

(19) World Intellectual Property Organization
International Bureau



(43) International Publication Date
15 November 2007 (15.11.2007)

PCT

(10) International Publication Number
WO 2007/129986 A1

(51) International Patent Classification:
B65D 19/12 (2006.01)

(21) International Application Number:
PCT/SG2006/000119

(22) International Filing Date: 8 May 2006 (08.05.2006)

(25) Filing Language: English

(26) Publication Language: English

(71) Applicant (for all designated States except US): **CADDEE PTE LTD** [SG/SG]; 24 Jurong Port Road, #03-00 Office Block, CWT Distripark (HQ), Singapore 619097 (SG).

(72) Inventor; and

(75) Inventor/Applicant (for US only): **CHEOK, Hwai, Teck** [MY/MY]; No. 303 Jalan TBK 2/1, Taman Bukit Keping 70200, Seremban, Negeri Sembilan (MY).

(74) Agent: **DREW & NAPIER LLC**; 20 Raffles Place, #17-00 Ocean Towers, Singapor 048620 (SG).

(81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM,

AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KM, KN, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, LY, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NG, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SM, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.

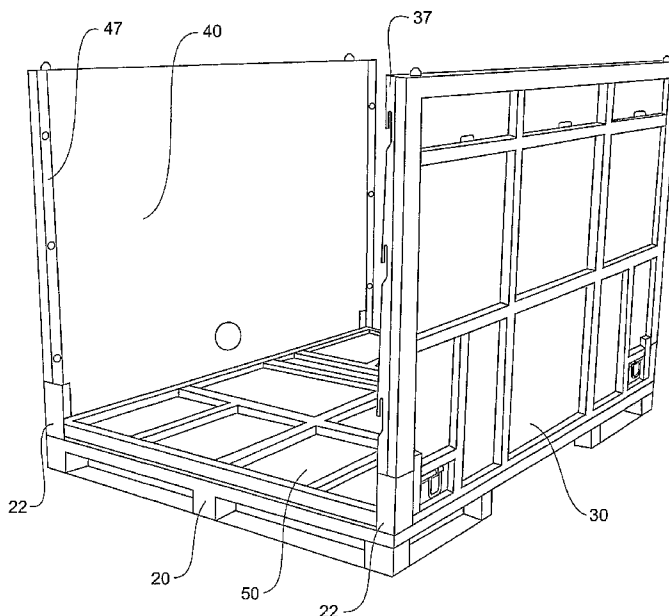
(84) Designated States (unless otherwise indicated, for every kind of regional protection available): ARIPO (BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IS, IT, LT, LU, LV, MC, NL, PL, PT, RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Published:

— with international search report

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

(54) Title: COLLAPSIBLE CONTAINER



(57) Abstract: The invention is a shipping container (10) which is foldable into a collapsed configuration, which takes up only a small volume. The container comprises upright sidewalls (30, 40, 50) that are pivotally attached to a base (20) via pillars (22) which extend upwardly from the base. The sidewalls are removable and are pivotable at various heights above the base (20). One sidewall is removable from container when it is in an erected configuration. This allows cargo to be withdrawn horizontally from the container (10).

WO 2007/129986 A1

COLLAPSIBLE CONTAINER

FIELD OF THE INVENTION

The present invention relates to containers for storing and transporting goods. In particular, the invention relates to collapsible or fold-up storage containers which may be transported to a storage site in a flat, folded configuration.

BACKGROUND TO THE INVENTION

Shipping containers are relatively bulky and so empty containers are expensive to transport. Accordingly, containers that are collapsible into a more compact configuration when empty are desirable.

Many examples of collapsible storage containers exist. An example of such a collapsible container can be found in US5289933. The storage container of US5289933 has side walls that are attached to a base unit and a cover unit using plug and socket connectors. The side walls are connected together by hinges and include a door, which can be used to access the container when it is in an assembled configuration. The side walls can be detached from the base and cover, folded into a flat configuration and placed between the base and the cover.

Another example of a collapsible container is described in US2003/0150769. The container of US2003/0150769 has side walls secured to a base unit using plug and socket type connectors. The side walls are connected to each other and to a cover using coaxial tubular members, which are joined together by a pin inserted within the tubular members.

A further example of a collapsible container can be found in US5722555. The container of US5722555 includes a side panel which can be pivoted out. The side panel is of a smaller height than the rest of the frame of the container.

While there are a number of collapsible shipping containers known in the art, it is an object of the present invention to provide a collapsible container that is modular for easy repair and maintenance, that is easy to assemble and disassemble, that allows for simple insertion and removal of goods from the container and that is suitable for both liquid, powder and solid cargo.

SUMMARY OF THE INVENTION

According to a first aspect of the invention, a collapsible container comprises:
a horizontal base member; and
a plurality of sidewalls;

- 2 -

wherein the base member includes a plurality of upwardly projecting pillars, and each sidewall is connected between two upwardly projecting pillars when the container is in an assembled configuration, and

wherein each pillar includes at least one slot formed in an upright wall of the pillar, and each sidewall includes two projections, the projections being received in the slots of the pillars between which the sidewall is connected when the container is in an erected configuration.

Preferably, the slots are elongate. Preferably, the slots extend in a substantially vertical direction.

Preferably, each projection is rotatably received in a slot.

Preferably, each slot includes an opening to the exterior of the respective pillar, so as to allow for insertion and removal of the projection from the slot via the opening in a direction non-parallel to an axis extending between the two projections. Preferably, the opening and the slot are dimensioned such that the projection can only be removed from the slot in certain orientations. Preferably, the projection can be removed from the slot only when the associated sidewall is substantially vertical. Preferably, the projections are elliptical in cross-section.

Preferably, each slot includes an elongate section that extends substantially vertically and a transverse section that includes the opening.

Preferably, each of the sidewalls is pivotable about the projections to a position overlying and substantially parallel to the base member.

The elongate section of the slots allows the projections to move vertically and so allows the pivot point to be at different heights above the base member. This means that the sidewalls can be folded over the base member and each other in several different orders.

Preferably, at least one sidewall is connected to a pillar by a bolt to retain the sidewall in a substantially vertical orientation. Preferably, the bolt is received in the same slot as a projection on the sidewall.

Preferably, each sidewall is connected to an adjacent sidewall. Preferably, each pillar has a lower height than the connected sidewalls.

Preferably, one of the sidewalls is connected to the base by a plug and socket type connection.

Preferably, the container further includes a cover, connected to each of the sidewalls when the container is in an erected configuration.

Preferably, in an erected configuration, the base member is connected to a first sidewall and a second sidewall, and the first sidewall is connected to the second sidewall,

wherein the first sidewall has at least one sidewall slot formed in a surface adjacent to the second sidewall, wherein when the container is in an erected configuration, the sidewall slot has an upright portion extending substantially vertically and a transverse section opening onto an edge of the first sidewall,

wherein the second sidewall has a projection adapted to fit into the sidewall slot to retain the second sidewall relative to the first sidewall, and

wherein the projection is able to pass through the transverse section to allow the first sidewall to move relative to the second sidewall and thereby expose the interior of the container.

Preferably, the sidewall slot is formed on an angle bar extending substantially perpendicular to the largest face of the first sidewall. Preferably, the sidewall slot is substantially L-shaped.

Preferably, the second sidewall is retained relative to the second sidewall by a bolt.

Preferably, the first sidewall is connected to the base member by a plug and socket type connection.

According to a second aspect of the present invention, a collapsible container comprises:

a horizontal base member; and

a plurality of sidewalls;

wherein the base member includes a plurality of upwardly projecting pillars and each sidewall is connected between two upwardly projecting pillars when the container is in an assembled configuration,

wherein each pillar includes at least one projection formed in an upright wall of the pillar and each sidewall includes two slots, the slots receiving the projections of the pillars between which the sidewall is connected when the container is in an erected configuration.

According to a third aspect of the present invention, a collapsible container comprises:

a horizontal base member;

a first sidewall; and

a second sidewall,

wherein, in an erected configuration, the base member is connected to the first sidewall and the second sidewall, and the first sidewall is connected to the second sidewall,

wherein the first sidewall has at least one slot formed in a surface adjacent to the second sidewall, wherein when the container is in an erected configuration, the slot has an upright

- 4 -

portion extending substantially vertically and a transverse section opening onto an edge of the first sidewall,

wherein the second sidewall has a projection adapted to fit into the slot to retain the second sidewall relative to the first sidewall, and

wherein the projection is able to pass through the transverse section to allow the first sidewall to move relative to the second sidewall and thereby expose the interior of the container.

Preferably, the slot is formed on an angle bar extending substantially perpendicular to the largest face of the first sidewall. Preferably, the slot is substantially L-shaped.

Preferably, the second sidewall is retained relative to the second sidewall by a bolt.

Preferably, the first sidewall is connected to the base member by a plug and socket type connection.

According to a fourth aspect of the invention, a collapsible container comprises:

a horizontal base member;

a first sidewall; and

a second sidewall,

wherein, in an erected configuration, the base member is connected to the first sidewall and the second sidewall, and the first sidewall is connected to the second sidewall,

wherein the first sidewall has at least one projection extending parallel to the largest surface of the first sidewall

wherein the second sidewall has a slot formed in a surface adjacent to the projection on the first sidewall, wherein when the container is in an erected configuration, the slot has an upright portion extending substantially vertically and a transverse section opening onto an edge of the second sidewall, wherein the projection is adapted to fit into the slot to retain the second sidewall relative to the first sidewall, and

wherein the projection is able to pass through the transverse section to allow the first sidewall to move relative to the second sidewall and thereby expose the interior of the container.

