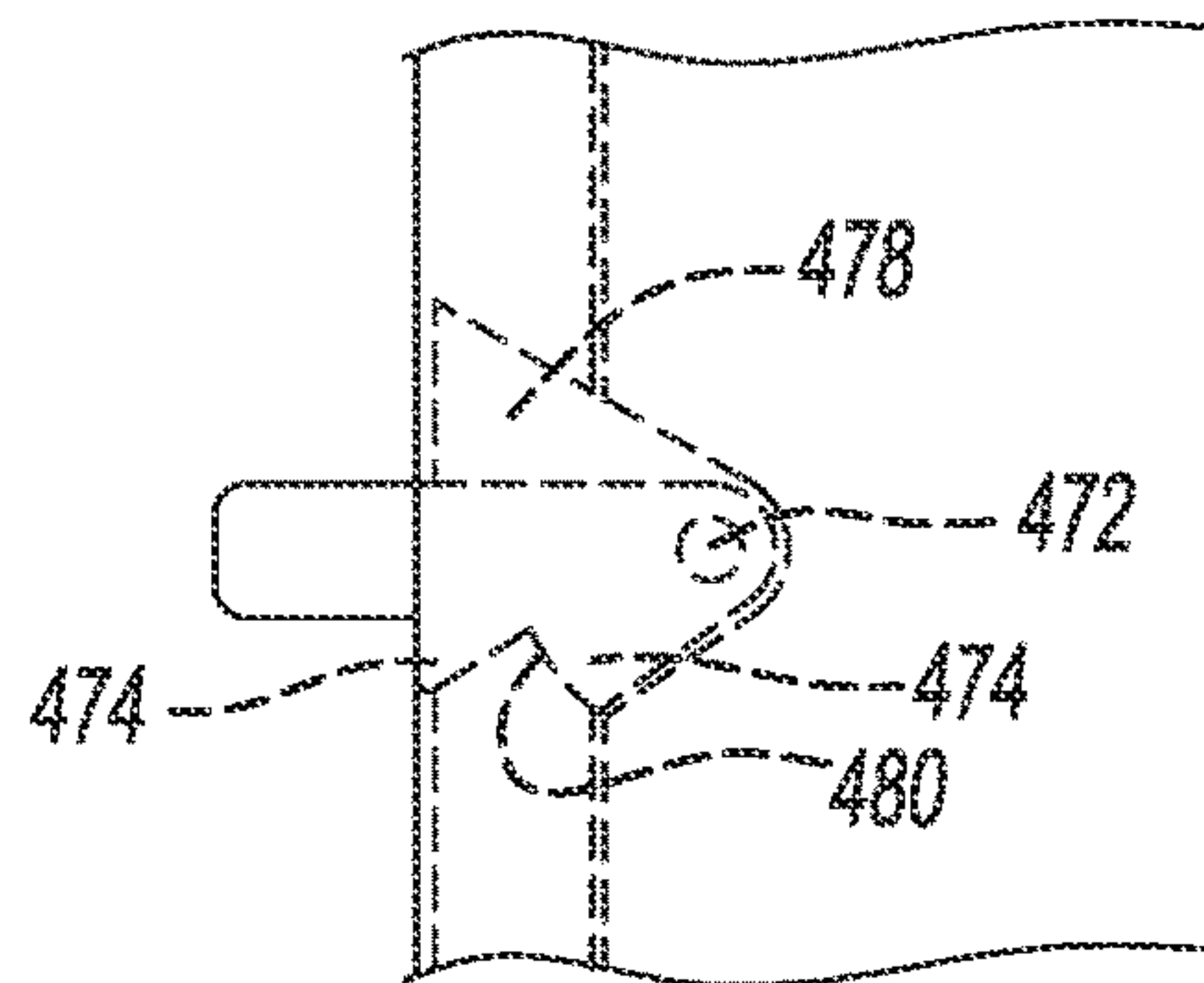


Fig-93B

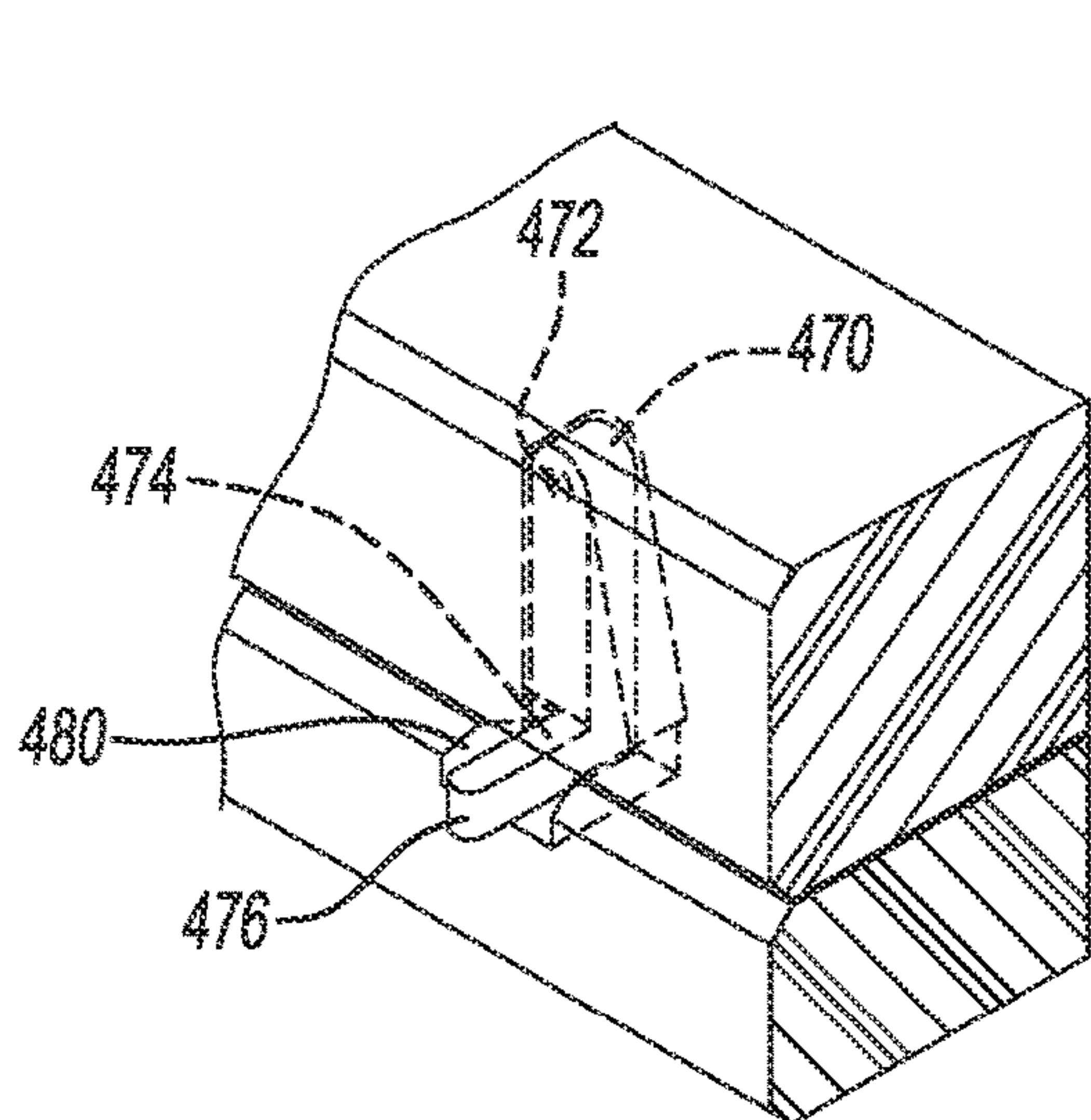


Fig-94A

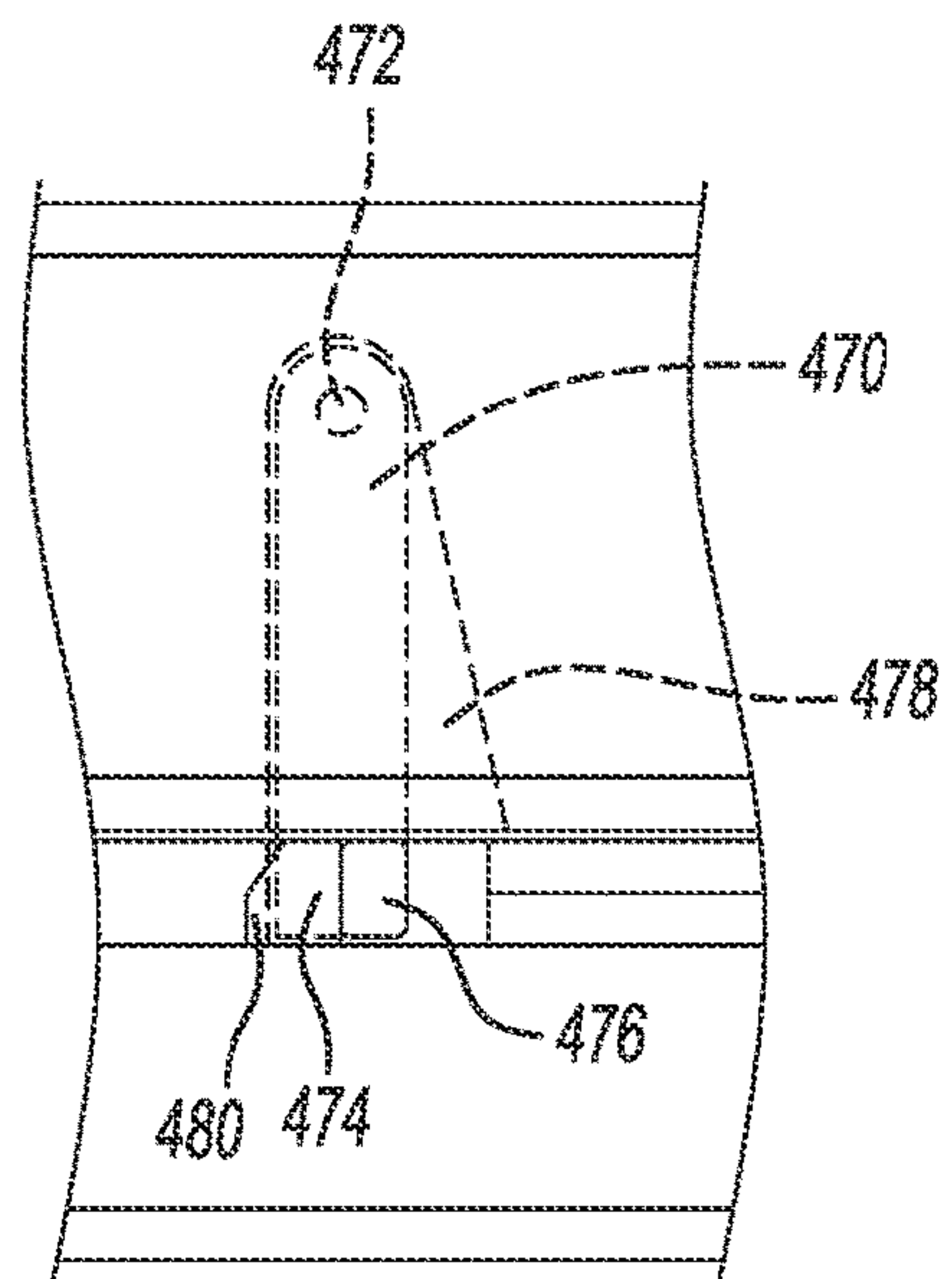


Fig-94B

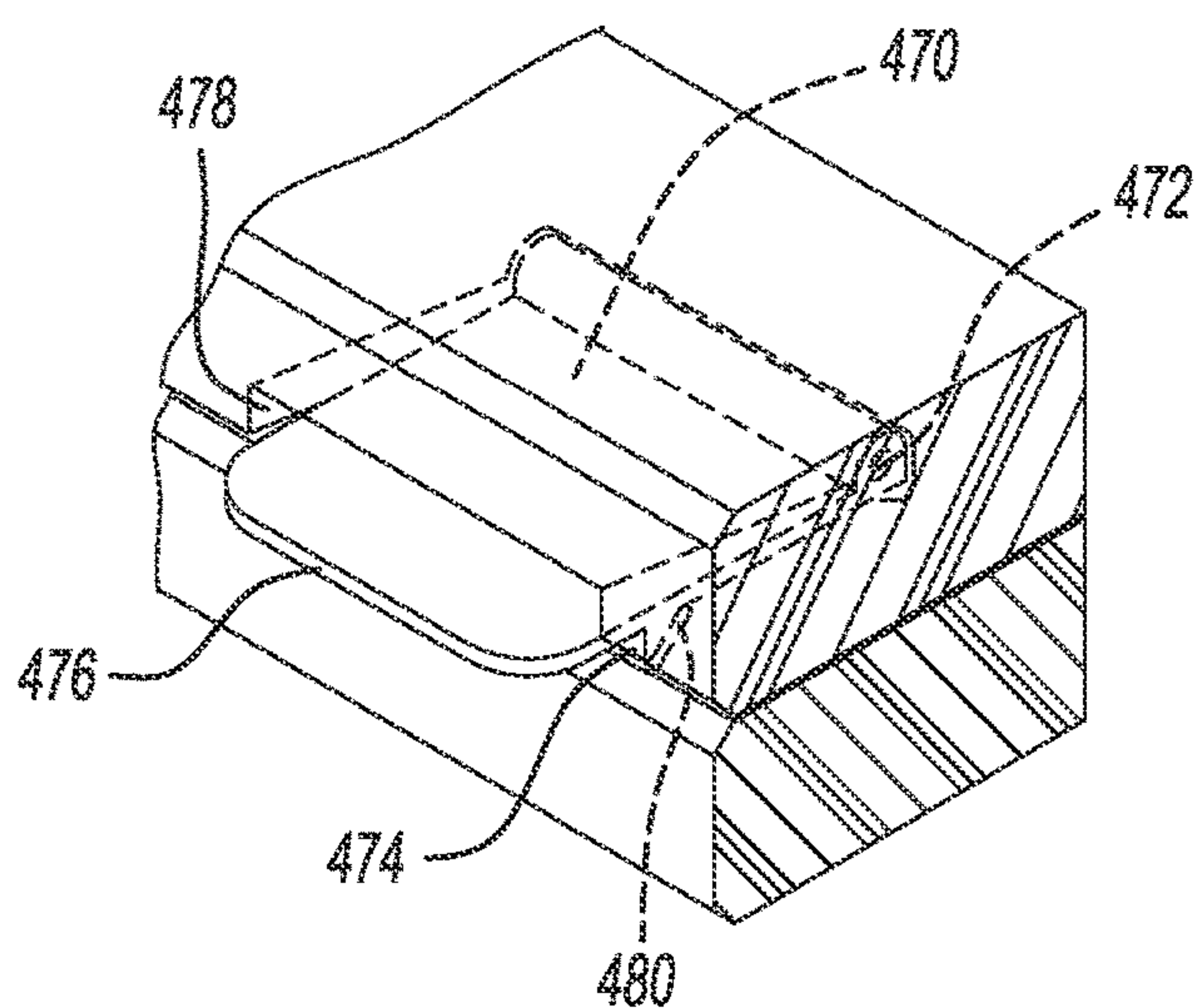


Fig-95A

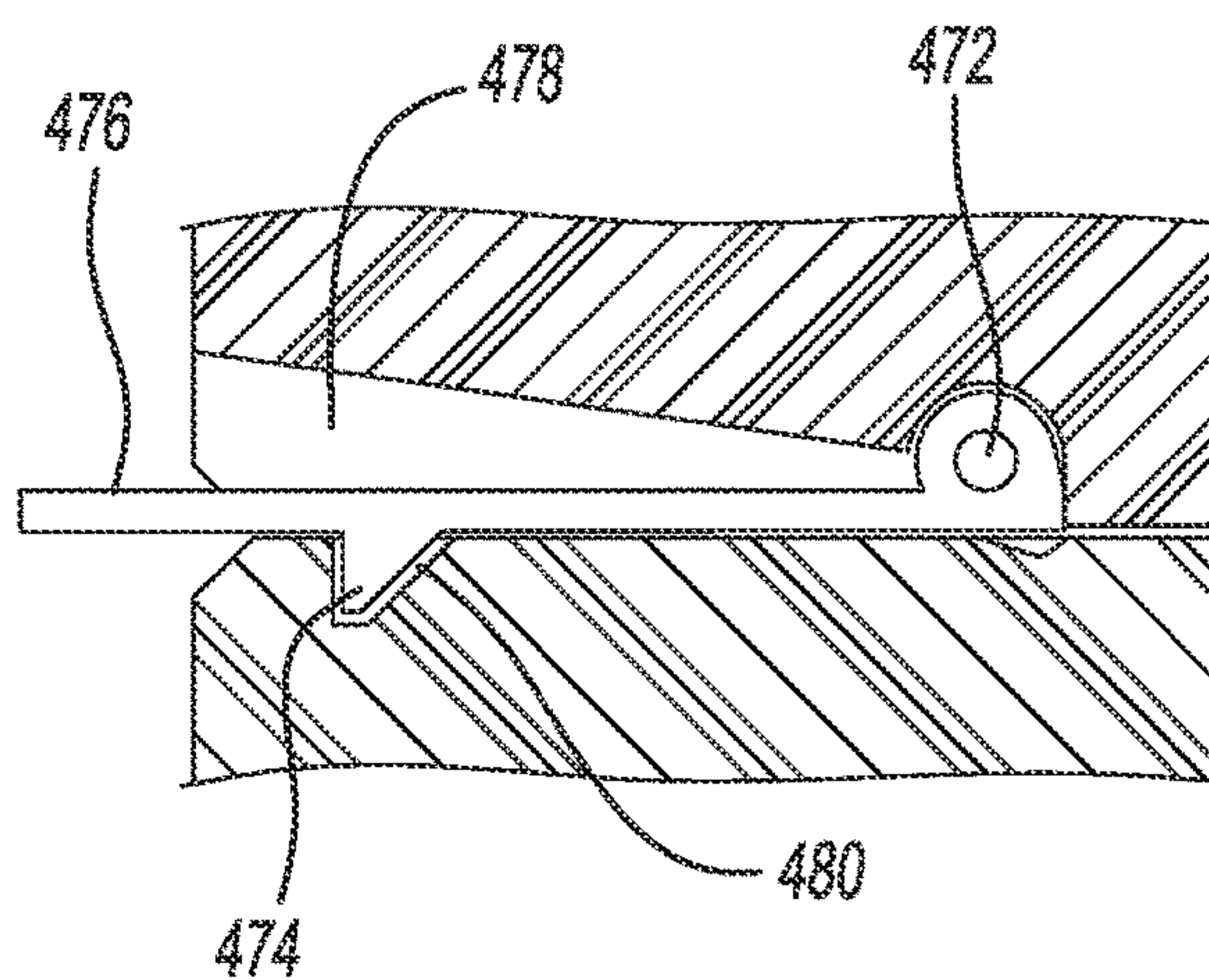


Fig-95B

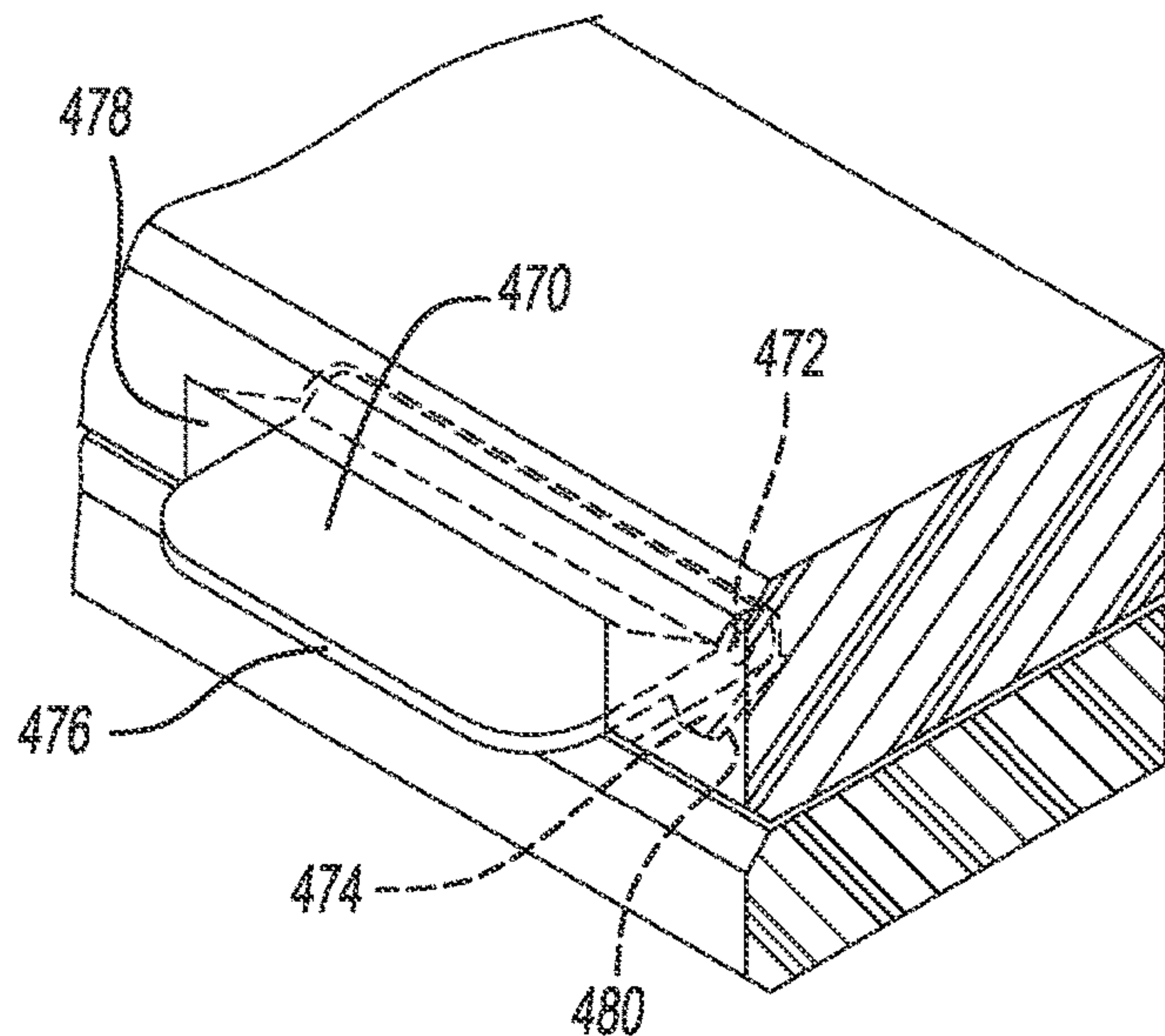


Fig-96A

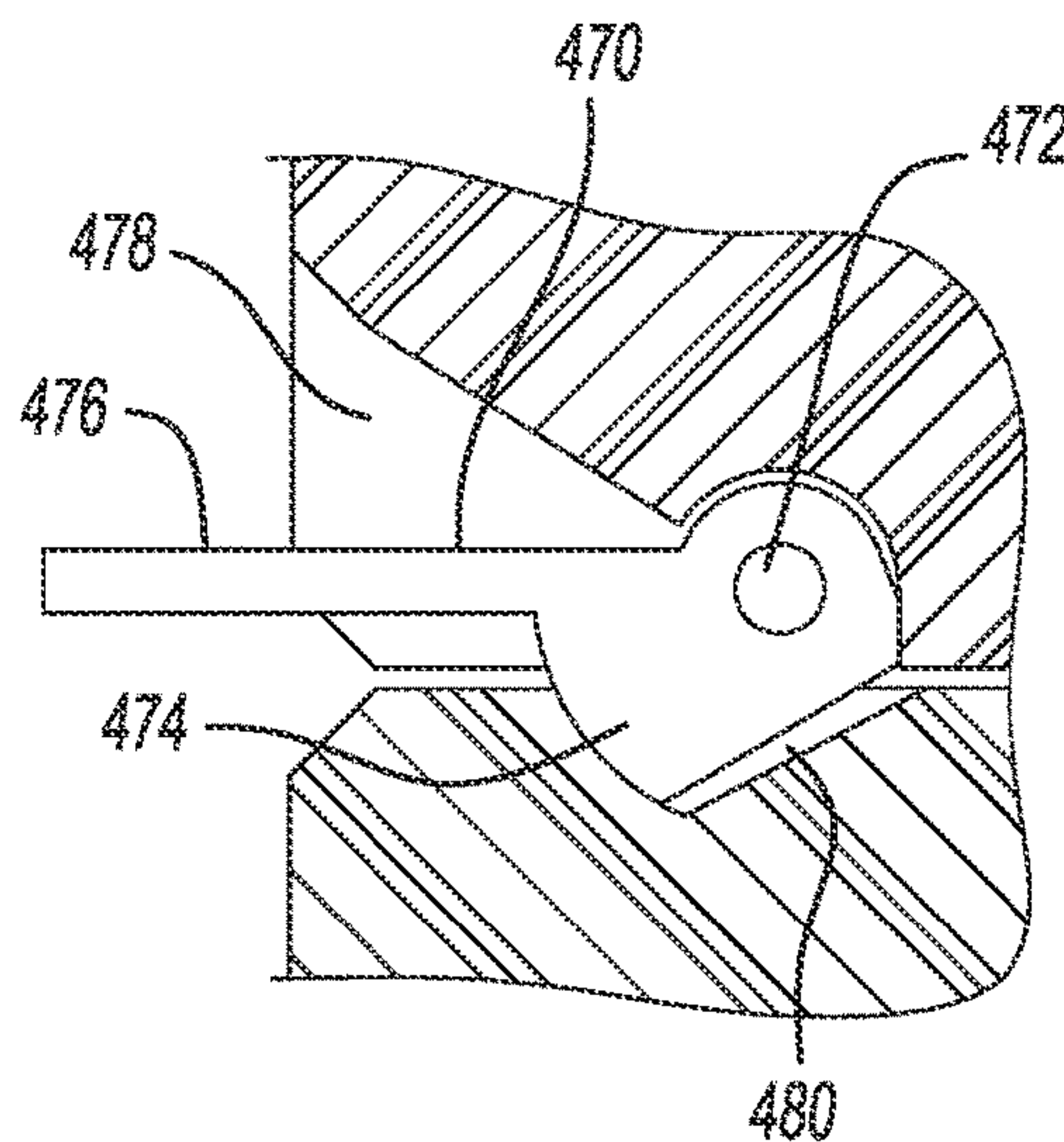


Fig-96B

