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(54) **TRAY FOR TRANSPORTING AND
STACKING LAYERS OF STRUCTURAL
BOTTLES**

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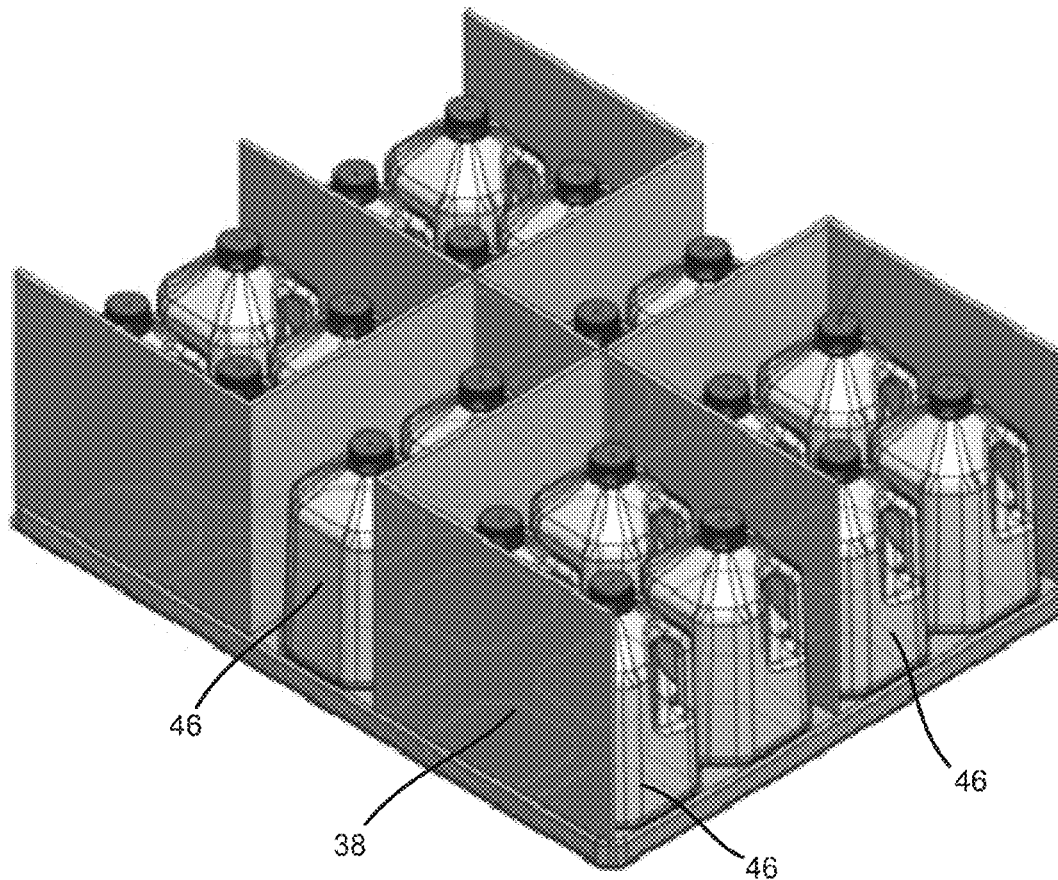
(2013.01); **B65D 1/34** (2013.01); **B65D 1/36**

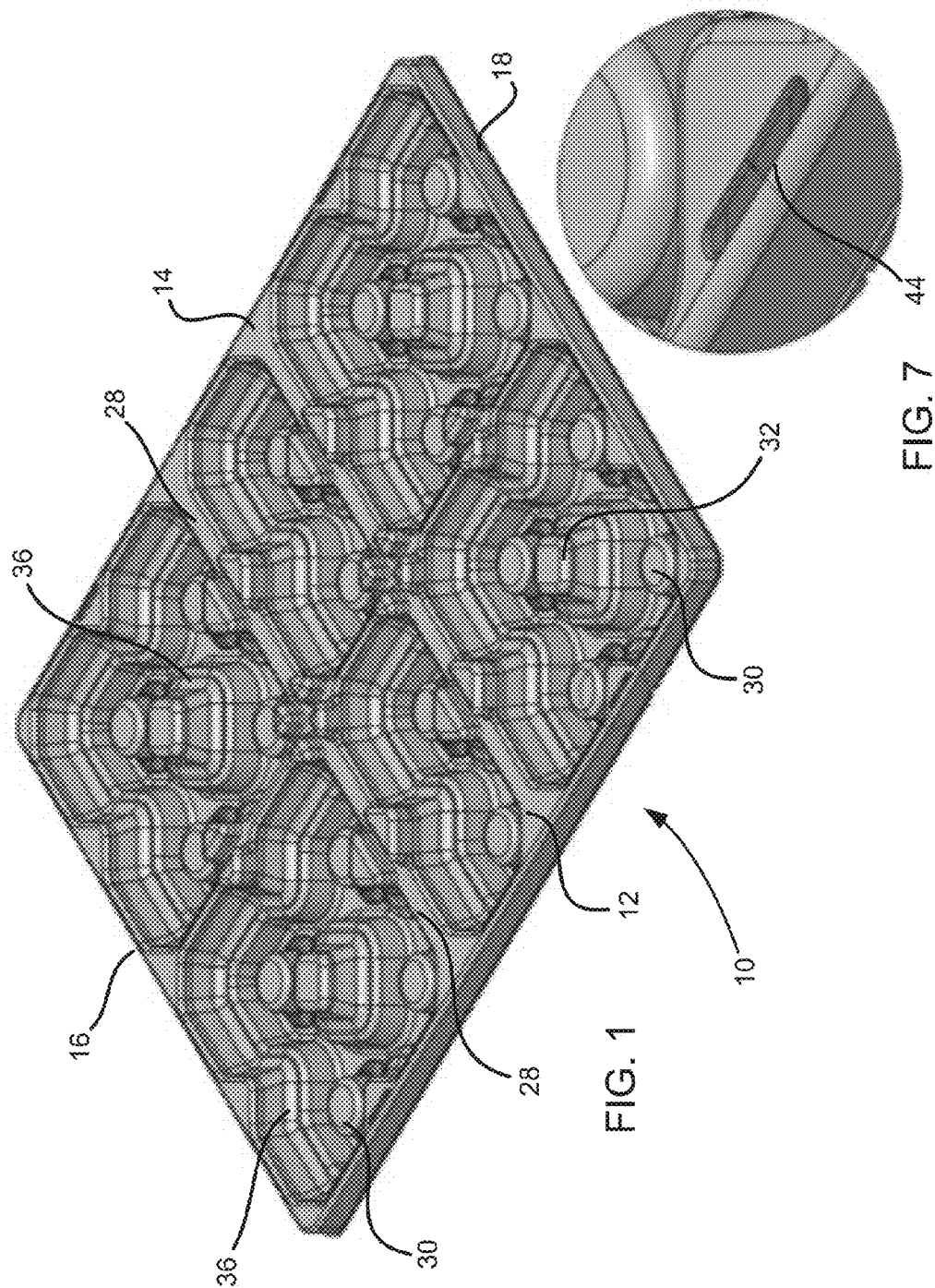
(2013.01); **B65D 71/70** (2013.01)

