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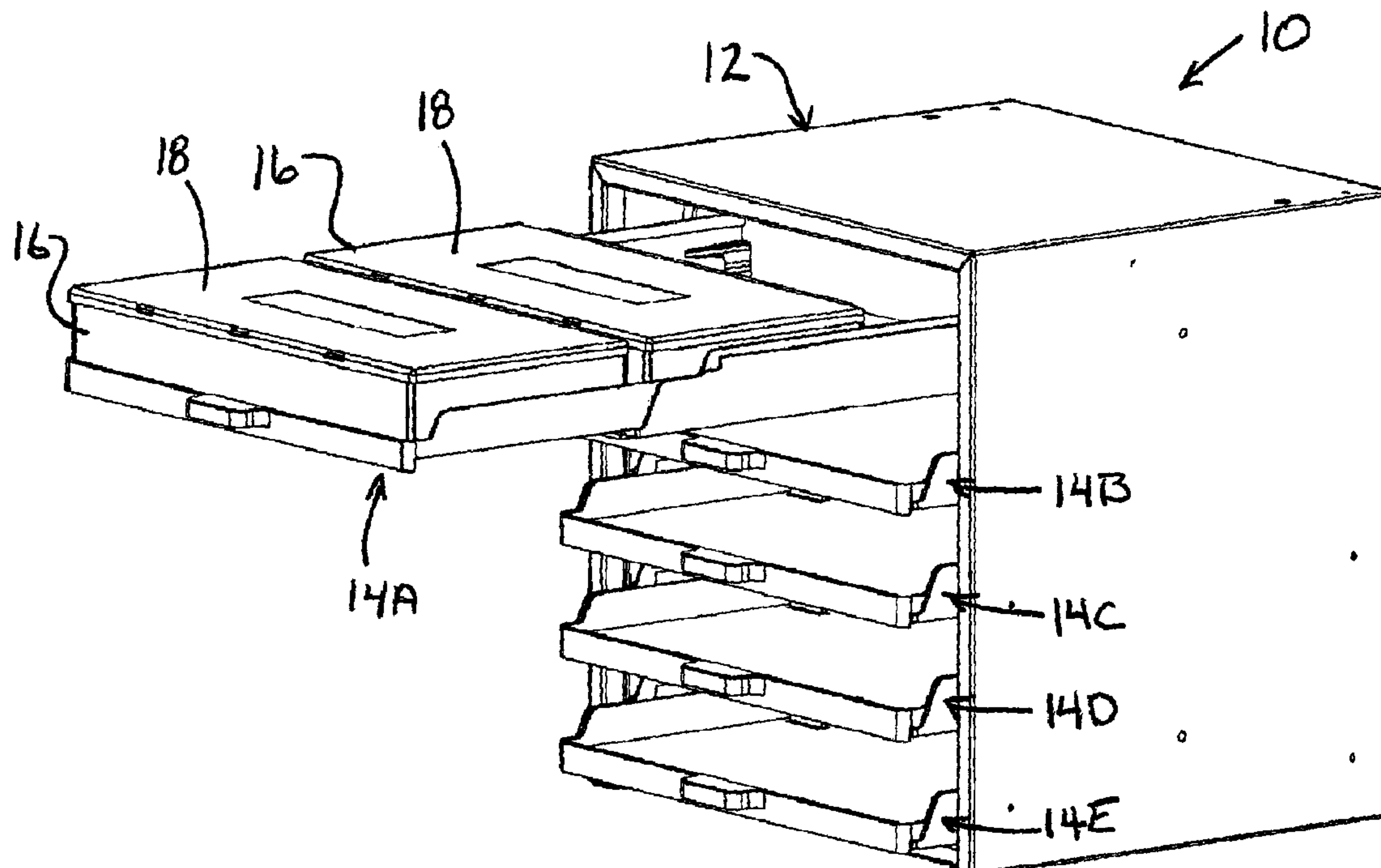
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(54) Title: CABINET WITH TELESCOPING TRAYS FOR FASTENER BINS



(57) Abrégé/Abstract:

A fastener storage and display cabinet includes a housing defining an internal space, with a plurality of tray units positioned within the internal space. Each tray unit is movable between a closed position primarily within the internal space and an extended position



(57) **Abrégé(suite)/Abstract(continued):**

in which a majority of the tray unit is cantilevered forward of the housing. At least one tray unit is formed as a telescoping tray assembly comprising an upper tray component and a lower tray component, wherein the upper tray component fits within the lower tray component and is movable with respect to the lower tray component between a first position nested within the lower tray component and a second position cantilevered forwardly from the lower tray component.

Abstract

A fastener storage and display cabinet includes a housing defining an internal space, with a plurality of tray units positioned within the internal space. Each tray unit is movable between a closed position primarily within the internal space and an extended position in which a majority of the tray unit is cantilevered forward of the housing. At least one tray unit is formed as a telescoping tray assembly comprising an upper tray component and a lower tray component, wherein the upper tray component fits within the lower tray component and is movable with respect to the lower tray component between a first position nested within the lower tray component and a second position cantilevered forwardly from the lower tray component.

CABINET WITH TELESCOPING TRAYS FOR FASTENER BINS

TECHNICAL FIELD

[0001] This application relates generally to storage and display of fasteners and, more specifically, to a cabinet with telescoping trays that enable two fastener bins to be contained within each tray.

BACKGROUND

[0002] Fasteners are often presented for selection in hardware stores in rectangular fastener bins, where each bin typically has a lid that can be pivoted upward to access the bin interior, and the bin interior typically includes multiple compartments, each compartment holding a particular fastener component (e.g., bolts, nuts, washers etc.). In the past such bins have been supported on trays or shelves that can be pulled outward by a customer. Typically fastener cabinets have utilized trays of single-piece design, where the effective limits for tray withdrawal while still providing support for the fastener bin have limited each tray to holding and supporting a single bin. Product storage space is a premium within most retail environments.

[0003] Accordingly, it would be desirable to provide a fastener cabinet and associated tray arrangement that enables a higher density of fastener bin storage.

SUMMARY

[0004] In one aspect, a fastener storage and display cabinet includes a housing defining an internal space, with a plurality of tray units positioned within the internal space. Each tray unit is movable between a closed position primarily within the internal space and an extended position in which a majority of the tray unit is cantilevered forward of the housing. At least one tray unit is formed as a telescoping tray assembly comprising an upper tray component and a lower tray component, wherein the upper tray component fits within the lower tray component and is movable with respect to the lower tray component between a first position nested within the lower tray component and a second position cantilevered forwardly from the lower tray component.

[0005] The details of one or more embodiments are set forth in the accompanying drawings and the description below. Other features, objects, and advantages will be apparent from the description and drawings, and from the claims.

BRIEF DESCRIPTION OF THE DRAWINGS

- [0006] Fig. 1 shows one embodiment of a fastener cabinet;
- [0007] Figs. 2 and 3 show the fastener cabinet of Fig. 1 with a tray unit in extended position for fastener bin access;
- [0008] Fig. 4 shows an exploded view of one embodiment of a tray unit assembly;
- [0009] Fig. 5 shows the tray unit in assembled collapsed position;
- [0010] Fig. 6 shows the tray unit in assembled extended position from a cabinet;
- [0011] Fig. 7 shows an exploded view of the cabinet housing and track inserts;
- [0012] Fig. 8 shows an assembled view of the cabinet housing and track inserts;
- [0013] Figs. 9 and 10 show perspective and side elevation views of one embodiment of a left track insert;
- [0014] Fig. 11 shows a partial perspective of the left track insert;
- [0015] Figs. 12 and 13 show partial perspectives a corner portion of a lower tray component;
- [0016] Fig. 14 shows a partial cross-section of a tray unit slide within a track;
- [0017] Fig. 15 shows a partial perspective of a corner portion of the lower tray component;
- [0018] Fig. 16 shows a partial perspective of a corner portion of the upper tray component;
- [0019] Fig. 17 shows another embodiment of a fastener cabinet;
- [0020] Fig. 18 shows an exploded view of another embodiment of a tray unit assembly;
- [0021] Fig. 19 shows the tray unit in assembled collapsed position;
- [0022] Fig. 20 shows the tray unit in assembled extended position;
- [0023] Fig. 21 shows a bottom perspective of the lower tray component;
- [0024] Fig. 22 shows a partial perspective of the bottom of the lower tray component;
- [0025] Fig. 23 shows a perspective of another embodiment of a left track insert;
- [0026] Fig. 24 shows a partial perspective of the left track insert; and
- [0027] Fig. 25 shows a partial cross-section of tray units engaged with tracks.

DETAILED DESCRIPTION

[0028] Referring now to Figs. 1-16, a fastener storage and display cabinet 10 includes a housing 12 with left, right, top, bottom and rear sidewalls 13 defining an internal space 15, and a front side opening 17 providing access to the internal space. In one example, the housing is of metal construction, but other materials could be used. In the illustrated example the housing has sidewalls that are generally planar and closed, but it is recognized that other housing configurations, such as frame-type housings are possible. The housing 12 includes a plurality of tray units 14A-14E mounted within the internal space. Although five tray units are shown in the illustrated embodiment, variations with more or less tray units are possible. Each tray unit is movable between a closed position (e.g., per Fig. 1 where all tray units are in closed positions), where the closed position is primarily within the internal space of the housing, and an extended position (e.g., per Fig. 2 where tray unit 14A is in the extended position) in which a majority of the tray unit is cantilevered forward of the housing.

[0029] The tray units are sized to support fastener bins 16, where each tray unit is capable of holding two fastener bins as shown in Fig. 2. When a tray unit is in its extended position, both fastener bins 16 are sufficiently accessible and clear of the housing 12 and other tray units to permit the bin lids 18 to be pivoted upward for access to fasteners within the bin (per Fig. 3, where all tray units are shown holding bins). In an alternative configuration the fastener bins 16 could be positioned side-by-side on the tray units.

[0030] As best seen in Figs. 4-6, each tray unit 14 is formed as a telescoping tray assembly with an upper tray component 20 and a lower tray component 22. The upper tray component 20 fits within the lower tray component 22 and is movable with respect to the lower tray component (per arrow 24 in Fig. 5) between a position nested within the lower tray component (Fig. 5) and a position cantilevered forwardly from the lower tray component (Fig. 6). In one implementation, each tray component may be of a molded plastic material, but variations on material and formation process are possible.

[0031] When a tray unit is moved into its extended position (e.g., per Fig. 6) as a result of pulling forward on a front handle 26 the upper tray component 20, the lower tray component 22 slides along a track system within the housing 12. In this regard, reference is made to Fig. 7 where a cabinet housing 12 and left and right track inserts 30A and 30B are shown in an exploded view. The track inserts can be loaded in through the housing opening

17, which is defined by a narrow frame 34 having left and right frame segments 36A and 36B that help capture and retain the track inserts 30A and 30B when the track inserts are pressed against the respective left and right sidewalls of the housing. In this regard, a lower base portion 38A, 38B of each track insert and upwardly extending arms 40A, 40B of each insert are sized to abut against the bottom and top walls of the housing to further aid in retaining the inserts in place. Fig. 8 shows the track inserts 30 seated within the housing against the left sidewall. Each track insert may, in one example, be formed of molded plastic, but variations on material and formation process are possible.

[0032] Referring to Figs. 9 and 10, where perspective and inner side elevation views of track insert 30A are shown, the track insert 30A includes plurality of tracks 50A-50E thereon (e.g., corresponding to the number of tray units that will be held). Here, as best seen in Fig. 11, each track is formed as a slot with a lower rail (e.g., 52A) and an upper rail (e.g., 54A), where the lower rail 52A extends inwardly relative to the interior space of the cabinet further than the upper rail 54A for tray support as will be described in greater detail below. Each track includes a primary path (e.g., 56A) that is substantially horizontal and the extends substantially the entire front to back dimension of the track insert (where the terms front and back are used relative to the orientation of the housing in which the track insert is placed). The primary path 56A enables movement of the loaded tray unit between its closed position and its extended position. Each track also includes a raised removal path (e.g., 58A) that intersects the primary path toward a forward end of the primary path. The raised removal path includes an inwardly projecting slide ramp (e.g., 60A) that facilitates removal of the tray unit from the housing as will be described in further detail below. The track insert 30B has its tracks oriented in a mirror image of those of the track insert 30A so that the tracks of the two inserts will oppose each other in an aligned manner when the inserts are positioned within the housing.

[0033] The lower tray component of each tray unit includes a left side engaged with a track in track insert 30A and a right side engaged with a corresponding and opposed track in the track insert 30B. In this regard, reference is made to Figs. 12 and 13 showing partial perspective views of the right rear corner region of lower tray component 22, with an outwardly projecting slide 62B that rides within the track. Slide 62B also acts as a stop that

contacts the wall at the forward end of the track when the tray assembly is in its extended position to limit forward movement of the lower tray component relative to the housing.

[0034] Referring again to Fig. 4 and Figs. 12-13, the lower tray component 22 includes a tray base 70 (for supporting the upper tray component), an upwardly extending left sidewall 72A, an upwardly extending right sidewall 72B and an upwardly extending rear wall 74. The outwardly projecting slide 62B is located on a tab portion 76B of the sidewall 72B, where the tab portion 76B is capable of flexing inward (per arrow 78B) to facilitate installation and removal of the tray unit from the housing. The left sidewall 72A includes a similar tab portion 76A with an outwardly projecting slide 62A (shown in dashed line in Fig. 4). The right side of lower tray component includes an outwardly projecting slide 80B located on another flexible tab portion 82B of the right sidewall 72B, where tab portion 82B and slide 80B are located rearwardly of the slide 62B. Slide 62B also rides within the track and provides added stability, and may also act as a stop that contacts the wall at the rearward end of the track when the tray assembly is in its closed position. Left sidewall 72A includes a similar tab portion 82A and slide 80A (shown in dashed line form in Fig. 4).

[0035] Referring to the partial cross-section of Fig. 14, track 50A is shown with slide 80A riding in the primary track portion 56A. As shown, lower rail 52A extends below and supports the left sidewall 72A (along substantially the entire front to rear extend of the sidewall) for additional support. The rail 52A may be supported by a plurality of ribs 90 and 92 as seen in Figs. 9 and 10, where ribs 92 extending from the rail 52A down to the upper rail of the next track.

