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Thrush et al.(10) **Pub. No.: US 2007/0084864 A1**(43) **Pub. Date: Apr. 19, 2007**(54) **COLLAPSIBLE CONTAINER****Publication Classification**(75) Inventors: **Bruce A. Thrush**, Laguna Niguel, CA (US); **John Grimm**, Santee, CA (US)(51) **Int. Cl.**
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Rutan & Tucker, LLP**Robert D. Fish****611 ANTON BLVD****SUITE 1400****COSTA MESA, CA 92626 (US)**(57) **ABSTRACT**(73) Assignee: **The Parallax Group International, LLC**(21) Appl. No.: **11/581,204**(22) Filed: **Oct. 13, 2006****Related U.S. Application Data**

(60) Provisional application No. 60/726,729, filed on Oct. 14, 2005.

A storage crate has a side access doorway, which is preferably closable by a hinged door. Preferred crates are also collapsible in some manner, most preferably using pivots disposed between the floor and two of the sides, and horizontally along in about the middle of those two sides. Depending on the configuration, collapsing can advantageously reduce the height of the crate by at least 50%, 75% or more. Preferred crates are also stackable, most preferably by virtue of at least two of the sides have sufficient wall strength such that one could safely stack of at least three of the crates when unfolded to an operating configuration, and when each of the crates are loaded with at least 10 kilograms of stored material.