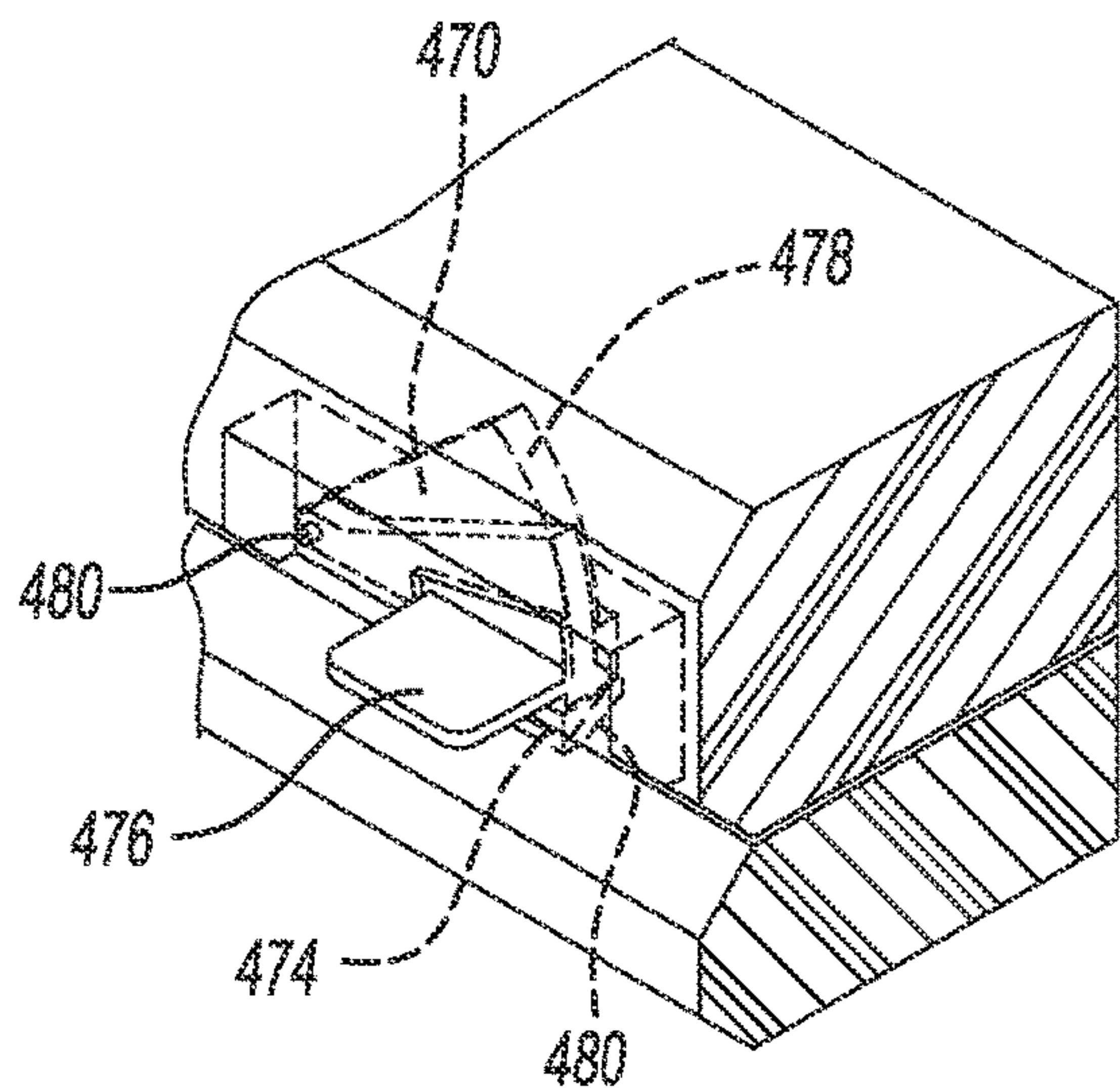


Fig-97A

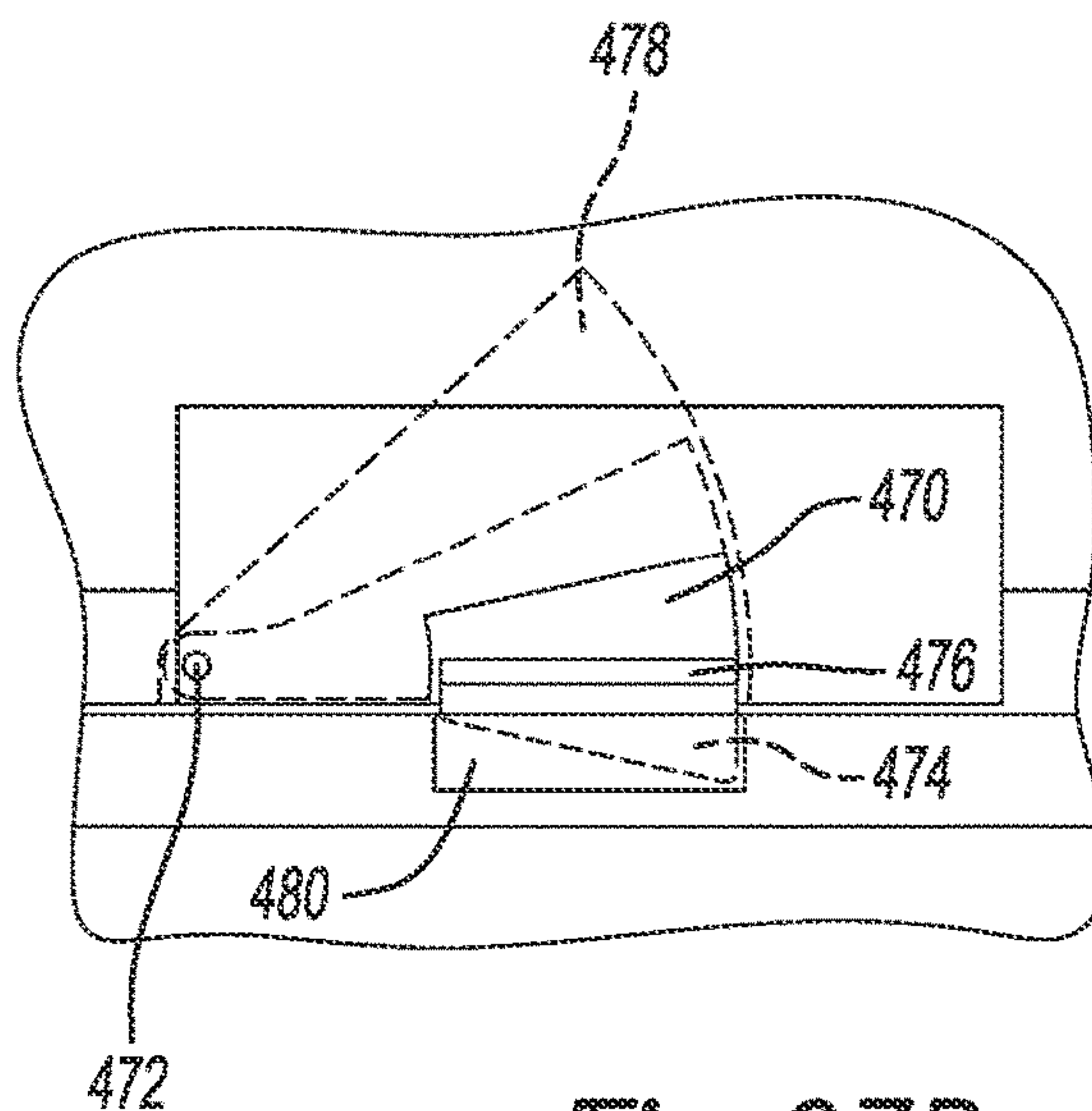


Fig-97B

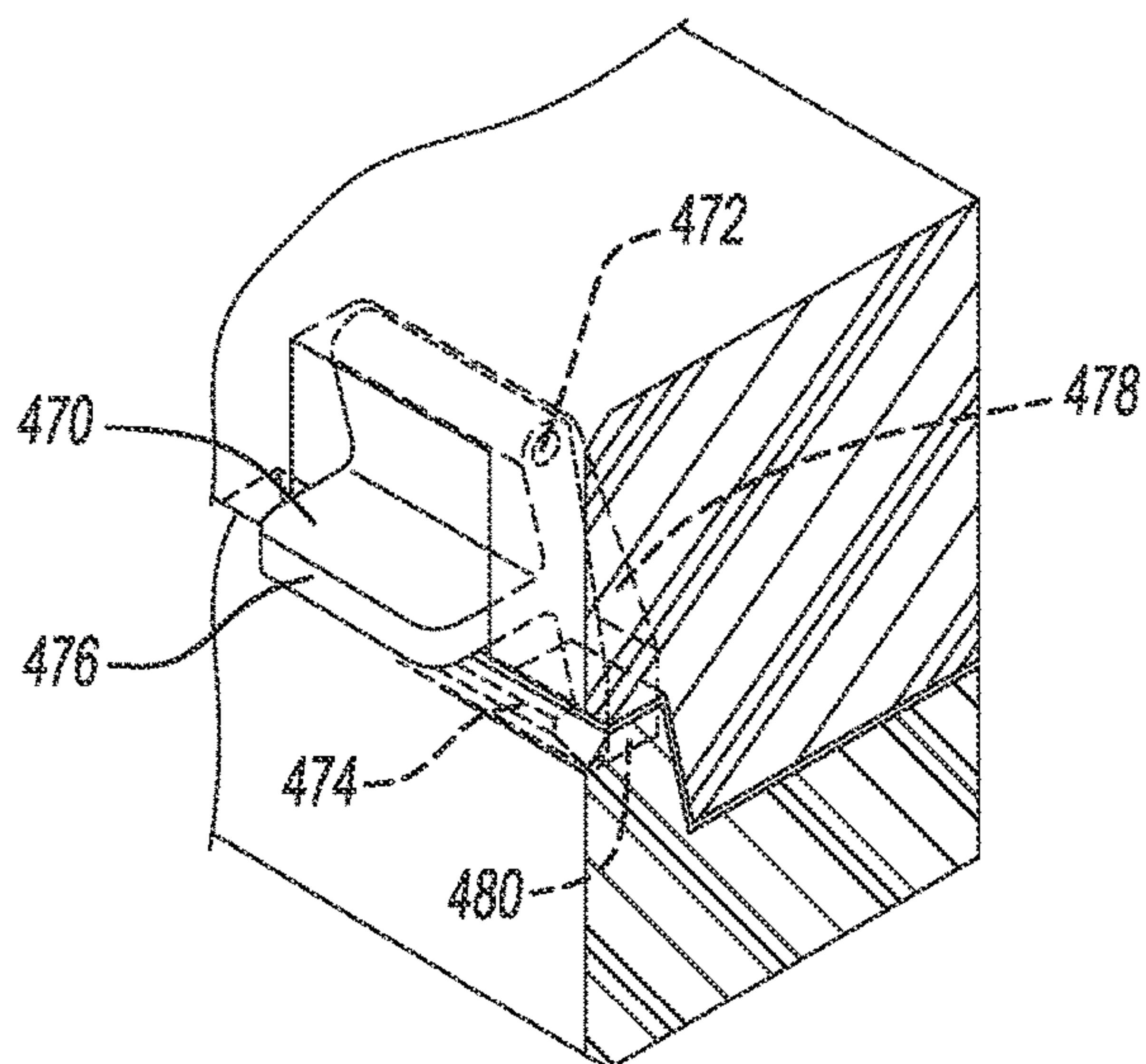


Fig-98A

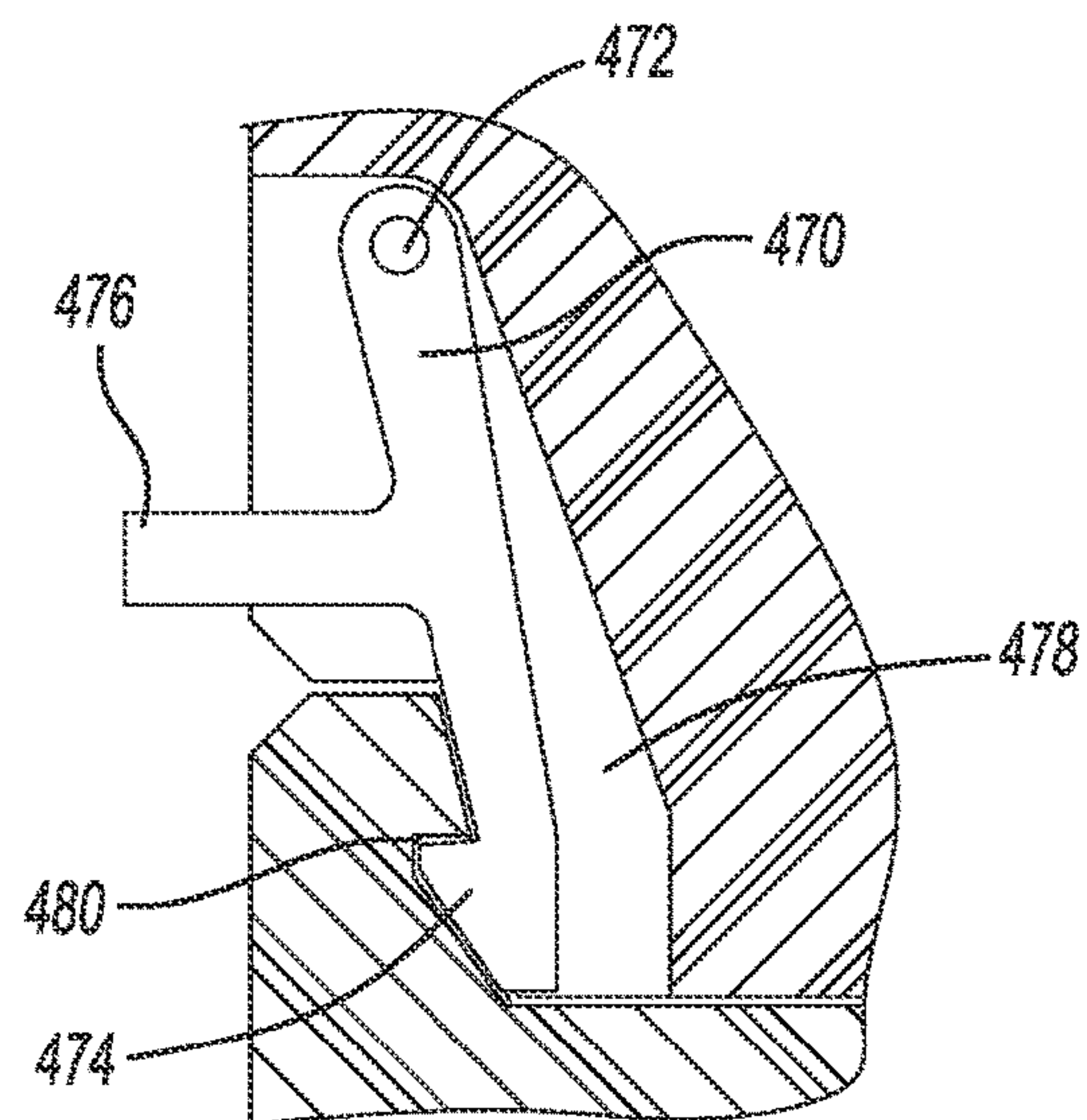


Fig-98B

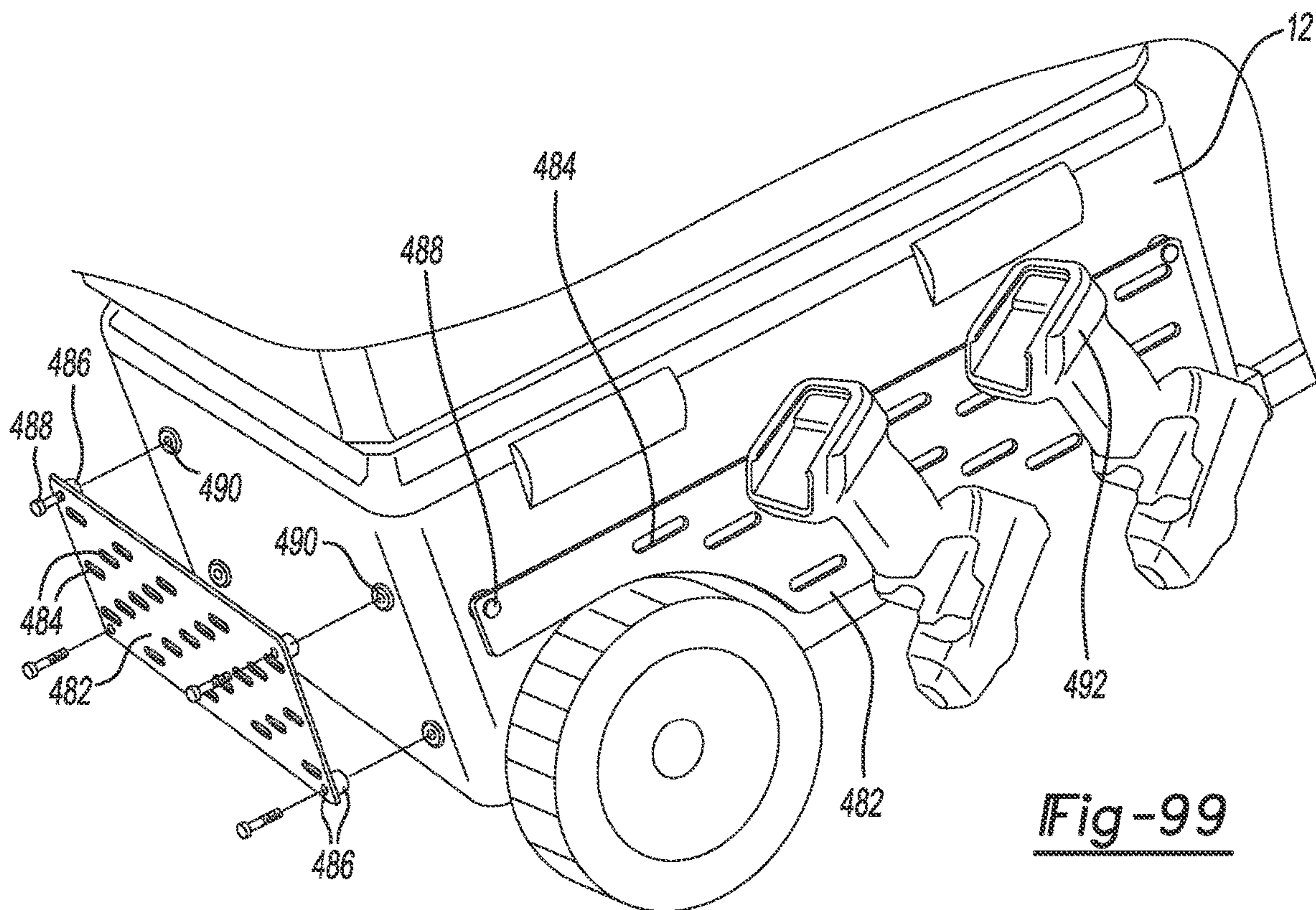
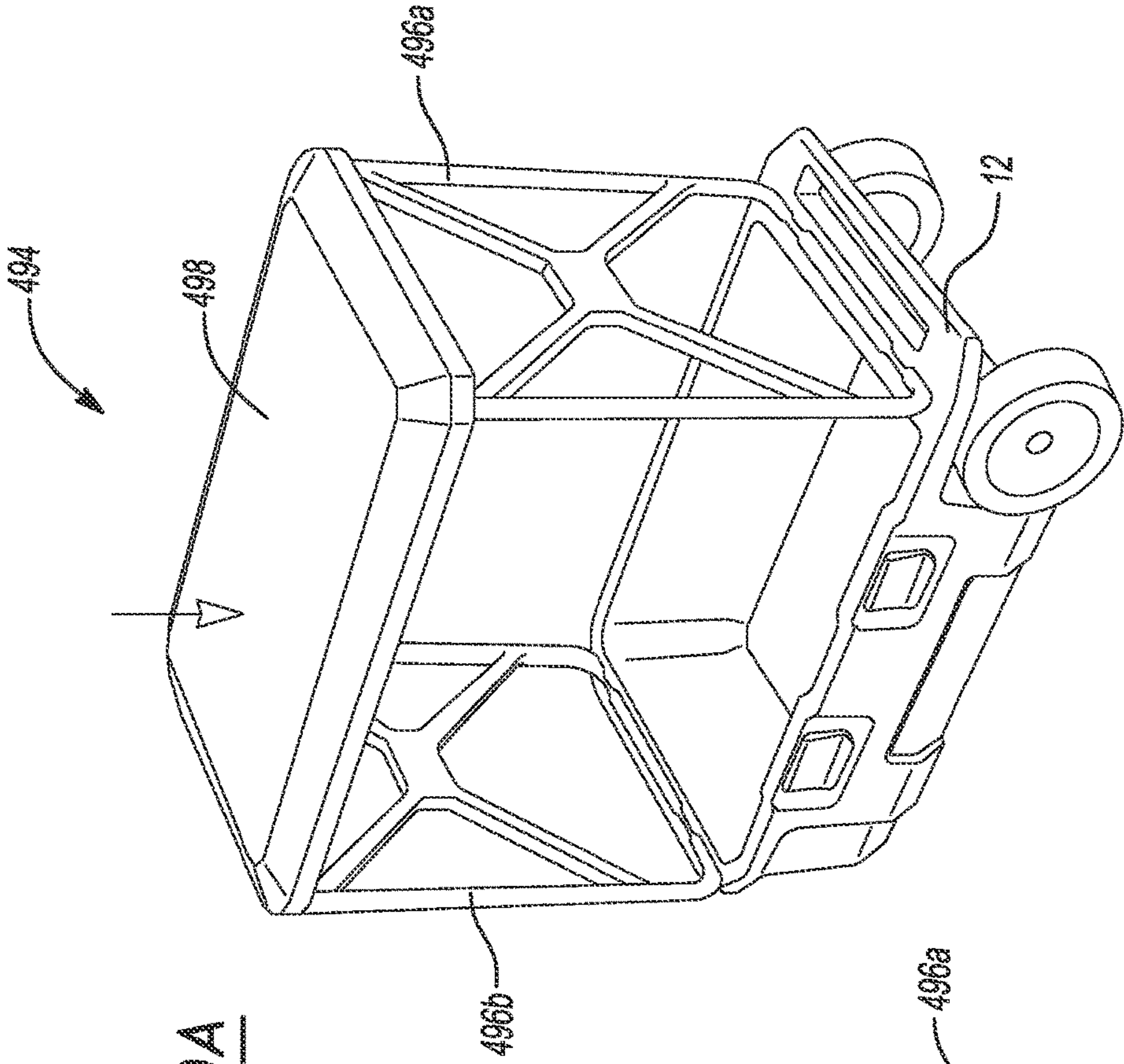
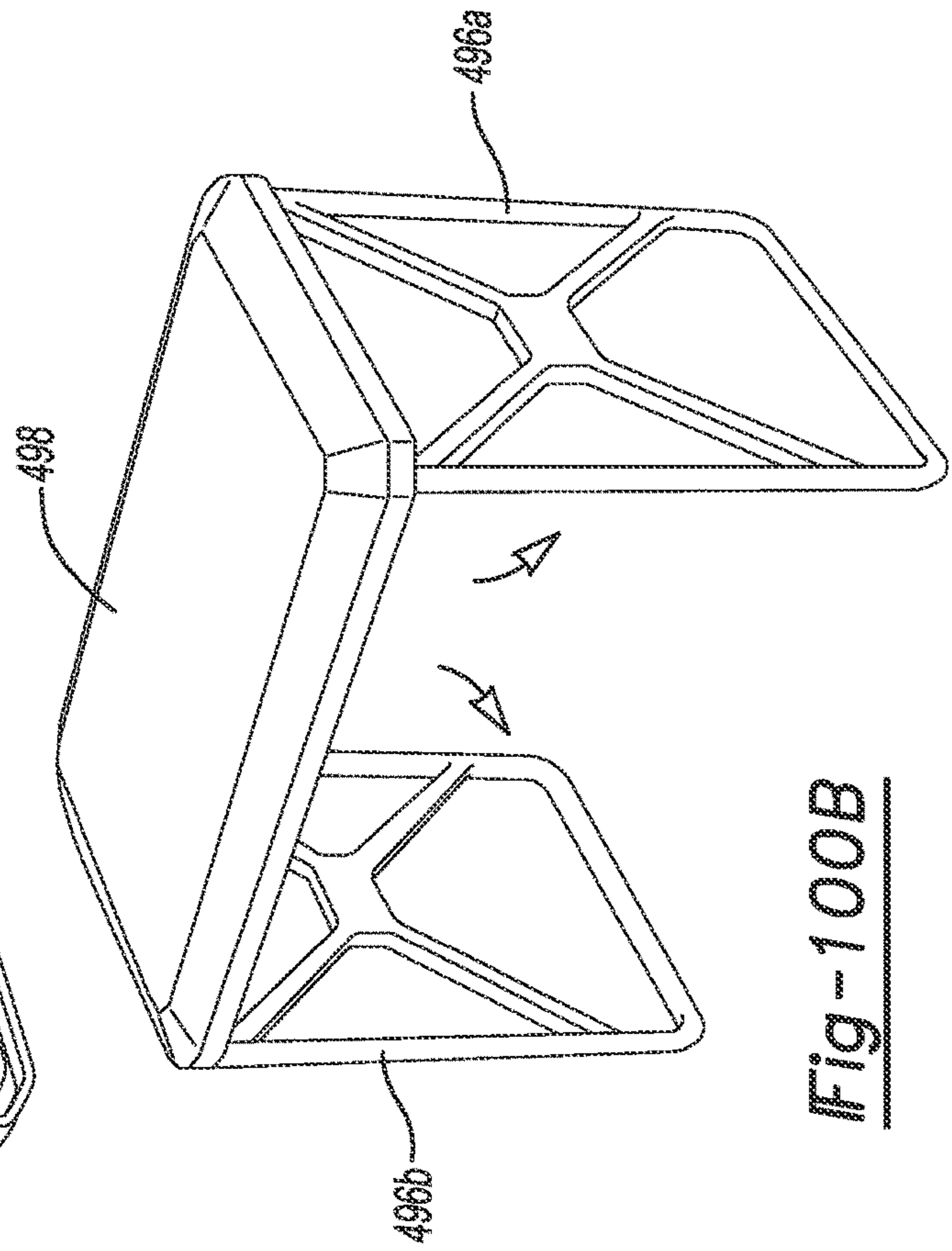
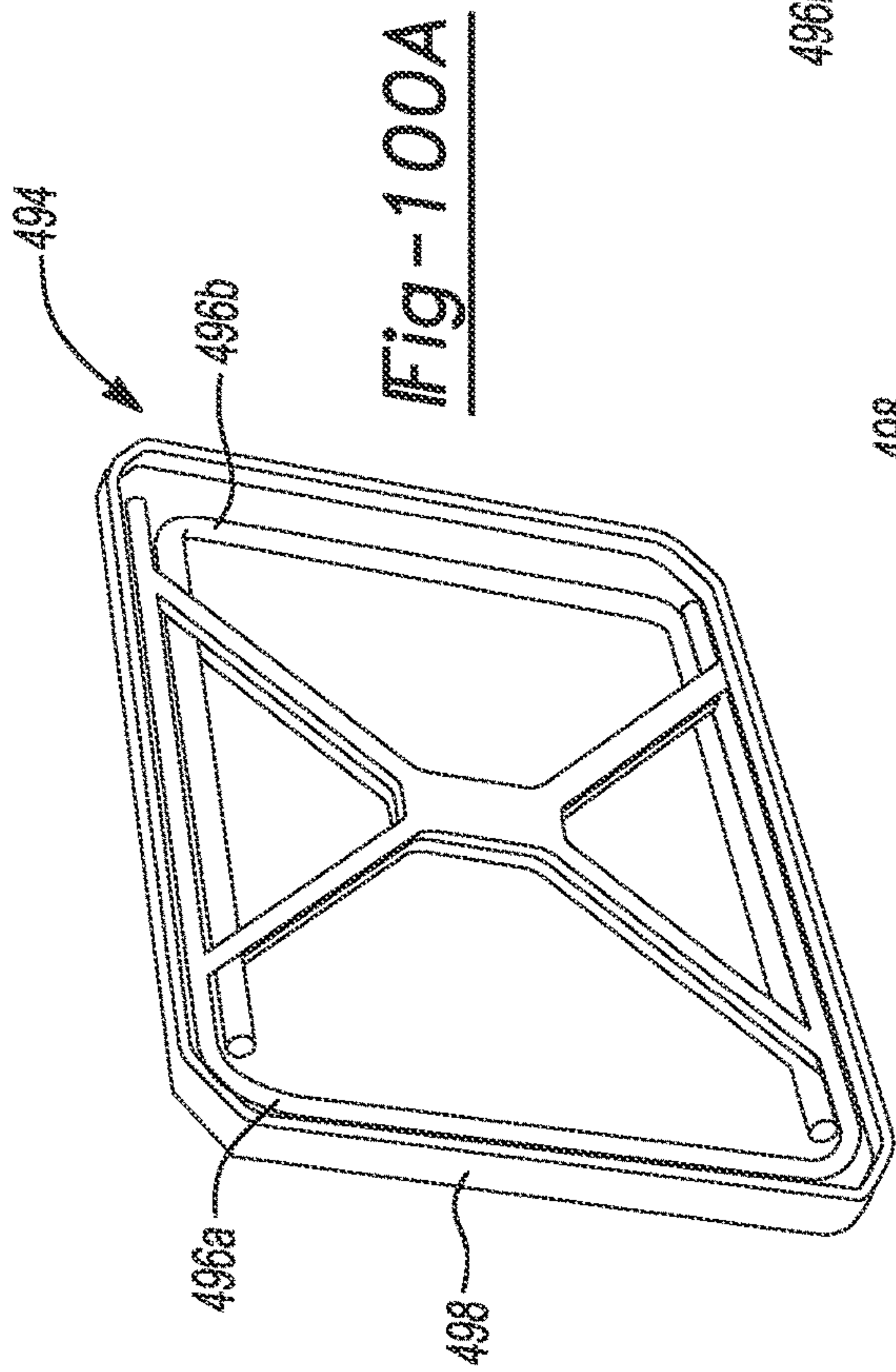


