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(57) Abstract: A collapsible container, which maximises the collapsed height to non-collapsed storage volume ratio, includes four vertical side assemblies, a base member and a top support frame. The base member defines a footprint of 'x' length and 'y' width. In the collapsed state the vertical height of the container assembly is the equivalent to five thicknesses of the base and in the non-collapsed state the vertical height is equal to the shorter of 'x' and 'y'. Also provided is a collapsible container in which, in the collapsed condition, all side walls and the top overlie the base and two opposed side walls are folded.



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CONTAINER

Field of the Invention

This invention relates to containers or boxes specifically such storage devices that are used to store and/or deliver goods to a destination.

- 5 Accordingly, while reference will be made below to containers, it should be understood that this term is used, as far as the invention is concerned, in connection with such having wider uses.

Background to the Invention

- 10 The purpose of a container is to store parts, typically manufactured on a mass scale. Containers are employed in many industries and used for a variety of different applications. The soft drinks industry employs hundreds of thousands of containers to store plastic caps/enclosures and bottle preforms. Such products are typically transported from a manufacturing
15 company to a customer.

- Often in today's global economy the manufacturing company and the customer could be many miles apart, even countries apart. It is highly desirable that the containers are designed with due respect to the
20 loading/off-loading and storage in the transportation means, herewith referred as a lorry.

- Furthermore in today's environmentally conscious society, reusable containers are highly fashionable. As such, the reusable element of the
25 container dictates that the containers need to be transported too and from the manufacturing company to the customer.

- On the return journey, the containers are typically empty. The economics of transportation costs, fuel and vehicle tax mean that it is highly desirable to
30 make the returning container as compact as possible, thereby allowing as many containers as possible into the lorry means.

Therefore a significant environmental and cost saving benefits can be realised if the container is designed to be the most compact possible when stored yet open out so that it can contain/store the most volume of contents in its operational position.

5

Given the mass producing industry is extremely time conscious, it deemed advantageous if said container can be easily compressed, after use as not only does this reduce the warehouse space required to store the containers, it means that more containers can be installed in the lorry.

10

Pigott et al US 6,414,271 teaches a container which contains three fundamental and separate elements; a top member, a bottom member and a sleeve member. Said assembly is designed to be compressed in height by removing the sleeve member from engagement with the top and bottom members. Unfortunately, in practice, this is quite a lengthy and cumbersome procedure to complete. Furthermore, the folding sleeve member is relatively thin and weak under compressive loads when the container is full of components and stacked one on top of another in warehouse storage. Therefore, in practice, metallic braces are employed to support the sleeve and to prevent buckling under such compressive conditions. Said metallic braces further prevent and hinder the folding viability of said container.

20

It is therefore deemed specifically advantageous if said container is easily and quickly foldable for empty storage yet is strong under compressive loads when filled and stacked. Furthermore said folding mechanism and procedure should be inherently safe and controllable by container design.

25

It is furthermore advantageous if the container is substantially water resistant, so that the contents and the container can be left outside, uncovered. This has clear warehouse/storage space saving advantages.

30

Containers are often employed in conjunction with fork-lift trucks. The forks on a fork-lift truck are particularly prone to damaging containers, causing expensive repair costs for the user. It is deemed advantageous if the container is substantially resistant to said damage. Furthermore, forklift truck operators are known to shunt two or more containers together to slide them over a given distance. This often results in further damage therefore again, if the container discourages the forklift truck driver to shunt, it will reduce container damage.

Containers are also placed on conveyors, for transportation around industrial premises application. Again, certain features of the container, specifically the containers feet are prone to damage when mounted on said conveyor, primarily because of the unevenness of the conveying system and joining practice between two or more conveyors. Hence advantages are obtained if the container is less-prone to such damage.

Containers are designed to hold mass produced parts, often such parts are manufactured from plastic. When such parts are poured into and out of the containers, they rub together creating static electricity. It is deemed to be further advantageous if the container has means to dissipate said static electric to ground/safe place.

Lastly, containers are used in their hundreds of thousands, hence are often moulded in mass production processes as plastic moulding/forming. The production equipment complexity and costs in said industry is high, therefore it is deemed of great value if the top, base and walls of the are of a modular construction where the same part is employed in more than one location in the container assembly. This reduces the mould costs, making the container more economical to produce and sell.

30

Statements of the Invention

According to the present invention there is provided a collapsible container, comprising of four vertical side assemblies, a base member and a top support frame, said base member substantially defining the footprint of the container of "x" length and "y" width, whereby in the collapsed state the vertical height of the container assembly is the total sum of thicknesses "t" of the base and side members substantially equivalent to five lots of "t", yet in the non-collapsed state the vertical height of the container assembly is substantially equivalent to the shorter length of the container footprint; "x" length or "y" width.

Preferably the container includes a top member, whereby in the collapsed state the vertical height of the container assembly is the total sum of thicknesses "t" of the base and side members substantially equivalent to six lots of "t", yet in the non-collapsed state the vertical height of the container assembly is substantially equivalent to the shorter length of the container footprint "x" length or "y" width.

Preferably the top, base and four side members/assemblies are substantially solid in construction so that when the container is in the fully collapsed or non-collapsed position its inside surfaces are inherently free from water penetration.

Preferably at least one of the side members has a folding construction, comprising of two or more members which are pivotally hinged about their horizontal axis.

Preferably at least one of the side members is pivotally hinged to the base member and/or the top frame.

Preferably at least one of the side members is pivotally hinged to the base only and substantially of monolithic, solid construction in that when decoupled from the other members, under gravity said construction creates a wind-break, which cushions the velocity of the side member fall.

5

Preferably the substantially monolithic side member is hinged in a vertical axis to the base and/or top frames, whereby the axis of pivot is displaced to the vertical hinging axis of the opposing side member.

- 10 Preferably at least one of the side members incorporates a handle device, which preferably is pivotally attached to said side member and weighted so that it falls vertically flush when not used.

- 15 Preferably the side member assembly comprising of two or more hinged members, is hinged to the base and/or top frames in a vertical axis whereby the axis of pivot is displaced to the vertical hinging axis of the opposing side member.

- 20 Preferably each side member is hinged to the base and/or top frames in a different vertical axis from any other side member.

Preferably the top member is pivotally hinged to the top frame and preferably comprises of two or more members.

- 25 Preferably the container assembly includes a base frame and the base member is pivotally hinged to said base frame and preferably one or more of the side wall members are pivotally hinged to said base frame.

- 30 Preferably the base comprises of two or more members which when unsupported in the vertical position are permitted to fall under gravity exposing the inner surfaces of the container.

Preferably, the top frame incorporates a vertical sliding hinge assembly which permits relative vertical displacement between said top frame and one or more of the side members.

5

Preferably, the container assembly is modular in that it may be employed to contain components such as preforms which do not need to be placed inside a liner as well as components that are required to be placed inside a liner.

- 10 Preferably, at least one top members incorporates a substantially ratcheted sealing roller which automatically releases the liner when the lip opens and/or permits

- 15 Preferably, one or more of the side members are non-permanently attached to another side member and/or the top and/or base frames by a handle comprising of a live spring like joining means. Preferably said handle is also designed to resist forces at 90 degrees to the live spring so that it may be employed as a side panel lifting device.

- 20 Embodiments of container in accordance with the present invention may be such that the arrangement includes one or more anti-tamper devices which notify the user when the inner surfaces of the non-collapsed sealed container have been exposed.

- 25 Furthermore, the embodiments include the containers ability to dispense components through either the bottom member or top member.

- Embodiments also include the modularity aspects of the design whereby one member is used in multiple positions, not least the fact that the top frame and bottom frame are identical parts which may or may not be orientated differentially. Furthermore, embodiments include the modularity of the side
- 30

members, specifically the opposing side members which are of identical construction.

According to the present invention there is provided a collapsible container,
5 comprising of four vertical side assemblies, a base member, a top member, a
base support frame and a top support frame, said base frame member
substantially defining the footprint of the container of "x" length and "y" width,
whereby in the collapsed state the vertical height of the container assembly
is the total sum of thicknesses "t" of the base, top and side members
10 substantially equivalent to ten lots of "t" as each side member is horizontally
hinged and comprises of two or more members and each member has
substantially the same footprint as the container, yet in the non-collapsed
state the vertical height of the container assembly is substantially equivalent
to twice that of the shorter length of the container footprint; "x" length or "y"
15 width.

Preferably the container base frame member can accept one or feet
members of sufficient vertical height so to accept the forks from a fork lift
truck used to lift the container. Preferably six feet members are employed, in
20 two assemblies either side of the access/opening for the forklift truck.

Preferably each feet assembly comprises of three feet which are supported
by horizontal and/or vertical webbing.

25 Preferably at least one front or rear foot has a chamfer adjacent to the floor
so that when the container sits on a conveyor, said chamfer accommodates
any vertical displacement variance between two or more conveyors without
damaging the foot.

30 Preferable at least one front and rear foot has a vertical chamfer adjacent to
the corner of the container. This female chamber permits a substantially

male protrusion of a 3rd party frame to contact the underside of the container and thereby take the load of the container when the container is positioned over a hole and the bottom members open to release the contents of the container.

5

Preferably, the container includes a customer identification member with anti-tamper feature, thereby permitting the traceability of the contents back to the supplier.

- 10 According to another aspect of the present invention, there is provided a collapsible container comprising a base, a top and first and second pairs of opposed side walls, each of said side walls being hingedly mounted on said base for movement between an uncollapsed condition, in which said side wall extends from the base to the top, and a collapsed condition in which
- 15 side wall overlies said base, the side walls of the first pair being non-foldable and one of said side walls being arranged to overlie the other of said side walls when in their collapsed condition, the side walls of the second pair being foldable into two parts about a substantially central hinge lying parallel to the base so that, in their collapsed condition, the side walls are folded and
- 20 one overlies the other.

Preferably the side walls of the second pair are hingedly connected to the top such that, with these side walls in their collapsed condition, the top overlies them and the base.

25

Description of the drawings

The accompanying drawings are as follows:

Figure 1 is an isometric assembly view of the container of the invention.

- 30 **Figure 2** corresponds to Figure 1 and shows the monolithic side panel pivotally hinging about the base frame.

Figure 3 corresponds to **Figure 2** and shows the opposing monolithic side panel pivotally hinging about the base frame.

Figure 4 corresponds to **Figure 3** and shows both opposing monolithic side panels in their most compact vertical position.

5 **Figure 5** corresponds to **Figure 4** and shows a bi-fold side panel pivotally hinged about the top and base frame

Figure 6 corresponds to **Figure 5** and shows one fully collapsed bi-fold panel in its most compact vertical position.

10 **Figure 7** corresponds to **Figure 6** and shows the fully collapsed position of the container.

Figure 8 corresponds to **Figure 1** and shows the container of the invention with a hinged top member.

15 **Figure 9** corresponds to **Figure 1** and shows the container of the invention with a hinged bottom member, showing a shoot design by way of example only.

Figure 10 corresponds to **Figure 1** and shows an enlarged version of the customer identification member.

Figure 11 corresponds to **Figure 1** and shows an enlarged version of the bi-fold side member handle.

20 **Figure 12** corresponds to **Figure 8** and shows both top members of the container in the open position.

Figure 13 shows a partial longitudinal view on the front foot assembly of the container of the invention.

25 **Figure 14 and Figure 15** shows a partial longitudinal cross section of a hinge of the invention showing the live-spring retaining mechanism.

Figure 16 corresponds to **Figure 1** and shows an enlarged version of the monolithic side member handle with a live-spring mechanism.

Figure 17 corresponds to **Figure 12** and shows an enlarged version of the integral ratchet liner mechanism in the top member.

Figure 18 shows a side view of the non-collapsed container with a vertically sliding hinge mechanism in the top support frame in its extended position.

Figure 19 shows a side view of the part-collapsed container with a vertically sliding hinge mechanism in the top support frame in its extended position.

Figure 20 shows a side view of the collapsed container with a vertically sliding hinge mechanism in the top support frame in its contracted position.

Figure 21 shows an isometric view of the erected container with one side assembly, comprising of two side panels. Said assembly having two horizontal hinge mechanisms

Figure 22 corresponds to Figure 21 and shows a view of the upper side panel pivoting on the upper hinge of the lower side panel and the lower side panel pivoting on the lower hinge with the base frame

Figure 23 shows an isometric view of the security system, for box identification.

Detailed description of the Invention

The invention will now be described, by way of example only, with reference to the accompanying drawings.

Figure 1 is an isometric assembly view of the container 10 of the invention.

The container 10 comprises of a two opposing bi-fold side assemblies 11 and 12 (not shown). Said bi-fold assemblies 11 and 12 are substantially modular and interchangeable. This embodiment has specific advantages in the production ease/costs of manufacturing the container.