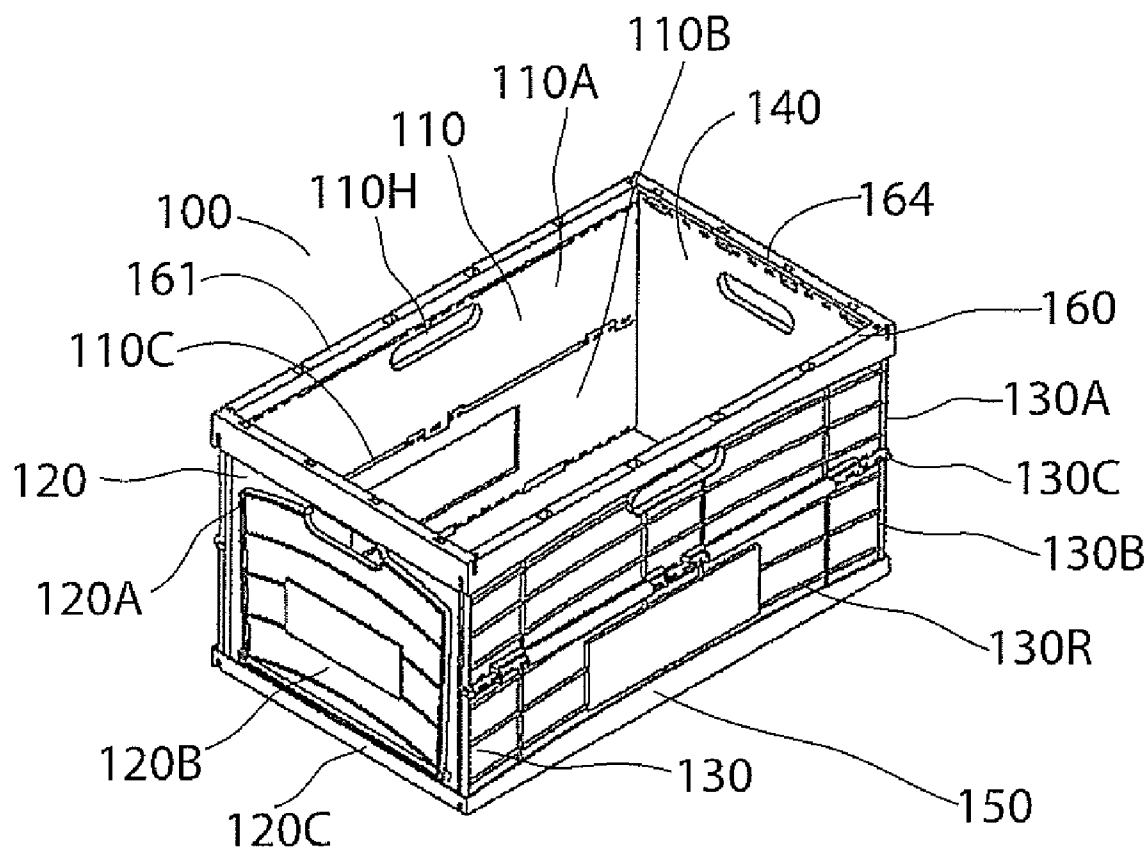


Fig. 1

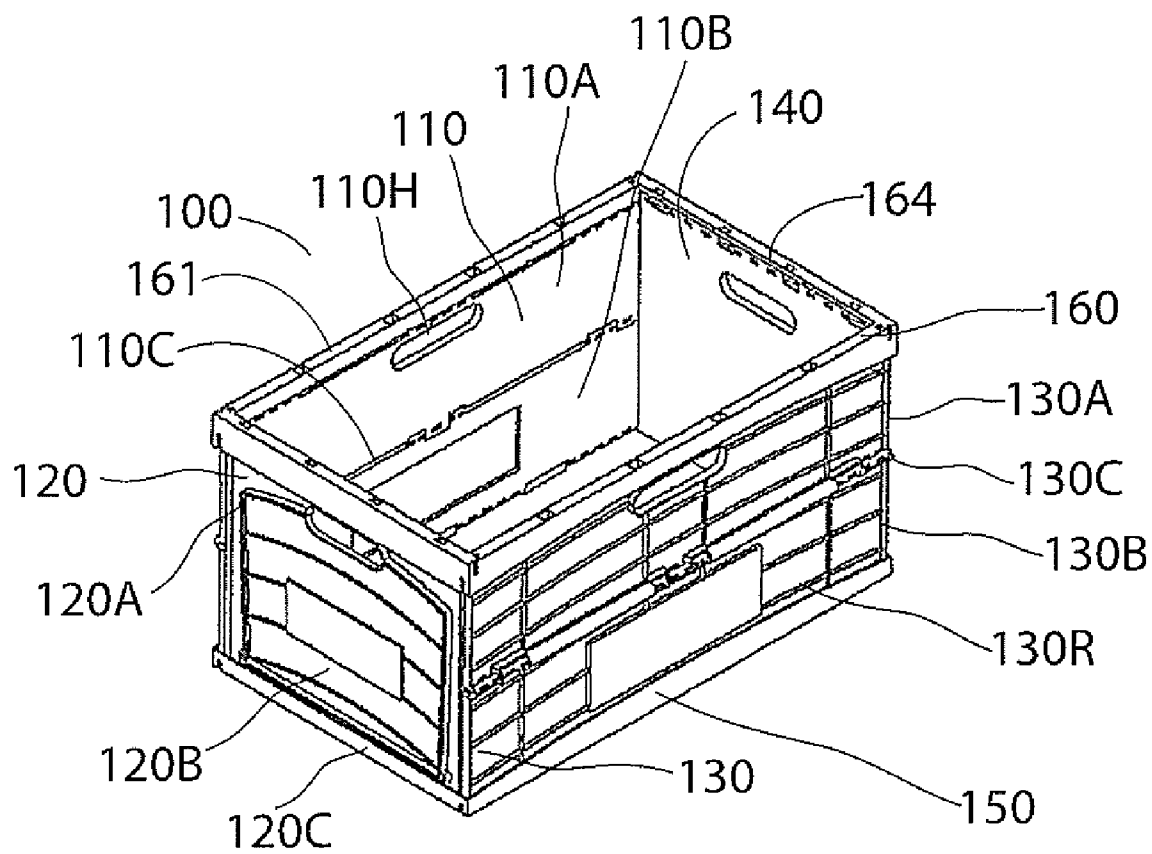