[0036] As noted above, the raised removal path of each track includes a ramp feature (e.g., 60A at the forward end). In order to remove the tray assembly from the housing, a user simply tilts the tray assembly up when the forward slides 62A and 62B are aligned with the intersection point of the raised path and the primary path and continues to pull so that the slides move up along the path. When the slides 62A, 62B engage the respective ramp features of their respective tracks, the tab portions 76A, 76B are urged so as to flex inward, along the slides 62A, 62B to clear the front portion of the tracks as well as the side frame segments of the housing opening. The rear slides 80, and 80B are moved along the same path for similar inward flexing, and the tray assembly can be completely removed from the housing. To install

a tray assembly, a user manually pushes the tab portions inward during to clear the housing side frame segments and enter the track.

[0037] As mentioned above, the upper tray component 20 sits within the lower tray component 22 in a nested manner that permits a relative telescoping movement. In this regard, and referring to Figs. 4, 5, 15 and 16, the upper tray component 20 includes a tray base 110 (for supporting the fastener bins), an upwardly extending left sidewall 112A, an upwardly extending right sidewall 112B and an upwardly extending rear wall 114. The left sidewall 112A of the upper tray component sits internally of the left sidewall 72A of the lower tray component, and the right sidewall 112B of the upper tray component sits internally of the right sidewall 72B of the lower tray component. Each sidewall 72A, 72B includes a rail (e.g., rail 120A) extending inwardly, where the rail includes a substantially horizontal support portion (e.g., 122A) and downwardly extending stop portion (e.g., 124A). Each sidewall of the upper tray component includes a rearward slide (e.g., 126A, 126B) that sits below the substantially horizontal support portion of its respective rail and rearwardly of the downwardly extending stop portion of its respective rail to help retain the upper tray component 20 within the lower tray component 22. In the illustrated embodiment, the rearward slides are formed by an elevated upper edge extent (e.g., 128A) of the sidewalls of the upper tray component. Notably, the front to back dimension of the extents 128A and 128B is less than one-half of the front to back dimension of the respective rails 120A, which enables the upper tray component to slide forward within the lower tray component (e.g., until the front of extent 128A hits the stop portion 124A of the rail) for the telescoping movement.

[0038] The lateral dimension between the outer surfaces of sidewalls 112A and 112B may substantially match the lateral dimension between the inner surfaces of sidewalls 72A and 72B (below the rails) so that the outer surfaces of walls 112A and 112B lie in adjacent contact with or in close proximity to the inner surfaces of sidewalls 72A and 72B. To engage the two tray components together the upper tray component is simply pressed down into the lower tray component (as suggested by the dashed line arrows in Fig. 4) and the sidewalls 72A, 72B and/or 112A, 112B will flex enough to allow the sidewalls to slide past the rails and once the upper edges of the sidewalls 112A and 112B move below the rails (e.g., 124A), the slides 126A and 126B move beneath the rails.

[0039] In the illustrated embodiment the rails (e.g., 120A) is formed by a laterally inward offset of the wall (e.g., while maintaining the same wall thickness). The upper tray component 20 may also include one or more upward projecting tabs 130A, 130B (Fig. 4) that are positioned to maintain a spacing between fastener bins loaded onto the tray. As seen in Fig. 13 the base 70 of the lower tray component (and similarly the base of the upper tray component) may include a grid or lattice beam structure for additional strength.

[0040] Referring now to Figs. 17-25 another embodiment of a fastener storage and display cabinet 210 is shown, utilizing a housing 212 with multiple tray units 214A-214E (where tray unit 214C is in its extended position in Fig. 17, and all other tray units are in closed positions). The tray units 214 are formed by upper and lower tray components 220 and 222, where the upper tray component 220 sits within the lower tray component 222 and is slidable relative to the lower tray component (between the relative positions of Figs. 19 and 20) substantially the same as described above for tray component 14. Here, the lower tray component 222 includes a single, outwardly projecting and elongated slide on each side (e.g., slides 262A and 262B) and located on a flexing or flexible tab portion 276A or 276B of the tray sidewall. Guide slots 251A and 251B are also formed at the bottom sides of the lower tray component 222 for interaction with the cabinet tracks.

[0041] Exemplary track insert 230A is shown in Figs. 23 and 24, with multiple tracks 250A-250E, where each track is formed as a slot with a lower rail (e.g., 252A) and an upper rail (e.g., 254A), where the lower rail 252A extends inwardly relative to the interior space of the cabinet further than the upper rail 254A for tray support. Each track includes a primary path (e.g., 256A) that is substantially horizontal and the extends substantially the entire front to back dimension of the track insert (where the terms front and back are used relative to the orientation of the housing in which the track insert is placed). The primary path 256A enables movement of the loaded tray unit between its closed position and its extended position. Each track also includes a raised removal path (e.g., 258A) that intersects the primary path toward a rear end of the primary path. The raised removal path is substantially parallel to primary path 256A and includes an inwardly projecting slide ramp (e.g., 260A) at the forward end that facilitates removal of the tray unit from the housing (similar to ramp 60A described below). Notably, an elongated retaining protrusion (e.g., 271A) is located at the front of each track and

extends upward from the lower rail 252A of the track and is configured to interact with both the guide slot 251A and slide 262A of the lower tray component. In particular, as seen in Fig. 25, retaining protrusion 271B is shown riding within guide slot 251B (for a tray unit that is in its closed position) and retaining protrusion 271C is shown located at the inner side of slide 262C and tab portion 276C (for a tray unit that is in its extended position). Thus, the retaining protrusions serve to prevent the flexible tab portions of the lower tray components from prying or twisting out of the tracks when the tray unit is in a fully extended and heavily loaded condition (e.g., under high cantilever loads).

[0042] To remove a tray unit from the cabinet 210, the tray unit is tilted upward while the lower tray component is in the fully rearward position so that the slides (e.g., 262A) will move up into the removal paths (e.g., 258A) of the tracks when the lower tray component is pulled forward. The slides (e.g., 262A) will interact with the track ramps (e.g., 260A) to cause the tab portions (e.g., 276A) to flex inward allowing the tray unit to be fully removed from the cabinet.

[0043] It is to be clearly understood that the above description is intended by way of illustration and example only, is not intended to be taken by way of limitation, and that other changes and modifications are possible.

Claims

1. A fastener storage and display cabinet, comprising:
 - a housing defining an internal space;
 - a plurality of tray units positioned within the internal space, each tray unit movable between a closed position primarily within the internal space and an extended position in which a majority of the tray unit is cantilevered forward of the housing;
 - wherein at least one tray unit is formed as a telescoping tray assembly comprising an upper tray component and a lower tray component, wherein the upper tray component fits within the lower tray component and is movable with respect to the lower tray component between a first position nested within the lower tray component and a second position cantilevered forwardly from the lower tray component.
2. The fastener storage and display cabinet of claim 1 wherein the lower tray component includes a left side having a left tab portion with an outwardly projecting left slide and a right side having a right tab portion with an outwardly projecting right slide, wherein both the left tab portion and the right tab portion are capable of flexing inward toward each other to enable removal of the tray assembly from the housing.
3. The fastener storage and display cabinet of claim 2 wherein the left slide rides within a left track within the housing and the right slide rides within a right track within the housing, wherein the left track includes a left retaining protrusion that aligns with the left tab portion when the one tray unit is in its extended position to limit inward flexing of the left tab portion under cantilever loads, and the right track includes a right retaining protrusion that aligns with the right tab portion when the one tray unit is in its extended position to limit inward flexing of the right tab portion under cantilever loads.
4. The fastener storage and display cabinet of claim 3 wherein the lower tray component includes a bottom side with a downwardly facing left guide slot and a downwardly facing right

guide slot, the left retaining protrusion rides within the left guide slot and the right retaining protrusion rides within the right guide slot.

5. The fastener storage and display cabinet of claim 3 wherein the left slide contacts a forward end of the left track when the tray assembly is in its extended position and the right slide contacts a forward end of the right track when the tray assembly is in its extended position, to limit forward movement of the lower tray component relative to the housing.

6. The fastener storage and display cabinet of claim 1, wherein the lower tray component includes a first side engaged with a first track within the interior space and a second side engaged with a second track within the interior space for sliding movement along the first and second tracks, the first track is formed on a first track insert positioned within the interior space on a left sidewall of the housing, and the second track is formed on a second track insert positioned within the interior space on a right sidewall of the housing.

7. The fastener storage and display cabinet of claim 6 wherein the first track insert includes a lower base portion abutting a bottom wall of the housing and an upper portion abutting a top wall of the housing to aid in retaining the first track insert in place within the housing, the second track insert includes a lower base portion abutting the bottom wall of the housing and an upper portion abutting the top wall of the housing to aid in retaining the second track insert in place within the housing.

8. The fastener storage and display cabinet of claim 6 wherein the housing includes a front opening through which the tray units move between the closed position and the extended position, the front opening includes left frame segment that aids in retaining the first track insert within the housing and a right frame segment that aids in retaining the second track insert within the housing.

9. The fastener storage and display cabinet of claim 1 wherein the lower tray component includes a first side engaged with a first track within the interior space and a second side

engaged with a second track within the interior space for sliding movement along the first and second tracks, wherein the first track includes a lower first primary path that for movement of the at least one tray unit between its closed position and its extended position, and a raised first removal path intersecting the first primary path for enabling removal of the at least one tray unit from the housing, and the second track includes a lower second primary path for movement of the at least one tray unit between its closed position and its extended position, and a raised second removal path intersecting the second primary path for enabling removal of the at least one tray unit from the housing.

10. The fastener storage and display cabinet of claim 9 wherein the raised first removal path includes a first inwardly projecting slide ramp and the raised second removal path includes a second inwardly projecting slide ramp.

11. The fastener storage and display cabinet of claim 1 wherein the lower tray component includes a first side engaged with a first track within the interior space and a second side engaged with a second track within the interior space for sliding movement along the first and second tracks, wherein the first side includes a first outwardly projecting slide that rides within the first track and contacts a forward end of the first track when the tray assembly is in its extended position and the second side includes a second outwardly projecting slide that rides within the second track and contacts a forward end of the second track when the tray assembly is in its extended position, to limit forward movement of the lower tray component relative to the housing.

12. The fastener storage and display cabinet of claim 1 wherein the lower tray component includes a left sidewall and a right sidewall, the left sidewall includes a left rail extending inwardly, the left rail including a left substantially horizontal support portion and a left downwardly extending stop portion, the right sidewall includes a right rail extending inwardly, the right rail including a right substantially horizontal support portion and a right downwardly extending stop portion.

13. The fastener storage and display cabinet of claim 12 wherein the upper tray component includes a left sidewall upper edge portion and a right sidewall upper edge portion, the left sidewall upper edge portion sits beneath the left substantially horizontal support portion of the left rail and the right sidewall upper edge portion sits beneath the right substantially horizontal support portion of the right rail.

14. The fastener storage and display cabinet of claim 1 wherein the tray units ride on sets of paired left and right tracks within the housing, wherein the left tracks are formed on a first track insert positioned within the interior space, and the right tracks are formed on a right track insert position within the interior space.

15. The fastener storage and display cabinet of claim 14 wherein each left track includes a left primary path and a left removal path intersecting the left primary path, and each right track includes a right primary path and a right removal path intersecting the right primary path.

16. A fastener storage and display cabinet, comprising:

a housing defining an internal space;

at least one tray unit positioned within the internal space, the tray unit movable between a closed position primarily within the internal space and an extended position in which a majority of the tray unit is cantilevered forward of the housing, wherein the tray unit is formed as a telescoping tray assembly comprising an upper tray component and a lower tray component, wherein the upper tray component fits within the lower tray component and is movable with respect to the lower tray component between a first position nested within the lower tray component and a second position cantilevered forwardly from the lower tray component, wherein the lower tray component includes left and right slides extending from respective left and right flexible tab portions of the lower tray component.

17. The fastener storage and display cabinet of claim 1 wherein the left slide rides within a left track within the housing and the right slide rides within a right track within the housing, wherein the left track includes a left retaining protrusion that aligns with the left tab portion

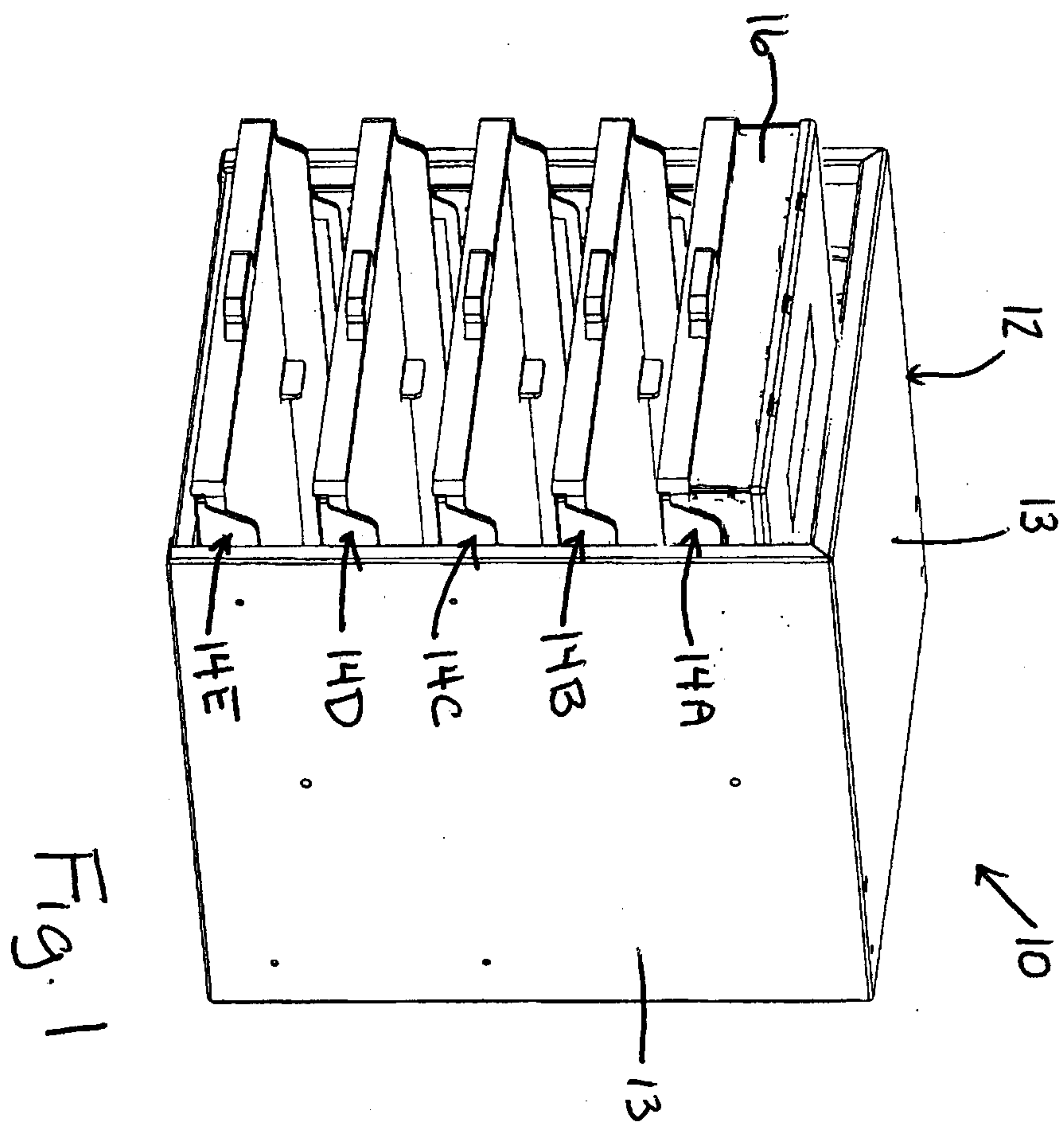
when the tray unit is in its extended position to limit inward flexing of the left tab portion under cantilever loads, and the right track includes a right retaining protrusion that aligns with the right tab portion when the tray unit is in its extended position to limit inward flexing of the right tab portion under cantilever loads.

