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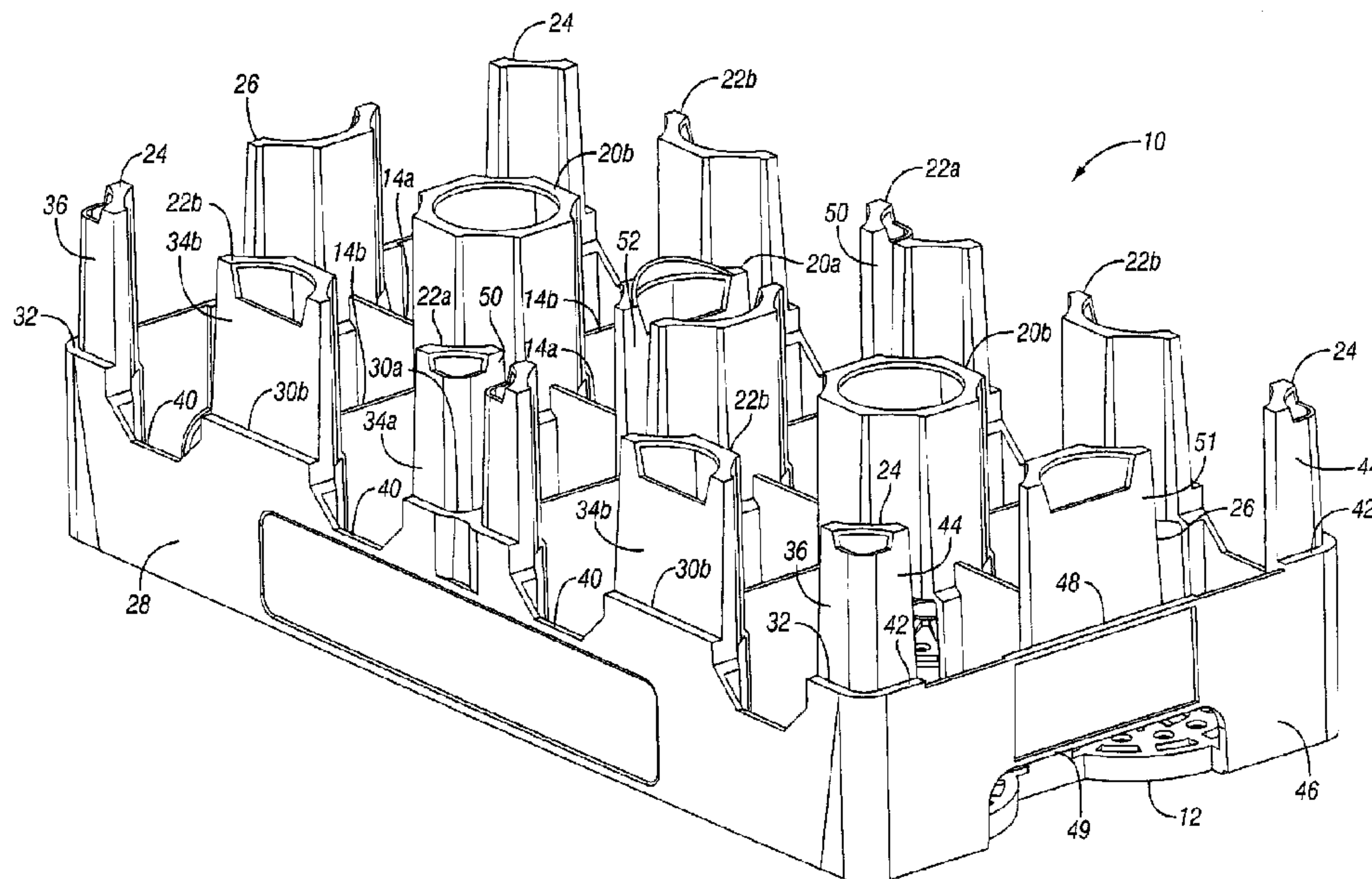
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(54) **Title: STACKABLE LOW DEPTH TRAY**



(57) **Abrégé/Abstract:**

A tray for storing and transporting bottles according to one embodiment of the present invention includes a base and a plurality of corner columns and side columns extending upwardly from the base, including center side columns. The center side columns and the corner columns having outer ledges defining a nesting height of the tray, such that the side walls of a similar tray nested thereon would contact and rest on the outer ledges of the center side columns and the corner columns. According to another, independent feature of the present invention, the noncenter side columns are offset inwardly relative to adjacent columns. This accommodates the handle of the tray in a ninety-degree cross-stacked configuration. As another optional feature, end columns are offset inwardly relative to adjacent corner columns in order to accommodate the handle of a similar tray nested thereon.

ABSTRACT OF THE DISCLOSURE

A tray for storing and transporting bottles according to one embodiment of the present invention includes a base and a plurality of corner columns and side columns extending upwardly from the base, including center side columns. The center side columns and the corner columns having outer ledges defining a nesting height of the tray, such that the side walls of a similar tray nested thereon would contact and rest on the outer ledges of the center side columns and the corner columns. According to another, independent feature of the present invention, the noncenter side columns are offset inwardly relative to adjacent columns. This accommodates the handle of the tray in a ninety-degree cross-stacked configuration. As another optional feature, end columns are offset inwardly relative to adjacent corner columns in order to accommodate the handle of a similar tray nested thereon.

STACKABLE LOW DEPTH TRAY

BACKGROUND OF THE INVENTION

The present invention relates to a stackable low depth tray for storing and transporting
5 beverages containers, such as bottles.

Plastic bottles are widely used as containers for soft drinks and other beverages. These
bottles are often stored and transported in trays, particularly plastic trays having side walls, end
walls and dividers defining pockets between the side walls and end walls. There are many
known tray designs that are referred to as “low depth” trays in which the side walls, end walls
10 and dividers are lower than the height of the stored bottles, and in which the bottles support the
weight of additional trays and bottles stacked thereon.

One known type of low-depth tray had sidewalls and dividers all at the same height. In
later versions of this tray, a portion of the dividers was lowered to reduce weight. This height of
the side walls and dividers was the nest stop for empty crates stacked thereon in both a column
15 (i.e. trays aligned) and cross stack (i.e. each row of trays is ninety degrees relative to the row of
trays below it, or the trays are longitudinally aligned and longitudinally offset by 50%).

In the known trays, the bottom ribs of the tray base extend down approximately 0.1”
further than the sidewall. Raising the bottom edge of the sidewalls in this manner makes it easier
for a delivery person to get a hand truck blade under a stack of crates to move them. As a result,
20 the sidewalls of stacked empty crates do not rest on each other. It is the bottom ribs extending
down from the base that rest on top of the dividers when stacked. One problem with this raised
side wall design is that empty stacks are not as stable because the footprint is much smaller
stacking on dividers only.

Later generation trays improved on this design by adding ribs on the outside of the walls
25 to capture the sidewall of the crate above and also widening the lower part of the castle to
capture the bottom ribs of the crate above.

In another tray, the side walls between the columns and the dividers are lowered for more
visibility. As a result, the side walls do stack on the top of the side walls of the tray below. In
this design, the columns are taller in order to better support bottles with a portion of reduced
30 diameter between the base and a mid-portion of the bottle. One problem with this design is that
the taller columns extend into the handle area of the tray above, in both a column stack and a

cross stack position. In order to accommodate the handle, the columns are aggressively tapered on the outside face of the columns on the perimeter of the tray. However, the center columns still do not accommodate the handle in a longitudinal cross-stack arrangement. Also, this design results in corner columns that are more fragile because they include the aggressive taper on two
5 sides.