Fig-99



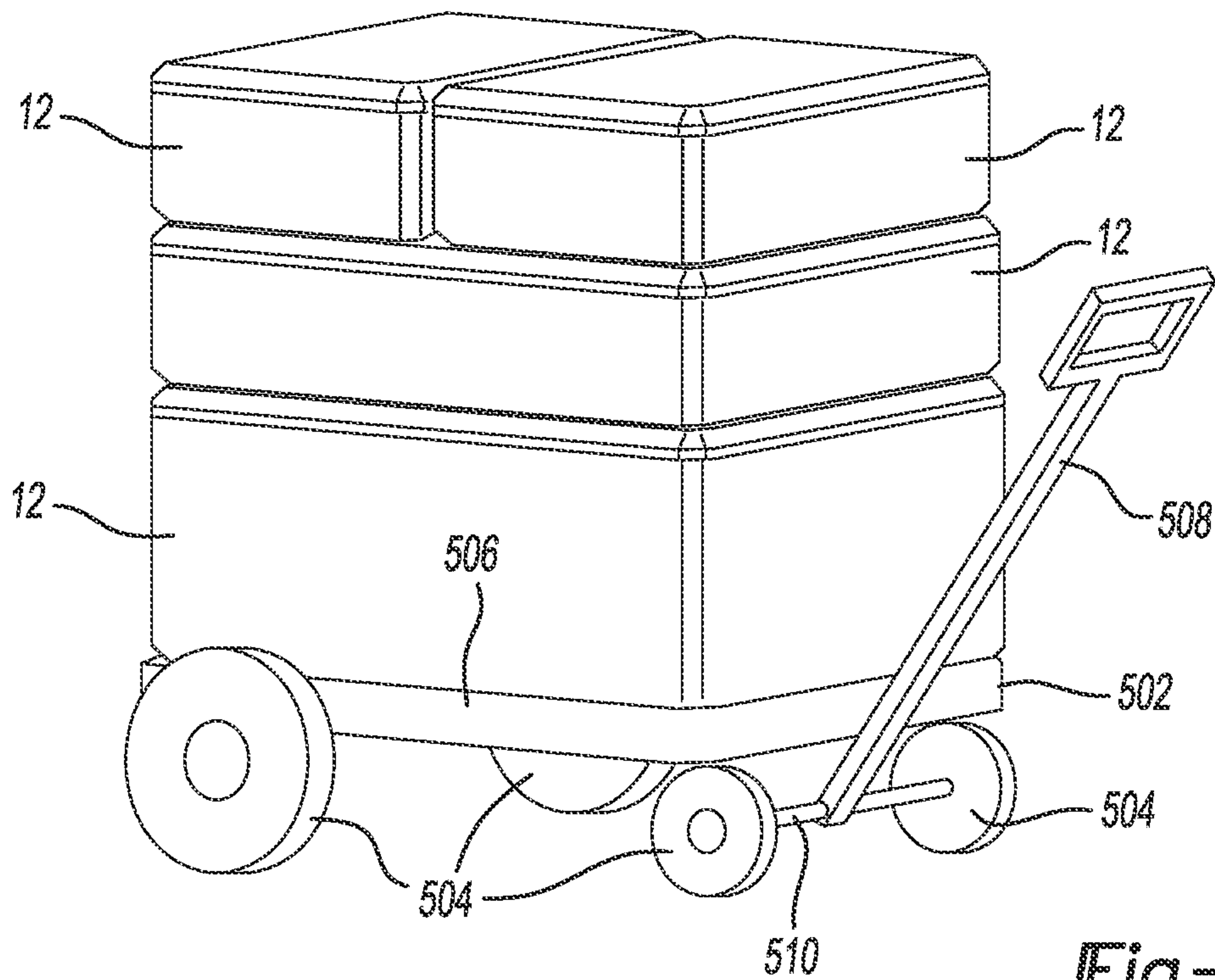


Fig-101

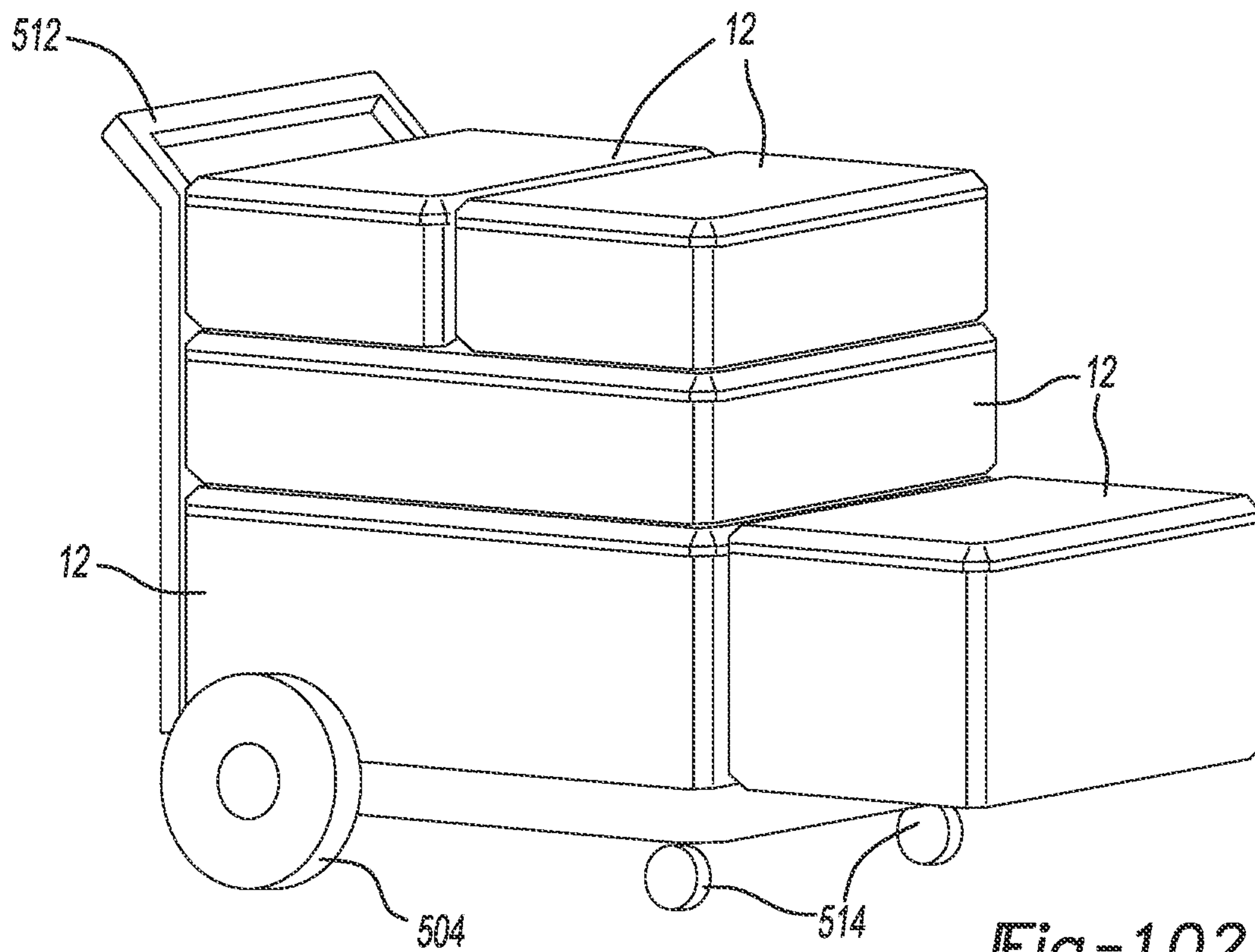


Fig-102

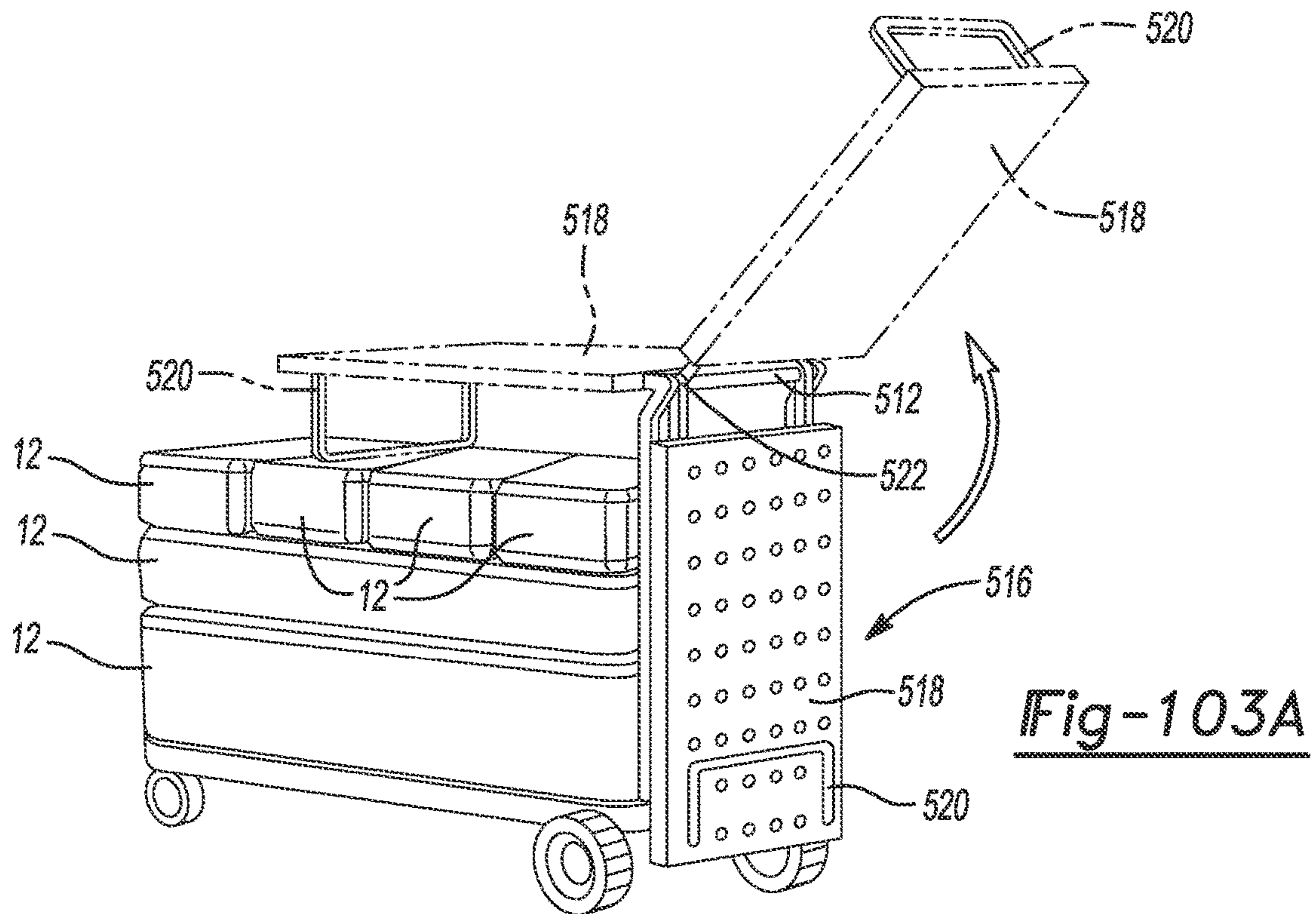


Fig-103A

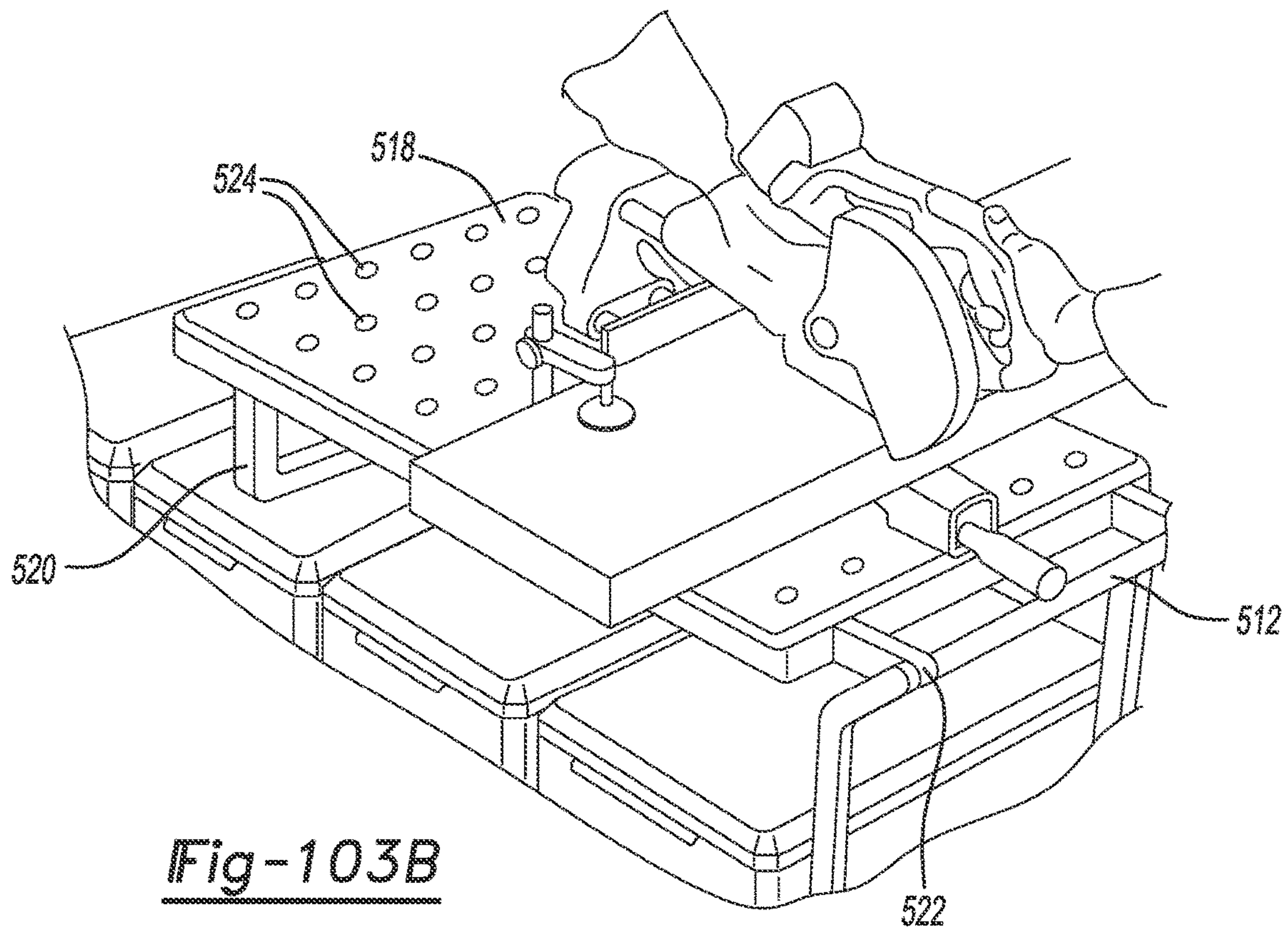
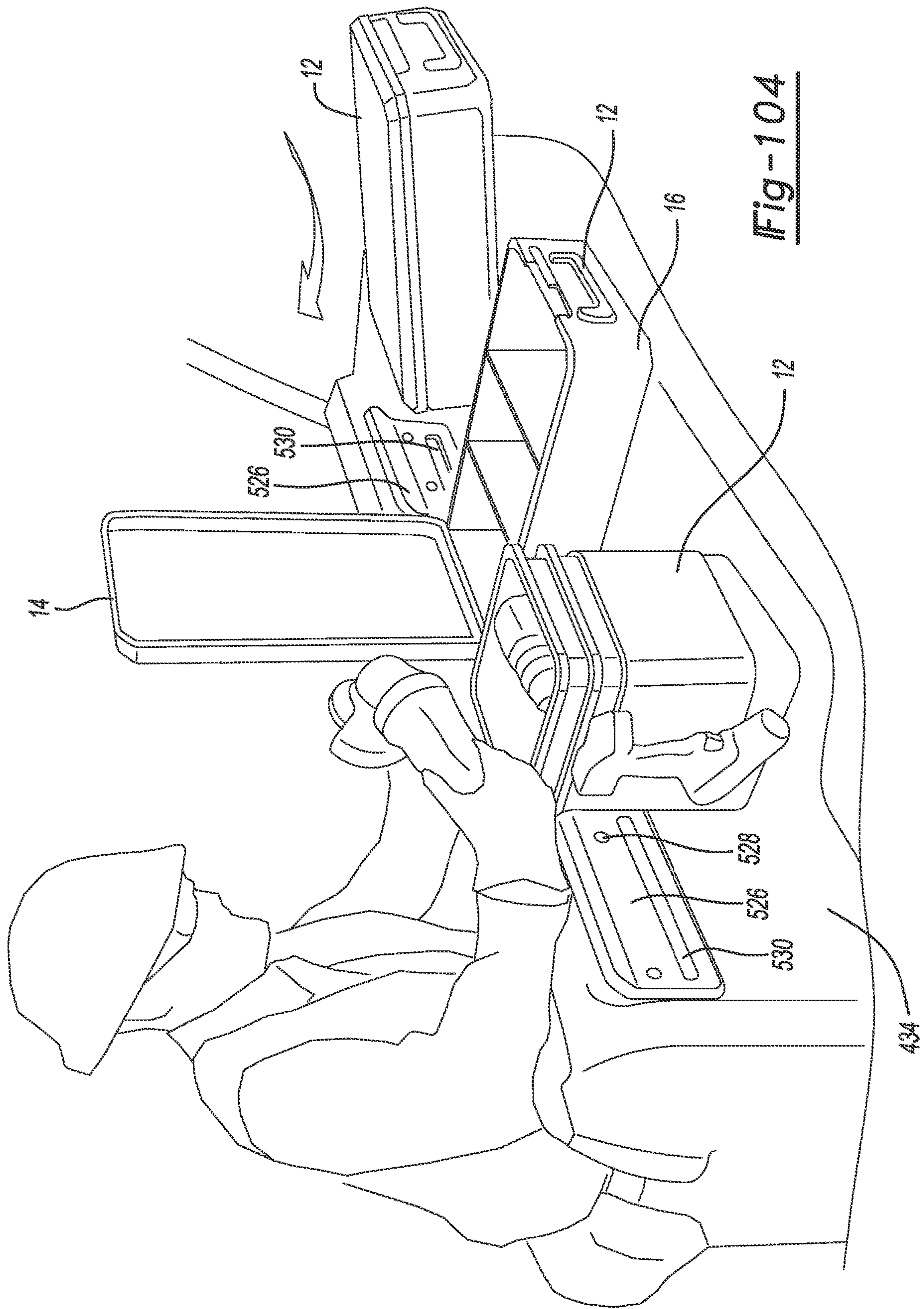


Fig-103B



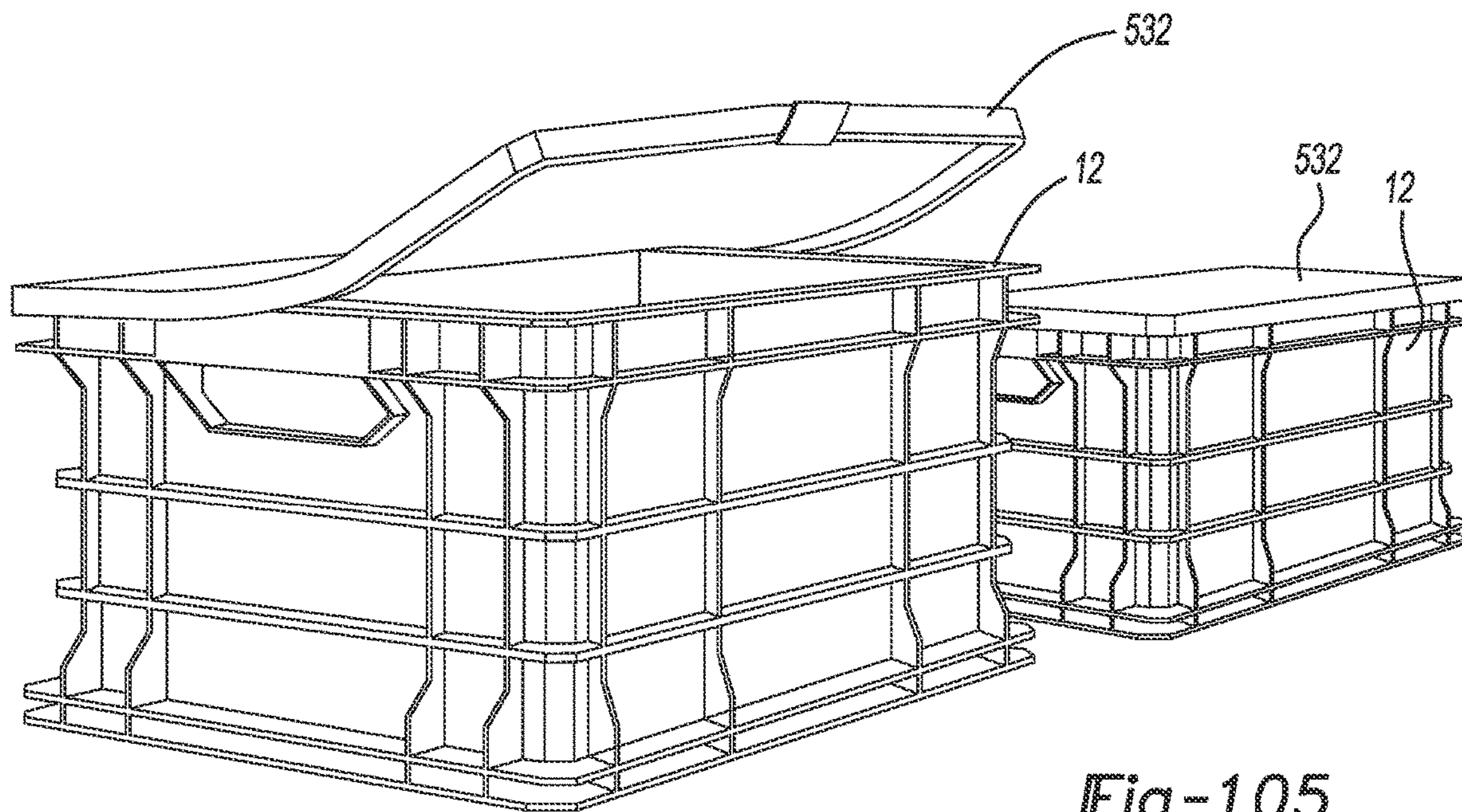


Fig-105

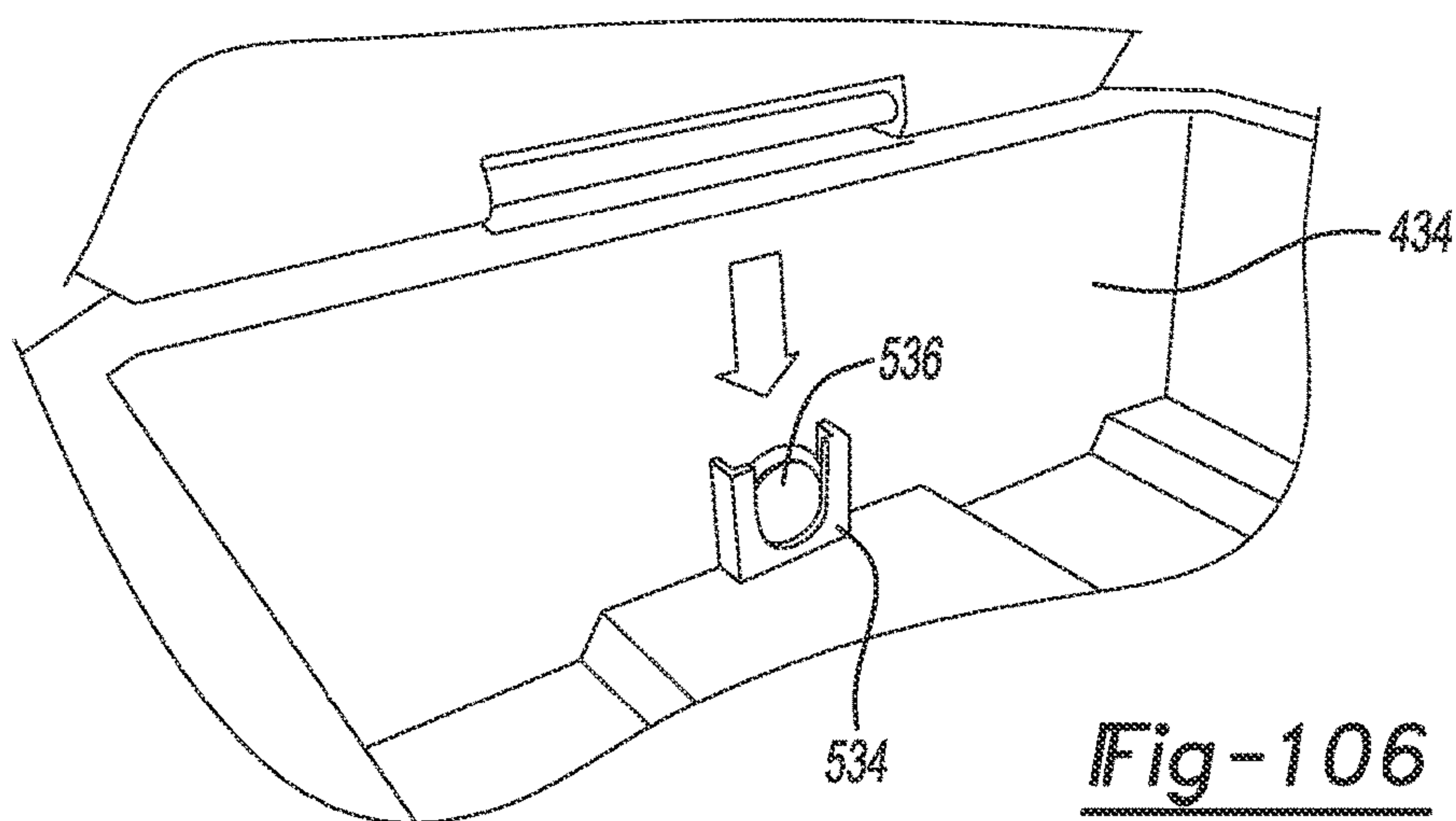


Fig-106

**MODULAR STORAGE SYSTEM WITH
STORAGE BOX CONNECTIVITY AND
EXTERNAL BOX FEATURES AND
ACCESSORIES**

[0001] This application claims the benefit of U.S. provisional patent application Ser. No. 63/356,031, filed Jun. 27, 2022, and of U.S. provisional patent application Ser. No. 63/355,498, filed Jun. 24, 2022, and of U.S. provisional patent application Ser. No. 63/355,461, filed Jun. 24, 2022, and of U.S. provisional patent application Ser. No. 63/280,896, filed Nov. 18, 2021, and of U.S. provisional patent application Ser. No. 63/256,490, filed Oct. 15, 2021, the entire contents of which are incorporated herein by reference.

FIELD

[0002] Example embodiments in the present disclosure are directed to storage boxes for storing and transporting items that can be stacked and which have accessories and internal organization features to enhance storage capacity and transport and access to items stored in the boxes or mounted thereon.

BACKGROUND

[0003] Containers or utility boxes can be used in commercial, military and consumer environments to store and transport a wide variety of items such as tools, accessories, parts, materials and supplies for construction, remodeling, repairs, outdoor landscaping, artwork, different hobbies, medical care delivery, sports, among other applications. Some known containers can be stacked to more effectively store and transport items.

SUMMARY

[0004] The above and other problems are overcome, and additional advantages are realized, by illustrative embodiments.

[0005] It is an aspect of illustrative embodiments to provide a modular storage system having a system for interconnecting two storage boxes comprising: at least one raised guide disposed along a surface of a first box, and at least one channel disposed along a surface of a second box and dimensioned to receive the guide. The guide extends along a dimension of the surface of the first box chosen from a box width and a box length, and the guide has a length that corresponds to the dimension of the surface of the first box chosen from the box width and the box length of the first box.

[0006] In accordance with aspects of illustrative embodiments, the channel extends along a dimension of the surface of the second box chosen from a box width and a box length, and the channel has a length that corresponds to the dimension of the surface of the second box chosen from the box width and the box length of the second box.

[0007] In accordance with aspects of illustrative embodiments, the channel is open at opposite ends thereof.

[0008] In accordance with aspects of illustrative embodiments, the first box is stacked on top of the second box in a stacked configuration, the surface of the first box that comprises the at least one guide is a bottom exterior surface of the first box, the surface of the second box comprising the at least one channel is a top exterior surface of the second

box, and the channel is a cavity formed in the top exterior surface of the second box, the cavity comprising a channel bottom and two channel side walls extending inwardly from the top exterior surface of the second box toward the channel bottom.

[0009] In accordance with aspects of illustrative embodiments, the guide is a raised member extending from the bottom exterior surface of the first box.

[0010] In accordance with aspects of illustrative embodiments, the at least one channel comprises opposite side walls with top edges that extend at least partially over the channel and notches in the top edges of the side walls, the at least one guide comprises tabs that can be aligned with the notches for insertion of the guide into the channel and be misaligned to abut at least one tab against an underside of one of the top edges to provide a surface to prevent the guide from being lifted out of the box channel.

[0011] In accordance with aspects of illustrative embodiments, the tabs extend from a top edge of the guide in a direction transverse to the box engagement path.

[0012] In accordance with aspects of illustrative embodiments, the first box and the second box can slide relative to each other in both a forward direction and a backward direction along a box engagement path when the guide of the first box contacts the channel in the second box.

[0013] In accordance with aspects of illustrative embodiments, an integrative locking system is configured to secure the first box and the second box as two interconnected boxes, the integrative locking system having a cleat disposed on one of the two interconnected boxes, and a receptacle configured to receive the cleat and disposed on the other one of the two interconnected boxes.

[0014] In accordance with aspects of illustrative embodiments, the integrative locking system further comprises a cleat member configured as a flat member with the cleat extending from a portion thereof between a first end and a second end, the flat member being securable at the first end thereof to one of the two interconnected boxes, the flat member being movable to remove the cleat from the receptacle when force is applied to the second end to move the second end toward the box and stationary to retain the cleat in the receptacle when no force is applied to the second end to move the second end toward the box.

[0015] In accordance with aspects of illustrative embodiments, one of the two interconnected boxes to which the flat member is secured is molded with a depression in the bottom exterior surface thereof that is dimensioned to receive the flat member.

[0016] In accordance with aspects of illustrative embodiments, the at least one guide and the at least one channel are configured to prevent relative translational movement between the first box and the second box in a first direction corresponding to one of two-dimensional directions comprising an x-axis and a y-axis perpendicular to the x-axis, and further comprising an integrative locking system for preventing relative translational movement between the first box and the second box in a second direction corresponding to the other one of the two-dimensional directions.

[0017] In accordance with aspects of illustrative embodiments, the at least one guide and the at least one channel extend along the first box and the second box, respectively, in the second direction between a first edge and a second edge on each of the first box and second box, and the integrative locking system comprises a cleat disposed at one

of the first edge and the second edge of the first box and a cleat retaining member chosen from a receptacle and a wedge disposed at the corresponding one of the first edge and the second edge of the second box that is aligned to receive the cleat when the first box is translated over the second box in the second direction.

[0018] It is an aspect of illustrative embodiments to provide a storage system comprising: a first box; a second box; a box-to-box interconnection system to releasably interconnect the first box to the second box; and at least one latch. Each of the first box and the second box comprises a top portion and a bottom portion that define an inner volume for a storage compartment, and the at least one latch is provided on a side wall of each of the first box and the second box to releasably secure the top portion to the bottom portion to enclose the storage compartment thereof, and open and close the top portion relative to the bottom portion independently of the box-to-box interconnection system to allow access to the storage compartment when the first box and the second box are interconnected for a stacked configuration.

[0019] In accordance with aspects of illustrative embodiments, at least one of the first box and the second box comprises the at least one latch mounted on each of opposite sides of a box to allow opening the top portion from either of the opposite sides of the box.

[0020] In accordance with aspects of illustrative embodiments, when the first box and the second box stacked, the first box and the second box each comprises the at least one latch mounted on the same facing side wall.

[0021] In accordance with aspects of illustrative embodiments, the storage system further comprises a dolly with a flat surface, and wheels connected to one side of the flat surface. The first box and the second box are stacked together on an opposite side of the flat surface with the at least one latch mounted on each of the boxes directed from the same facing side wall.

[0022] It is an aspect of illustrative embodiments to provide a system for interconnecting two storage boxes comprising: protuberances extending from each of a top surface and a bottom surface of a box, the protuberances extending from the top surface being arranged relative to each other to delineate channels of space in between rows of protuberances along at least one of a width dimension and a length dimension of the top surface. The channels of space between rows of protuberances are open on respective ends thereof.

[0023] In accordance with aspects of illustrative embodiments, the protuberances extending from the top surface of the box are formed with an edge to engage the protuberances extending from the bottom surface of a second box, and/or the protuberances extending from the bottom surface of the box are formed with an edge to engage the protuberances extending from the top surface of a second box.

[0024] In accordance with aspects of illustrative embodiments, the protuberances are configured as unitary and continuous protuberances extending across a dimension of the top surface of the box to form open and continuous channel cavities with continuous side walls, and as unitary and continuous protuberances extending across a dimension of the bottom surface of the box and arranged to form continuous raised guides disposed and dimensioned to be received in the channel cavities of a second box.

[0025] In accordance with aspects of illustrative embodiments, the box and the second box slide relative to each other in both a forward direction and a backward direction

along a box engagement path when the guide of the box contacts the channel in the second box.

[0026] In accordance with aspects of illustrative embodiments, the protuberances that extend from the bottom surface are arranged to engage with one or more of the protuberances extending from the top surface of a second box when the first box is moved in a translational direction that is parallel to the rows of channels.

[0027] In accordance with aspects of illustrative embodiments, the protuberances that extend from the bottom surface are arranged to engage with one or more of the protuberances extending from the top surface of a second box when the box is moved in a translational direction that is parallel to the channels of space, and further comprising an integrative locking system to retain the box from translational relative to the second box when stacked.

[0028] In accordance with aspects of illustrative embodiments, the protuberances and corresponding channels are arranged along the box and the second box, respectively, in a direction between a first edge and a second edge on each of the box and second box, and the integrative locking system comprises a cleat disposed at one of the first edge and the second edge of the box and a cleat retaining member chosen from a receptacle and a wedge disposed at the corresponding one of the first edge and the second edge of the second box that is aligned to receive the cleat when the box is translated over the second box in the direction of the channels.

[0029] It is an aspect of illustrative embodiments to provide a storage box that comprises a lid for covering a bottom portion and defining an inner volume. The lid comprises a plurality of ribs are formed on an inner surface of the lid that faces the inner volume of the storage box when the lid is closed against the bottom portion of the storage box, and a plurality of holes formed at one or more intersections of the ribs that are configured to receive a fastener.

[0030] In accordance with aspects of illustrative embodiments, the plurality of holes formed at one or more intersections of the ribs are configured as molded bosses.

[0031] In accordance with aspects of illustrative embodiments, the storage box further comprises an item to be disposed in the storage box that is connected to the lid by at least one fastener inserted into at least one of the plurality of holes to affix the item to the inner surface of the lid.

[0032] In accordance with aspects of illustrative embodiments, at least one of the ribs comprises a slot configured to receive a retention member chosen from a strap and a tab on an item to affix the item to the inner surface of the lid.

[0033] In accordance with aspects of illustrative embodiments, the ribs are formed using a grid pattern having greater density in a center portion of the box than at end portions of the box.

[0034] In accordance with aspects of illustrative embodiments, the grid pattern comprises two sets of ribs forming double trusses disposed on respective sides of the center portion of the top portion of the box, each set of the double trusses having ribs arranged in a lattice structure between the trusses.

[0035] In accordance with aspects of illustrative embodiments, the storage box further comprises a plurality of lids wherein each of the plurality of lids has a length dimension and a width dimension that is the same as the bottom portion of a storage box and different respective height dimensions,

the plurality of lids providing a different inner volume depending on which of the plurality of lids is connected to the bottom portion.