18. A fastener storage and display cabinet, comprising:

a housing defining an internal space;

at least one tray unit positioned within the internal space, the tray unit movable between a closed position primarily within the internal space and an extended position in which a majority of the tray unit is cantilevered forward of the housing, wherein the tray unit is formed as a telescoping tray assembly comprising an upper tray component and a lower tray component, wherein the upper tray component fits within the lower tray component and is movable with respect to the lower tray component between a first position nested within the lower tray component and a second position cantilevered forwardly from the lower tray component, wherein the tray unit is engaged for movement along left and right tracks within the housing, the left track includes a left primary movement path and left removal path intersecting the left primary movement path, the right track includes a right primary movement path and a right removal path intersecting the right primary movement path.

19. The fastener storage and display cabinet of claim 18 wherein the left removal path includes a left inwardly projecting slide ramp and the right removal path includes a right inwardly projecting slide ramp.



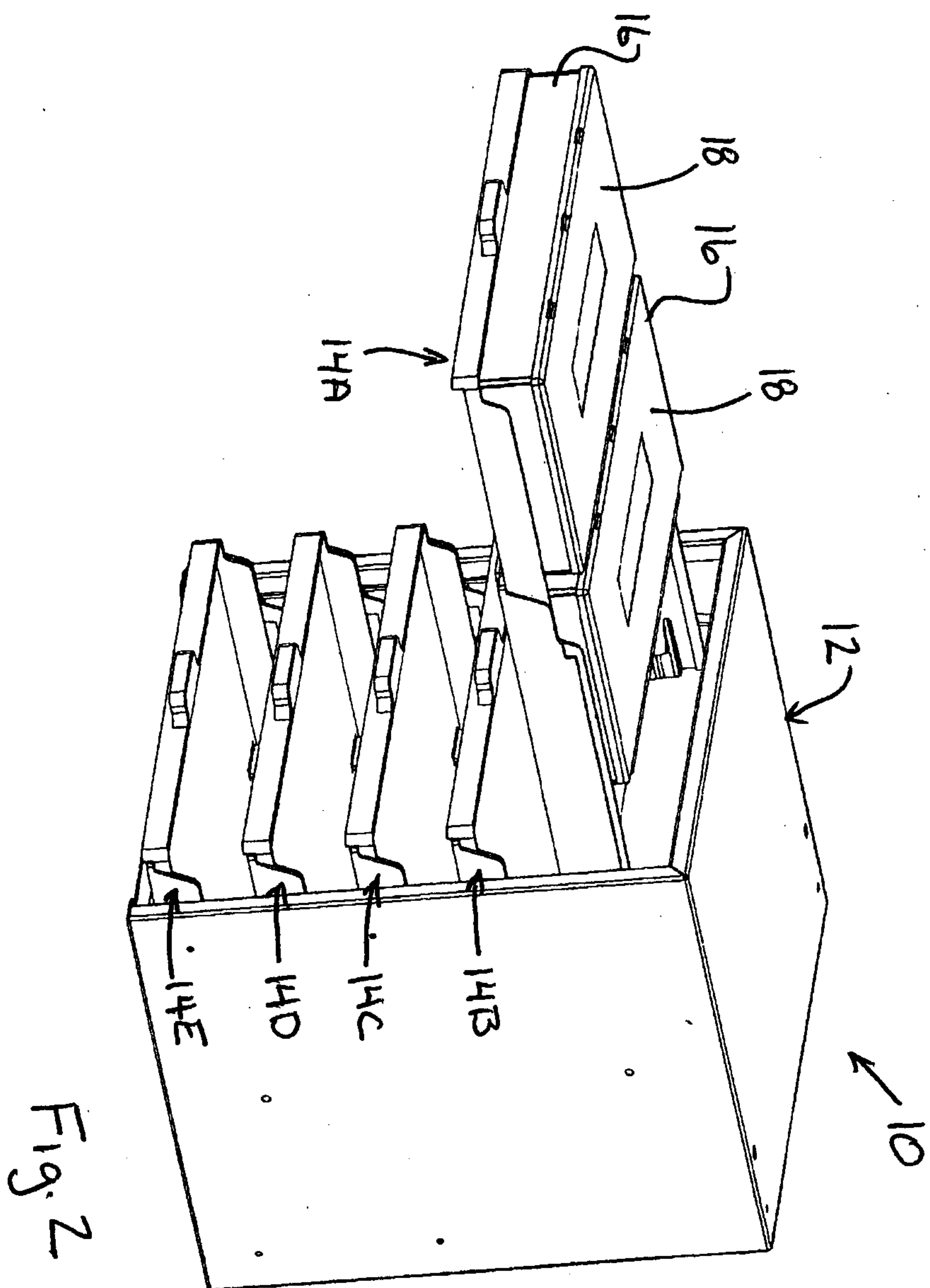
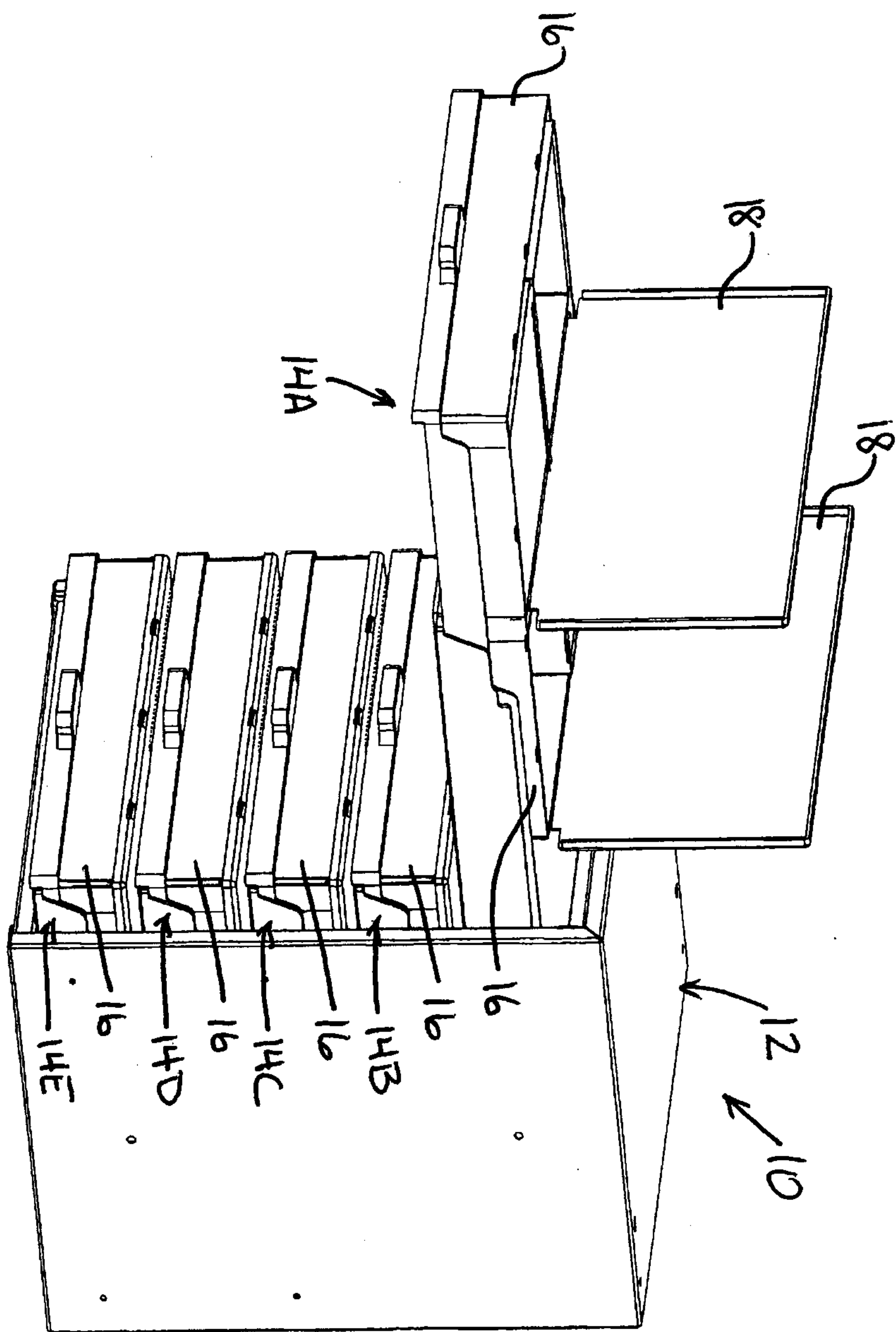
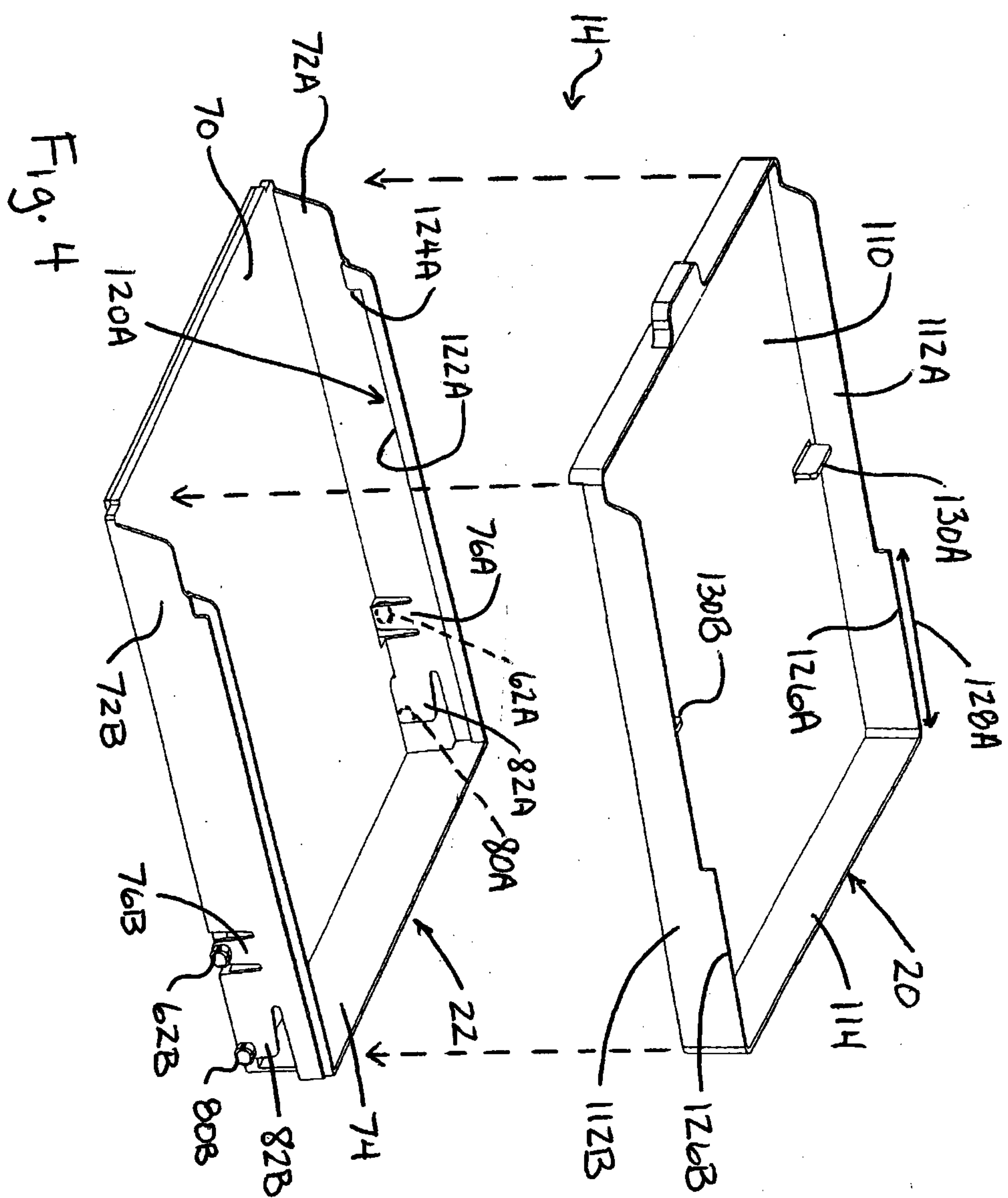
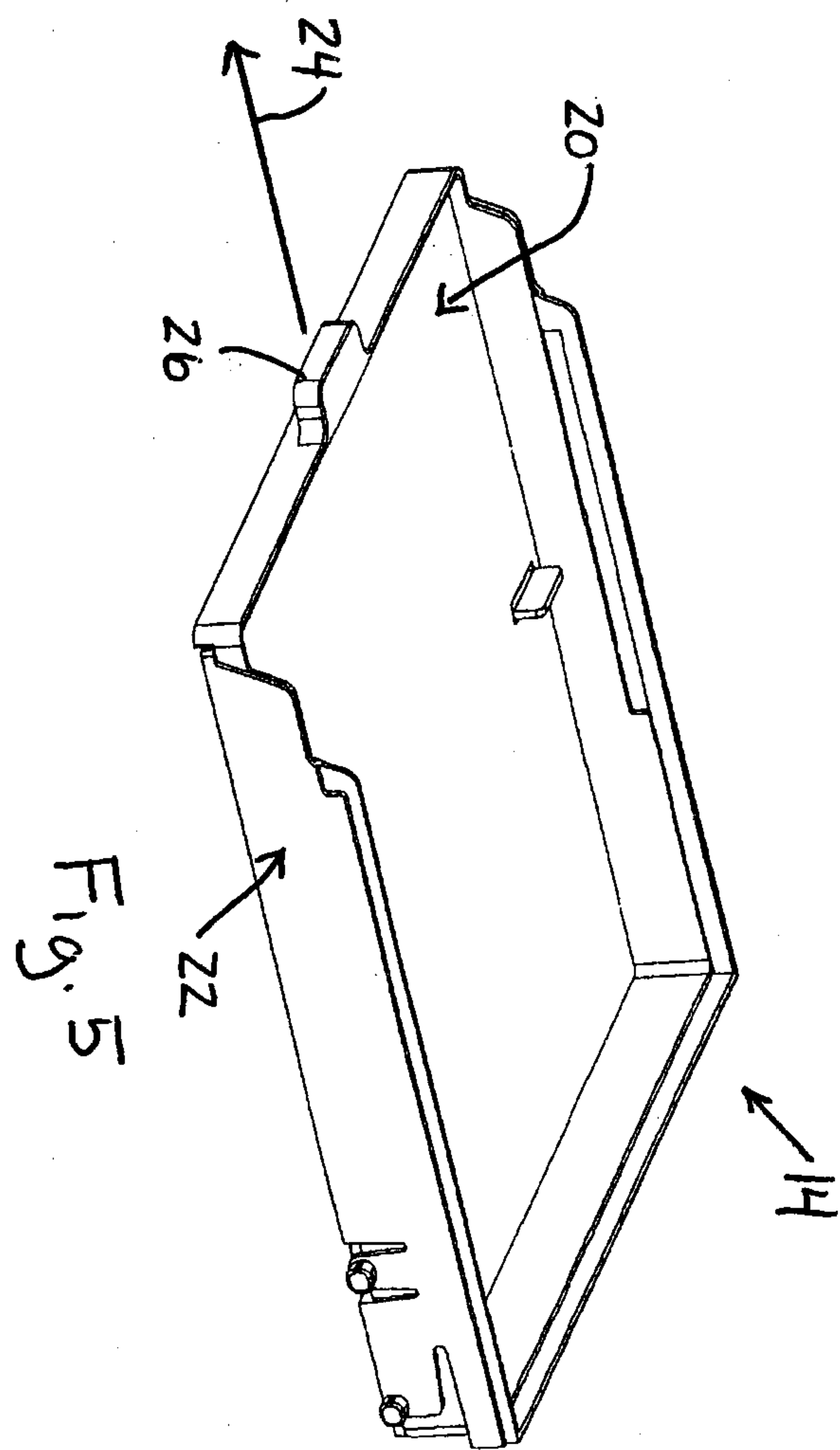
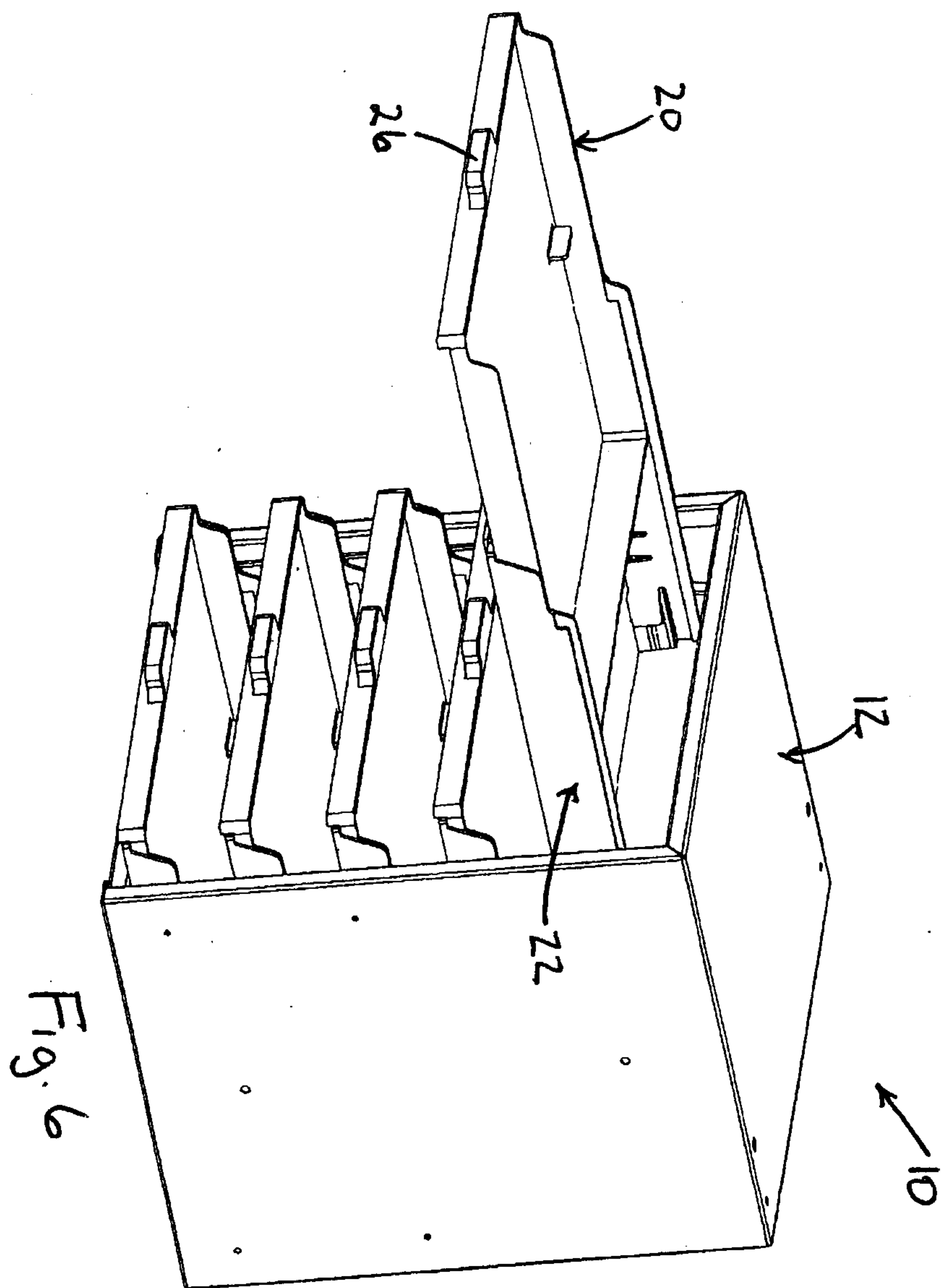