Fig. 2

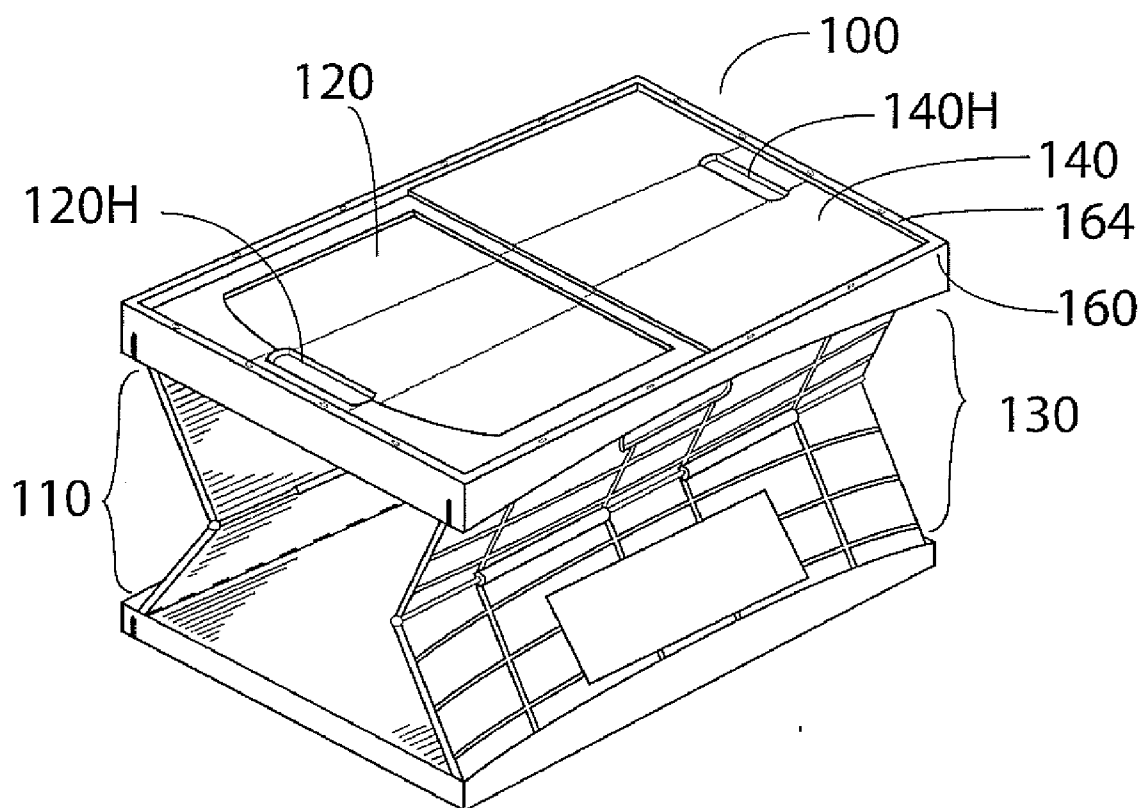


Fig. 3

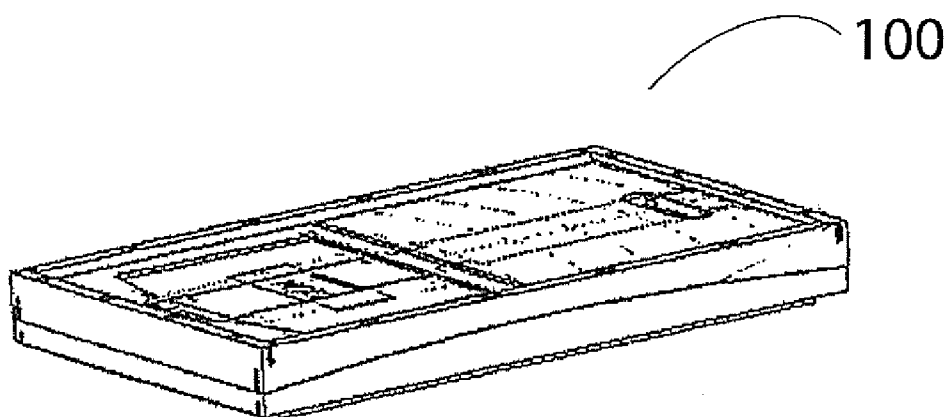