BRIEF DESCRIPTION OF THE DRAWINGS

Examples of the present invention will now be described in detail with reference to the accompanying drawings, in which:

Figure 1 shows a perspective view of a container in accordance with the invention in an assembled configuration;

Figure 2a is a plan view of a base unit of the present invention;

Figures 2b, 2c, and 2d are side views of the base unit shown in Figure 2a;

Figure 3a is a plan view of a first side wall for use with the base of Figure 2;

Figure 3b is a side view of the side wall of Figure 3a;

Figure 3c is a top view of this side wall of Figure 3a;

Figure 4a is a front view of a second side wall for use with the base of Figure 2;

Figure 4b is a side view of the side wall of Figure 4a;

Figure 5a is a front view of a third side wall for use with the base of Figure 2;

Figure 5b is a side view of the side wall of Figure 5a;

Figure 6a is a plan view of a cover for use with the base unit and side walls shown in Figures 2-5;

Figure 6b is a side view of the cover of Figure 6a;

Figure 7 is a perspective view of the container in a partially assembled configuration;

Figure 8 is a perspective view of the container of Figure 1 in a collapsed configuration, without a cover;

Figures 9a-9d are side views of an upwardly projecting pillar under base unit shown in Figure 2;

Figure 10a and Figure 10b are side views of an angle bar attached to the side walls shown in Figures 3-5; and,

Figure 11 shows side views of a second angle bar attached to the side or shown in Figures 3-5.

DETAILED DESCRIPTION

Figure 1 shows a perspective view of an assembled container 10 in accordance with one example of the present invention. The container is of a cuboidal shape, having a rectangular base 20, four upright sidewalls 30, 40, 50 and a rectangular cover 60. The container has a long side and a short side.

Each of the component parts of the container shown in Figure 1 will now be described in more detail.

Figure 2a shows a plan view of a base for use as part of the container shown in Figure 1. The base 20 is formed of a frame 21 of mild galvanised steel. At each corner of the base 20

there is an upstanding pillar 22 and along one of the long edges (hereinafter referred to as the front edge) there are a series of holes 23 for receiving corresponding projections on a sidewall.

Figure 2b shows a front view of the base shown in Figure 2a. In Figure 2b the pillars 22 can be clearly seen.

Figure 2c shows a view of the back of the base of Figure 2a. Between the two pillars 22 extends an angle bar 24 which is used to strengthen and retain the attached back sidewall. The underside of the base 20 is constructed as a pallet suitable for use with a forklift truck.

Figure 2d shows a view from the side of the base 20 of Figure 2a. Again the upstanding pillars 22 can clearly be seen. These pillars 22 will be described in more detail with reference to Figures 9a-9d. However, it can be seen from a comparison of Figures 2a and 2b that the opening slot is formed higher up in the pillars at the back edge of the base than in the pillars at the front edge of the base. This is related to the ability to remove the side wall attached to the front of the base.

In use, the base 20 can be covered with a sheet of metal to form a solid and continuous floor to the container. This sheet does not cover the holes 23 along the front edge of the base.

Figure 3 shows a front sidewall 30 which attaches to the front edge of the base shown in Figure 2. As can be seen in Figure 3a, which is the front view of the front sidewall, a series of projections 33 are formed on the bottom surface of the sidewall 30, which fit into the corresponding holes 23 on the front edge of the base plate 20. The front sidewall also connects to the pillars 22 at the corners of the base plate 20. It can be seen in Figure 3a that the front sidewall 30 includes a cut-away portion 32 corresponding to the pillars 22. Projecting pins 34 fit into slots in the pillars 22. The slots allow the sidewall to pivot about the pins 34. The sidewall 30 accordingly folds in and lies flat above the base unit 20 in a folded configuration. A further bolt 35 is used to fasten the sidewall to the pillar 22 when in an upright position. The bolts 35 are moveable from a locked position to an open position by hand using the U-shaped handles 36. The bolts fit into the top of the slots formed in the pillars 22.

As can be seen in Figure 2, the pillars 22 each include a projection 26 on their top. This projection 26 fits into a corresponding hole in the front and back sidewalls. It also fits into a corresponding hole in the cover when the container is in a collapsed configuration.

The front sidewall 30 is formed from a frame 31 of mild galvanised steel. Sheet steel 36 is placed on the inside of the frame 31 to form a continuous interior wall.

Figure 3b shows a side view of the front sidewall shown in Figure 3a. Figure 3b shows an angle bar 37 attached to the edge of the sidewall, the angle bar including L-shaped slots for

receiving corresponding pins on the shorter sidewalls shown in Figure 5. This arrangement will be described in more detail with reference to Figure 10.

Figure 3c shows a top view of the sidewall of Figure 3a. A pair of projections 39 at each end of the top of the sidewall is provided for fitting into corresponding holes in the cover units. Angle bars 37 can also be seen.

Figure 4a is a front view of the back sidewall 40 that is placed at the back edge of the base unit. The back side wall 40 has similar configuration to the front sidewall 30. However, the back sidewall 40 does not have any projections formed on its lower surface. It is instead retained by the angle bar 24 shown in Figure 2b. The back sidewall is formed from a frame 41 of mild galvanised steel and the interior surface is formed from a sheet of steel 42. The back sidewall also includes an aperture 43 in a central lower section. This aperture 43 is used for filling and emptying the container with liquid. The back sidewall 40 includes the same pin and bolt arrangement as the front side wall 30 for attaching to pillars 22.

Figure 4b shows a side view of the back sidewall of Figure 4a. The back side wall does include an angle bar as shown in Figure 3b, but the angle bar 47 of the back sidewall does not include L-shape slots but round holes. These holes receive pins on the short sidewalls shown in Figure 5.

Figure 5a shows a front view of the short sidewalls 50 that are used to connect to the base 20. Both short sidewalls are identical and are formed from a frame 51 of mild galvanised steel with a sheet steel lining 52. The side wall shown in Figure 5a includes a pair of pins 53 at the bottom of the side edges. These pins 53 locate into corresponding slots in the upright pillars 22 on the base 20. It can also be seen that along the side edges there is a series of projections 55 which correspond to the L-shape slots 38 and holes 48 in the angle plates of the front and back side walls shown in Figures 3a and 4b.

The short side wall shown in Figure 5a also includes a pair of bolts 56 which can be moved from a closed position to an open position by hand using the U-shaped handle 57. The bolts 56 fit into corresponding holes on the adjacent front and back side walls 30, 40.

Figure 5b is a side view of the short side wall shown in Figure 5a. The series of projections 55 can be more clearly seen.

Figure 6a is a plan view of the cover 60 of the container shown in Figure 1. The cover 60 is formed of sheet steel and includes a pair of handles 61 to allow the cover to be lifted off. The cover includes holes 63 at each corner for receiving corresponding lugs 39, 49 on the top of each of the front and back side walls 30, 40. Figure 6b is a side view of the cover 60.

Figure 7 is a perspective view of the container shown in Figure 1 in a partially erected configuration. The front and back sidewalls 30, 40 are in an upright configuration, secured to the base 20 and pillars 22. The short sidewalls 50 are folded down over the base. The cover 60 is removed and not shown. Angle bars 37, 47 can be seen to extend parallel to the short sidewall 50.

Figure 8 shows the container in a folded configuration. When folding the container from an erected configuration to the folded configuration, the short side walls 50 are first folded down followed by one or other of the front and back side walls 30, 40, followed by the other of the front and back side walls 30, 40. The cover 60 is then placed on top. The method of assembly and disassembly is described in more detail below. In the example shown in Figure 8, the front sidewall 30 lies on top of the back sidewall 40. The back sidewall 40 lies on top of the short sidewalls 50 and the base 20. The cover 60 is not shown but can be placed on top of the front sidewall 30 and over the pillars 22.

Figure 9 shows one of the upright pillars 22 on the front corner of the base 20 in more detail. Figure 9a shows a first side view. Figure 9b shows a front view. Figure 9c shows a second side view and Figure 9d shows a rear view.

Figures 9a and 9d show the slot 90 into which pins on a short sidewall 50 locate. A pin 53 is inserted in a horizontal direction through opening 91. The sidewall 50 then drops as the pin 53 locates in the bottom of the elongate section 92 of the slot 90. The pin 53 is free to rotate within the elongate section of the slot 92 and, as the pin is rigidly connected to the sidewall, the sidewall 50 is free to pivot from a vertical position to a horizontal position.

The short sidewall 50 can be removed by lifting the sidewall until the pin 53 is level with the opening 91 and then withdrawing the pin horizontally through the opening 91. The vertical dimension of the opening 91 is less than the horizontal dimension of the elongate section 92. The pins 53 are shaped so that they are only able to pass through the opening 91 when the sidewall 50 is in a substantially vertical orientation. In the preferred form, the pins 53 are elliptical in cross-section. The long axis of the ellipse is marginally shorter than the horizontal width of the elongate section 92 but longer than the vertical dimension of the opening 91. The short axis of the ellipse is marginally shorter than the vertical dimension of the opening 91. This ensures that the pin 53 will only pass through the opening 91 when the short axis of the ellipse is substantially vertical. The pins 53 are connected to the sidewall 50 such that the short axis of the pin 53 is vertical when the sidewall is vertical.

Figures 9b and 9c show the elongate slot 94 into which pins 34 attached to the front sidewall 30 locate. The aperture 93 and the pins on the front sidewall 30 are dimensioned such that the pins 34 can only be removed when the front sidewall 30 is in a substantially vertical orientation, in the same manner as described above. The same arrangement is used for the back sidewall 40. The position of the opening 93 is lower than that of opening 91. This means that the front sidewall needs to be lifted a shorter distance in order to be removed. The distance corresponds with the dimensions of L-shaped slots 38 on the angle bars 37 on the front sidewall. This is described in more detail below.

The elongate section of the slot 94 extends vertically beyond the opening 93. This not only allows the front sidewall to lie horizontally over the base at various heights, it also provides a space into which bolt 35 can locate. The location of bolt 35 in slot 94 keeps the front sidewall in a vertical orientation. A similar arrangement is used for the back sidewall 40.