SUMMARY OF THE INVENTION

A tray for storing and transporting bottles according to one embodiment of the present invention includes a base and a plurality of interior columns extending upwardly from the base, including a center interior column. A plurality of side columns extend upwardly along sides of
10 the tray, including two noncenter side columns and a center side column on each side of the tray, each center side column between the two noncenter side columns. Corner columns are at corners of the tray. The center side columns and the corner columns have outer ledges defining a nesting height of the tray, such that the side walls of a similar tray nested thereon would contact and rest
15 on the outer ledges of the center side columns and the corner columns. The noncenter side columns do not include an outer ledge at the nesting height.

According to another, independent feature of the present invention, exterior surfaces of opposing noncenter side columns on opposite sides of the tray are spaced from one another by a distance less than that by which exterior surfaces at the first height of opposing center side
20 columns on opposite sides of the tray. In other words, the noncenter side columns are offset inwardly relative to adjacent columns. This accommodates the handle of a tray stacked thereon in a ninety-degree cross-stacked configuration.

According to another, independent feature of the present invention, exterior surfaces of the end columns are offset inwardly relative to the respective adjacent corner columns. This
25 accommodates the handle of a tray nested thereon in a column stack configuration.

According to another, independent feature of the present invention, the center interior column and the center side columns include spaced apart halves, defining a passage therethrough. The halves of the center interior column are spaced further apart than the halves of the center side columns in order to accommodate the handle cross-stacked longitudinally
30 thereon.

These and other features of the application can be best understood from the following specification and drawings, the following of which is a brief description.

BRIEF DESCRIPTION OF THE DRAWINGS

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

Figure 2 is a side perspective view of the tray.

Figure 3 is a bottom perspective view of the tray.

Figure 4 is a bottom perspective view of the tray.

10 Figure 5 is a side view of the tray.

Figure 6 is an end view of the tray.

Figure 7 is a perspective of the tray with a similar tray column stacked thereon.

Figure 8 is a perspective of the tray with the similar tray cross-stacked ninety degrees thereon.

15 Figure 9 is an end view of the trays of Figure 8.

Figure 10 is a section view through the trays of Figures 8 and 9.

Figure 11 shows the tray with the similar tray cross-stacked longitudinally thereon.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

20 A tray 10 according to one embodiment of the present invention is shown in Figure 1. The tray 10 includes a base wall 12. A plurality of longitudinal dividers 14a and a plurality of lateral dividers 14b (or, together “dividers 14”) extend outward from a plurality of interior columns 20a, 20b which, together with the base walls 12, longitudinal dividers 14a and lateral dividers 14b define a plurality of bottle receiving pockets. The interior columns include a center
25 interior column 20a and two noncenter interior columns 20b arranged generally along a longitudinal centerline of the tray 10.

The lateral dividers 14b each connect one of the interior columns 20 with one of a plurality of side columns 22a, 22b positioned along a side edge of the tray 10. The side columns 22a, 22b (collectively “side columns 22”) center side columns 22a and noncenter side columns
30 22b. The tray 10 further includes four corner columns 24 extending upwardly from the corners

of the tray 10. End columns 26 extend upwardly from ends of the tray 10, between the corner columns 24.

Side walls 28 on each side of the tray 10 define outer ledges 30a, 30b adjacent the center side columns 22a and noncenter side columns 22b, respectively. The side walls 28 further define
 5 outer ledges 32 adjacent the corner columns 24. Exterior surfaces 34b of the noncenter side columns 22b adjacent the outer ledges 30b are offset inwardly relative to the exterior surfaces 34a of the center side columns 22a adjacent the outer ledges 30a and relative to the exterior surfaces 36 of the corner columns 24 adjacent the outer ledges 32. The outer ledges 30a of the center side columns 22a and the outer ledges 32 of the corner columns 24 define the nesting
 10 height, and the outer ledges 30b of the noncenter side columns 22b are slightly lower than the nesting height. Alternatively, the outer ledges 30b of the noncenter side columns 22b could be eliminated.

At the ends of the tray 10, an end wall 46 defines outer ledges 42 at the nesting height adjacent exterior surfaces 44 of the corner columns 24. The end wall 46 also defines an outer
 15 ledge 48 below the nesting height adjacent an exterior surface 51 of the end column 26. The exterior surface 51 of the end column 26 is offset inwardly relative the exterior surfaces 44 of the corner columns 24. A handle 49 is defined by a downwardly open recess formed in the end wall 46 below the end column 26.

The center side columns 22a are split to define a lateral passage 50 therethrough, which is
 20 aligned with a lateral passage 52 through the center interior column 20a. As shown in Figure 2, the lateral passage 52 through the center interior column 20a is wider than the lateral passage 50 through the center side columns 22a, such that the interior surfaces 54 of the center interior column 20a are offset away from center relative to the interior surfaces 56 of the center side columns 22a. The lateral divider 14b aligned with the center interior column 20a is at the same
 25 height as a lower surface 58 of the lateral passage 52 through the center interior column 20a, which is below the nesting height. The lower surface 60 of the lateral passage 50 through the center side columns 22a is at the nesting height, continuous with the outer ledges 30a of the center side columns 22a.

As a result, only the outer ledges 30a and lower surface 60 of the lateral passage 50 of the
 30 center side columns 22a and the outer ledges 32, 42 of the corner columns 24 are at the nesting height. Considering the tray 10 as two sets of 2x2 pockets, this creates nesting stops only at the

four corners of each of the sets of four pockets. This provides stable, consistent nesting in a column stack and in cross-stack (longitudinal or lateral).

Further, within each set of 2x2 pockets, if one considers the split center interior column 20a and the center side columns 22a as two separate columns each, then the non-corner columns
 5 along the perimeter of each 2x2 set (i.e. end column 26, noncenter side columns 22b, and one half of the center interior column 20a) are each offset inwardly relative to its adjacent "corner columns" (now also considering the split center side columns 22a as "corners" within each 2x2 set). The offset end column 26 provides clearance for the handle 49 of a similar tray column stacked thereon. The offset noncenter side columns 22b provide clearance for the handle 49 of a
 10 similar tray cross-stacked laterally (i.e. 90 degrees) thereon. The offset halves of the center interior column 20a provide clearance for the handle 49 of a longitudinally cross-stacked similar tray.

Figures 3 and 4 are bottom perspective views of the tray 10. The base 12 includes a plurality of interconnected ribs 58 generally defining the lowermost plane of the tray 10. The
 15 lowermost edge of the side walls 28 and end walls 46 are spaced slightly above the lowermost plane of the ribs 58. Additionally, a channel 60 is formed laterally through the center of the ribs 58 (i.e. aligned with the center lateral divider 14b) to provide another surface that is in the same plane as the lowermost edges of the side walls 28 and end walls 46. These are the bottom nesting surfaces of the tray 10, i.e. the surfaces that contact the nesting stop surfaces at the
 20 nesting height of the tray 10 nested below. Thus, these lower perimeter surfaces of the trays 10 support the trays 10 in any nesting configuration, rather than the ribs 58 which are spaced inwardly from the perimeter. This provides increased stability of the stacked trays 10. The ribs 58 also form cone-shaped bottle-cap receiving recesses 62, which receive the bottle-caps of bottles in a tray 10 stacked therebelow when the trays are loaded. The cone-shaped recesses 62
 25 increase the stability of the stacked, loaded trays 10.

Figure 5 is a side view of the tray 10. Again, the outer ledges 30a and 32 are at the nesting height, while the outer ledges 30b and longitudinal dividers 14a (and lateral dividers 14b, Figure 2) are spaced slightly below the nesting height. As a result, all of the contact with the upper tray 10 is only on the surfaces that are at the nesting height. Also, as shown, the ribs 58 of
 30 the base 12 extend downwardly slightly further than the side walls 28 (and end walls 46, Figure

3). The channel 60 through the center of the base 12 provides another surface at the same height as the side walls 28 and end walls 46.

