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Thibodeau

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(54) **CONTAINER/CARGO RACK WITH INTEGRATED LOCK DOWN AND INDEXING SLIDE**

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(52) **U.S. Cl.** **211/11**

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See application file for complete search history.

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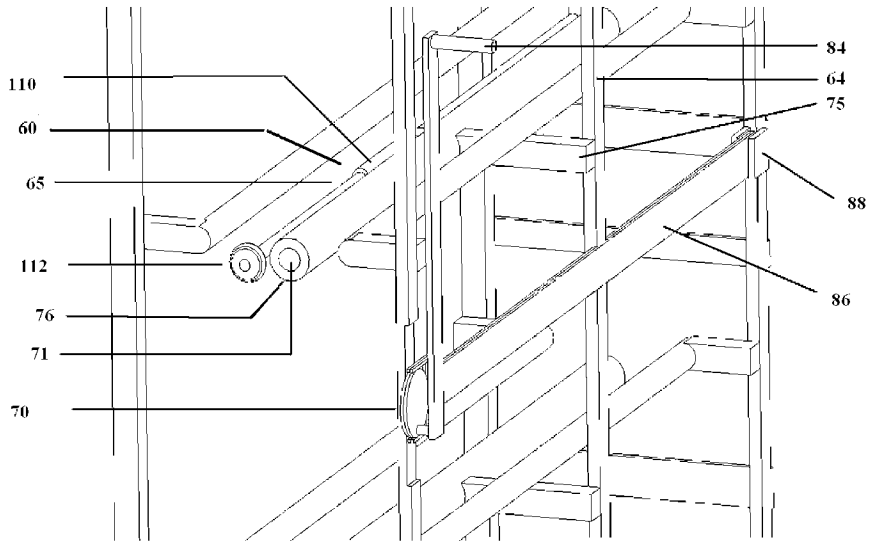
(57) **ABSTRACT**

The present invention is a container rack that locks down the containers to prevent shock and vibration damage to the containers. The device consists of a rack structure, a trombone means which is used to pull the containers forward, a lock down means to hold the containers in place and a closing means which is used to close the lock down means in place.