The front sidewall 30 may be removed from the container 10 when it is in an erected configuration to allow access to the interior of the container.

As has already been described, the front and back sidewalls each have angle bars 37, 47 connected along their side edges. Figure 10 shows an angle bar 37 attached to the front side wall 30. The angle bars are L-shaped in cross-section as can be seen from Figure 3c. The face 101 containing the slots 38 shown in Figure 10a is perpendicular to the front wall (parallel to the adjacent to the short side wall 50 when the container is in an erected configuration. This is shown in Figure 7. The face 102 shown in Figure 10b is parallel to the front side wall and includes a hole 103 for receiving a bolt 56 from the adjacent short side wall. The slots 38 receive projections 55 from the adjacent short side wall 50.

Figure 11 shows an angle bar that is attached to the back sidewall. The angle bar 47 is again L-shaped in cross section. Figure 11 shows the face 111 that is perpendicular to the back sidewall and parallel to an adjacent short sidewall 50. Face 111 includes holes 48 for receiving projections 55 on the adjacent sidewalls 50. Face 112 is parallel to the back sidewall 40 and includes a hole 114 for receiving a bolt 56 from the adjacent sidewall 50.

The method of assembly of the container described with a reference to Figures 1 to 11 will now be described. The assembly starts with a base unit 20. Short sidewalls 50 are then attached. The pins 53 on the short sidewall 50 are inserted into the slots 90 on the pillars 22. The short sidewalls 50 are in a vertical configuration when inserted. They are then pivoted down over the base unit. The front sidewall 30 and the back sidewall 40 are then attached to the base 20. These sidewalls are attached by inserting pins 34 into the slots 94 in the

appropriate pillars, with the sidewall in a vertical orientation. The front side wall is lowered until the top of the pillars 22 engage with corresponding seats on the sidewall and the projections 33 on the base of the front sidewall engage with the corresponding holes in the base 20. Similarly, the back sidewall 40 is lowered into position, so that the top of the pillars 22 engage with the corresponding seats in the sidewall 40. Bolts 35 can then be slid into a locked position to retain the front and back sidewalls in a vertical orientation. The position of the back sidewall is further strengthened by the angle bar 24 running along the back edge of the base 20. At this point, the container is in the configuration shown in Figure 7.

The short sidewalls 50 are then pivoted up into a vertical position in which the projections 55 engage with the corresponding slots or holes 38, 48 in the angle bars of the front and back sidewalls. Bolts 56 can then be slid into the locked position to retain the short sidewalls relative to the front and back sidewalls in a vertical orientation.

Finally, the cover 60 is placed on the top of the four sidewalls.

It is possible to assemble the container in a different order, with the front and back sidewalls being attached prior to the insertion of the short sidewalls.

The assembled container can be folded down into a collapsed configuration in the following manner. First the cover 60 is removed. The short sidewalls are then unbolted using bolts 56 from the adjacent front and back sidewalls 30, 40 and pivoted about pins 53 until they lie flat on top of the base 20. Either of the short sidewalls 50 can be pivoted on to the base first to lie in contact with the base 20. The elongate nature of the slots in the pillars 22 allows the pins 53 and 34 to be located at different heights above the base.

The front and back sidewalls 30, 40 are then unbolted from pillars 22 using bolts 35. Again, either the front or the back sidewall can be pivoted down first. The front sidewall 30 has to be lifted slightly, to free the projections 33 on its bottom edge from the base 20 prior to pivoting.

Finally, the cover 60 is placed on a top of the sidewalls, engaging with the top of the pillars 22.

The container is erected from a folded condition by reversing the steps described above for folding the container.

The front sidewall of the container 10 can be removed while the rest of the container remains in an erected configuration. In order to remove the front sidewall 30, the bolts 56 attaching the adjacent short sidewalls 50 to the front sidewall 30 are unlocked. The cover 60 is also removed. The front sidewall 30 is then lifted so that the projections 33 on its bottom edge

are clear of the base unit 20, the pins 34 align with the opening 84 in the upright pillars and the projections 55 line up with the opening in the L-shaped slots 38. In this position, the front sidewall 30 can be withdrawn horizontally from the container. The cover 60 can be replaced with the front sidewall removed if desired.

The ability to remove the front sidewall 30 gives a large access area to the interior of the container. The lack of an angle bar on the front edge of the base allows the contents of the container to be withdrawn and inserted horizontally without any interference.

The front sidewall can be replaced into the assembled container by reversing the steps taken for its removal.

The container described is suitable for liquid cargo as well as solid cargo. In order to house liquid cargo, a liquid impermeable liner is used. The liner fits inside the container and has an opening in a position corresponding with opening 43 on the back sidewall. The opening 43 may be closed by a plate that is received in rails 44 adjacent the opening.

It should be appreciated that the container described is just one example of a container in accordance with the present invention. For example, it is possible where there are plug and socket type connections in which pins (or projections) engage holes (or slots) that the pins and holes be reversed. For example, it is possible for the upright pillars 22 to have a series of projections formed on their surfaces and the sidewalls to have slots formed in their sides for receiving the projections. Equally, it is possible that projections 33 and holes 23 be switched so that projections are formed on the base 20 and holes are formed on the bottom surface on the front sidewall 30.

Also, it should be appreciated that although the container is described as a generally cuboid shaped, which meets with international standards, it is perfectly possible to construct a container in accordance with the present invention that is of a different aspect ratio or of an entirely different shape.

A container according to the present invention is easy to maintain. Each of the base sidewalls and cover are detachable and replaceable if they are damaged. Sidewalls can be folded down over the base in a number of different orders. The interior of the container can be accessed via a large area by removal of the front sidewall 30. The container is light weight, takes up a low volume in a folded configuration. The container has no loose parts when in a folded configuration, which might be misplaced. Furthermore, cargo can be loaded and unloaded into the container from either the front or from the side without any interference from angle bars on the base.

CLAIMS:

1. A collapsible container comprising:
a horizontal base member; and
a plurality of sidewalls;
wherein the base member includes a plurality of upwardly projecting pillars, and each sidewall is connected between two upwardly projecting pillars when the container is in an assembled configuration, and
wherein each pillar includes at least one slot formed in an upright wall of the pillar, and each sidewall includes two projections, the projections being received in the slots of the pillars between which the sidewall is connected when the container is in an erected configuration.
2. A collapsible container according to claim 1, wherein the slots are elongate.
3. A collapsible container according to claim 2, wherein the slots extend in a substantially vertical direction.
4. A collapsible container according to any one of the preceding claims, wherein each projection is rotatably received in a slot.
5. A collapsible container according to any one of the preceding claims, wherein each slot includes an opening to the exterior of the respective pillar, so as to allow for insertion and removal of the projection from the slot via the opening in a direction non-parallel to an axis extending between the two projections.
6. A collapsible container according to any one of the preceding claims, the opening and the slot are dimensioned such that the projection can only be removed from the slot in certain orientations.
7. A collapsible container according to claim 6, wherein the projection can be removed from the slot only when the associated sidewall is substantially vertical.
8. A collapsible container according to claim 7, wherein the projections are elliptical in cross-section.

9. A collapsible container according to any one of the preceding claims, wherein each slot includes an elongate section that extends substantially vertically and a transverse section that includes the opening.
10. A collapsible container according to any one of the preceding claims, wherein each of the sidewalls is pivotable about the projections to a position overlying and substantially parallel to the base member.
11. A collapsible container according to any one of the preceding claims, wherein at least one sidewall is connected to a pillar by a bolt to retain the sidewall in a substantially vertical orientation.
12. A collapsible container according to claim 11, wherein the bolt is received in the same slot as a projection on the sidewall.
13. A collapsible container according to any one of the preceding claims, wherein each sidewall is connected to an adjacent sidewall.
14. A collapsible container according to claim 13, wherein each pillar has a lower height than the connected sidewalls.
15. A collapsible container according to any one of the preceding claims, wherein one of the sidewalls is connected to the base by a plug and socket type connection.
16. A collapsible container according to any one of the preceding claims, further including a cover, the cover connected to each of the sidewalls when the container is in an erected configuration.
17. A collapsible container according to any one of the preceding claims, wherein, in an erected configuration, the base member is connected to a first sidewall and a second sidewall, and the first sidewall is connected to the second sidewall,

wherein the first sidewall has at least one sidewall slot formed in a surface adjacent to the second sidewall, wherein when the container is in an erected configuration, the sidewall slot has an upright portion extending substantially vertically and a transverse section opening onto an edge of the first sidewall,

wherein the second sidewall has a projection adapted to fit into the sidewall slot to retain the second sidewall relative to the first sidewall, and

wherein the projection is able to pass through the transverse section to allow the first sidewall to move relative to the second sidewall and thereby expose the interior of the container.

18. A collapsible container according to claim 17, wherein the sidewall slot is formed on an angle bar extending substantially perpendicular to the largest face of the first sidewall.

19. A collapsible container according to claim 17 or 18, wherein the sidewall slot is substantially L-shaped.

20. A collapsible container according to claim 17, 18 or 19, wherein the second sidewall is retained relative to the second sidewall by a bolt.

21. A collapsible container according to any one of claims 17 to 20, wherein the first sidewall is connected to the base member by a plug and socket type connection.

22. A collapsible container comprising:

a horizontal base member; and

a plurality of sidewalls;

wherein the base member includes a plurality of upwardly projecting pillars and each sidewall is connected between two upwardly projecting pillars when the container is in an assembled configuration,

wherein each pillar includes at least one projection formed in an upright wall of the pillar and each sidewall includes two slots, the slots receiving the projections of the pillars between which the sidewall is connected when the container is in an erected configuration.