Side bi-fold assembly 11 comprises of an upper side member 13 and a lower side member 14 pivotally coupled to each other about hinge 15. By way of example only, said hinge 15 comprises of a series of substantially circular

male 16 and female 17 boss members, longitudinally meshing together. Each boss member has a central common orifice whereby a circular rod (not shown) provides the means of the upper and lower side members 13 and 16 to connectably pivot.

5

In a similar manner, upper side member 13 is pivotally connected to the top support frame 18 and the lower side member 14 is pivotally connected to the bottom support frame 19

10 A significant advantage of the container of invention is that top support frame 18 and bottom support frame 19 are modular and of identical construction, but shown, preferably in a non-identical orientation. This modularity again provides substantial manufacturing cost/ease benefits.

15 The bottom support frame 19 is securely connected to two or more feet assemblies 20. Said feet assemblies 20 comprising of at least two feet 21 and 22 longitudinally spaced and preferably positioned on the corners of the container. For additional support, a third foot 23 is preferred, positioned midway between feet 21 and 22. Said feet 21, 22 and 23 are longitudinally
20 supported by horizontal support 24 and preferably a vertical support (not shown). Said vertical support serves two purposes. Firstly it supports the feet members 21, 22 and 23 helping to prevent damage if knocked. Secondly it blocks off the side access between the feet 21, 22 and 23 both opposing container sides. This means that the forklift may only enter and subsequently
25 lift the container 10 from the floor in any of the other two other opposing sides 25 and 26 (not shown). This vertical support member embodiment is deemed as a significant user advantage.

From Figure 1, the container 10 incorporates two substantially modular and
30 preferably monolithic side panels 30 and 31 (not shown). Both side panels

30 and 31 and pivotally coupled to the base support frame 19 in a similar method as previously described.

Said side panels 30 and 31 are preferably locked in position by one or more
5 live-spring handle assemblies 32 and 33. These will be described later with reference to Figure 16.

The top member 34 and 35 are preferably pivotally coupled to the top support frame 18 in a similar manner as previously described.

10

Often containers are shipped to a variety of customers from one common manufacturer. Customer and content identification of the container is therefore extremely important. Prior art techniques of providing said information include stickers and labels. These can be scrapped and attacked
15 by various weather conditions.

From Figure 1, an embodiment of the present invention is to provide a means to attach, store and protect said vital customer information integral with the container by way of an identification member 40. Said identification
20 member 40 also includes an anti-tamper mechanism 41 and will further be described with reference to Figure 10.

Since the containers 10 of the invention are often required to be stacked on top of each other, the top members 34 and 35 have one or more male protruding feature 45. The position and orientation of said male protruding
25 features 45 correspond to female protruding orifices 46 (not shown) in the feet assembly members 23. This male 45 and female 46 engagement provides locational support for said stacked containers permitting them to be stacked safely.

30

On one or more corners of the bottom support frame 19 is an anti-shunt mechanism 47. If containers 10 are pushed together by a forklift truck driver in a shunting operation, they are prone to damage, specifically the feet 21 can break. Said anti-shunt mechanism 47 of the invention ensures that if the
5 containers are pushed together they will not align perfectly. If they don't align, the shunting operation can not be performed. This embodiment of the invention is particularly useful to users as it reduces the repair/refurbishment costs of the containers 10.

10 **Figure 2** corresponds to Figure 1 and shows the monolithic side panel 10 pivotally hinging 50 about the base frame 19.

An embodiment of the invention is that the side, top and base panels are substantially solid in construction. This clearly provides a weather resistant
15 feature of the container, protecting the contents. However, equally as important is that the design creates a wind break as the side member 30 falls with gravity.

Therefore, by design, instead of the side member 30 falling rapidly,
20 uncontrollably, potentially making a noise, the wind brake cushions the side members fall, controlling the dropping velocity.

Figure 3 corresponds to Figure 2 and shows the opposing monolithic side panel 31 pivotally hinging about the base frame 19. Furthermore, Figure 3
25 shows the fully collapsed side panel 30 in position inside the bottom support frame 19.

It is important to note that the two monolithic side panels 30 and 31 have a different vertical pivot position. This allows them both to stack correctly and
30 flatly on top of one another, thus minimising the collapsed vertical height.

Figure 4 corresponds to Figure 3 and shows both opposing monolithic side panels 30 and 31 in their most compact vertical position.

Figure 5 corresponds to Figure 4 and shows a bi-fold side panel assembly 11 pivotally hinged about the top support frame 18 and base support frame 19 in a partially collapsed orientation.

Figure 6 corresponds to Figure 5 and shows one fully collapsed bi-fold panel assembly 11 in its most compact vertical position.

10

Figure 7 corresponds to Figure 6 and shows the fully collapsed position of the container 10.

Figure 8 corresponds to Figure 1 and shows the container 10 of the invention with the top member 34 open and hinged on the top support frame 18.

From Figure 8, the reader will note that the corresponding top member 35 contains an integral liner sealing member 80. Said member will be further discussed with reference to Figure 17.

Figure 9 corresponds to Figure 1 and shows the container 10 of the invention shown with the bottom member 81 securely attached to the two feet assemblies 20 in the open position.

25

Figure 9 shows a side shoot assembly 82, by way of example only. Clearly the experienced reader will note that a vertical, gravity fed shoot assembly or any other means of dispensing the contents of the box from the bottom is anticipated by the invention.

30

From Figure 9, the side shoot assembly comprises of a base member 81 and one or more flap members 83 and 84. Said flap members 83 and 84 help to guide and direct the dispensed contents of the box in a side exit manner and away from the footprint of the container 10.

5

The reader will note that the front and back feet 21 and 22 have a vertical chamfer 85. This chamfer 85 is a female recess which permits the box to be lowered on a supporting frame 86 incorporating a corresponding male support. This support frame 86 and feature, positioned on each of the four
10 corners of the container 10, carries the whole weight of the container through the stiffest part of the container 10 structure. The support frame 86 clearly has a recess/hole which corresponds with the shoot assembly 82, thereby permitting the shoot assembly to drop under gravity and dispense the goods thereafter.

15

Figure 10 corresponds to Figure 1 and shows an enlarged version of the customer identification member 40. The identification member assembly 40 comprises of a cover 91 which is preferably constructed of clear plastic and a pivoting flap 92. In the open position said flap 92 permits paperwork and
20 documentation to be added in the recess 93 behind the protective cover 91. Once the paperwork is inserted the flap 93 is closed providing a substantially weather proof sealed enclosure. An anti-tamper feature is also anticipated by the embodiment and can be supplied in various forms. By way of example only, said anti-tamper feature could be a high strength adhesive backed
25 security sticker than secures the flap 92 to the cover 91 at the mating joint line. This embodiment is deemed to be an advantage given box contents and there cleanliness is vital in many industries such as the food and beverage industry.

30 **Figure 11** corresponds to Figure 1 and shows an enlarged version of the bi-fold side member handle 100. Said handle 100 is pivoted, preferably about a

common bi-fold hinge joint 15 between side members 13 and 14. Preferably said handle 100 is weighted so that it naturally falls flush under gravity into the recess 101 in side member 14, when not used.

- 5 This handle 100 embodiment is of particular benefit to the user, given it provides a means to positively displace a collapsed bi-fold side member assembly into its erected position.

Figure 12 corresponds to Figure 8 and shows both top members 34 and 35
10 of the container 10 in the open position. Also shown is a clearer view of integral the liner sealing member 80.

Figure 13 shows a partial longitudinal view on the front foot assembly 20 of the container 10 of the invention positioned on a conveyor 110 adjacent to a
15 second conveyor 111.

The reader will note that it is not uncommon for said conveyors 110 and 111 to be vertically displaced to one another.

The front and rear feet 21 have a longitudinal chamber 112 which
20 corresponds and accommodates any possible conveyor vertical displacement inaccuracies. Said foot chamfer 112 permits the container 10 to transit from conveyor to conveyor without damaging the containers feet.

Figure 14 and Figure 15 shows a partial longitudinal cross section of a live-spring hinge 120 of the invention in both a partially open position (Figure 15) and a closed position (Figure 14). The boss 121 on the top member 122 has a discontinuation 123 which creates a tang 124. Said tang 124 engages the lower member 125 to positively retain said lower member 125 aligned with said upper member 122.

30

This embodiment of the invention is specifically advantageous to the user during the assembly of the container 10 from the collapsed state.

Figure 16 corresponds to Figure 1 and shows an enlarged version of the
5 monolithic side member handle assembly 33 of the container 10.

Said handle 33 contains a live-spring mechanism 130 which clips the monolithic side member 30 into alignment with the bi-fold side panel assembly 11. Said handle 33 also includes a recess which permits a user to
10 put their fingers through the handle 33 and vertically plug the monolithic side member 30 into vertical alignment from the collapsed position.

This dual function handle embodiment is deemed to be particularly advantageous as it reduces the manufacturing cost of the container and the
15 assembly time.

Figure 17 corresponds to Figure 12 and shows an enlarged version of the integral ratchet liner sealing mechanism 140 mounted in the top member 35.

20 Said liner sealing mechanism 140 comprises of a barrel 141 which is pivotally attached between support webs 142 and 143 of the top member 35.

Said barrel 141 has a longitudinal orifice 144 which permits a liner to be pushed through said orifice. The reader will note that liners are typically
25 large plastic bags which hold components in a ultra clean environment within the container 10. Liners are often employed to store and transport components to customer sites when no further component cleaning operation is necessary.

The ends of the barrel 141 incorporate a series of circumferential indentations 145. Said indentations correspond with a live-spring member 146, as shown on the end view A-A.

5 In operation, when the liner is in position, the barrel 141 is allowed to rotate and in doing so, twists the top of the liner, sealing the contents. The ratchet embodiment prevents the liner between un-sealed in transportation and general container 10 movement.

10 **Figure 18** shows a side view of the non-collapsed container 150 with a vertically sliding hinge mechanism in the top support frame 151. Said vertically sliding mechanism is shown by way of example only, as a male protrusion 152 operating in a female extended recess 153 and is shown in an extended position.

15

Figure 19 corresponds to Figure 18 and shows a side view of the part-collapsed container 150.

Figure 20 corresponds to Figure 18 and shows a side view of the collapsed container 150 with a vertically sliding hinge mechanism in the top support frame 151 in its contracted position.

25 This specific embodiment of a sleeved top member 151 wrapping around the side walls of the container provides additional component storage capacity when the assembly is non-collapsed yet minimises the compact height when the container is fully collapsed.

This sliding sleeve top assembly embodiment is deemed to be of incredible user benefit, as, by way of example only, it permits more collapsed containers to be stored in a transportation lorry on the return journey back to the manufacturing plant.

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Figure 21 shows an isometric view o the erected container with one side assembly 160, comprising of two side panels 161 and 162, said assembly 160 having two horizontal hinge mechanisms 163 and 164. Said upper side panel 161 pivotably hinging about hinge mechanism 163 and said lower side panel 162 pivotably hinging about hinge mechanism 164 between said panel 162 and said base frame 165.

Figure 22 corresponds to Figure 21 and shows a view of the upper side panel 161 pivoting on the upper hinge 163 of the lower side panel 162 and the lower side panel 162 pivoting on the lower hinge 164 with the base frame 165.

From figure 21 and 22 it will be clear that the container of the invention permits additional storage volume, over and above the otherwise permissible volume dictated by the size of the box footprint, as is the case when a single hinged side panel. This is considered to be extremely value adding as this embodiment of the invention means that the volume ratio of the erected container is not restricted by the footprint of the container. Clearly, two, three or more hinges can be added to any specific side panel to increase the height of said container.

Figure 23 shows an isometric view of the security system 170, for box identification.

This comprises of a back member 171 which is preferably see through and transparent so that the contents of the container can be viewed without exposing the contents to the outside.

The cover member 172 is preferably also see through and transparent. This is shown to slide vertically in a suitable recess/channel in the container (not shown).

The embodiment of the invention is to create a gap between back member 171 and cover member 172 for inspection of a label 173.

- 5 Above the cover member 171 is a peg 174. Preferably, said peg 174 is a shear pin. When the container is used, the label 173 must be removed. In order to remove the label 173 the sliding cover 173 must shear the peg 174. This means that the contents of the container have been viewed, prior to the container being used. This is deemed important and value adding to the
- 10 customer and the supplier as it avoids mistakes of the wrong container contents being dispensed in the wrong production line.