[0036] In accordance with aspects of illustrative embodiments, the storage box further comprises an internal organizing system configured to organize stored items within the inner volume.

[0037] In accordance with aspects of illustrative embodiments, the internal organizing system comprises a receptacle having a bottom surface and side walls for defining an interior storage space therein and an opening at the top of the receptacle, and wherein the ribs are formed using a grid pattern comprising intersecting ribs and some of the intersecting ribs about the receptacle and close the opening when the lid is closed.

[0038] In accordance with aspects of illustrative embodiments, the internal organizing system comprises features for preventing movement of the receptacle within the box and chosen from protrusions arranged at respective locations on a bottom interior surface of the box to coincide with placement of the receptacle in the box and at least partially contact a wall of the receptacle, a tray that can be provided in the bottom portion of the box and that at least one protrusion in a surface thereof that cooperates with a recess formed in the bottom surface of the receptacle, at least one rib on an interior side wall of the bottom portion of the box that contacts a receptacle, and a contoured surface on the bottom of the receptacle that cooperates with a complementary contoured surface on the interior wall of the bottom portion of the box that contacts a receptacle.

[0039] In accordance with aspects of illustrative embodiments, the internal organizing system comprises a divider removably provided in the bottom portion to divide the inner volume into plural storage sections. The divider is configured to be removed from the bottom portion and affixed against the inner surface of the lid. The divider has a plurality of through holes, and the plurality of holes formed at one or more intersections of the ribs are configured to receive a fastener inserted through a selected one of the plurality of through holes aligned with a selected one of the plurality of holes to affix the divider against the inner surface of the lid.

[0040] In accordance with aspects of illustrative embodiments, the divider has a plurality of slots to which items are connected using a strap inserted into one or more of the slots.

[0041] In accordance with aspects of illustrative embodiments, the slots are arranged in the divider to configure the divider as a Modular Lightweight Load-carrying Equipment or MOLLE-board type interface.

[0042] In accordance with aspects of illustrative embodiments, the lid can be removably attached to the bottom portion by at least one latch connecting the lid to the bottom portion.

[0043] In accordance with aspects of illustrative embodiments, the lid is removably attached to the bottom portion on opposing sides thereof by at least one latch which is configured as a hinge when closed to open the lid from only one of the opposing sides.

[0044] Additional and/or other aspects and advantages of illustrative embodiments will be set forth in the description that follows, or will be apparent from the description, or may be learned by practice of the illustrative embodiments. The illustrative embodiments may comprise apparatuses related to a modular storage system and boxes and accessories

thereof and method of using same having one or more of the above aspects, and/or one or more of the features and combinations thereof. The illustrative embodiments may comprise one or more of the features and/or combinations of the above aspects as recited, for example, in the attached claims.

BRIEF DESCRIPTION OF DRAWINGS

[0045] The above and/or other aspects and advantages of the illustrative embodiments will be more readily appreciated from the following detailed description, taken in conjunction with the accompanying drawings, of which:

[0046] FIGS. 1A, 1B and 1C are, respectively, a side elevation view and opposite side perspective views of a modular storage system in accordance with an example embodiment wherein a number of storage boxes are stacked;

[0047] FIG. 2 is a perspective view of an modular storage system in accordance with an example embodiment wherein the storage boxes are unstacked or disassembled from each other;

[0048] FIG. 3 is a side elevation view of an example modular storage system in accordance with an example embodiment and in an upright position relative to its wheels;

[0049] FIGS. 4A and 4B are opposite side perspective views of a storage box in accordance with an example embodiment;

[0050] FIGS. 5A, 5B, 5C, 5D, 5E, 5F and 5G depict perspective, top, bottom, left, right, back and front views, respectively, of a rolling base box in accordance with an example embodiment;

[0051] FIGS. 6A, 6B, 6C, 6D and 6E depict different perspective views of a rolling base box in accordance with an example embodiment;

[0052] FIGS. 7A, 7B, 7C, 7D, 7E, 7F and 7G are perspective, left, right, top, bottom, front and back views, respectively, of a portable storage box in accordance with an example embodiment;

[0053] FIG. 8 is a perspective view of a portable storage box aligned to be placed on the extended handle of a rolling base box and connected via an extension connection system in accordance with an example embodiment;

[0054] FIGS. 9A and 9B are, respectively, a perspective view of an extension connection component on a rolling base box and a partial, enlarged perspective view of the extension connection component, in accordance with an example embodiment;

[0055] FIGS. 10A and 10B are, respectively, partial, enlarged perspective and top views of an extension connection component of a rolling base box in accordance with an example embodiment;

[0056] FIG. 11 is a bottom perspective view of an extension connection component on a portable storage box in accordance with an example embodiment;

[0057] FIGS. 12A and 12B are, respectively, a perspective view of an extension connection component of a portable storage box and a partial, enlarged perspective view of the extension connection component, in accordance with an example embodiment;

[0058] FIGS. 13A and 13B depict respective side views of placement of an extension connection component of a portable storage box onto an extension connection component of a rolling base box in accordance with an example embodiment;

[0059] FIGS. 14A and 14B depict, respectively, a side view of the cooperation between respective extension connection components of a rolling base box and a portable storage box, and a partial, enlarged side view of the extension connection components, in accordance with an example embodiment;

[0060] FIGS. 15A and 15B depict, respectively, a bottom perspective view of a portable storage box with cutouts on a rolling base box handle, and a bottom view of the portable storage box, in accordance with an example embodiment;

[0061] FIGS. 16A, 16B, 16C, 16D, 16E, 16F and 16G depict perspective, top, bottom, front, back, left and right views, respectively, of a large storage box in accordance with an example embodiment;

[0062] FIGS. 17A, 17B, 17C and 17D show various views of a storage box constructed in accordance with an example embodiment of the present disclosure to have a dual hinge latch function wherein FIGS. 17A and 17B are respective interior and external views of the storage box with its lid pivotably latched to its bottom portion on one side thereof, and FIG. 17C is a view of the storage box with its lid pivotably latched to a side of the box opposite to the side shown in FIG. 17B, and FIG. 17D is a view of the storage box with the lid removed from its bottom portion;

[0063] FIGS. 18A, 18B, 18C, 18D, 18E, 18F and 18G depict perspective, top, bottom, left, right, back and front views, respectively, of a medium storage box in accordance with an example embodiment;

[0064] FIGS. 19A, 19B, 19C, 19D, 19E, 19F and 19G depict perspective, top, bottom, front, back, left and right views, respectively, of a compact organizer in accordance with an example embodiment;

[0065] FIGS. 20A, 20B, 20C, 20D, 20E, 20F and 20G depict perspective, top, bottom, left, right, back and front views, respectively, of a low profile organizer in accordance with an example embodiment;

[0066] FIGS. 21A, 21B, 21C, 21D, 21E, 21F and 21G depict perspective, front, back, top, bottom, left and right views, respectively, of a latch in accordance with an example embodiment;

[0067] FIGS. 22A, 22B, 22C, 22D, 22E, 22F and 22G depict perspective, front, back, top, bottom, left and right views, respectively, of a latch in accordance with another example embodiment;

[0068] FIGS. 23A, 23B, 23C, 23D, 23E, 23F and 23G depict perspective, front, back, top, bottom, left and right views, respectively, of an example pivotable handle in accordance with an example embodiment;

[0069] FIGS. 24A, 24B and 24C depict respective views of a storage box being stacked upon and interconnected to another storage box using a box-to-box connection system in accordance with an example embodiment;

[0070] FIGS. 25A, 25B and 25C depict respective cross-section views of the top box in FIGS. 24A, 24B and 24C being stacked upon the bottom box in FIGS. 24A, 24B and 24C by a front to back translation of the top box relative to the bottom box in the stack, and FIGS. 26A, 26B and 26C depict respective cross-section views of the top box being stacked upon the bottom box by a back to front translation of the top box relative to the bottom box in the stack, using the box-to-box connection system in accordance with an example embodiment;

[0071] FIGS. 27A and 27B are, respectively, top and bottom views of a storage box having a box-to-box connection system in accordance with an example embodiment;

[0072] FIGS. 27C and 27D are, respectively, a front view of two stacked and interconnected storage boxes using a box-to-box connection system in accordance with an example embodiment, and a partial enlarged cross-section view of a box-to-box connection system component provided on a top surface of a storage box, in accordance with an example embodiment;

[0073] FIGS. 27E and 27F are, respectively, a cross-section view of the two stacked and interconnected storage boxes in FIGS. 27C and 27D, and a partial enlarged cross-section view of a box-to-box connection system component provided on a bottom surface of top storage box engaged with a box-to-box connection system component provided on a top surface of a bottom storage box, in accordance with an example embodiment;

[0074] FIGS. 28A, 28B, 28C, 28D, 28E, 28F and 28G are perspective, top, bottom, left, right, back and front views, respectively, of a locking cleat member in accordance with an example embodiment;

[0075] FIG. 29A is a cross-section view of the two stacked and interconnected storage boxes in FIGS. 27C and 27D, and FIGS. 29B and 29C are partial enlarged cross-section views of an integrative locking system, in accordance with an example embodiment;

[0076] FIG. 30 is a perspective view of a wall mount system for storage boxes in accordance with an example embodiment;

[0077] FIG. 31A is a perspective view of a wall mount system for storage boxes in accordance with another example embodiment;

[0078] FIGS. 31B and 31C are perspective views of example folding shelves for the wall mount system of FIG. 31A;

[0079] FIGS. 32A and 32B are perspective and front views, respectively, of a divider for a rolling base box constructed in accordance with an example embodiment;

[0080] FIGS. 33A and 33B are perspective views of the dividers of FIGS. 32A and 32B inserted into and removed from the rolling base box, respectively, in accordance with an example embodiment;

[0081] FIGS. 34A and 34B are perspective views of a tray for a rolling base box constructed in accordance with an example embodiment;

[0082] FIGS. 35A and 35B are perspective views of the tray of FIGS. 34A and 34B inserted into and removed from the rolling base box, respectively, and FIG. 35C is a partial enlarged perspective view of interior supports for the tray in the rolling base box, in accordance with an example embodiment;

[0083] FIGS. 36A and 36B are perspective and top views, respectively, of a tray constructed in accordance with another example embodiment and shown inserted into a rolling base box;

[0084] FIGS. 37A and 37B are perspective views of a tray inserted into and removed from a portable storage box, respectively, in accordance with an example embodiment;

[0085] FIGS. 38A, 38B, 38C, 38D, 38E, 38F, 38G and 38H are top perspective, bottom perspective, top, bottom, left, right, front and back views, respectively, of the tray shown in FIG. 37B;

[0086] FIG. 39 is a perspective view of a tray constructed in accordance with another example embodiment for insertion into a portable storage box;

[0087] FIGS. 40A and 40B are perspective views of a tray constructed in accordance with yet another example embodiment and shown inserted into and removed from the portable storage box, respectively;

[0088] FIG. 40C is a perspective view of the tray in FIGS. 40A and 40B;

[0089] FIGS. 41A and 41B are perspective and front views, respectively, of a divider for a large storage box constructed in accordance with an example embodiment;

[0090] FIGS. 42A and 42B are, respectively, perspective views of plural dividers of FIGS. 41A and 41B inserted into the large storage box, and of the dividers of FIGS. 41A and 41B together with a tray constructed in accordance with an example embodiment aligned for insertion into the large storage box, respectively;

[0091] FIGS. 43A and 43B are, respectively, a perspective view of the large storage box with the dividers and tray of FIGS. 42A and 42B removed, and a partial enlarged perspective view of interior supports for the tray in the large storage box, in accordance with an example embodiment;

[0092] FIGS. 44A, 44B and 44C are perspective views of the tray of FIGS. 42A and 42B and FIG. 44C depicts the tray with removable dividers in accordance with an example embodiment;

[0093] FIGS. 45A, 45B and 45C are, respectively, perspective, top and side views of an arrangement of bins for use in a medium storage box, in accordance with an example embodiment;

[0094] FIG. 46 is another perspective view of the arrangement of bins shown in FIGS. 45A, 45B and 45C and having an inner bin placed in a different bin in accordance with an example embodiment;

[0095] FIGS. 47A and 47B are, respectively, perspective views of an arrangement of bins for use in a compact organizer in accordance with an example embodiment and showing an inner bin removed and inserted into a bin;

[0096] FIGS. 47C and 47D are, respectively, top and side views of the arrangement of bins shown in FIGS. 47A and 47B;

[0097] FIGS. 48A, 48B and 48C are, respectively, perspective, top and side views of an arrangement of bins for use in a low profile organizer in accordance with an example embodiment;

[0098] FIGS. 49A, 49B, 49C, 49D, 49E, 49F and 49G are perspective, top, bottom, left, right, front and back views, respectively, of a bin constructed in accordance with an example embodiment;

[0099] FIGS. 50A and 50B are, respectively, perspective views of the bin of FIGS. 49A, 49B, 49C, 49D, 49E, 49F and 49G showing a bin divider removed and inserted into the bin in accordance with an example embodiment;

[0100] FIG. 51 is a perspective view of a plurality of the bin of FIGS. 50A and 50B in an arrangement of bins for use as a tray in a compact organizer in accordance with an example embodiment;

[0101] FIG. 52 is a perspective view of the bin of FIGS. 50A and 50B on an alignment tray for a compact organizer in accordance with an example embodiment;

[0102] FIGS. 53A and 53B are enlarged top and bottom views, respectively, of the bin of FIGS. 50A and 50B;

[0103] FIGS. 54A and 54B are, respectively, front and perspective views of an interior surface of a box lid constructed in accordance with an example embodiment;

[0104] FIG. 55 is a partial view of a box lid with an arrangement of bosses, and an enlarged view of a boss, in accordance with an example embodiment;

[0105] FIGS. 56A and 56B are, respectively, a perspective view and a partial enlarged view of a box lid constructed in accordance with an example embodiment;

[0106] FIGS. 57A and 57B are, respectively, interior views of a lid portion and a bottom portion of a box in accordance with an example embodiment;

[0107] FIG. 58 is a partial cross-section view of a lid mounted on a bottom portion of a storage organizer having bins therein, and an inner bin within one of the bins, in accordance with an example embodiment;

[0108] FIGS. 59A and 59B are, respectively, an exterior view and an interior view of a lid for a medium storage box in accordance with an example embodiment;

[0109] FIG. 60 is an interior view of a lid for a compact organizer in accordance with an example embodiment;

[0110] FIGS. 61A and 61B are, respectively, an exterior view and an interior view of a lid for a low profile organizer with an example embodiment;

[0111] FIG. 62 is an interior view of a lid for a portable storage box in accordance with an example embodiment;

[0112] FIG. 63 is a perspective view of a box with a lid portion having a rib pattern that cooperates with an alignment feature in a bottom portion of a box to retain bins in accordance with an example embodiment;

[0113] FIG. 64A is a perspective view of a box with a lid portion having a rib pattern that cooperates with an alignment feature in a bottom portion of a box to retain bins in accordance with an example embodiment;

[0114] FIG. 64B is a perspective view of an alignment tray for use in the box shown in FIG. 64A in accordance with an example embodiment;

[0115] FIGS. 64C and 64D are, respectively, perspective top and bottom views of a bin for use with the alignment tray in FIG. 64B in accordance with an example embodiment;

[0116] FIGS. 65A, 65B and 65C are internal views of respective lids having different rib grid patterns in accordance with example embodiments;

[0117] FIGS. 66A and 66B are perspective views of a box with a lid portion having a rib pattern that cooperates with an alignment feature in a bottom portion of the box to retain bins in accordance with an example embodiment;

[0118] FIG. 67 is a perspective view of dividers and box side panels with pockets that can be provided in a box in accordance with an example embodiment;

[0119] FIG. 68 is a perspective view of a lid on a rolling base unit that is configured to have dividers affixed to the lid and items affixed to the dividers for lid storage in accordance with an example embodiment;

[0120] FIG. 69 is a perspective view of a corner clamp affixed to a box in accordance with an example embodiment;

[0121] FIG. 70 is a perspective view of a box in a modular storage system of stacked boxes that has corner clamps affixed to opposite corners thereof in accordance with an example embodiment;

[0122] FIG. 71 is a perspective view of the box with corner clamps in FIG. 70 having a tool mounted in the corner clamp and secured to the modular storage system in FIG. 70 in accordance with an example embodiment;

[0123] FIG. 72A is a perspective view of stacked boxes having a corner clamp accessory mount and a corner mount accessory, respectively, in accordance with an example embodiment;

[0124] FIG. 72B is a perspective view of stacked boxes in FIG. 72A with a tool mounted using corner mount accessories in both corner clamps in accordance with an example embodiment;

[0125] FIG. 73 is an perspective view of a corner clamp affixed to a box and having an accessory mount in accordance with another example embodiment;

[0126] FIGS. 74A and 74B are top and perspective views, respectively, of the corner clamp in FIG. 73;

[0127] FIGS. 74C and 74D are respective views of the corner clamp in FIG. 73 having a mounting member for an accessory inserted and removed from the accessory mount;

[0128] FIGS. 75A and 75B are top views of a box pinch corner having a corner clamp removed from and affixed thereto in accordance with another example embodiment;

[0129] FIG. 76A illustrates a modular storage system having its retractable handle stopper members in use as a truck tailgate grip in accordance with an example embodiment;

[0130] FIG. 76B illustrates two boxes constructed in accordance with an example embodiment arranged therein in a truck bed;

[0131] FIG. 77 illustrates a removable work surface lid for a box in accordance with an example embodiment;

[0132] FIGS. 78A and 78B are, respectively, perspective top and bottom views of a storage box having a box-to-box connection system in accordance with an example embodiment;

[0133] FIG. 79 is a perspective view of the storage box in FIGS. 78A and 78B;

[0134] FIG. 80 is a partial view of a storage box in accordance with an example embodiment;

[0135] FIGS. 81A and 81B are views of two storage boxes that are stacked and interconnected using a box-to-box connection system, and unstacked, respectively, in accordance with an example embodiment;

[0136] FIGS. 82A and 82B are views of two storage boxes that are stacked and interconnected using a box-to-box connection system, and unstacked, respectively, in accordance with an example embodiment;

[0137] FIGS. 83A and 83B are views of two storage boxes that are stacked and interconnected using a box-to-box connection system, and unstacked, respectively, in accordance with an example embodiment;

[0138] FIGS. 84A and 84B are side and perspective views, respectively, of two storage boxes that are stacked and interconnected using a box-to-box connection system in accordance with an example embodiment;

[0139] FIG. 84C is a perspective view of the two storage boxes of FIGS. 84A and 84B unstacked and in accordance with an example embodiment;

[0140] FIGS. 85A and 85B are side and perspective views, respectively, of two storage boxes that are stacked and interconnected using a box-to-box connection system in accordance with an example embodiment;

[0141] FIG. 85C is a perspective view of the two storage boxes of FIGS. 85A and 85B unstacked and in accordance with an example embodiment;

[0142] FIGS. 86A and 86B are side and perspective views, respectively, of two storage boxes that are stacked and

interconnected using a box-to-box connection system in accordance with an example embodiment;

[0143] FIG. 86C is a perspective view of the two storage boxes of FIGS. 86A and 86B unstacked and in accordance with an example embodiment;

[0144] FIGS. 87A and 87B are views of two storage boxes that are stacked and interconnected using a box-to-box connection system, and unstacked, respectively, in accordance with an example embodiment;

[0145] FIGS. 88A and 88B are side and perspective views, respectively, of two storage boxes that are stacked and interconnected using a box-to-box connection system in accordance with an example embodiment;

[0146] FIG. 88C is a perspective view of the two storage boxes of FIGS. 88A and 88B unstacked and in accordance with an example embodiment;

[0147] FIGS. 89A and 89B are side and perspective views, respectively, of two storage boxes that are stacked and interconnected using a box-to-box connection system in accordance with an example embodiment;

[0148] FIG. 89C is a perspective view of the two storage boxes of FIGS. 89A and 89B unstacked and in accordance with an example embodiment;

[0149] FIGS. 90A and 90B are side and perspective views, respectively, of two storage boxes that are stacked and interconnected using a box-to-box connection system in accordance with an example embodiment;

[0150] FIG. 90C is a perspective view of the two storage boxes of FIGS. 90A and 90B unstacked and in accordance with an example embodiment;

[0151] FIGS. 91A and 91B are side and perspective views, respectively, of two storage boxes that are stacked and interconnected using a box-to-box connection system in accordance with an example embodiment;

[0152] FIG. 91C is a perspective view of the two storage boxes of FIGS. 91A and 91B unstacked and in accordance with an example embodiment;

[0153] FIGS. 92A and 92B are side and perspective views, respectively, of two storage boxes that are stacked and interconnected using a box-to-box connection system in accordance with an example embodiment;

[0154] FIG. 92C is a perspective view of the two storage boxes of FIGS. 92A and 92B unstacked and in accordance with an example embodiment;

[0155] FIGS. 93A and 93B are partial perspective and top views, respectively, of a locking system for use between two stacked storage boxes in accordance with an example embodiment;

[0156] FIGS. 94A and 94B are partial perspective and cross-section side views, respectively, of a locking system for use between two stacked boxes in accordance with an example embodiment;

[0157] FIGS. 95A and 95B are partial perspective and cross-section side views, respectively, of a locking system for use between two stacked boxes in accordance with an example embodiment;

[0158] FIGS. 96A and 96B are partial perspective and cross-section side views, respectively, of a locking system for use between two stacked boxes in accordance with an example embodiment;

[0159] FIGS. 97A and 97B are partial perspective and cross-section side views, respectively, of a locking system for use between two stacked boxes in accordance with an example embodiment;

[0160] FIGS. 98A and 98B are partial perspective and cross-section side views, respectively, of a locking system for use between two stacked boxes in accordance with an example embodiment;

[0161] FIG. 99 is a perspective view of a box having an external mounting board connected thereto in accordance with an example embodiment;

[0162] FIGS. 100A and 100B are perspective views of a work surface lid folded and unfolded, respectively, in accordance with an example embodiment;

[0163] FIG. 100C is a perspective view of the work surface lid of FIGS. 100A and 100B unfolded and deployed on a storage box in accordance with an example embodiment;

[0164] FIG. 101 is a perspective view of a modular storage system in accordance with an example embodiment;

[0165] FIG. 102 is a perspective view of a modular storage system in accordance with an example embodiment;

[0166] FIGS. 103A and 103B are, respectively, a perspective view of a modular storage system with a pivotable work surface, and a partial view of the pivotable work surface in a deployed position, in accordance with an example embodiment;

[0167] FIG. 104 depicts a wall mount system for storage boxes in accordance with an example embodiment and deployed on side walls of a truck bed;

[0168] FIG. 105 depicts a flexible lid for use on storage boxes in accordance with an example embodiment; and

[0169] FIG. 106 is a partial view of a storage box interior with integrated air tag holder and air tag in accordance with an example embodiment.

[0170] Throughout the drawing figures, like reference numbers will be understood to refer to like elements, features and structures.

DETAILED DESCRIPTION OF ILLUSTRATIVE EMBODIMENTS

[0171] Reference will now be made in detail to illustrative embodiments, which are depicted in the accompanying drawings. The embodiments described herein exemplify, but do not limit, the illustrative embodiments by referring to the drawings.

[0172] A robust, heavy-duty, professional-grade, organized modular storage system 10 is provided by example embodiments herein to allow users the ability to securely organize, store, access and transport their tools, accessories, materials, supplies, consumables, and personal items throughout their daily movements between their home, vehicle, office, shop, and worksite. The modular storage system of the present disclosure provides efficient storage, organization, transport of stored items as well as efficient and convenient access to the stored items, which enables users to capture more productive minutes in their day by converting more of their minutes to working minutes and allowing them to be more efficient to complete more jobs for greater earning capacity, and to present themselves and their stored items more professionally.

[0173] In accordance with example embodiments a modular storage system 10 of connectable, heavy-duty storage boxes, cases, container modules, crates, organizers, trays, tool boxes, accessories for item storage and convenient access for use, and rolling carts and/or dollies is provided wherein the system 10 is modular, expandable, and readily adaptable to have new connectable items to it in the future.

Example embodiments described herein provide storage boxes 12 of different sizes by length, width and/or height. Several of the boxes 12 can be configured with removable, customizable organization inserts (e.g., dividers, storage trays, alignment trays, and bins of different sizes). In accordance with illustrative embodiments, the boxes can have advantageous top portions (e.g., lids), exterior and internal features, and accessories as described below. The modular storage system 10 products and features of the example embodiments are connectable to a variety of different housing and transport modes including on a wall, on a side of a truck or van, on a shelf, on a dolly, and in or on a cart, and configurable to meet the needs and pain points of tradesmen, for example, such as electricians, plumbers, HVAC contractors, finish carpenters, framing carpenters, general contractors and remodelers. Example implementations of the disclosed embodiments are likewise applicable and configurable for non-commercial, consumer usage and for military usage.

[0174] Various terms are used to refer to particular system components. Different companies may refer to a component by different names. The present disclosure does not intend to distinguish between components that differ in name but not function. For example, a storage box as described herein can be also considered as a case or container or storage module or storage unit insofar that each can have a bottom wall, side walls and optionally a top wall or lid that define a storage volume, space or compartment therein for storing one of more items such as tools or supplies or other various articles.

[0175] It will be understood that the terms “include,” “including,” “comprise, and/or “comprising,” when used in this disclosure, specify the presence of stated features, integers, steps, operations, elements, and/or components, but do not preclude the presence or addition of one or more other features, integers, steps, operations, elements, components, and/or groups thereof. It will be further understood that, although the terms “first,” “second,” “third,” “front,” “back,” “side,” “bottom,” “top,” etc., may be used herein to describe various elements, components, regions, layers and/or sections, these elements, components, regions, layers and/or sections may not be limited by these terms. These terms are only used to distinguish one element, component, region, layer or section from another element, component, region, layer or section for clarity in their description in the present disclosure. As used herein, the term “and/or” includes any and all combinations of one or more of the associated listed items. Expressions such as “at least one of,” when preceding a list of elements, modify the entire list of elements and do not modify the individual elements of the list. Matters of disclosed example embodiments that are obvious to those of ordinary skill in the technical field to which these example embodiments pertain may not be described here in detail.

[0176] Modular Storage System 10

[0177] FIGS. 1A, 1B and 1C are, respectively, a side elevation view and opposite side perspective views of a modular storage system 10 in accordance with an example embodiment wherein a number of storage boxes 12 are stacked. FIG. 2 is a perspective view of an example modular storage system 10 wherein the storage boxes are unstacked or disassembled from each other.

[0178] With reference to FIGS. 1A through 1C and 2, a mobile and modular design of a storage system 10 constructed in accordance with example embodiments com-

prises, but is not limited to, the following features and products, and any practical combinations thereof. Different sizes of storage boxes **12** (e.g., boxes **12a** through **12g**) are provided such as, but not limited to, a rolling base box **12a** with a telescoping or retractable handle, a connectable extra-large portable storage box **12b**, a large storage box (e.g., a full box) **12c**, a medium storage box (e.g., a half box) **12d**; a compact organizer (e.g., a quarter box) **12e**, and a low profile organizer **12f**. One or more of the boxes **12** has a see-through top cover and removable, customizable organization inserts. The rolling base box **12a** can be dimensioned, for example, for the portable storage box **12b**, and a large storage box **12c** (or two medium boxes **12d** arranged side-by-side) to be releasably connected thereto. Additional boxes **12d**, **12e** and/or **12f** are releasably connected to the large storage box **12c** and optionally another adjacent stacked box **12**. As described, the sizes of boxes **12**, and numbers of boxes **12** constituting a stacked configuration, and the configurations of the stacked boxes **12** can vary from that shown in the FIGS. **1A** through **1C** and **2** and are also within the scope of the example embodiments of the present disclosure and the claims.

[0179] For non-limiting illustrative purposes, example length by width by height dimensions in inches of the respective boxes can be on the order of 36.78"×22.08"×11.62" for the rolling base box **12a** (e.g., FIGS. **5A** through **5G** and **6A** through **6E**) with its retractable handle in a fully retracted position, and 56.78"×22.08"×11.62" for the rolling base box **12a** with its retractable handle in a fully extended position, and 31.58"×22.08"×9.36" for the large storage box **12c** (e.g., FIGS. **16A** through **16G** and **17A** through **17D**). Thus, when aligned and stacked, the rolling base unit and the large storage box have essentially the same perimeter boundary or footprint. Example length by width by height dimensions of a medium storage box or half box **12d** (e.g., FIGS. **18A** through **18G**) can be on the order of 15.33"×22.08"×6.34" such that, when two of the medium storage boxes **12d** are aligned side by side and stacked on a surface of the large storage box, they have essentially the same perimeter boundary or footprint as the large storage box **12c** or the rolling base box **12a**. Example length by width by height dimensions of a compact organizer or quarter box **12e** (e.g., FIGS. **19A** through **19G**) can be on the order of 15.33"×11.0"×6.34" such that, when two of the compact organizer or quarter boxes **12e** are aligned front to back or side by side and stacked on a surface of the medium storage box **12d**, they have essentially the same perimeter boundary or footprint as the medium storage box **12d**. Example length by width by height dimensions of a low profile organizer **12f** (e.g., FIGS. **20A** through **20G**) can be on the order of 15.33"×23.5"×3.37" such that when it is aligned and stacked on a medium storage box **12d**, both boxes **12f** and **12d** have a similar perimeter boundary or footprint. The footprint of the low profile organizer **12f** can be slightly larger because it has a different handle and latch configuration than other boxes **12** as described below in connection with FIGS. **20A** through **20G** depicting different views of an example low profile organizer **12f**.

[0180] Example length by width by height dimensions of portable storage box **12b** (e.g., FIGS. **7A** through **7G** and FIGS. **13A-13B**) can be on the order of 15.33"×22.08"×18.38" such that, when the portable storage box **12b** is connected to a side of the rolling base box **12a** via a box extension connection system **220** described below with

reference to FIGS. **9A-9B**, **10A-10B**, **11** and **12A-12B** and rests on its extended retractable handle, the portable storage box **12b** and rolling base box **12a** have a similar width. The height of the portable storage box **12b** can be considerably greater than the heights of the other boxes **12a**, **12c**, **12d**, **12e** and **12f** to enable storage for larger items such as power tools (e.g., a circular saw).

[0181] FIG. **3** is a side elevation view of an example modular storage system **10** in an upright position relative to its wheels **140**. In accordance with an example embodiment, the wheels **140** and a foot or feet **136** are oriented downwardly and proud of a side of the rolling base box **12a** for placement against an essentially planar ground surface when the stacked configuration is in an upright position for rolling via the wheels. The longitudinal axis of a bottom exterior surface of the rolling base box (e.g., the surface opposite the top surface against which a large storage box **12b** in the stacked configuration of FIGS. **1A-1C** is coupled) and the ground surface is approximately 90 degrees. The upright position of the stacked storage system can be slightly tilted (e.g., with the angle between the bottom exterior surface of the rolling base unit and the ground surface being less than 90 degrees) to facilitate a user tilting the stacked storage system **10** further for transport by holding the handle **120** and rolling via the wheels **140**.