Figure 6 is an end view of the tray 10. As shown, the outer ledge 48 adjacent the end column 26 is slightly lower than the outer ledges 42, 32 of the corner columns 24, which are at the nesting height.

Figure 7 shows the tray 10 with a similar tray 10' column stacked thereon. The side walls 28' and end walls 46' rest on the outer ledges 30a, 32, 42 of the lower tray 10. The offset end column 26 of the lower tray 10 nests in the handle 49' of the upper tray 10'.

Figure 8 shows the tray 10 with the similar tray 10' cross stacked ninety degrees thereon. In this configuration, one side wall 28' of the upper tray 10' rests on the lower surfaces 60 of the passages 50 through the center side columns 22a of the lower tray 10. The other side wall 28', shown in Figure 9, rests on the outer ledges 42 of the corner columns 24 of the lower tray 10.

Figure 10 is a section view through a portion of the trays 10, 10' of Figures 8 and 9. Because the outer surface 34b of the noncenter side column 22b is offset inwardly, the noncenter side column 22b can nest behind the handle 49' of the upper tray 10'. The side wall 28' of the upper tray 10' is received within the passage 50 through the center side column 22a. The end wall 46' of the upper tray 10' rests on the outer ledge 30a of the center column 22a of the lower tray 10.

Figure 11 shows the two trays 10, 10' in a longitudinally cross-stacked configuration. The end wall 46' of the upper tray 10' is received within the passages 50, 52 of the center side columns 22a and the center interior column 20a and rests on the outer ledges 30a of the center side columns 22a. The side walls 28' of the upper tray 10' rest on the outer ledges 32 of the lower tray 10.

The scope of the claims should not be limited by the preferred embodiments set forth in the examples, but should be given the broadest interpretation consistent with the description as a whole.

CLAIMS:

1. A tray for storing and transporting bottles comprising:
 - a base for supporting bottles thereon;
 - a plurality of interior columns extending upwardly from the base, including a center interior column;
 - a plurality of side columns along sides of the tray, including two noncenter side columns and a center side column on each side of the tray, each center side column between the two noncenter side columns;
 - a plurality of corner columns at corners of the tray; side walls extending along the sides of the tray; and
 - the center side columns and the corner columns having outer ledges defining a nesting height of the tray, such that the side walls of a similar tray nested thereon would contact and rest on the outer ledges of the center side columns and the corner columns, wherein the noncenter side columns do not include an outer ledge at the nesting height.
2. The tray of claim 1 further including a plurality of longitudinal dividers connecting the interior columns to one another.
3. The tray of claim 1 or 2 wherein the side walls are contiguous with the outer ledges.
4. The tray of claim 3 further including window openings between the center side column and the noncenter side columns, and wherein the side walls are lower below the window openings than at the outer ledges.
5. The tray of any one of claims 1 - 4 wherein exterior surfaces at the nesting height of opposing noncenter side columns on opposite sides of the tray are spaced from one another by a distance less than that by which exterior surfaces at the nesting height of opposing center side columns on opposite sides of the tray.

6. The tray of any one of claims 1 - 5 wherein the center interior column and the center side columns each include a first half and a second half spaced away from the first half, and wherein the center first half and second half of the center interior column are spaced away from one another by a distance greater than that of the first half and second half of each of the center side columns.

7. A tray for storing and transporting bottles comprising: a base for supporting bottles thereon;

a plurality of corner columns at corners of the tray;

a plurality of interior columns extending upwardly from the base, including a center interior column, wherein at least one of the plurality of interior columns includes an upper portion having a continuous perimeter;

a plurality of side columns along sides of the tray, including two noncenter side columns and a center side column on each side of the tray, each center side column between the two noncenter side columns, exterior surfaces at a first height of opposing noncenter side columns on opposite sides of the tray are spaced from one another by a distance less than that by which are spaced exterior surfaces at the first height of opposing center side columns on opposite sides of the tray, wherein the center interior column and the center side columns each include a first half and a second half spaced away from the first half, and wherein the center first half and second half of the center interior column are spaced away from one another by a distance greater than that of the first half and second half of each of the center side columns.

8. The tray of claim 7 further including end columns at ends of the tray, each end column between two of the corner columns, exterior surfaces of the end columns offset inwardly relative to the respective adjacent corner columns.

9. A tray for storing and transporting bottles comprising: a base for supporting bottles thereon;

a plurality of corner columns at corners of the tray;

a plurality of interior columns extending upwardly from the base, including a center interior column;

a plurality of side columns along sides of the tray, including two noncenter side columns

and a center side column on each side of the tray, each center side column between the two noncenter side columns, exterior surfaces at a first height of opposing noncenter side columns on opposite sides of the tray are spaced from one another by a distance less than that by which are spaced exterior surfaces at the first height of opposing center side columns on opposite sides of the tray, and

end walls at opposite ends of the tray, each end wall including a recess opening downwardly to form a handle opening, wherein each end wall includes an end column having a continuous upper surface extending between opposing sides of the end column.

10. The tray of claim 9 further including end columns at ends of the tray, each end column between two of the corner columns, exterior surfaces of the end columns offset inwardly relative to the respective adjacent corner columns.

11. The tray of claim 10 wherein the end walls form outer ledges exterior of the corner columns and the end columns, wherein the ledges adjacent the corner columns are disposed in a common plane parallel to the base, and wherein the ledge adjacent the end column is offset downwardly from the common plane.

12. The tray of claim 11 wherein the end columns are arranged to extend upwardly higher than a lowermost edge of the handles of a similar tray nested thereon.

13. A tray for storing and transporting bottles comprising:
 a base for supporting bottles thereon;
 a plurality of corner columns at corners of the tray;
 a plurality of interior columns extending upwardly from the base, including a center interior column;
 a plurality of side columns along sides of the tray;
 end columns at ends of the tray, each end column between two of the corner columns, exterior surfaces of the end columns offset inwardly relative to the respective adjacent corner columns; and

end walls at opposite ends of the tray, each end wall including a recess opening downwardly to form a handle opening below the end columns, wherein the end columns are

arranged to be extend upwardly higher than a lowermost edge of the handles of a similar tray nested thereon, wherein each end wall includes an end column having a continuous upper surface extending between opposing sides of the end column.

14. The tray of claim 13 wherein the end walls form outer ledges exterior of the corner columns and the end columns, wherein the ledges adjacent the corner columns are disposed in a common plane parallel to the base, and wherein the ledge adjacent the end column is offset downwardly from the common plane.

15. A tray for storing and transporting bottles comprising:

a base for supporting bottles thereon;

a center side column on each side of the tray, the center side column including a first interior half and a second interior half spaced away from the first half;

a center interior column extending upwardly from the base, the center interior column including a first side half and a second side half spaced away from the first side half, the first interior half and second interior half of the center interior column are spaced away from one another by a distance greater than that of the first side half and second side half of each of the center side columns;

a plurality of corner columns at corners of the tray;

side walls extending along the sides of the tray; and

noncenter side columns on each side of the tray, the center side columns between the noncenter side columns, wherein the noncenter side columns are offset inwardly relative to adjacent center side columns and corner columns, wherein at least one noncenter side column includes a continuous upper surface extending between opposing sides of the noncenter side column.

16. The tray of claim 15 further including noncenter side columns on each side of the tray, the center side columns between the noncenter side columns, wherein exterior surfaces of opposing noncenter side columns on opposite sides of the tray are spaced from one another by a distance less than that by which exterior surfaces of opposing center side columns on opposite sides of the tray.

17. The tray of claim 15 or 16, wherein the center interior column includes a lower interior surface between the first interior half and the second interior half, and wherein the center side columns each include a lower side surface between the first side half and the second side half, the lower interior surface spaced below a plane containing the lower side surfaces.