21 Claims, 12 Drawing Sheets



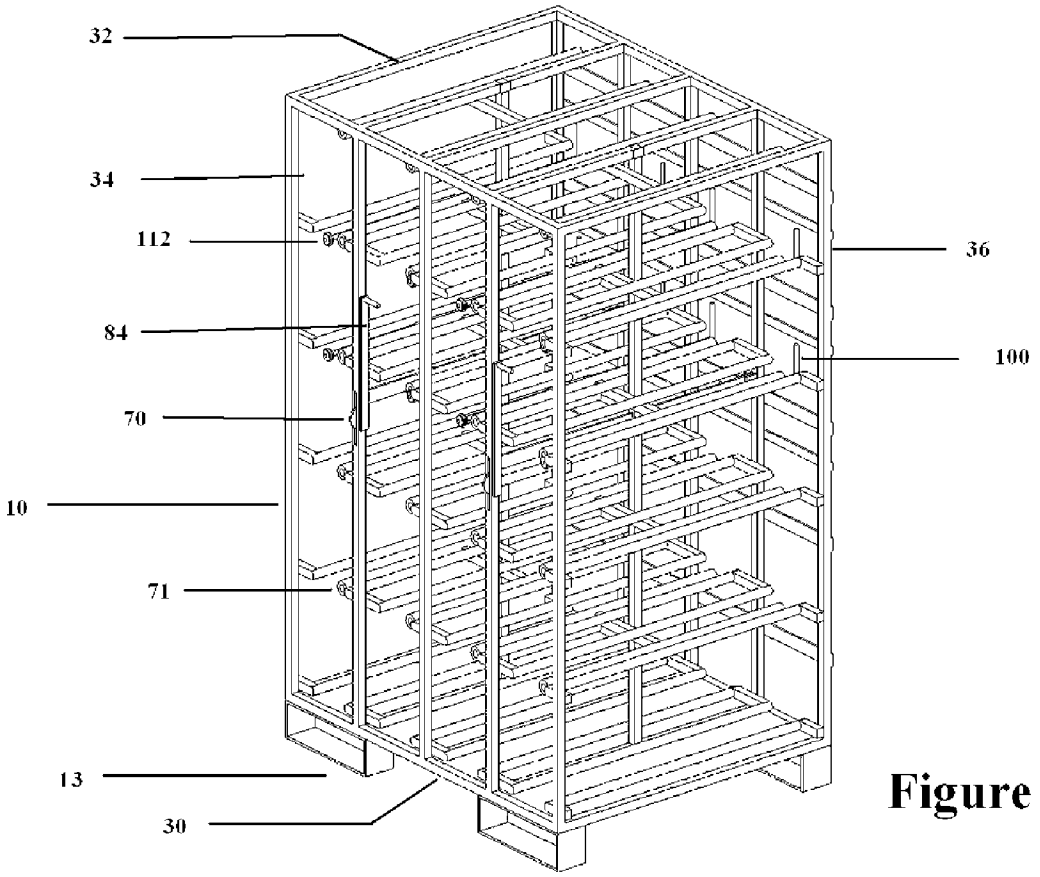


Figure 1 a

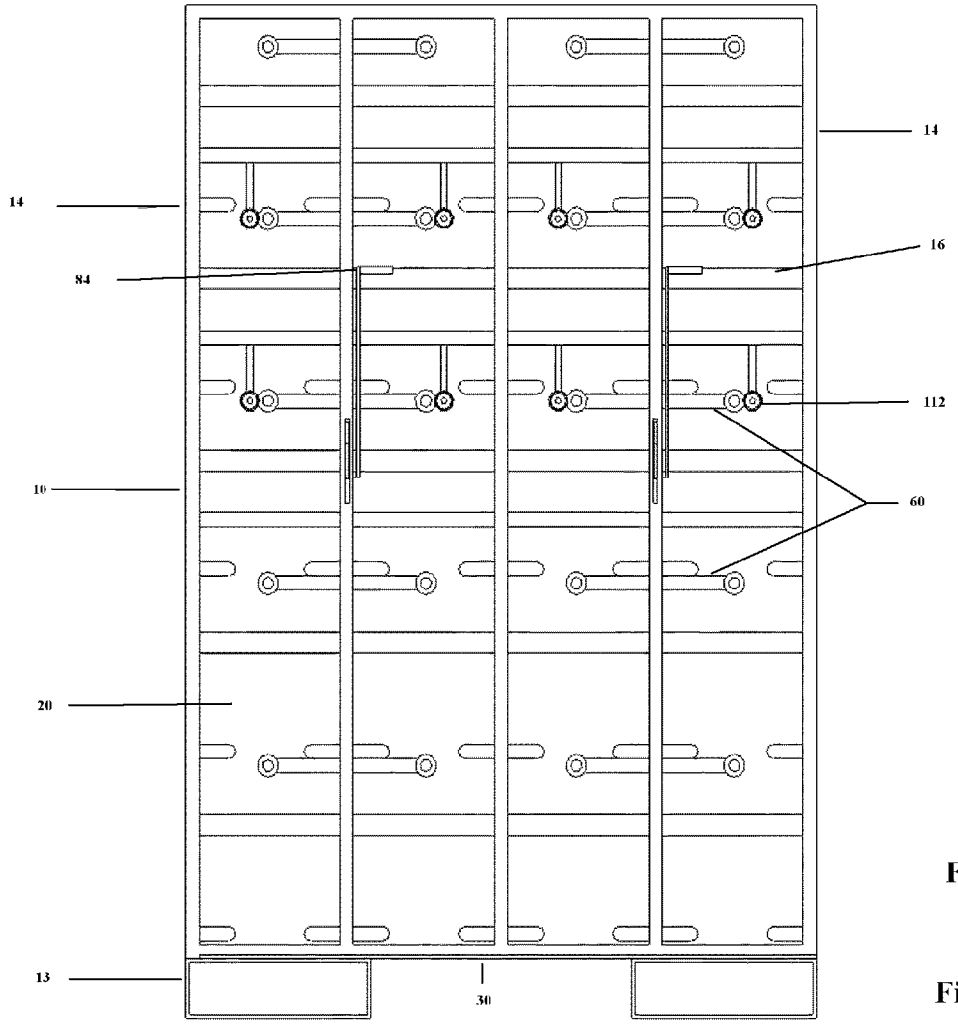
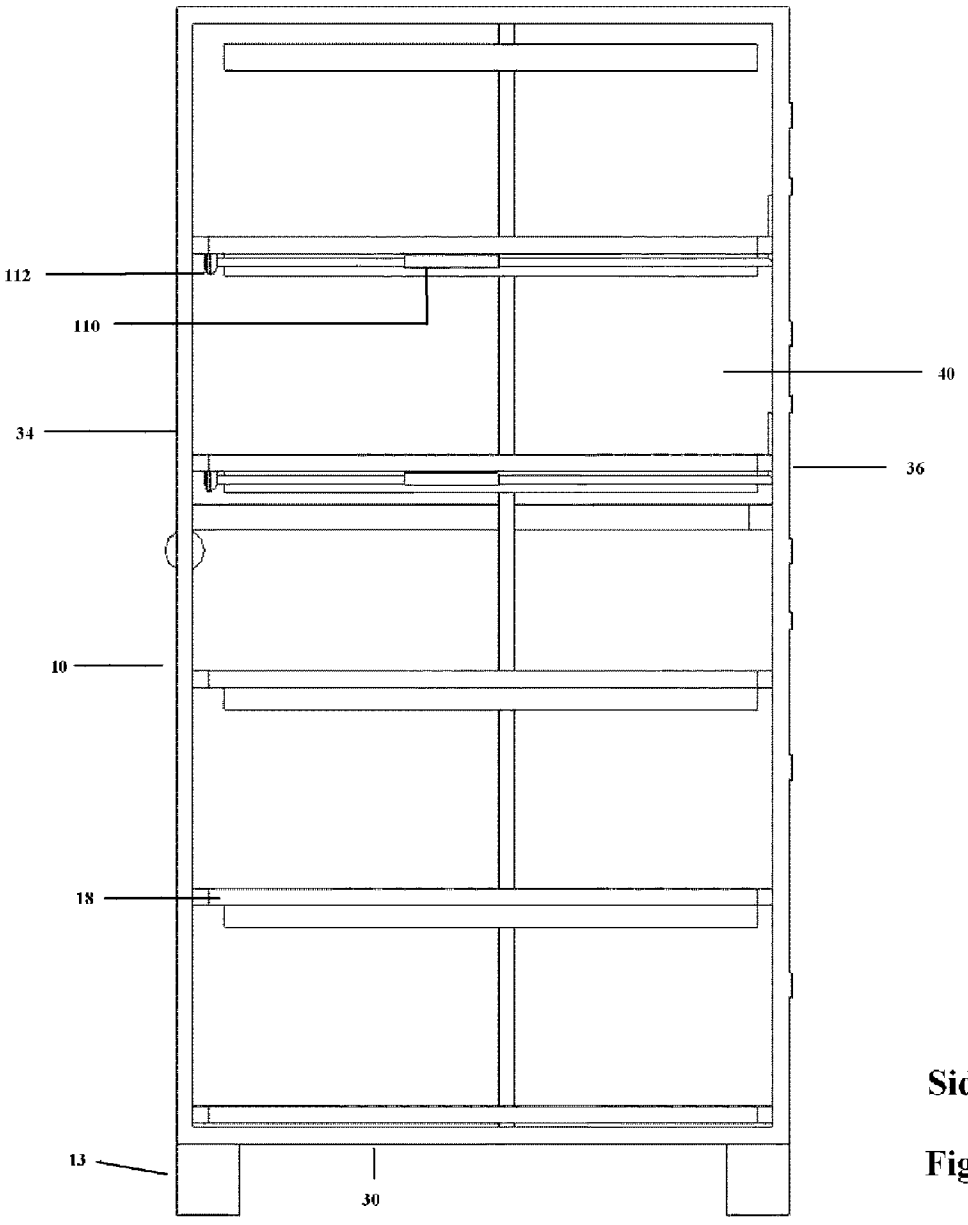