[0182] Example Storage Box **12**

[0183] Other features of the example boxes **12a** through **12f** will now be described with reference to FIGS. **4A** and **4B** which are perspective views of a medium storage box **12d** for illustrative purposes. The reference numerals shown in FIGS. **4A** and **4B** refer to the same parts or components of a box **12** shown in the drawing figures of the present disclosure but may be omitted in one or more of the drawing figures for clarity. While the modular storage system **10** can comprise different sizes of boxes (e.g., **12a** . . . **12n**) with each having different features, a box is referenced generally herein as **12**. Features that are functionally common among the example boxes **12** shall be referenced herein using the same reference numerals in the accompanying drawings, even if their dimensions may vary. Each box **12** comprises, for example, a top exterior surface **13a**, a bottom exterior surface **13b**, and side walls **13c**, **13d**, **13e** and **13f** that define an inner volume **18** for a storage compartment, at least one latch **28** on a side wall of the box to releasably secure a top portion **14** to a bottom portion **16** of the box **12**, at least one handle **38** pivotably secured to a side wall of the box **12** (e.g., except for box **12f** having a fixed handle **46**), and a box-to-box connection system referenced generally as **150** on the top exterior surface **13a** and the bottom exterior surface **13b** of the box **12** to allow the box **12** to be releasably secured to another box **12** (e.g., an adjacent box). An example box-to-box connection system **150** is described below in connection with FIGS. **24A** through **29C** and additional alternate example box-to-box connection systems are shown in FIGS. **78A** through **92C**.

[0184] As described below, the different storage boxes **12** of the modular storage system **10** have features (e.g., a box-to-box connection system **150**, placement of latch(es) **28** and hinge members **22,24** on the top and bottom portions **14, 16**, and box handle(s) **38, 46** placement) that encourage and facilitate different stacking patterns or configurations of boxes **12** stacked one on top of another, that increase effectiveness, stability and efficiency of the boxes **12** when they are stacked together, and that allow access to contents

of boxes 12 while stacked for greater convenience than provided by existing stackable container systems. For example, example embodiments of different storage boxes 12, various external and internal features thereof and accessories described in the present disclosure that encourage the storage boxes 12 to be reconfigurable and multi-functional for customization by users for their particular item storage, organization, transport and access needs.

[0185] With reference continued to FIGS. 4A and 4B, the boxes 12 of different sizes each includes a top portion 14 and a bottom portion 16 that define an inner volume 18 for storage, wherein the top portion 14 can be open or closed relative to the bottom portion 16, or removed from the bottom portion 16 altogether, and the top and bottom portions 14 and 16 can be secured together via one or more latches 28 and optionally hinge members 22, 24. The top portion 14 of a box 12 comprises, for example, an exterior surface 14a of a top wall, an interior surface 14b of the top wall, and four side walls 14c-f comprising a front wall 14c, a back wall 14d opposite the front wall 14c, and third and fourth end side walls 14e and 14f that are opposite to each other. The bottom portion 16 of a box 12 comprises, for example, an exterior surface 16a of a bottom wall, an interior surface 16b of the bottom wall, and four side walls 16c-16f comprising a front wall 16c, a back wall 16d opposite the front wall 16c, and third and fourth end side walls 16e and 16f that are opposite to each other. When the top portion 14 and the bottom portion 16 of a box 12 are closed together, the box 12 has exterior surfaces 13 defined, for example, as the box top exterior surface 13a, the box bottom exterior surface 13b, and four surrounding box exterior side walls 13c-f comprising a front wall 13c, a back wall 13d opposite the front wall, and third and fourth end side walls 13e and 13f that are opposite to each other. The box exterior side walls 13c-f correspond to the respective joined side walls 14c-14f and 16c-16f of the top portion 14 and bottom portion 16. The box top exterior surface 13a of the box corresponds to the exterior surface 14a of the top portion 14, and the box bottom exterior surface 13b of a box 12 corresponds to the exterior surface 16a of the bottom portion 16. It is to be understood that the others sizes of boxes 12a-12c and 12e-12f have similar enumerated parts as shown in and described above with reference to FIGS. 4A and 4B, but some of these part numbers may be omitted for clarity.

[0186] The bottom portion 16 of a box 12 has a designated depth and opening over which the top portion 14 can be affixed to enclose an inner volume 18 for storage. More details of the top portion 14 are described below with reference to example embodiments for lids shown in FIGS. 54A through 65C. The side walls 14c-14f of the lids 14 can have different heights among the boxes 12a-12f, and even different height options for the same type of box 12, to accommodate different accessories (e.g., lights and power supply or battery) and provide for different volumes of interior space 18 within the box 12.

[0187] As stated above, the bottom portion 16 of a box 12 has four surrounding exterior side walls 16c-16f comprising a back wall 16d extending between the two opposite side walls 16e-16f, and a front wall 16c positioned opposite the back wall 16d and extending between the two opposite side walls 16e-16f. As described below with reference to the different boxes 12a-12f, different ones of the back wall 16d, front wall 16c and side walls 16e-16f can be provided with one or more of hinge members 22, 24 for connecting to the

top portion 14, and a latch(es) 28 or other closure means for securing the top portion 14 to the bottom portion 16. Also, front wall and back wall designations are merely used for differentiating among four side walls of a top portion 14 or a bottom portion 16 of a box 12 and do not necessarily designate a front or a back of a box 12. As described below, several of the boxes 12a through 12c are advantageously designed with a dual hinge latches arrangement (e.g., one or more latches 28 on each of two opposite sides of the box) that allows access to the box storage compartment 18 from either of the two opposite sides of the box. Different ones of the back wall, front wall and side walls of the boxes (e.g., side walls 16c-16f of the bottom portion 16) can be provided with one or more of a pivotable handle 38. An example pivotable handle 38 is described below with reference to FIGS. 23A-23G. The pivotable handles 38 used on the respective boxes 12a through 12e are similar in design and function but may have different dimensions with respect to each other to accommodate the different proportional sizes of the boxes 12a through 12e on which they are mounted. An example hinge (e.g., with hinge members 22, 24) is described below with reference to the medium storage box 12d shown in FIGS. 18A-18E. The hinge members 22, 24 are similar for the compact organizer shown in FIGS. 19A-19E and the low profile organizer 12f shown in FIGS. 20A-20E. An example large latch is described with reference to FIGS. 16A-17D depicting a large storage box 12c and FIGS. 21A-21G showing a large version of a latch 28. The large latch 28 is similar to those used for the rolling base box 12a, the portable storage box 12b, the medium storage box 12d and the compact organizer 12e. A different type of latch 28, that is, a small version of the latch 28, is described with reference to FIGS. 20A-20G showing the low profile organizer 12f and FIGS. 22A-22G showing a small version of the latch 28.

[0188] As described below, the boxes 12 have a rugged design which allow their various components to withstand impacts, falls, and long-term use. The boxes 12 are molded or otherwise formed from a durable plastic material. As described below, portions 32, 36 of the side walls 13c-13f of the boxes 12 are formed thicker than other areas on the box for increased structural strength and to create recesses 34 for components such as handles 38 and latches 28 to be arranged flush within a perimeter or exterior boundary of the box 12 to protect handle(s) 38 and latch(es) 28 when side walls 13c-13f of the box(es) 12 are subjected to an applied force or impact. Also, the recesses 34 provide convenient lid lift access for a user's hand, particularly when the lid is closed and the latches 28 are released.

[0189] Rolling Base Box 12a

[0190] FIGS. 5A through 6E show respective views of a rolling base box 12a constructed in accordance with an example embodiment of the present disclosure. FIGS. 5A through 5G depict perspective, top, bottom, left, right, back and front views, respectively, of an example rolling base box 12a. The rolling base box 12a has a top portion (e.g., a lid) 14 and a bottom portion 16 that define an internal storage compartment 18. The rolling base box 12a can be provided with one or two large latches 28 on both of its left and right side walls 16e, 16f to pivotably open the box lid 14 on one side 13e of the box or the other side 13f, or to remove the lid 14 from the box 12a altogether, for advantageous dual sided latch hinge operation of the top portion 14 on the box 12a. A pivotable handle 38 can also be provided on at least

one of the left and right side walls **16e**, **16f**. The top portion **14** has components on its top exterior surface **14a** for a box-to-box connection system **150** described below in connection with FIGS. **24A** through **29C**, and components on two of its left and right side walls **14e,f** to engage the latch(es) **28** as described below. For example, the rolling base box **12a** has a box-to-box connection system **150** comprising channels **156** on its top exterior surface **14a** that interact with guides **160** on the bottom exterior surfaces **16a** of other boxes **12** stacked on the top of the box **12a**.

[0191] Reference is now made to FIGS. **6A** through **6E** which are different perspective views of a rolling base box **12a** in accordance with an example embodiment. In addition to the above illustrative enumerated features of a box **12** described above in connection with FIGS. **5A-5G**, the bottom portion **16** of the rolling base box **12a** also has wheels **140**, a telescopic or retractable handle **120**, and a foot member **136** with fixed handle **146** and feet indicated at **137**. The fixed handle **146** is particularly helpful to a user as a loading lift handle to assist with leveraging a rolling base box **12a** into a truck bed **434** from a tilted orientation as shown in FIG. **76A**. The wheels **140** are for example implemented as two wheels (e.g., 9" wheels) connected to respective opposite ends of an axle **143** and arranged along the axle **143** such that the hubs of the wheels do not sit proud of the sides **16e,16f** of the box **12a** and therefore remain in the perimeter boundary or footprint of the box **12a**. The axle **143** can be substantially exposed from the bottom external surface **16a** of the box **12a** as shown in FIG. **6C**, or be mostly encased in an integral axle track integrally formed in side wall **16f** of the bottom portion **16**. The wheels **140** have a tread pattern indicated generally at **142** that is configured for durability and traction, as well as mud and dirt resistant to discourage clumps of debris from getting stuck among and within the treads **142**. The rolling base box **137** further comprises a foot member **136** with feet **137** on the bottom portion **16** that are arranged to be even with or slightly proud of the wheels to facilitate standing the rolling base unit **12a** and any boxes **12** stacked thereon in an upright position as depicted in FIG. **3**. The feet **137** can also serve as mudflaps to block mud and debris being kicked up by the wheels **140** when in motion.

[0192] An extension connection component **222** is provided on a front wall **16c** of the bottom portion **16** of the rolling base box **12a** that is configured to be removably engaged with an extension connection component **228** provided on one or more of the side walls (e.g., **16e,16f**) of the portable storage box **12b** or other type of box (e.g., a crate **532** as shown in FIG. **105**). The cooperation between the extension connection component **222** of a rolling base box **12a** and one of the extension connection components **228** on side walls of a portable storage box **12b** is described below in connection with FIGS. **9A-15B**.

[0193] The bottom portion **16** of rolling base box **12a** further comprises handle tracks **128a**, **128b** as illustrated in FIGS. **6A-6D** that are configured to receive the retractable handle **120**. The handle **120** comprises two legs **122a**, **122b** and a grip portion **124** extending between two ends of the legs **122a**, **122b**. The handle **120** is shown in a fully extended position in FIGS. **5A-5G**, in partially extended position in FIGS. **6A-6E**, and in a fully retracted position in FIG. **3**, for example. The bottom portion **16** of the rolling base unit **12a** is formed with the two handle tracks **128a**, **128b** disposed along a longitudinal axis thereof and proximal to respective

opposite sides **16e**, **16f** and the bottom exterior surface **16a**. The handle tracks **128a**, **128b** are, for example, formed integrally in the bottom portion **16**. The handle tracks are dimensioned with a length to receive a portion of the handle legs **122a**, **122b** in its fully retracted position. Handle insertion openings **130a**, **130b** to the handle tracks **128a**, **128b** are formed in a front wall **16c** of the bottom portion **16** to receive the respective handle legs **122a**, **122b**. The handle insertion openings **130a**, **130b** and a cross-section of the handle tracks **128a**, **128b** are dimensioned to slidably and stably receive corresponding legs **122a**, **122b** of the handle **120**. In accordance with an advantageous example configuration, the handle tracks **128a**, **128b** are at least partially open relative to the bottom exterior surface **16a** of the rolling base box **12a** as shown generally by the handle track openings **132a**, **132b** (FIG. **6D**) to allow debris that may be introduced into the handle tracks (e.g., via the handle insertion openings **130a**, **130b** and the handle track openings **132a**, **132b**) to fall out of the handle tracks **128a**, **128b** to prevent the handle tracks **128a**, **128b** from being clogged with debris. Further, as the handle legs **122a**, **122b** slide manually in and out of the handle tracks **128a**, **128b**, the handle tracks can also be cleared of debris. For durability and less complexity and cost, the handle **120** can be configured without a rocker lock or locking mechanism that can prevent the handle from being extended or retracted, or locked at a selected position.

[0194] The grip portion **124** of the handle **120** comprises a rubberized grip pad **126** secured to at least a portion of the grip portion **124** to add comfort and to improve a user's manual grip pressure on the handle. The grip portion **124** can also be angled relative to the handle legs **122a**, **122b** to improve ergonomic access to and gripping of the grip portion **124** of the handle **120** by the user when the exterior surface **16a** of the bottom portion **16** of the rolling base box **12a** is disposed along a ground surface. Each of the legs **122a**, **122b** comprises a rubberized or nylon stopper member **134a**, **134b** disposed adjacent to where it adjoins the grip portion **124**. The stopper member **134a**, **134b** each has a catch dimensioned to extend from the handle leg a distance selected to provide a catch against an edge of a tail gate of a truck bed **434** or other surface against which the rolling base box **12a** can be leaned as shown in FIG. **76A**. The side wall **16e** of the rolling base box **12a** can be provided with stopper members **135a**, **135b** (e.g., FIGS. **5D** and **5E**) near the handle insertion openings **130a**, **130b** that abut the grip portion **124** of the handle **120** when the handle is in a fully retracted position. Different portions of the bottom surface **16a** of the rolling base box **12a** can be provided with one or more pattern(s) of raised ribs **144** that can protect the exterior surface **16a** from scuffs.

[0195] Portable Storage Box **12b**

[0196] FIGS. **7A** through **7E** depict perspective, left, right, top, bottom, front and back views, respectively, of an example portable storage **12b**. The portable storage box **12b** has a top portion **14** (e.g., a lid **14**) and a bottom portion **16** that define an internal storage compartment **18**. The bottom portion **16** of the portable storage box **12b** has a latch **28** and a pivotable handle **38** on each of its front and back walls **16c**, **16d**. The latches **28** and the handles **38** are described below in connection with FIGS. **21A-21G** and FIGS. **23A-23G**, respectively. Aligned apertures **44** are provided in the top and bottom portions **14** and **16** to function as a padlock eyelet and receive a shackle of a lock when the top portion

or lid 14 on the box 12b is closed to lock the contents of the box 12b. The top portion 14 has components 156 on its top exterior surface 14a to engage components 160 on the bottom exterior surface 16a of another box in accordance with an example box-to-box connection system 150, and features on two of its four side walls (e.g., 14c, 14d) such as a latch bar 30 to engage the latches 28 as described below in connection with FIGS. 21A-21G. The bottom portion 16 has components 160 on its bottom exterior surface 16a for the box-to-box connection system 150 described below in connection with FIGS. 24A through 29C. For example, the portable storage box 12b has a connection system 150 comprising channels 156 on its top exterior surface 14a that can interact with guides 160 on the bottom exterior surfaces 16a of other boxes 12 stacked on the top of the box 12b, and guides 160 on its bottom exterior surface 16a that can interface with channels 156 on the top exterior surfaces 14a of boxes on which the portable storage box 12b is stacked.

[0197] The bottom portion 16 also has components such as an extension connection component 228 provided on at least one of its side walls (e.g., 16e, 16f) that can cooperate with the extension connection component 222 of the rolling base box 12a. The portable storage box 12b can be provided with an extension connection component 228 on each of its two side walls 16e, 16f that have the same width dimension as the width of rolling base box 12a. The length by width by height dimensions of portable storage box 12b are configured such that, when the portable storage box 12b is connected to a side of the rolling base box 12a via a box extension connection system 220 described below with reference to FIGS. 8 through 15B and the portable storage box 12b can rest on the extended retractable handle 120 of the rolling base box 12a, the portable storage box 12b and rolling base box 12a have a similar width. The height of the portable storage box 12b can be considerably greater than the heights of the other boxes 12a, 12c, 12d, 12e and 12f to enable storage for larger items such as motorized tools.

[0198] Box Extension Connection System 220

[0199] FIGS. 8 through 15B show respective views of an example box extension connection system 220 between two boxes 12 (e.g., between a rolling base box 12a and a portable storage box 12b) constructed in accordance with an example embodiment of the present disclosure. As stated above, an extension connection component 222 is provided on a side wall 16e of the bottom portion 16 of the rolling base box 12a that is configured to be removably engaged with an extension connection component 228 provided on another box 12 such as on one or more of the side walls (e.g., 16e, 16f) of the portable storage box 12b. The cooperation between the extension connection components 222 and 228 of the rolling base box 12a and the portable storage box 12b will now be described with reference to FIGS. 8 through 15B.

[0200] FIG. 8 is a perspective view of two boxes with an example box extension connection system 220 that are in a disconnected state.

[0201] FIGS. 9A and 9B are, respectively, a perspective view of the extension connection component 222 on the rolling base box 12a and a partial, enlarged perspective view of the extension connection component 222 in FIG. 9A. FIGS. 10A and 10B are, respectively, partial, enlarged perspective and top views of the extension connection component 222 of the rolling base box 12a. FIG. 11 is a bottom perspective view of the extension connection component 228 on the portable storage box 12b. FIGS. 12A and

12B are, respectively, a perspective view of the extension connection component 228 on the portable storage box 12b and a partial, enlarged perspective view of the extension connection component 228 in FIG. 12A. FIGS. 13A and 13B depict respective side views of the placement of the extension connection component 228 of the portable storage box 12b onto the extension connection component 222 of the rolling base box 12a. FIGS. 14A and 14B depict, respectively, a side view of the engagement of the respective extension connection components 222 and 228 of the rolling base box 12a and the portable storage box 12b, and a partial, enlarged side view of the extension connection components 222 and 228 in FIG. 13A. FIGS. 15A and 15B depict a bottom perspective view of a portable storage box 12b engaged with a rolling base box 12a via the box extension connection system 10, and a bottom view of the portable storage box 12b in accordance with another example embodiment. As shown in FIG. 15B, the guides 160 on the bottom surface 16a of a portable storage box 12b can be configured with two transverse cutouts 238 that are spaced apart a distance and having a cutout width dimensioned to receive the retractable handle legs 122a, 122b for additional stability for the portable storage box 12b when placed on the extended retractable handle 120.

[0202] As an example, the extension connection component 222 provided on the side wall 16e of the rolling base box 12a can be an insert member, and the extension connection component 228 provided on one or more of the side walls (e.g., 16e, 16f) of the portable storage box 12b can be a sleeve configured to receive the insert member when the portable storage box 12b is placed adjacent to the rolling base box 12a and on its handle 120 in an extended position. The insert member 222 can comprise a planar portion 224 molded or otherwise formed on a free end of a neck portion 225, and an opposite end of the neck portion can be molded or otherwise formed integrally with the side wall 16e of the rolling base unit 12a. The sleeve 228 formed on a side wall of the portable storage box 12b comprises an outer wall 230 that defines a cavity 232 between the outer wall 230 and a side wall 16e, 16f. The sleeve 228 has an opening 234 to receive a top edge of the planar portion 224 of the insert member 222 into the cavity 232.

[0203] With reference to the enlarged, partial, cross-section view of the insert member engaging with the sleeve is provided in FIG. 14B, the depth of the cavity 232 is at least the distance between the outer edge of the planar portion 224 and the neck portion 226. The width of the insert member 222 and the sleeve 228 can vary with respect to the width of the boxes 12a and 12b but can correspond to a recess between thicker areas of the side walls described below to accommodate a handle and/or latch. The opening of the sleeve 234 and the neck portion 226 of the insert member are provided at respective distances from the bottom surfaces of the boxes 12a and 12b such that the box 12b can rest on the extended retractable handle 120 of box 12a when the sleeve 228 is placed on the insert member 222 and the planar portion 224 is received in the cavity 232. The side wall 16e, 16f can be provided with ribs 236 in the cavity 232 to provide structural reinforcement to the side wall of the box 12b.

[0204] The extension connection components 222 and 228 of the rolling base box 12a and the portable storage box 12b can have different shapes than shown in the drawing figures of the present disclosure. For example, an insert member

222 can have a U-shaped planar piece **224** with two legs of the planar piece extending toward the top portion **14** of the box **12a** and that cooperates with a sleeve **228** having a correspondingly shaped cavity **232** to receive the two legs of the insert member **222**. In accordance with other example embodiments, the extension connection component **228** can be provided on the sides of other types of boxes and containers besides the portable storage box **12b** such as on the side of a crate (e.g., FIG. **105**), a bucket, a cord holder, a soft storage bag, and so on to accommodate one of these other types of boxes and containers on rolling base box **12a** and its extended handle **120**.

[0205] Large Storage Box **12c**

[0206] FIGS. **16A** through **17D** show respective views of a large storage box **12c** constructed in accordance with an example embodiment of the present disclosure. FIGS. **16A** through **16G** depict perspective, top, bottom, front, back, left and right views, respectively, of an example large storage box **12c**. FIGS. **17A** through **17D** show various views of a large storage box **12c** constructed in accordance with an example embodiment of the present disclosure to have a dual hinge latch function.

[0207] The large storage box **12c** has a top portion **14** (e.g., a lid **14**) and a bottom portion **16** that define an internal storage compartment **18**. The large storage box **12c** can be provided with two large latches **28** on both of its front and back walls **16c**, **16d** to pivotably open the box lid or top portion **14** on one side **13c** of the box **12c** or the other side **13d**, or to remove the lid **14** from the box **12c** altogether, for advantageous dual sided latch hinge operation of the top portion **14** on the box **12a**, as illustrated in FIGS. **17A** through **17D**. A pivotable handle **38** can also be provided on each of the left and right side walls **16e**, **16f** to increase user convenience of picking up and carrying the large storage box. A pivotable handle **38** is also shown provided on the front wall **16c** and can also be provided on the back wall **16d**. The latches **28** and the handles **38** are described below in connection with FIGS. **21A-21G** and FIGS. **23A-23G**, respectively. The top portion **14** has components **156** on its top exterior surface **14a** for a box-to-box connection system **150** described below in connection with FIGS. **24A** through **29C**, and components on its front and back walls **14c**, **14d** to engage the latch(es) **28** as described below in connection with FIGS. **17A** through **17D**. The bottom portion **16** also has components **160** on its bottom exterior surface **16a** for the box-to-box connection system **150**. For example, the large storage box **12c** has a connection system comprising channels **156** on its top exterior surface **14a** that interact with guides **160** on the bottom exterior surfaces **16a** of other boxes **12** stacked on the top of the box **12c**, and guides **160** on its bottom exterior surface **16a** that can interface with channels **156** on the top exterior surfaces **14a** of boxes **12** on which the large storage box **12c** is stacked.

[0208] FIGS. **21A** through **21G** depict perspective, front, back, top, bottom, left and right views, respectively, of a larger version of an example large latch **28** than is shown in FIGS. **23A** through **23G**. The large latch **28** shown in FIGS. **21A** through **21G** comprises components to securely mount the large latch **28** to a side wall **16c,d** of the box **12c** shown in FIGS. **16A** through **17D**. It is to be understood that the large latch **28** shown on the box **12d** depicted in FIGS. **18A** through **18G**, and on the box **12e** depicted in FIGS. **19A** through **19G**, is configured and operates in same manner as

that of the latches **28** and the box **12c** described with reference to FIGS. **17A** through **17D** and FIGS. **21A** through **21G**.

[0209] In accordance with an example embodiment, the latch **28** has a mounting piece **70** that is secured to a side wall of a bottom portion **16** of the box. The mounting piece **70** has a latch lip member **72** that is set apart from mounting piece **70** to create space for a clamp bar **88**, and a pivotable clamping piece **80**. The latch lip member **72** comprises a bar lip **74** that abuts the clamp bar **88** when the latch is in a locked position, and hinge members (e.g., hinge knuckles) **76** with apertures to receive a pin **80**. The pivotable clamping piece **80** is configured to be pivotable relative to box **12** and the mounting piece **70**, and is dimensioned to retain the clamp bar **88** behind the bar lip **74** when in a locked position and to allow the clamp bar **88** to clear the bar lip **74** when in an unlocked position and pivoted relative to the latch lip member **72**. As shown in FIG. **35C**, the rim of the bottom portion **16** of the box **12** can be provided with one or more bar support members **92** to pivotably receive the clamp bar **88** when in a locked position to facilitate the hinge operation of the lid **14** when latch **28** is in the locked position. The pivotable clamping piece **80** comprises hinge members (e.g., hinge knuckles) **82** with apertures that interleave with the hinge members (e.g., hinge knuckles) **72** to receive the pin **78** for the pivotal movement of the clamping piece **80** relative to the mounting piece **70** with latch lip member **72** and the box **12**. The pivotable clamping piece **80** further comprises a finger member **84** that is manually moved by a user. The finger member **84** has a lip **85** at the free end thereof that is angled away from the side wall of the box **12** to accommodate one or more of the user's fingers for easy and ergonomic operation of the latch **12** to move the latch in and out of locked and unlocked positions.

[0210] As shown, for example, in FIGS. **17A** through **17D**, the top portion or lid **14** of the box **12c** has a latch bar **30** that cooperates with a latch **28** to lock and create a latch hinge operation for the lid **14** relative to the bottom portion **16** of the box. For example, the arrangement of the clamp bar **88** relative to the mounting piece **70** on the side wall of the box can rotatably engage the latch bar **30** when the latch **28** is in a locked position to create a pivot point about the latch bar **30** for the lid **14**. In accordance with an alternative example embodiment, the top portion **14** can have a groove that rotatably receives the clamp bar **88** of the latch **28** to create the pivot point for the lid **14** when the latch **28** is in a locked position.

[0211] In accordance with an example embodiment, the side walls **16c**, **16d**, **16e** and **16f** of the box **12** can be molded or otherwise formed to have thicker portions **32** of the side walls relative to other portions of the side walls to create side wall recesses **34**. Where thicker portions **32** of side walls are at an adjoining corner **36**, the thickness of the corner **36** and edges formed by a proximal recess **34** creates a pinch grip corner **36** for an advantageous corner clamp accessory described below in connection with FIGS. **69** through **75B**. Another advantage of the thicker portions **32** and recesses **34** in the side walls of a box **16c**, **16d**, **16e** and **16f** are that a latch **28** and a handle **38** can be mounted to the bottom portion **16** of a box **12** and within a recess **34** to maintain the latch **28** and a handle **38** within the perimeter boundary or footprint of the box **12** when the latch **28** is in a locked position and the handle **38** is in a resting position against the side wall of the box. Similarly, the latch bar **30** or recess in

the top portion 14 that engages the clamp bar 88 can be disposed in a recess of inset area on the top portion 10. Configuring external features of a box 12 to be within the perimeter boundary or footprint of the box 12 is advantageous to facilitate stacking or use or storage of boxes 12 side by side because their external walls 13a through 13f have a more level surface, as well as to provide the boxes 12 and the system 10 with an aesthetically pleasing appearance. Also, placing the handles 38 and latches 28 in recesses 34 of a box side wall can protect them against impacts because the thicker areas 32 can absorb the impact. Arranging box handles 38 to be on side walls 13c-13f of a box 12 (e.g., as opposed on a top surface 13a) is also advantageous for carrying, stacking and unstacking boxes 12.

[0212] The example embodiment of the latch 28 described with reference to FIGS. 21A through 21G and FIGS. FIGS. 17A through 17D is also advantageous because the latch 28 secures the top portion 14 to the bottom portion 16 of the box 12 independently of the means for interconnecting two boxes (e.g., the box-to-box connection system 150), and can release the top portion 14 from the bottom portion 16 of a box 12 to allow access to its storage compartment 18 even when another box is interconnected on top of it in a stacked configuration.

[0213] An example handle 38 that is pivotable relative to its box 12 will now be described with reference to FIGS. 23A through 23G which depict perspective, front, back, top, bottom, left and right views, respectively, of an example pivotable handle. A handle 38 has handle legs 50a, 50b, each being pivotably mounted at one end thereof to a side wall 13c-13f of a box 12 and being joined to a handle grip portion 52 at an opposite end thereof. The handle grip portion between the handle legs 50a, 50b can be provided with rubberized grip material or a textured portion indicated at 54 to facilitate a user's grip and comfort when gripping the handle 38. The pivotably mounted ends of the legs can be implemented, for example, by forming them with fingers 56 and grooves 58 that interleave with corresponding fingers and grooves provided on the box 12 where the handle 38 is disposed. For example, the box 12 can be provided with corresponding fingers 60 and grooves 58 therebetween in a thicker area 32 of the side wall, as shown in FIG. 17A, to engage with the fingers 56 and grooves 58 of the handle 38. Aligned apertures 62 in the fingers 56 of the handle 38 and in the side wall fingers 60 can receive a rod therein for pivotable engagement with each other.

[0214] Medium Storage Box 12d

[0215] FIGS. 18A through 18G depict perspective, top, bottom, left, right, back and front views, respectively, of an example medium storage box 12d. The medium storage box 12d has a latch 28 on its front wall 13c, and a hinge with hinge members 22, 24 on its back wall 13d. A pivotable handle 38 is provided on at least one of its side walls 16f, for example. The latch 28 and the handle 38 are described in connection with FIGS. 21A-21G and FIGS. 23A-23G, respectively. Aligned apertures 44 are provided in the top and bottom portions 14 and 16 to function as a padlock eyelet and receive a shackle of a lock when the top portion or lid 14 on the box 12d is closed to lock the contents of the box 12d. The top portion 14 has components 156 on its top exterior surface 14a to engage components 160 on the bottom exterior surface 16a of another box in accordance with an example box-to-box connection system 150, and a feature on its front wall (e.g., 14c) such as a latch bar 30 or

recess to engage the latch 28 as described in connection with FIGS. 21A-21G. The bottom portion 16 has components 160 on its bottom exterior surface 16a for the box-to-box connection system 150 described in connection with FIGS. 24A through 29C. For example, the box 12d has a connection system 150 comprising channels 156 on its top exterior surface 14a that can interact with guides 160 on the bottom exterior surfaces 16a of other boxes 12 stacked on the top of the box 12d, and guides 160 on its bottom exterior surface 16a that can interface with channels 156 on the top exterior surfaces 14a of boxes 12 on which the box 12d is stacked.

[0216] Unlike boxes 12a, 12b and 12c, wherein one or more of latch(es) 28 can be mounted on each of opposite sides of the box to allow opening its top portion 14 from either of the opposite sides of the box, the medium storage box can comprise a hinge between the top portion 14 and the bottom portion 16 of the box 16d on one side thereof, and at least one latch 28 on the side of the box 12d opposite the hinge, to allow opening the top portion from only one side of the box. The hinge can comprise, for example, top portion hinge members (e.g., latch knuckles) 22 that interleave with bottom portion hinge members (e.g., latch knuckles) 24. A hinge rod or pin 26 can be inserted into aligned apertures of the hinge members 22, 24 to pivotably connect them to each other.

