Abstract Title: Collapsible crate with support members

A collapsible container (or crate) includes a plurality of walls 14, 18, collapsible onto the base 12. At least one wall has a support (or flap) 20 pivotably mounted below a lip 36 formed on an upper edge of the wall 18. The support is pivotable between a support position where it is partially supported on an adjacent wall and a retracted position. A cutout 38 through the lip in the wall provides access for a user to flip the support from the retracted position to the support position. In the retracted position, the wall can be pivoted downward onto the base, with a portion of the support passing through a channel 24 formed on the interior of the adjacent wall.

Fig. 1
CONTAINER

BACKGROUND OF THE INVENTION

The present invention relates generally to collapsible crates and more particularly to a collapsible crate with support members for supporting another container thereon.

Collapsible crates are well known. Four walls each connected via a hinge to a base are selectively movable about the hinge between a use position, in which the wall is generally perpendicular to the base, and a collapsed position onto the base. Various mechanisms have been provided to connect adjacent walls at the corner to selectively lock the crate in the use position.

Some collapsible crates also include retractable supports so that another container can be supported thereon. One such crate includes end walls each having a support that is partially supported on the adjacent walls when in the support position. As the end walls are pivoted to the upright position, a biasing member on the support contacts a portion of the adjacent wall to automatically move the support to the support position. However, the biasing members are subject to breakage and it is not always necessary to deploy the supports.

SUMMARY OF THE INVENTION

The present invention provides a collapsible container having a plurality of walls collapsible onto the base. At least one wall has a support pivotably mounted below an upper end thereof. The support is pivotable between a support position where it is partially supported on an adjacent wall and a retracted position. In the retracted position, the wall can be pivoted downward onto the base, with a portion of the support passing through a channel formed on the interior of the adjacent wall.

When the wall is pivoted to the upright position, a small cutout in the top of the wall permits access to the support. Through the cutout, a user can flip the support from the retracted position to the support position with a thumb when it is desirable to support another container.
The supports may be formed on short end walls of the container, such that
the supports and end walls can be collapsed onto the base and the long side walls
can be pivoted onto the end walls.

5 **BRIEF DESCRIPTION OF THE DRAWINGS**

Other advantages of the present invention can be understood by reference to
the following detailed description when considered in connection with the
accompanying drawings wherein:

Figure 1 is a perspective view of a container according to the present
invention, with the walls in the upright position and the supports in the support
position.

Figure 2 is a partial section view of the container of Figure 1 with the end
wall in the collapsed position.

Figure 3 is a view similar to that of Figure 2, with the end wall being pivoted
toward the upright position.

Figure 4 is a view similar to that of Figure 2 with the end wall in the upright
position and the support in the retracted position.

Figure 5 is a perspective view of the container of Figure 4.

Figure 6 is a view similar to that of Figure 2 with the end wall in the upright
position and the support in the support position.

Figure 7 is a perspective view of the container of Figure 6.

Figure 8 illustrates the container of Figure 7 with another container
supported thereon.

Figure 9 is a section view of the containers of Figure 8.

Figure 10 is an exterior side view of the container with the end wall in the
upright position and the support in the retracted position

Figure 11 is an exterior side view of the container with the walls in the
upright position and the support in the support position.

Figure 12 is an exterior end view of the container with the walls in the
upright position.

Figure 13 is an end view of one of the end walls.
Figure 14 is a section view taken along line A-A of Figure 13 illustrating one embodiment of the support and end wall in a retracted position. Figure 15 illustrates the support and end wall of Figure 14 in a support position.

Figure 16 is a section view taken along line A-A of Figure 13 illustrating a second embodiment of the support and end wall in a retracted position. Figure 17 illustrates the support and end wall of Figure 16 in a support position.

Figure 18 is a section view taken along line B-B of Figure 13 illustrating a third embodiment of the support and end wall in a retracted position. Figure 19 illustrates the support and end wall of Figure 18 in a support position.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

Referring to Figure 1, a container 10 includes a base 12 having upstanding side walls 14 (or long walls) and upstanding end walls 18 (or short walls). The side walls 14 and end walls 18 are pivotably connected along long and short edges of the base 12, respectively. The side walls 14 and end walls 18 are movable between the upright position shown and a collapsed position on the base 12.