1/11

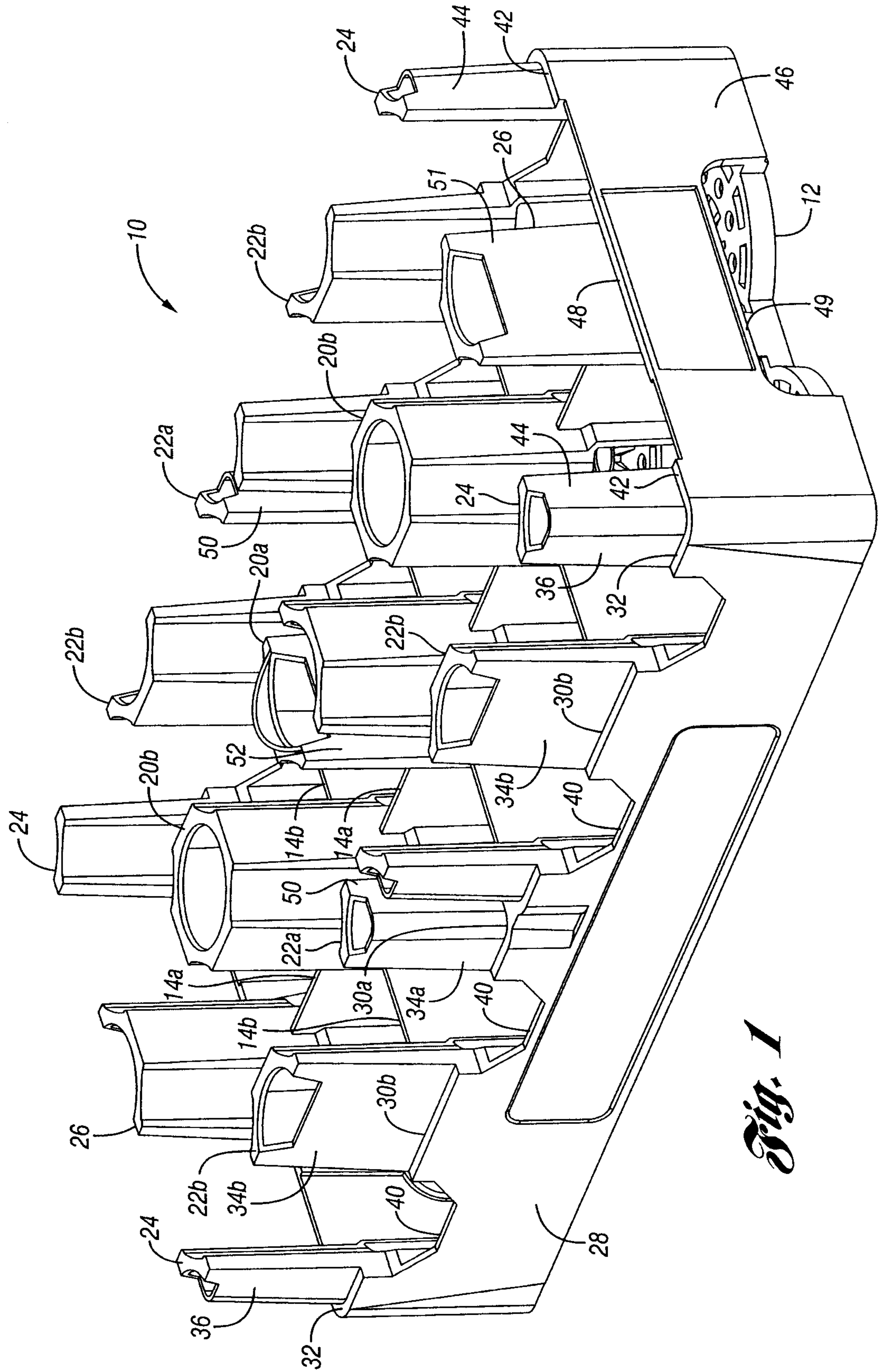


Fig. 1

2/11

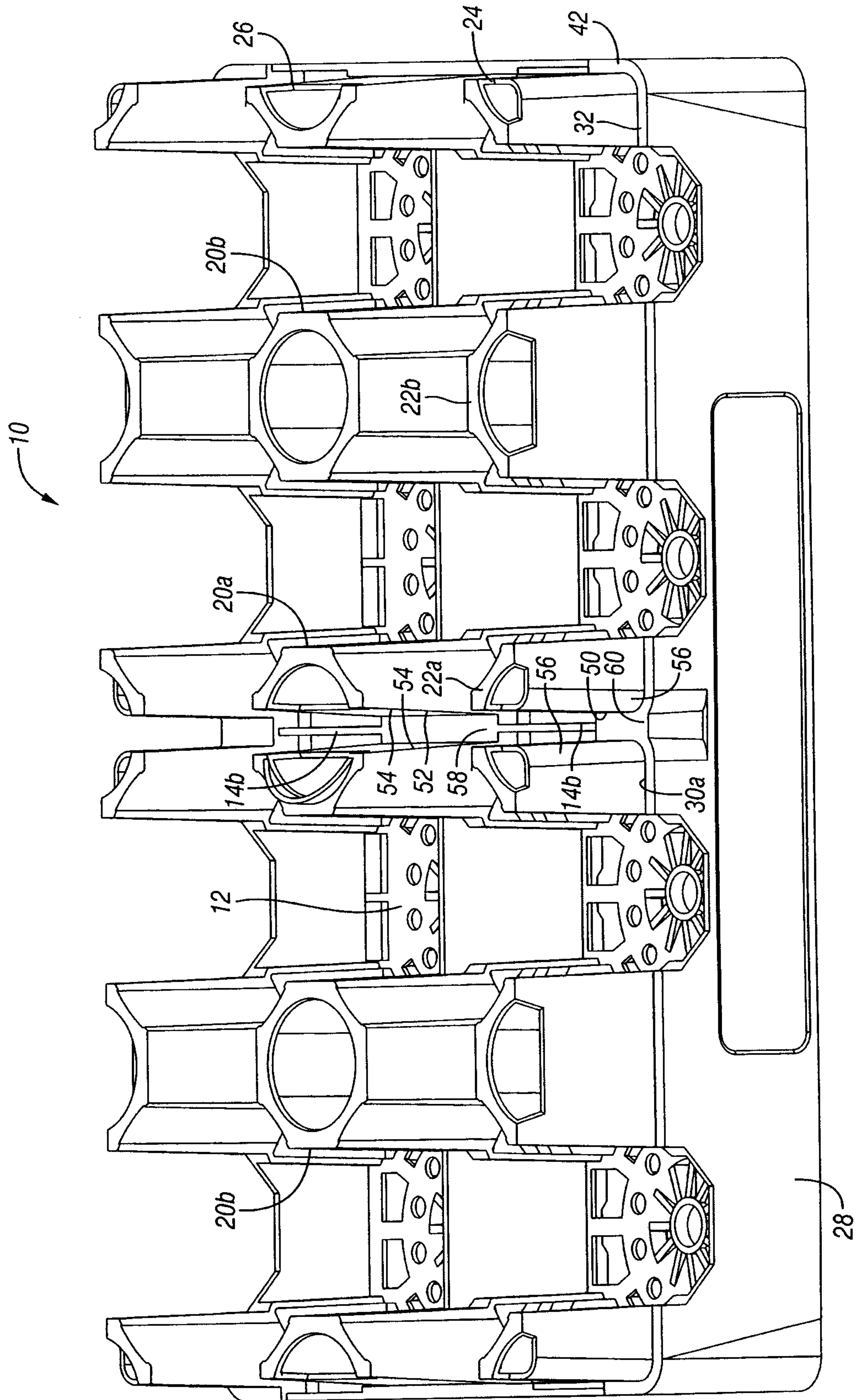
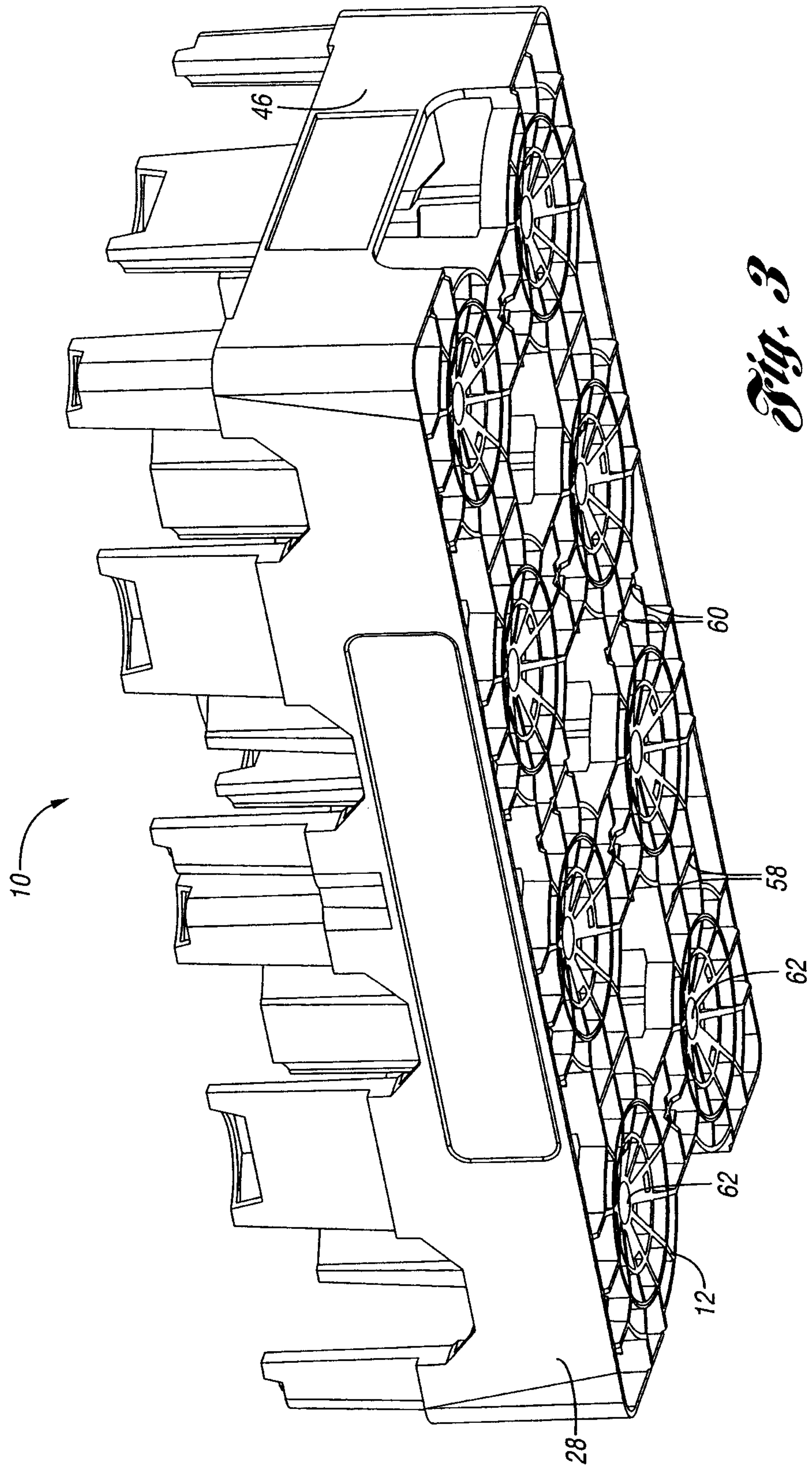


Fig. 2



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Fig.