(57)

ABSTRACT

A tray is provided for supporting and transporting layers of bottles. The tray includes a plurality of pockets for holding bottles separated by channels. A sleeve having a plurality of panels is placed in the channels. The sleeve and bottles support additional layers of trays.





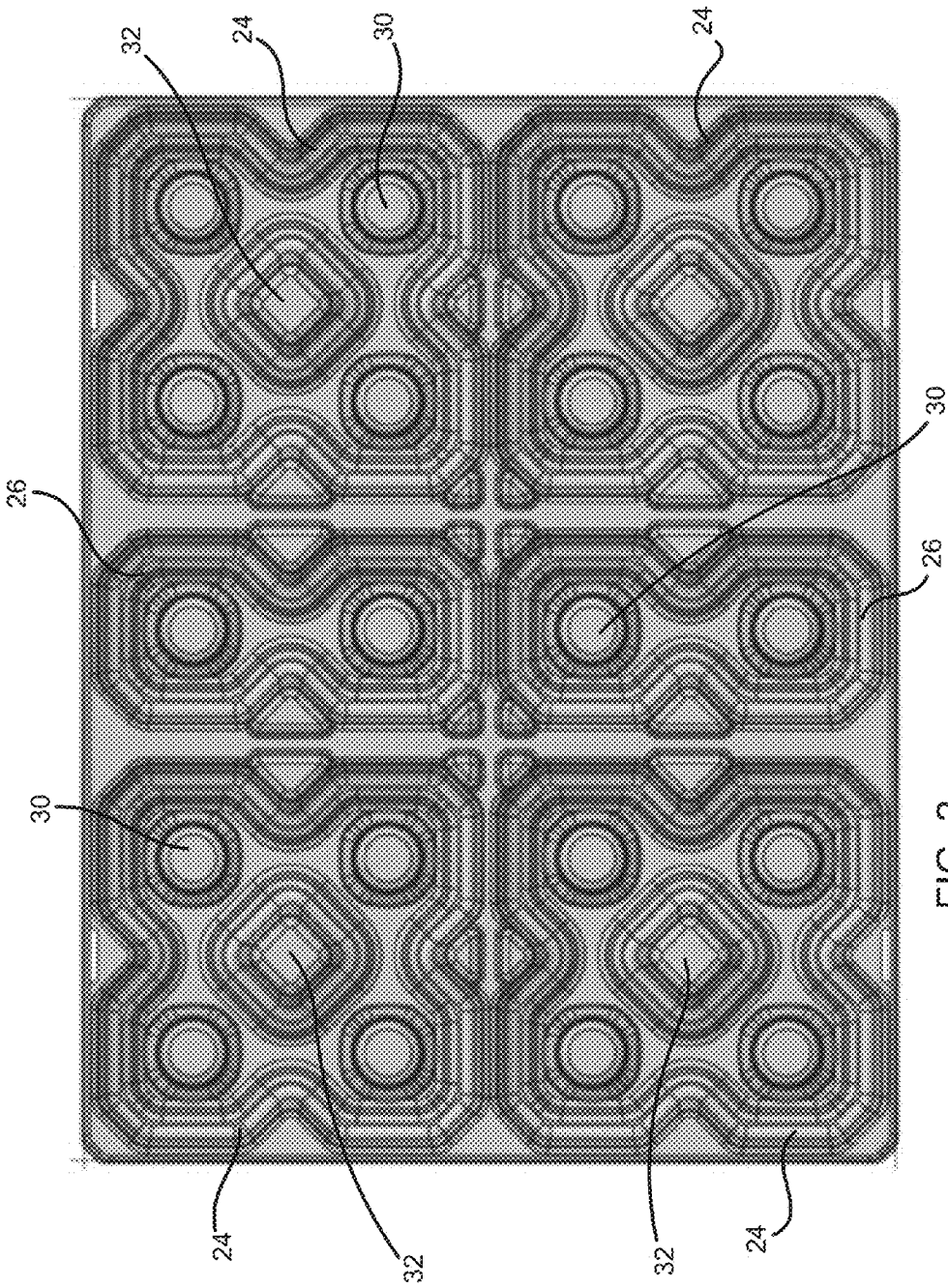


FIG. 2

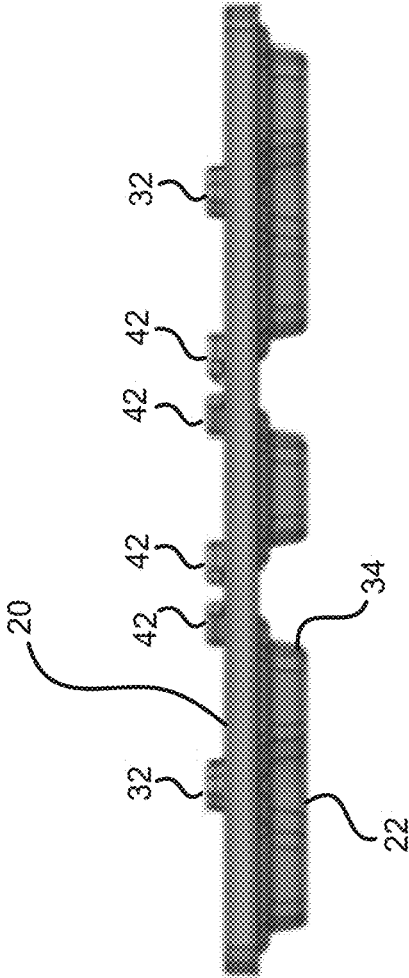


FIG. 3

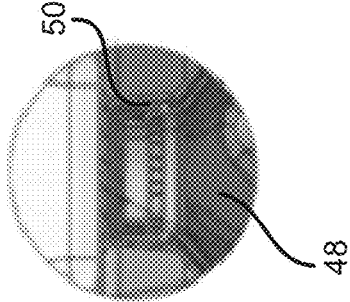


FIG. 8

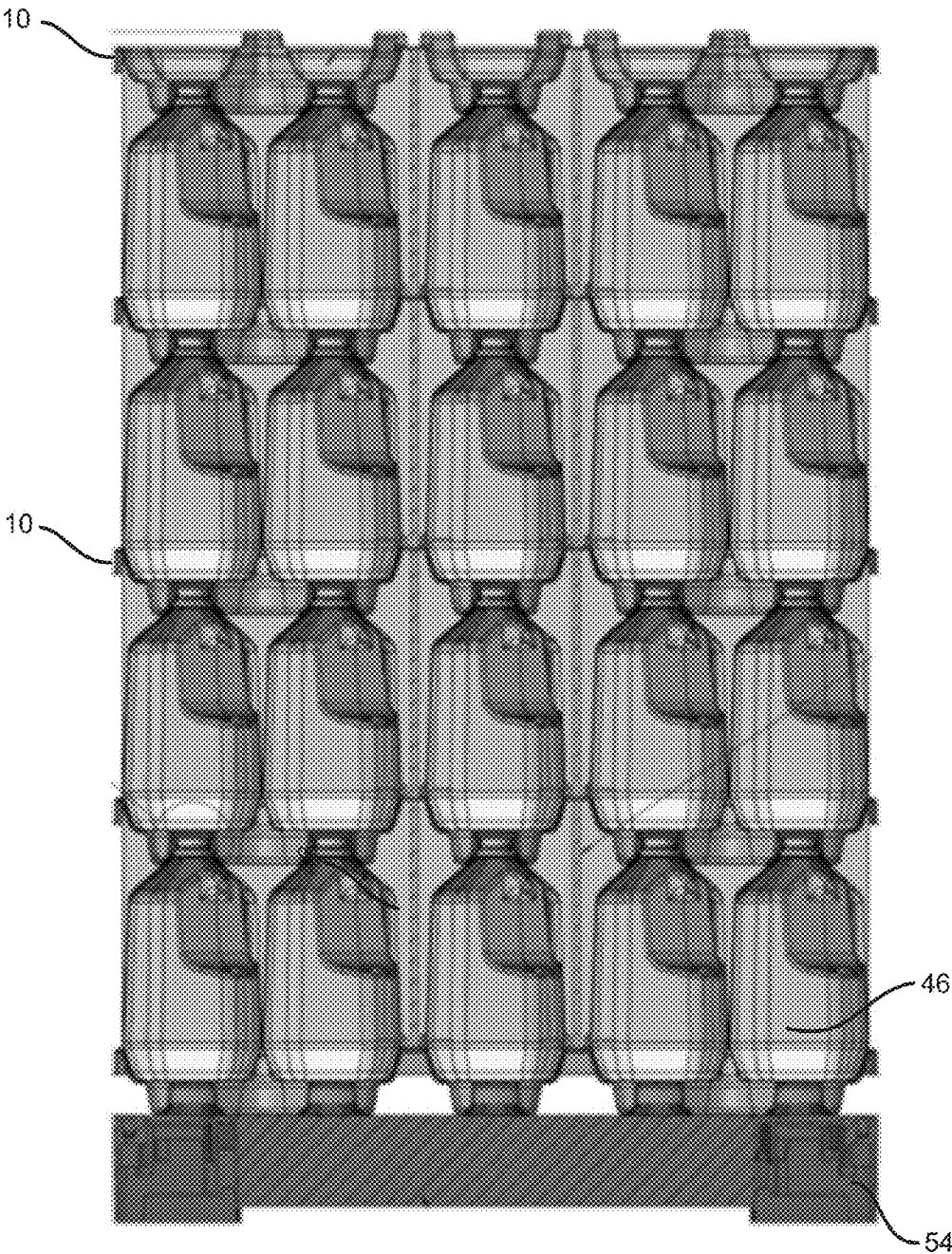


FIG. 4

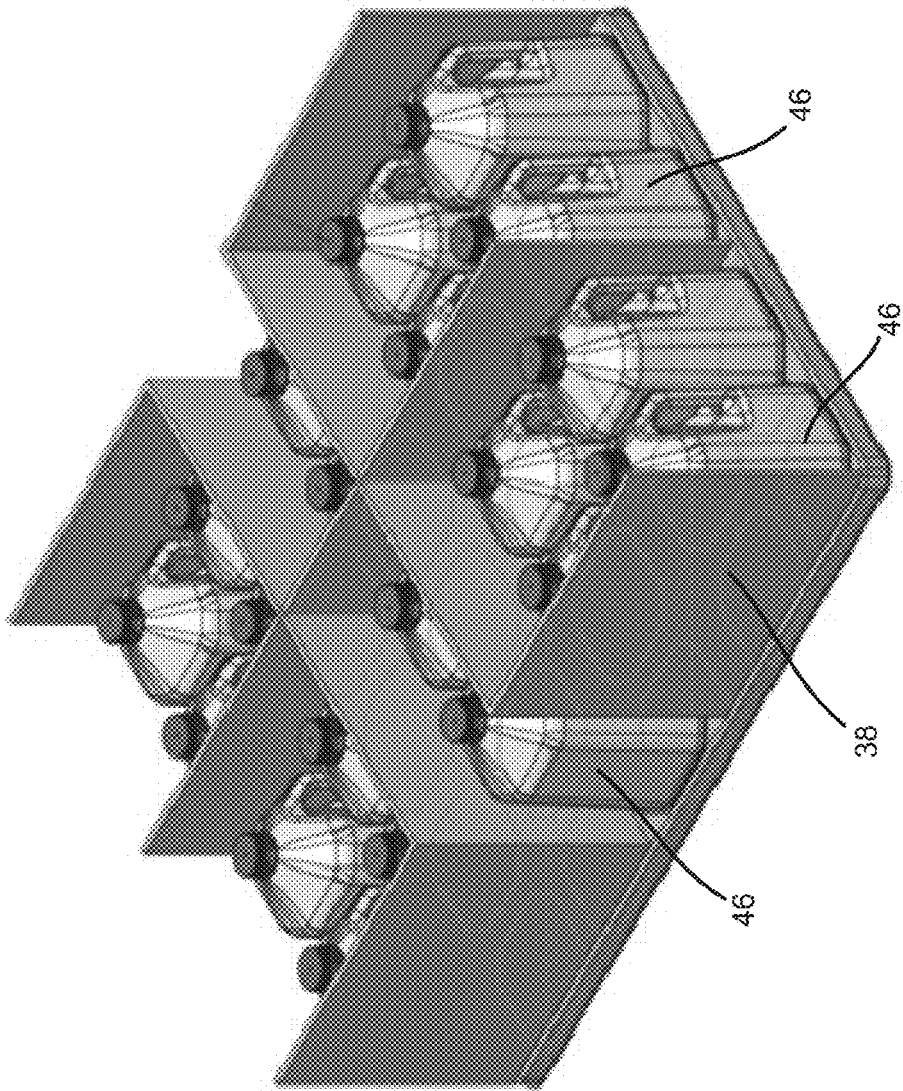


FIG. 5

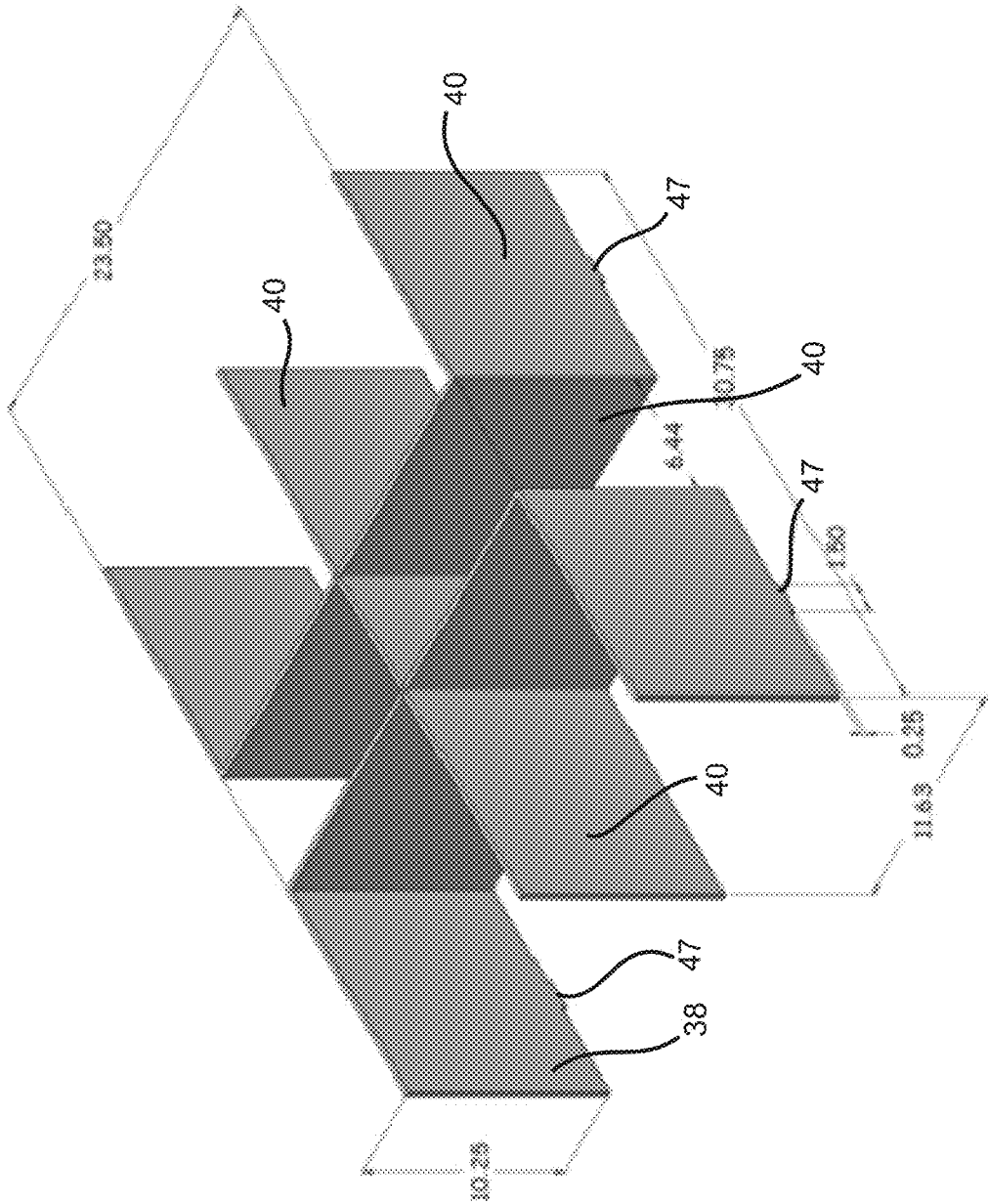


FIG. 6

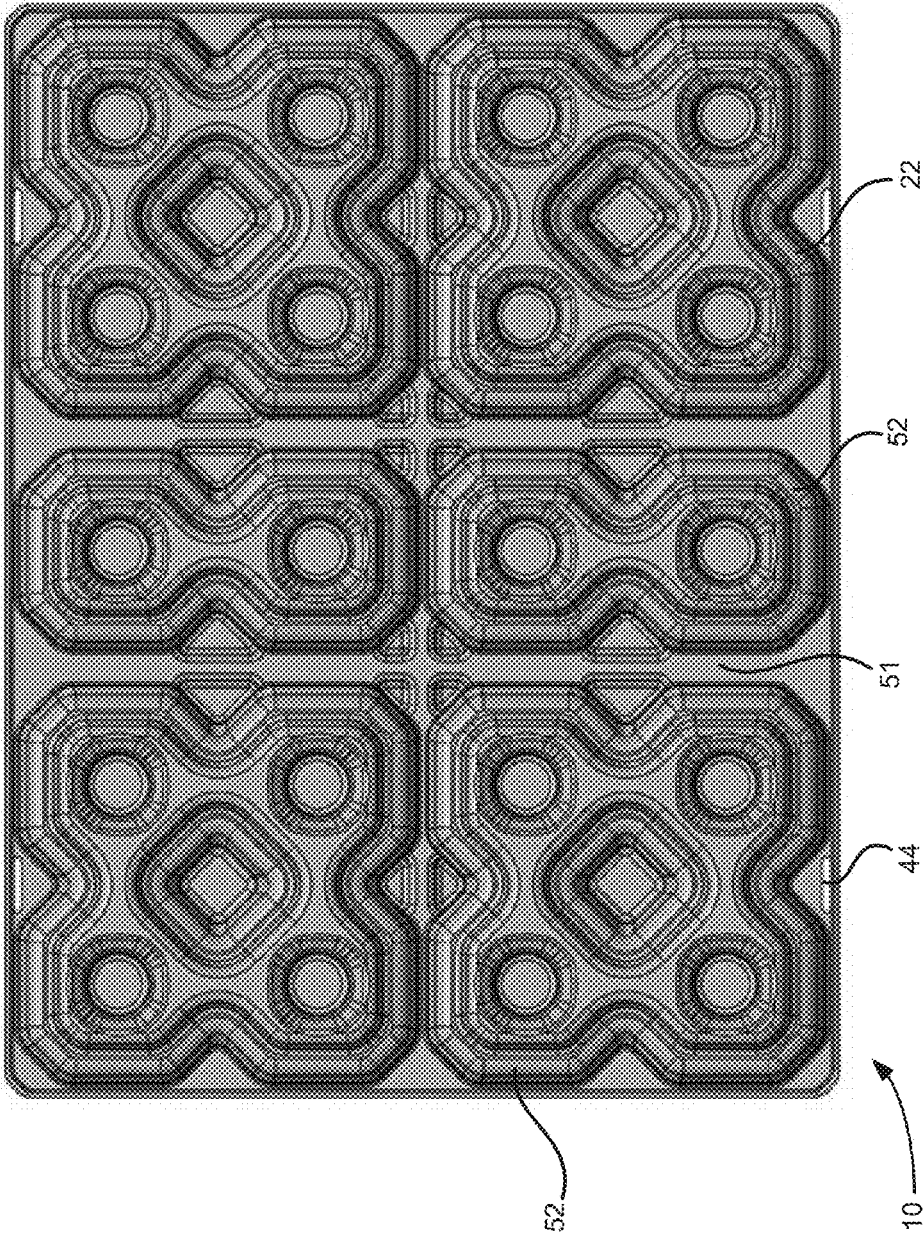


FIG. 9

TRAY FOR TRANSPORTING AND STACKING LAYERS OF STRUCTURAL BOTTLES

CROSS-REFERENCE TO RELATED APPLICATIONS

[0001] This application claims the benefit of U.S. Provisional Patent Application No. 62/322,373, filed Apr. 14, 2016, the contents of which are hereby incorporated by reference.

FEDERALLY SPONSORED RESEARCH OR DEVELOPMENT

[0002] N/A

FIELD OF THE INVENTION