Each end wall 18 has a support 20 (or flap). The support 20 is pivotably mounted at its lower edge to a position spaced below an upper edge of the end wall 18. The supports 20 are shown in Figure 1 pivoted to a retracted position against the end walls 18, where they do not project into the interior of the container 10. The supports 20 each include a tab 21 projecting from each side into the side walls 14. The end walls 18 each include a lip 36 protruding inwardly from the uppermost edge above the support 20. The lip 36 includes at least one inwardly-open cutout 38 therethrough.

The interiors of the side walls 14 each include an upper frame portion 22 protruding into the container 10. A pair of curved channels 24 is formed through each upper frame portion 22. The interiors of the side walls 14 each further include a lower frame portion 26 having a pair of channels 28 formed therethrough. A recess 30 is defined between the upper frame portion 22 and the lower frame portion
26. The base 12 includes a pair of side upstanding portions 32 to which the side walls 14 are pivotably attached. Each side upstanding portion 32 includes a pair of channels 34 formed on an interior thereof. The channels 24, 28 and 34 are aligned with one another and with the tabs 21 on the supports 20, so that the end walls 18 can be pivoted to the collapsed position.

The base 12 includes a pair of shallow recessed channels 40 (one shown) in alignment with the channels 34 of the side upstanding portions 32. When the end wall 18 is collapsed onto the base 12 as shown in Figure 2, the lip 36 of the end wall 18 and the upper edge of the support 20 are received in the channel 40 in the base 12. As can be seen in Figure 2, the lip 36 and the support 20 both project toward the interior of the container 10 further than the inner surface of the remainder of the end wall 18, so the recess 40 permits the end wall 18 to lie flatter on the base 12. This reduces the overall stacking height of the container 10 in a collapsed position.

In Figure 3, the end wall 18 is being pivoted toward the upright position from the position of Figure 2. The tab 21 passes through the channels 24, 28, 34 and the recess 30 in side wall 14 as the end wall 18 is pivoted toward the upright position, as shown in Figure 4.

Referring to Figure 5, the support includes an inverted-L-shaped mid-portion 46, an upper portion 48 and extending inwardly from the outer edge of the mid-portion 46 and a lower portion 50 that forms a hinge with the end wall 18. The mid-portion 46 and the upper portion 48 extend over the handle 52 to the other half (not shown) of the support 20, which is the mirror-image. A stop 54 is formed on the end wall 18 adjacent the handle 52 and spaced inwardly from the support 20. The tab 21 at the end of the support 20 includes a downwardly-extending interlocking portion 56, which is aligned to interlock behind a rail 58 formed on an inner portion of the upper frame portion 22. In the retracted position, the upper portion 48 of the support 20 can be accessed via the cutout 38 through the lip 36. With a thumb or finger, a user can flip the support 20 to the support position, as shown in Figures 6 and 7.

Referring to Figures 6 and 7, the upper portion 48 of the support 20 is generally parallel to the base 12 in the support position. The tab 21 of the support 20 is supported by the side walls 14, specifically by the rails 58 of the side walls 14.
The interlocking portion 56 is received behind (outward of) the rail 58, which acts as a complementary interlocking portion to prevent the side wall 14 from bowing outward and releasing the support 20. The center of the support 20 is also supported on the stops 54 (one shown) on the end wall 18.

In the support position, the support 20 can support another container 100 in a stacked position, as shown in Figures 8 and 9. The container 100 rests on the upper portion 48 of the support 20 (and the opposite support 20).

Figure 10 is an exterior side view of the container 10 with the support 20 (not visible) in the retracted position. A window 62 is formed through the side wall 14 that aligns with the rail 58 on the inside of the container 10. When the support 20 (not visible) is moved to the support position as in Figure 11, the interlocking portion 56 of the support 20 is between the rail 58 and the window 62 and is visible through the window 62. This provides a visual indication of the position of the support 20 to a user, particularly if the container 10 is stacked above the user’s head.