[0217] Compact Organizer 12e

[0218] FIGS. 19A through 19G depict perspective, top, bottom, front, back, left and right views, respectively, of an example compact organizer 12e. The compact organizer 12e has a latch 28 on its front wall 13c, and a hinge with hinge members 22, 24 on its back wall 13d. A pivotable handle 38 is provided on at least one of its side walls 16f, for example. The latch 28 and the handle 38 are described in connection with FIGS. 21A-21G and FIGS. 23A-23G, respectively. Aligned apertures 44 are provided in the top and bottom portions 14 and 16 to function as a padlock eyelet and receive a shackle of a lock when the top portion or lid 14 on the box 12d is closed to lock the contents of the box 12e. The top portion 14 has components 156 on its top exterior surface 14a to engage components 160 on the bottom exterior surface 16a of another box in accordance with an example box-to-box connection system 150, and a feature on its front wall (e.g., 14c) such as a latch bar 30 or recess to engage the latch 28 as described in connection with FIGS. 21A-21G. The bottom portion 16 has components 160 on its bottom exterior surface 16a for the box-to-box connection system 150 described in connection with FIGS. 24A through 29C. For example, the box 12e has a connection system 150 comprising channels 156 on its top exterior surface 14a that can interact with guides 160 on the bottom exterior surfaces 16a of other boxes 12 stacked on the top of the box 12e, and guides 160 on its bottom exterior surface 16a that can interface with channels 156 on the top exterior surfaces 14a of boxes 12 on which the box 12d is stacked.

[0219] Unlike boxes 12a, 12b and 12c, wherein one or more of latch(es) 28 can be mounted on each of opposite sides of the box to allow opening its top portion 14 from either of the opposite sides of the box, the compact organizer 12e can comprise a hinge between the top portion 14 and the bottom portion 16 of the box 16d on one side thereof, and at least one latch 28 on the side of the box 12d opposite the hinge, to allow opening the top portion 14 from only one side of the box 12d. The hinge can comprise, for example, top portion hinge members (e.g., latch knuckles) 22 that inter-

leave with bottom portion hinge members (e.g., latch knuckles) 24. A hinge rod can be inserted into aligned apertures of the hinge members 22, 24 to pivotably connect them to each other.

[0220] Low Profile Organizer 12f

[0221] FIGS. 20A through 20G depict perspective, top, bottom, left, right, back and front views, respectively, of an example low profile organizer 12f. The low profile organizer 12f has two latches 28 at opposite corners of along its front wall 13c, and a hinge with hinge members 22, 24 on its back wall 13d. A fixed handle 46 is provided on its front walls 16c, for example. Aligned apertures 44 are provided in the top and bottom portions 14 and 16 to function as a padlock eyelet and receive a shackle of a lock when the top portion or lid 14 on the box 12d is closed to lock the contents of the box 12f. The top portion 14 has components 156 on its top exterior surface 14a to engage components 160 on the bottom exterior surface 16a of another box in accordance with an example box-to-box connection system 150, and a feature on its front wall (e.g., 14c) such as a recess 108 to engage a small version of the latch 28 as described below in connection with FIGS. 22A-22G. The bottom portion 16 has components 160 on its bottom exterior surface 16a for the box-to-box connection system 150 described in connection with FIGS. 24A through 29C. For example, the box 12f has a connection system 150 comprising channels 156 on its top exterior surface 14a that can interact with guides 160 on the bottom exterior surfaces 16a of other boxes 12 stacked on the top of the box 12f, and guides 160 on its bottom exterior surface 16a that can interface with channels 156 on the top exterior surfaces 14a of boxes 12 on which the box 12f is stacked.

[0222] Unlike boxes 12a, 12b and 12c, wherein one or more of latch(es) can be mounted on each of opposite sides of the box to allow opening its top portion 14 from either of the opposite sides of the box, the low profile organizer 12f can comprise a hinge between the top portion 14 and the bottom portion 16 of the box 16f on one side thereof, and at least one latch 28 on the side of the box 12f opposite the hinge, to allow opening the top portion 14 from only one side of the box 12f. The hinge can comprise, for example, top portion hinge members (e.g., latch knuckles) 22 that interleave with bottom portion hinge members (e.g., latch knuckles) 24. A hinge rod can be inserted into aligned apertures of the hinge members 22, 24 to pivotably connect them to each other.

[0223] The latches 28 on the low profile organizer 12f will now be described in connection with FIGS. 22A through 22G in accordance with another example embodiment. FIGS. 22A through 22G depict perspective, front, back, top, bottom, left and right views, respectively, of an example small version of a latch 28.

[0224] The latch 28 comprises a mounting bar 100 that is pivotably connected to the bottom portion 16 of the low profile organizer 12f. The mounting bar 100 is disposed over a grooved lip 102 that extends from a corner of the top portion 14. A pivotable clamping piece 104 is pivotably connected to the mounting bar 100. The pivotable clamping piece 104 comprises a finger pad 106 and a 108. The clamp bar 108 is configured to be received in a groove in the top surface 14a of the corner of top portion 14 of the box 12f (e.g., in a groove formed in the lip 102) when the latch 28 is in a locked position. When a user lifts the finger pad 106, the pivotable clamping piece 104 swings towards the

grooved lip 102 to release the clamp bar 108 to achieve an unlocked position for the latch 28. Apertures 110 in the pivotable clamping piece 104 receive respective ends of the clamp bar 108 and allow the clamp bar 108 to rotate therein when the pivotable clamping piece 104 is rotated by the user relative to the mounting bar 100.

[0225] It is to be understood that latches 28 are not limited to the configurations shown in FIGS. 21A-21G and 23A-23G.

[0226] Box-to-Box Connection System 150

[0227] An example box-to-box connection system 150 for interconnecting a box 12 to a top exterior surface 13a (e.g., a top portion exterior surface 14a) or a bottom exterior surface 13b (e.g., a bottom portion exterior surface 16a) of another box 12 will now be described with reference to FIGS. 24A through 29C in accordance with an example embodiment. FIGS. 24A, 24B and 24C depict respective views of a storage box (e.g., a medium storage box 12d) being stacked upon and interconnected to another storage box (e.g., a large storage box 12c) using a box-to-box connection system 150 in accordance with an example embodiment. It is to be understood that the box-to-box connection system 150 can be implemented on different sizes of boxes and other accessories (e.g., a wall mount system as shown in FIGS. 30 and 31A through 31C). Further, it is to be understood that different box-to-box connection systems can be used with the modular storage system 10 (e.g., as illustrated in FIGS. 78A through 98B described below).

[0228] In accordance with an advantageous aspect of the box-to-box connection system 150, FIGS. 25A, 25B and 25C depict respective cross-section views of the top box 12d in FIGS. 24A, 24B and 24C being stacked upon the bottom box 12c by a front to back translation of the top box 12d relative to the bottom box 12c in the stack shown using the box-to-box connection system 150. FIGS. 26A, 26B and 26C depict respective cross-section views of the top box 21d being stacked upon the bottom box 12c by a back to front translation of the top box 12d relative to the bottom box 12c in the stack shown using the box-to-box connection system 150. As described below, the top and bottom boxes in a stacked configuration are provided with respective box-to-box connection system components that are advantageously configured to make initial alignment or registration of the boxes relative to each other simple and versatile for easy and fast stacking, and are also generally self-clearing when exposed to debris.

[0229] The respective box-to-box connection system components will now be described with reference to FIGS. 27A through 27F and described with respect to two stacked large storage boxes 12_{c1} and 12_{c2} by way of an example. FIGS. 27A and 27B are, respectively, top and bottom views of a large storage box 12 having a box-to-box connection system 150 in accordance with an example embodiment. The box-to-box connection system components provided on a top surface 14a of a box 12c comprise channels 156 and a receptacle 168 for a locking cleat member 174. The box-to-box connection system components provided on a bottom surface 16a of the box 12c comprise guides 160 configured to be received in the channels 156 and the locking cleat member 174. As shown in the FIGS. 27A through 27F, the channels 156 and guides 160 extend along an entire dimension of the box 12 (e.g., the width dimension of box 12c) and the channels 156 are open on their respective ends. It is to

be understood that the channels **156** and guides **160** can extend along an entire length dimension of a box **12**, depending on the type of box **12** and its intended orientation relative to other boxes in a stacked configuration of a storage system **10**. The channels **156** and guides **160** extend continuously along the width dimension of the box **12c**. In other words, the side walls of each channel **160** are continuous and extend along a width or length dimension of a box **12**, and the respective ends of the channel **160** are open for self-clearing of any debris. The guide **156** can be a unitary raised member extending from a bottom surface **16a** of a box **12** along a width or length dimension of a box **12**. This continuity of the channels **156** and guides facilitates alignment and registration of two boxes **12** relative to each other by the user for stacking purposes.

[0230] FIGS. **27C** and **27D** are, respectively, a front view of the two stacked and interconnected storage boxes **12_{c1}** and **12_{c2}**, and a partial enlarged cross-section view of an example channel **160** in accordance with an illustrative embodiment. The channel **160** is formed as a cavity in the top surface **14a** of the box **12** and comprises side walls **156a**, **156b** and a bottom **156c**. A top edge **156d** of the side walls **156a**, **156b** partially extends over channel cavity. FIGS. **27E** and **27F** are, respectively, a cross-section view of the two stacked and interconnected storage boxes **12_{c1}** and **12_{c2}**, and a partial enlarged cross-section view of the guide **160** on the bottom surface **16a** of top storage box **12_{c2}** engaged with the channel **156** provided on the top surface **14a** of the bottom storage box **12_{c1}**. The connection system components **156** and **160** on the boxes **12_{c1}** and **12_{c2}** are essentially level and therefore encourage the boxes **12_{c1}** and **12_{c2}** to be level when stacked and the guides and channels are engaged.

[0231] As illustrated in FIGS. **27A** and **27B**, the channels **158** can be provided with a plurality of notches **158** in the top edges **156d**. The guides **160** can each have tabs **162** extending therefrom in a lateral direction. The tabs **162** are configured to be aligned with the notches **158** for insertion of a guide **160** into a channel **156**, and be misaligned with respect to the notches **158** such that portion(s) of a channel edge **156d** where there is no notch **158** provide a surface to prevent the guide **160** from being lifted out of the channel **156**. The guide tabs **162** and the channel notches **158** do not interfere with the versatility of the front to back and back to front engagement afforded by the box-to-box connection system **150**. The arrangement of the channel notches **158** and the guide tabs **162** permits a box **12** to be placed at different points along the top of another box **12** to find notch **158** and tab **162** alignment for insertion of a guide **160** into a channel **156** at various points, obviating the need to commence feeding guides **160** of a box **12** into channels **156** of another box from the front and rear edges of the boxes **12**, respectively. Thus, the alignment of boxes **12** for stacking is easy and fast for the user. The extension of the channels **156** along a length or width dimension of a box **12** (e.g., front to back) presents essentially open cavities that discourage debris from collecting on the top surface **14a** of a Box. The corresponding extension the guides **160** along a length or width dimension of a box **12** likewise discourages debris from collecting on the bottom surface **16a** of a box **12**. The channels **156** and guides **160** are therefore advantageous over other box-to-box connection systems that employ recesses which are prone to collecting debris and becoming clogged and therefore less able to interconnect with components on another box.

[0232] Where the direction of the channels **156** and guides **160** is considered, for example, as a longitudinal direction, then cooperation between complementary channels **156** and guides **160** between two stacked boxes **12** prevents latitudinal movement relative to the longitudinal direction of the channels **156** and guides **160**. In accordance with another aspect of the box-to-box connection system **150**, an integrative locking system **166** is provided that releasably prevents longitudinal movement (e.g., front to back relative movement of the stacked boxes **12_{c1}** and **12_{c2}** in FIGS. **27C** through **27F**), whereby a locking cleat **174** on the bottom surface **16a** of a top box **12** extends downwardly to releasably cooperate with a receptacle **168** on the top surface **14a** of a bottom box **12**, as shown in FIGS. **27A** and **27B**.

[0233] FIGS. **28A**, **28B**, **28C**, **28D**, **28E**, **28F** and **28G** are perspective, top, bottom, left, right, back and front views, respectively, of a locking cleat member **174** in accordance with an example embodiment. FIG. **29A** is a cross-section view of the two stacked and interconnected storage boxes **12_{c1}** and **12_{c2}** in FIGS. **27C** and **27D**, and FIGS. **29B** and **29C** are partial enlarged cross-section views of an integrative locking system **166** implemented in the interconnected storage boxes **12_{c1}** and **12_{c2}** in accordance with an example embodiment.

[0234] The integrative locking system **166** comprises a receptacle **168** provided on a top surface **14a** of a bottom box **12**, and a locking cleat member **174** provided on a bottom surface **16a** of a top box **12**. The receptacle **168** can be, for example, a depression molded into the rim or periphery of the top surface of **14a** and dimensioned to receive a cleat **180** in a locking cleat assembly **170** that is releasable, for example, locking cleat member **174** is manually pivoted by a user. An example locking cleat assembly **170** comprises graduated depression **172** in the bottom surface **16a** of top box **12c2** dimensioned to receive the locking cleat member **174** that has narrow end toward box **12** interior and wider end toward box exterior side wall. The molding of the box **12** to form the graduated depression **172** can result in corresponding raised portion in the interior surface **16b** of the box **12**. The graduated depression has a U-channel **176** at the narrow end which is dimensioned to receive an anchor member **184** of the locking cleat member **174**. The locking cleat member **174** further comprises a flat member **178** that is dimensioned to anchor one end thereof in the graduated depression **172** via the anchor member **184** and have a finger hold member **182** that extends from side wall of the top box but not outside perimeter boundaries of the stacked boxes **12_{c1}** and **12_{c2}**. For example, the top and bottom portions **14** and **16** of the boxes have recesses in their side walls (e.g., one of **13c-13f**) so that the finger hold member **182** extends from the graduated depression **172** and is accessible by a user but does not extend beyond perimeter of boxes **12** defined by thicker areas **32** of their side walls.

[0235] As stated above, a cleat **180** extends from the flat member **178** and is dimensioned to be snug fit into the receptacle **168** when the top box guides **160** slide along the channels **156** of the bottom box sufficiently to align the locking cleat **180** on the top box over the receptacle **168** in the bottom box. The boxes **12** are configured to have receptacles **168** on one or both opposing ends of their top surface **14a** in the longitudinal direction of the channels **156**. Multiple receptacles **168** can be provided as shown in FIG. **27A** to allow the locking cleat members of multiple boxes **12** to be engaged with receptacles **168** when more than one

other box is stacked on the box 12. When a user applies manual finger pressure on the finger hold member 132 of a locking cleat member 174 on a top box (e.g., box 12_{c1}), the flat member 178 pivots (and can flex based on its material) toward the top of the graduated depression 172 in the top box 12_{c1}, causing the cleat 180 to disengage from the receptacle 168 and allowing the top box (e.g., box 12_{c2}) to translate longitudinally relative to the corresponding channel 156 in the bottom box (e.g., box 12_{c1}).

[0236] The locking cleat member 174 and receptacle 168 in bottom and top portions 16 and 14 of two stacked, respectively, do not allow a stacked box to be removed from the other box without manually releasing the cleat 180 from the receptacle 168. The locking cleat member 174 has a low profile and is easy to access by the user with only one hand to release the cleat 180 from the receptacle 168, yet does not interfere with other box features such as latches 28 or a handle 38 and is protected from accidental contact by other objects that could result in unintended release of the cleat 180 from the receptacle 168. In accordance with another advantageous feature of the example box-to-box connection system 150, a user can operate a latch(es) 28 to open the lid portion 14 of a box 12 (e.g., box 12_{c1}) to access its contents while having another box (e.g., box 12_{c2}) stacked thereon.

[0237] Wall Mount System 200

[0238] Features of the above-described example box-to-box connection system 150 can be advantageously incorporated into various wall mount systems for vertically storing boxes 12 in the modular storage system on a wall at a home or base location when not stacked on a rolling base box 12_a for transport to another site, for example. FIG. 30 is a perspective view of a wall mount system 200 for storage boxes 12 in accordance with an example embodiment. The wall mount system 200 comprises panels 202 each having channels 156 as described above. The panels 202 are arranged and secured (e.g., by conventional means such as by wall anchors and fasteners) to a wall in a grid pattern such that their respective channels 156 together form continuous channels 156 across a vertical dimension, for example, of the grid pattern. The panel channels 156 cooperate with guides 160 on bottoms of various boxes 12. For example, the wall mount system 200 in FIG. 30 accommodates a large storage box 12_c, a portable storage box 12_b, a medium storage box 12_d, and two low profile organizers 12_f. One of the low profile organizers 12_f connected to the wall mount system 200 has another low profile organizers 12_f stacked on its top surface 14_a. The panels 202 can be provided with one or more receptacles 168 that can cooperate with a locking cleat member 174 of a box 12, and/or another box brace component or accessory that can be fixed or removably attachable to the panels 202 or the boxes to support the boxes 12 against the wall.

[0239] FIG. 31A is a perspective view of a wall mount system 200 for storage boxes in accordance with another example embodiment wherein one or more of a folding shelf assembly 208 is secured to a wall (e.g., by conventional means such as by wall anchors and fasteners). For example, a panels 202 and a folding shelf assembly 208 can be provided with one or more fastener holes 204 as illustrated in FIG. 31B to receive a fastener screwed or otherwise inserted into the wall. In contrast to the panels 202 in the wall mount system 200 in FIG. 30, the folding shelf assembly 208 in the wall mount system 200 shown in FIG. 31A can be mounted spaced apart from other folding shelf

assemblies 208, or can be secured side by side on the wall to support the same box such as a large storage box 12_c. The folding shelf assembly 208 comprises a mounting portion 210 that is secured to a wall, a shelf 214 with channels 156, a hinge 212 that pivotably connects the shelf 214 to the mounting portion 210, and folding brackets 216. The brackets 216 can be folded flat against mounting portion 210 when the folding shelf assembly 208 is folded or closed, and can be pivoted away from the mounting portion 210 when the folding shelf assembly 208 is unfolded or opened. FIGS. 31B and 31C are perspective views of different arrangements of example folding shelf assemblies 208 with at least one folding shelf assembly 208 folded and at least one folding shelf assembly 208 unfolded for example. An advantage of the wall mount system 200 in FIG. 31A over the wall mount system 200 in FIG. 30 is that the folding shelf assemblies 208 allow a user to open or remove a box lid 14 and access the contents of the box 12 without the contents falling out of the box while it is in storage in the wall mount system.

[0240] In accordance with another embodiment, a cleated mount bar 526 can be provided for mounting on the sides of a truck bed 434 as shown in FIG. 104. The cleated mount bar 526 can be a unitary piece dimensioned to extend along most sizes of truck beds 434 or consist of small panels that can be connected side by side. The cleated mount bar 526 is secured to the side of a truck bed 434 or other vertical surface in a conventional manner as indicated by the fastener receptacles 528. The cleated mount bar 526 comprises a cleat receptacle 530 that engages a feature on a box to releasably connect the box 12 to the cleated mount bar 526. For example, a box 12 can have an integral or removably mounted accessory with a cleat configured to releasably engage the cleat receptacle 530. For example, an angled cleat on a box 12 can be inserted into the cleat receptacle 530 by initially tilting the free end of box 12 upwardly relative to the cleat receptacle 530 such that when the box is levelized, the cleat engages a retaining edge at the top of the cleat receptacle 530.

[0241] Internal Organization Features of Boxes 12

[0242] The boxes 12 of the modular storage system 10 are provided with different advantageous features and accessories for internal organization of boxes 12 to facilitate versatile and convenient customization of the boxes 12 to suit different users' individual needs. Example features and accessories are described below with respect to different sizes of boxes using the boxes 12_a through 12_f as examples. It is to be understood that the features and accessories for internal organization of boxes 12 in accordance with the example embodiments of the present disclosure are not limited to the boxes 12_a through 12_f or the specific implementations of the features and accessories shown in the drawing figures of the present disclosure.

[0243] In accordance with an example embodiment, a rolling base box 12_a can be provided with one or more internal dividers 250 as shown in FIGS. 32A and 32B, and FIGS. 33A and 33B. The dividers 250 can have a thickness, for example, on the order of 0.4-0.5 inches (in), length dimensions designed to fit the divider snugly between two opposite side walls 16_e, 16_f, and height dimensions to optionally rest against an interior surface 16_b of the bottom portion 16 of the box 12_a and/or an interior surface 14_b of the top portion 14 of the box 12_a, to divide the inner volume or storage compartment 18 of the box into smaller portions to organize items and separate them from each other within

the respective smaller portions of the compartment 18. For example, the height of the divider 250 can be selected to abut both inner surfaces 14b, 16b of the top and bottom portions 14, 16 of the box 12a to prevent items in one portion from entering another portion from intended or unintended box motion (e.g., during box transport, or a disturbance of the box when stored or otherwise intended to be stationary). The edges and corners of the divider 250 can be shaped to cooperate with contours within the box 12a. As shown in FIGS. 33A and 33B, a rolling base box 12a can have one or more slots 258 dimensioned to receive the thickness of the divider 250 in a snap-fit configuration for manual insertion and removal of the divider 250 into and from the slot 258.

[0244] With continued reference to FIGS. 32A and 32B, and FIGS. 33A and 33B, and with reference to FIG. 68, a number of fastener holes 256 are provided in the divider 250 to securely affix the divider 250 to an inner surface 14b of the top portion 14 of the rolling base box 12a. As shown in FIG. 68, the divider 250 is advantageously dual purposed for use as yet another internal organization tool mounted on the interior surface of a lid 14, instead of use as a compartment divider as shown in FIGS. 33A and 33B. As shown in FIG. 67, the divider 250 can be provided with pockets 394 of one or more different sizes to store tools (e.g., pens, drill bits, screw driver, and the like). Panels with pockets 392 can also be affixed to the side walls 16c through 16f of the rolling base box 12a as shown in FIG. 67.

[0245] A planar surface of the divider 250 can be designed, for example, as a Modular Lightweight Load-carrying Equipment or MOLLE-type board or flexible interface with columns and rows of apertures 252 and slots 254 to create a webbing design that can be used to connect items thereto by different methods such, but not limited to, as a flexible strap interwoven into one or more slot(s) 254 of the webbing design; or fastener(s) on a lid mounted item that engage with corresponding one(s) of the aperture(s) 252; or cleats or other mounting features on a lid mounted item that releasably engage with corresponding one(s) of the slot(s) 254; or a rigid mounting assembly having (a) a Velcro® strap, fastener or other mounting hardware to connect the mounting assembly to the divider 250 via one or more of the apertures 252 or slots 254 and (b) a releasable connection feature that engages a cooperating connection feature provided on a tool or other item for convenient access. Thus, the divider 250 planar surface having a MOLLE-type interface can removably secure tool holders or item holders, or the tools or items themselves, to the divider's planar surface.

[0246] As shown in FIG. 99, the divider 250 or other shape of MOLLE-type interface board 482 can be mounted to the exterior of the rolling base box 12a or other box 12. The MOLLE board can have slots 484 or other shapes of apertures, and a spacer with fastener receptacle 486 to receive a fastener 488 for insertion into a box screw receptacle or bolt 490 to secure the board 482 to the exterior of the box 12. Thus, a tool 492 can be releasably and conveniently mounted on and accessible from the external MOLLE board 482. Also, the external MOLLE board(s) 482 can each extend the transport and storage capacity of the box 12 to which it is connected in accordance with an advantageous feature of the example embodiments of the modular storage system 10.

[0247] The interior of a rolling base box 12a can be further customized for organization using a removable tray. FIGS. 34A and 34B are perspective views of an example tray 278

for a rolling base box 12a in accordance with an example embodiment. FIGS. 35A and 35B provide perspective views of the tray 278 inserted into and removed from an example location in the rolling base box, and FIG. 35C is a partial enlarged perspective view of interior supports 276 in the rolling base box 12a for the tray 278. The tray 278 has a lip 274 configured to abut the interior supports (e.g., molded hangers) 276 in the side wall of the box 12a. The tray 278 is also configured with integral inset side handles 280. Tray divider ribs 268 create retention slots in the tray side walls to receive a tray divider 282 that can be a partial divider as indicated in FIG. 34A to retain a stored item in place, or a divider that extends across a dimension of the tray to create a separate storage compartment. The tray 278 can be advantageously configured to store different types of items and, in particular, provide a battery solution tray. For example, the central area between the tray dividers 282 can be used for a power inverter or charger. The areas on either side of the central area can be used to hold respective one of a 5 amp hour battery and 2 amp hour battery, for example. The charger can have an interface to an AC power source at a home, office or shop location. The batteries can have interfaces for charging using the charger such that the battery solution tray provides a convenient way of transporting tools to work locations without power supplies and charging the tools.

[0248] FIGS. 36A and 36B are perspective and top views of a tray 260 constructed in accordance with another example embodiment for use in a rolling base box 12a. The tray 260 has different integrated storage compartments 266 and a central integral handle 270 and apertures 272 in its rim to accommodate a pencil, shaft of a screw driver, drill bit or other tool for convenient access when the lid 14 is removed. The tray 260 can be configured with a top rim that cooperates with the edges of the box 12a. The tray can fit, for example, into each third of the box 12a divided by two dividers 250 as shown. The tray 260 can have top edges with an overhang dimensioned to contact and partially overlap portions of the top edge of storage compartment 18 opening in the box 12a. The tray 260 has large internal area(s) 266 for stowing hand tools, for example, as well as slots 272 in the rim thereof to receive the blades or shafts of hand tools or writing instruments, and other smaller storage areas therein for smaller item storage such as screws or other fastener hardware.

[0249] The interior of a portable storage box 12b can be further customized for organization using a removable tray. FIGS. 37A and 37B are perspective views of an example tray 284 for a portable storage box 12b in accordance with an example embodiment. FIGS. 37A and 37B provide perspective views of the tray 284 inserted into and removed from the opening to the bottom portion 16 of the portable storage box 12b.

[0250] FIGS. 38A, 38B, 38C, 38D, 38E, 38F, 38G and 38H are top perspective, bottom perspective, top, bottom, left, right, front and back views, respectively, of the tray 284. The tray 284 has integral inset side handles 280, and at least partial tray dividers 282 which can also be walls 286 that define a compartment 283. The walls 286 can provide reinforcement to the tray bottom in the area where the tray lip 274 is supported by molded hangers 276 in the portable storage box 12b. With reference to FIG. 39, the compartments 283 can also define a central area therebetween that is dimensioned for a charger for a battery solution tray as

described above in connection with the tray 278 for the rolling base box 12a. The bottom of the tray 285 can be molded with a recess 285 at a particular location to accommodate certain larger tools that can be stored in the bottom portion 16 of the portable storage box 12b such a circular saw.

[0251] FIGS. 40A and 40B are perspective views of a tray 288 constructed in accordance with another example embodiment and shown inserted into and removed from the portable storage box 12b, respectively. FIG. 40C is a perspective view of the tray 288. The tray 288 can have a central integral handle 270 and apertures 272 in its rim to accommodate a pencil, shaft of a screw driver, drill bit or other tool for convenient access when the lid 14 is removed. The tray 288 can be configured with a top rim that cooperates with the edges of the box 12b. The tray 288 can fit, for example, into the opening of the bottom portion 16 of the box 12b. The tray 288 can have different sizes of storage compartments 266 defined by dividers 282 some of which can be removable dividers as indicated at 287.

[0252] In accordance with an example embodiment, a large storage box 12c can be provided with one or more internal dividers 290 as shown in FIGS. 41A and 41B, and FIGS. 42A and 42B. The dividers 290 are similar the dividers 250 in that they can have a thickness, for example, on the order of 0.4-0.5 inches (in), length dimensions designed to fit the divider snugly between two opposite side walls 16e, 16f, and height dimensions to optionally rest against an interior surface 16b of the bottom portion 16 of the box 12c and/or an interior surface 14b of the top portion 14 of the box 12c, to divide the inner volume or storage compartment 18 of the large storage box 12c into smaller portions to organize items and separate them from each other within the respective smaller portions of the compartment 18. For example, the height of the divider 290 can be selected to abut both inner surfaces 14b, 16b of the top and bottom portions 14, 16 of the box 12c to prevent items in one portion from entering another portion from intended or unintended box motion (e.g., during box transport, or a disturbance of the box when stored or otherwise intended to be stationary). The edges and corners of the divider 290 can be shaped to cooperate with contours within the large storage box 12c. As shown in FIGS. 42A and 42B, a large storage box 12ca can have one or more slots 258 (FIGS. 33A and 33B) dimensioned to receive the thickness of the divider 290 in a snap-fit configuration for manual insertion and removal of the divider 290 into and from the slot 258.

[0253] With continued reference to FIGS. 41A and 41B, and FIGS. 42A and 42B, a number of fastener holes 256 are provided in the divider 290 to securely affix the divider 290 to an inner surface 14b of the top portion 14 of the large storage box 12c. In a manner similar to the divider 250 for the rolling base box 12a and shown in FIG. 68, the divider 290 is advantageously dual purposed for use as yet another internal organization tool mounted on the interior surface of a lid 14 of a large storage box 12c, instead of use as a compartment divider as shown in FIGS. 42A and 42B. A planar surface of the divider 290 can be designed, for example, as a MOLLE-type board or flexible interface with columns and rows of apertures 252 and slots 254 to create a webbing design that can be used to connect items thereto by different methods, in manner similar to the divider 250 described above. In a manner similar to the divider 250 shown in FIG. 67, the divider 290 can be provided with

pockets 394 of one or more different sizes to store tools (e.g., pens, drill bits, screw driver, and the like). Panels with pockets 392 can also be affixed to the side walls 16c through 16f of the large storage box 12c in a manner similar to the side wall panels with pockets 392 shown in the rolling base box 12 as in FIG. 67.

[0254] FIG. 42 shows an example tray 292 constructed in accordance with an example embodiment and aligned for insertion into the large storage box 12c. As shown in FIGS. 43A, 43B and 44C, the tray 292 has a lip 274 configured to abut the interior supports (e.g., molded hangers) 276 in the side wall of the box 12c. The tray 292 is also configured with integral inset side handles 280. Tray divider ribs 268 create retention slots in the tray side walls to receive a tray divider 282 that can be a partial divider as indicated in FIG. 44A to retain a stored item in place, or a divider 287 that extends across a dimension of the tray to create a separate storage compartment as shown in FIG. 44C. The tray 292 can be therefore also advantageously configured to store different types of items and, in particular, provide a battery solution tray as described above in connection with the tray 250 for the rolling base unit 12a.

[0255] The molded hangers 276 along the side walls of the boxes 12a-12c described above can be used to cooperate with fasteners (e.g., hooks or slots) in soft bags to hang them within the box 12a-12c storage compartment 18. In accordance with another example embodiment, a soft sided bag can comprise cleats along a top edge thereof that cooperate with dividers 250, 290 and edges of a box 12a-12c (e.g., a portion of a cleat hangs over an edge of a divider or box, or inserts into a slot provided in the sides of the box).