[0003] The present invention generally relates to a molded plastic tray for supporting a plurality of milk bottles, and more particularly to a tray that can be combined with a sleeve to allow for stacking a plurality of layers of trays supporting such bottles.

BACKGROUND OF THE INVENTION

[0004] Currently, metal carts—referred to as “bossy” carts—are typically used to transport and present milk to customers via a series of rigidly connected racks on each cart. The milk bottles on each rack are not used to provide any support for any additional racks above the bottles.

[0005] The present invention provides an improved tray system that uses the bottles on the tray in conjunction with a sleeve to support layers of bottles (on additional trays) above the tray at issue.

SUMMARY OF THE INVENTION

[0006] The present invention provides a tray, sometimes referred to as a milk tray, to transport a plurality of bottles, such as gallon sized milk bottles or containers (the bottles can hold other fluids, such as distilled water or apple cider for example). The milk tray can utilize the bottles supported on the tray, along with a sleeve, to support layers of other bottle loaded trays above the tray at issue. The tray and sleeve, collectively, is a collapsible packaging solution that reduces freight cost and storage space requirements when empty.

[0007] The top of the milk tray is configured to include pockets for containing the milk bottles and channels to position and hold the sleeve. The bottom of the tray is configured to engage the neck of the bottle below (when stacked on a lower tray supporting bottles) to increase surface area and reduce pressure per bottle when stacked. The bottom also includes channels or other similar structure designed to engage the upper portion of the sleeve on the lower tray.

[0008] In accordance with one embodiment of the present invention, a tray for holding bottles is provided. The tray is formed from a generally rectangular sheet of material having a first side, a second side opposing the first side, a first end and a second end opposing the first end. A plurality of pockets forms depressions in the sheet. Each pocket includes a plurality of upwardly extending bottle supporting projections. Each bottle supporting projection is positioned to support a central portion of a bottom of a bottle. Each pocket