Figure 1 b



Side

Figure 2

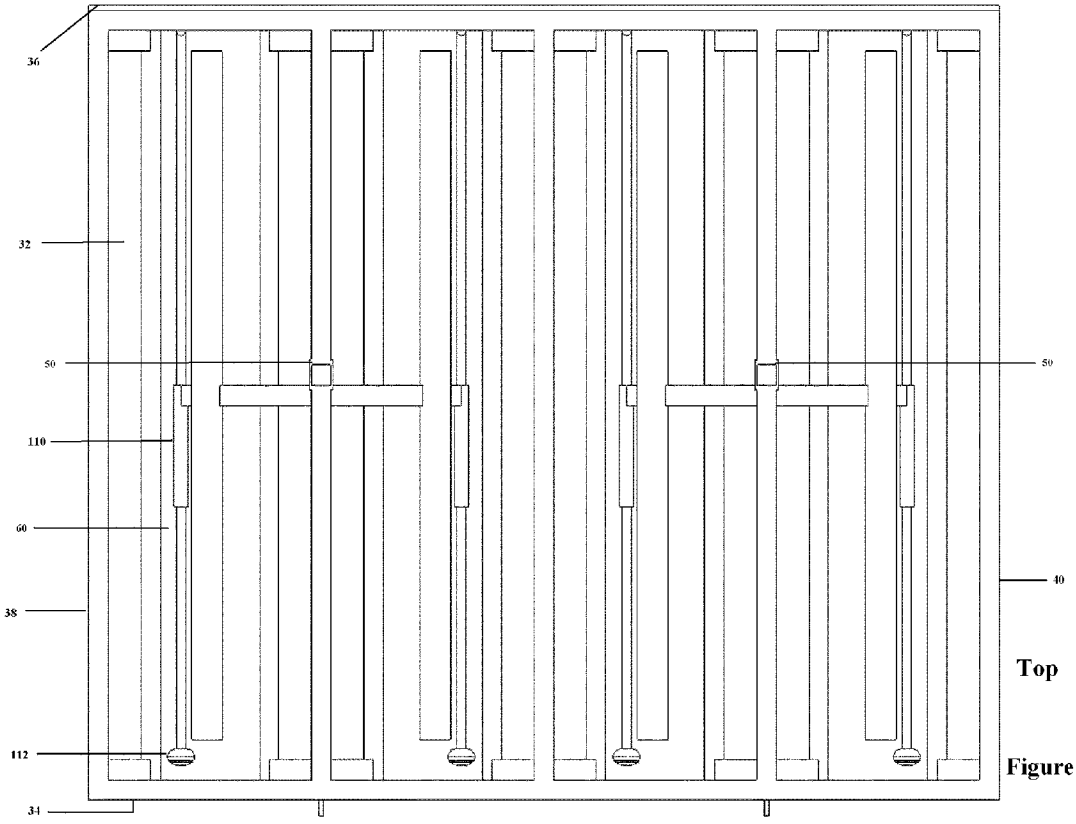
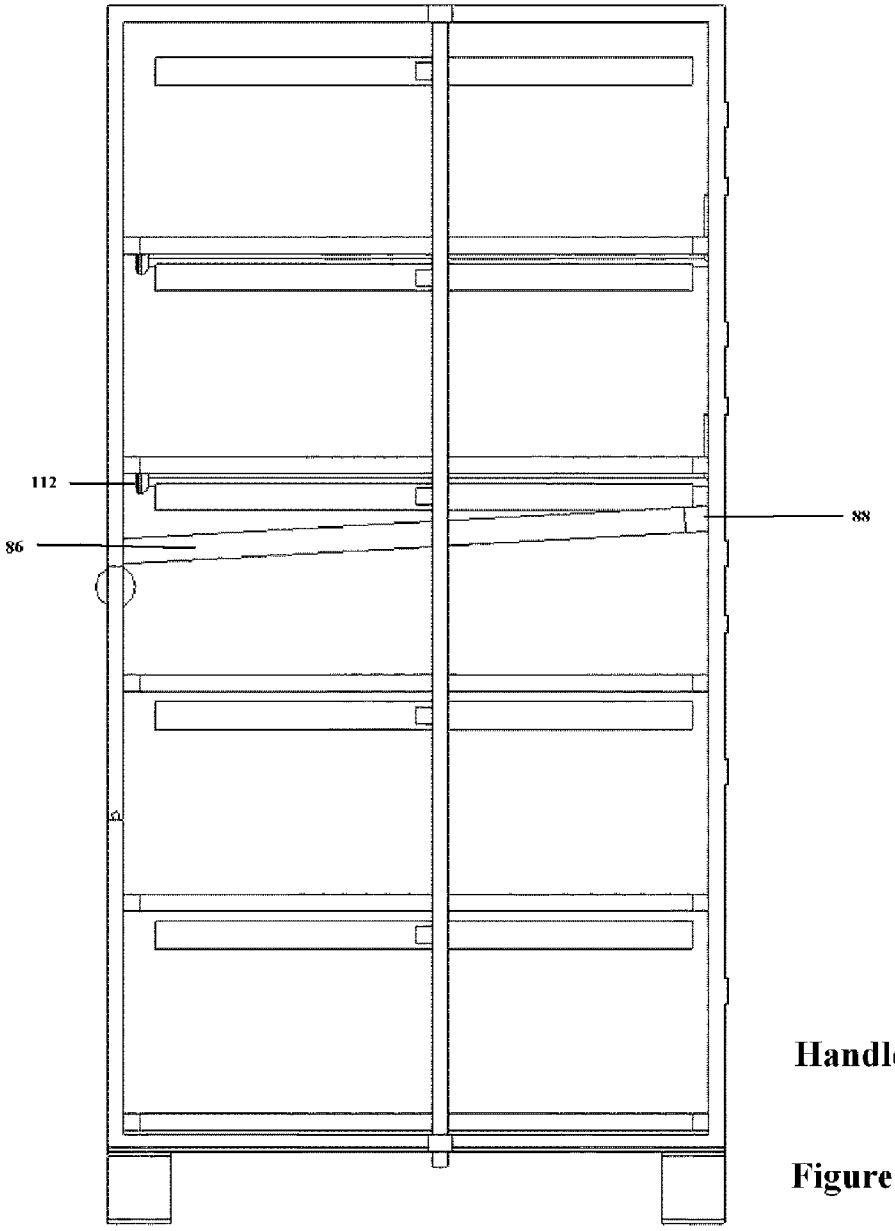
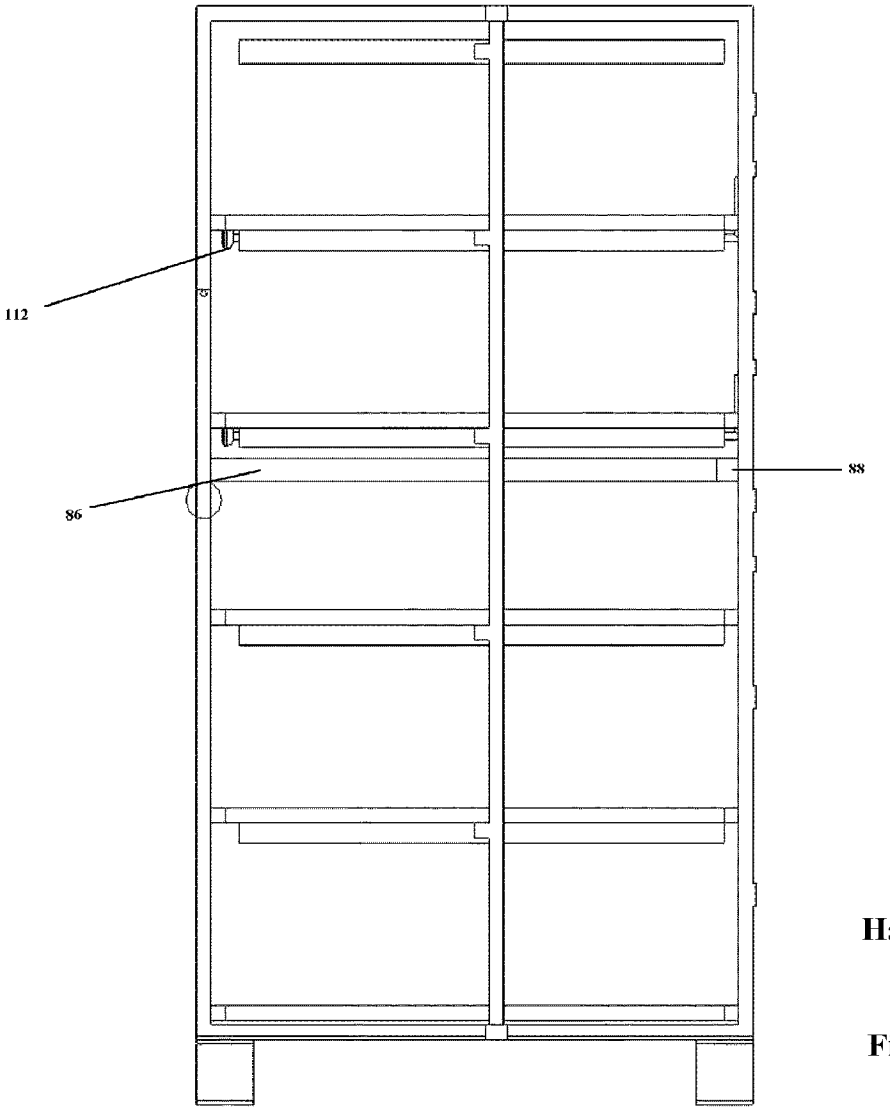