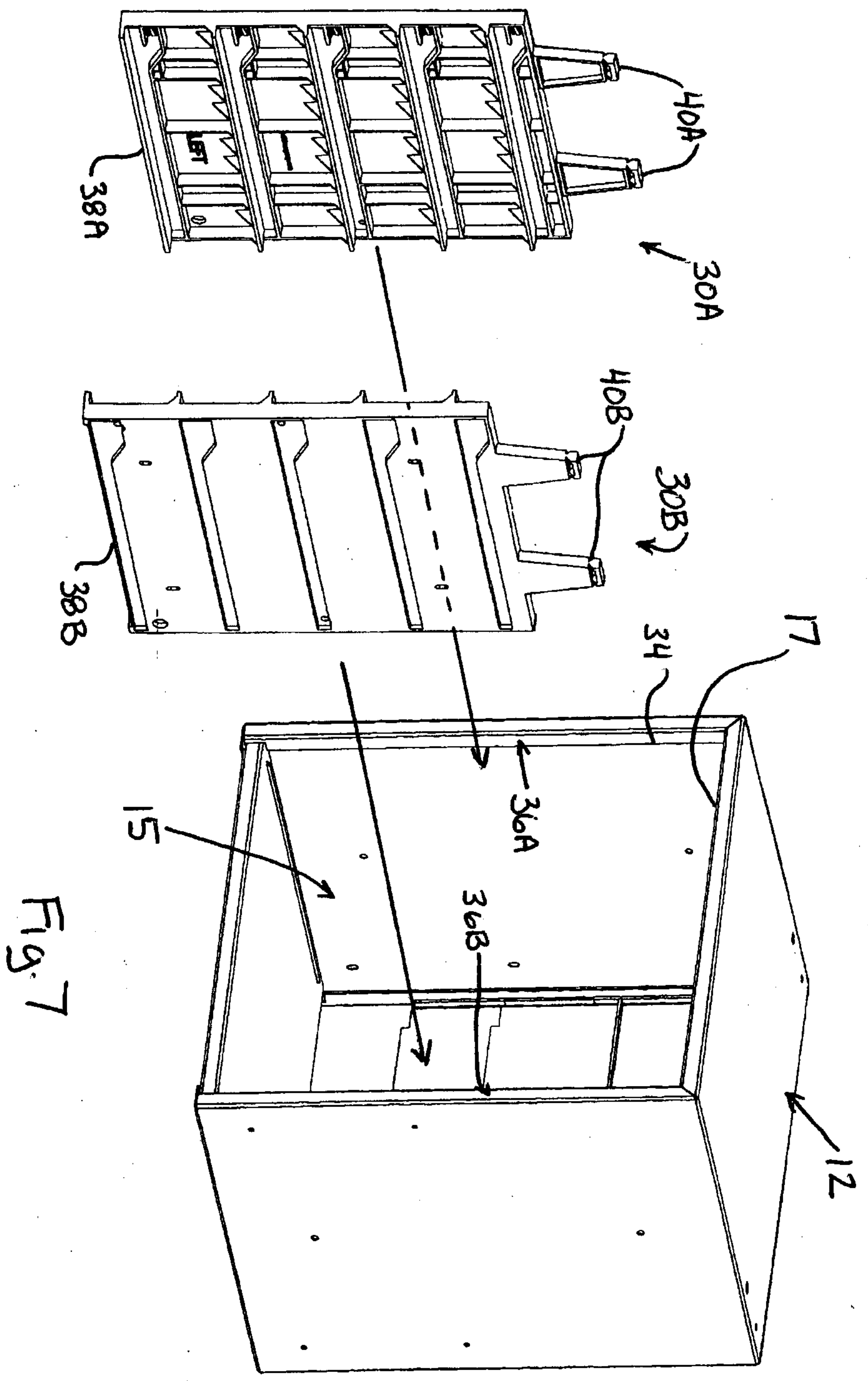
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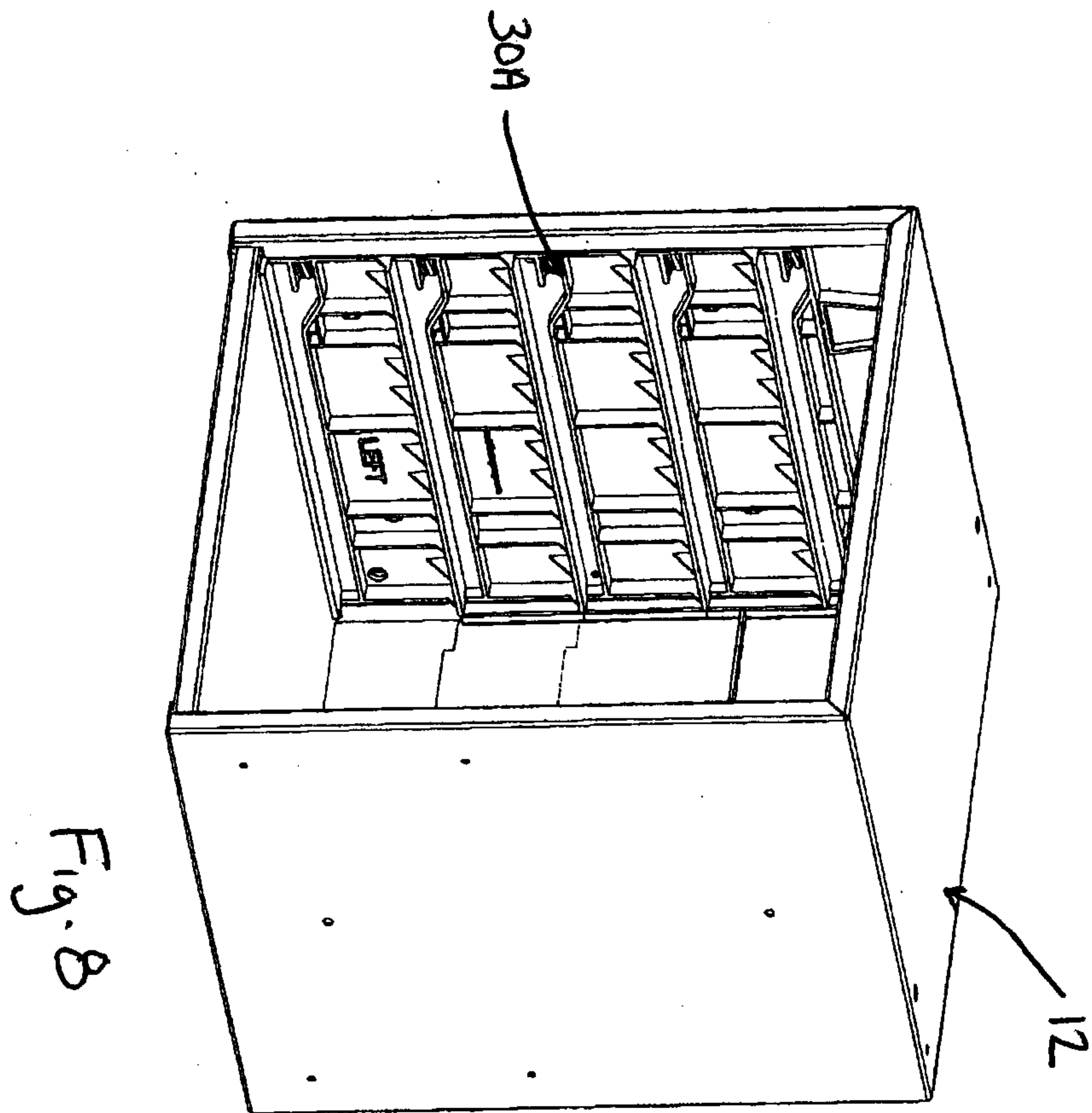