further includes sidewalls having transitional ledge portions. The transitional ledge portions are positioned to support a peripheral edge of the bottom of the bottle. The tray further includes a plurality of channels separating each of the plurality of pockets.

[0009] The tray can be configured so that at least one of the plurality of pockets includes a centrally positioned upwardly extending projection. Preferably, four bottle supporting projections surround the centrally positioned projection. The centrally positioned upwardly extending projection is configured to have a transitional ledge portion positioned to support a peripheral edge of the bottom of the bottle. The centrally positioned upwardly extending projection, along with the transitional ledge portions in the sidewalls and the bottle supporting projection fully support each bottle in the tray.

[0010] The tray can further comprise an upwardly extending sleeve having panels positioned in the plurality of channels. Additionally, the tray can include a plurality of slots formed in the plurality of channels. The sleeve can include a plurality of downwardly extending tabs positioned to engage the slots. The slots and tabs help position and maintain the sleeve on the tray.

[0011] Additionally, the tray can include a plurality of bosses extending upwardly from the channels. Like the slots and tabs, the bosses also help to hold the sleeve in place.

[0012] Each bottle supporting projection can include a lower surface configured to rest on a shoulder portion of a bottle below the tray (when layers of trays are stacked on each other). This helps spread the pressure and allows for the bottles and sheet of one tray to support layers of trays above it.

[0013] The tray can be formed from a molded plastic. The sheet can also be plastic, such as a corrugated plastic having a first outer layer and a second outer layer separated from the first outer layer by a plurality of flutes. Other suitable materials can be also be used.