4/11

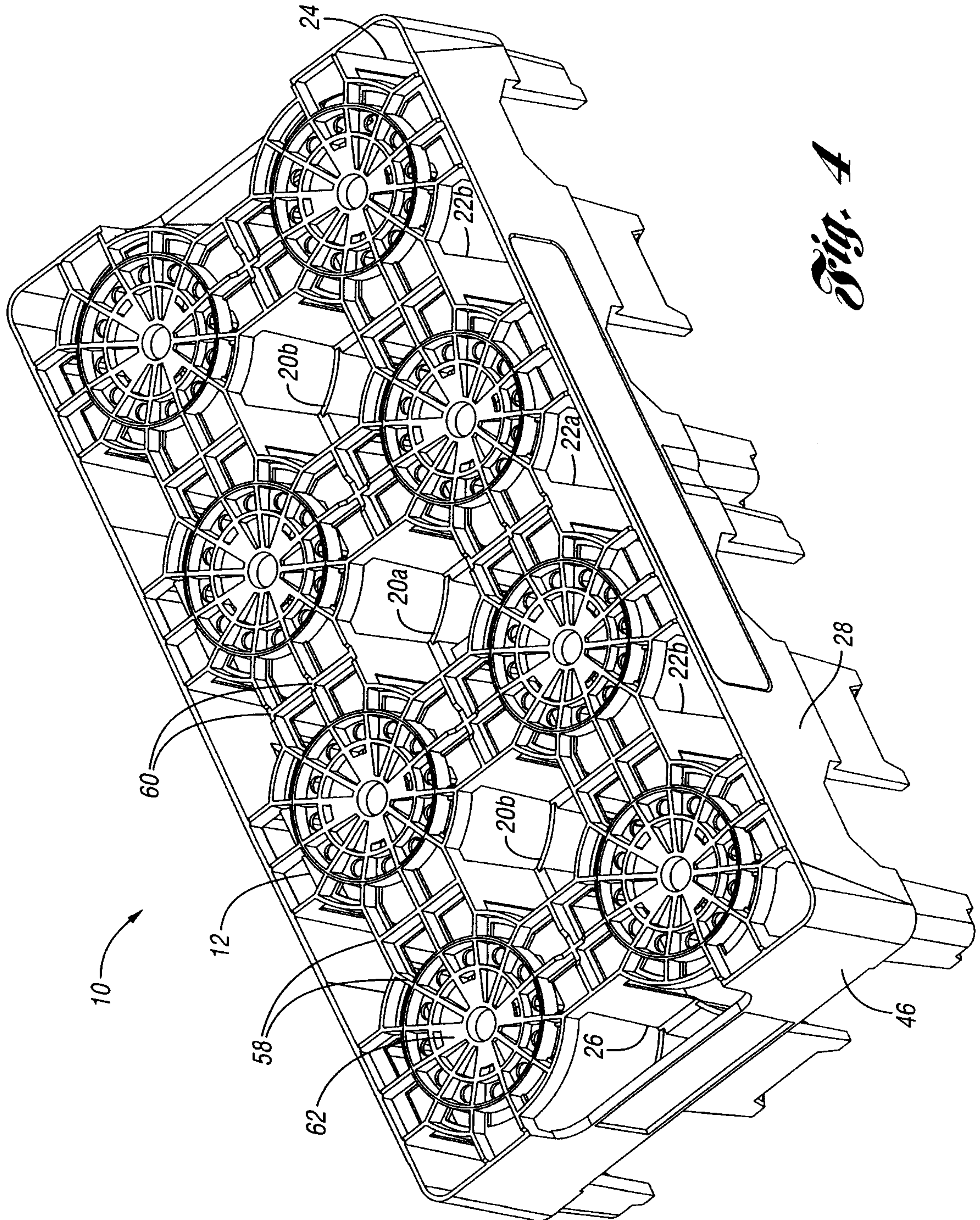


Fig. 4

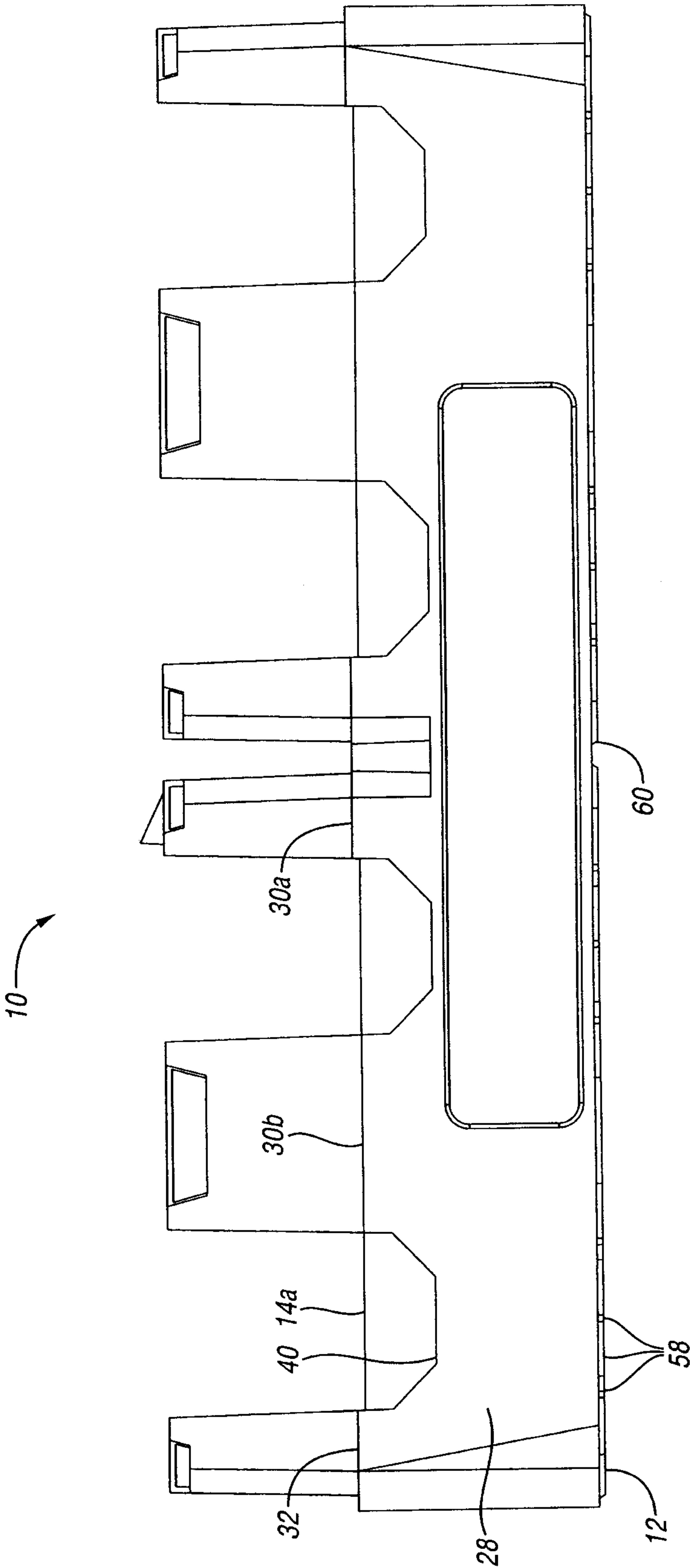