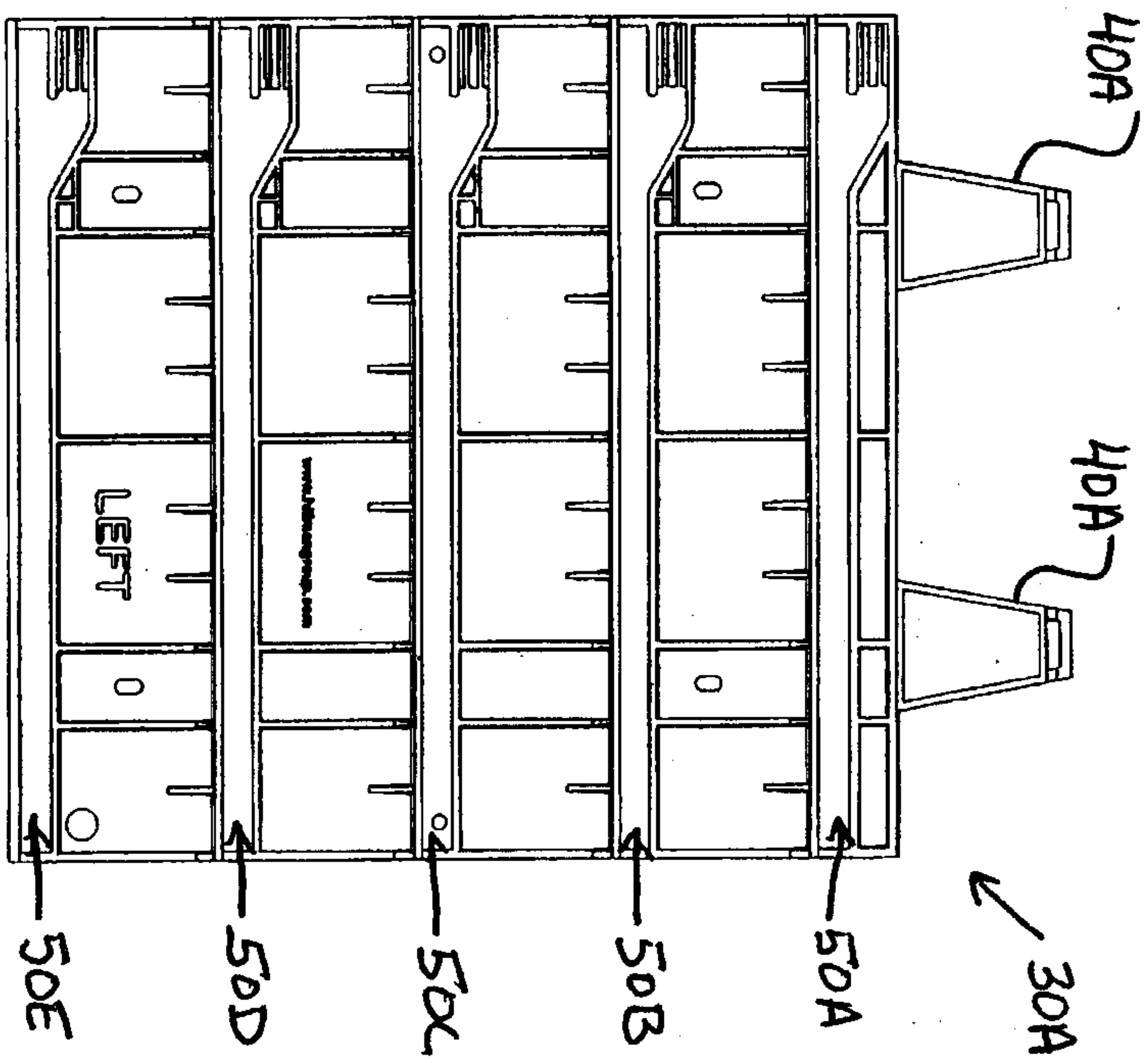


Fig. 10

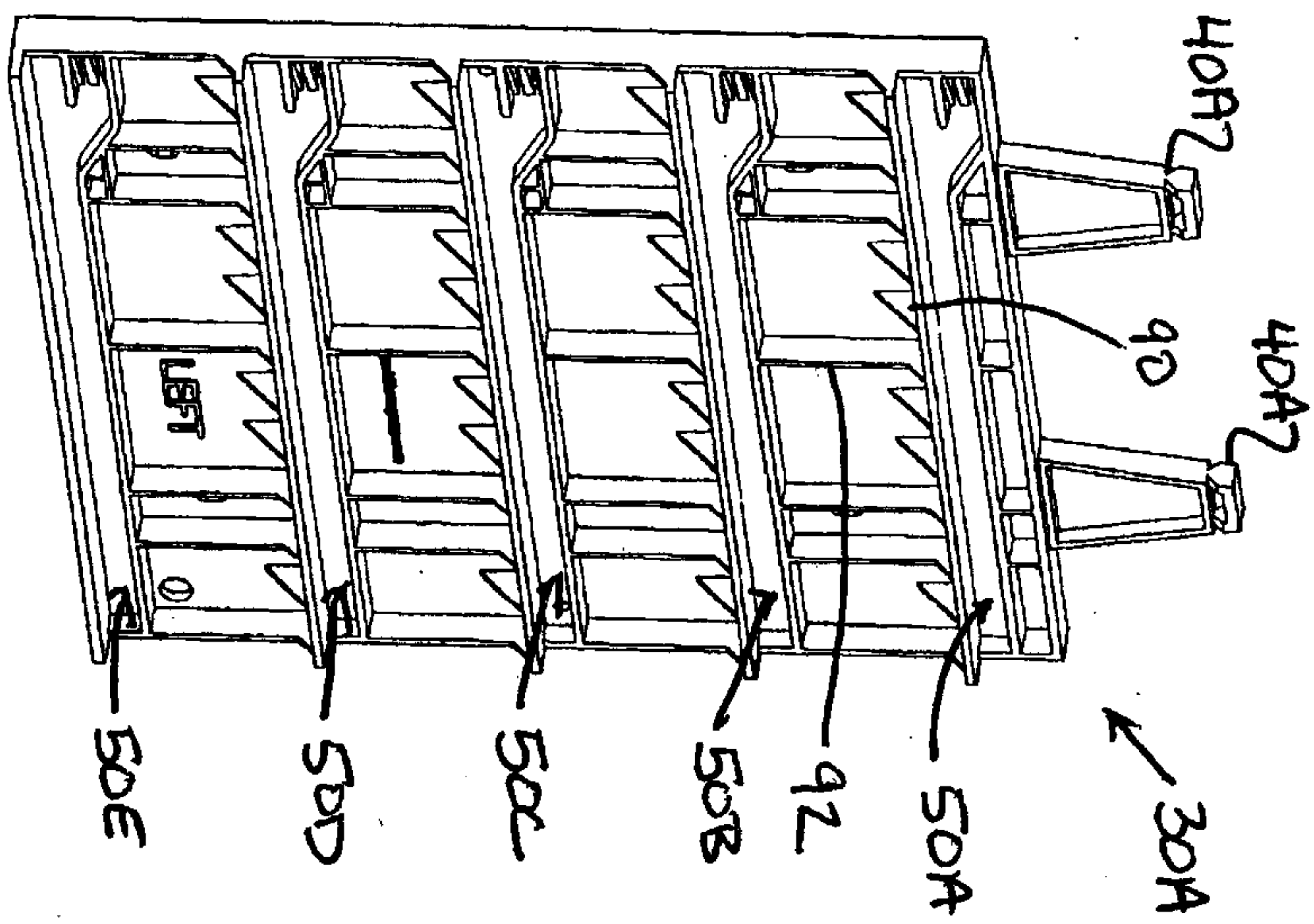
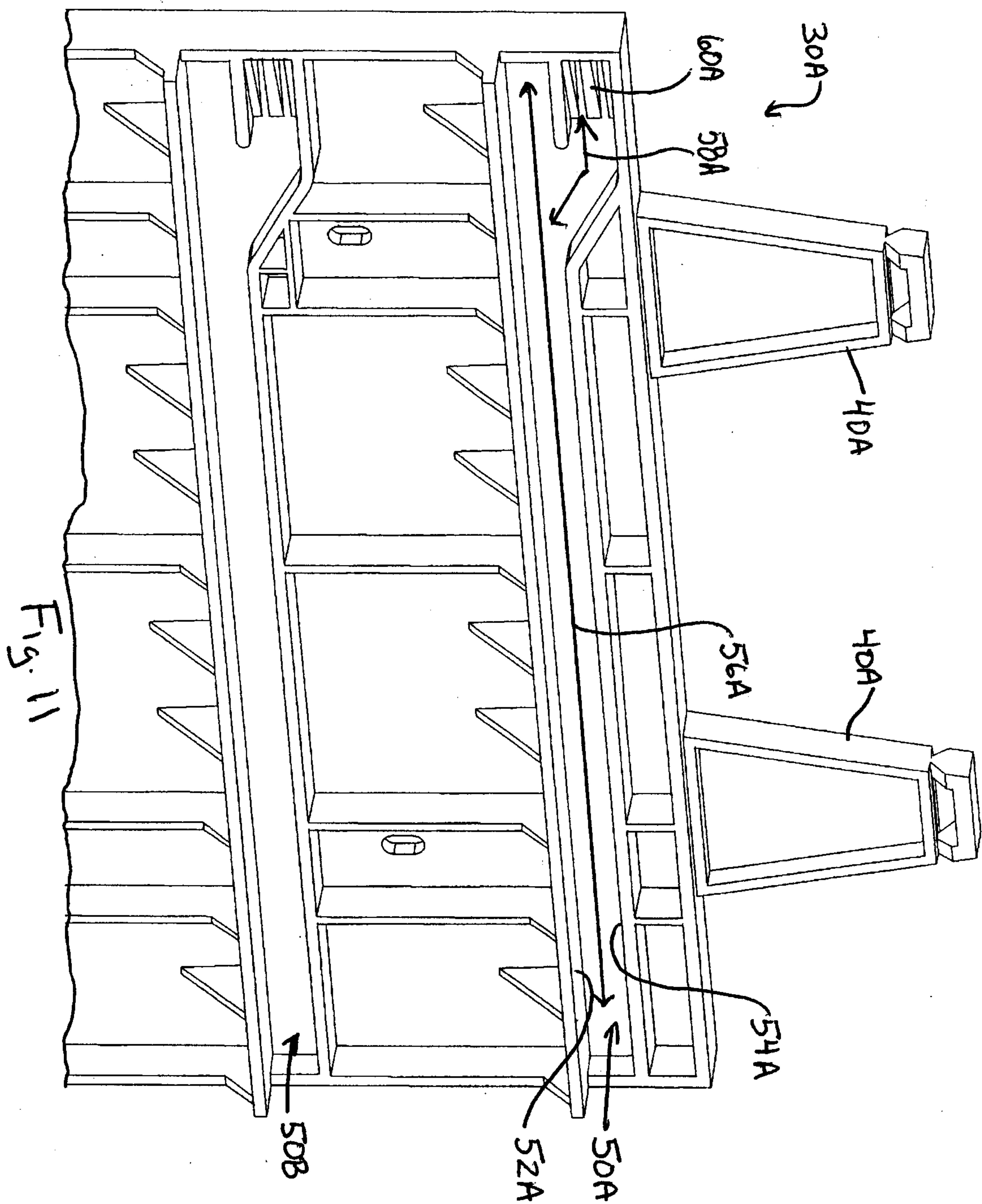
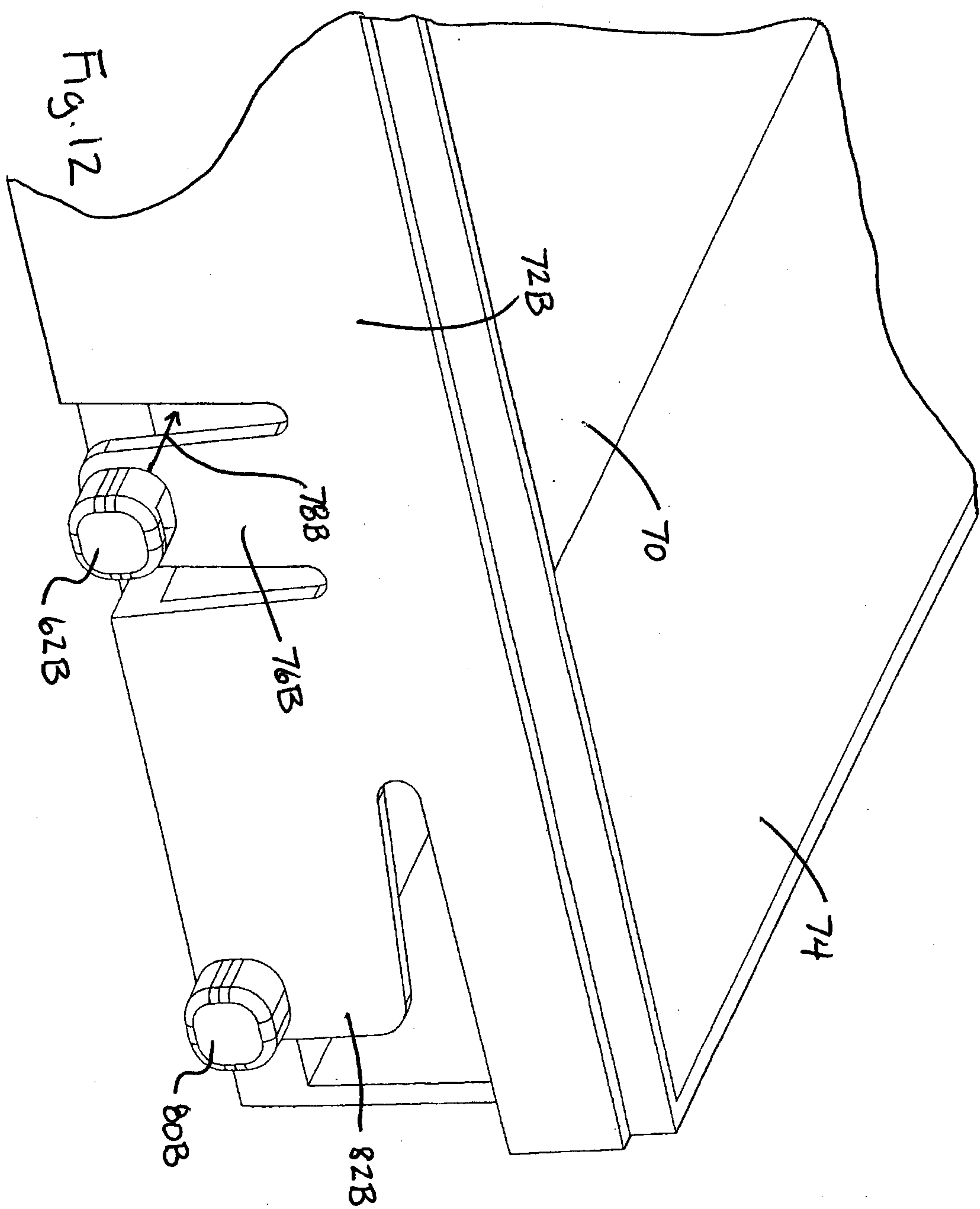