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CLAIMS

1. A collapsible container, comprising of four vertical side assemblies, a base member and a top support frame, said base member substantially defining the footprint of the container of "x" length and "y" width, whereby in the collapsed state the vertical height of the container assembly is the total sum of thicknesses "t" of the base and side members substantially equivalent to five lots of "t", yet in the non-collapsed state the vertical height of the container assembly is substantially equivalent to the shorter length of the container footprint; "x" length or "y" width.
2. A collapsible container in accordance with Claim 1, with a top member, whereby in the collapsed state the vertical height of the container assembly is the total sum of thicknesses "t" of the base and side members substantially equivalent to six lots of "t", yet in the non-collapsed state the vertical height of the container assembly is substantially equivalent to the shorter length of the container footprint "x" length or "y" width.
3. A collapsible container in accordance with Claim 2, whereby the top, base and four side members/assemblies are substantially solid in construction.
4. A collapsible container in accordance with Claim 2 whereby at least one of the side members has a folding construction, said folding construction comprising of two or more members which are pivotally hinged about their horizontal axis.
5. A collapsible container in accordance with Claim 2 whereby at least one of the side members is pivotally hinged to the base member and/or the top frame.

6. A collapsible container in accordance with any preceding claims whereby at least one of the side members is pivotally hinged to the base only and substantially of monolithic, solid construction in that when de-coupled from the other members, under gravity said construction creates a wind-break.
7. A collapsible container in accordance with any preceding claims whereby the substantially monolithic side member is hinged in a vertical axis to the base and/or top frames, whereby the axis of pivot is displaced to the vertical hinging axis of the opposing side member.
8. A collapsible container in accordance with any preceding claims whereby at least one of the side members incorporates a handle device, which preferably is pivotally attached to said side member and weighted so that it falls vertically flush when not used.
9. A collapsible container in accordance with any preceding claims whereby the side member assembly comprising of two or more hinged members, is hinged to the base and/or top frames in a vertical axis whereby the axis of pivot is displaced to the vertical hinging axis of the opposing side member.
10. A collapsible container in accordance with any preceding claims whereby each side member is hinged to the base and/or top frames in a different vertical axis from any other side member.
11. A collapsible container in accordance with any preceding claims whereby the top member is pivotally hinged to the top frame and preferably comprises of two or more members.

- 12.A collapsible container in accordance with any preceding claims
whereby the container assembly includes a base frame and the base
member is pivotally hinged to said base frame and preferably one or
more of the side wall members are pivotally hinged to said base
frame.
- 13.A collapsible container in accordance with any preceding claims
whereby the base comprises of two or more members which when
unsupported in the vertical position are permitted to fall under gravity
exposing the inner surfaces of the container.
- 14.A collapsible container in accordance with any preceding claims
whereby, the top frame incorporates a vertical sliding hinge sleeve
assembly which permits relative vertical displacement between said
top frame and one or more of the side members.
- 15.A collapsible container in accordance with any preceding claims
whereby, the container assembly is modular in that it may be
employed to contain components such as preforms which do not need
to be placed inside a liner as well as components that are required to
be placed inside a liner.
- 16.A collapsible container in accordance with any preceding claims
whereby, at least one top members incorporates a substantially
ratcheted sealing roller which automatically releases the liner when
the lip opens and/or permits
- 17.A collapsible container in accordance with any preceding claims
whereby, one or more of the side members are non-permanently
attached to another side member and/or the top and/or base frames
by a handle comprising of a live spring like joining means.

- 5 18.A collapsible container in accordance with any preceding claims whereby, said handle is also designed to resist forces at 90 degrees to the live spring so that it may be employed as a side panel lifting device.
- 10 19.A collapsible container in accordance with any preceding claims whereby said container includes one or more anti-tamper devices which notify the user when the inner surfaces of the non-collapsed sealed container have been exposed.
- 15 20.A collapsible container in accordance with any preceding claims whereby, the container has the ability to dispense components through either the bottom member or top member under gravity means.
- 20 21.A collapsible container in accordance with any preceding claims whereby, one common side member is modular and is used in multiple positions.
22. A collapsible container in accordance with any preceding claims whereby, one common frame member is used in the top and bottom frame positions
- 25 23.A collapsible container in accordance with any preceding claims whereby, one common bi-fold side member is used in multiple positions.
- 30 24.A collapsible container in accordance with any preceding claims comprising of four vertical side assemblies, a base member, a top member, a base support frame and a top support frame, said base

frame member substantially defining the footprint of the container of
"x" length and "y" width, whereby in the collapsed state the vertical
height of the container assembly is the total sum of thicknesses "t" of
the base, top and side members substantially equivalent to ten lots of
5 "t" as each side member is horizontally hinged and comprises of two
or more members and each member has substantially the same
footprint as the container, yet in the non-collapsed state the vertical
height of the container assembly is substantially equivalent to twice
that of the shorter length of the container footprint; "x" length or "y"
10 width.

25.A collapsible container in accordance with any preceding claims
whereby the container base frame member can accept one or feet
members of sufficient vertical height so to accept the forks from a fork
15 lift truck used to lift the container.

26.A collapsible container in accordance with any preceding claims
whereby each feet assembly comprises of three feet which are
supported by horizontal and/or vertical webbing.
20

27.A collapsible container in accordance with any preceding claims
whereby at least one front or rear foot has a chamfer adjacent to the
floor so that when the container sits on a conveyor, said chamfer
accommodates any vertical displacement variance between two or
25 more conveyors without damaging the foot.

28.A collapsible container in accordance with any preceding claims
whereby at least one front and rear foot has a vertical chamfer
adjacent to the corner of the container, said female chamber permits a
substantially male protrusion of a 3rd party frame to contact the
underside of the container and thereby take the load of the container
30

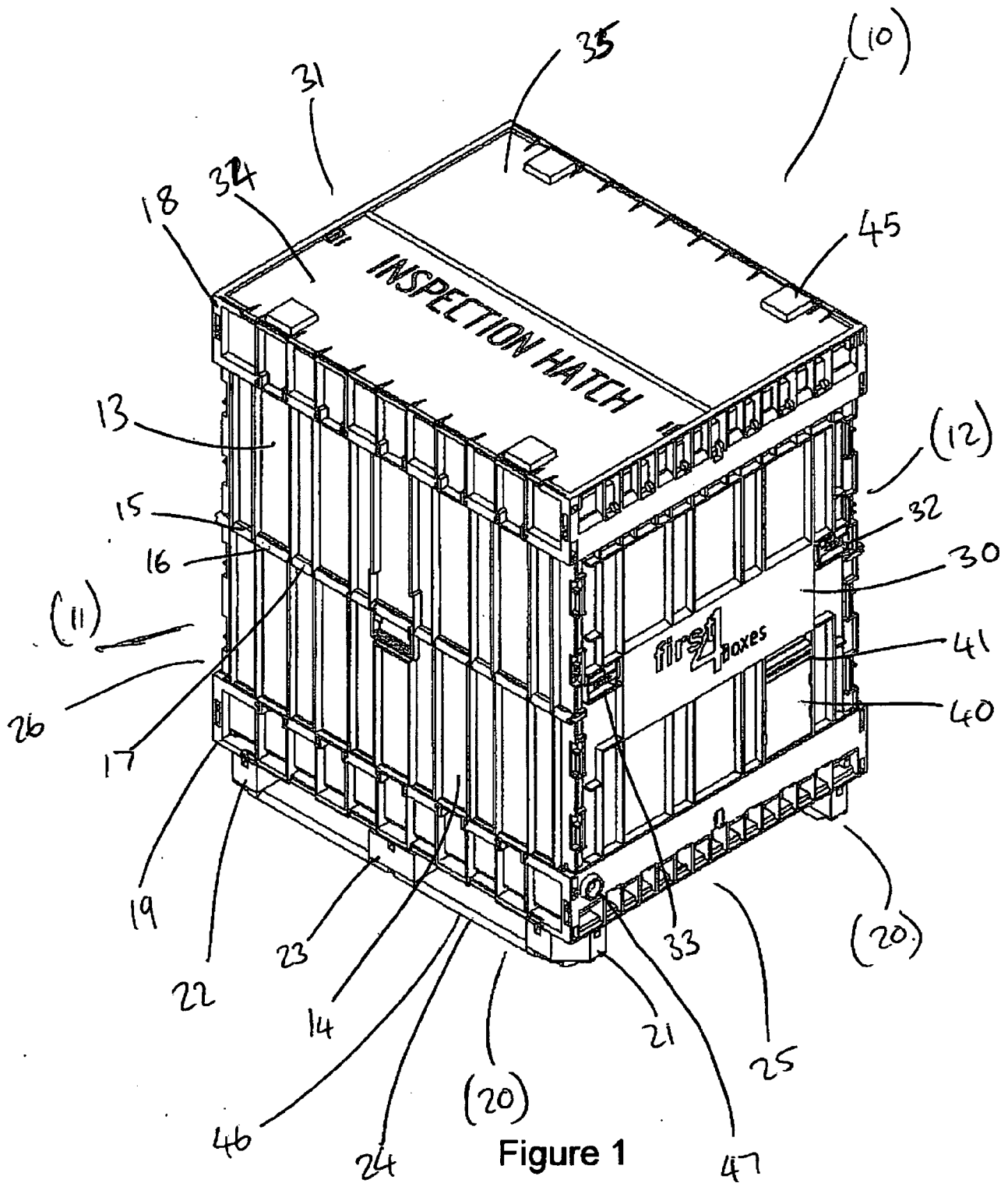
when the container is positioned over a hole and the bottom members open to release the contents of the container.

5 29. A collapsible container in accordance with any preceding claims whereby, the container includes a customer identification member with anti-tamper feature, thereby permitting the traceability of the contents back to the supplier.

10 30. A collapsible container comprising a base, a top and first and second pairs of opposed side walls, each of said side walls being hingedly mounted on said base for movement between an uncollapsed condition, in which said side wall extends from the base to the top, and a collapsed condition in which side wall overlies said base, the
15 side walls of the first pair being non-foldable and one of said side walls being arranged to overlie the other of said side when in their collapsed condition, the side walls of the second pair being foldable into two parts about a substantially central hinge lying parallel to the base so that, in their collapsed condition, the side walls are folded and one overlies the other.

20 31. A collapsible container according to Claim 30, wherein the side walls of the second pair are hingedly connected to the top such that, with these side walls in their collapsed condition, the top overlies these side walls and the base.

25 32. A container as defined in claim 1 and substantially as detailed in Figures 1 to 20.