Fig. 5

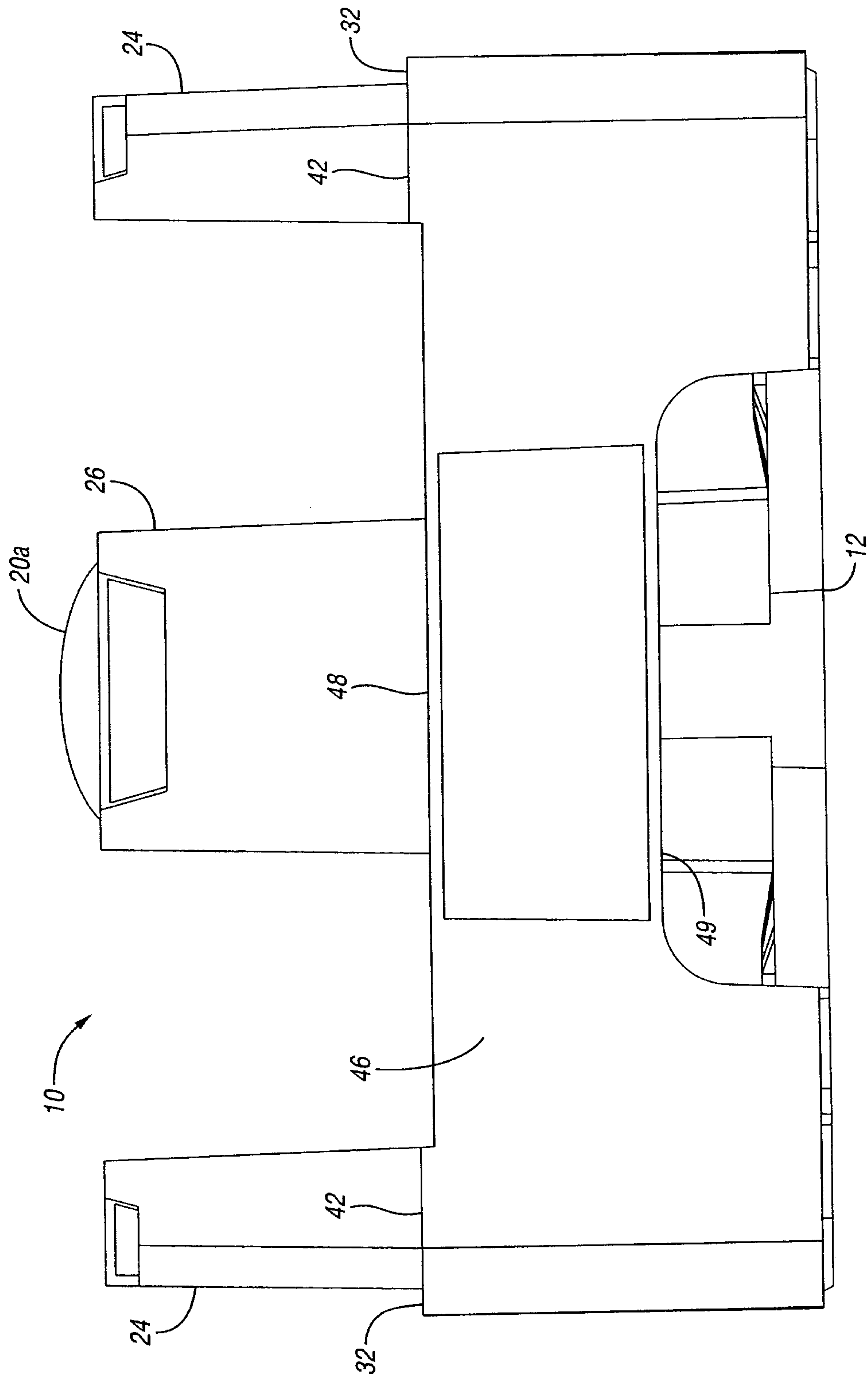
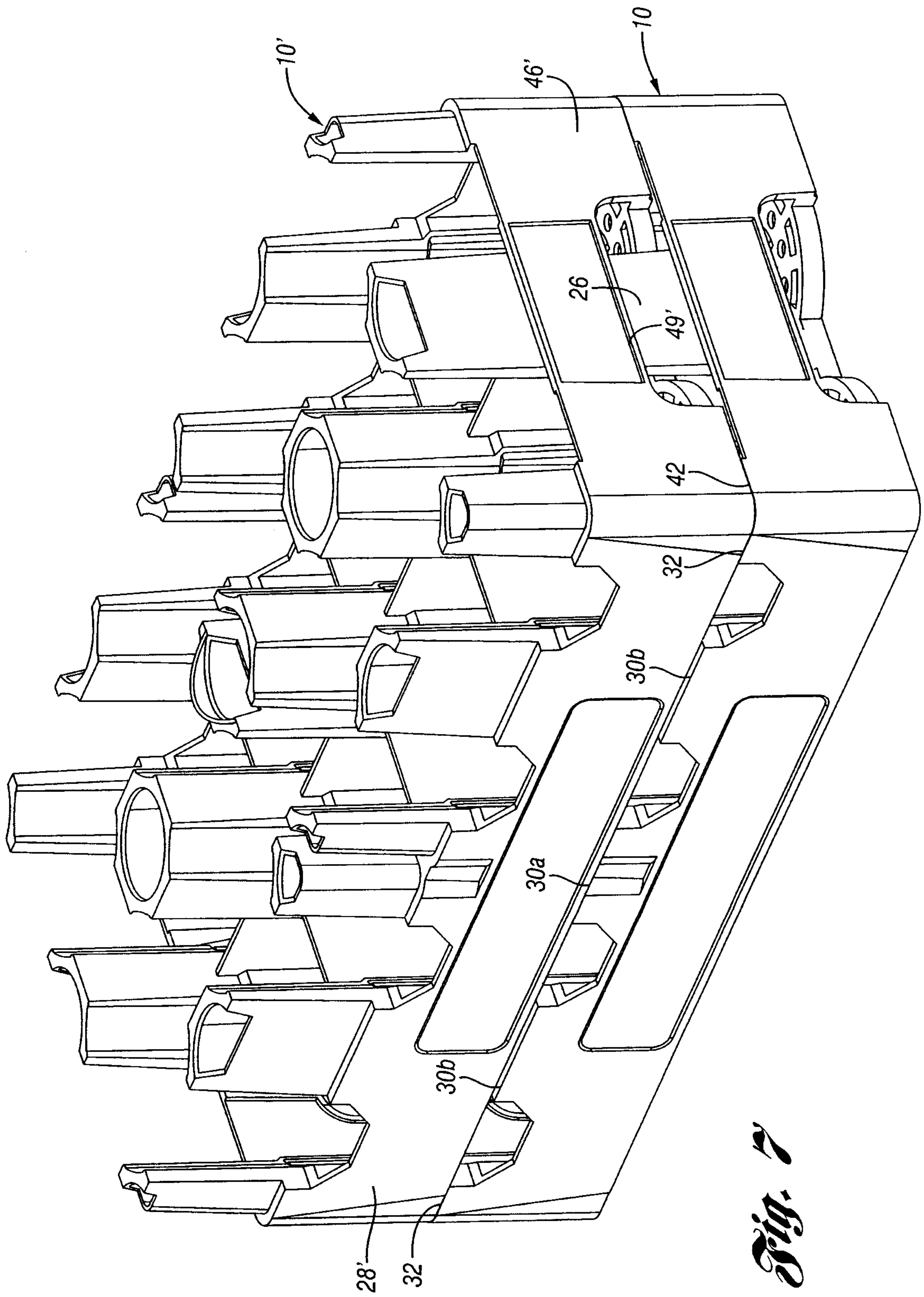