Fig. 9





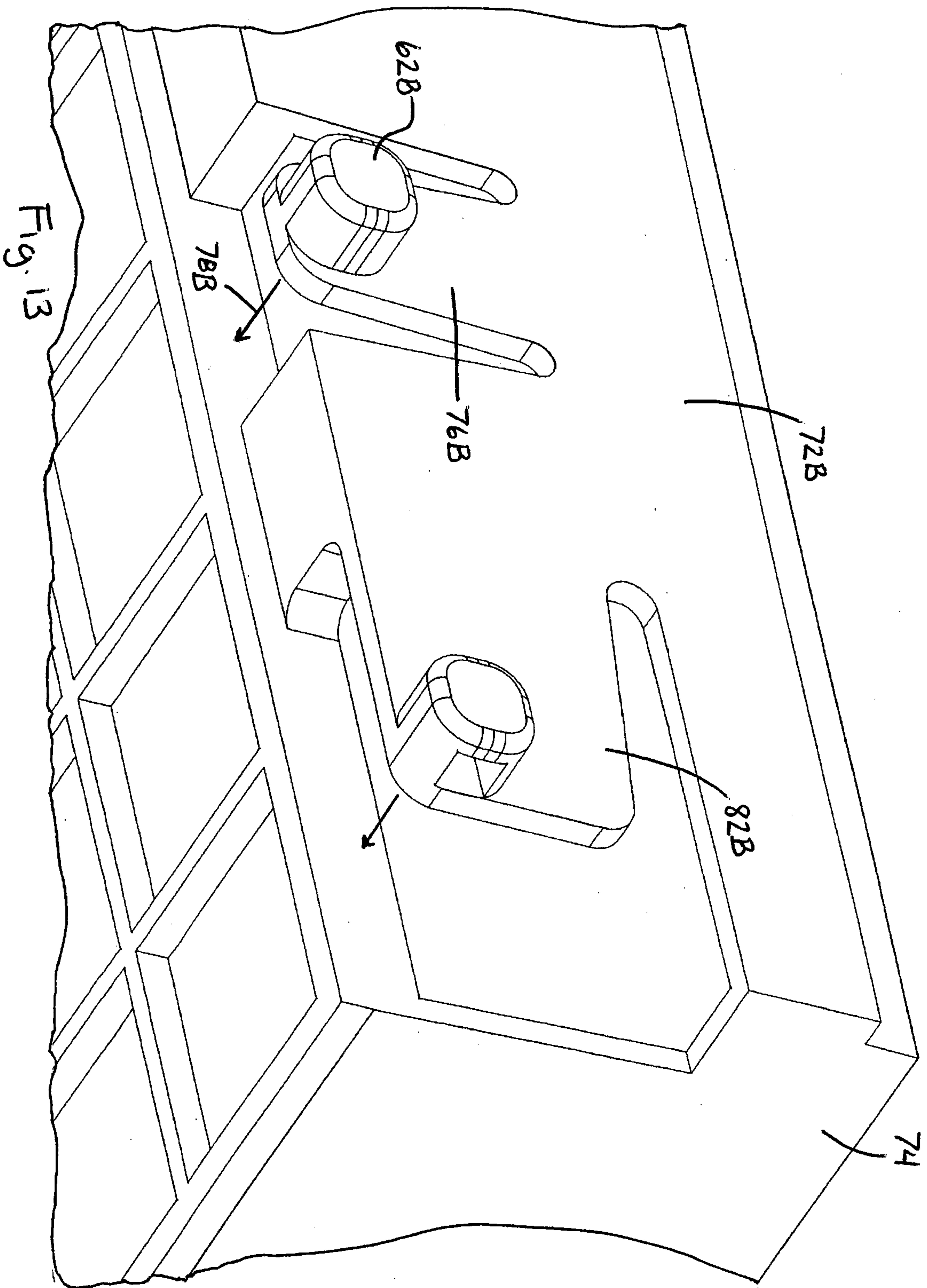
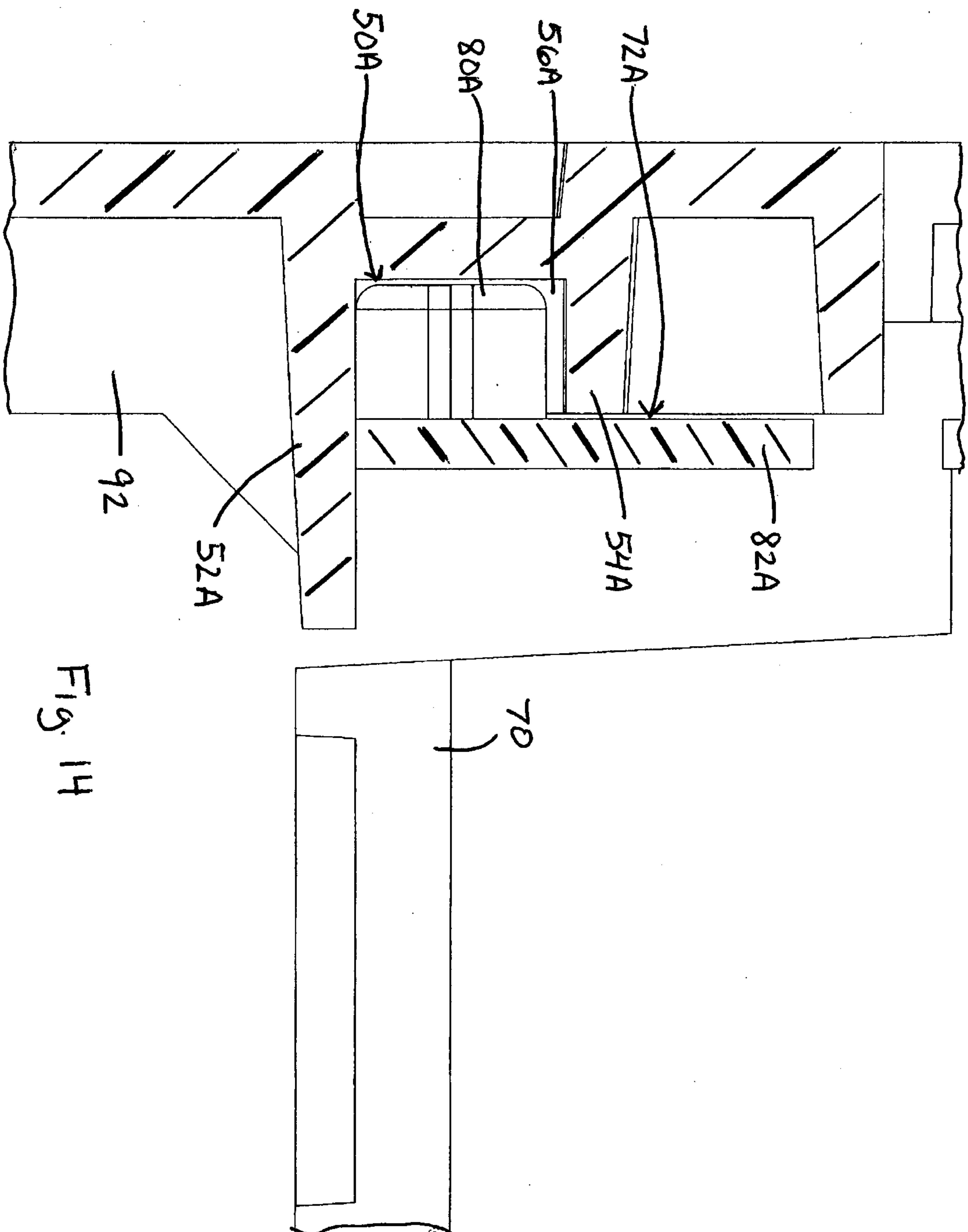
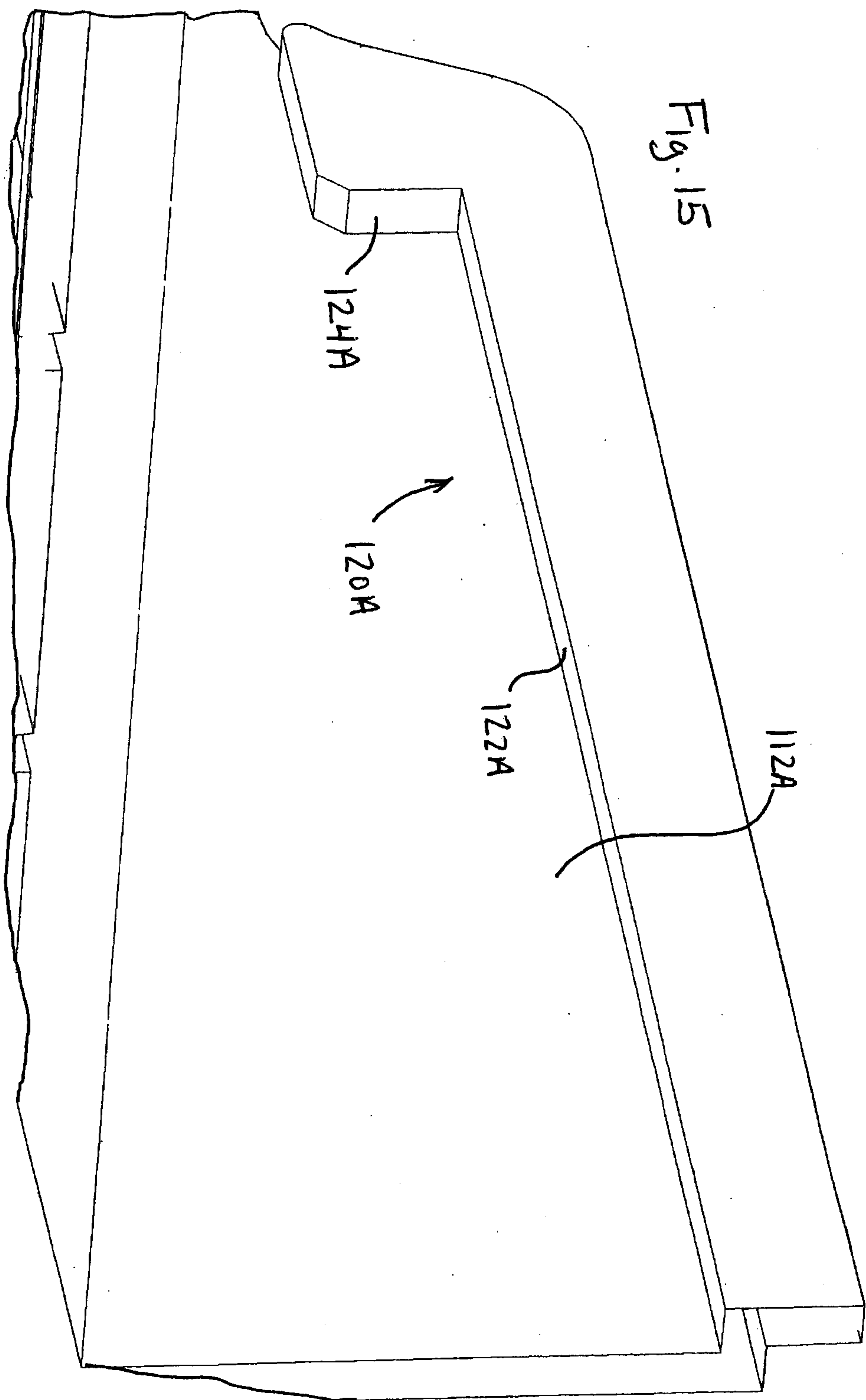