23. A collapsible container comprising:

- 15 -

a horizontal base member;

a first sidewall; and

a second sidewall,

wherein, in an erected configuration, the base member is connected to the first sidewall and the second sidewall, and the first sidewall is connected to the second sidewall,

wherein the first sidewall has at least one slot formed in a surface adjacent to the second sidewall, wherein when the container is in an erected configuration, the slot has an upright portion extending substantially vertically and a transverse section opening onto an edge of the first sidewall,

wherein the second sidewall has a projection adapted to fit into the slot to retain the second sidewall relative to the first sidewall, and

wherein the projection is able to pass through the transverse section to allow the first sidewall to move relative to the second sidewall and thereby expose the interior of the container.

24. A collapsible container according to claim 23, wherein the slot is formed on an angle bar extending substantially perpendicular to the largest face of the first sidewall.

25. A collapsible container according to claim 23 or 24, wherein the slot is substantially L-shaped.

26. A collapsible container according to any one of claims 23 to 25, wherein the second sidewall is retained relative to the second sidewall by a bolt.

27. A collapsible container according to any one of claims 23 to 26, wherein the first sidewall is connected to the base member by a plug and socket type connection.

28. A collapsible container comprising:

a horizontal base member;

a first sidewall; and

a second sidewall,

wherein, in an erected configuration, the base member is connected to the first sidewall and the second sidewall, and the first sidewall is connected to the second sidewall,