[0256] The interiors of a medium storage box 12d, a compact organizer 12e, and low profile organizer 12f can be further organized and customized using various arrangements of bins. The arrangement of bins can cover the entire bottom interior surfaces 16b of these boxes 12e-f.

[0257] FIGS. 45A, 45B and 45C depict an example arrangement 296 of individual receptacles or bins 300 for use in a medium storage box 12d in accordance with an example embodiment. As shown, the bins 300 can be different sizes in terms of length and width, and can also have different depths as shown by the inner bin 330 that can be placed within a bin 300. FIG. 46 is another perspective view of the arrangement of bins 296 shown in FIGS. 45A, 45B and 45C but having an inner bin 330 placed in a different bin 300 in accordance with another example embodiment. Some of the bins 300 have a contoured and protruding portion 320 on the exterior bin bottom that abuts ribs or complementary contours in the interior bottom surface 16b of the box as shown in FIG. 58. Other bins 300 have a flat bottom 324 with or without legs to cooperate with a complementary interior bottom surface 16b of the box 12. The contours 320 or legs 325 of the bins 300 and/or the complementary contours or ribs in the interior bottom surface 16b of the box 12 operate together to maintain the bins at their corresponding location within the box 12 and within the bin arrangement (e.g., 296).

[0258] The bins 300 can have inset external corners and corresponding interior corner protrusions as shown in the FIGS. 45A through 45C to cooperate, for example with features on lid 14 or interior bottom surface 16b of a box 12. The opening defined by the curved rim or edge of the bin 330 can be dimensioned to be received within the opening defined by the curved rim or edge of the bin 300. The interior

corner protrusions of the bins 300 as shown in the FIGS. 45A through 45C can engage with the underside of the outer edge of the bin 330 rim to maintain the position of the bin 330 at a corresponding height relative to the top edge of the bin 300.

[0259] FIGS. 47A through 47D depict an example arrangement 297 of individual bins 300 for use in a compact organizer 12e in accordance with an example embodiment, and also show an inner bin 330 removed and inserted into one of the bins 300. FIGS. 48A, 48B and 48C depict an example arrangement 298 of individual bins 300 for use in a low profile organizer 12f in accordance with an example embodiment. The depth of the low profile organizer 12f is less than that of the other boxes 12d and 12e and therefore the bins 300 are more shallow.

[0260] The bins 300 and 330 are particularly useful for organizing and storing small items such as different types of fasteners, for example. As described below with respect to advantageous lid 14 features, the lids 14 can be configured to abut the bins 300 and 330 to discourage migration of small parts out of a bin during intended or unintended movement of the box 12.

[0261] It is to be understood that different numbers, and sizes and configurations or arrangements of bins can be used with the boxes 12d through 12f than shown with respect to the arrangements 296, 297 and 298 of bins shown in the drawing figures. For example, some of the bins 300 can be omitted to leave space in a box for an elongated item (e.g., pliers or scissors). Also, the opening defined by the curved rim or edge of the bin 300 can be dimensioned to receive the bottom of another bin 300 for stacking purposes within a box.

[0262] FIGS. 49A through 49G depict another configuration for a bin 300 in accordance with an example embodiment. The bin 300 can have a lip 306 at its top opening similar to the bins shown in FIGS. 45A through 48C. A label area 308 can be provided. As described below, the lids 14 of the boxes can be clear or translucent which enables a user to see contents of the bins 300 and 330 as well as to read any labels or markings applied to the label area 308. The bins 300 can each be provided with one or more pairs of opposite ribs 312 or slots that are configured to receive a removable divider 310 as shown in FIGS. 50A and 50B. The oblong bins 300 shown in FIGS. 45A through 48C can similarly have one or more pairs of opposite ribs 312 or slots that are configured to receive a removable divider 310. As described below, the bottom exterior surface of a bin 300 can have a recess 316 and a notch or channel 317 that can cooperate with features such as a protrusion and ribs, respectively, in the bottom surface 16b of a box 12. The bottom interior surface of a bin 300 can be smooth or have an elevated area 318 corresponding in shape to the recess 316 and channel 317 depending on how the bin bottom is molded.

[0263] FIG. 51 shows an example arrangement of bins 300 with dividers 310 arranged in a compact organizer 12e. The bins 300 can be retained in position within a box 12 using an alignment tray 332 in accordance with an example embodiment. For example, as shown in FIGS. 49A through 49G and in the enlarged views of a bin 300 in FIGS. 53A and 53B, a bin 300 can be provided with at least one recess 316 on the bottom exterior surface thereof that can engage a feature such as a complementary protrusion 338 provided on the bottom inner surface 16b of a box 12 or on an alignment tray 332 configured for placement on the bottom inner

surface 16b of the box 12. The inner circumference of a recess 316 and the outer circumference of a protrusion 338 are dimensioned, respectively, similarly with respect to each other to provide a releasable snug-fit or snap-fit engagement with each other while allowing a user's manual force on a bin 300 to separate the bin recess(es) 316 from coordinating or complementary protrusion(s) on the a box 12 surface 16b or alignment tray 332. Also, the depth of the recess 316 and/or the height of the protrusion 338 can be dimensioned to increase the manual force used to separate the bin from the box or tray, or decrease a moment arm of the bin relative to the box or tray. Also, the shape of a recess 316 and a protrusion 338 are similar or, if different, at least part of a recess 316 accommodates a protrusion 338, and the shape is selected from a basic shape (e.g., a geometric shape with few sides or having symmetrical sides) or a more complex shape (e.g., an intricate shape with several sides and/or an irregular shape) to prevent translation of the bin 300 relative to the box 12 in the plane of the bottom interior surface 16b of the box.

[0264] A distribution pattern of one or more recesses 316 in a bin 300 can corresponds to at least part of a distribution pattern of protrusions 338 extending from a surface of a box 12 or a planar member 334 of a tray 332. For example, the spacing between two recesses 316 corresponds to the spacing between two protrusions 338 to allow one or more of the recesses 316 to receive corresponding ones of the protrusions 338. Corresponding distribution patterns of one or more recesses 316 in a bin 300 and one or more protrusions 338 in a box 12 or tray 332 can be symmetrical or irregular, and can have different densities (e.g., the number of recesses and protrusions within a designated square area) depending on the sizes of the bins 300, box 12 and tray 332 and on the respective inner and outer circumferences of the recesses 316 and protrusions 338 and the distances therebetween. For example, a different and more dense pattern of bin recesses 316 and tray protrusions 338 is shown in FIGS. 64B, 64D and 66A, 66B as compared with those in FIGS. 52, 53A and 53B. The tray 332 can be provided with one or more footers 336 to displace the bottom exterior surface of the tray 332 away from the bottom 16b of the box 12 to allow storage of tools underneath the tray 332 or to accommodate contours in the bottom surface 16b of the box. The tray 332 can also have one or more finger holes dimensioned to accommodate respective user fingers to allow a user to grip and lift the tray 332 from the box 12.

[0265] In accordance with another embodiment, a box 12 interior can be configured to releasably hold an air tag with unique identifier to facilitate wireless monitoring of box 12 locations. FIG. 106 is a partial view of a storage box 12 interior with integrated air tag holder 534 and a removable air tag 536 inserted therein in accordance with an example embodiment. The integrated air tag holder 534 can be molded, for example, as an integrated slot in an interior side wall 13c-13c or on an interior surface 14b 16b of a box and dimensioned to receive the air tag 536 in the slot, and secure the air tag 536 within the box 12e while protecting the air tag 536 from box contents.

[0266] Box Lids 14

[0267] The interior structure of the top portion or lid 14 of a box 12 in the modular storage system 10 will now be described with reference to FIGS. 54A through 68. The interior features of the lids 14 described in accordance with example embodiments realize many advantages such as, but

not limited to, increased versatility and storage options for, and easier user access to, stored items in the modular storage system **10**. In addition to other lid features described herein, the lid for each box **12** can be provided with a seal along its interior perimeter and have clearances and tolerances with respect to the box **12** enclosure to achieve at least an Ingress Protection rating of IP65 and can be configured for a minimum of IP66 dust and water rating (e.g., up to IP68).

[0268] FIGS. **54A** and **54B** depict an example interior surface **14b** of a top portion or lid **14** of a rolling base box **12a**. The same sized lid **14** and configuration shown in FIGS. **54A** and **54B** can also be used for a large storage box **12c**. The top portion **14** can be a clear or opaque lid structure with an internal surface **14b** comprising a grid pattern of ribs **350**, and a plurality of receptacles (e.g., screw bosses) **354** provided in accordance with a boss pattern that can include all or only a subset of intersections of at least two of the ribs **350**. Each receptacle **354** is configured to provide a hole or channel in which a screw or other fastener, or a pin, can be inserted therein to allow for items to be affixed to the lid **14** in a convenient and versatile manner. Such lid storage is useful for additional specialized organization to complement bulk storage available in the storage compartment **18** or bottom portion of a box, and is particularly useful for items that often find their way to the bottom of a storage box **12** due to their thinner or overall smaller size (e.g., hand tools, drilling and driving bits, chargers and batteries, and so on).

[0269] The ribs **350** increase structural strength of the lid **14** structure to prevent flexing thereof under a designated weight tolerance (e.g., 200 pounds standing or stationary weight applied to the top portion of the box such as from other boxes stacked on top of the box). For example, rib **350** height and the plastic volume can be selected to reduce to a desired amount the deflection distance in response to a force (e.g., a standing load). The grid pattern of ribs can be designed to have a more dense pattern in some areas of the lid structure (e.g., its middle section) than other areas of the lid structure (e.g., end sections of the lid structure that are disposed on opposite side of a more densely reinforced middle section). An example pattern of greater density can be centered double trusses **366** and with more diagonal ribs providing a reinforcing lattice structure **368** therebetween, or otherwise smaller areas defined by intersecting ribs **350**.

[0270] With continued reference to FIGS. **54A** and **54B** and with reference to FIGS. **56A** and **56B**, the top portion or lid **14** of a box has slots or undercuts **360** provided in at least one of the ribs **350**. These undercuts **360** are also advantageous features that accommodate snap-fit or fastened accessories or tools to be connected to the lid **14**. For example, an accessory or tool can be provided with a cleat or cleats that mate with one or more of the slots **360** to releasably hold the accessory or tool against the underside **14b** of the lid **14** when not in use, and to allow for convenient access and detachment of the accessory or tool from the lid **14** when needed.

[0271] As shown in FIG. **55**, the selected boss **354** size at the rib **350** intersections or elsewhere on the lid **14** can have an outer diameter of 10 millimeters (mm) and an internal dimension of 3.5 mm×3.5 mm, for example, to fit a standard #10 screw, or other dimensions to securely receive a self-tapping 0.25 inch screw, for example. Example grid spacing between adjacent bosses on a lid **14** can be, for example, on the order of 90-96 mm. A fastening mount to the screw boss can also be a two-part item wherein a first part employs

pressure to securely fit into a screw boss **354** provided on the underside of the lid **14**, and a second part screws into the first part to ensure fitting of the fastener into the screw boss **354**. It is to be understood that different boss **354** sizes can be used to cooperate with different types of fasteners such as a wing nut, slotted or Phillips head screw or other fastener such as a snap fit plug. The bosses **354** allow different accessories and/or items to be connected to the lid **14** such as, for example, holders for various tools such as for blades for different types of saws (e.g., circular, reciprocating, diamond, and cut-off saw, among others) or drill or driver bits, cordless devices (e.g., light source, radio), cables and cable management accessories, hand tools, and so on. For example, a bar structure can be mounted between two screw bosses **354** and span essentially any distance across the lid **14**, thereby allowing a tool with a clip to be removably mounted to the bar structure and therefore to the lid **14** (e.g., a power adapter, a tape measure, or other items that are provided with belt clips). Also, a pressure slotted accessory can be affixed to the lid **14** via fasteners in corresponding screw bosses. The pressure slotted accessory is a board or other substrate with increasing thickness from one end to the other, or a board of uniform thickness with graduated pedestal. In either example, the thickest portion of the pressure slotted accessory is oriented toward the bottom of the planar part of the lid **14** when it is open relative to the bottom portion **16** of a box **12**. The accessory can have one or more straps or bands that apply retention pressure on a tool or item located under the strap(s) to retain the tool or item against the board. When the lid **14** is open, the increased thickness of the pressure slotted accessory toward the bottom part thereof reduces the effect of gravity pulling the tool or item downward and off the pressure slotted accessory board or substrate.

[0272] As described below, the tops of ribs **350** that surround areas defined by portions of intersecting ribs **350** in the grid pattern on a lid **14** can cooperate with the upper edges of internal organization bins **300** shaped similarly to these areas and placed in the bottom portion **16** of a box **12** to prevent items (e.g., fasteners of different types) in bins **300** from escaping their respective bins when the lid **14** is closed over the bottom portion of the box. The grid patterns of the ribs **350** can vary among the respective sizes of boxes **12a-f** and therefore permit these respective boxes to accommodate different numbers and locations of internal organization bins **300** and withstand varying amounts of standing forces. FIGS. **54A**, **57A** and **60** illustrates example amounts of grid spacing and resulting grid patterns with different sizes of areas that accommodate internal organization bins **300**.

[0273] For example, FIG. **57A** is a planar view of the interior surface **14b** on an example lid **14** for a storage organizer with lid features such as rib **350** spacing and 'X' ribs **358** provided at selected bosses **354** to retain bins **300** arranged in a bottom portion of the box as shown in FIG. **57B**. FIG. **57B** is a planar view of the interior of the bottom portion **16** of the box **12d** with the different bins **300** arranged therein in, for example, a symmetrical layout of bins of various sizes. At least the ribs **350** proximal to the rim or outer circumference of the lid **14** have tabs **351** that engage the bins arranged proximally to the outer circumference of the lid.

[0274] In accordance with example embodiments, a lid **14** is provided with rib and tab features that stabilize different

types of internal organizer bins (e.g., bin 300, inner bin 330) within the box 12. FIG. 58 is a partial cross-section view of a lid 14 mounted on a bottom portion of a box 12 having internal bins 300 therein, and an inner bin 330 within one of the bins 300. A rib 350 can have a tab 351 to hold a bin 300 at the middle of at least one of its four sides as illustrated in FIGS. 57A and 58 to thereby hold the bin 300 in place within the bottom portion 16 and prevent shifting of the bin during transport of the box 12.

[0275] As shown in FIGS. 57A, 58, 60 and 61B, for example, the 'X' ribs 358 are provided at respective intersection points of the ribs 350 on the lid 14 to align and hold an inner bin 330 as illustrated in FIGS. 57A and 58. The 'X' ribs 358 can be configured at the intersections of ribs where bosses 354 are located. In accordance with an embodiment, the center of an 'X' rib 358 can include or be a boss 358 or other connection point. Alternatively, the 'X' rib 358 structure be implemented as an accessory, whereby a detachable 'X' rib 358 accessory can be secured at a boss location 358 on the lid 14 where needed to hold down bins of various sizes (e.g., an inner bin 330).

[0276] The lid 14 of a medium storage organizer and low profile organizer 12f (e.g., FIGS. 59A and 59B and FIGS. 61A and 61B), a compact organizer 12e (e.g., FIG. 60), and a portable storage box 12b (e.g., FIG. 62) can have respective ribbing patterns formed in accordance with alternative embodiments in accordance with the different box sizes and functions (e.g., to cooperate with bins therein, and/or releasable mount items therefore for storage and convenient access). It is to be understood that the lids 14 can be formed from a clear material such as polycarbonate, or of an opaque material such as polypropylene, depending on the different box functions (e.g., an opaque and clear lid 14 options can be provided for a box to accommodate box content privacy or visibility goals, respectively).

[0277] With reference to FIGS. 63 through 66B, lids can have different gridded ribbing and/or alignment ribbing configurations to align with different internal organization bins 300 and cooperate with different box bottom alignment structures. As shown in FIG. 65C and in accordance with a first alternative example rib design embodiment 378, the interior surface 14b of the lid 14 is formed using gridded ribbing and alignment ribbing. This rib design can align bins 300 from the top and bottom in any orientation, and a lid rib sits flush to top edges of bin(s) to prevent parts migration. Alignment tray protrusions cooperate with recesses formed in the bottom(s) of the bin(s) (e.g., FIGS. 63 through 64D). With reference to FIG. 65B and in accordance with a second alternative example rib design embodiment 376, the interior surface of the lid 14 is formed using a reverse ribbing pattern. The reverse ribbing pattern creates a desirable visual effect from the inside of the lid and can prevent most parts from migrating because a lid rib sits, for the most part, flush to top edges of bin(s) except, depending on bin size, for a few gaps that may allow small parts to travel. This second rib design also does not align bins from the top like the first alternative design in FIG. 65C. With reference to FIG. 65A and in accordance with a third example rib design embodiment 350, the interior surface of the lid 14 is formed using gridded ribbing 350 and mounting holes or bosses 354. This third design is used in the example lids 14 shown in FIGS., 54A, 57A, 59B, 60, 61B and 62, and provides a grid pattern of ribs 350 that is easier to see through and therefore has improved visibility of stored items from the exterior of the

box 12. The mounting holes or bosses 354 can also be advantageously used for mounting accessories and tools as described above when the lid is not being used with bins 300 as a parts organizer. Since the ribs 350 sit flush to top edges of bin(s), this rib design also prevents parts migration, and uses the least plastic compared to the first and second rib designs.

[0278] The lid 14 can be removable from the box (e.g., the rolling base 12a) altogether and placed with the rib 350 grid pattern facing upward to allow convenient access to tools or items secured thereto or otherwise stored thereon (e.g., a battery and charger, an arrangement of bits for a powered drill, a flashlight or other light source, a measuring tape, a level, and/or screw driver, among other items) by the use of the bosses and fasteners, and rib slots and straps (e.g., elastic straps). In addition to the rib 350 grid pattern and screw bosses 354 provided integrally to the lid, a box storage compartment divider 250, 290 can be removed from the storage compartment or inner volume of the box 12 and affixed to the lid 14 (e.g., via screws in selected screw bosses) to provide a MOLLE-board type interface

[0279] Alternatively, the lid 14 can be affixed to the bottom portion 16 of a box 12 instead of removable therefrom. For example, a cable can have a first end with a screw that can be secured to the lid 14 via a fastener in a screw boss provided on one of the side walls 14c-14f of a box extending between the front and back sides of the box, for example. Alternatively, the first end of the cable can be permanently screwed in and sealed within an aperture in the lid 14. The second end of the cable can be provided with a shaped end that can be placed in one end of a key hole fitting provided in a divider groove in a side wall 16c-16f of the bottom portion 16 of the box 14. Installment of the key hole fitting can be disposed opposite the installment of the first end of the cable when the lid 14 is closed over the bottom portion 14 of the box. The other end of the key hole fitting is shaped and/or is smaller to accommodate the thickness of the cable but also prevent the shaped end of the cable from being removed therefrom. A cable can be installed on one or both side walls of a box 12.

[0280] As shown in FIG. 105, a box, bucket, or crate 12 can have a flexible lid 532 as shown in FIG. 105. Also, lids 14 of differing heights can be provided for a box 12, which in exemplary implementations can accommodate different accessories (lights and power supply or battery), and provide for different volumes of interior space within the box 12.

[0281] With reference to FIGS. 100A through 100C, a lid 14 can be dual purposed by being configured as a removable and collapsible raised work surface lid 494, in addition to providing cover for and access to the interior of the box 12. An example work surface lid 494 has a work surface 498 and folding legs 496a, 496b that pivot toward and are stowed against the work surface 498 when the work surface 498 is deployed as a lid. A lid mechanism for connecting the latch 28 to the lid 494 is omitted for clarity of the drawing figures but can be implemented, for example, as described herein with respect to the top portion 14 engagement with a latch 28. The folding legs 496a, 496b can be opened and mounted in receptacle or groove in the bottom portion 16 of the box when the work surface 498 is deployed and in use as a work surface.

[0282] FIG. 77 depicts a lid 14 that can be dual purposed by being configured as a removable work surface lid 398 in accordance with another example embodiment. The work

surface 398 and the bottom portion 16 of the box 12a can both be provided with apertures in the corners (e.g., 4021 through 4024) thereof to removably receive opposite ends of legs 4001 through 4004. When the work surface lid 398 is not in use as a work surface, the legs 4001 through 4004 can be stowed inside the box 12a or connected to the exterior of a box 12 in a modular storage system 10 using an exterior organization accessory such as a MOLLE-board 482 (FIG. 99) or a corner clamp 404 described with reference to FIGS. 69 through 75B.

[0283] Lids 14 can also be provided with differing exterior mounts or features designed for different themes of uses such as camping, sports spectating and other recreational uses, or performing different types of jobs or trades such as carpentry, plumbing, vehicle maintenance, and so on.

[0284] Lids 14 can be provided with lights mounted thereon and can be provided with a motion sensor or on/off switch that is activated to turn a lid light off when the lid is closed on the case. A charger or light or battery mounted on a lid can be powered by one or more photovoltaic or solar cells provided on the exterior of the case. LED lights can be provided along the interior or exterior of a case and powered via a battery pack or the solar cells.

[0285] As explained above on connection with FIGS. 17A through 17D, a lid can provide dual sided latch hinge operation whereby, in exemplary implementations, a lid 14 with hinges on two opposite sides thereof allows convenient access to the contents of the box 12 on which the lid is deployed from either side of the case. This arrangement is particularly convenient when the box (e.g., a rolling base unit 12a) is loaded onto a truck bed 434 and a user can reach the box contents from either side of the truck bed 434 as shown in FIG. 76B.

[0286] In accordance with an example embodiment, a lid 14 can be configured as an organizer lid comprising a thin case with at least one side being a clear or semitransparent lid and storage cubbies in a bottom portion thereof, and that serves as a lid 14 when the organizer lid assembly is secured to a box 12.

[0287] External Organization Features of Boxes 12

[0288] In accordance with example embodiments, the boxes 12 in a modular storage system can be provided with different external features and accessories relative to the outsides of the boxes 12 to expand the ability of the system 10 to store and transport items and increase access to these items.

[0289] An exterior box mounting accessory can include, for example, 0.5 inch diameter by 20 thread (i.e., 1/2x20) or 1/4x20 bolts or other fasteners for easy addition of exterior mounting systems (e.g., MOLLE boards, soft bags, hand tool pockets, do-it-yourself (DIY) solutions, and so on) to a case or combination of cases to allow a user of a portable modular system to quickly move around a jobsite with convenient access to externally mounted items without having to pack and unpack case(s) to gain access to those items. For example, as stated above, an exterior organization accessory such as a MOLLE-board 482 (FIG. 99) can be affixed to the exterior of a box 12 to enable connection of tools and other items. Long handled tools (e.g., shovel, rake) can be detachably connected to a side 13c-13f of a box (e.g., lengthwise along a rolling base box 12a) for transport.

[0290] As stated above, the thicker areas 32 of a box 12 can form a pinch grip corner 36 on which a corner clamp 404 can be mounted in accordance with an example embodi-

ment. With reference to reference to FIGS. 69 through 75B, the corner clamp 404 can be affixed to a corner 406 of a box 12 having an inset edge (e.g., implemented via a pinch grip corner 36 with an adjacent recess side wall 34). The corner clamp 404 can comprise a first clamp member 410 that can be provided with an accessory mount 424. The first clamp member 410 can be releasably secured to a second clamp member 412 by a clamp fastener 414 (e.g., an inset screw as shown in FIGS. 74A-74D, or a thumb screw as shown in FIGS. 75A-75B). Different accessories 416 with different accessory mounts to the corner clamp 404 and to a tool or other item 418 to be attached to the exterior of a box 12 can be used in accordance with example embodiments. For example, a fixed mounting member 420 (FIG. 72A) of the accessory 416 can be detachably connected to or integrated with a corner clamp and have an engagement feature (e.g., a lip, slot or recess 411, or insert member 424) to receive or otherwise detachably cooperate with a complementary mounting member 422 provided to a tool or other item 418. The mounting member 422 connected to the tool or other item 418 can comprises a further tool connection feature such as a band or pocket 428 to hold a long tool (e.g., a level as shown in FIGS. 71 and 72B), or a prong 432. Corner clamps 404 with prongs 432 can be provided on opposite corners of a box to facilitate winding an electrical power cord for external storage and convenient access.

[0291] The rolling base box 12a described herein is a two-wheel solution for a modular storage system 10. In accordance with another example embodiment, the modular storage system 10 can be configured with an adaptable four wheel dolly system can include a dolly base 502 having wheels 504 on one side and a flat bed or support surface 506 on the other side that accommodates one or more boxes 12 thereon, and a pivotable handle 508 attached to the base 502 (e.g., to a front wheel axle 510 that allows the front wheels to pivot laterally in the direction of handle operation) to allow a user to move heavy loads with minimal strain on the user's body. The adaptable four wheel dolly system fits easily through doors, and provides increased maneuverability compared to two wheel handcart configurations. The flat bed or support surface 506 can be provided with box-to-box connection system parts (e.g., channels 160 as described with reference to the box-to-box connection system 150 or other connecting means) to connect a bottom layer of box(es) 12 to the support surface 506 of the dolly 502.

[0292] FIG. 102 depicts another example embodiment of an adaptable four wheel dolly system 520 having a cart handle 512 with rails connected to the dolly base 506. Two of the wheels 514 can be configured to pivot laterally. With reference to FIGS. 103A and 103B, the handle 512 can support a fixed or detachable pivotable work surface 516. The pivotable work surface 516 has a pivotable connecting mechanism 518 that is configured to allow a work surface 518 to rotate about a grip portion of the handle 512 from an undeployed position adjacent the rails of the cart handle 512 to a deployed position across stacked boxes 12 on the dolly 502. The work surface 518 has foldable legs 520 and can be provided with work surface mounting features 524 for various tools and applications.

[0293] As shown in FIG. 102, an extension connection system 220 can be used on two of the boxes 12 on the four wheel dolly 502, allowing a box to extend beyond the dimensions of the dolly base 502. Alternatively, the rails of the cart handle 512 or the handle 120 can have a quick

mounted rail system to allow affixing a box to the legs thereof (e.g., to add another row to the current combination of boxes **12** placed on the dolly cart handle **512**).

[0294] Alternate Box-to-Box Connection Systems

[0295] An example box-to-box connection system **150** is described herein with reference to FIGS. **24A** through **29C**. Other example embodiments of box-to-box connection systems will now be described with reference to FIGS. **78A** through **98B**.

[0296] FIGS. **78A** and **78B** are, respectively, top and bottom of perspective views of a storage box **12** constructed in accordance with an example embodiment. The top surface **14a** of the box **12** comprises a plurality of protuberances **440** extending from the top surface. The protuberances **440** can be arranged in clusters **441** (FIG. **79**). As shown in FIGS. **78A** through **84C**, protuberances **440** or clusters **441** are arranged along a top surface **14a** of a box in a manner that delineate open, continuous channels **444** of space in which protuberances **440** arranged on a bottom surface **16a** of another box can be received to stack the two boxes together and prevent translation in at least one of lateral and longitudinal directions relative to the stacked boxes **12**. The protuberances **440** on the top and/or bottom surfaces **14a**, **16a** of the boxes **12** can be configured with one or more edges **496** that engage cooperating protuberances **440** to prevent the boxes **12** from being unstacked.

[0297] As shown in FIGS. **78A** through **81B** and **83A** and **83B**, a box **21** can have a rim **448** surrounding the edge of its top surface **14a** or only partially surrounding it (e.g., rims only at box corners in FIG. **79**) to reinforce and protect the top surface of the box. The rims, however, do not interfere with arrangements of protuberances **400** to provide several continuous channels **444** of space in between. FIG. **80** illustrates a latch **28** as described in FIGS. **22A** through **22G** and **20A** implemented with respect to a section of reinforced rim **448**. Instead of or in addition to a rim **448**, edges of the top portion **14** of a box can be reinforced with buttress members **450** as shown in FIGS. **82A** through **83B**.

[0298] FIGS. **78A** through **84C** and **88A** through **92B** illustrate different sizes and shapes of protuberances **440** on the top and bottom surfaces **14a**, **16a** of boxes for cooperating with complementary protuberances **440** on another box stacked relative thereto. FIGS. **78A** through **84C** and **88A** through **92B** also illustrate different arrangements of protuberances **440** and density or number of protuberances **440** in these arrangements, as well as different types of edges **446** and placement of edges **446** on protuberances **440**. FIGS. **89A-89C** show recesses **464** arranged among the protuberances **440** on a top surface **14a** of a box that are each dimensioned to receive a complementary protuberance **440** on the bottom surface **16a** of another box **12**. The recesses **464** reduce translational movement of stacked boxes relative to each other but do not have a retaining edge like other types of protuberances **440** provided on the box **12** surfaces **14a** and **16a**. The different example box-to-box connection systems illustrated in FIGS. **78A** through **92C** provide two-way box connection using dual slide attachment configurations that allow boxes **12** to be connected front-to-back or back-to-front. The box-to-box connection system illustrated in FIGS. **82A** and **89B** is an example of a four-way box connection that allow boxes **12** to be connected front-to-back or back-to-front, as well as side-to-front, or side-to-back.

[0299] FIGS. **85A** through **87B** illustrate unitary and continuous protuberances **440** across a dimension of a top surface **14a** of a box **12** to essentially form open and continuous channel cavities **452** with continuous side wall similar in function to the channels **156** in the box-to-box connection system **150**. Unitary and continuous protuberances **440** across a dimension of a bottom surface **16a** of a box **12** are arranged to form continuous guides **458** arranged and dimensioned to be received in channel cavities **452** of another box **12**. The guides **458** are similar in function to the guides **160** in the box-to-box connection system **150**. As shown in FIGS. **85A** and **85B**, the channel cavities **452** can be provided with tabs **454** for a retaining edge **446**. The channel cavities **452** can also be provided with stoppers at the ends thereof that are dimensioned to keep the channel cavities **452** open at their ends. As shown in FIG. **85C**, the guides **458** can be provided with spaced T-shaped tabs **460** to provide a retaining edge **446**.

[0300] Similar to the example box-to-box connection system **150**, the example embodiments of box-to-box connection systems in FIGS. **78A** through **92B** have spaces extending entire length and/or width dimensions of top and bottom surfaces **14a** and **16a** (e.g., or nearly entire length and/or width dimensions of top and bottom surfaces **14a** and **16a** of a box **12** that has a surrounding or partially surrounding rim) and therefore do not collect debris, in contrast with designs that use tongues or other male coupling members within respective recesses or depressions for coupling two boxes for stacking purposes. The arrangements of protuberances are advantageous over box connection components such as recesses or depressions with or without ribs that connect to tongues or other male coupling members since the box connection components that employ such recesses or depressions cannot engage the tongues or other male coupling members effectively when they contain debris and/or are obscured by debris. By contrast, the protuberances **440** are arranged in rows with columns of self-cleaning space therebetween.