Fig. 13





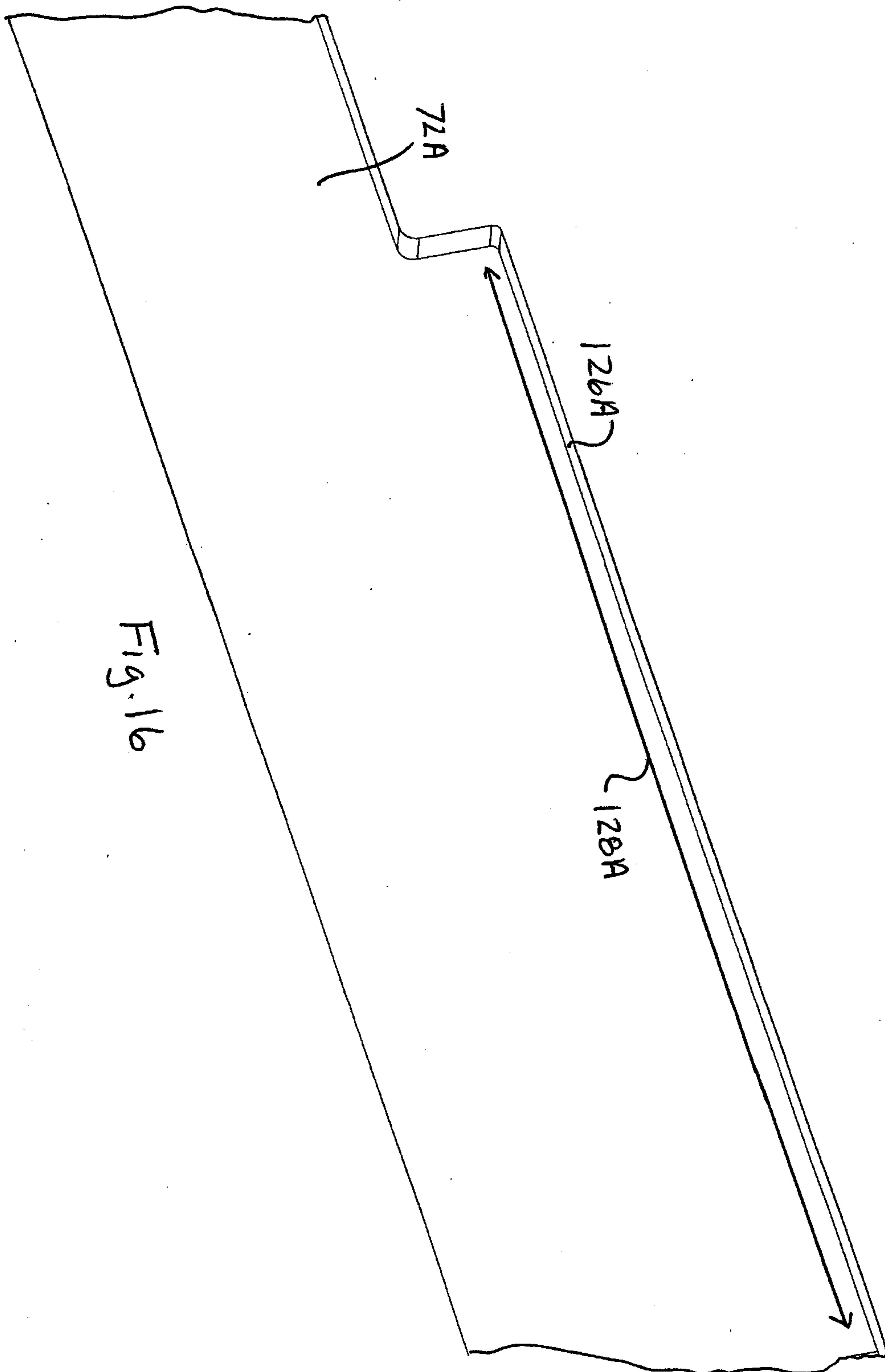
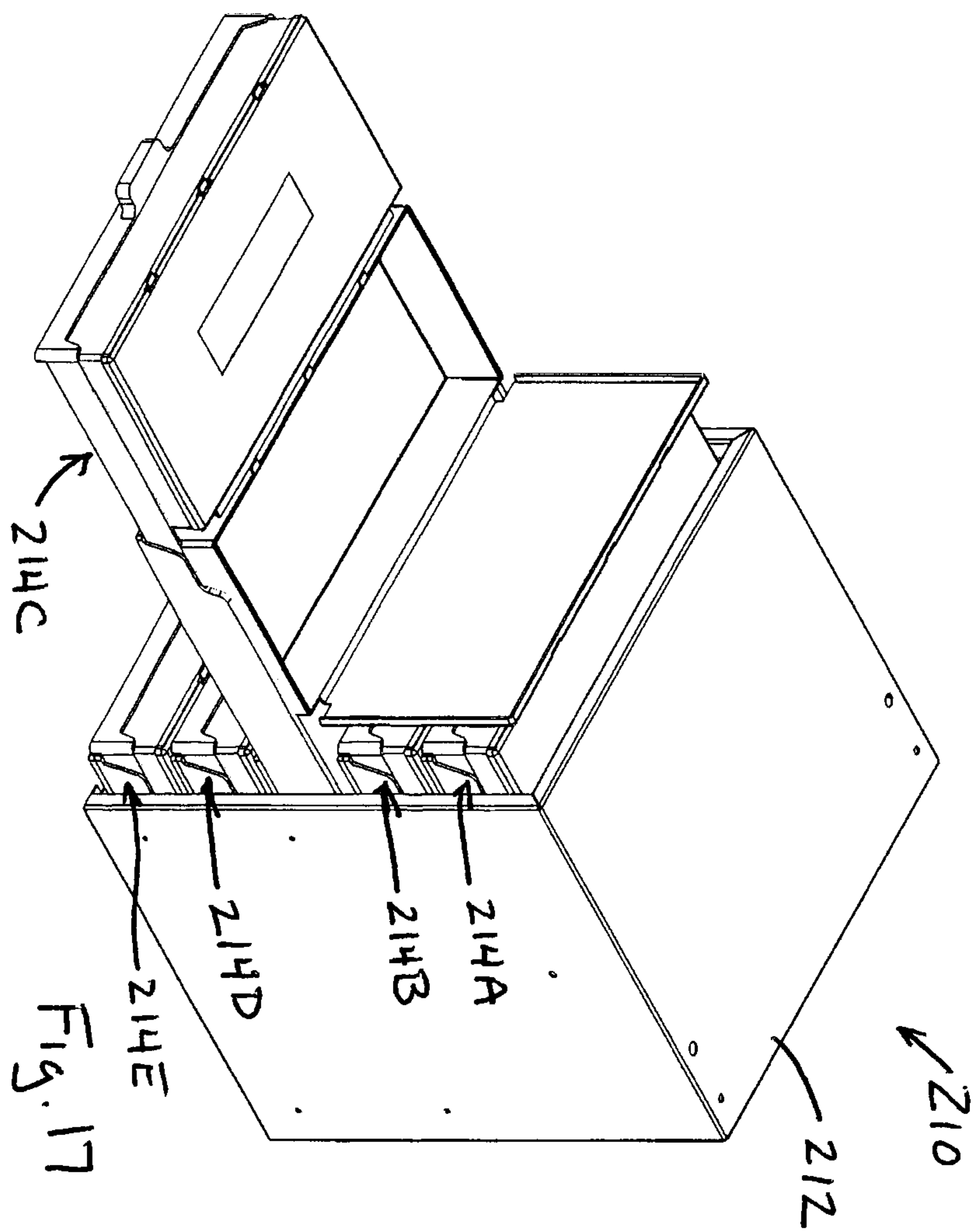
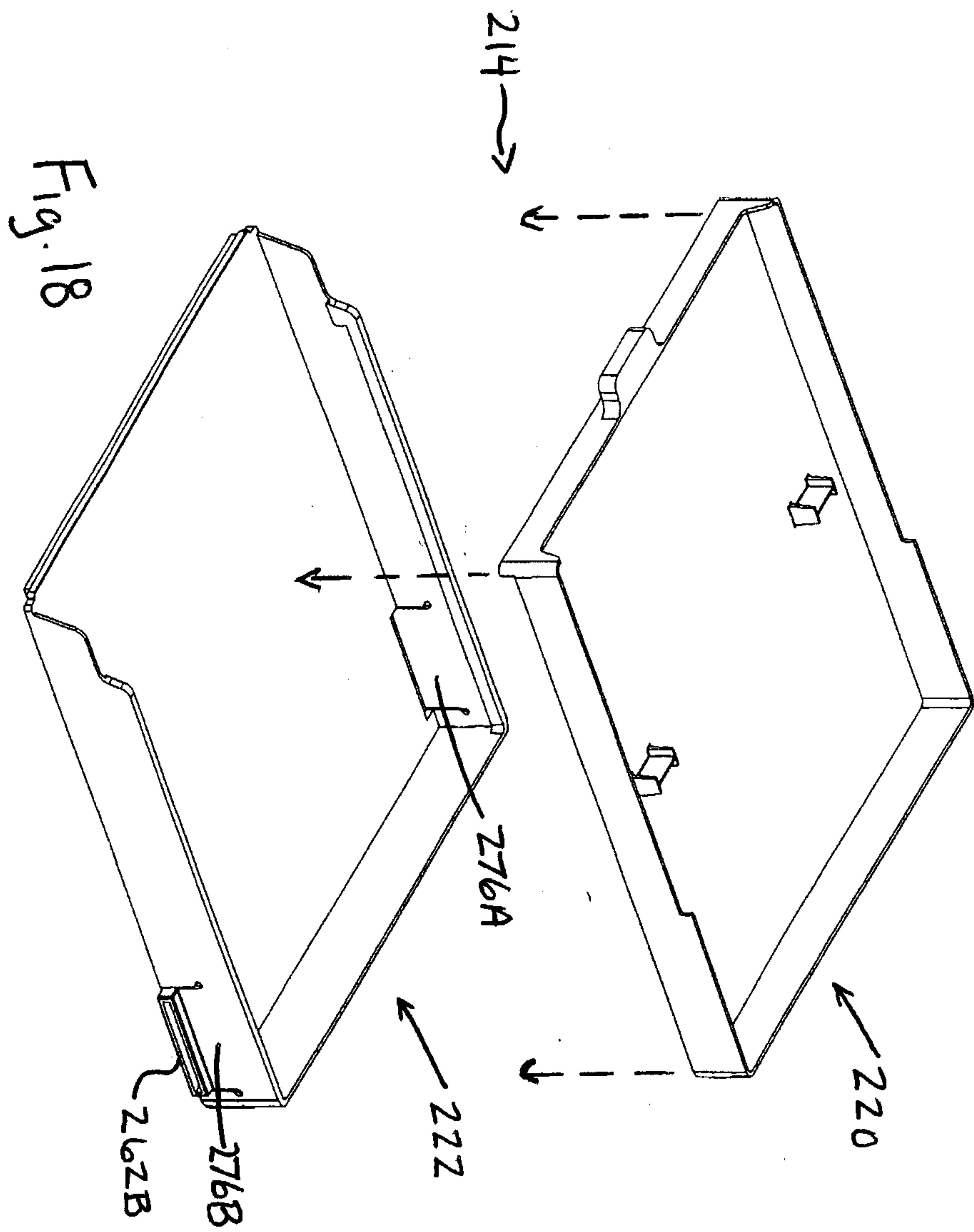
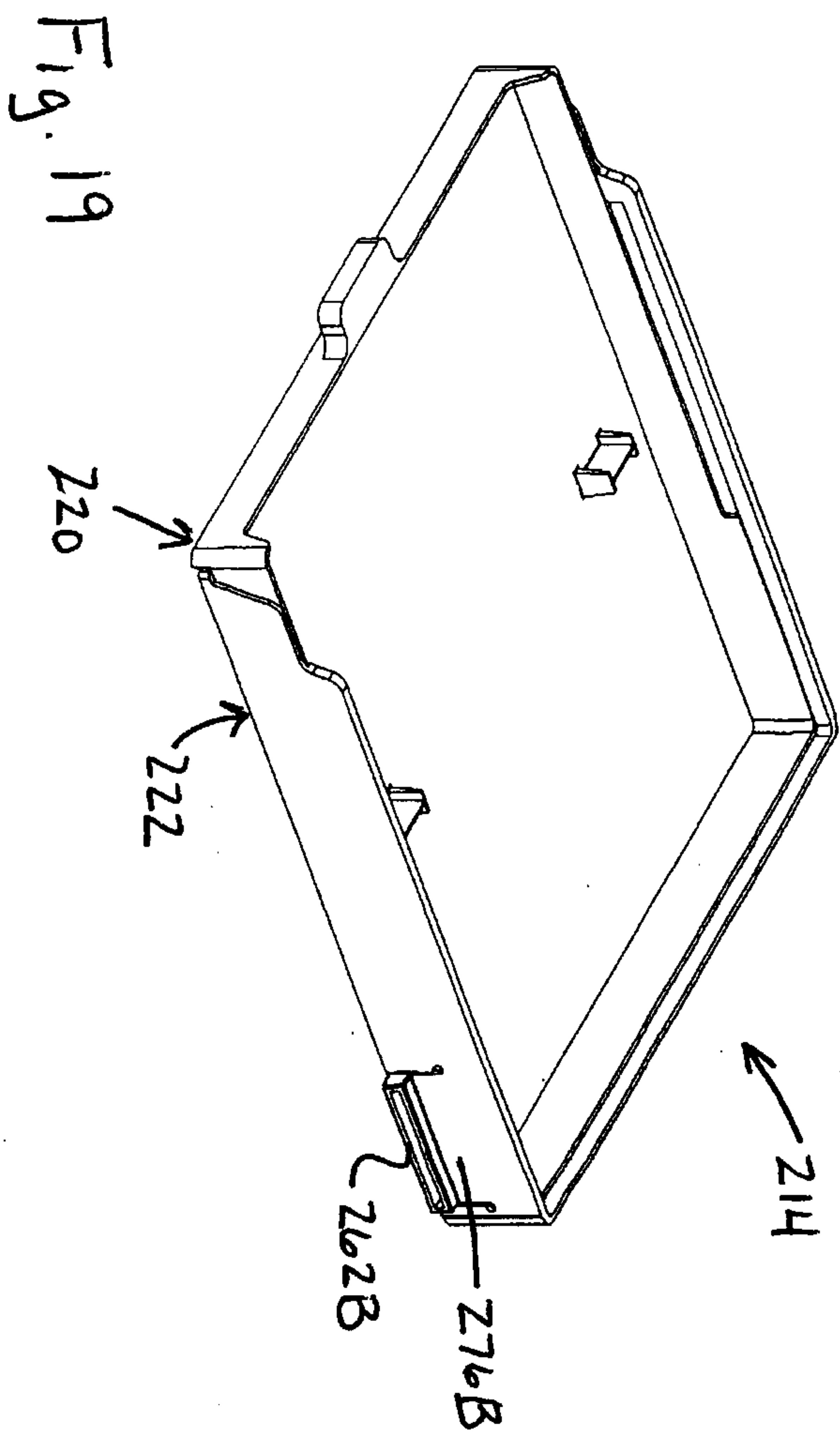
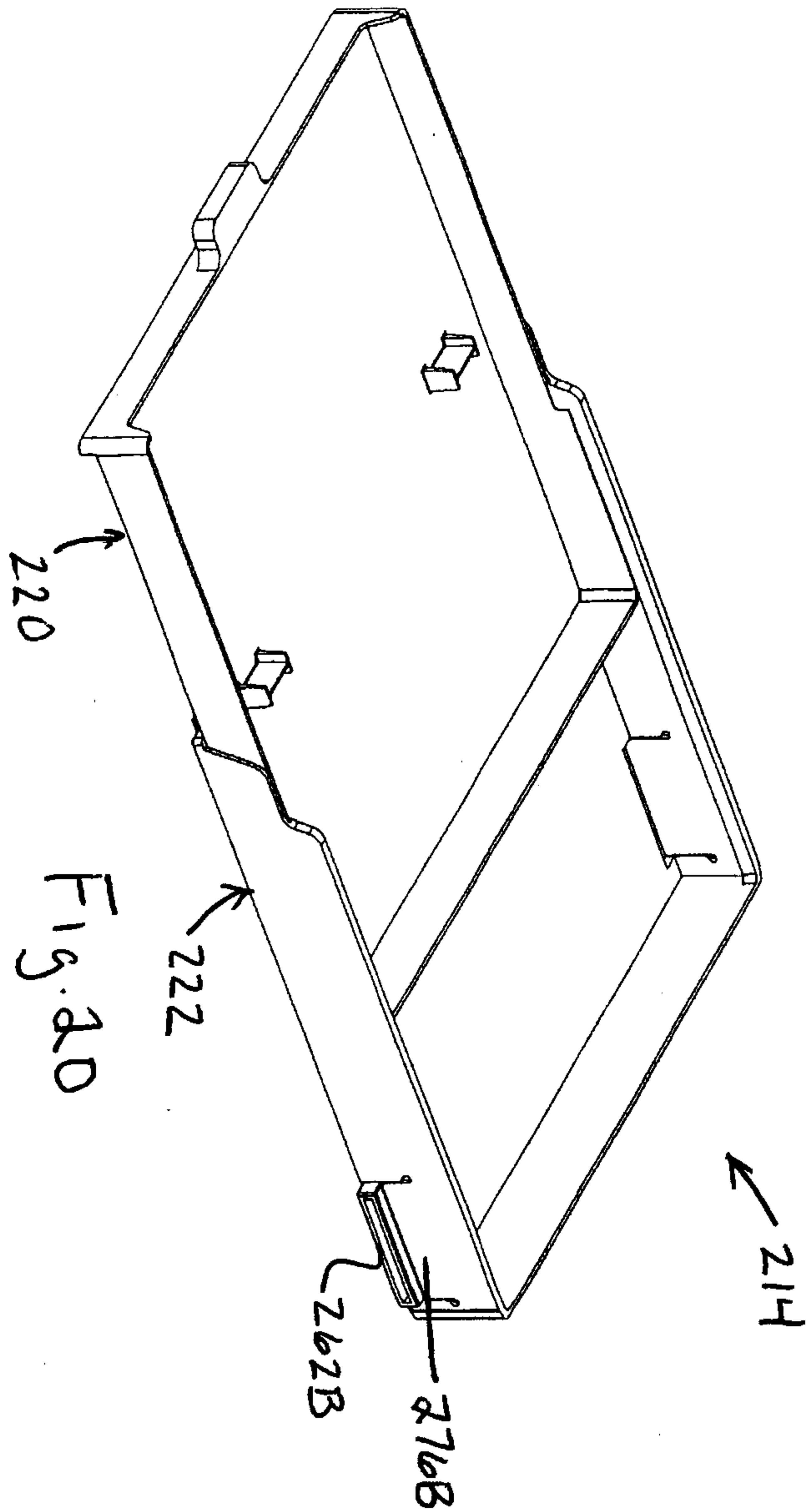