1/13

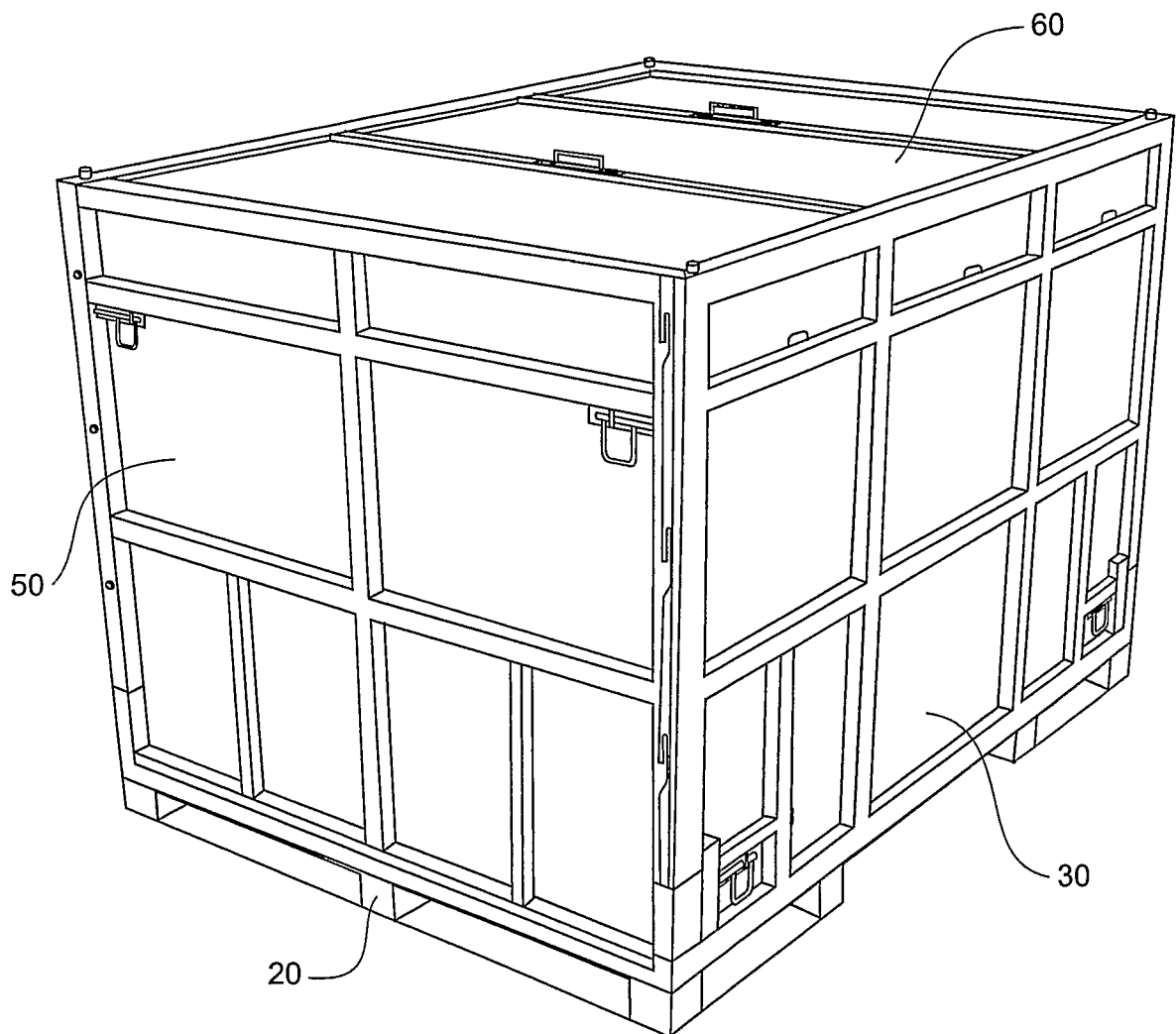


FIGURE 1

2/13

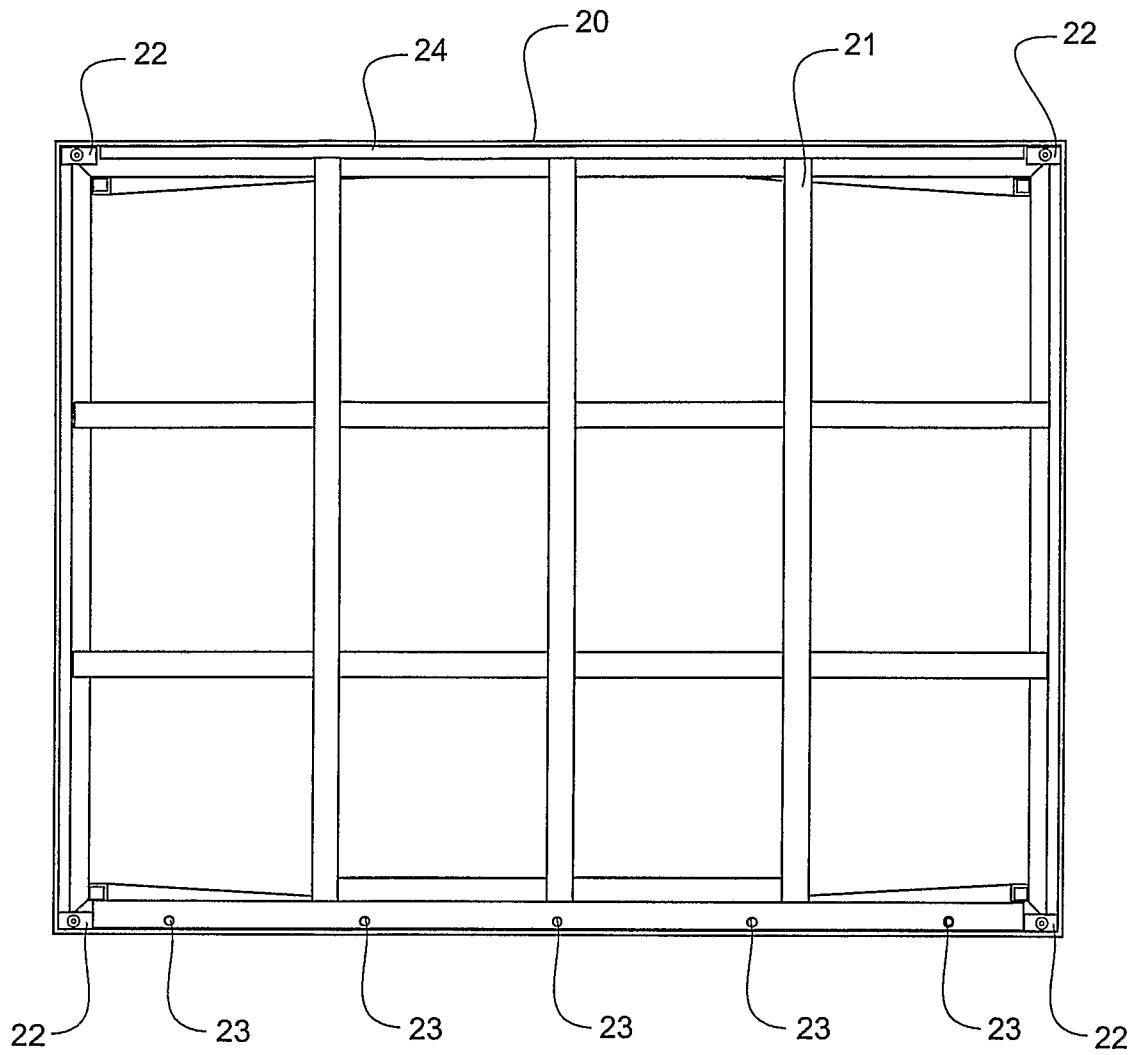


FIGURE 2a

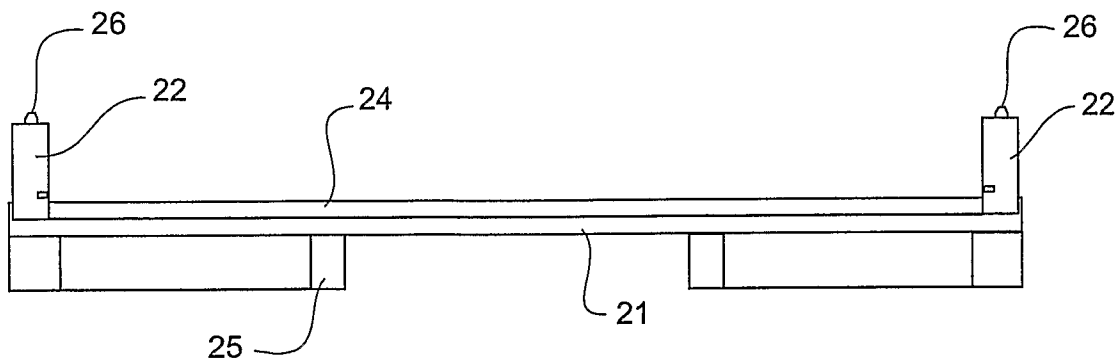


FIGURE 2b

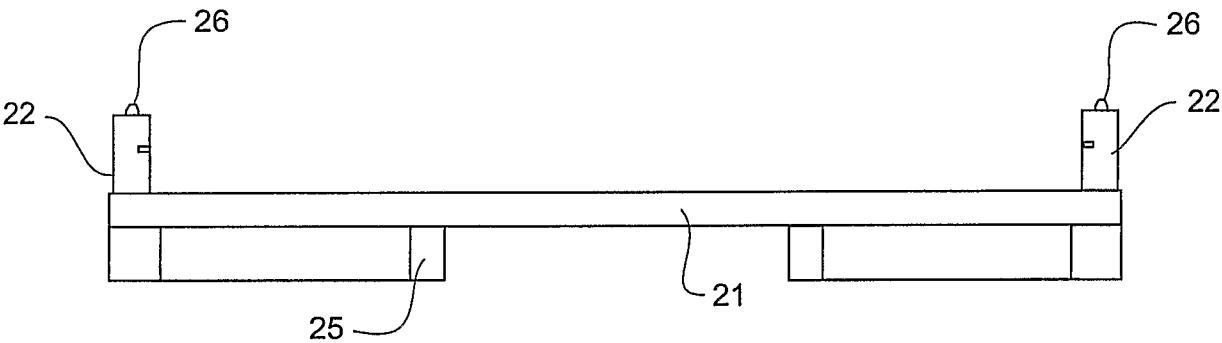


FIGURE 2c

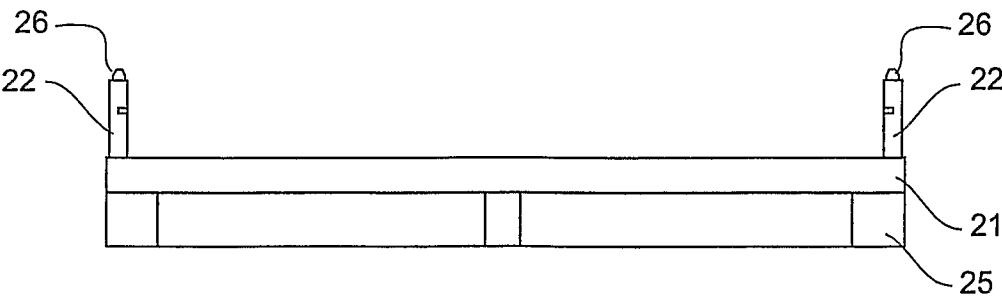


FIGURE 2d

4/13

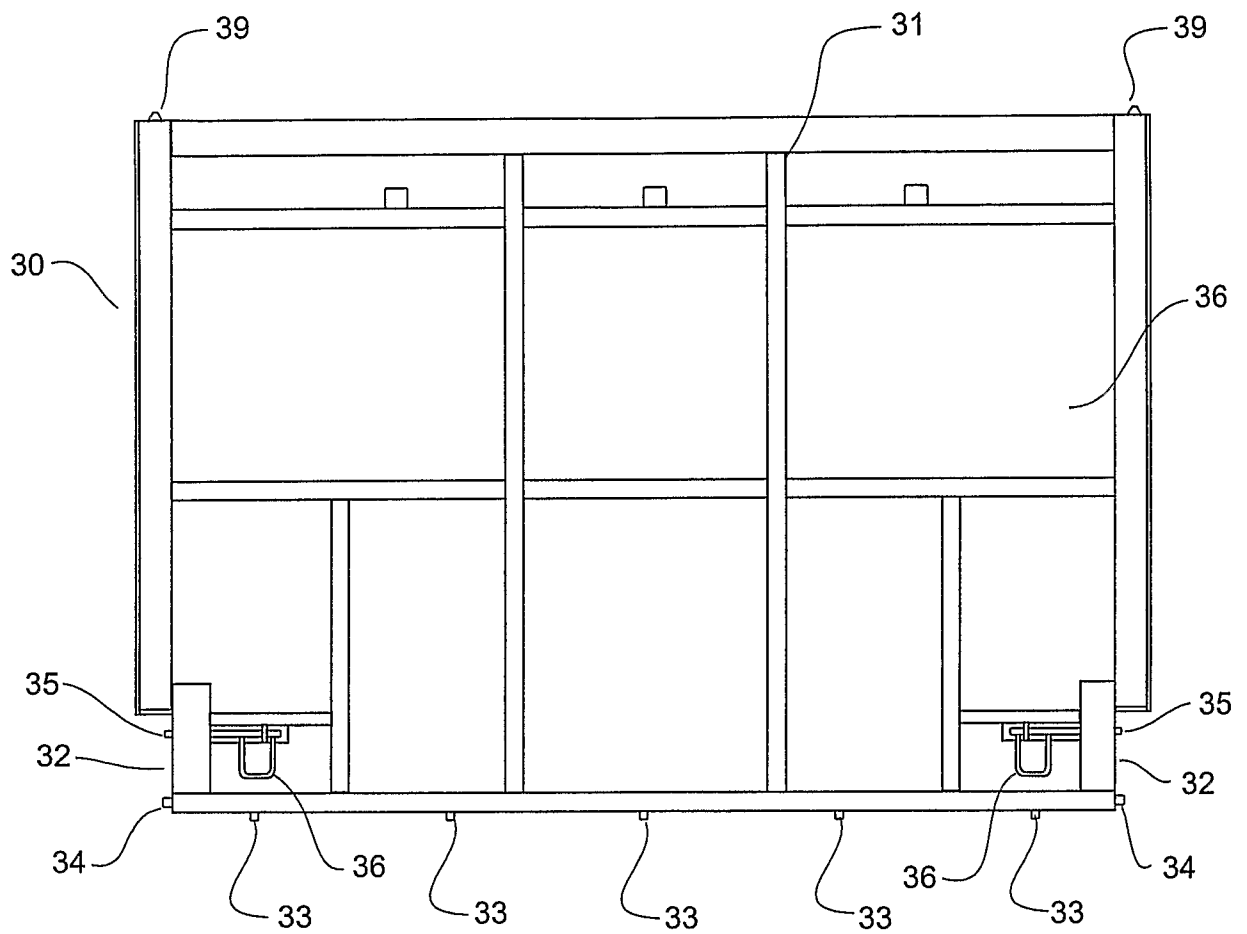


FIGURE 3a

5/13

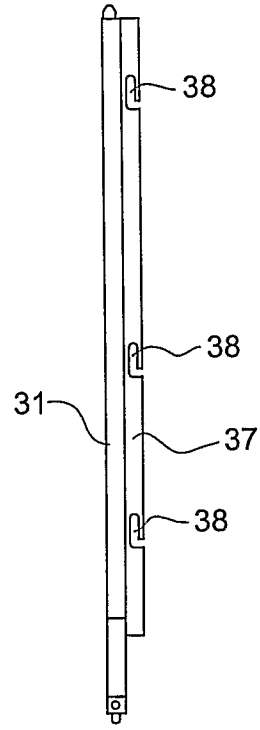


FIGURE 3b

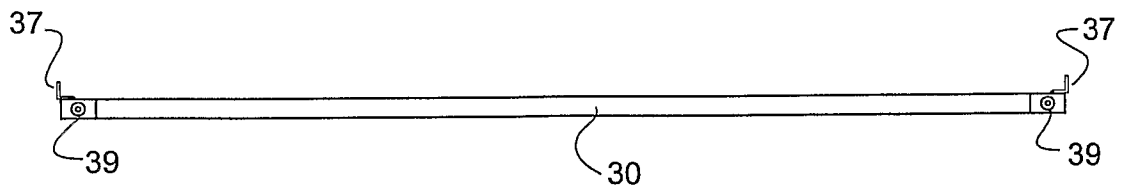


FIGURE 3c

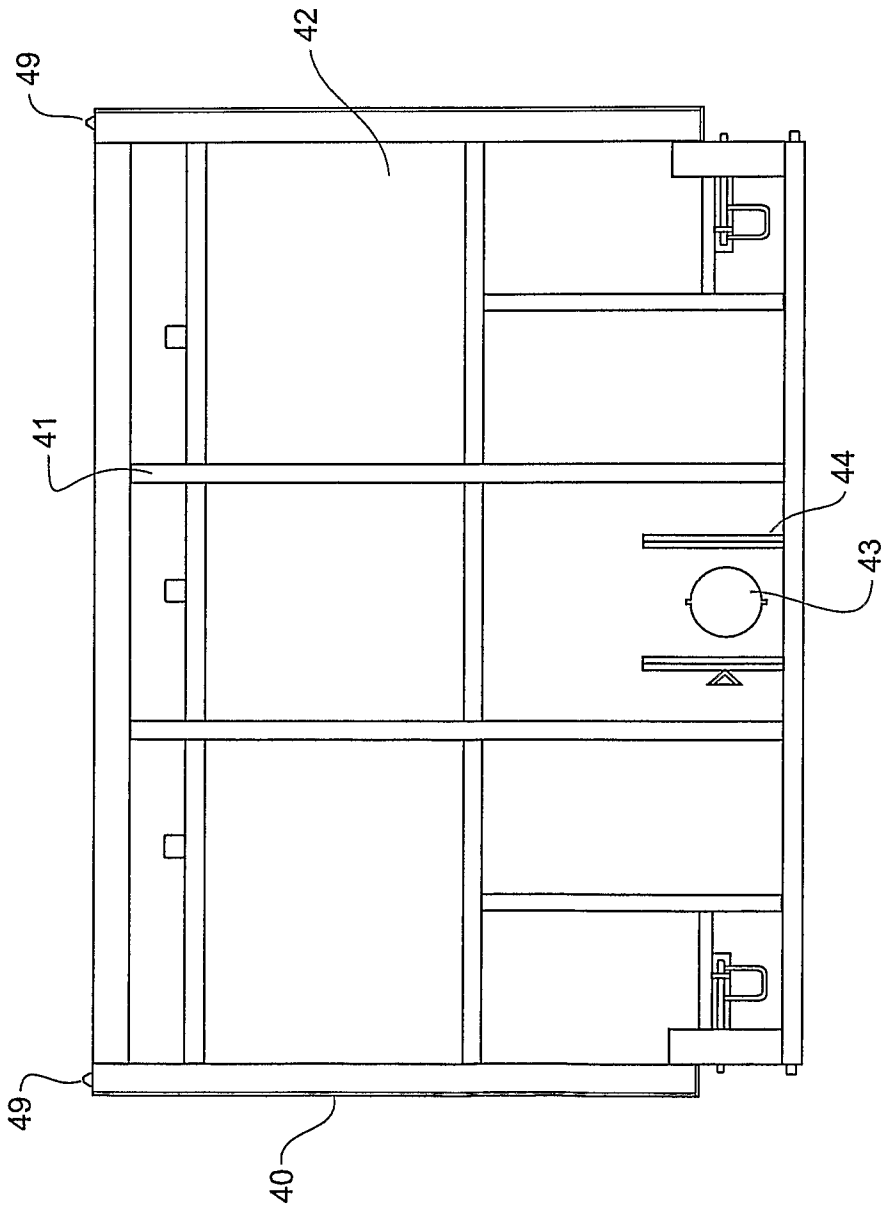


FIGURE 4a

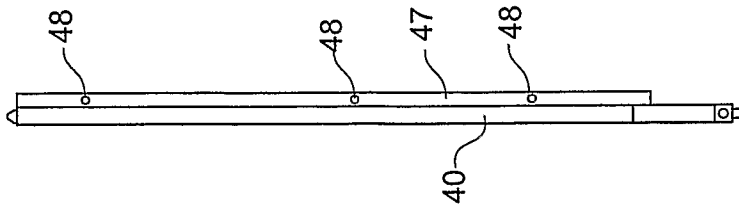


FIGURE 4b

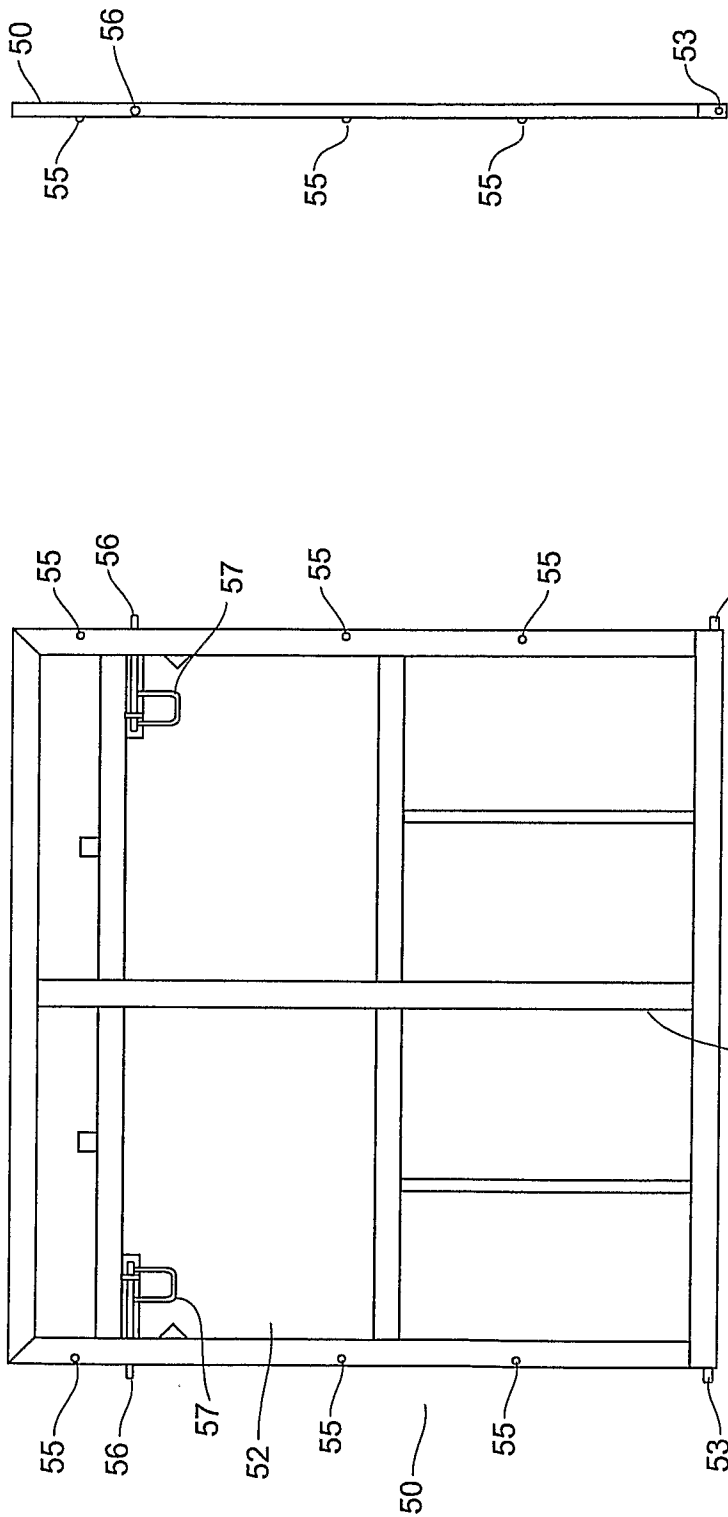


FIGURE 5b

FIGURE 5a

8/13

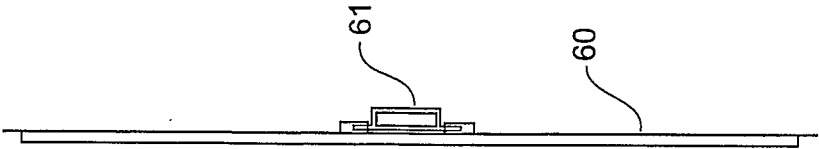


FIGURE 6b

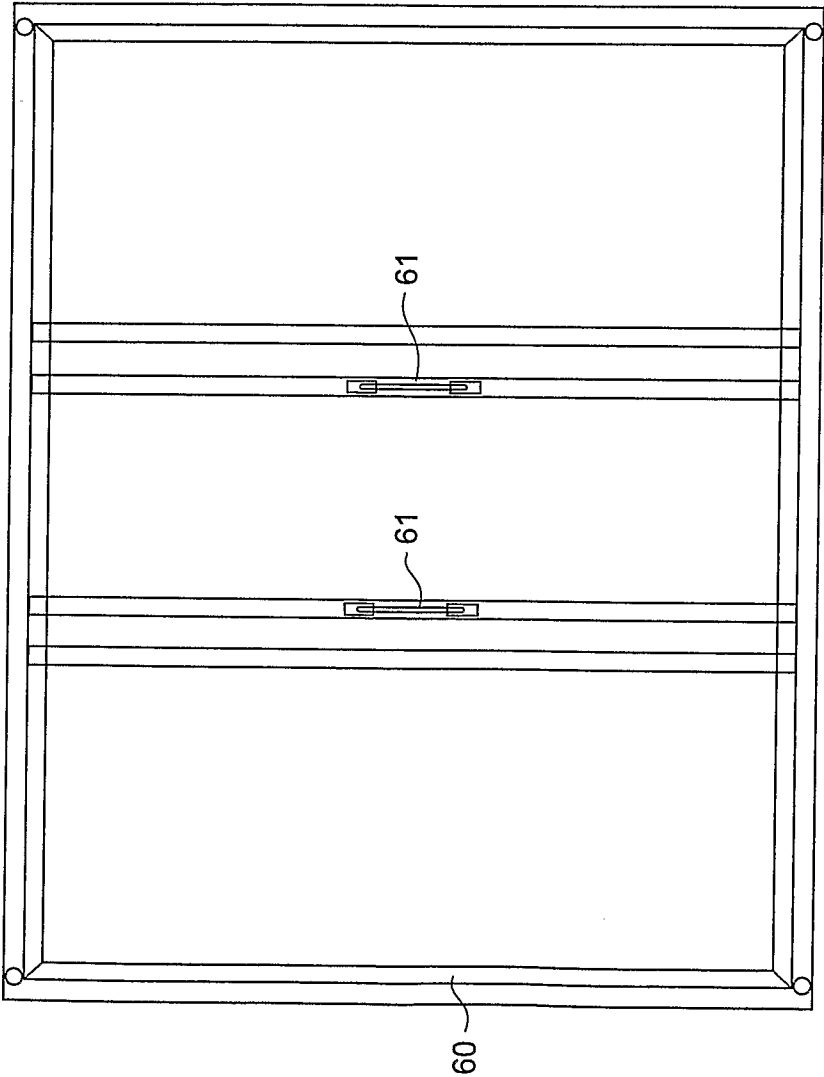


FIGURE 6a

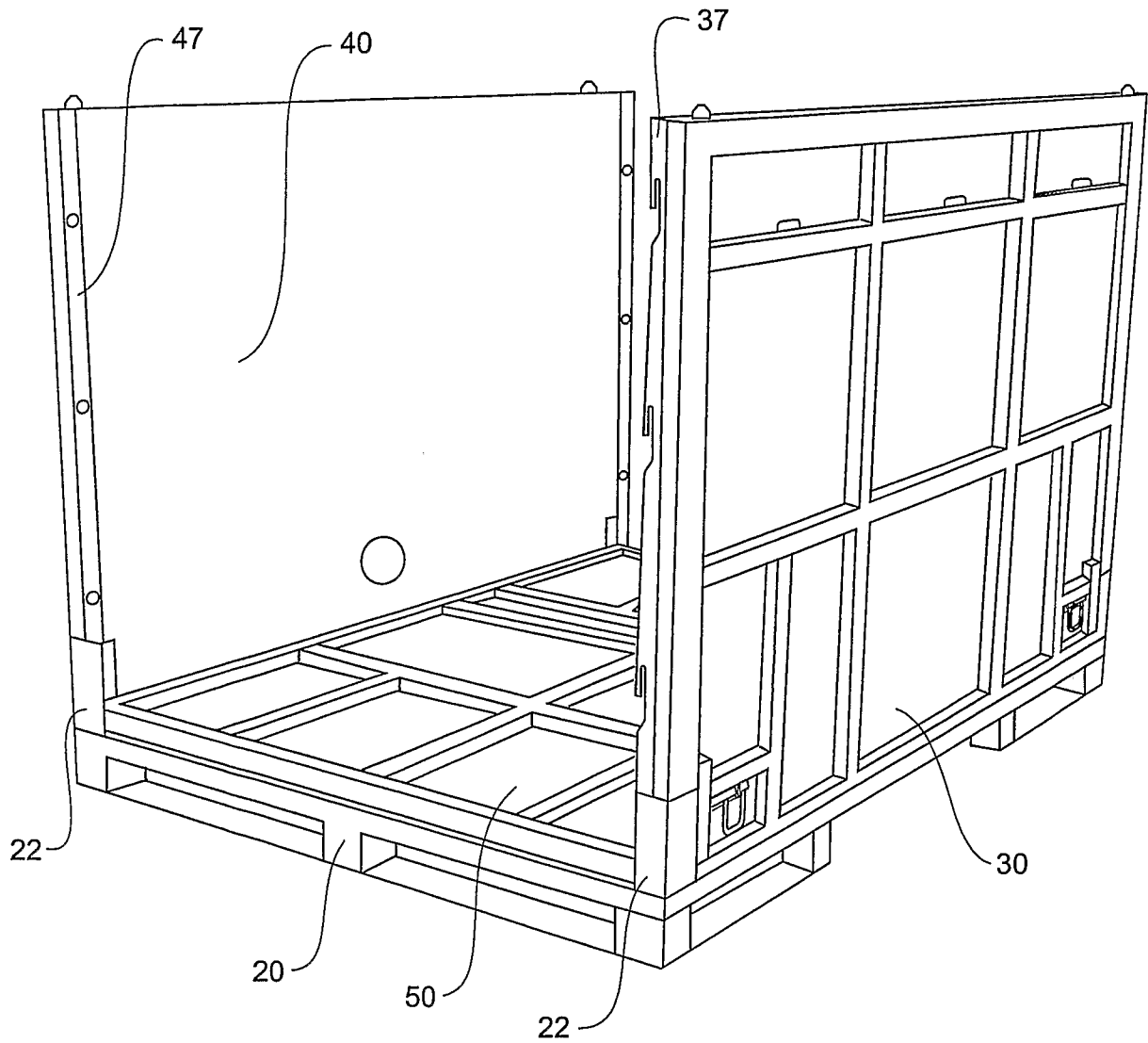


FIGURE 7

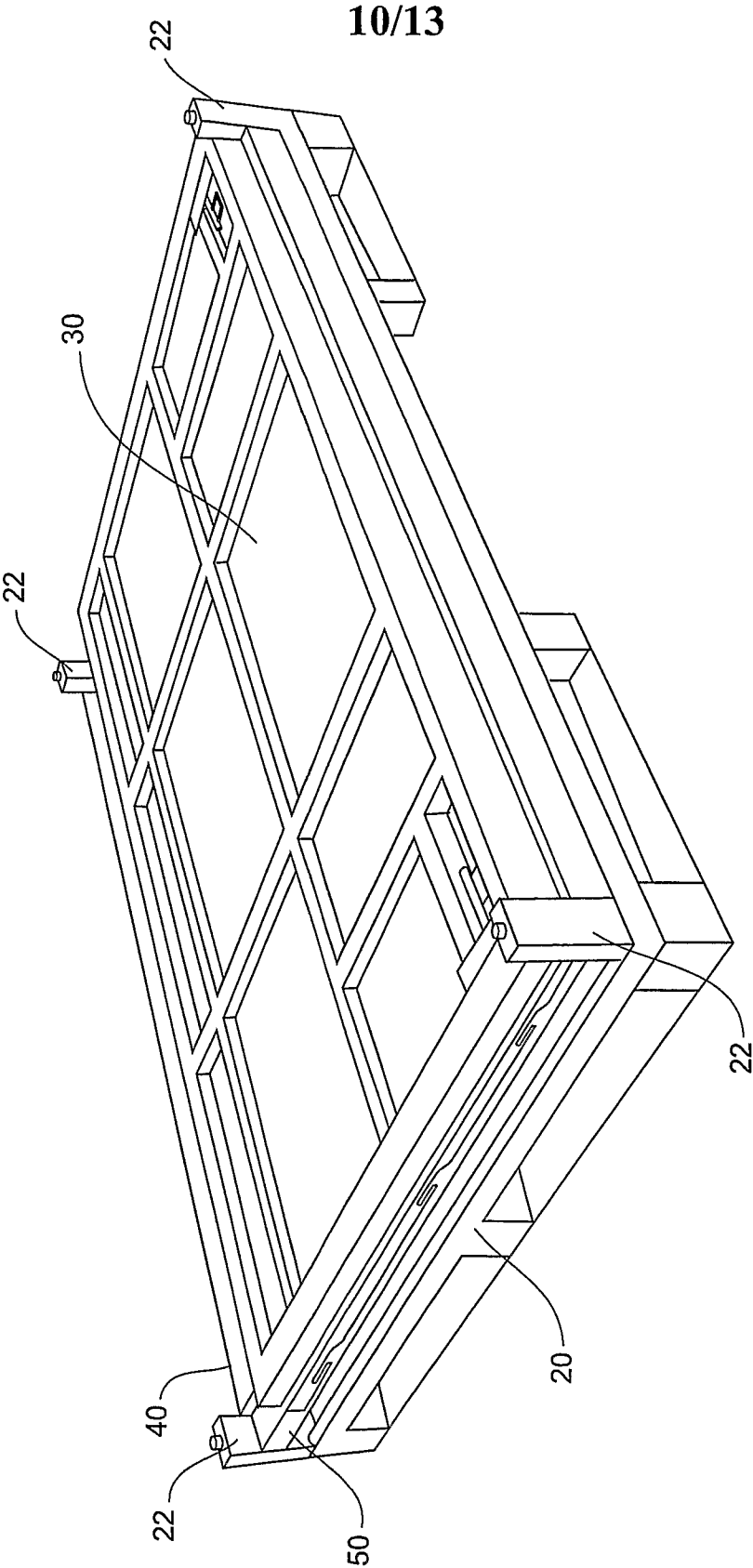


FIGURE 8

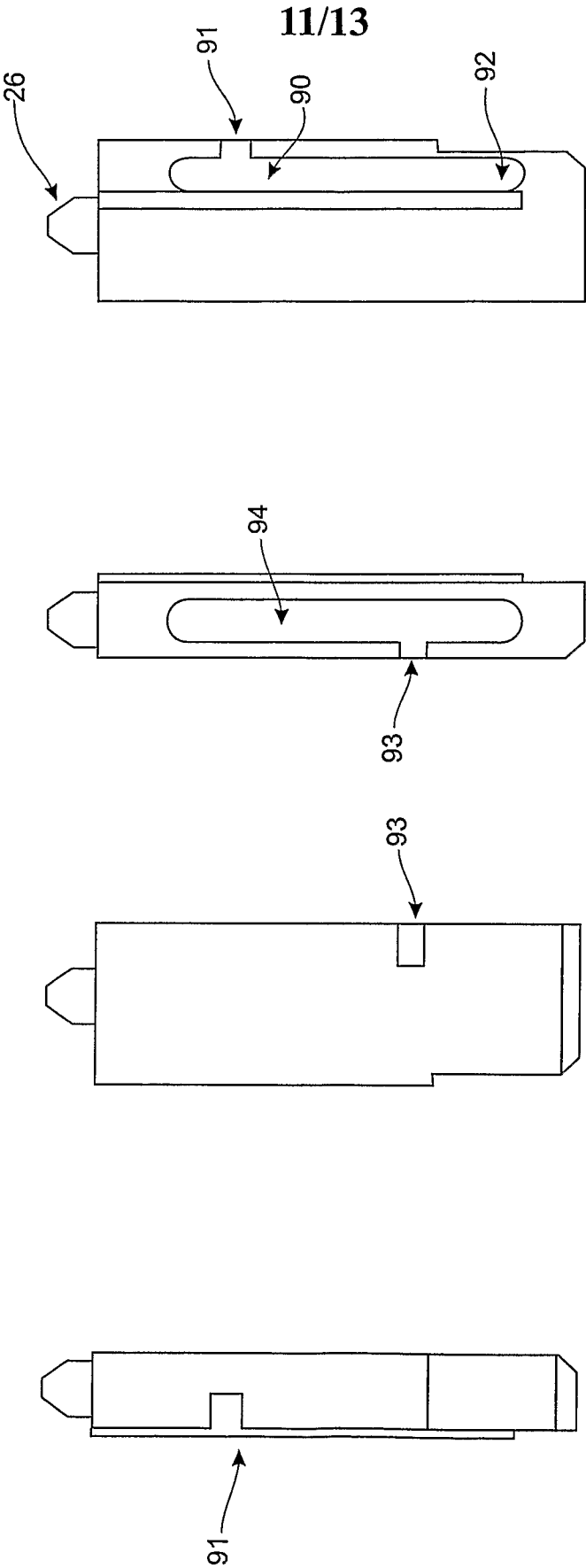


FIGURE 9d

FIGURE 9c

FIGURE 9b

FIGURE 9a

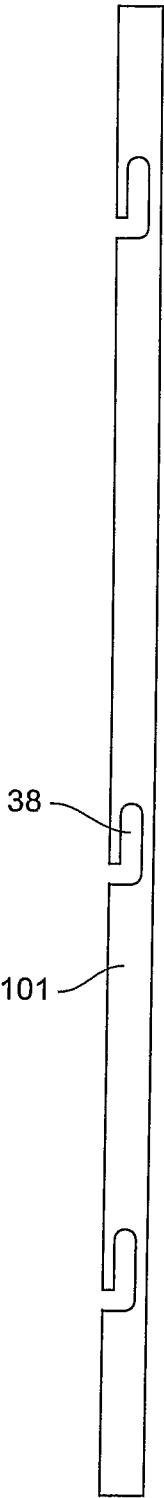


FIGURE 10a

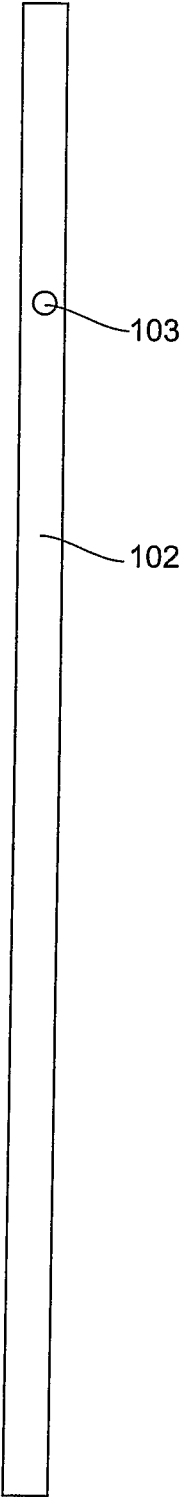


FIGURE 10b

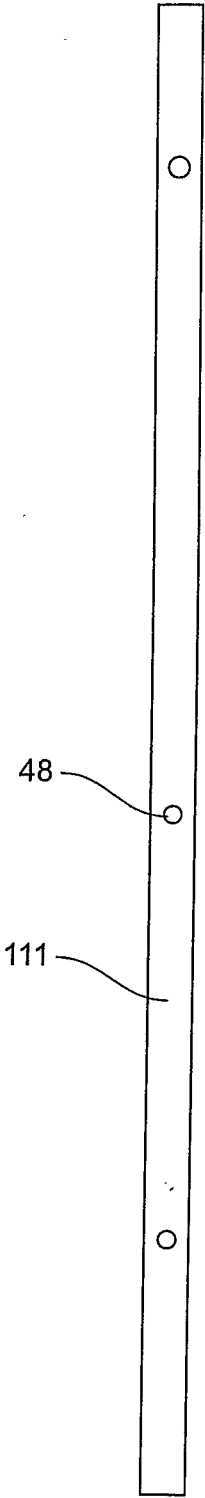


FIGURE 11a

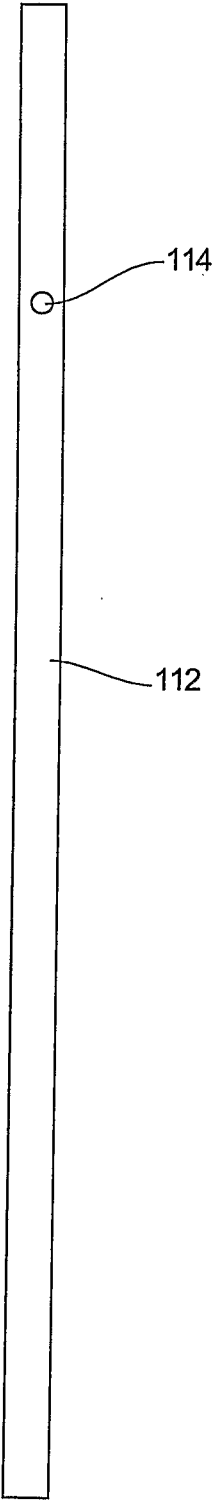


FIGURE 11b

INTERNATIONAL SEARCH REPORT

International application No
PCT/SG2006/000119

A. CLASSIFICATION OF SUBJECT MATTER
INV. B65D19/12

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
B65D

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	DE 297 04 111 U1 (NEUBAUER MICHAEL [DE]) 17 April 1997 (1997-04-17) page 7, line 11 - page 8, paragraph 1; claim 1; figures 1-3 -----	1-22
