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(54) **FORK TINE NOTCH**

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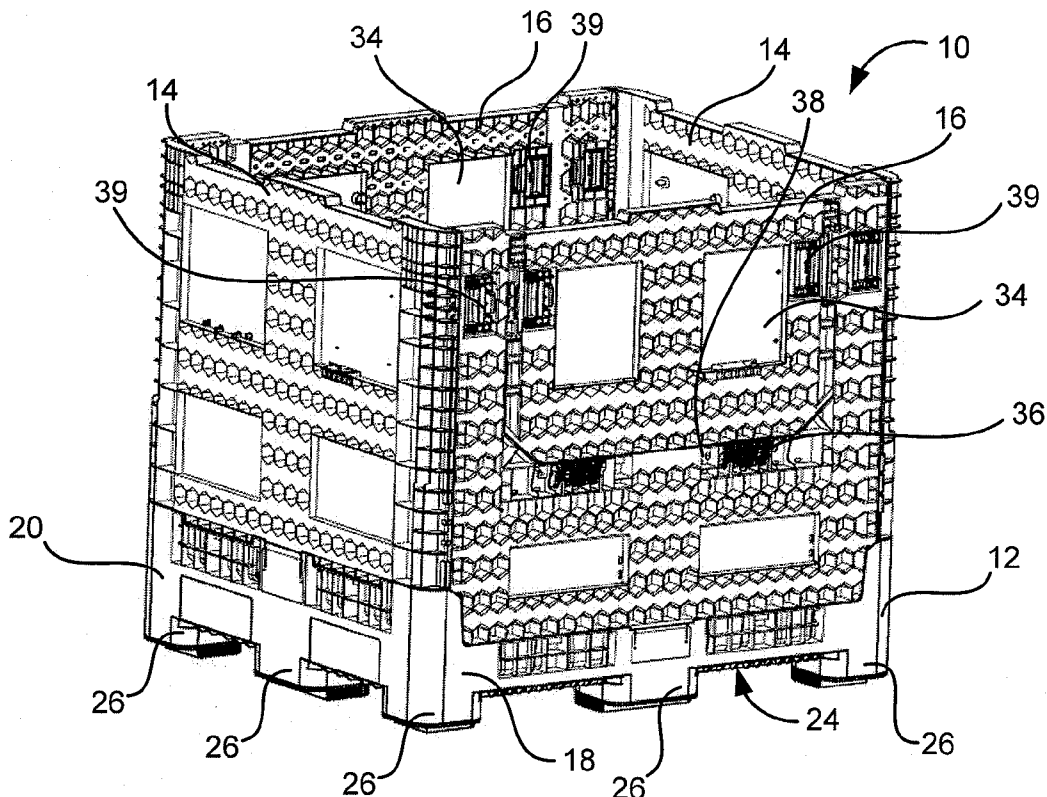
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(57) **ABSTRACT**

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Feb. 10, 2010	(CN)	201020111642.6
Mar. 17, 2010	(CN)	201020132357.2
Mar. 30, 2010	(CN)	201020145498.8
Apr. 14, 2010	(CN)	201020159206.6
Apr. 23, 2010	(CN)	201020169698.7
May 21, 2010	(CN)	201020198781.7
Jun. 8, 2010	(CN)	201020218082.4
Jun. 8, 2010	(CN)	201020218085.8

The present invention provides a stackable bin having a collapsed position and an erected position. The bin includes a base having an upper surface, a pair of opposing ends, and a pair of opposing sides. In an embodiment of the present invention, the base has raised upper edges along at least one of the pair of opposing sides or opposing ends. The bin also includes a pair of opposing side walls, each side wall attached at a lower edge to a respective base side, each side wall also including an upper edge. The bin further includes a pair of opposing end walls, each end wall attached at a lower edge to a respective base end, each end wall also including an upper edge. The bin includes at least one base notch in at least one raised upper edge of the base to provide forklift fork tine access when the bin is in the collapsed position, and at least one wall notch in the upper edge of at least one of the pair of side walls or end walls to provide forklift fork tine access when the bin is in the erected position.