Fig. 16









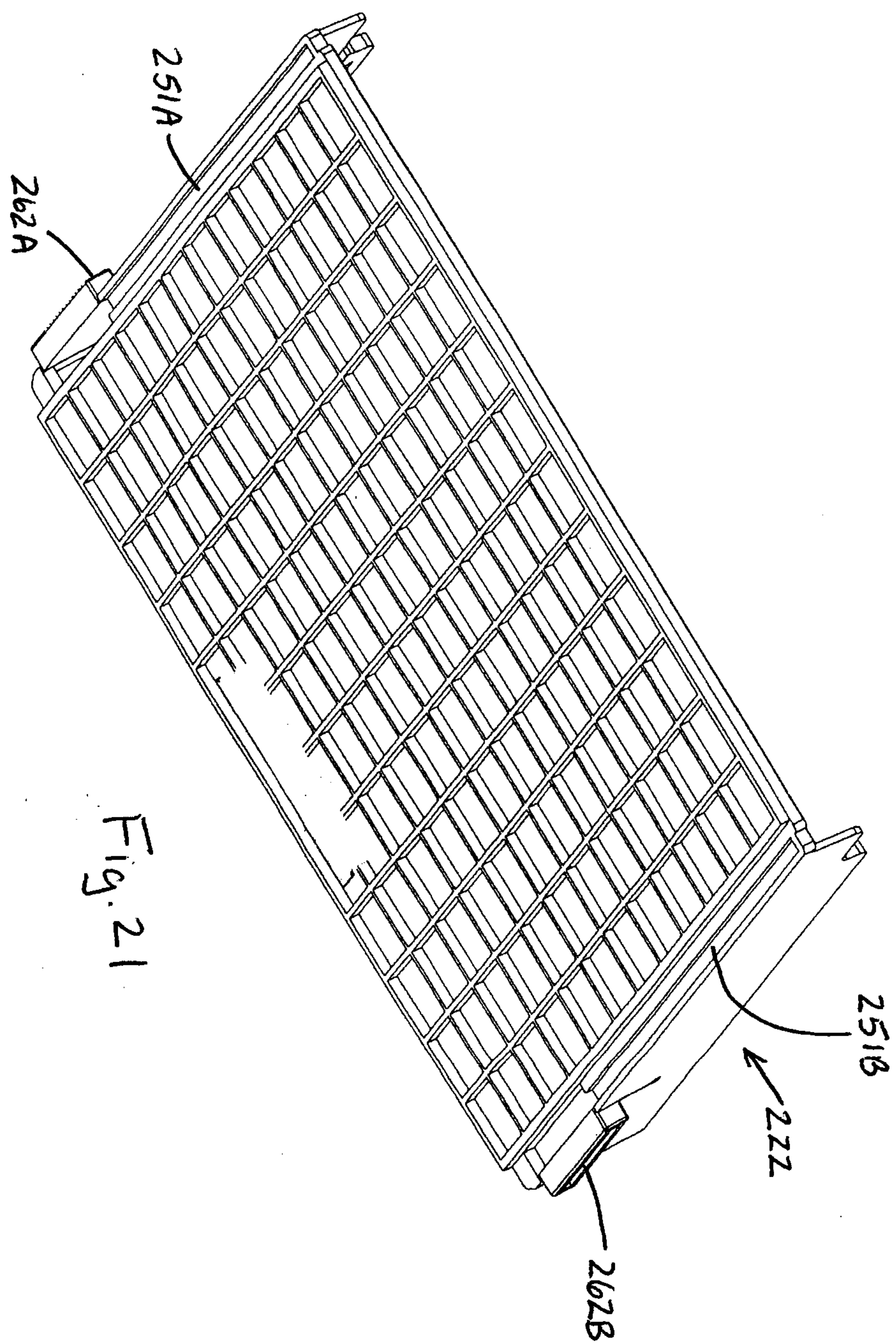


Fig. 21

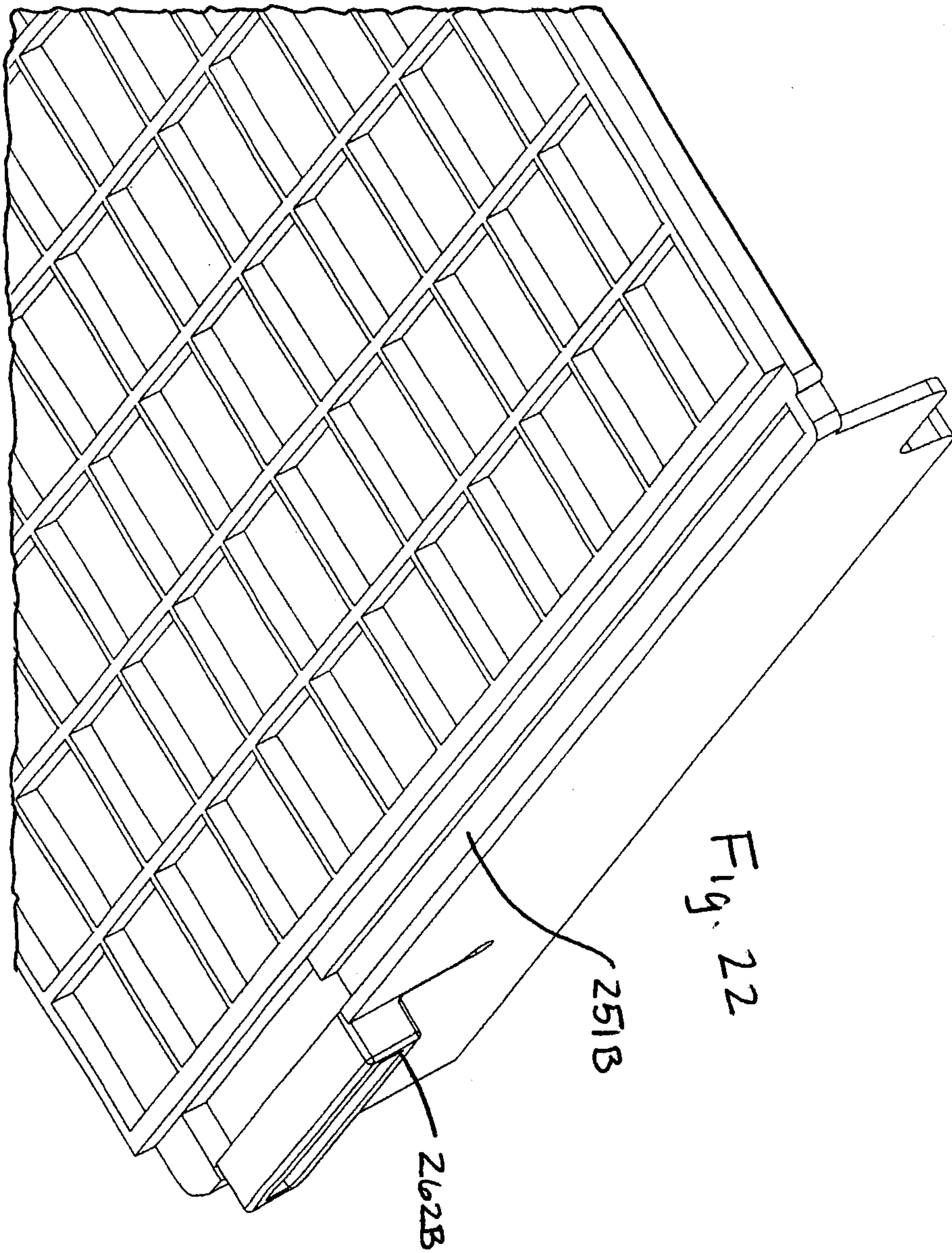


Fig. 22

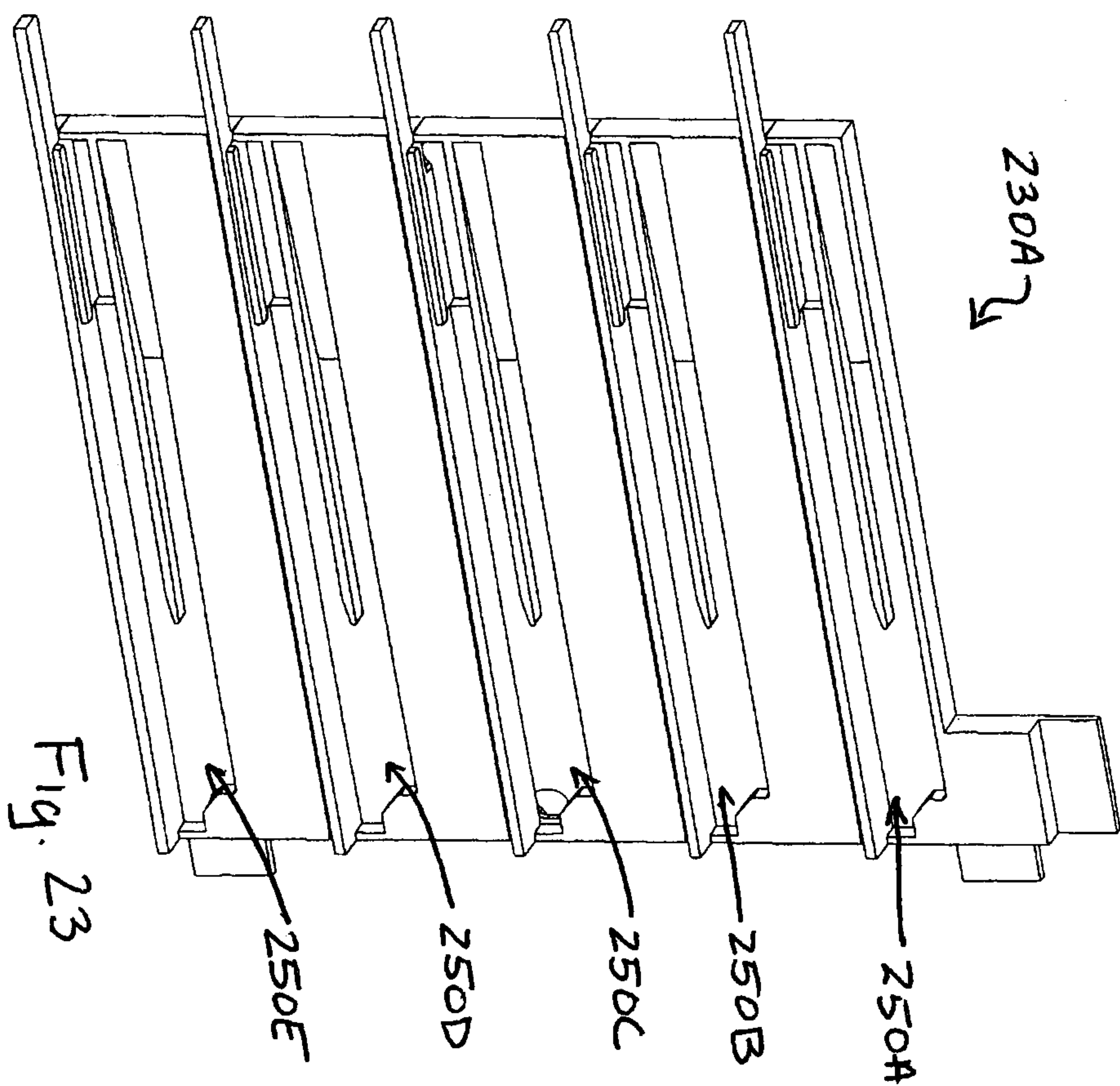


Fig. 23