The support 20 (including integral interlocking portion 56) may be a different color from the side wall 14, which would provide even better visual indication.

Figure 12 is an end view of the container 10. A window 64 is formed through the end wall 18 in order to form the stop 54.

Figure 13 is an end view of one of the end walls 18. Each end wall 18 includes a plurality of integrally molded hinge members 64 including hinge pins.

Figure 14 is a section view taken along line A-A of Figure 13 illustrating one embodiment of the support and end wall 18 in a retracted position. The lower portion 50 of the support 20 includes a hinge pin 68 upon which the support 20 pivots. A rear portion 70 of the lower portion 50 engages a rear wall 72 of the end wall 18 above a shelf 73 of the end wall 18. The rear portion 70 includes adjacent flats 74, 76 and the lower portion 50 includes adjacent flats 78, 80. In the retracted position as shown, the flat 74 engages the rear wall 72 and the flat 78 engages the shelf 73. When rotated to the support position, as shown in Figure 15, the flat 76 engages the rear wall 72 and the flat 80 engages the shelf 73. The flats 74, 76, 78, 80 keep the support in either the retracted position or the support position and bias the support fully toward retracted position and the support position.
Figure 16 illustrates a second embodiment of the support 20a and end wall 18a in a retracted position. The support 20a is pivotable on the hinge pin 68. The rear portion 70a of the support 20a includes a projection 84 that engages a projection 82 from the rear wall 72a of the end wall 18. The support 20a may also include the flats 78, 80 also included in the Figure 14-15 embodiment. When the support 20a is in the retracted position, the interfering projections 82, 84 also retain the support 20a in the retracted position. When the support 20 is forced downward, the interfering projections 82, 84 snap past one another and the support 20 moves to the support position as shown in Figure 17. The flat 80 engages the shelf 73.

Figure 18 is a section view taken along line B-B of Figure 13 illustrating a third embodiment of the support 20b and end wall 18b in a retracted position. In this embodiment, the hinge pin 68b includes a cam 88 or projection positioned adjacent a cantilevered arm 90 extending upwardly from the shelf 73b of the end wall 18b, inwardly of the hinge pin 68b. The arm 90 and cam 88 retain the support 20b in the retracted position as shown. When the support 20b is forced downward, the cam 88 deflects the arm 90 inwardly as shown in Figure 19, and the arm 90 retains the cam 88 in that position with the support 20b in the support position.

Alternatively, two or more of the interfering members of the embodiments shown in Figures 14-19 could also all be used together in a single end wall 18.

While embodiments of the invention have been illustrated and described, it is not intended that these embodiments illustrate and describe all possible forms of the invention. Rather, the words used in the specification are words of description rather than limitation, and it is understood that various changes may be made without departing from the spirit and scope of the invention. For example, in any of the occurrences above, the hinge members and hinge pins could be reversed and formed on opposite parts.
CLAIMS

1. A container comprising:
   a base;
   a first wall pivotably mounted relative to the base, a lip projecting inwardly from an upper edge of the first wall, the lip including an inwardly-open cutout; and
   a support pivotably mounted to the first wall below the lip, the support pivotable about an axis generally parallel to the base between a support position and a retracted position, the support accessible via the inwardly-open cutout through the lip.

2. The container of claim 1 further including an adjacent wall adjacent the first wall, the support supported by the first wall and the adjacent wall in the support position.

3. The container of claim 2 wherein the support has a lower end pivotably attached to the first wall below the lip.

4. The container of claim 3 wherein the first wall and the support are collapsible onto the base when the support is in the retracted position.

5. The container of claim 4 wherein the support includes a laterally-extending tab, the tab contacting the adjacent wall to support the support in the support position.