Fig. 4

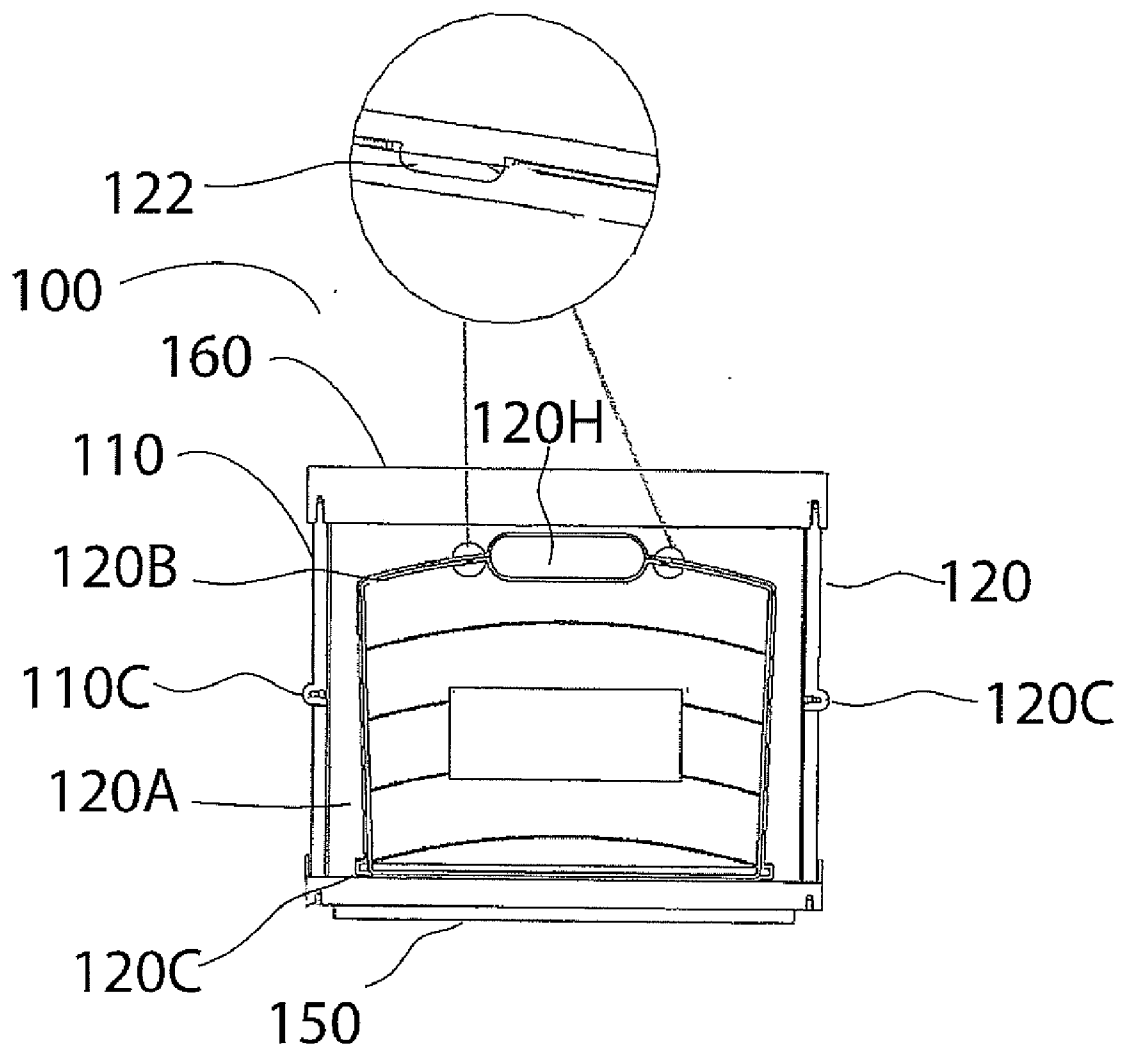


Fig. 5

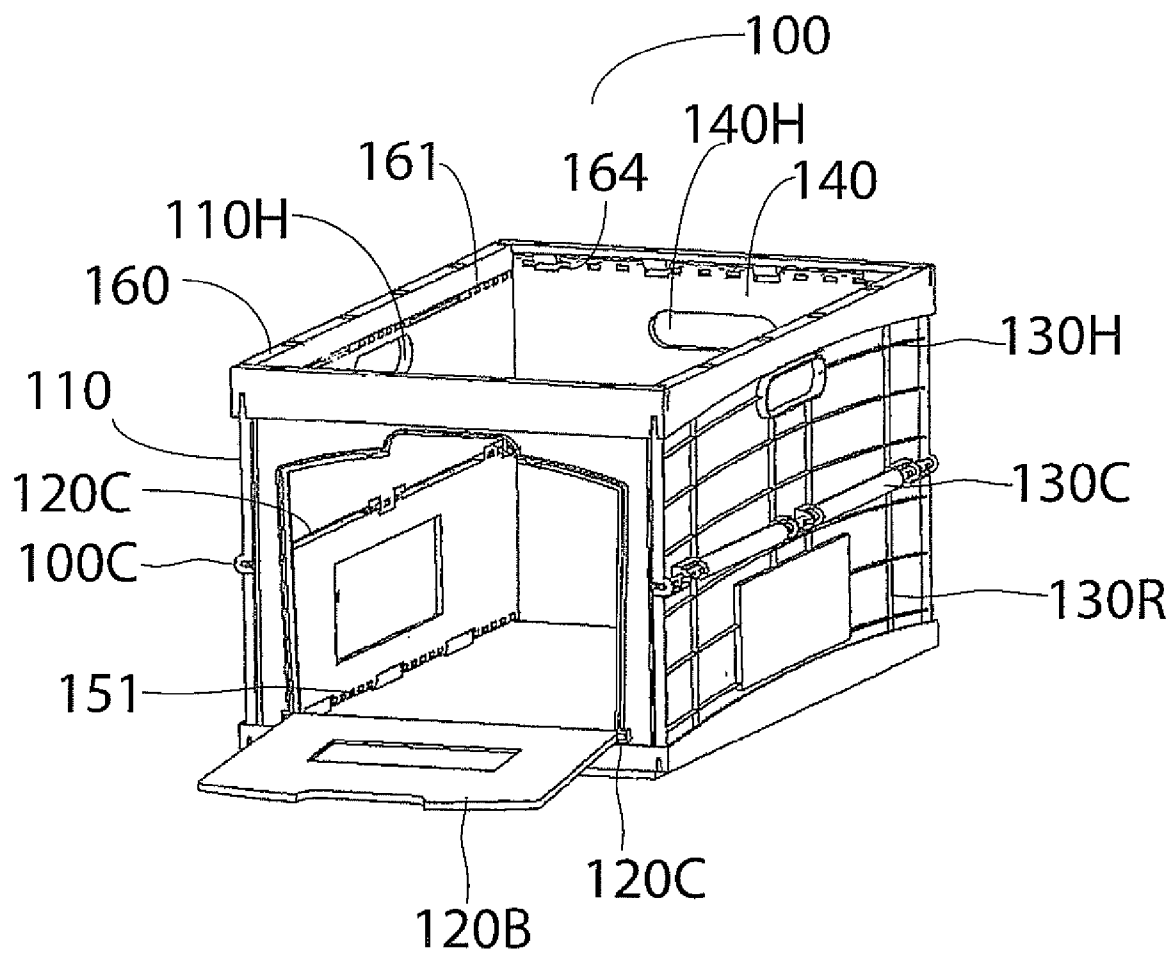