[0014] In accordance with another aspect of the invention, a tray for supporting bottles in a stack of bottles is provided. The tray comprises a generally rectangular sheet of material having a first side, a second side opposing the first side, a first end and a second end opposing the first end. The tray includes a plurality of upwardly extending bottle supporting projections formed in the rectangular sheet of material. The tray also includes a plurality of channels formed in the rectangular sheet of material and a sleeve having panels positioned in the plurality of channels.

[0015] The tray can also include other features mentioned herein and/or shown in the Figures.

[0016] Further aspects of the invention are disclosed in the Figures, and are described herein.

BRIEF DESCRIPTION OF THE DRAWINGS

[0017] To understand the present invention, it will now be described by way of example, with reference to the accompanying drawings in which:

[0018] FIG. 1 is a perspective view of a milk tray in accordance with aspects of the present invention;

[0019] FIG. 2 is a top plan view of the milk tray of FIG. 1;

[0020] FIG. 3 is a side plan view of the milk tray of FIG. 1;

[0021] FIG. 4 is a side plan view of a plurality of milk trays holding milk bottles on a pallet;

[0022] FIG. 5 is a perspective view of a loaded milk tray with a divider sleeve between groups of milk bottles;

[0023] FIG. 6 is a perspective view of the divider sleeve of FIG. 5;

[0024] FIG. 7 is partial perspective view of a slot on the milk tray for receiving a tab from a divider sleeve;

[0025] FIG. 8 is a partial side plan view of a top of milk bottle supporting a milk tray above the bottle; and,

[0026] FIG. 9 is a bottom plan view of the tray of FIG. 1.

DETAILED DESCRIPTION

[0027] While this invention is susceptible of embodiments in many different forms, there is shown in the drawings, and will herein be described in detail preferred embodiments of the invention with the understanding that the present disclosure is to be considered as an exemplification of the principles of the invention and is not intended to limit the broad aspect of the invention to the embodiments illustrated.

[0028] A tray 10 for supporting, transporting and/or stacking layers of structural bottles in accordance with the present invention is shown in FIGS. 1-9. While the invention is sometimes referred to as a “milk tray” herein, and is primarily designed to carry bottles having shapes typically associated with containing a gallon of milk, other fluids can be carried in the bottles. For example, such bottles are also used for distilled water, apple cider, fruit juices, etc. Accordingly, the tray of the present invention is not limited to only transporting milk. Moreover, other bottle shapes or designs may be utilized.

[0029] As shown in FIG. 1, the tray 10 is a generally rectangular sheet of material, such as a molded plastic, having a first side 12, an opposing second side 14, a first end 16 and an opposing second end 18. The tray 10 includes an upper or top surface 20 and a lower or bottom surface 22.

[0030] The tray 10 shown in FIG. 1 is designed to hold twenty gallon-sized bottles (e.g., milk bottles). The top surface 20 is divided into four large pockets or sections 24 configured to hold four bottles each, and two small pockets or sections 26 configured to hold two bottles each. The small sections 26 for holding two bottles each are positioned in a central portion of the tray 10. Each of the pockets 24, 26 form a depression in the tray 10 and extend downward from an upper part of the tray 10 surrounding and dividing the various pockets 24, 26, to a lower level 34 (see FIG. 3).

[0031] Each of the large sections 24 for holding four bottles includes four generally conical shaped bottle resting projections 30 and a central projection 32 (having a generally rectangular cross-sectional shape) surrounded by the bottle resting projections 30. Each of the projections 30, 32 are hollow and extend upward from the lower level 34 of the tray 10. As shown in FIG. 3, the central projection 32 in each large section 24 extends upward above the upper part of the tray 10 surrounding each of the sections 24, 26.

[0032] Additionally, each of the central projections 32, along with sidewalls forming the depressions of the sections 24, includes a ledge or transition portion 36 that separates a lower portion of the sidewalls and central projections 32 from an upper portion. Each of the lower portions of the sidewalls extends further into the depression than the upper portions. With respect to each central projection 32, the lower portion extends outward further than the upper portion. That is, the base of each projection is wider than the upper portion.

[0033] The bottle resting projections 30 support a central portion of the bottom of each bottle. Together, the bottle resting projections 30 along with the ledge portions 36 of the sidewalls and central projections 32 support the central portions of the bottoms of the bottles. The ledge portions 36 support around the periphery of the bottom of each bottle. The projections 30 can also be formed to have a ledge portion.

[0034] The top surface 20 also includes a plurality of channels 28 that are formed in the upper part of the tray. The channels 28 separate each of the large pockets 24 for holding four bottles and each of the small pockets 26 for holding two bottles. The channels 28 are used to support a sleeve 38 that separates the pockets 24 and 26.

[0035] FIG. 5 shows a tray 10, sleeve 38 and bottle 46 assembly that forms a layer that can be used in a stack of assemblies (see FIG. 4). FIG. 5 shows the tray 10 holding twenty milk bottles 46.

[0036] The sleeve 38 is shown in FIG. 6 without the tray 10 or bottles 46. The sleeve 38 includes a plurality of panels 40 configured to form generally U-shaped areas—one for each of the pockets 24, 26. The panels 40 can be connected together or formed as a single piece of material. Alternatively, the sleeve 38 can be a plurality of separate pieces (each piece being one or more panels).

[0037] The sleeve 38 can be formed from a corrugated material, such as corrugated paper or corrugated plastic, having a first outer layer and a second outer layer separated from the first outer layer by a plurality of flutes or other similar structure. The sleeve 38 can also be a solid structure and formed from other suitable materials.