6. The container of claim 5 wherein the adjacent wall includes a channel on an interior surface thereof, the tab passing through the channel as the first wall and the support are pivoted relative to the base to a collapsed position on the base.
7. The container of claim 6 wherein the channel is an upper channel through an upper frame portion, the interior surface of the adjacent wall further including a lower channel through a lower frame portion and a recess between the upper frame portion and the lower frame portion, the tab passing through the upper channel, the recess and the lower channel as the first wall and the support are pivoted relative to the base to a collapsed position on the base.

8. The container of claim 6 further including an interlocking portion extending downwardly from the tab, the interlocking portion received behind a complementary interlocking portion formed on an inner portion of the channel.

9. The container of claim 8 further including a window opening through the adjacent wall aligned with the complementary interlocking portion, such that the interlocking portion of the tab is visible through the window when the support is in the support position.

10. The container of claim 1 further including a recessed channel formed in the base, the lip of the first wall received in the recessed channel when the first wall is in the collapsed position.

11. The container of claim 10 wherein the lip protrudes toward the interior of the container further than the rest of the first wall when the first wall is in the upright position.
12. A container comprising:
   a base having an elongated recess formed therein;
   a first wall pivotably mounted to the base and movable between an upright position and a collapsed position, the first wall having a lip projecting inwardly from an upper edge, the lip received in the elongated recess of the base when the first wall is in the collapsed position;
   a second wall adjacent the first wall and movable between an upright position and a collapsed position on top of the first wall; and
   a flap pivotably mounted adjacent an upper end of the first wall, the flap movable between a support position supported on the second wall and a retracted position below the lip of the first wall.

13. The container of claim 12 wherein the flap and the first wall are movable to the collapsed position when the flap is in the retracted position.

14. The container of claim 12 wherein the second wall includes a channel on an interior surface thereof, the tab passing through the channel as the first wall and the support are pivoted relative to the base to a collapsed position on the base.

15. The container of claim 14 wherein the channel is an upper channel through an upper frame portion, the interior surface of the adjacent wall further including a lower channel through a lower frame portion and a recess between the upper frame portion and the lower frame portion, the tab passing through the upper channel, the recess and the lower channel as the first wall and the support are pivoted relative to the base to a collapsed position on the base.

16. The container of claim 15 further including an interlocking portion extending downwardly from the flap, the interlocking portion received behind a complementary interlocking portion formed on an inner portion of the channel.
17. The container of claim 16 further including a window opening through the second wall aligned with the complementary interlocking portion, such that the interlocking portion of the tab is visible through the window when the support is in the support position.

18. A container comprising:
   a base;
   a first wall pivotably mounted relative to the base; and
   a support pivotably mounted to the first wall, the support pivotable about an axis generally parallel to the base between a support position and a retracted position, at least one of the support and the first wall including at least one interfering member retaining the support in the retracted position relative to the first wall.

19. The container of claim 18 further including an adjacent wall adjacent the first wall, the support supported by the first wall and the adjacent wall in the support position.

20. The container of claim 19 wherein the support has a lower end pivotably attached to the first wall below a lip extending inwardly from an upper edge of the end wall.

21. The container of claim 20 wherein the first wall and the support are collapsible onto the base when the support is in the retracted position.

22. The container of claim 21 wherein the support includes a laterally-extending tab, the tab contacting the adjacent wall to support the support in the support position.

23. The container of claim 18 wherein the at least one interfering member includes a projection extending from the support.
24. The container of claim 18 wherein the at least one interfering member includes at least one flat portion on the support engaging a surface of the end wall in only one of the support position or the retracted position.

25. The container of claim 18 wherein the support is pivotally mounted to the end wall with a hinge pin, the at least one interfering member includes a projection from the hinge pin.
Application No: GB0722382.9  
Examiner: Mr Darren Williams  
Claims searched: 1-11  
Date of search: 11 March 2008  

**Patents Act 1977: Search Report under Section 17**

**Documents considered to be relevant:**

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**Field of Search:**

Search of GB, EP, WO & US patent documents classified in the following areas of the UKC:

Worldwide search of patent documents classified in the following areas of the IPC:

B65D

The following online and other databases have been used in the preparation of this search report:

EPODOC, WPI

**International Classification:**

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