A	US 5 722 555 A (POELZL FRANZ [AT]) 3 March 1998 (1998-03-03) cited in the application abstract; figures 1-7 column 1, last paragraph - column 2, line 64 -----	1-22
A	US 5 289 933 A (STREICH ROLAND [DE] ET AL) 1 March 1994 (1994-03-01) cited in the application abstract; figures 1-10 column 5, line 36 - column 10, paragraph 1 ----- -/--	1-22

☒ Further documents are listed in the continuation of Box C.

☒ See patent family annex.

* Special categories of cited documents :

- *A* document defining the general state of the art which is not considered to be of particular relevance
- *E* earlier document but published on or after the international filing date
- *L* document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
- *O* document referring to an oral disclosure, use, exhibition or other means
- *P* document published prior to the international filing date but later than the priority date claimed

T later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

X document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

Y document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

Z document member of the same patent family

Date of the actual completion of the international search

10 January 2007

Date of mailing of the international search report

09/05/2007

Name and mailing address of the ISA/
European Patent Office, P.B. 5818 Patentlaan 2
NL - 2280 HV Rijswijk
Tel. (+31-70) 340-2040, Tx. 31 651 epo nl,
Fax: (+31-70) 340-3016

Authorized officer

Segeberer, Heiko

INTERNATIONAL SEARCH REPORT

International application No

PCT/SG2006/000119