Fig. 6

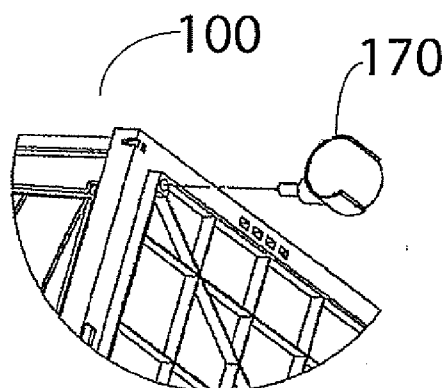
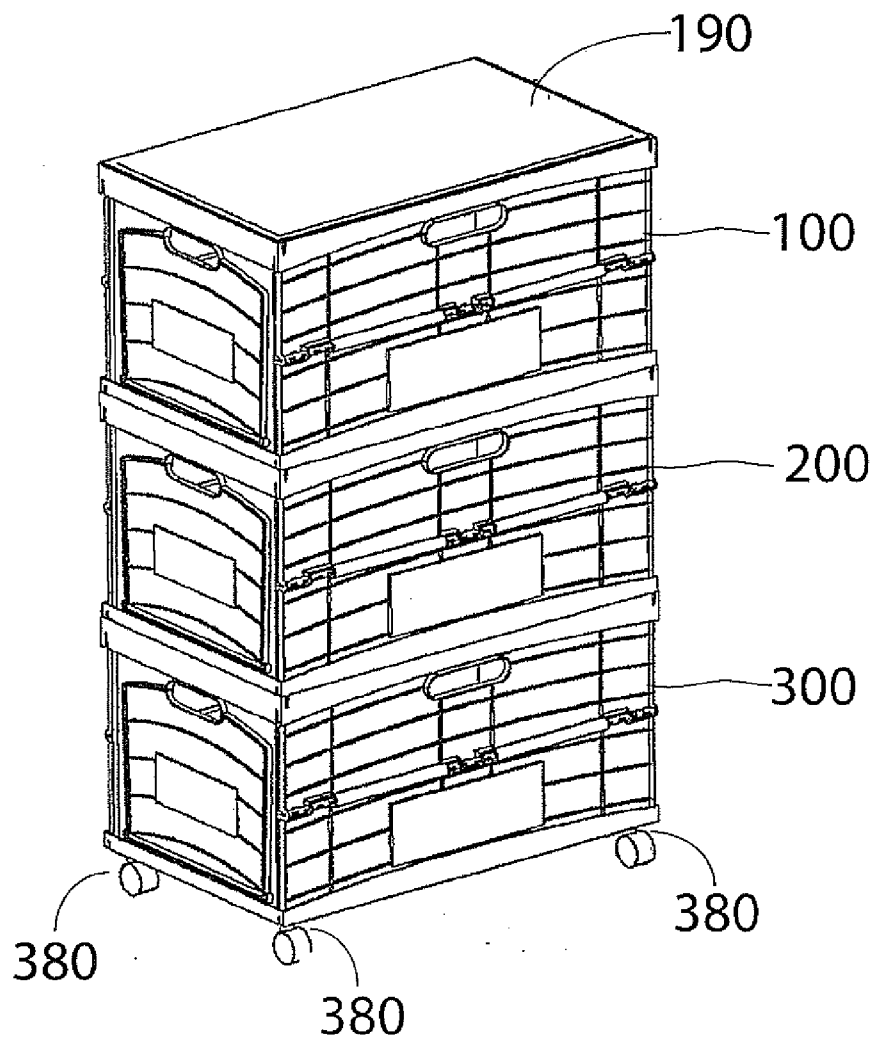