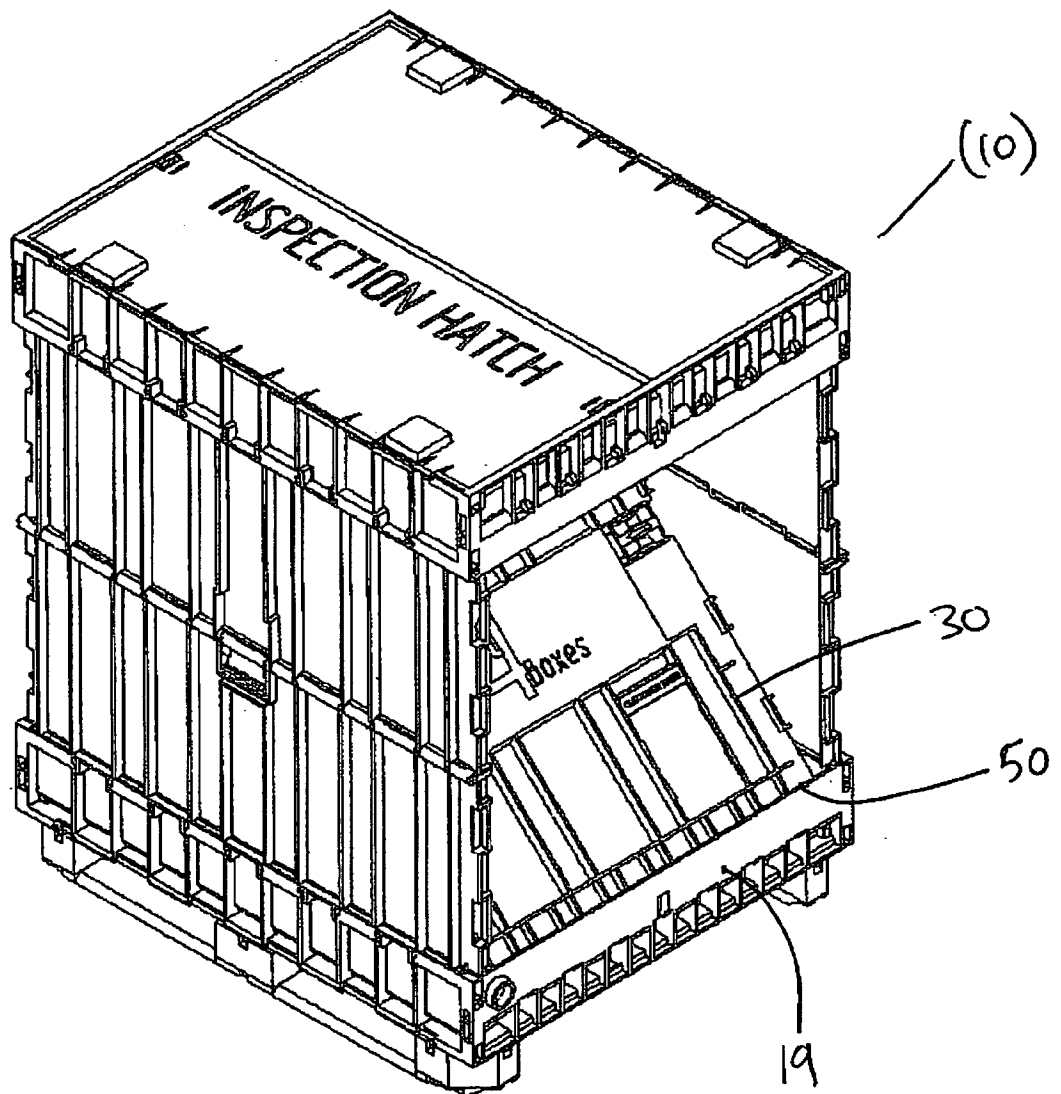


Figure 2

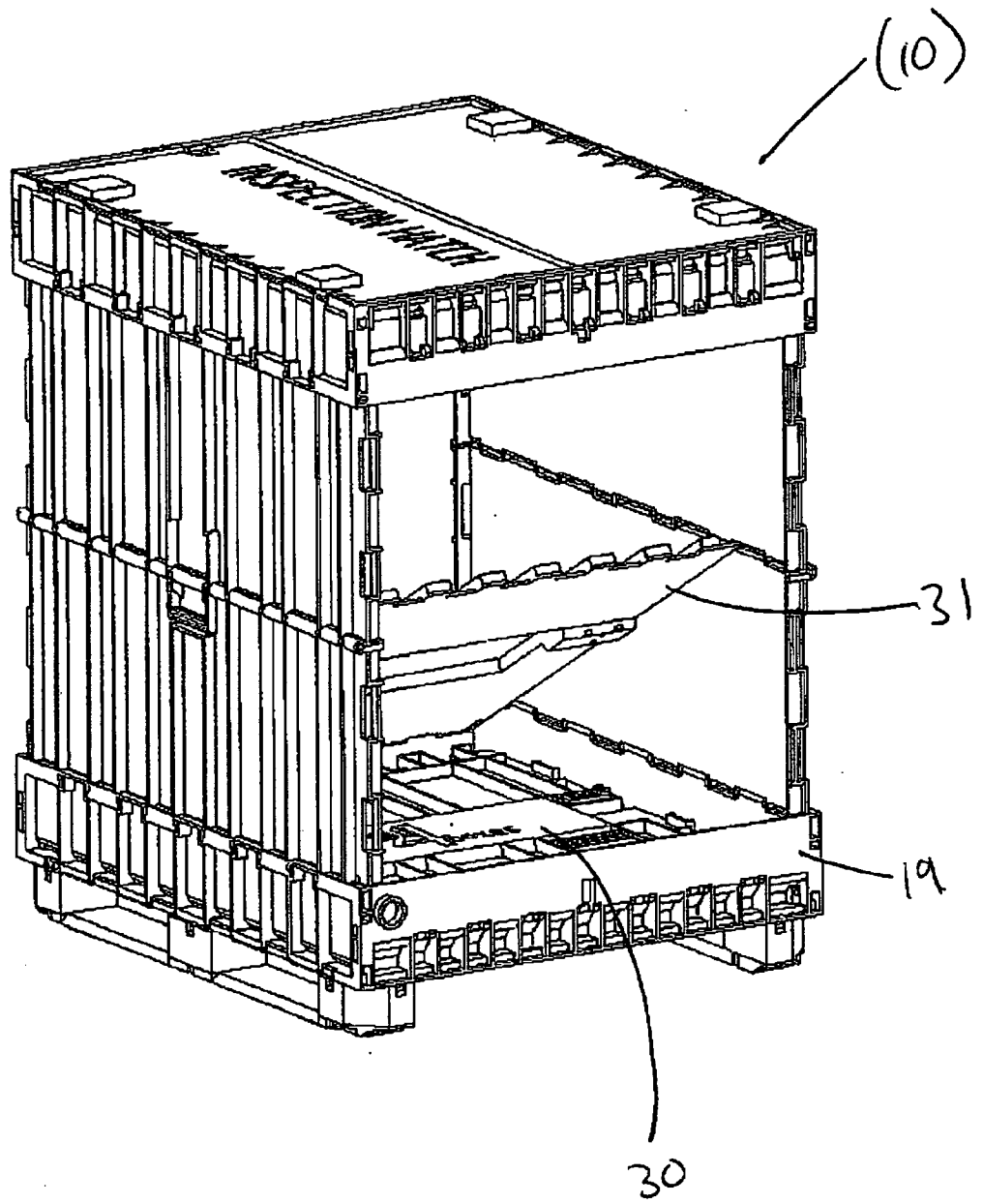


Figure 3

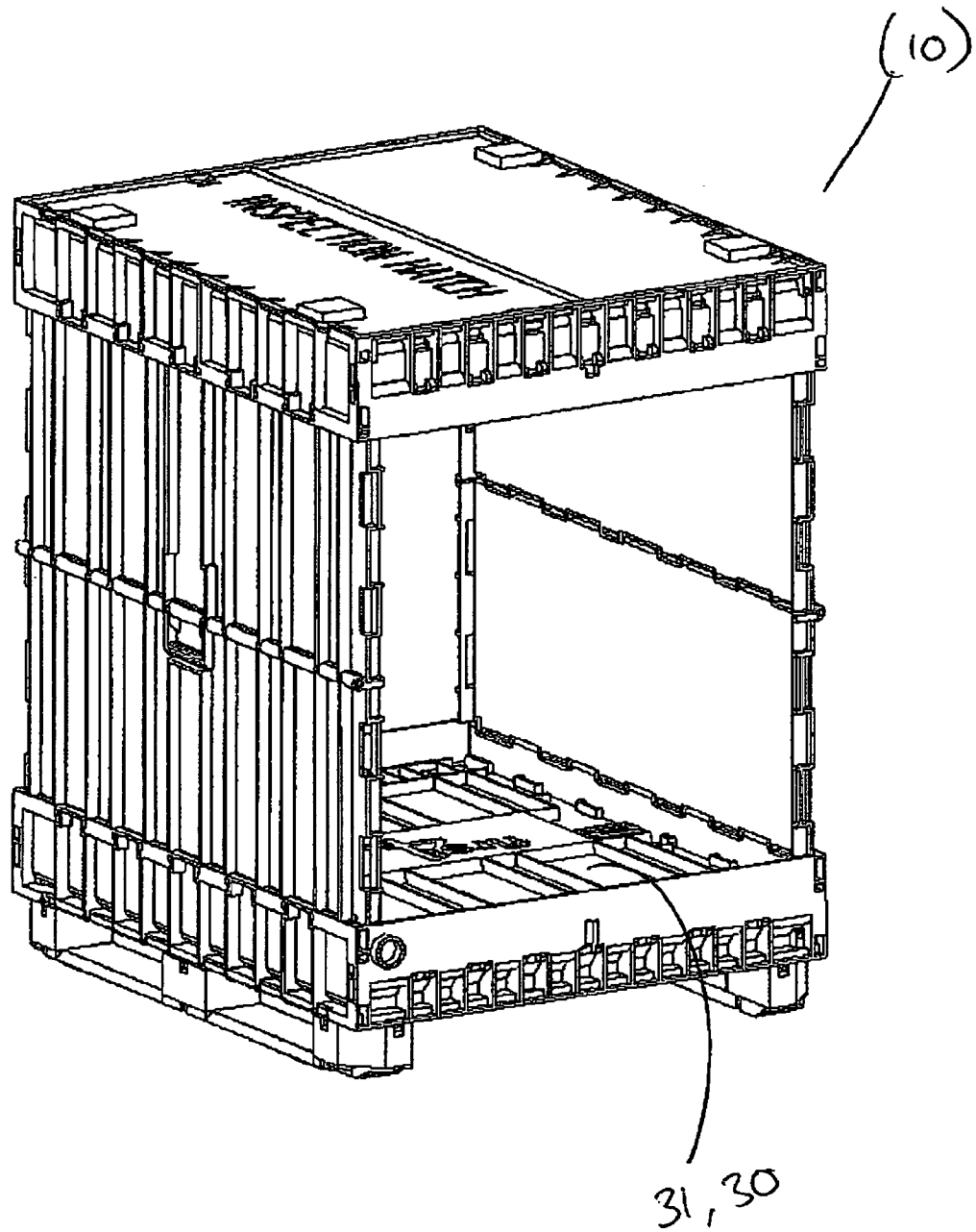


Figure 4

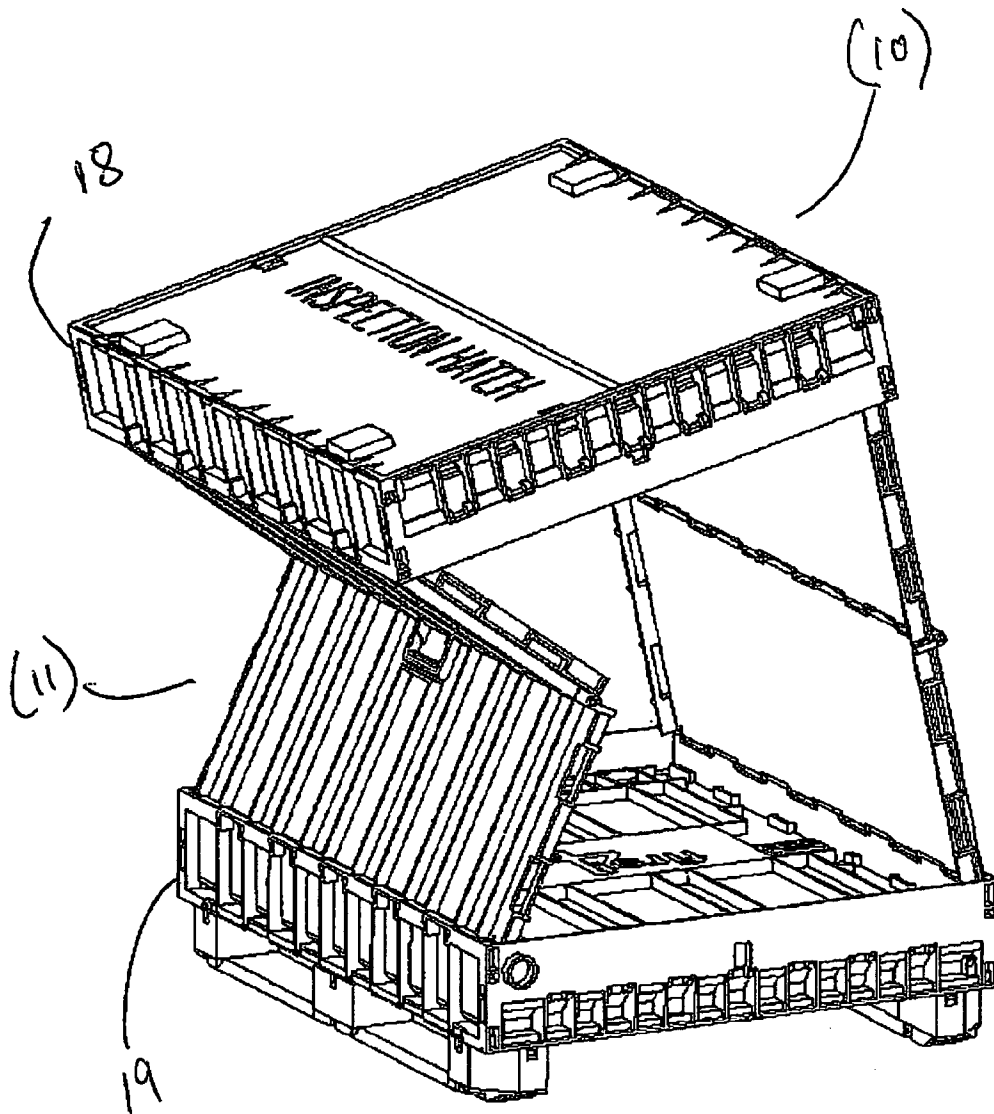