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	WO 01/96214 A (VSI HOLDING AS [DK]; NESTING ERIK MARKVARD GRUBBE [DK]) 20 December 2001 (2001-12-20) abstract; figures 1,2a,2b,3a,3b page 6, line 11 - page 10, paragraph 1 -----	1-22

INTERNATIONAL SEARCH REPORT

International application No.
PCT/SG2006/000119

Box II Observations where certain claims were found unsearchable (Continuation of item 2 of first sheet)

This International Search Report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:
2. ☐ Claims Nos.:
because they relate to parts of the International Application that do not comply with the prescribed requirements to such an extent that no meaningful International Search can be carried out, specifically:
3. ☐ Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box III Observations where unity of invention is lacking (Continuation of item 3 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

see additional sheet

1. ☐ As all required additional search fees were timely paid by the applicant, this International Search Report covers all searchable claims.
2. ☐ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.
3. ☐ As only some of the required additional search fees were timely paid by the applicant, this International Search Report covers only those claims for which fees were paid, specifically claims Nos.:
4. ☒ No required additional search fees were timely paid by the applicant. Consequently, this International Search Report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

1-22

Remark on Protest

- ☐ The additional search fees were accompanied by the applicant's protest.
- ☐ No protest accompanied the payment of additional search fees.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

This International Searching Authority found multiple (groups of) inventions in this international application, as follows:

1. claims: 1-22

Base member pillars for a collapsible container

2. claims: 23-28

Collapsible container sidewalls including open slots

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

PCT/SG2006/000119

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
DE 29704111	U1	17-04-1997	NONE	
US 5722555	A	03-03-1998	AT 400703 B	25-03-1996
			AT 234193 A	15-07-1995
			WO 9513970 A1	26-05-1995
			AU 682548 B2	09-10-1997
			AU 8099894 A	06-06-1995
			CA 2176002 A1	26-05-1995
			CH 692784 A5	31-10-2002
			CN 1135199 A	06-11-1996
			DE 59402682 D1	12-06-1997
			EP 0728106 A1	28-08-1996
			ES 2131998 A1	01-08-1999
			FI 962063 A	20-05-1996
			GR 3024258 T3	31-10-1997
			JP 3375965 B2	10-02-2003
			JP 9505017 T	20-05-1997
			NO 961981 A	14-05-1996
US 5289933	A	01-03-1994	AT 130819 T	15-12-1995
			CS 9200958 A3	18-11-1992
			DE 4113438 A1	29-10-1992
			DK 510353 T3	09-04-1996
			EP 0510353 A2	28-10-1992
			ES 2083009 T3	01-04-1996
			GR 3019103 T3	31-05-1996
			HU 60972 A2	30-11-1992
			JP 5254590 A	05-10-1993
			NO 921573 A	26-10-1992
			SK 279763 B6	12-03-1999
WO 0196214	A	20-12-2001	AR 028734 A1	21-05-2003
			AT 258884 T	15-02-2004
			AU 7389101 A	24-12-2001
			CA 2412042 A1	20-12-2001
			CZ 20030137 A3	12-05-2004
			DE 60008032 D1	11-03-2004
			DE 60008032 T2	09-12-2004
			DK 1043239 T3	14-06-2004
			EP 1043239 A2	11-10-2000
			ES 2214240 T3	16-09-2004
			LV 12967 B	20-04-2003
			NO 20025953 A	11-12-2002
			PT 1043239 T	31-05-2004
			US 2004026296 A1	12-02-2004