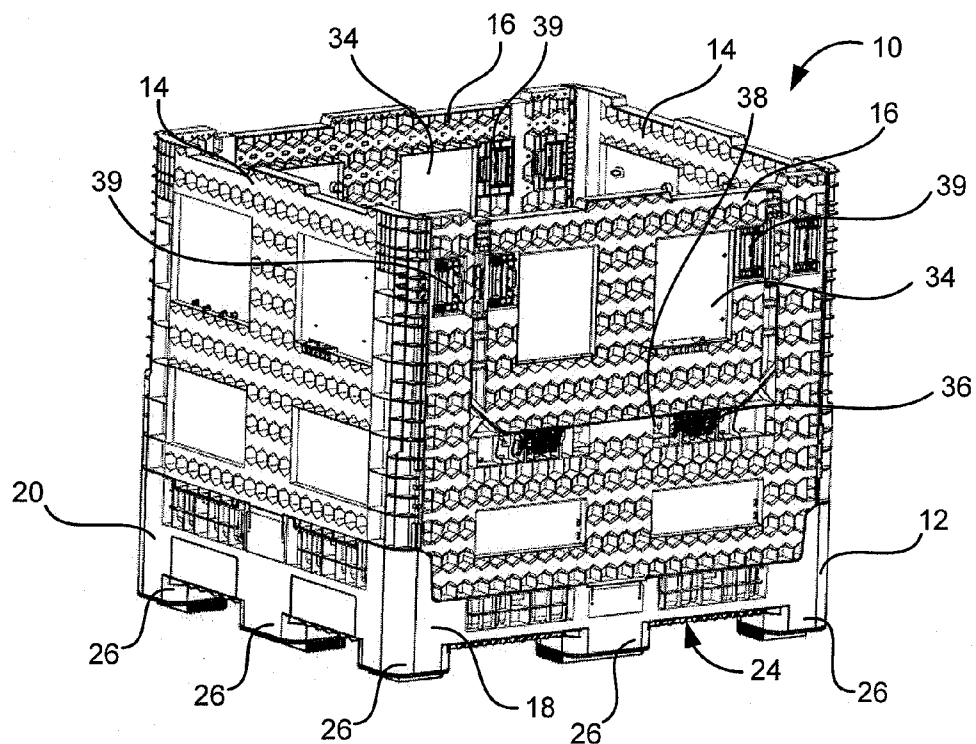


FIG. 1

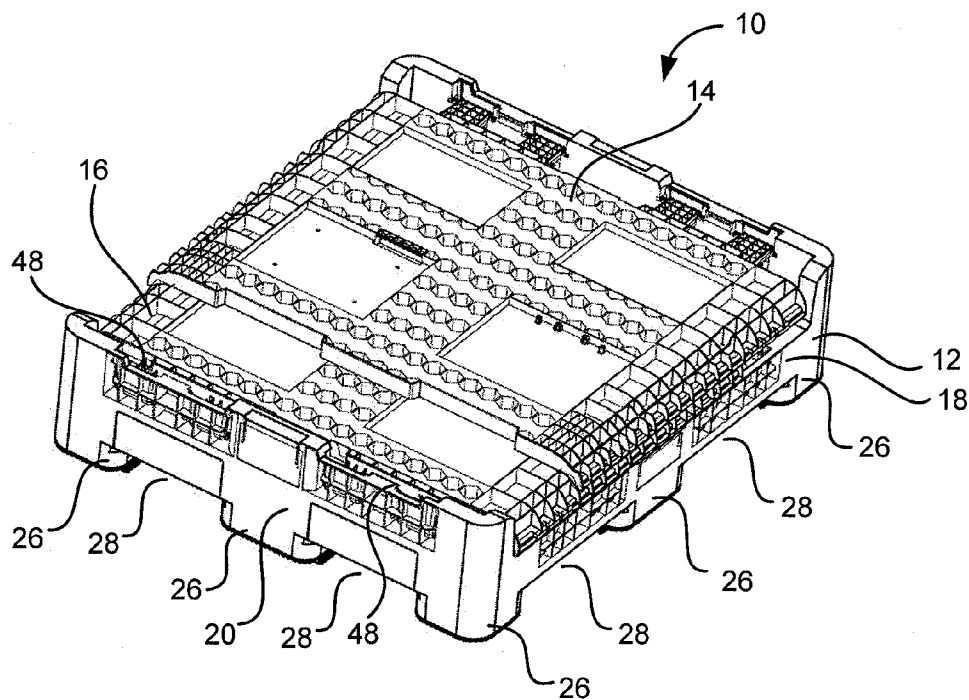


FIG. 2

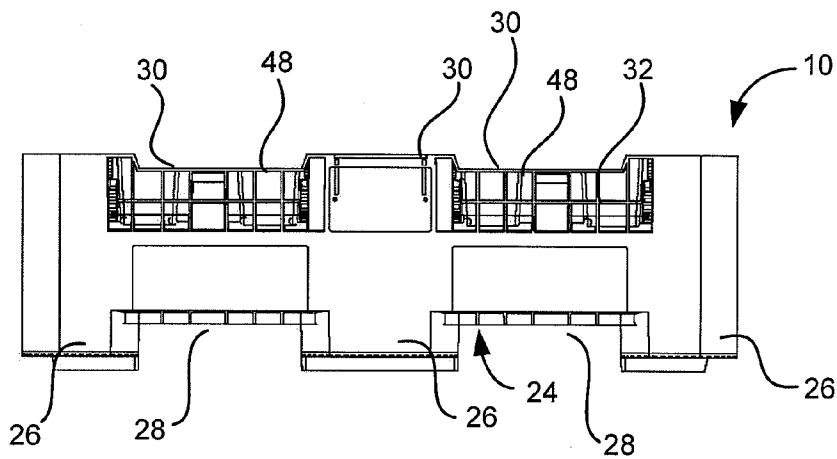


FIG. 3

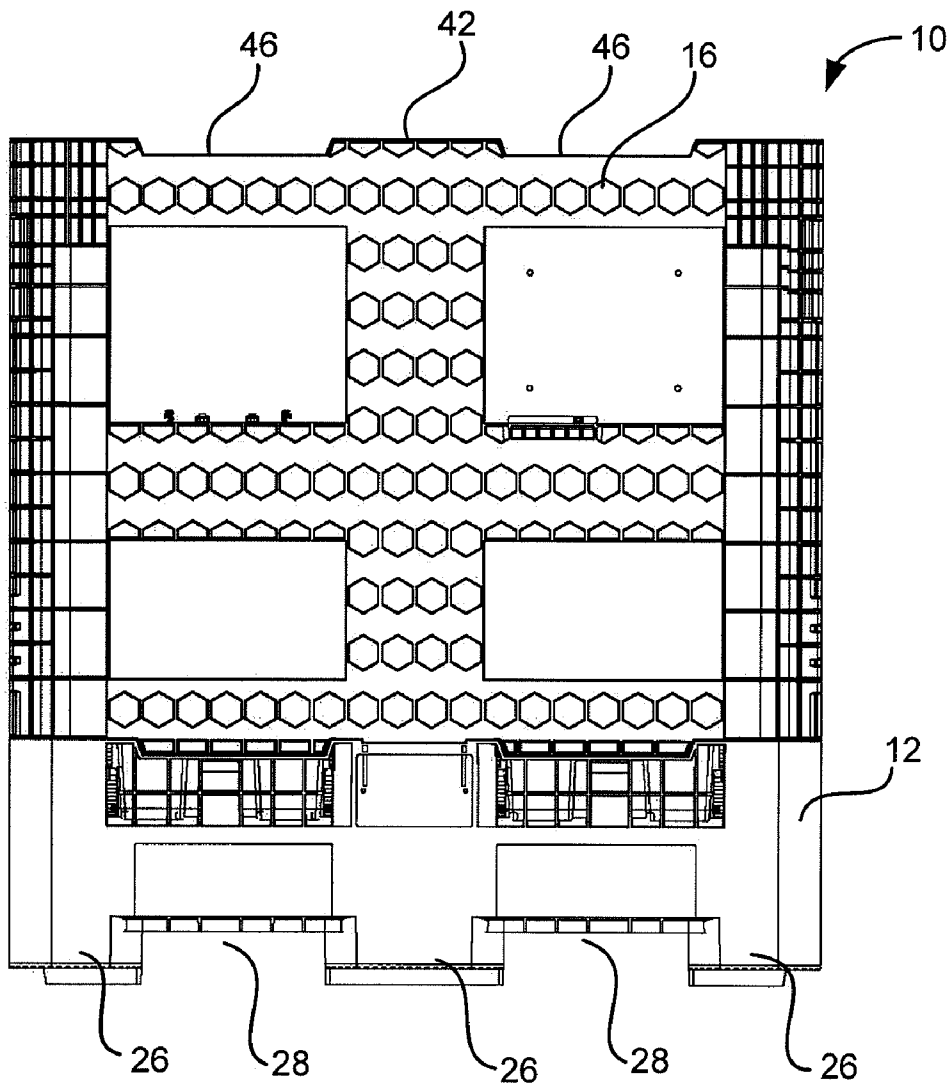


FIG. 4

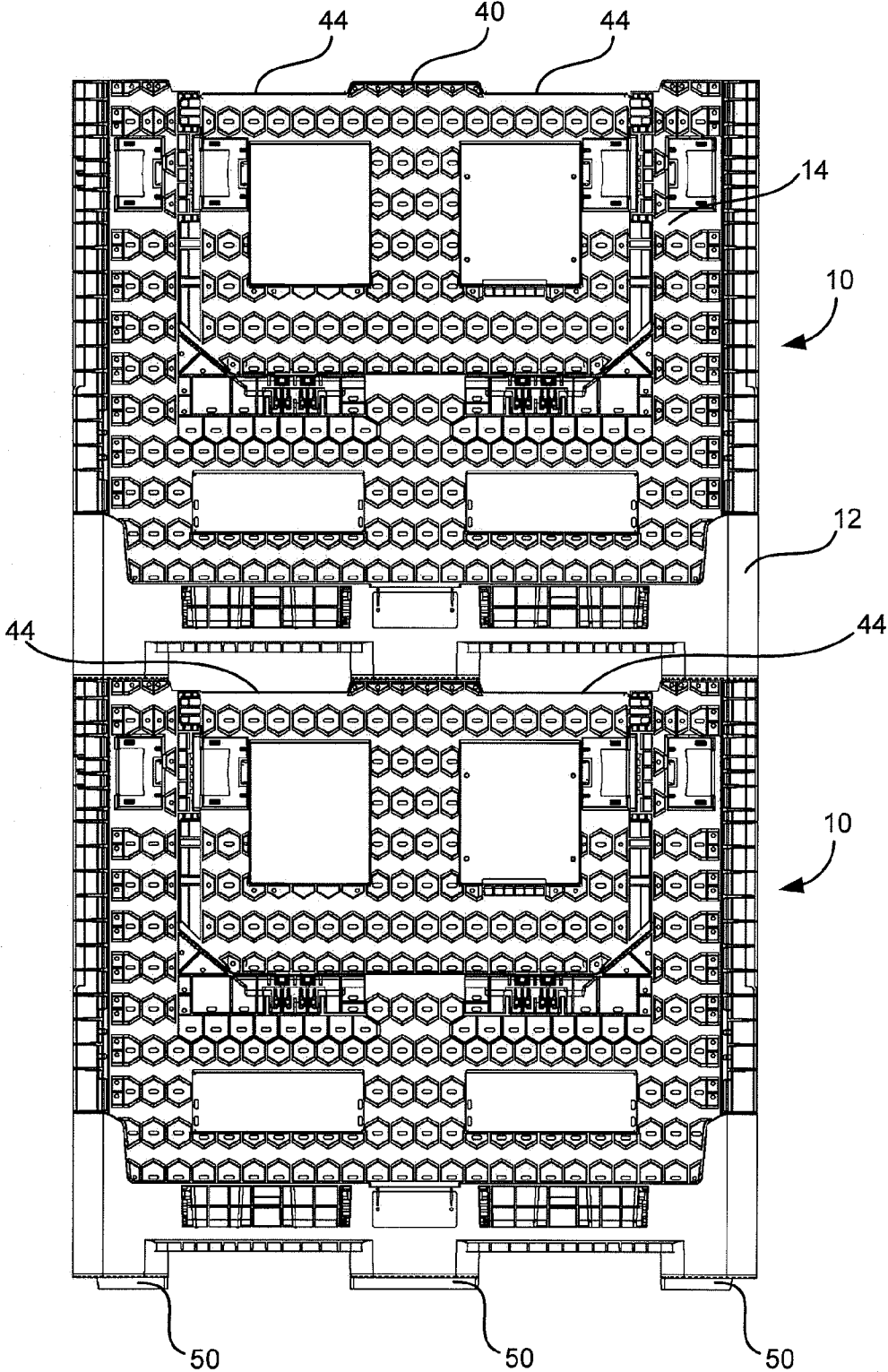


FIG. 5

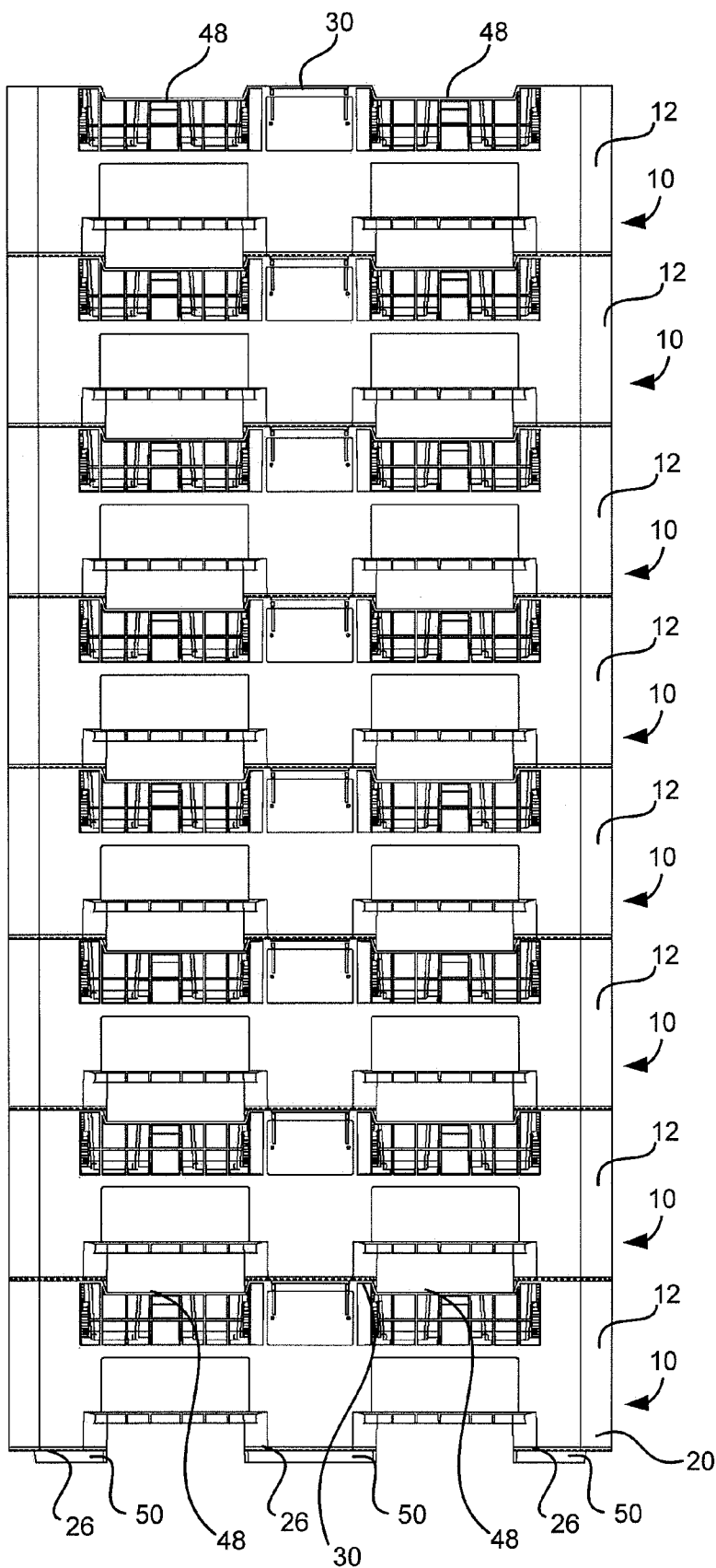


FIG. 6

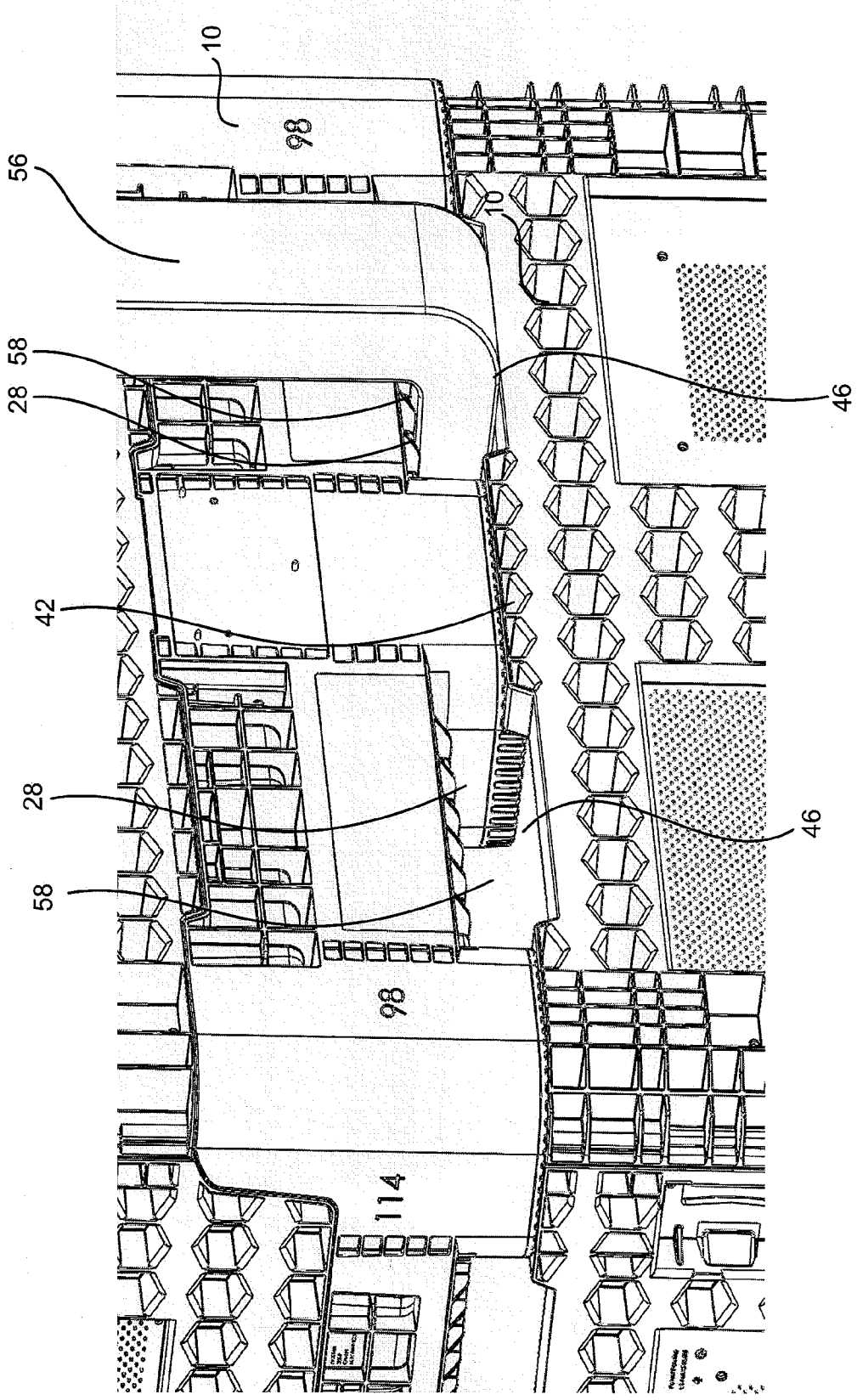


FIG. 7

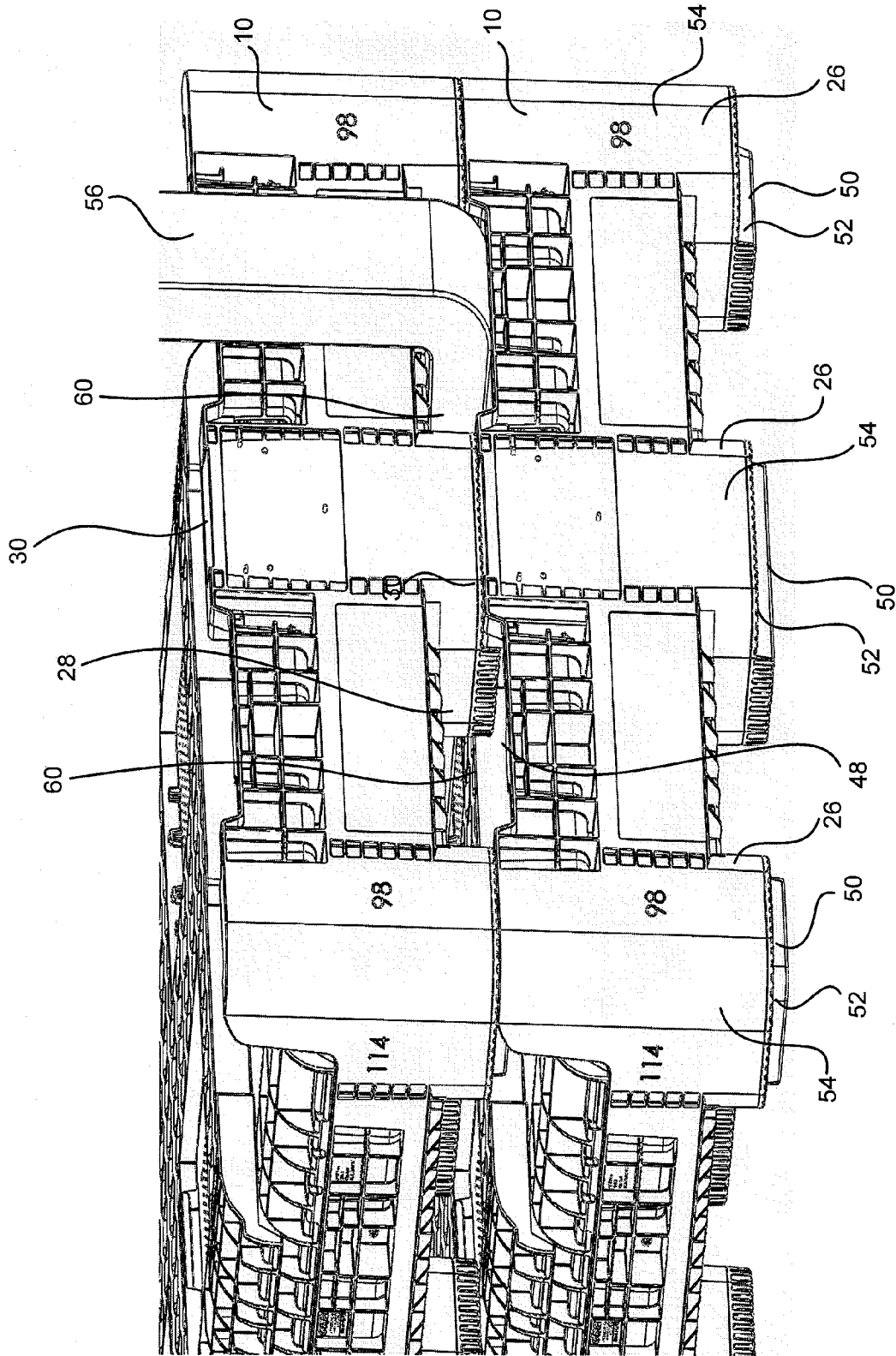


FIG. 8



**FORK TINE NOTCH**

**CROSS-REFERENCE TO RELATED APPLICATIONS**

**[0001]** The present application claims the benefit of Chinese Patent Application No. 200930355384.9, entitled Nine Feet Geometric Bulk Plastic Container—No Door, filed Dec. 16, 2009; Chinese Patent Application No. 200930355383.4, entitled, Stringer Geometric Bulk Plastic Container, filed Dec. 16, 2009; Chinese Patent Application No. 200930355382.X, entitled Nine Feet Geometric Bulk Plastic Container, filed Dec. 16, 2009; Chinese Patent Application No. 201020111642.6, entitled Bulk Plastic Container Panel By Geometric Structure, filed Feb. 10, 2010; Chinese Patent Application No. 201020132357.2, entitled Universal Latch for Bulk Plastic Container, filed Mar. 17, 2010; Chinese Patent Application No. 