Figure 5

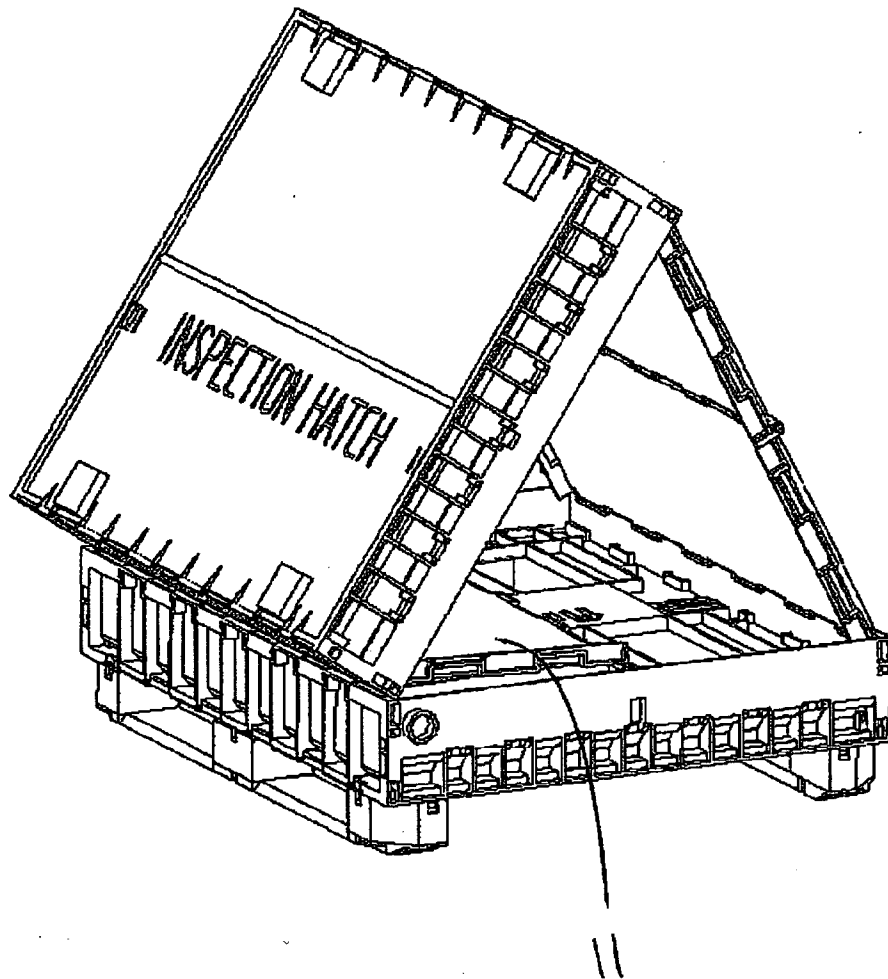


Figure 6

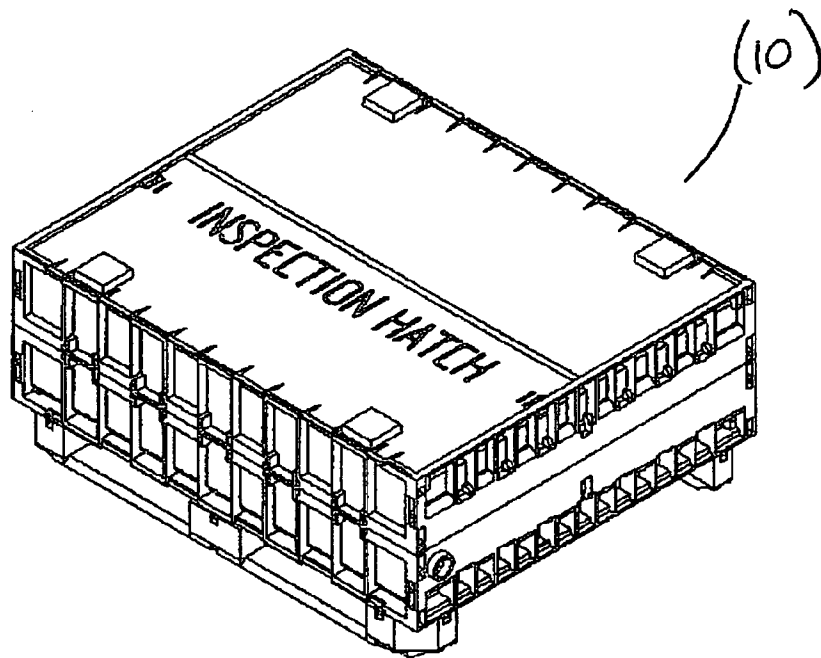


Figure 7

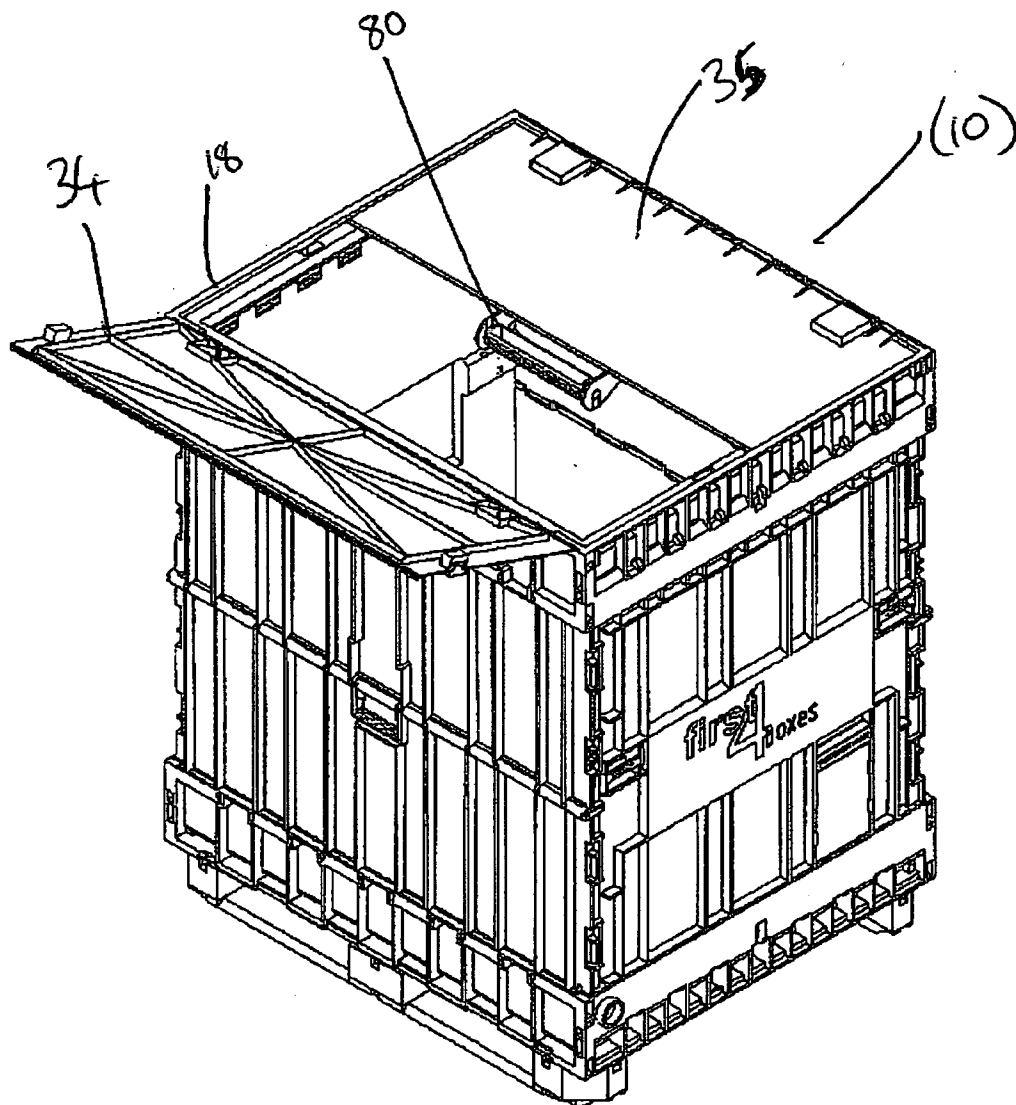
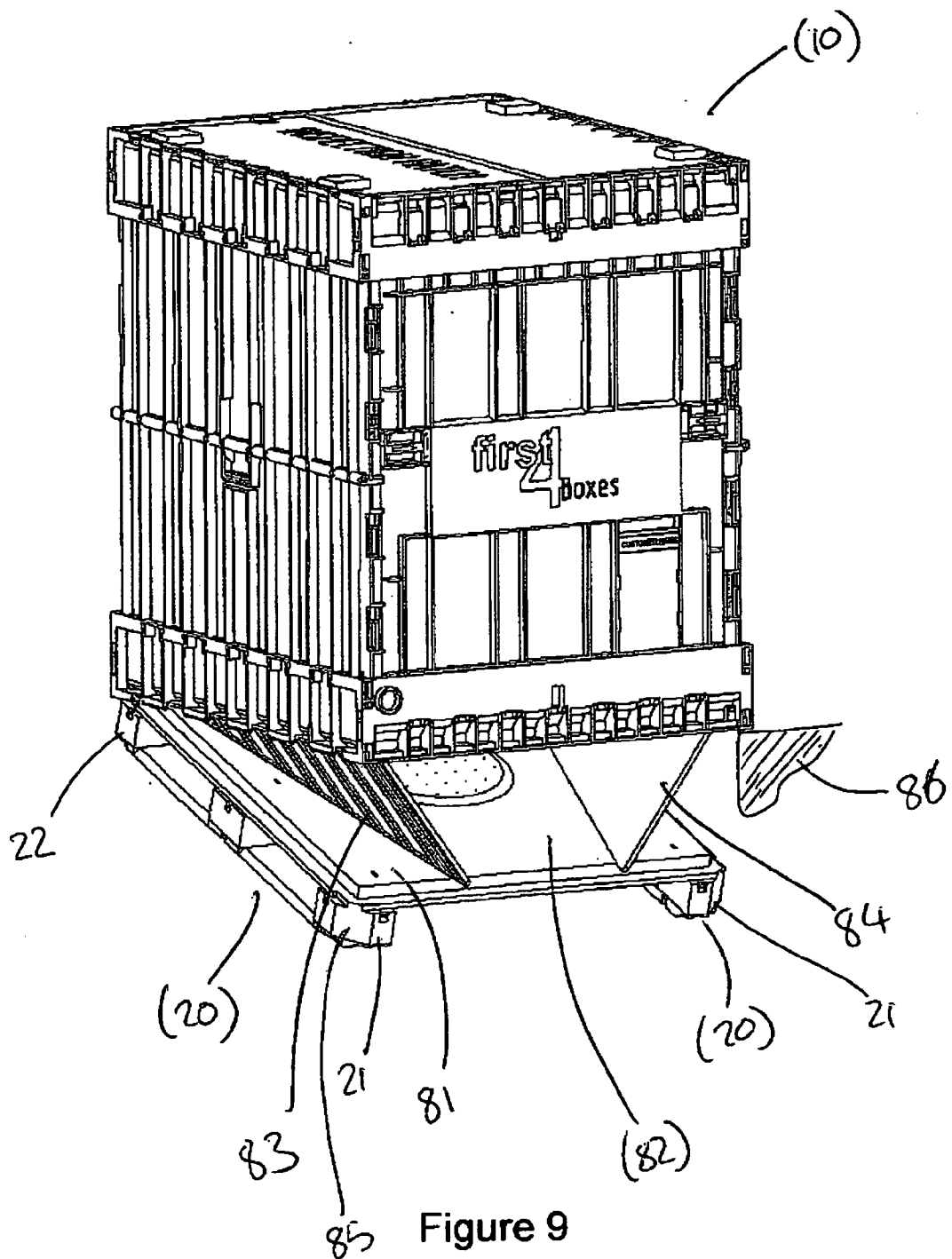