[0301] The box-to-box connection systems shown in FIGS. **78A** through **92C** can be configured with different types of integrative locking systems such as the integrative locking system **166** described with reference to FIGS. **28A** through **29C** and well as with different components. For example, some of the stacked boxes in FIGS. **78A** through **92C** employ a locking cleat member **174**, while a different locking cleat member **470** (FIG. **78B**) can be used. Some of the stacked boxes in FIGS. **78A** through **92C** employ a receptacle **168** to receive a cleat, and others employ an edge **468** to abut against a cleat. The receptacle can be implemented in a reinforced rim **448** (FIG. **78A**) or in the top surface **14a**. A cleat **474** of a locking cleat member **470** can engage more than one of spaced receptacles **168** (FIG. **86B**). FIGS. **93A** through **98B** show different implementations of a locking cleat member **470** having a pivot connection **472** in a recess **478** of a top stacked box to pivot the locking cleat member **470** to disengage a cleat **474** from a recess **480** in a bottom stacked box. The locking cleat member **470** is provided with a finger member **476** for a user's finger(s) to pivot the locking cleat member **470** to disengage the cleat **474**.

[0302] The modular storage system **10** realizes a number of advantages over existing storage cases and storage systems such as, but not limited to: easier unloading and unloading of boxes **12** from a vehicle; increased accessibil-

ity to stored items in a bottom stacked box **12**; longer boxes **12a** and **12c** to store longer tools and materials not accommodated in existing boxes, box dimensions that increase efficiency of use of storage compartment (e.g., less wasted box space); box **12** features and storage accessories that optimize work from a truck at a remote site; rugged, minimized and easier to manipulate connection points (e.g., handles, latches, locking cleat members) to open or unstack/stack or carry boxes; improved and expanded options for interior organization of boxes; among other improvements. For example, the modular storage system **10** provides a comprehensive range of modular, professional grade, ruggedized mobile storage solutions for tools, materials, supplies and other items that are durable and designed for improved ability to transportation, accessibility, storage, and organization of stored items to address multiple and customizable uses or applications for different kinds of users.

[0303] Boxes **12** in a system **10** (e.g., FIGS. 1A-1C) with vertically aligned latching mechanisms (e.g., latches **28**) among stacked boxes along at least one side of the stack allows a user to conveniently open boxes from the same side for easy access to box contents. Also, the user is not required to unstack boxes **12** to open a box disposed in a stack under one or more other boxes. The modular storage system **10** provides different scalable sizes of boxes **12**, each box **12** having the same box-to-box connection components for interchangeability, and scalable hinges and latches, for a professional and aesthetically appealing appearance, and a functionally organized appearance that facilitates ergonomically efficient and convenient use of all system **10** boxes **12**, box components and accessories.

[0304] The design of the larger boxes **12a** and **12c** to emphasize horizontal content distribution realizes a number of advantages such as, but not limited to: accommodating longer tools and materials than possible with existing cases; improved storage efficiency and therefore less wasted storage space; fewer tools covered by other items for easier location, retrieval and use; and easier loading.

[0305] The rolling base box **12a**, for example, is easy to load and unload from a truck bed **434**, particularly with its handle **120** stoppers **134a**, **134b** configured to operate as a tailgate grip. The handle legs **122a**, **122b** provide a pivot point(s) that, when rested on a truck bed tailgate, allow a user to leverage a heavy box **12** or combination **10** of boxes **12** into a truck bed **434** without first having to disassemble the box(es) **12** from the rolling base box **12a** or dolly **502** (FIG. 102).

[0306] The horizontal form factor of the rolling base box **12a** permits its storage within the depth of most conventional pickup truck beds **434** so as not to interfere with a truck bed cover for improved security of the box **12a** and its stored items.

[0307] One aspect of the example embodiments of the present disclosure that improves accessibility is a user's ability to quickly store an object and remove the object from storage in a box. For example, the box-to-box connection system (e.g., **150**) with integrative locking system (e.g., **160**) being independent of the lid latch **28** design allows for opening a box **12** to access items stored therein even when it has other boxes stacked upon it.

[0308] The dual hinge design of the latches **28** on several of the boxes **12** allows access from either side of the box **12**, which makes access easier when the box or stacked boxes are located in different places such as on the bed **434** of a

pick-up truck (see FIG. 76B). Also with the lids still secure on the boxes **12**, they can rest back to back on each other and be held in place while the boxes are on the truck bed. The dual hinge design of the latches **28** also does not interfere with box contents.

[0309] Another aspect of accessibility is the storage system's ability to engage many differently sized boxes with a standardized connection mechanism (e.g., channels **156** and guides **160**) between the boxes **12** and various modular storage system accessories (e.g., such wall mount systems as shown in FIGS. 30 through 31C). This facilitates engagement of an object or box(es) **12** at a plurality of locations.

[0310] The boxes **12** in the modular storage system **10** have multiple connection points for increased storage capacity and accessibility of stored and transported items such as, but not limited to: the extension connection system **220**, the box-to-box connection system features (e.g., channels **156**, guides **160**), the pinch grip corners **36**, among other features in accordance with example embodiments.

[0311] The boxes **12** in the modular storage system **10** have multiple customizable interior organization features such as, but not limited to: dividers **250**, **290**, bins **300**, trays, and lid design and lid mounting solutions, among other features in accordance with example embodiments.

[0312] For example, tool attachment accessories for lids and outer and inner sides of boxes can include external attachment accessories to removably attach tools (e.g., shovel, broom, battery pack, charger, light, handheld tools, and so on) to the exteriors of a box **12** such as on its side or on its lid, and internal attachment systems to secure light(s) to a lid underside to provide interior case lighting or to attach other types of tools to a lid underside such as a bottle opener, and so on. The lid underside is provided with a grid of ribs and recesses to expand storage options. Mounting accessories also include a cleated mount bar that can be attached to sides of a panel van or a truck bed, and a corresponding back mounted cleated system secured to a surface of a case to mount the case to the mount bar, as well as wall panels that employ box-to-box connection features (e.g., channels) to engage complementary features in a box to be removably stowed on a wall via the wall panels.

[0313] The modular storage system **10** products (e.g., boxes **12**) and features of the example embodiments are designed with attention to: durability, mobility, security and weather resistance. For example, regarding durability, strong materials and rugged design are used which allow the modular storage system and its components to withstand impacts, falls, long-term use, which includes using heavy-duty wheels that hold up against a variety of different worksite landscapes among other ruggedized components.

[0314] An advantageous mobile design of the modular storage system **10** comprises convenient and comfortable handles that do not extend beyond the outer dimensions of the box **12** and that allow for hand mobility of the box **12** and connectability of the box **12** to a variety of different wheeled transport devices. The modular storage system **10** products and features are secure, that is, the boxes **12** are designed to allow for a secured locking mechanism, both from entry into the storage box **12** and from nefarious removal of a box **12** from an open truck bed because the box **12** did not fit under a truck bed cover. The storage system boxes **12** and features are weather resistant, including covered cases and trays with seals tight enough to keep dirt, dust, and water out.

[0315] In accordance with example embodiments, a modular storage system **10** is provided for interconnecting boxes or container modules **12** to each other in a stacked configuration. For example, a box or container module **12** configured for connection with another box or container module **12** can have any number of and any combinations of the following features. Further, first and second interconnecting boxes or container modules **12** can have the same number of and combinations of the following features. Accessories for a box or container module **12** in the modular storage system **10** can have any number of and any combinations of the following features.

[0316] 1) A storage system comprises means for removably connecting a first container module to a second container module.

[0317] 2) The storage system can further comprise means for selectively locking the first container module to the second container module.

[0318] 3) A storage system comprises an open container, a lid for covering a container, and a dual hinge system selectively attaching said lid at either side of said container to selectively close said container and/or provide access to said container.

[0319] 4) A storage system comprising at least one of, or any combination of: means for removably connecting a first container module to a second container module; means for selectively locking the first container module to a second container module; and a lid for covering at least one of said first and second container module, and a dual hinge system selectively attaching said lid at either side of at least one of said first and second container module to selectively close said at least one of said first and second container module and/or provide access to said at least one of said first and second container module.

[0320] 5) The storage system can further comprise means for removably connecting said first container module to said second container module.

[0321] 6) The storage system can further comprise means for selectively locking the first container module to the second container module.

[0322] 7) The means for removably connecting said first container module to said second container module can comprise connecting components disposed on opposite surfaces of at least one of said lid and said container module, respectively.

[0323] 8) In a storage system, the means for interconnecting boxes can comprise at least one raised guide disposed along a surface of a first box, and at least one channel disposed along a surface of a second box and dimensioned to receive the guide.

[0324] 9) The guide can extend along a dimension of the surface of the first box chosen from a box width and a box length.

[0325] 10) The guide has a length that corresponds to the dimension of the surface of the first box chosen from the box width and the box length of the first box.

[0326] 11) The channel can extend along a dimension of the surface of the second box chosen from a box width and a box length.

[0327] 12) The channel has a length that corresponds to the dimension of the surface of the second box chosen from the box width and the box length of the second box.

[0328] 13) The channel is open at opposite ends thereof.

[0329] 14) In a stacked configuration where the first box is stacked on top of the second box, the surface of the first box comprising the at least one guide is a bottom exterior surface of the first box, and the surface of the second box comprising the at least one channel is a top exterior surface of the second box, the channel is a cavity formed in the top exterior surface of the second box, the cavity comprising a channel bottom and two channel side walls extending inwardly from the top exterior surface of the second box toward the channel bottom.

[0330] 15) In a stacked configuration where the first box is stacked on top of the second box, the surface of the first box comprising the at least one guide is a bottom exterior surface of the first box, and the surface of the second box comprising the at least one channel is a top exterior surface of the second box, the guide is a raised member extending from the bottom exterior surface of the first box.

[0331] 16) The at least one channel comprises opposite side walls with top edges that extend at least partially over the channel and notches in the top edges of the side walls, the at least one guide comprises tabs that can be aligned with the notches for insertion of the guide into the channel and be misaligned to abut at least one tab against an underside of one of the top edges to provide a surface to prevent the guide from being lifted out of the box channel.

[0332] 17) The first box and the second box can slide relative to each other in both a forward direction and a backward direction along a box engagement path when the guide of the first box contacts the channel in the second box.

[0333] 18) The tabs extend from a top edge of the guide in a direction transverse to the box engagement path.

[0334] 19) Means for interconnecting boxes can comprise an integrative locking system having a cleat disposed on one of two interconnected boxes, and a receptacle configured to receive the cleat and disposed on the other one of the two interconnected boxes.

[0335] 20) The integrative locking system further comprises a cleat member configured as a flat member with the cleat extending from a portion thereof between a first end and a second end, the flat member being securable at the first end thereof to one of the two interconnected boxes, the flat member being movable to remove the cleat from the receptacle when force is applied to the second end to move the second end toward the box and stationary to retain the cleat in the receptacle when no force is applied to the second end to move the second end toward the box.

[0336] 21) The box to which the flat member is secured is molded with a depression in the bottom exterior surface thereof that is dimensioned to receive the flat member.

[0337] 22) The at least one guide and the at least one channel are configured to prevent relative translational movement between the first box and the second box in a first direction corresponding to one of two-dimensional directions comprising an x-axis and a y-axis perpendicular to the x-axis, and the means for interconnecting boxes further comprises integrative locking means for preventing relative translational movement between the first box and the second box in a second direction corresponding to the other one of the two-dimensional directions.

[0338] 23) Wherein the at least one guide and the at least one channel extend along the first box and second box, respectively, in the second direction between a first edge and a second edge on each of the first box and second box, and the integrative locking means can comprise, for example, a

cleat disposed at one of the first edge and the second edge of the first box and cleat retaining member chosen from a receptacle and a wedge disposed at the corresponding one of the first edge and the second edge of the second box that is aligned to receive the cleat when the first box is translated over the second box in the second direction.

[0339] 24) In a modular storage system comprising at least two boxes with means for interconnecting the at least two boxes to each other in a stacked configuration, each of the boxes can comprise a top portion and a bottom portion that define an inner volume for a storage compartment, and at least one latch on a side wall of the box to releasably secure the top portion to the bottom portion and enclose the storage compartment.

[0340] 25) The latch secures the top portion to the bottom portion of the box independently of the means for interconnecting the at least two boxes, and can release the top portion from the bottom portion of the box to allow access to the storage compartment when the at least two boxes are interconnected for a stacked configuration.

[0341] 26) One or more of the at least one latch can be mounted on each of opposite sides of a box to allow opening the top portion from either of the opposite sides of the box.

[0342] 27) The box can comprise a hinge between the top portion and the bottom portion of the box on one side thereof, and at least one latch on the side of the box opposite the hinge.

[0343] 28) The at least one latch is anchored to and pivots from a point on the bottom portion of the box, the at least one latch having a pivotable clamping piece that is pivotable relative to the box from an unlocked position whereby the pivotable clamping piece is detached from the box to a locked position whereby the pivotable clamping piece is releasably coupled to a clamping piece coupling feature in the top portion of the box.

[0344] 29) The clamping piece coupling feature in the top portion of the box is chosen from a groove that receives a portion of the pivotable clamping piece therein, and a bar that is disposed to be clamped under a portion of the pivotable clamping piece when the pivotable clamping piece is in the locked position.

[0345] 30) The box comprises a rod member along a side wall in the top portion thereof, and the latch comprises a cut-out portion that rotatably receives the rod member in the locked position to pivot about the top portion when the side wall opposite the rod member is moved away from the bottom portion of the box.

[0346] 31) A box can have at least one box carrying handle pivotably secured to at least one side wall of the box.

[0347] 32) A side wall of a box can be formed with at least one thinner area of less thickness than thicker areas at opposite ends of the side wall of the box at adjoining corners with other side walls of the box, the thicker areas at the adjoining corners providing reinforcing strength to the box against stacking pressure, the thinner area being configured as a depression in the side wall relative to the thicker areas at opposite ends of the side wall.

[0348] 33) A side wall of the box can have an additional thicker area disposed between the thicker areas at the opposite ends of the side wall and separated therefrom by the at least one thinner area.

[0349] 34) At least one of the latch and the box carrying handle can be disposed within the depression.

[0350] 35) The box carrying handle is configured to have a fixed end mounted to the box and a free end that can move relative to the box between an undeployed position wherein the box carrying handle is disposed along the side wall of the box and a deployed position wherein the free end extends away from the side wall of the box, the depression in the side wall having a selected depth to receive the box carrying handle in the undeployed position so that the box carrying handle does not extend beyond the thicker areas of the side wall.

[0351] 36) The latch is configured to have mounting piece mounted to the box and a pivotable clamping piece that is pivotable relative to the box from an unlocked position whereby the pivotable clamping piece is detached from the box to a locked position whereby the pivotable clamping piece is releasably coupled to a retention feature in the top portion of the box, the depression in the side wall having a selected depth to receive the latch in the unlocked position so that the latch does not extend beyond the thicker areas of the side wall.

[0352] 37) The retention feature can be chosen from a groove or a rod disposed in the top portion of the box.

[0353] 38) The latch is configured to have mounting piece mounted to the box at one of the adjoining corners and a pivotable clamping piece that is pivotable relative to the box from an unlocked position whereby the pivotable clamping piece is detached from the box to a locked position whereby the pivotable clamping piece is releasably coupled to a retention feature in the top portion of the box.

[0354] 39) In the modular storage system, a plurality of boxes characterized by a plurality of sizes are stackable in a plurality of combinations of boxes that can comprise different numbers of the boxes and different ones of the plurality of sizes of boxes.

[0355] 40) Each of the plurality of boxes can comprise a top portion and a bottom portion that define an inner volume for a storage compartment, and at least one of the plurality of boxes has a first length, a first width and a first depth, the first length being greater than the first width.

[0356] 41) At least two of the plurality of boxes are large boxes characterized by the first length and the first width and that have means for interconnecting to various ones of the plurality of boxes, the large boxes being stackable one on top of the other along an exterior surface thereof having the first length.

[0357] 42) The large boxes are characterized by a top exterior surface and a bottom exterior surface having the first length and side walls, two of the side walls each having the first length and two of the latches.

[0358] 43) At least one of the plurality of boxes is a medium box characterized by two side walls having one-half of the first length and the other side walls having the first width, and having the means for interconnecting to various ones of the plurality of boxes, and one of the latches disposed on at least one of the side walls of one-half of the first length.

[0359] 44) At least one of the plurality of boxes is a compact box characterized by two side walls having one-half of the first length and the other side walls having the one-half of the first width, and having the means for interconnecting to various ones of the plurality of boxes, and one of the latches disposed on at least one of the side walls of one-half of the first length.

[0360] 45) At least one of the plurality of boxes is a low profile box characterized by two side walls having one-half of the first length and the other side walls having the first width, and having the means for interconnecting to various ones of the plurality of boxes, and a depth that is less than a depth of the large box.

[0361] 46) At least one of the plurality of boxes is a high profile box characterized by two side walls having a length less than the first length and the other side walls having the first width, and having the means for interconnecting to various ones of the plurality of boxes, and a depth that is greater than a depth of the large box. In the modular storage system having at least two boxes, one of the at least two large boxes is a rolling base box comprising at least one wheel and a retractable handle connected relative to respective ends of the bottom portion.

[0362] 47) The rolling base box can have exterior surfaces comprising a top exterior surface, a bottom exterior surface, and four exterior side walls, the exterior side walls comprising a front first side wall, a back second side wall opposite the front first side wall, and third and fourth side walls opposite each other that are, respectively, a bottom side wall when the rolling base box is set on its end that has the wheel connected relative thereto, and a top side wall from which the retractable handle extends.

[0363] 48) An axis of the wheel is disposed a distance relative to the bottom side wall that allows a tread of the wheel to be proud of the bottom side wall.

[0364] 49) The rolling base box comprises one or more foot members disposed adjacent the wheels and having a bottom edge thereof that is proud of the bottom side wall to operate with the wheel to balance the rolling base box when tilted to stand with its bottom side wall toward a ground surface.

[0365] 50) The rolling base box comprises a fixed handle disposed on the bottom side wall,

[0366] 51) The rolling base box comprises handle tracks in the bottom portion, the handle slides in and out of the handle tracks to selectively extend from track openings in the top side wall.

[0367] 52) The handle tracks are formed integrally in the bottom portion and are at least partially open relative to the bottom exterior surface of the rolling base box.

[0368] 53) The handle comprises two parallel handle legs having first ends that engage the handle tracks and slide therein, and second ends that join respective ends of a grip member, the second ends of the handle legs and the grip member each having a top surface and a bottom surface, and at least one stopper member provided on a bottom surface of at least one of the second ends of the handle legs and the grip member, the stopper member being configured with a protruding portion angled to catch an edge of a surface against which the rolling base box is inclined and retain the rolling base box against the surface.

[0369] 54) The top side wall of the rolling base box comprises first means for removable connection to another storage box that rests on the handle when the handle is extended. The other storage box comprises second means for removable connection to the top side wall of the rolling base box.

[0370] 55) The high profile box comprises the second means for removable connection to the top side wall of the rolling base box and the length of the high profile box is less than a length of the handle when fully extended.

[0371] 56) The first means for removable connection comprises an insert member, and the second means for removable connection comprises a sleeve configured to receive the insert member when the other storage box is placed adjacent to the rolling base box and on the handle thereof.

[0372] 57) At least one of the boxes comprises two side walls molded at an adjoining corner thereof to form a pinch grip corner, and means for attaching an accessory to the pinch grip corner.

[0373] 58) Wherein a side wall of a box has an inset edge relative to the adjoining corners to form the pinch grip corner, the means for attaching an accessory to the pinch grip corner comprising a corner clamp device that extends along the side wall of the box from one side of the adjoining corner to the other side of the adjoining corner and at least partially around the inset edge, the corner clamp device comprising a first clamp member and a second clamp member that can be secured relative to each other in a clamped configuration to secure the corner clamp device to the adjoining corner, and separated relative to each other in a loosened configuration to remove the corner clamp device from the adjoining corner.

[0374] 59) Wherein a side wall of a box can be formed with at least one thinner area of less thickness than thicker areas at opposite ends of the side wall of the box at adjoining corners with other side walls of the box, the thinner area being configured as a depression in the side wall relative to the thicker areas at opposite ends of the side wall to form the inset edge.

[0375] 60) The corner clamp device comprises an accessory holder mounted on at least one of the first clamp member and the second clamp member, the accessory holder chosen from a pocket, a band configured to surround an item, and a post having a retention member on a free end thereof to prevent an item from falling off the post.

[0376] 61) The means for attaching an accessory to the pinch grip corner further comprises a first accessory mounting member secured to the corner clamp device, and a second accessory mounting member secured to a removable accessory, the first accessory mounting member and the second accessory mounting member being removably engaged with each other.

[0377] 62) In a modular storage system comprising means for interconnecting at least two boxes to each other in a stacked configuration, further comprising means for surface mounting the at least two boxes to a surface, wherein the means for interconnecting the at least two boxes and the means for surface mounting the at least two boxes have common features.

[0378] 63) The means for surface mounting comprising a planar member that can be secured to a surface chosen from a wall of a building and a side of a vehicle, the planar member being configured to have the means for interconnecting to at least one box, the means for interconnecting on the planar member comprising at least one of a guide that cooperates with a channel on the at least one box, and a channel that receives a guide on the at least one box.

[0379] 64) The planar surface is mounted on a bracket that can be folded flush against the surface and deployed at an angle relative to the surface.

[0380] 65) Wherein the surface is a vertical wall, and the planar surface further comprises at least one stop member that can be removably placed at a selected location on the

planar surface, the stop member being configured to prevent the at least one box from descending along the wall.

[0381] 66) In a modular storage system comprising means for interconnecting at least two boxes to each other in a stacked configuration, the means for interconnecting boxes can comprise protuberances extending from each of a top surface and a bottom surface of a box, the protuberances extending from the top surface being arranged relative to each other to delineate channels of space in between rows of protuberances along at least one of a width dimension and a length dimension of the top surface.

[0382] 67) The channels of space between rows of protuberances are open on respective ends thereof.

[0383] 68) The protuberances extending from the bottom surface are arranged to engage with one or more of the protuberances extending from the top surface of a second box when the box is moved in a translational direction that is parallel to the rows of channels.

[0384] 69) The protuberances extending from the top surface of the box are formed with an edge to engage the protuberances extending from the bottom surface of a second box, and/or the protuberances extending from the bottom surface of the box are formed with an edge to engage the protuberances extending from the top surface of a second box.

[0385] 70) The protuberances are configured as unitary and continuous protuberances extending across a dimension of the top surface of the box to form open and continuous channel cavities with continuous side walls, and as unitary and continuous protuberances extending across a dimension of the bottom surface of the box and arranged to form continuous raised guides disposed and dimensioned to be received in the channel cavities of a second box.

[0386] In accordance with example embodiments, a modular storage system comprises different sizes of interconnecting storage boxes that can be coupled to each other in various configurations. The storage boxes can each comprise a top portion and a bottom portion that define an inner volume for a storage compartment. The top portion or lid can have a number of features to enhance structural strength of the lid, and improve efficiency of storage of items on the interior surface of the lid and/or in the storage compartment. The lid and interior features of a storage box can have any number of and any combinations of the following features and any number of and any combination of the external features of the boxes or container modules enumerated above.

[0387] 1) A storage box comprises a lid for covering a bottom portion and defining an inner volume, and means for organizing items stored within the inner volume.

[0388] 2) The means for organizing comprises a plurality of ribs formed on an inner surface of the lid.

[0389] 3) The means for organizing comprises a plurality of holes formed at one or more intersections of the ribs that are configured to receive a fastener such as a screw or pin.

[0390] 4) The holes formed at one or more intersections of the ribs are configured as molded bosses.

[0391] 5) A screw or pin is inserted into at least one of the plurality of holes to affix an item to the inner surface of the lid.

[0392] 6) At least one of the ribs comprises a slot configured to receive a retention member chosen from a strap and a tab on an item to affix the item to the inner surface of the lid.

[0393] 7) The ribs are formed using a grid pattern having greater density in a center portion of the box than at end portions of the box.

[0394] 8) The grid pattern comprises two sets of ribs forming double trusses disposed on respective sides of the center portion of the top portion of the box, each set of the double trusses having ribs arranged in a lattice structure between the trusses.

[0395] 9) The storage box can have means for organizing that further comprises a receptacle having a bottom surface and side walls for defining an interior storage space therein and an opening at the top of the receptacle, and wherein the ribs are formed using a grid pattern comprising intersecting ribs and some of the intersecting ribs about the receptacle and close the opening when the lid is closed.

[0396] 10) The means for organizing further comprises means for preventing movement of the receptacle within the box and chosen from protrusions arranged at respective locations on a bottom interior surface of the box to coincide with placement of the receptacle in the box and at least partially contact a wall of the receptacle, and a tray that can be provided in the bottom portion of the box and that at least one protrusion in a surface thereof that cooperates with a recess formed in the bottom surface of the receptacle.

[0397] 11) The means for preventing movement of the receptacle within the box further comprises at least one rib on an interior side wall of the bottom portion of the box that contacts a receptacle.

[0398] 12) The means for organizing further comprises a divider removably provided in the bottom portion to divide the inner volume into plural storage sections.

[0399] 13) The divider is configured to be removed from the bottom portion and affixed against the inner surface of the lid.

[0400] 14) The divider has a plurality of through holes, and the means for organizing comprises a plurality of holes formed at one or more intersections of the ribs that are configured to receive a fastener pin inserted through a selected one of the plurality of through holes aligned with a selected one of the plurality of holes to affix the divider against the inner surface of the lid.

[0401] 15) The divider has a plurality of slots to which items are connected using a strap inserted into one or more of the slots.

[0402] 16) The slots are arranged in the divider to configure the divider as a Modular Lightweight Load-carrying Equipment or MOLLE-board type interface.

[0403] 17) The lid can be removably attached to the bottom portion by at least one latch connecting the lid to the bottom portion.

[0404] 18) The lid can be attached to the bottom portion by a cable having a first end connected to the lid and a second end connected to the bottom portion.

[0405] 19) A storage box comprises a lid for covering a bottom portion and defining an inner volume, and means for organizing items stored within the inner volume.

[0406] 20) The means for organizing comprises a plurality of ribs formed on an inner surface of the lid.

[0407] 21) The means for organizing comprises a plurality of holes formed at one or more intersections of the ribs that are configured to receive a fastener such as a screw or pin.

[0408] 22) The holes formed at one or more intersections of the ribs are configured as molded bosses.

[0409] 23) A screw or pin is inserted into at least one of the plurality of holes to affix an item to the inner surface of the lid.

[0410] 24) At least one of the ribs comprises a slot configured to receive a retention member chosen from a strap and a tab on an item to affix the item to the inner surface of the lid.

[0411] 25) The ribs are formed using a grid pattern having greater density in a center portion of the box than at end portions of the box.

[0412] 26) The grid pattern comprises two sets of ribs forming double trusses disposed on respective sides of the center portion of the top portion of the box, each set of the double trusses having ribs arranged in a lattice structure between the trusses.

[0413] 27) The storage box can have means for organizing that further comprises a receptacle having a bottom surface and side walls for defining an interior storage space therein and an opening at the top of the receptacle, and wherein the ribs are formed using a grid pattern comprising intersecting ribs and some of the intersecting ribs abut the receptacle and close the opening when the lid is closed.

[0414] 28) The means for organizing further comprises means for preventing movement of the receptacle within the box and chosen from protrusions arranged at respective locations on a bottom interior surface of the box to coincide with placement of the receptacle in the box and at least partially contact a wall of the receptacle, and a tray that can be provided in the bottom portion of the box and that at least one protrusion in a surface thereof that cooperates with a recess formed in the bottom surface of the receptacle.

[0415] 29) The means for preventing movement of the receptacle within the box further comprises at least one rib on an interior side wall of the bottom portion of the box that contacts a receptacle.

[0416] 30) The means for preventing movement of the receptacle within the box further comprises a contoured surface on the bottom of the receptacle that cooperates with an complementary contoured surface on the interior wall of the bottom portion of the box that contacts a receptacle.

[0417] 31) The means for organizing further comprises a divider removably provided in the bottom portion to divide the inner volume into plural storage sections.

[0418] 32) The divider is configured to be removed from the bottom portion and affixed against the inner surface of the lid.

[0419] 33) The divider has a plurality of through holes, and the means for organizing comprises a plurality of holes formed at one or more intersections of the ribs that are configured to receive a fastener pin inserted through a selected one of the plurality of through holes aligned with a selected one of the plurality of holes to affix the divider against the inner surface of the lid.

[0420] 34) The divider has a plurality of slots to which items are connected using a strap inserted into one or more of the slots.

[0421] 35) The slots are arranged in the divider to configure the divider as a Modular Lightweight Load-carrying Equipment or MOLLE-board type interface.

[0422] 36) The lid can be removably attached to the bottom portion by at least one latch connecting the lid to the bottom portion.

[0423] 37) The lid can be attached to the bottom portion by a cable having a first end connected to the lid and a second end connected to the bottom portion.

[0424] It will be understood by one skilled in the art that this disclosure is not limited in its application to the details of construction and the arrangement of components set forth in the example embodiments of a modular storage system and aspects thereof provided herein as described herein and with reference to the drawing figures. The embodiments herein are capable of other embodiments, and capable of being practiced or carried out in various ways. Also, it will be understood that the phraseology and terminology used herein is for the purpose of description and should not be regarded as limiting.

1. A system for interconnecting two storage boxes comprising:

protuberances extending from each of a top surface and a bottom surface of a box, the protuberances extending from the top surface being arranged relative to each other to delineate channels of space in between rows of protuberances along at least one of a width dimension and a length dimension of the top surface;

wherein the channels of space between rows of protuberances are open on respective ends thereof.

2. The system of claim 1, wherein the protuberances extending from the top surface of the box are formed with an edge to engage the protuberances extending from the bottom surface of a second box, and/or the protuberances extending from the bottom surface of the box are formed with an edge to engage the protuberances extending from the top surface of a second box.

3. The system of claim 1, wherein the protuberances are configured as unitary and continuous protuberances extending across a dimension of the top surface of the box to form open and continuous channel cavities with continuous side walls, and as unitary and continuous protuberances extending across a dimension of the bottom surface the box and arranged to form continuous raised guides disposed and dimensioned to be received in the channel cavities of a second box.

4. The system of claim 3, wherein the box and the second box slide relative to each other in both a forward direction and a backward direction along a box engagement path when the guide of the box contacts the channel in the second box.

5. The system of claim 4, wherein the protuberances that extend from the bottom surface are arranged to engage with one or more of the protuberances extending from the top surface of a second box when the first box is moved in a translational direction that is parallel to the rows of channels.

6. The system of claim 2, wherein the protuberances that extend from the bottom surface are arranged to engage with one or more of the protuberances extending from the top surface of a second box when the box is moved in a translational direction that is parallel to the channels of space, and further comprising an integrative locking system to retain the box from translational relative to the second box when stacked.

7. The system of claim 6, wherein the protuberances and corresponding channels are arranged along the box and the second box, respectively, in a direction between a first edge and a second edge on each of the box and second box, and the integrative locking system comprises a cleat disposed at one of the first edge and the second edge of the box and a

cleat retaining member chosen from a receptacle and a wedge disposed at the corresponding one of the first edge and the second edge of the second box that is aligned to receive the cleat when the box is translated over the second box in the direction of the channels.

* * * * *