[0038] The upper surface 20 of the tray 10 also includes a plurality of bosses 42 positioned proximate portions of the channel 28. The bosses 42 help keep the sleeve 38 in place and prevent the panels 40 from moving or slipping off the channel 28.

[0039] Additionally, the upper surface 20 includes slots 44 formed at various spots on the channel 28 as shown in FIG. 7. The slots 20 are configured to receive tabs 47 extending from a lower edge of the sleeve 38. The slots 44 and tabs 47 also help keep the sleeve in the channel 28 and properly positioned.

[0040] The bottle resting projections 30, in addition to supporting the bottom of a bottle 46 on the upper surface 20 of the tray 10, are configured to receive and rest on a top portion 48 of a lower bottle 46 (when one tray 10 of bottles is stacked on a lower tray 10 of bottles 46). As shown in FIG. 8, the central portion 50 of the projection 30 is shaped to surround the cap of a lower bottle 46 and contact a portion of the shoulder of the bottle 46. That is, the central portion 50 of the projection 30 engages the neck portion of the bottle below to increase surface area and reduce pressure per bottle when stacked. In this manner, the lower bottles 46 help support an upper tray 10.

[0041] The sleeve 38 is also used to support additional layers of filled trays 10. That is, both the sleeve 38 and the bottles 46 (contacting the lower surface of the projections 30 of an upper tray 10), are used to support additional layers of trays 10. The sleeve 38 can be slightly higher than the tops of the bottles. Accordingly, the sleeve 38 may need to be compressed slightly (about 1/8 of an inch) before the upper tray 10 will rest on lower bottles. The lower surface of the tray 10 can also include channels 51 (see FIG. 9) to engage the upper edge of the sleeve in the tray below when stacked.

[0042] FIG. 9 provides a view of the lower surface 22 of the tray. As evident in this Figure, troughs 52 (projecting toward the viewer in this Figure) form an outline of the bottle holding pockets 24, 26.

[0043] FIG. 4 shows a stack of a plurality of trays 10 supporting bottles 46 in layers. The stack of trays 10 and bottles 46 are supported on a pallet 54. An empty tray 10 is placed on the top layer of bottles 46 to act as a cap.

[0044] Many modifications and variations of the present invention are possible in light of the above teachings. It is, therefore, to be understood within the scope of the appended claims the invention may be protected otherwise than as specifically described.

I/We claim:

1. A tray comprising:
 - a generally rectangular sheet of material having a first side, a second side opposing the first side, a first end and a second end opposing the first end;
 - a plurality of pockets forming depressions in the sheet, each pocket including a plurality of upwardly extending bottle supporting projections, each bottle supporting projection positioned to support a central portion of a bottom of a bottle, each pocket further including sidewalls having transitional ledge portions, the transitional ledge portions positioned to support a peripheral edge of the bottom of the bottle; and,
 - a plurality of channels separating each of the plurality of pockets.
2. The tray of claim 1 wherein at least one of the plurality of pockets includes a centrally positioned upwardly extending projection having a transitional ledge portion positioned to support a peripheral edge of the bottom of the bottle.
3. The tray of claim 2 wherein the at least one of the plurality of pockets includes four bottle supporting projections surrounding the centrally positioned projection.
4. The tray of claim 1 further comprising an upwardly extending sleeve having panels positioned in the plurality of channels.
5. The tray of claim 4 further comprising a plurality of slots formed in the plurality of channels.
6. The tray of claim 5 wherein the sleeve includes a plurality of downwardly extending tabs positioned to engage the slots.
7. The tray of claim 1 further comprising a plurality of bosses extending upwardly from the channels to hold the sleeve in place.

8. The tray of claim 1 wherein each bottle supporting projection includes a lower surface configured to rest on a shoulder portion of a bottle.

9. The tray of claim 1 wherein the sheet is formed from plastic.

10. The tray of claim 1 wherein the sleeve is formed from a plastic.

11. The tray of claim 10 wherein the sleeve is a corrugated material having a first outer layer and a second outer layer separated by a plurality of flutes.

12. A tray for supporting bottles in a stack comprising:

- a generally rectangular sheet of material having a first side, a second side opposing the first side, a first end and a second end opposing the first end;
- a plurality of upwardly extending bottle supporting projections formed in the rectangular sheet of material;
- a plurality of channels formed in the rectangular sheet of material; and,
- a sleeve having panels positioned in the plurality of channels.

13. The tray of claim 12 wherein the rectangular sheet of material includes a plurality of pockets forming depressions in the sheet and each bottle supporting projection is positioned to support a central portion of a bottom of a bottle.

14. The tray of claim 13 wherein each pocket further including sidewalls having transitional ledge portions positioned to support a peripheral edge of the bottom of the bottle.

15. The tray of claim 12 further comprising a plurality of bosses extending upwardly from the channels to hold the sleeve in place.

16. The tray of claim 12 further comprising a plurality of slots formed in the plurality of channels.

17. The tray of claim 16 wherein the sleeve includes a plurality of downwardly extending tabs positioned to engage the slots.

18. The tray of claim 12 wherein the projections are configured to receive and rest on a top portion of a bottle.

19. The tray of claim 12 wherein the rectangular sheet of material is formed from plastic.

20. The tray of claim 12 wherein the sheet is formed from plastic.

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