Figure 8



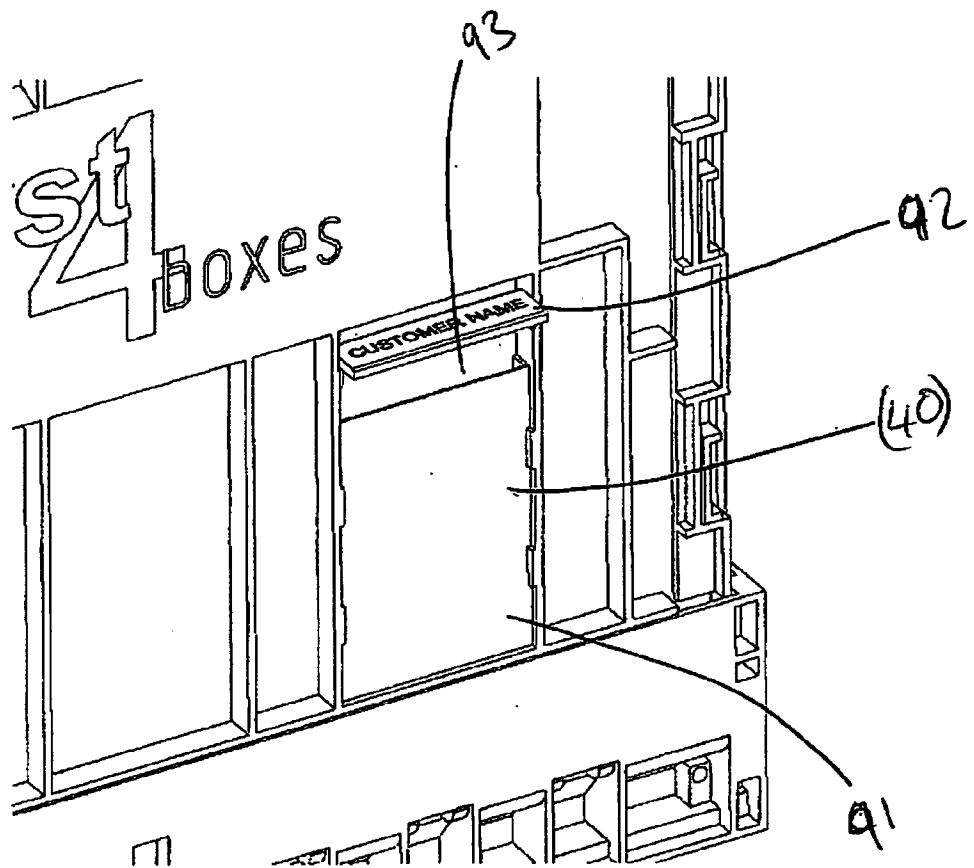


Figure 10

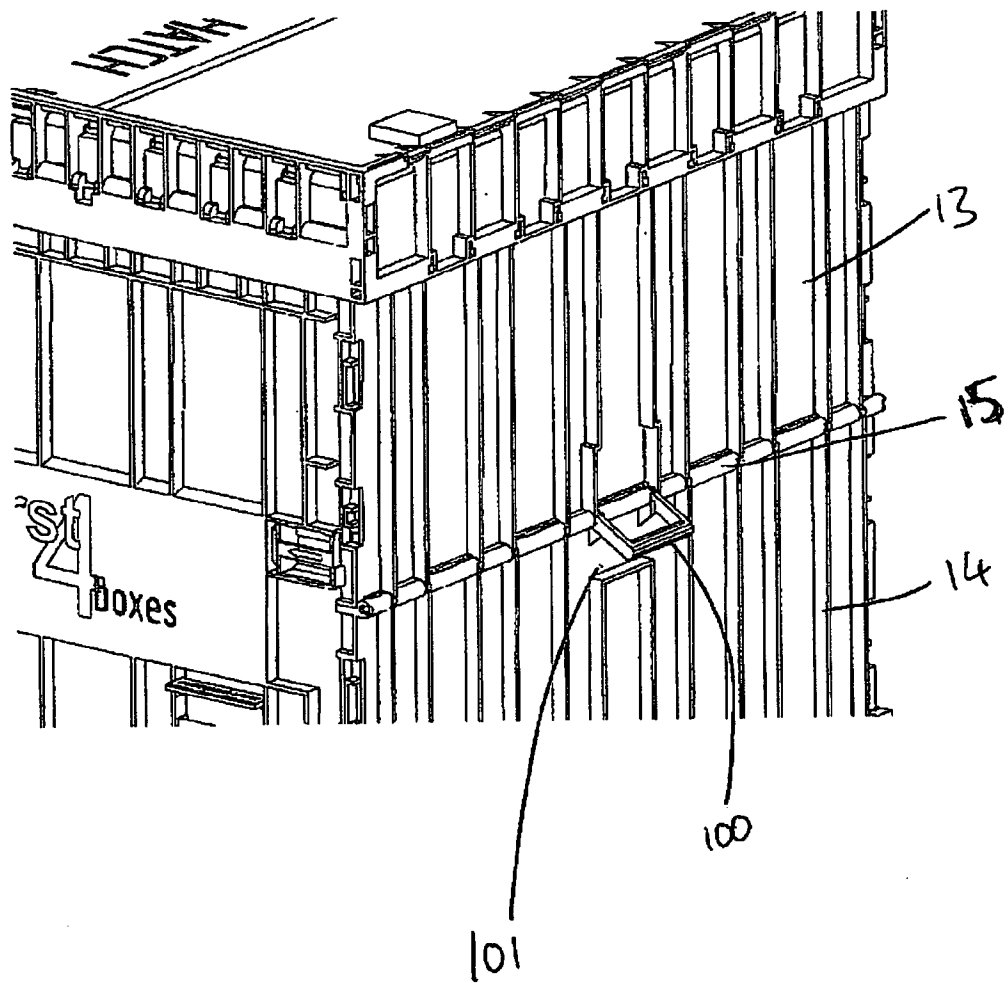


Figure 11

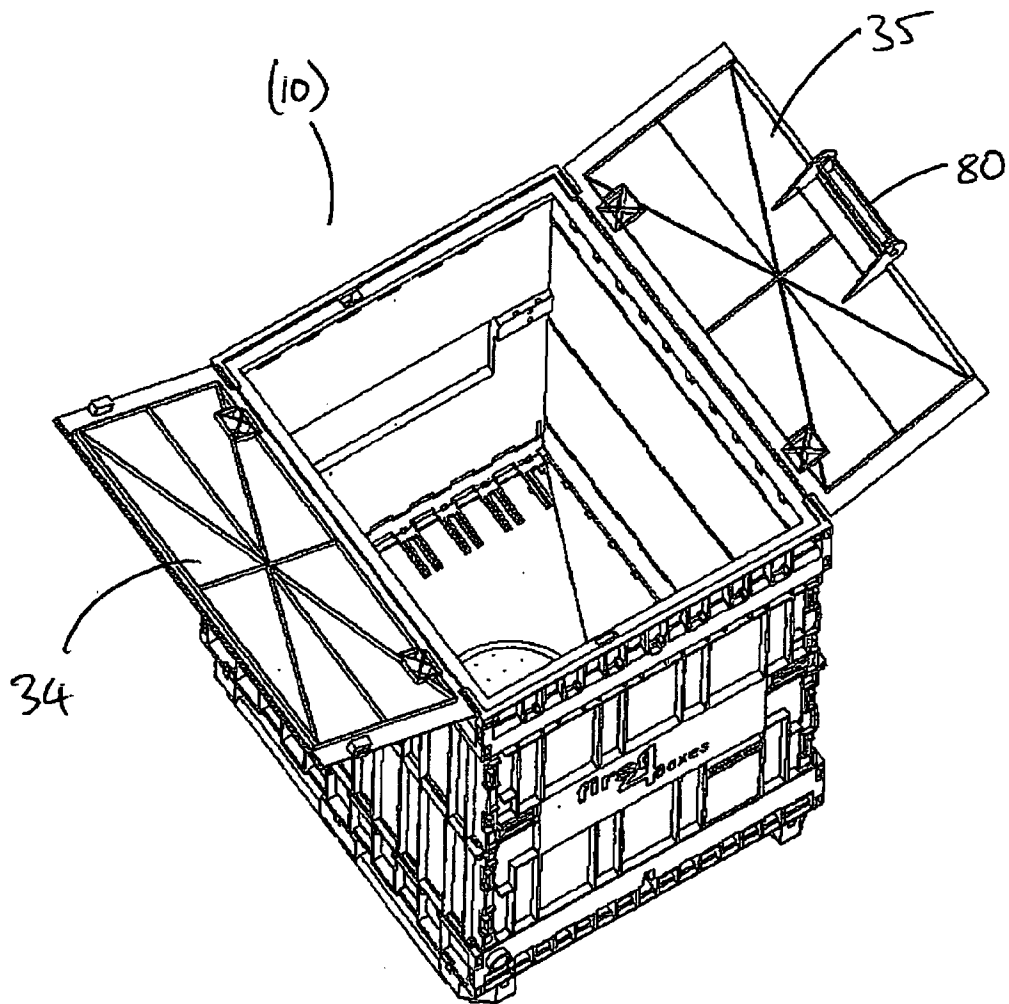


Figure 12

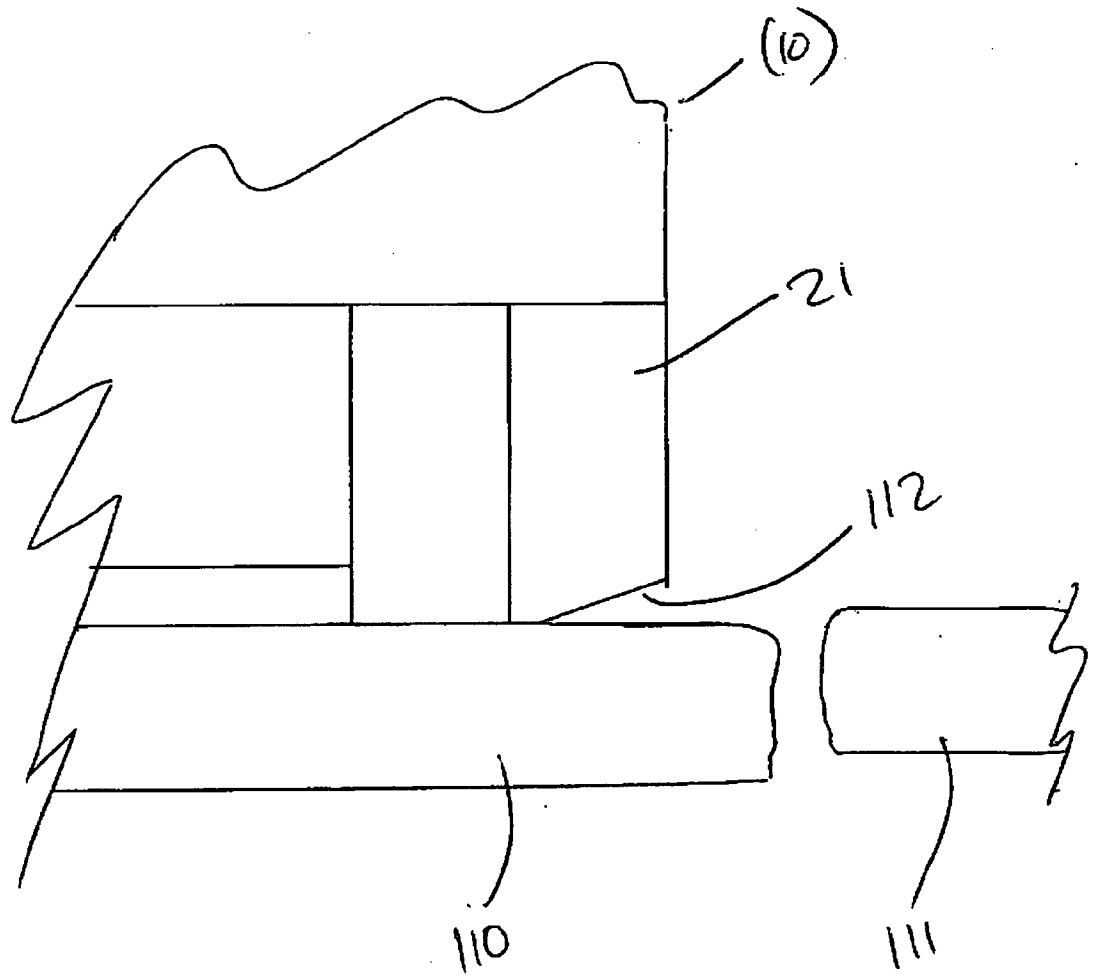


Figure 13

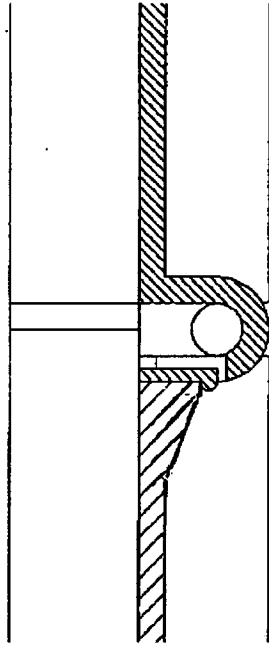