201020145498.8, entitled Floating Hinge Lock Structure, filed Mar. 30, 2010; Chinese Patent Application No. 201020159206.6, entitled Erected Side Wall Lock Structure, filed Apr. 14, 2010; Chinese Patent Application No. 201020169698.7, entitled 45 Degree Assembly Structure for Side Wall, filed Apr. 23, 2010; Chinese Patent Application No. 201020198781.7, entitled Notch Structure for Low Profile Container, filed May 21, 2010; Chinese Patent Application No. 201020218085.8, entitled Lock Structure for Connecting Panel-Long Ribs and Short Ribs, filed Jun. 8, 2010; Chinese Patent Application No. 201020218082.4, entitled Double Rib Structure on Panels, filed Jun. 8, 2010, the contents of all of which are incorporated herein by reference.

**[0002]** The present application also claims the benefit of copending U.S. patent applications entitled “Collapsible Bin,” Ser. No. \_\_\_\_\_, and Attorney Docket No. 52045-7373, and “Bulk Container with Angled Side Wall to Base Installation,” Ser. No. 12/963,751, and Attorney Docket No. 52045-7371, both concurrently filed herewith, the contents of which are incorporated herein by reference.

**FEDERALLY SPONSORED RESEARCH OR DEVELOPMENT**

**[0003]** Not applicable.