Figure 3



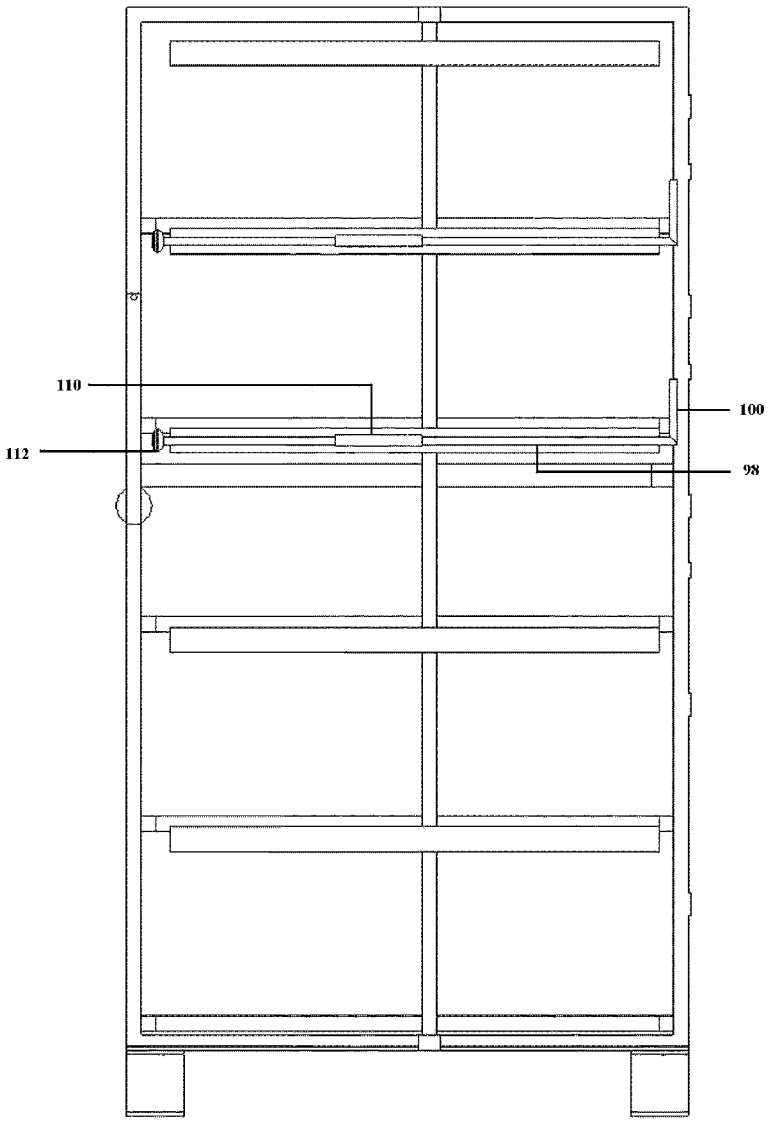
Handle Down

Figure 4



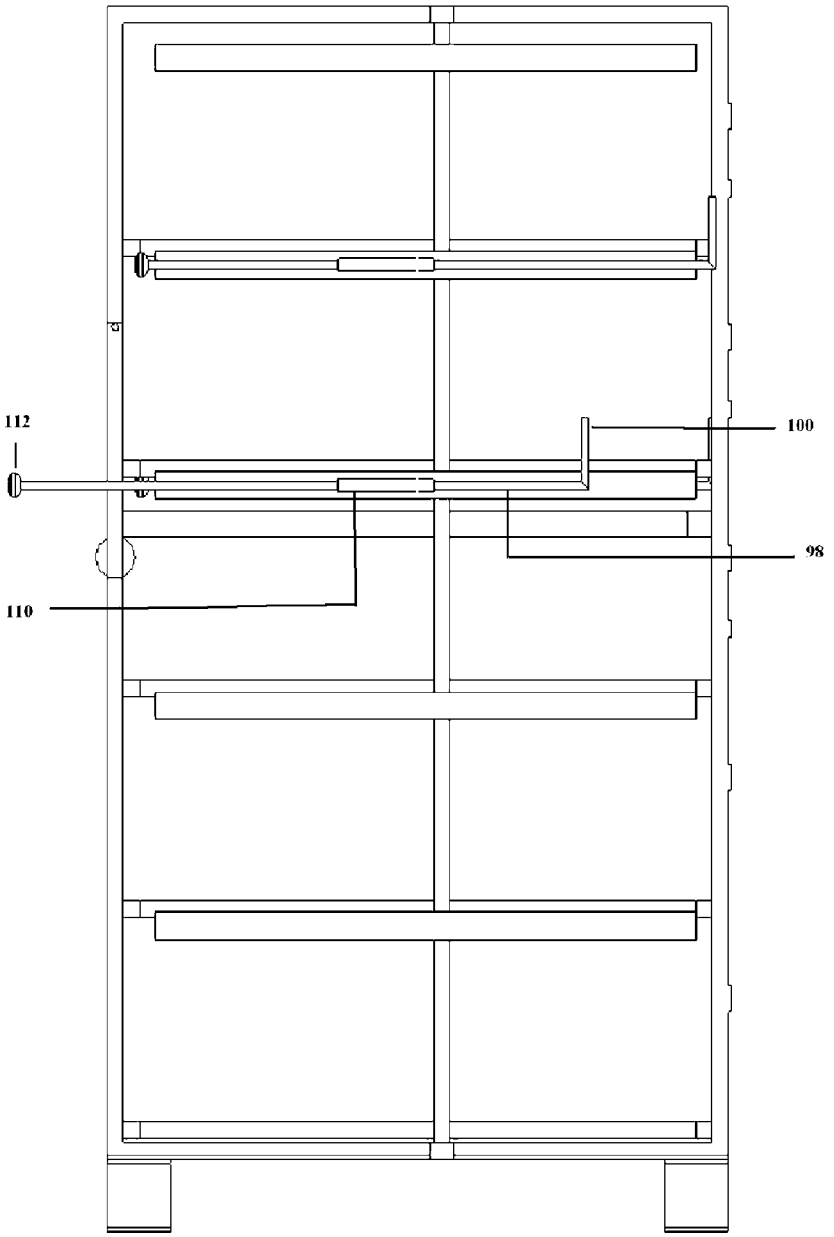
Handle Up

Figure 5



Trumbone In

Figure 6



Trombone Out

Figure 7

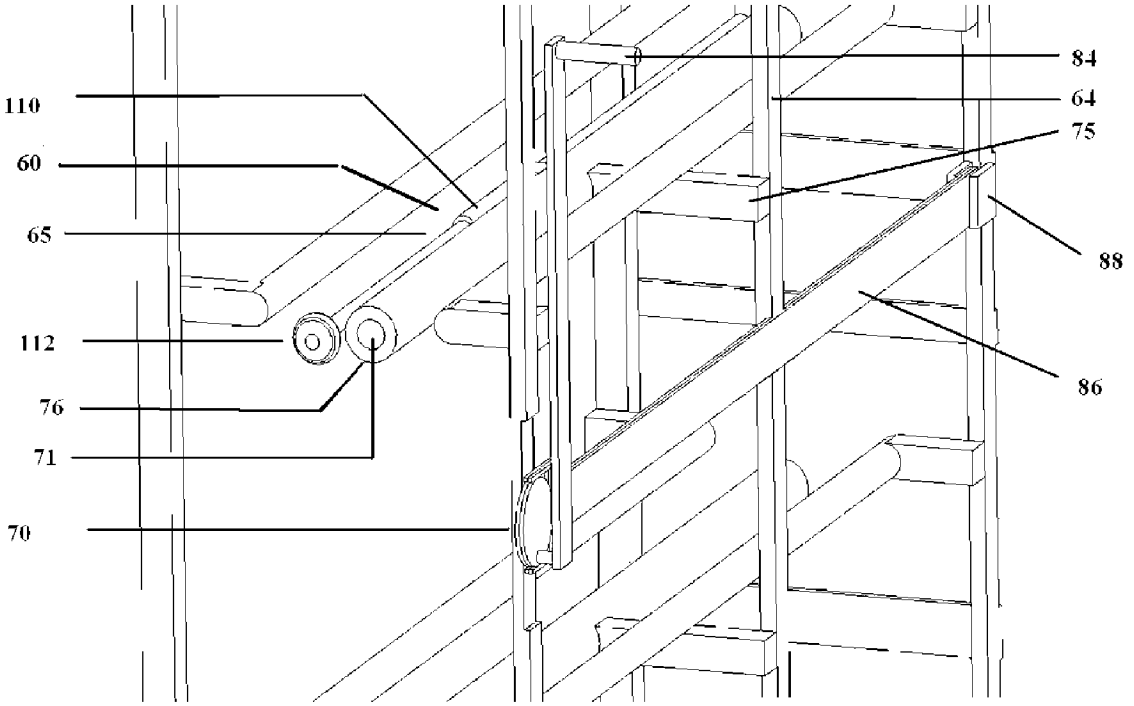