Fig. 7



COLLAPSIBLE CONTAINER

[0001] This application claims priority to U.S. Provisional Application Ser. No. 60/726729 filed Oct. 14, 2005.

FIELD OF THE INVENTION

[0002] The field of the invention is utility storage containers.

BACKGROUND

[0003] There are myriad different storage solutions on the market, addressing all manner of various needs. Of particular interest are utility crates, which are defined herein as storage boxes with open tops, usually myriad air holes or other openings in the sides, sufficient bottom strength to hold 10-15 kilograms or more, and storage capacity of between 0.02 to 0.75 cubic meter (m³).

[0004] It is known for utility crates to be collapsible. U.S. Pat. No. 4,789,075 to Sun (December 1988) describes a crate that is collapsible by virtue of the sides folding down against the bottom, similar in some ways to a corrugated paper box. Other crates are collapsible by virtue of the sides being pivotally coupled to the bottom, and the sides being hinged horizontally about a midline. (see e.g. U.S. Pat. No. 3,195,506 to Beard (November 1963) and U.S. Pat. No. 5,549,073 to Askins et al. (August 1996)). There are yet other crates that collapse in various ways, such as the animal carrier described in U.S. Pat. No. 5,669,331 to Richmond (September 1997). These and all other referenced patents and applications are incorporated herein by reference in their entirety. Where a definition or use of a term in a reference, which is incorporated by reference herein is inconsistent or contrary to the definition of that term provided herein, the definition of that term provided herein applies and the definition of that term in the reference does not apply.

[0005] It is also known for utility crates to be stackable. As used herein the term stackable means that the crates have sufficient wall and/or frame strength, and have top and bottom surfaces sized and dimensioned, such that one could safely stack of at least three of the crates when unfolded to an operating configuration, and when each of the crates are loaded with at least 10 kilograms of stored material. By way of illustration, the utility crate in U.S. Pat. No. 5,339,979 to Box (August 1994) is considered herein stackable, but the pet carrier of U.S. Pat. No. 4,603,658 to Garnsey (August 1986) is considered to be not stackable because it has a pointed roof. Similarly, the carrier of U.S. Pat. No. 4,800,842 to Jones (January 1989) and that of U.S. Pat. No. 5,803,018 to Liou (September 1998) are considered to be not stackable because they each have a rigid top carrying handle that would interfere with safe stacking.

[0006] Interestingly, it is not known for utility crates to have side access doors or doorways. The history of that omission is not clear, but it might derive from the fact that since utility crates are readily accessible from the top, those of ordinary skill in the art just never appreciated that side access doors would be useful. That theory is certainly consistent with the observation that pet cages, which are necessarily closed at the top sufficiently to prevent escape of the animal, often have side doors. Along those lines one can readily envision common bird cages, as well as portable pet carriers such as that described in U.S. Pat. No. 3,195,506 to

Beard (November 1963), U.S. Pat. No. 4,484,540 to Yamamoto (November 1984) and U.S. Pat. No. 5,493,818 to Wilson (February 1996).

[0007] The fact is, however, that when the contents of utility crates are essentially not accessible when the crates are stacked. True, one might be able to pull a pencil or other small item through one of the air holes, but the only way to access larger items is to unstuck the crates, remove any lid, and access those items through the open top. And that effort should be unnecessary. Thus, there is still a need to provide utility crates with side doors.

SUMMARY OF THE INVENTION

[0008] The present invention provides systems and methods in which a utility crate has a side access doorway.

[0009] Preferred crates are collapsible in some manner, most preferably using pivots disposed between the floor and two of the sides, and horizontally along in about the middle of those two sides. Depending on the configuration, collapsing can advantageously reduce the height of the crate by at least 50%, 75% or more.