**FIELD OF THE INVENTION**

**[0004]** The present invention generally relates to a collapsible bin for transporting and/or storing items or materials.

**BACKGROUND OF THE INVENTION**

**[0005]** Many different types of containers are used for transporting and displaying goods. Plastic collapsible bins with foldable side walls are in common use. An example of a collapsible bin is shown in U.S. Pat. No. 4,674,647 to Gyenge et al.

**[0006]** Plastic collapsible bins can vary in size to accommodate the intended items or materials with which they will be used. Larger bins can be handled by standard forklifts to facilitate transport and storage. The bins are typically made of a base with hinged side and end walls. The base and the side and end walls are generally made of an injection molded plastic, but can be made using any suitable material or process. The walls include hinges, integrally formed with the side and end walls, or in separate pieces, at their bottom edges. The hinges cooperate with the base to allow the end and side walls to be folded downward over the base when the

bin is not in use. To erect the side and end walls, the walls are typically extended upward from their folded position and interlocked at their edges. The edges of the side and end walls include mating or interlocking members. The side and end walls are latched to each other, or nested in pockets, for stability in the fully erected position.

**[0007]** It is desirable to transport empty bins in a folded or collapsed position to minimize their profile. This minimized profile allows the bins to be efficiently stacked. Typically, bins have a 3/4 inch deep stacking interlock inset on the order of 1 3/8 to 2 inches around the bin perimeter to enable bins to be stacked without their sliding off of each other. Because of the desire to maintain a low profile, when collapsed bins are stacked one upon another, or when erected bins are stacked, there is not enough clearance for a forklift fork tine to effect lifting of stacked bins other than from beneath the lowest bin. The loss of 3/4 inch when the bins are stacked prevents the forklift fork tines from being able to enter the fork tine tunnel area between stacked bins. Pallet jacks cannot be used with bins of this type because a pallet jack requires a higher profile.

**[0008]** The present invention provides a collapsible bin able to be selectively lifted by a forklift when stacked in both the collapsed and erected positions.

**SUMMARY OF THE INVENTION**

**[0009]** The present invention provides a stackable bin having a collapsed position and an erected position. The bin includes a base having an upper surface, a pair of opposing ends, and a pair of opposing sides. In an embodiment of the present invention, the base has raised upper edges along at least one of the pair of opposing sides or opposing ends. The bin also includes a pair of opposing side walls, each side wall attached at a lower edge to a respective base side, each side wall also including an upper edge. The bin further includes a pair of opposing end walls, each end wall attached at a lower edge to a respective base end, each end wall also including an upper edge. The bin includes at least one base notch in at least one raised upper edge of the base to provide forklift fork tine access when the bin is in the collapsed position, and at least one wall notch in the upper edge of at least one of the pair of side or end walls to provide forklift fork tine access when the bin is in the erected position.