Figure 8

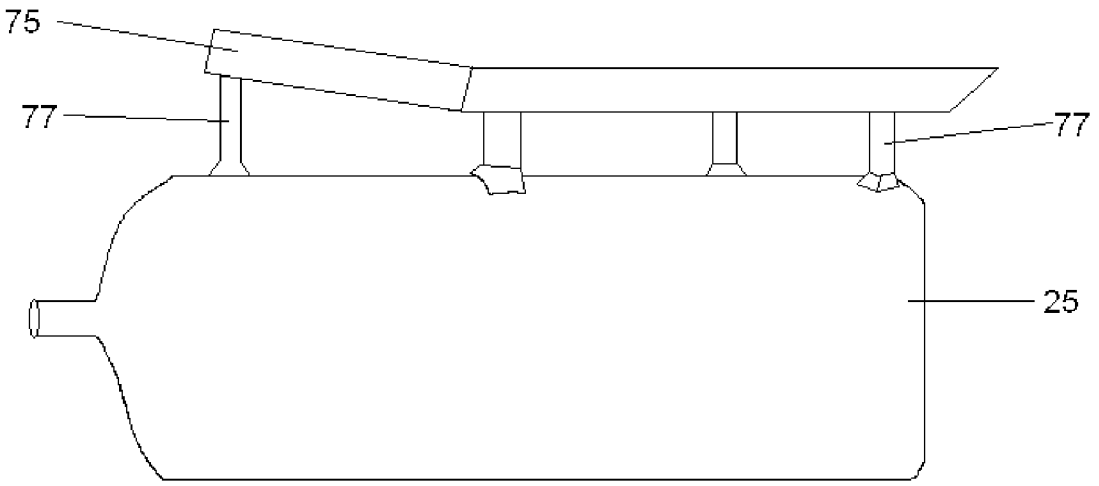


Figure 9a

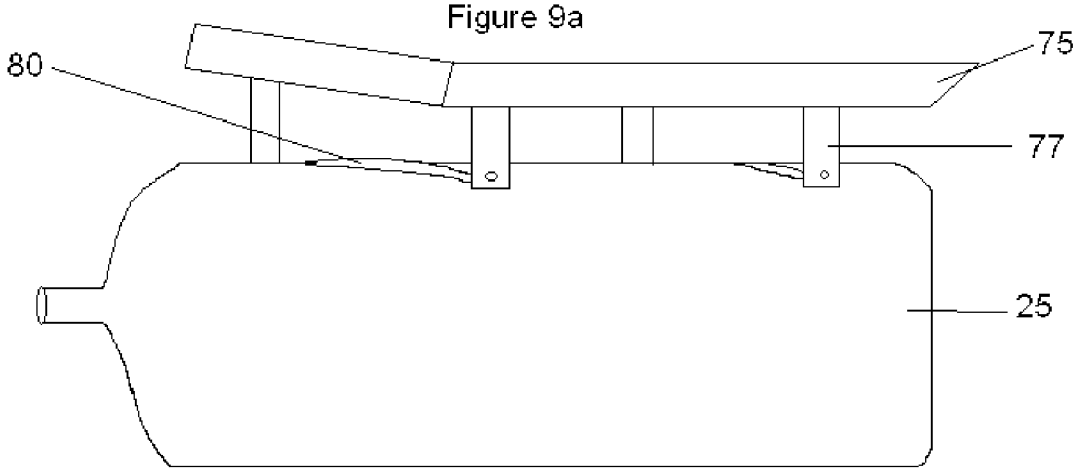


Figure 9b

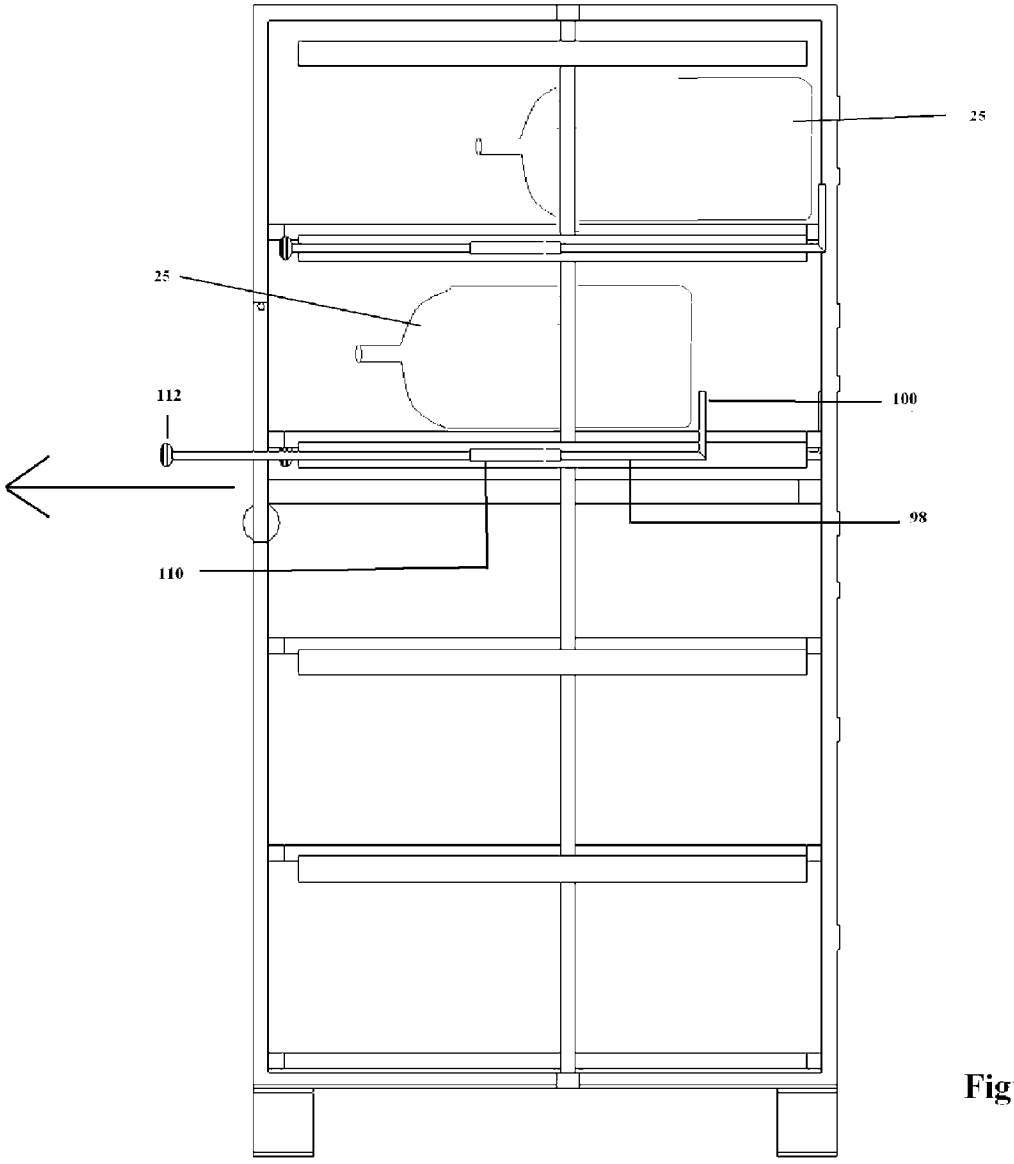


Figure 10

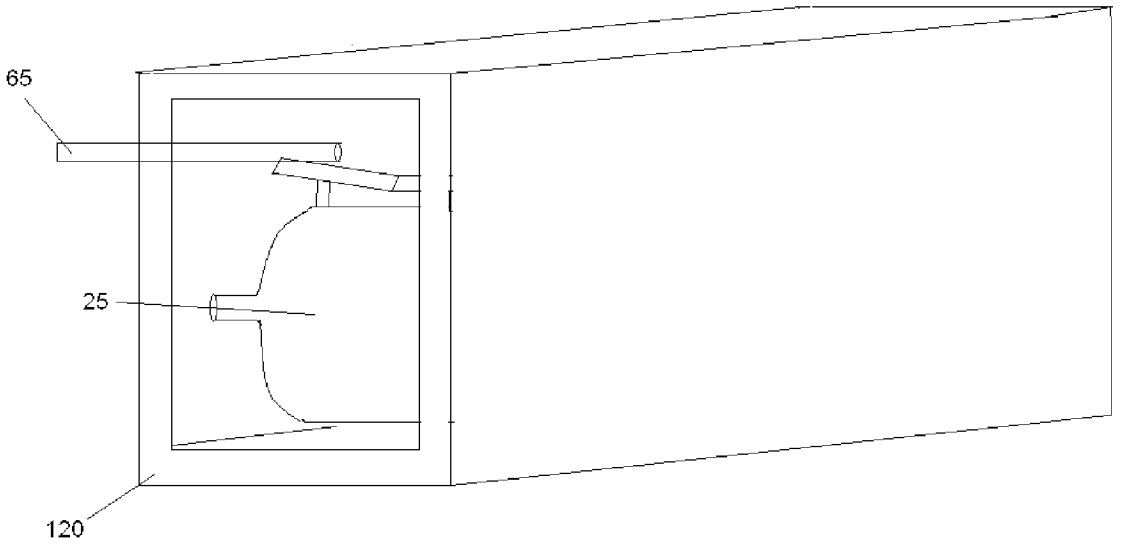


Figure 11

CONTAINER/CARGO RACK WITH INTEGRATED LOCK DOWN AND INDEXING SLIDE

RELATED APPLICATION

This application claims the benefit of U.S. Provisional Application No. 60/521,117, filed Feb. 23, 2004.