[0010] Preferred crates are also stackable, most preferably by virtue of at least two of the sides have sufficient wall strength such that one could safely stack of at least three of the crates when unfolded to an operating configuration, and when each of the crates are loaded with at least 10 kilograms of stored material. Crates can advantageously have mating upper and lower rims that provide additional stability when multiple ones of the crate are stacked. A removable lid can be included as part of, or as an accessory to, the crate. In especially preferred embodiments, the crates are stackable with or without the lid.

[0011] A door can operate within the doorway in any suitable manner, including especially using hinges coupled to a body portion of the side in which it is disposed. It is contemplated that crates could have additional side doorways, which could be disposed in the same side as the first doorway, or in other sides. In especially preferred embodiments, the crate is rectangular, with at least one doorway disposed in one of the ends.

[0012] Various objects, features, aspects and advantages of the present invention will become more apparent from the following detailed description of preferred embodiments of the invention, along with the accompanying to-scale drawings in which like numerals represent like components.

BRIEF DESCRIPTION OF THE DRAWING

[0013] FIG. 1 is a perspective top view of a utility crate according to various aspects of the inventive subject matter.

[0014] FIG. 2 is a perspective view of the crate of FIG. 1, in a partially collapsed configuration.

[0015] FIG. 3 is a perspective view of the crate of FIG. 1, in a fully collapsed configuration.

[0016] FIG. 4 is an end view of the crate of FIG. 1.

[0017] FIG. 5 is a perspective view of the crate of FIG. 1, showing the access door and doorway in an open configuration.

[0018] FIG. 6 is a perspective bottom view of a corner section of the crate of FIG. 1, showing a removable caster.

[0019] FIG. 7 is a perspective view of a stack of three crates, the bottom one having four castors.

DETAILED DESCRIPTION

[0020] In FIG. 1 a utility crate 100 generally includes four sides 110, 120, 130, 140 and a floor 150. Sides 120 and 140 can be considered ends since they are narrower than sides 110 and 130.

[0021] Side 110 includes upper and lower sections 110A, 110B that pivot with at hinge 110C. The lower section 110B pivots against the floor 150 at hinge 151, and against an upper frame element 160 at hinge 161. Side 130 also includes upper and lower sections 130A, 130B pivoted at hinge 130C. The lower section 130B is pivots against the floor 150 at hinge 153, and against the upper frame element 160 at hinge 163.

[0022] Side 120 includes a body 120A upon which an access door 120B pivots at hinge 120C to open or close doorway 125. Door 120B includes finger holes 122. Sides 120 pivot against the upper frame element 160 at a hinge that is not shown. Side 140 pivots against the upper frame element 160 at hinge 164. As used herein, the term “doorway” is an access portal having an area of at least 35 cm². Contemplated doorways include those configured to be substantially closed by a door (closable doorways) and also non-closable doorways. Preferred doorways have an area of at least 50 cm², more preferably at least 200 cm², more preferably at least 500 cm², more still more preferably at least 750 cm², and most preferably at least 1000 cm². These numbers are chosen to reflect contemplated uses in which an adult person can reach his/her hand through the doorway to insert or remove a piece of paper, a stapler, a cell phone or some other relatively small, commonly stored item.

[0023] In the particular example of FIG. 1, the overall dimensions of the crate 100 are approximately 77 cm wide by 47 cm deep by 35 cm tall, and the doorway has an area of approximately 1085 cm². In an alternative, smaller version, the crate is approximately 57 cm wide by 39 cm deep by 30 cm tall, and the doorway has an area of approximately 618 cm².

[0024] Crates can also advantageously include a handle in one or more of the sides. FIG. 1 shows handles 110H, 120H, 130H, and 140H in each of the four sides. Alternative embodiments can have a greater or lesser number of sides with handles, and a greater or lesser number of handles in any given side.

[0025] By viewing the inner facing of the sides, the reader should be able to appreciate that the sides are substantially solid, as opposed for example, to the wire mesh sides of the cage of U.S. Pat. No. 5,549,073 (August 1996). The only substantial air-flow passages are the handle holes and, when open, the doorway 120B. This solid sides are configured that way mostly to minimize thickness of the plastic while still providing sufficient compression and torsion strength. Those skilled in the art will also appreciate that reinforcing ribs 120R, 130R (FIG. 1) and 110R, 150R (FIG. 6) are used to increase strength without adding substantial additional weight.

[0026] As discussed above, crates are defined herein (among other things) to be limited to storage containers having a capacity of between 0.02 to 0.75 cubic meter (m³). Of particular interest, however, are crates within those ranges that correspond to standard sizes. For example, “milk crates” and paper file storage crates are especially contemplated. Note that unless a contrary meaning is plain from the context, all ranges herein should be interpreted as including the endpoints.