**[0010]** Other features and advantages of the invention will be apparent from the following specification taken in conjunction with the following Figures.

**BRIEF DESCRIPTION OF THE FIGURES**

**[0011]** To understand the present invention, it will now be described by way of example, with reference to the accompanying Figures in which:

**[0012]** FIG. 1 is a perspective view of a collapsible bin in an erected position in accord with an embodiment of the present invention;

**[0013]** FIG. 2 is a perspective view of a collapsible bin in a collapsed position in accord with an embodiment of the present invention;

**[0014]** FIG. 3 is a side view of the collapsed collapsible bin of FIG. 2;

**[0015]** FIG. 4 is a side view of the erected collapsible bin of FIG. 1;

**[0016]** FIG. 5 is a side view of stacked collapsible bins in an erected position in accord with an embodiment of the present invention;

[0017] FIG. 6 is a side view of stacked collapsible bins in a collapsed position in accord with an embodiment of the present invention;

[0018] FIG. 7 is a perspective view of stacked collapsible bins in an erected position with forklift fork tine shown in accord with an embodiment of the present invention; and

[0019] FIG. 8 is a partial perspective view of stacked collapsible bins in a collapsed position with forklift fork tine shown in accord with an embodiment of the present invention.

#### DETAILED DESCRIPTION OF THE INVENTION

[0020] While this invention is susceptible of embodiments in many different forms, there is shown in the Figures 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.

[0021] Referring to FIG. 1, a collapsible bin 10 includes a base 12, a pair of opposing end walls 14, and a pair of opposing side walls 16. The base 12, the end walls 14, and side walls 16 are preferably made using a plastic molding process.

[0022] The base 12 has a pair of opposing ends 18 and a pair of opposing sides 20. The base 12 also includes an upper surface (not shown), also known as the deck, and a lower surface 24. Items or materials to be transported or stored are placed on the upper surface. Legs 26 extend from the lower surface 24 to support the base 12. Legs 26 define fork tunnels 28 for forklift tine access to permit the bin 10 to be moved using a forklift. The upper surface is typically of flat sheet of plastic. The lower surface 24 of the base 12 can include ribs (not shown) to provide structure and to strengthen the base 12.

[0023] As best shown in FIGS. 1 through 4, the base 12 includes at its opposing sides 20 raised edges 30 extending upwardly from the base 12. In accord with an embodiment of the present invention, the end walls 14 and side walls 16 are attached to the base 12 via hinges 32 at the base ends 18 and sides 20, respectively. The raised edges 30 along the sides 20 permit the end walls 14 and side walls 16 to be folded over the base 12 as shown in FIGS. 2 and 3.

[0024] Either the end walls 14 or side walls 16 can have doors 34 for access to items or materials stored within the bin 10 when the bins 10 are stacked upon each other. The doors 34 have hinges 36 at a bottom edge 38 to permit the doors 34 to swing downwardly about the hinges 36. The doors also include latches 39 to selectively open and secure the doors 34.

[0025] The end walls 14 have upper edges 40. The side walls 16 have upper edges 42. In accord with an embodiment of the present invention, one or both of the end walls 14 or side walls 16 include a pair of end wall notches 44 and side wall notches 46 along upper edges 40 and 42. In addition, the raised edges 30 of the base 12 have a pair of base notches 48. The notches 44, 46, and 48 are spaced apart from each other at a distance to accommodate forklift fork tines as will be described in greater detail below. The notches 44, 46, and 48 preferably extend in a range from approximately  $\frac{3}{8}$  inch to  $1\frac{1}{2}$  inches below the upper edges 40 and 42 of the end and side walls 14 and 16, and the raised edges 30 of the base 12. In another embodiment, the upper edges 40 and 42 of the end and side walls 14 and 16, or raised edges 30 of the base 12 can include a single notch sized to accommodate both forklift fork tines.

[0026] FIG. 5 shows bins 10 stacked in their erected position. FIG. 6 shows bins 10 stacked in their collapsed position. As best shown in FIGS. 4, 5, and 8, the base 12 includes at the bottoms of its legs 26 a stacking interlock 50. The interlock 50 includes an inset wall 52 on the order of  $\frac{3}{4}$  inch tall inset approximately  $1\frac{1}{2}$  inches from an outer surface 54 of each leg 26. As best shown in FIGS. 5 through 8, the interlock 50 allows stable stacking of the bins 10 in either the erected or collapsed position. However, when collapsed or erected bins are stacked one upon another, there is not enough clearance for a forklift fork tine to effect lifting of stacked bins other than from beneath the lowest bin. The loss of  $\frac{3}{4}$  inch when the bins are stacked prevents the forklift fork tines from being able to enter the fork tine tunnel area between stacked bins. The notches 44, 46, and 48 regain the lost  $\frac{3}{4}$  inch to permit sufficient space for a fork tine 56.

[0027] FIG. 7 shows stacked bins 10 in their erected position. FIG. 7 shows interaction between a forklift fork tine 56 and the present invention. Only one tine 56 is shown for clarity purposes although it will be understood that two forklift fork tines 56 are used. Fork tines 56 are typically on the order of  $2\frac{1}{2}$  and  $2\frac{3}{4}$  inches thick at their thickest point. To lift a bin 10 that is stacked on another bin 10, the fork tines 56 are inserted into an opening 58 created by the fork tunnels 28 of the upper bin 10 and side wall notches 46 in the upper edge 42 of the side wall 16 of the lower bin 10. The fork tunnels 28 and notches 46 should align to allow insertion of the fork tines for lifting of the upper bin or bins 10. On most forklifts, the distance between the fork tines 56 is adjustable. It will be understood that a forklift can similarly be used on the fork tunnels 28 and end wall notches 44 of the end walls 14.