Fig. 6

7/11



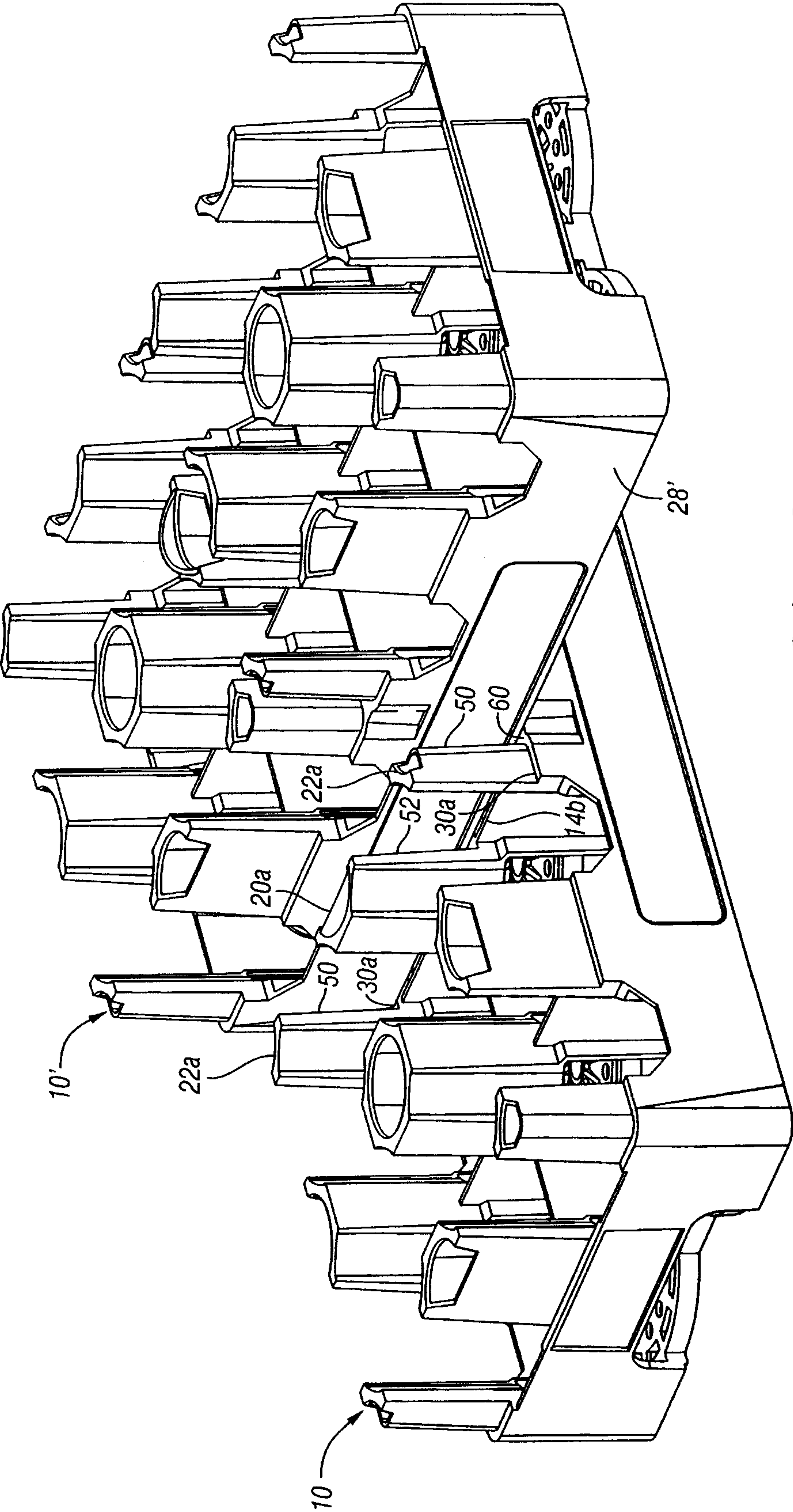


Fig. 8

9/11