Figure 14

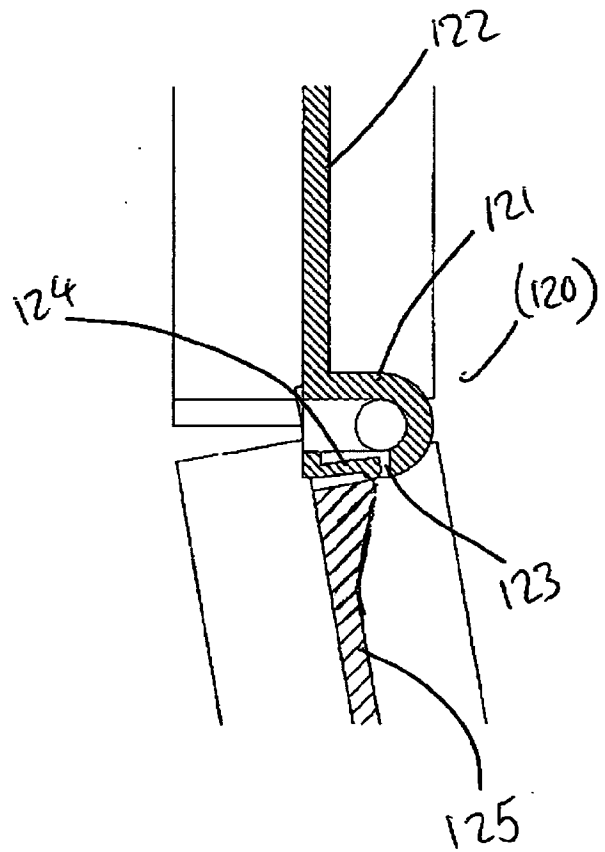


Figure 15

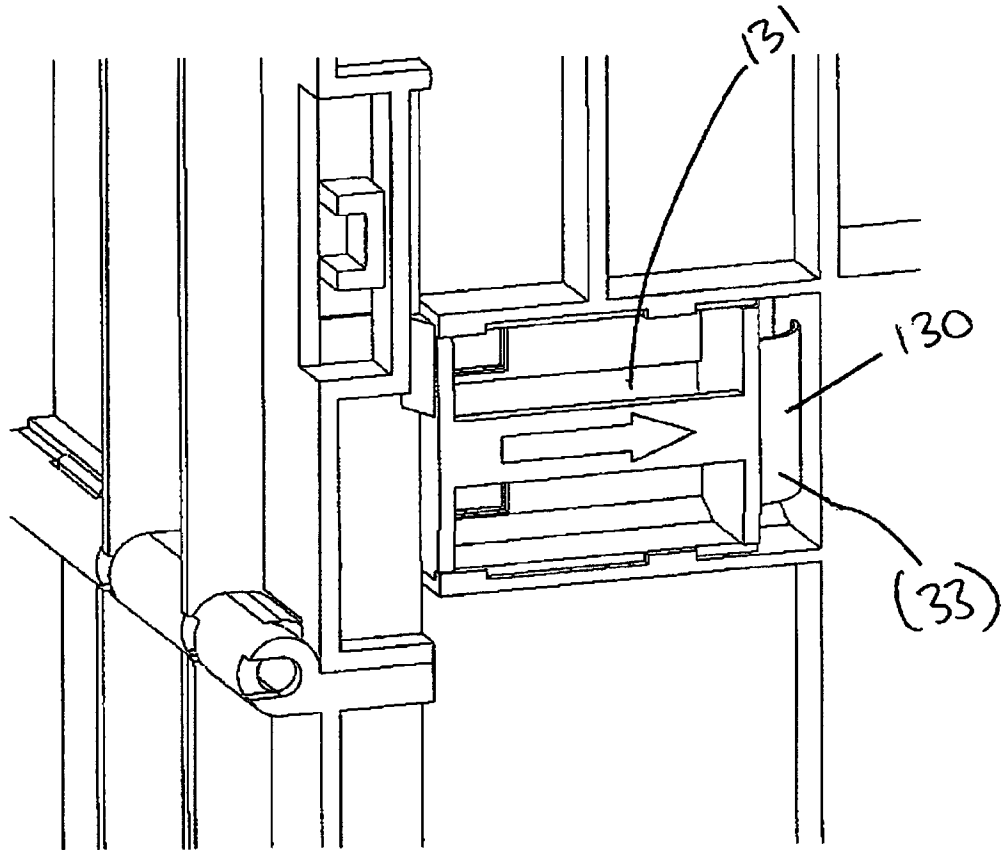


Figure 16

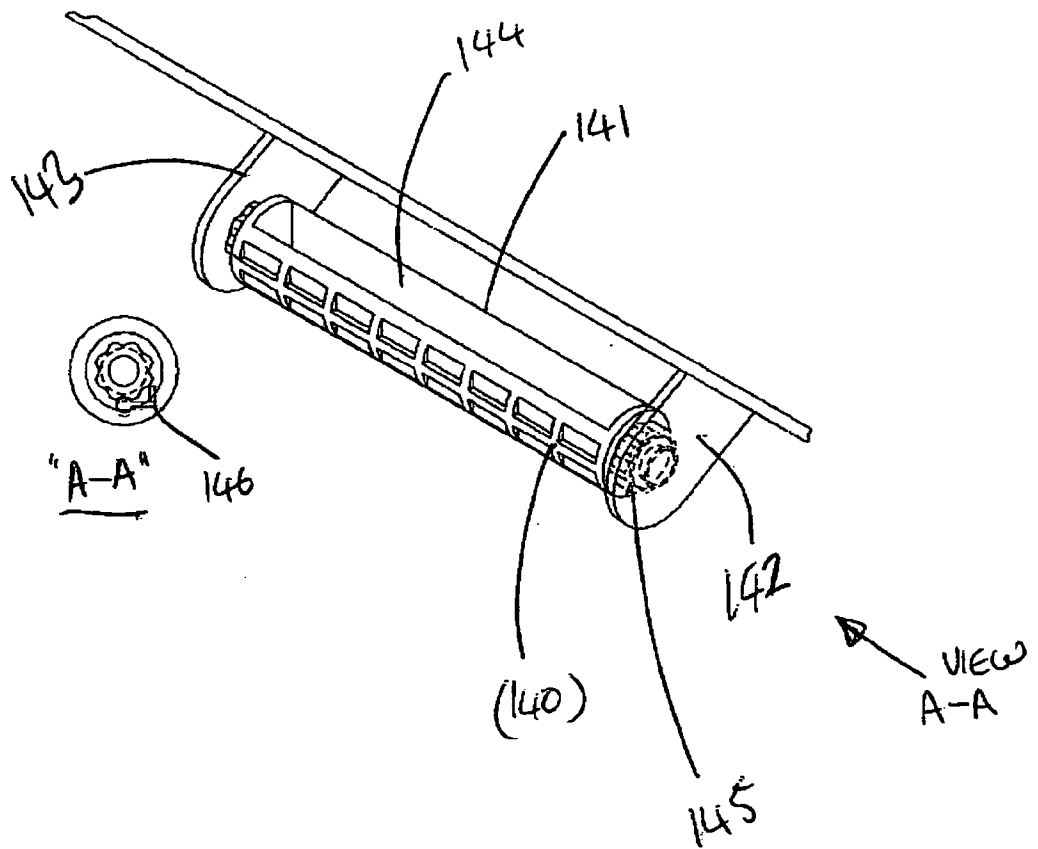


Figure 17

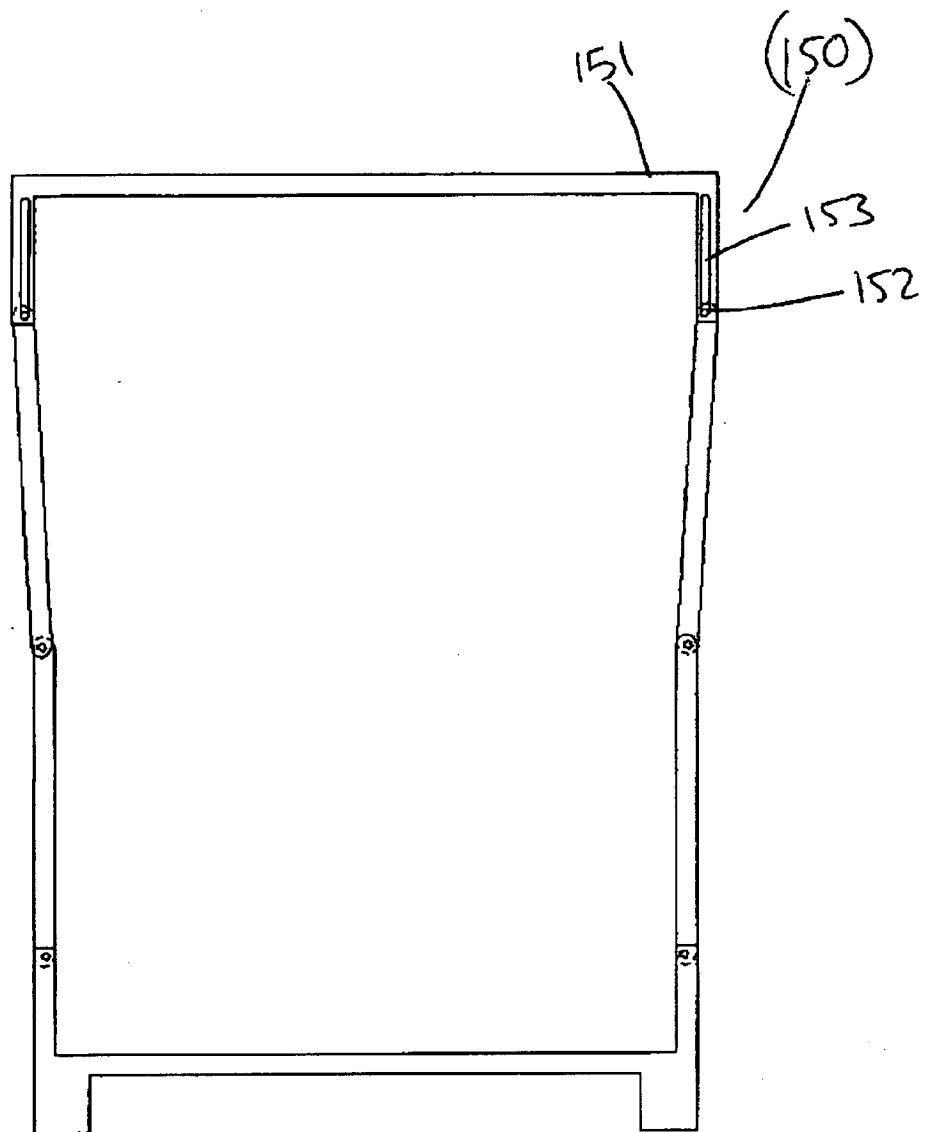


Figure 18