[0028] Similarly, FIGS. 6 and 8 show stacked bins 10 in their collapsed position. To lift a bin 10 that is stacked on another bin 10, the fork tines 56 are inserted into an opening 60 created by the fork tunnels 28 of the upper bin 10 and base notches 48 in the raised upper edge 30 of the side end 16 of the base 12.

[0029] While the specific embodiments have been illustrated and described, numerous modifications come to mind without significantly departing from the spirit of the invention and the scope of protection is only limited by the scope of the accompanying Claims.

I claim:

1. A stackable bin, the bin having a collapsed position and an erected position, the bin including:
  - a base having an upper surface, a pair of opposing ends, and a pair of opposing sides;
  - the base also having raised upper edges along at least one of the pair of opposing sides or opposing ends;
  - a pair of opposing side walls, each side wall attached at a lower edge to a respective base side, each side wall also including an upper edge;
  - a pair of opposing end walls, each end wall attached at a lower edge to a respective base end, each end wall also including an upper edge; and
  - at least one base notch in the raised upper edge of at least one side of the pair of opposing sides or at least one end of the pair of opposing ends of the base to provide forklift fork tine access when the bin is in the collapsed position.
2. The bin of claim 1 wherein the at least one base notch includes first and second notches.
3. The bin of claim 1 further including at least one end wall notch in the upper edge of at least one end wall of the pair of

opposing end walls to provide forklift fork tine access when the bin is in the erected position.

4. The bin of claim 3 wherein the at least one end wall notch in the upper edge of the at least one end wall of the pair of opposing end walls includes first and second notches.

5. The bin of claim 1 further including at least one side wall notch in the upper edge of at least one side wall of the pair of opposing side walls to provide forklift fork tine access when the bin is in the erected position.

6. The bin of claim 5 wherein the at least one side wall notch in the upper edge of the at least one side wall of the pair of opposing side walls includes first and second notches.

7. The bin of claim 5 wherein the at least one side wall notch extends within a range from 3/8 inch to 1 1/2 inches below the upper edge of the at least one side wall.

8. The bin of claim 3 wherein the at least one end wall notch extends within a range from 3/8 inch to 1 1/2 inches below the upper edge of the at least one end wall.

9. The bin of claim 1 wherein the at least one base notch extends within a range from 3/8 inch to 1 1/2 inches below the raised upper edge of the base.

10. A stackable bin, the bin having a collapsed position and an erected position, the bin including:

a base having an upper surface, a pair of opposing ends, and a pair of opposing sides;

the base also having raised upper edges along at least one of the pair of opposing sides or opposing ends;

a pair of opposing side walls, each side wall attached at a lower edge to a respective base side, each side wall also including an upper edge;

a pair of opposing end walls, each end wall attached at a lower edge to a respective base end, each end wall also including an upper edge; and

at least one wall notch in the upper edge of at least one side wall of the pair of opposing side walls or at least one end wall of the pair of opposing end walls to provide forklift fork tine access when the bin is in the erected position.

11. The bin of claim 10 further including at least one base notch in the raised upper edge of at least one side of the pair of opposing sides or at least one end of the pair of opposing ends of the base to provide forklift fork tine access when the bin is in the collapsed position.

12. The bin of claim 11 wherein the at least one base notch in the upper edge of the raised upper edge of the at least one side of the pair of opposing sides or the at least one end of the pair of opposing ends of the base includes first and second notches.

13. The bin of claim 10 wherein the at least one wall notch in the upper edge of the at least one side wall of the pair of

opposing side walls or the at least one end wall of the pair of opposing end walls includes first and second notches.

14. The bin of claim 11 wherein the at least one base notch extends within a range from 3/8 inch to 1 1/2 inches below the raised upper edge of the base.

15. The bin of claim 10 wherein the at least one wall notch extends within a range from 3/8 inch to 1 1/2 inches below the upper edge of the at least one end wall or the at least one side wall.

16. A stackable bin, the bin having a collapsed position and an erected position, the bin including:

a base having an upper surface, a pair of opposing ends, and a pair of opposing sides;

the base also having raised upper edges along at least one of the pair of opposing sides or opposing ends;

a pair of opposing side walls, each side wall attached at a lower edge to a respective base side, each side wall also including an upper edge;

a pair of opposing end walls, each end wall attached at a lower edge to a respective base end, each end wall also including an upper edge;

at least one base notch in the raised upper edge of at least one side of the pair of opposing sides or at least one end of the pair of opposing ends of the base to provide forklift fork tine access when the bin is in the collapsed position; and

at least one wall notch in the upper edge of at least one side wall of the pair of opposing side walls or at least one side wall of the pair of opposing end walls to provide forklift fork tine access when the bin is in the erected position.

17. The bin of claim 16 wherein the at least one wall notch in the upper edge of the at least one side wall of the pair of opposing side walls or the at least one end wall of the pair of opposing end walls includes first and second notches.

18. The bin of claim 16 wherein the at least one base notch in the upper edge of the raised upper edge of the at least one side of the pair of opposing sides or the at least one end of the pair of opposing ends of the base includes first and second notches.

19. The bin of claim 16 wherein the at least one base notch extends within a range from 3/8 inch to 1 1/2 inches below the raised upper edge of the base.

20. The bin of claim 16 wherein the at least one wall notch extends within a range from 3/8 inch to 1 1/2 inches below the upper edge of the at least one end wall or the at least one side wall.

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