[0027] The various hinges connected to the floor 150 and the upper frame element 160 allow the crate 100 to be collapsed. FIG. 2 shows the crate in a partially collapsed configuration, and FIG. 3 shows the crate 100 in a fully collapsed configuration. Fully collapsed configurations are preferably have a height no more than 50% of the fully deployed (un-collapsed) height, and more preferably no more than 25% of the fully deployed (un-collapsed) height.

[0028] In FIGS. 4 and 5, one can readily visualize the several of the hinges 110C, 120C, 130C, 151, 161, and 164. One can also see the finger holes 122.

[0029] FIG. 6 is a perspective bottom view of a corner section of crate 100, showing a removable caster 170. Crates can advantageously include one or more (preferably four) castors or other wheels extending from the underside of the crate. Attachment is preferable near the corners, and the wheel(s) is/are preferably user removable. All other suitable wheels are contemplated, whether casters or not, and regardless of placement and removability.

[0030] FIG. 7 is a perspective view of a stack of three crates 100, 200, 300. The top crate 100 has a lid 190, and the bottom crate 300 has four castors 380 (three of which are shown).

[0031] In terms of materials, crates are preferably made from one or more polymers (poly-carbonate or other plastic, rubber, etc) having sufficient rigidity and other strength characteristics. Any of the floor and/or sides can be perforate or solid, although is preferred that at least two of the sides have considerable perforation to provide airflow. Determination of appropriate thicknesses of the material or materials used in various portions of the crate will depend on intended strength characteristics, and engineering of same should be well within the scope of those of ordinary skill in the art. Among other things, thickness will likely depend to some extent on the size of the crate, with larger crates requiring thicker walls and floor.

[0032] Thus, specific embodiments and applications of a utility crate with a side access doorway have been disclosed. It should be apparent, however, to those skilled in the art that many more modifications besides those already described are possible without departing from the inventive concepts herein. The inventive subject matter, therefore, is not to be restricted except in the spirit of the appended claims. Moreover, in interpreting both the specification and the claims, all terms should be interpreted in the broadest possible manner consistent with the context. In particular, the terms “comprises” and “comprising” should be interpreted as referring to elements, components, or steps in a non-exclusive manner, indicating that the referenced elements, components, or steps may be present, or utilized, or combined with other elements, components, or steps that are not expressly referenced. Where the specification claims refers to at least one

of something selected from the group consisting of A, B, C . . . and N, the text should be interpreted as requiring only one element from the group, not A plus N, or B plus N, etc.

What is claimed is:

1. A utility crate comprising:
 - mechanically coupled first, second and third sides;
 - a floor mechanically coupled to at least the first side; and
 - a doorway in the second side.
2. The crate of claim 1, wherein the floor is pivotally coupled to the first and third sides.
3. The crate of claim 1, wherein at least one of the sides comprises hinged upper and lower sections.
4. The crate of claim 1, wherein the floor is pivotally coupled to the first side at a hinge, and further comprising at least one other hinge disposed such that the crate can be collapsed to a height no more than 25% of its unfolded configuration.
5. The crate of claim 1, wherein at least two of the sides have sufficient wall strength such that one could safely stack of at least three of the crates when unfolded to an operating configuration, and when each of the crates are loaded with at least 10 kilograms of stored material.
6. The crate of claim 1, further comprising upper and lower rims having mating configurations that provide additional stability when multiple ones of the crate are stacked.
7. The crate of claim 1, further comprising a door that can at least substantially close the doorway, the door hingedly coupled to a body portion of the second side.

8. The crate of claim 1, wherein the second side has a shorter horizontal lengths than the first and third sides.

9. The crate of claim 1, wherein each of the first and third sides has a horizontal length at least twice that of the second side.

10. The crate of claim 1, further comprising a fourth side mechanically coupled to the other sides.

11. The crate of claim 1, wherein the sides at least partially define an upper rim, and further comprising a removable lid that mates with the upper rim.

12. The crate of claim 1, further comprising at least a first wheel extending from an underside of the crate.

13. The crate of claim 12, wherein the wheel comprises a castor, and is user removable from the underside.

14. The crate of claim 1, further comprising a handle portion disposed in the first side.

15. The crate of claim 1, wherein the floor is substantially solid.

16. The crate of claim 1, wherein at least one of the sides is solid.

17. The crate of claim 1, further comprising a door that can at least substantially close the doorway, and wherein each of the door and the second side are substantially solid.

18. The crate of claim 1, wherein at least one of the floor and sides comprises a polymeric material.

19. The crate of claim 18, wherein the polymeric material comprises a plastic.

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