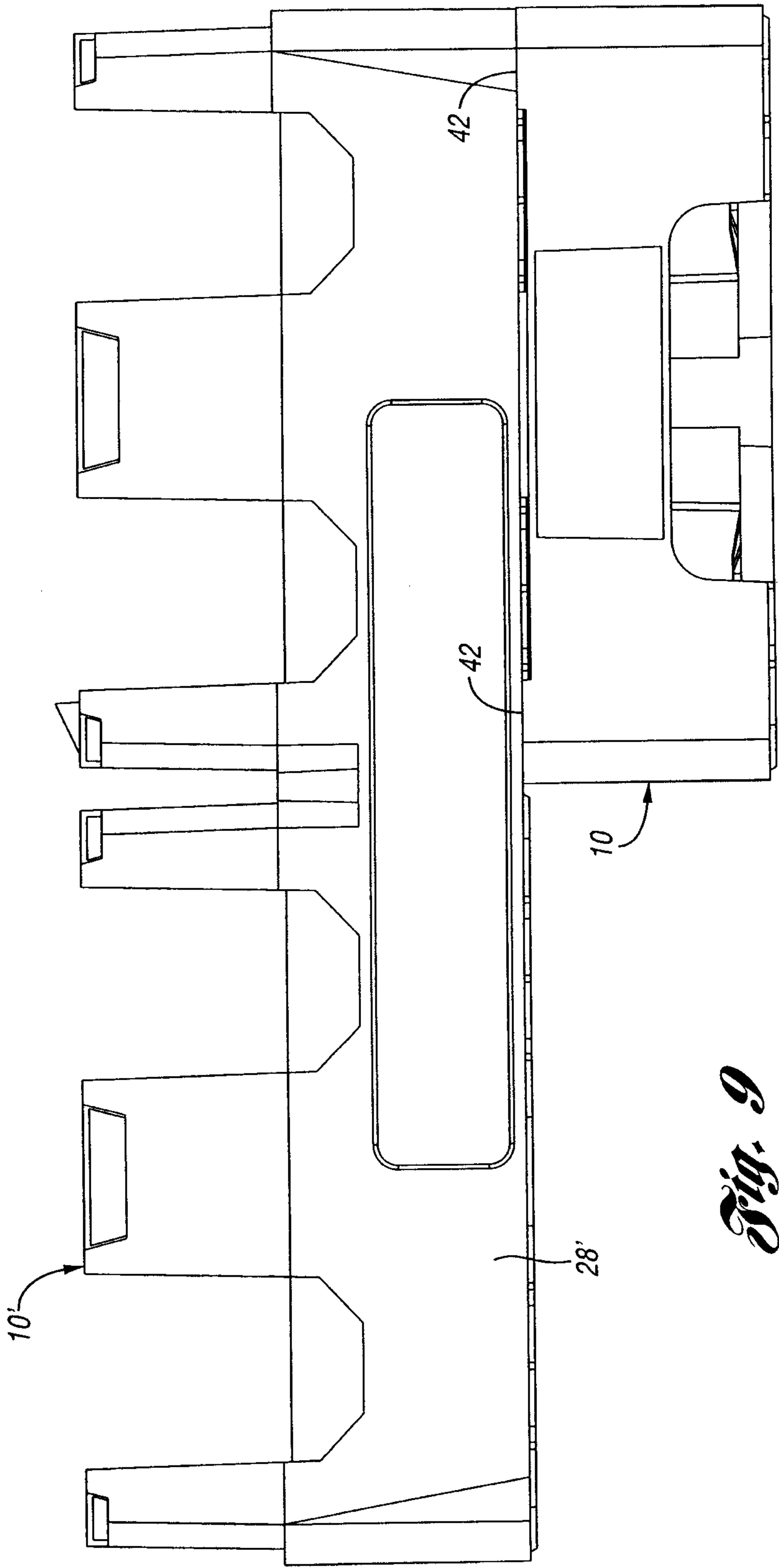
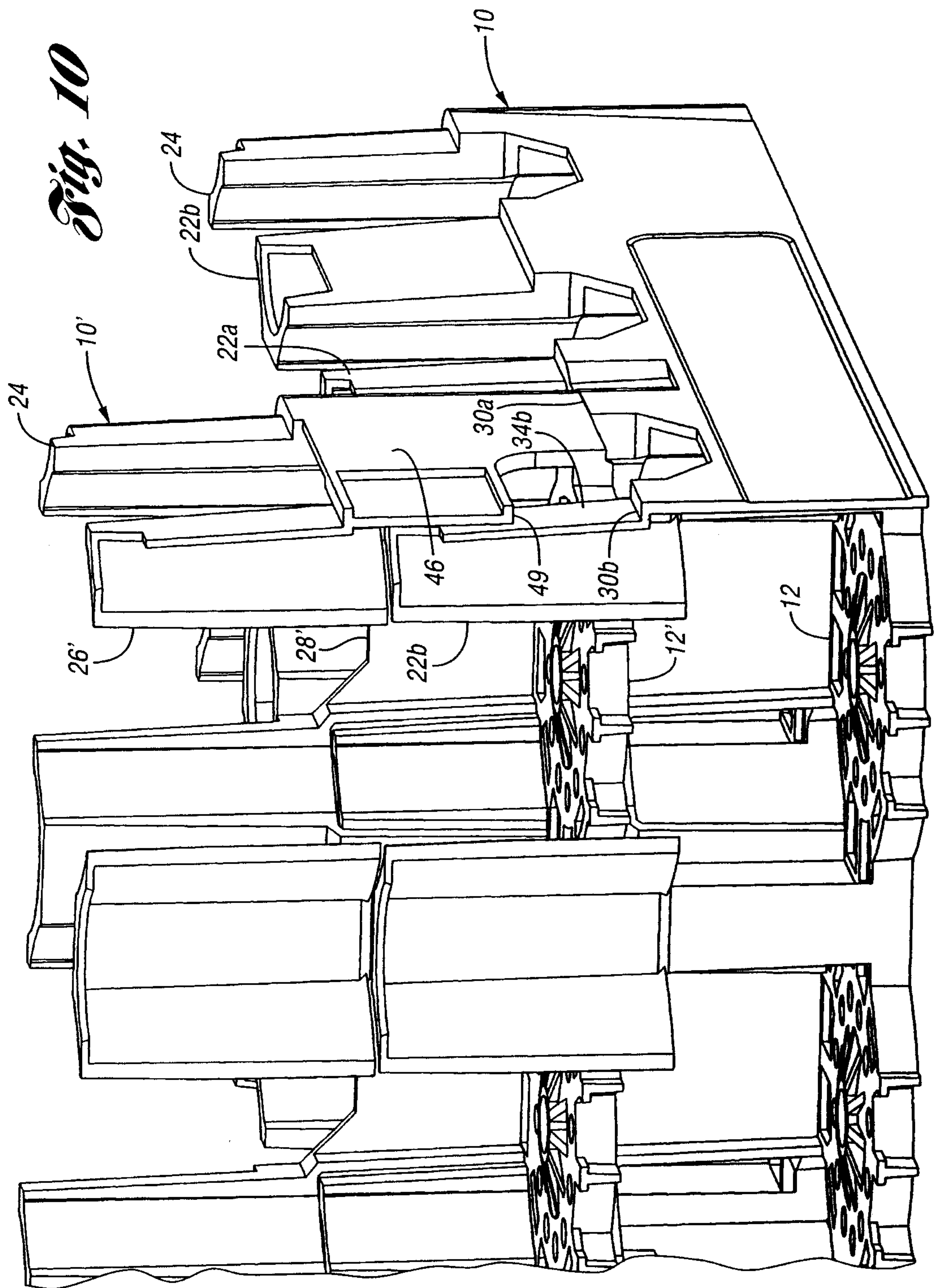


Fig. 9

10/11



11/11