BACKGROUND OF INVENTION

This invention relates to a method and a device for locking down containers/cargo and more particular the locking down of containers for safer transporting.

1. Background

There is a large demand for bottled water with an increased concern about the purity and potability of municipally provided water supplies. The commercially provided bottled water is said to be purer and better tasting than what comes out of the tap.

Drinking beverages, such as spring water and others, is typically sold commercially in a plurality of different bottle sizes. An economical way to sell bottled water is to put it in large containers of 5 gallons or more.

The most common type of commercially available bottled water dispensers are of an inverted bottle type construction wherein the bottle is turned upside down into an open receptacle or well which is on top of the cooler dispenser. The most common bottle receptacle of these re-usable polymeric bottles is a standard 5-gallon plastic jug having a narrow mouth and a flat bottom portion. These 5-gallon jugs have two or more annular rims extending outwardly from the bottle side wall to facilitate carrying of the jugs and to provide rolling surfaces when the jugs are rolled on their sides. Such size gallon bottled water containers are commercially available from a number of sources and are typically returned by the user when the water has been consumed there from. The jugs must be transported to and from the filling plant and are typically sterilized before refilling.

These bottled water jugs are normally delivered by delivery trucks. These trucks have a rack that places them horizontally. This horizontal position facilitates movement and storage of the container while on the delivery truck.

At the top of the list of every major analysis of bottle mortality is transit damage in racks. The shock and vibration during over the road transportation cause both hairline and catastrophic damage to full bottles. Many routes have such poor roads (and the resulting elevated damage and claims) that they are financially untenable for bottling companies and service is not offered.

Bottle designers have traditionally been restricted in the features used in water bottles because convenience features reduce bottle life. Designs that do not maintain a continuous round perimeter, i.e. handled bottles, are structurally unable to dissipate the dynamic stresses of the rack and the bottles crack or break near the handle.

During delivery, the driver is most vulnerable when unloading bottles from the upper tiers of the rack. Full bottles weigh upwards of 40 lbs., and reaching to the back cavity of the rack requires pulling a full bottle forward and assuming the weight while in a vulnerable position. At elevated heights, the opportunity to lose balance, lose control of the bottle or even drop it from 10 feet or more increases dramatically.

There is still room for improvement in the art.

SUMMARY OF INVENTION

The present invention relates to a container/cargo rack that locks down the containers/cargo to prevent shock and vibration damage to the containers/cargo. The device consists of a rack structure, a trombone means which is used to pull the containers/cargo forward, a lock down means to hold the containers/cargo in place and a closing means which is used to close the lock down means in place.

An objective of the current invention is to enhance driver and route efficiency. Additionally, an objective is that the driver will be less likely to return to base with full bottles, making the route more productive and route productivity will also be enhanced because bottles will not migrate up against the delivery door causing the door to jam shut. The device will make the driver activity more productive during unloading, lower the overall time spent at each delivery point, and reduce or eliminate the possibility of returning full bottles to base.

Another objective of the current invention is to improve driver safety in multiple dimensions while reducing injuries, lost time, and workman's compensation expenses for delivery truck operations.

A further objective of the current invention is to reduce the incidence and payment of consumer claims. Bottle life and functionality will be vastly improved through the use of this device. Overall, the device will deliver a quantum reduction in transit damage and the resulting extension of asset life for bottlers, and open new geography.

The current invention will enable unprecedented design flexibility for bottlers and convenience to their customers.

BRIEF DESCRIPTION OF DRAWINGS

Without restricting the full scope of this invention, the preferred form of this invention is illustrated in the following drawings:

FIG. **1***a* shows a perspective front view of basic rack used for the transportation of containers;

FIG. **1***b* shows a front view of the current invention;

FIG. **2** shows a side view of the current invention;

FIG. **3** shows a top view of the current invention;

FIG. **4** shows a side view with the handle down;

FIG. **5** shows a side view with the handle up;

FIG. **6** displays a side view with the trombone in;

FIG. **7** displays a side view with the trombone out;

FIG. **8** displays the lock down and trombone means;

FIGS. **9***a* and **9***b* displays alternative additional embodiments of the lock down means;

FIG. **10** shows the trombone means being used; and

FIG. **11** shows the device being used with a plastic side rack.

DETAILED DESCRIPTION

The following description is demonstrative in nature and is not intended to limit the scope of the invention or its application of uses.

There are a number of significant design features and improvements incorporated within the invention.

Referring to FIG. **1***a*-**6**, there is shown a standard water bottle rack **10** in accordance with an embodiment of the present invention. The water bottle rack **10** includes a peripheral frame **20** made of structural steel so as to form a generally parallelepiped shaped outer frame.

A typical rack has a height substantially in range of 68", a width substantially in the range of 48" and a depth substantially in the range of 40". Typically, these dimensions allow for the storage of 40 conventional 5-gallon water jugs. It should be understood that the rack **10** could have other configurations, construction materials and sizes without departing from the scope of the present invention.

A typical rack **10** has vertical **14**, lateral **16** and side **18** supports made of a structurally sound material such as metal like galvanized steel. These supports form a plurality of rectangular cells **200**. These cells can also be molded and constructed in plastic. Each of these cells is deep enough to store two standard containers **25** such as water bottles. The side **18** supports also serve as a resting place for the containers **25**.

The rack **10** has a bottom **30**, top **32**, front **34**, back **36**, left **38** and right **40** sides. The bottom **30** has a metal sheet. The rack **10** has four feet **13** on the bottom **30**. These feet **13** are positioned at the corners and so that the rack **10** can be moved with a forklift. The device has a trombone means **60**, lock down means **65** and a close means **70**.