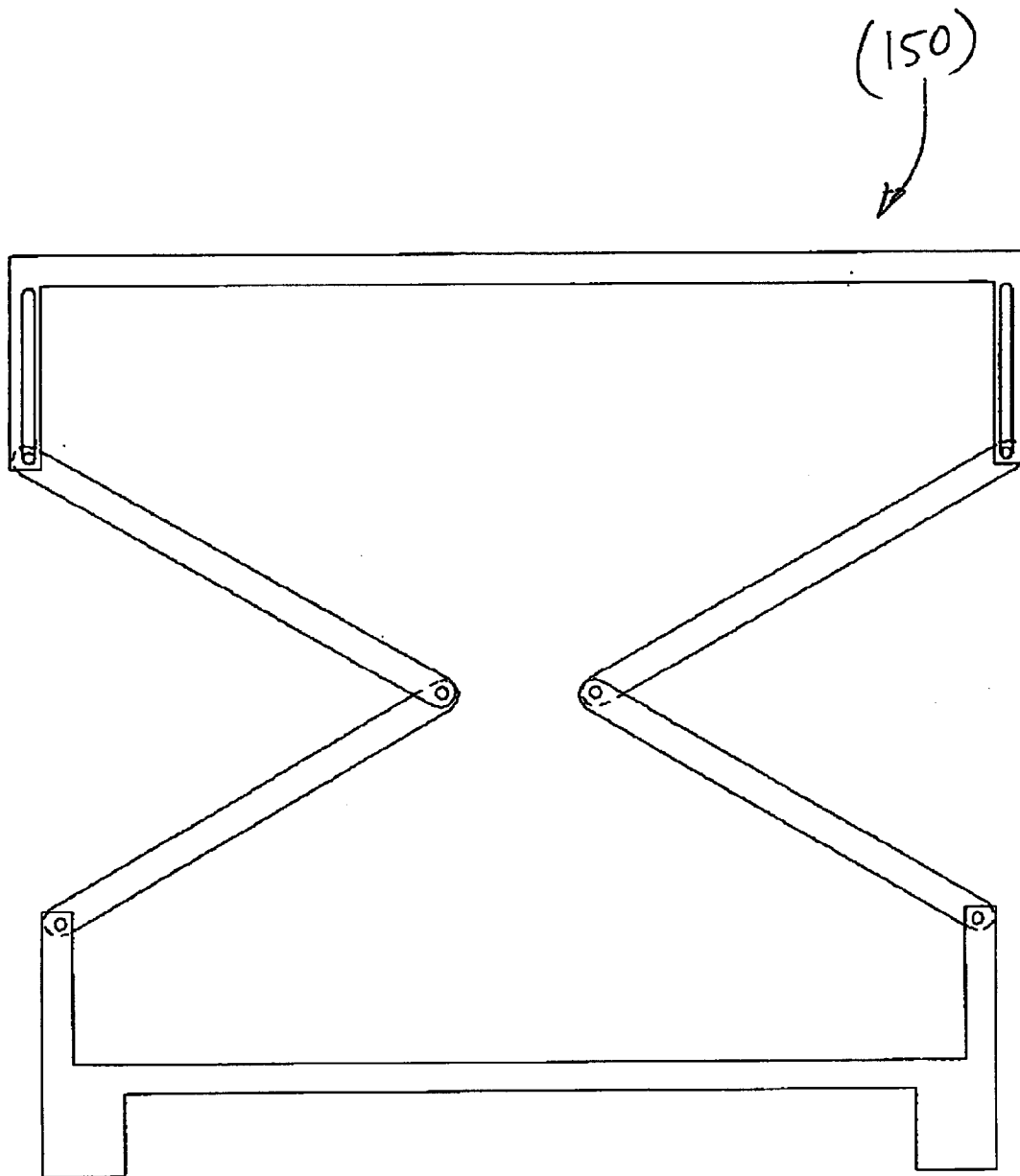


Figure 19

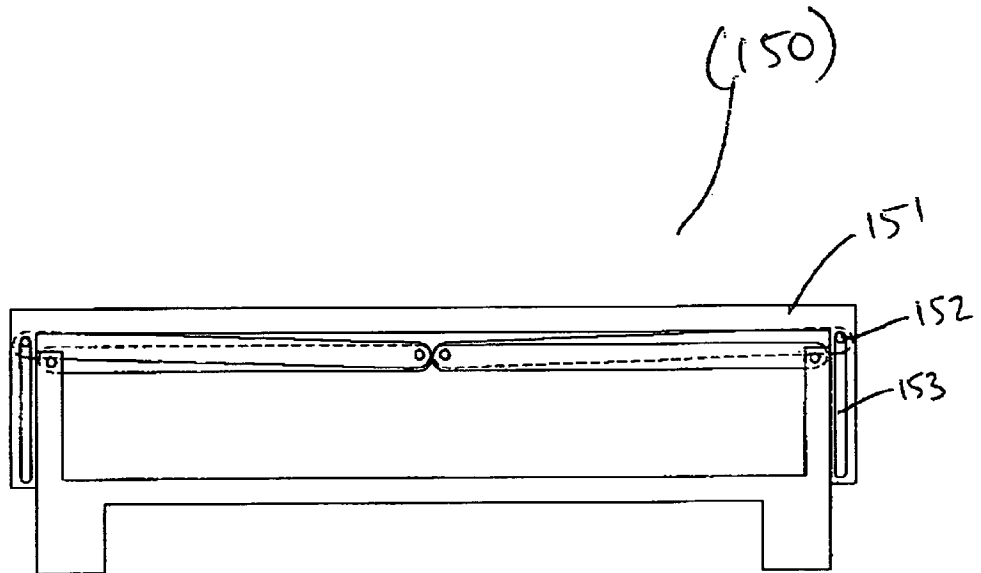


Figure 20

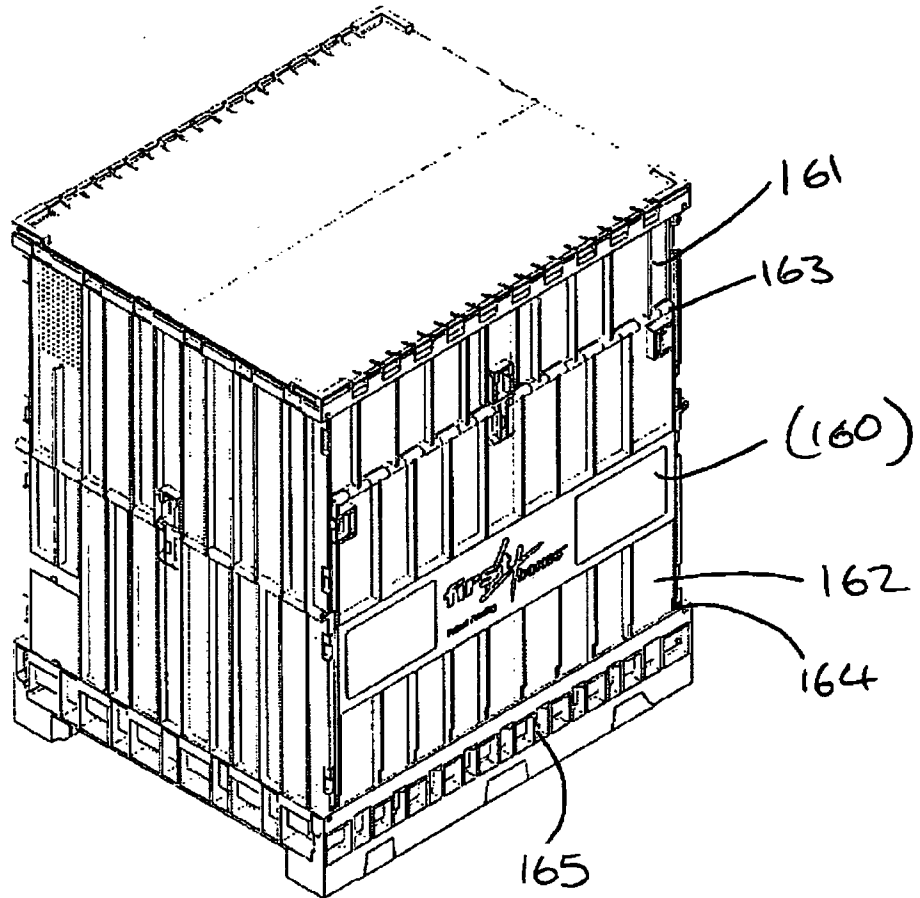


FIGURE 21

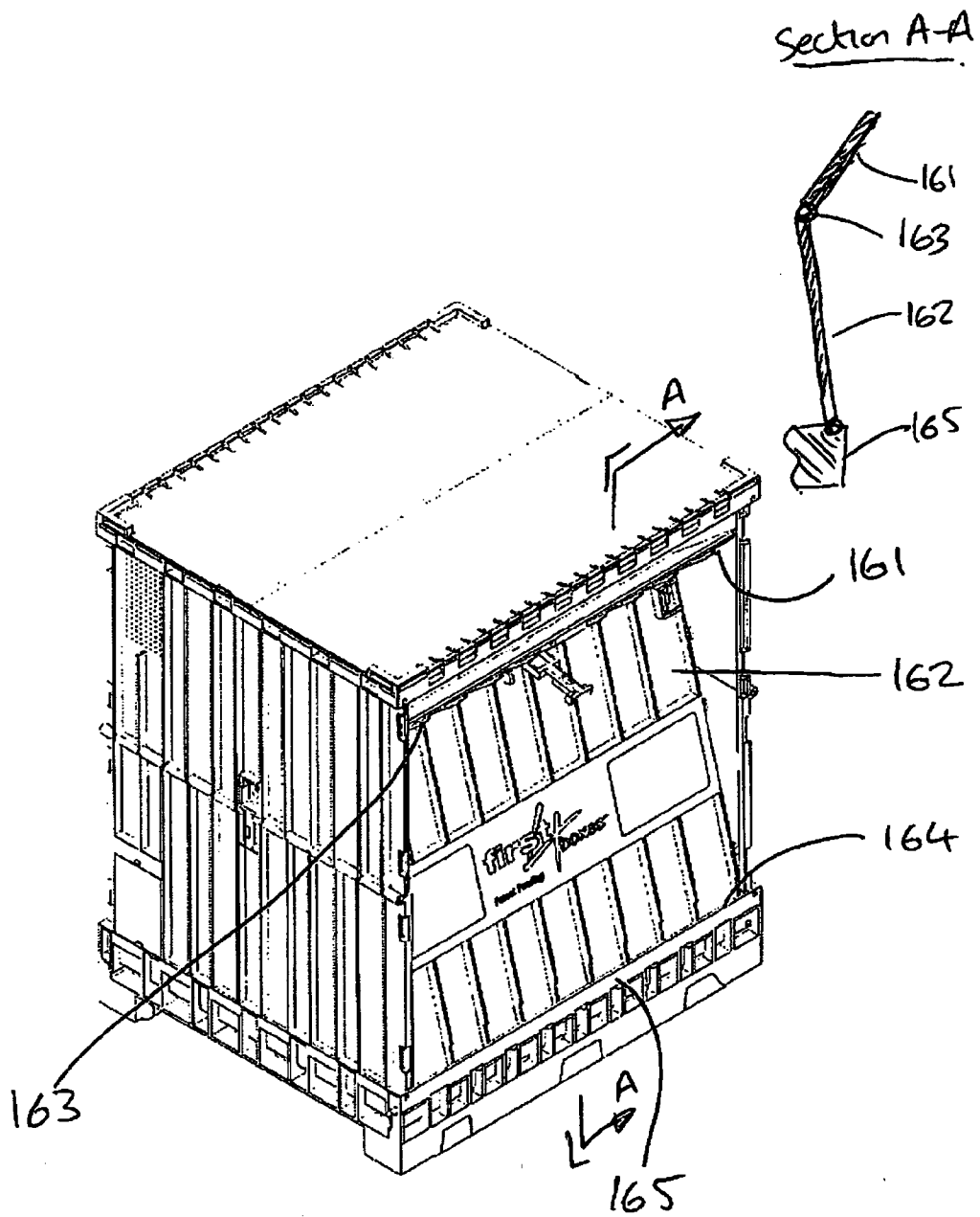


FIGURE 22

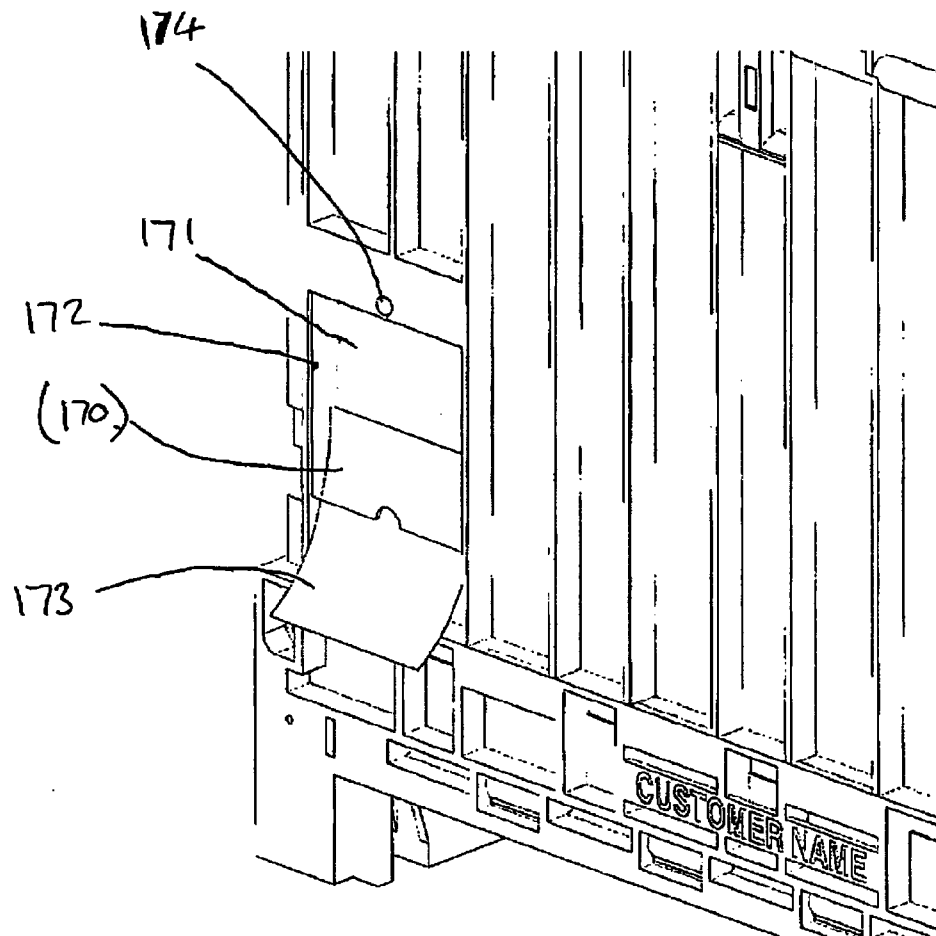


FIGURE 23