As shown in more detail in FIGS. **6**, **7**, and **10** the device **1**, preferred embodiment, is a rack **10** with a trombone means **60** which is used to move the containers **25** out of the cells **20**, a lock down means **65** and a close and tensioning means **70**. The close and tensioning means **70** runs through a post **64** which runs the height of the rack **10**. The posts **64** extend through guides **50**. The posts **64** can have an additional tensioning means such as a spring attached from posts **64** to the base of the rack **10**. The tension means **70**, **67** provides a downward force which is transferred to the lock down means **65**. A post **64** can have one or more lock down means **65** attached to it, one or more per container **25** in the cell **22**.

The lock down means **65** of the preferred embodiment is shown in FIG. **8**. The frame **75** is attached to the post **64**. Attached to the end of the frame **75** is the lock down tube **71**. Surrounding the lock down tube **71** is multiple numbers of plastic or rubber buffers **76** which encircle the lock down tube **71**. When the lock down means **65** is brought down by the close and tensioning mean **70** the buffer **76** are brought into contact with the container **25** holding it down and in place. The buffers **76** are compressible so that the containers **25** are held even with uneven container **25** sizes.

In an additional embodiment as shown in FIG. **9***a*, it consists of a lock down frame **75** from which lock down appendages **77** extend out from the lock down frame **75**. The lock down appendages **77**, in the preferred embodiment, has rubber tips **79** on their ends. These lock down appendages **77** touch and apply force to the container **25** holding it in place and preventing vibration from transporting. The rubber tips **79** are compressible so that the containers **25** are held even with uneven container **25** sizes. In the preferred embodiment, the appendages **77** and frame **75** are made of thin metal strips with some elasticity.

In an alternative embodiment as shown in FIG. **9***b*, the lock down frame **75** would have a plurality of appendages **77** positioned on opposite ends of the container **25** and extending below the top of the container **25** with a tension device **80** such as an elastic cord or rope connected on two of the plurality of appendages **77** across the container **25** to hold the container down.

The close means **70** is a hinging mechanism that closes the lock down means **65** on the containers. The close and tensioning means **70** has a handle **84**. The handle **84** can be rotated. The handle **84** is rotated up, the close means **70** rotates applying an upward force on hinge bar **86** causing post **64** to raise thereby opening lock means **65**. When the handle **84** is rotated down in its locking position the close means **70** applies a downward force on hinge bar **86** causing post **64** to lower thereby closing the lock means **65**.

The close means **70** has a bar **86** on which a plurality of lock down means **65** are connected. There is one lock down means **65** per post **64**. The lock down means **65** is on the end of the bar **75** in the preferred embodiment. The back of the bar **86** is connected to the frame in the back of the cell **22** to a hinge **88** or pivot means. The handle **84** is attached to close and tensioning means **70**. The close and tensioning means **70** rides in between a top and bottom plate on hinge bar **86**. When the handle **84** is rotated down, the bar **86** is pulled down and bringing the lock down means **65** in contact with the container **25**. When the handle **84** is rotated up, it pushes the bar **86** up and releasing the containers **25** from the lock down means **65**.

FIGS. **6**, **7**, **8** and **10** show the trombone means **60**. In its simplest form the trombone means **60** is a long pole **98** with a hook **100** in a track **110**. The hook **100** extends from the pole **98** at a ninety degree angle and extends beyond the upper portion of the container **25**. The pole **98** has a pull knob **112** opposite the hook **100**. When the pull knob **112** is pulled the hook **100** hooks the bottom of the container **25** in the cell **22** and pulls the container **25** forward with the hook **100**.

In an alternative embodiment, a screw mechanism with a hook can also be used or the trombone means **60** can be connected to the frame of the cell **22** instead of being incorporated into the bar **75**.

FIG. **11** displays the device **1** being used with a standard semi-circle plastic container holder. The locking means **65** is attached to the semi-circle holder **120** locking the containers **25** in place.

The device **1** will enhance driver and route efficiency. The trombone means **60** feature will prevent reaching into the back cavities of the racks for full bottles, saving time during unloading. The ability to see the back cavities and access them productively will make the driver more efficient. Additionally, the driver will be less likely to return to base with full bottles, making the route more productive.

The device **1** will increase route productivity because the containers will not migrate up against the delivery door. At the top of the list of every major analysis of bottle mortality is transit damage in racks. The shock and vibration during over the road transportation cause both hairline and catastrophic damage to full bottles. Many routes have such poor roads (and the resulting elevated damage and claims) that they are financially untenable for bottling companies and service is not offered.

During delivery, the driver is most vulnerable when unloading bottles from the upper tiers of the rack. Full bottles weigh upwards of 40 lbs., and reaching to the back cavity of the rack requires pulling a full bottle forward and assuming the weight while in a vulnerable position. At elevated heights, the opportunity to lose balance, lose control of the bottle or even drop it from 10 feet or more increases dramatically. The trombone means **60** prevents the driver from getting into the "reach" position at any level on the truck.

The lock down means **65** prevents container **25** migration out of the rack **10** during transit, preventing containers **25** from falling out of the truck onto the driver when the door is opened. It also prevents door jams and the resulting intervention between door and rack that drivers must perform in order to access racked containers **25**.

The lock down means **65** locks each container **25** in place and damps vibration to prevent typical stresses and breakage. The device **1** will deliver a quantum reduction in transit damage and the resulting extension of asset life for bottles, and opens new geography to water routes.

Use of the device **1** will enable unprecedented design flexibility for bottlers and convenience to their customers. Bottle designers have traditionally been restricted in the features used in containers **25** because convenience features reduce bottle life. Designs that do not maintain a continues round perimeter, i.e. handled bottles, are structurally unable to dissipate the dynamic stresses in a typical rack and the bottles crack or break near the handle. The lock down means **65** in the

product will enable handled bottles to survive at, near or above the rate of round bottles. The ability of bottlers to offer the convenience of handled or non-symmetrically shaped bottles, without the resulting early mortality, will open the door on consumer and brand friendly designs.

ALTERNATIVE EMBODIMENT

In an alternative embodiment, the lock down means **65** can be made of ropes, straps, bars, cables, bands, beams, cords, and any other similar material. The lock down means **65** can apply the lockdown force from any direction. The close means **70** can be activated by levers, gears, cams, hinges, clamps, and other mechanical devices. The trombone means **60** can consist of slides, rollers, bearings, springs, and screws (augers). The material that the device **1** can be made of can include plastic, metals, alloys that are welded, glued, or mechanically fastened together.

CONCLUSION

The device will enhance driver and route efficiency. Additionally, with the device, the driver will be less likely to return to base with full bottles, making the route more productive and route productivity will also be enhanced because bottles will not migrate up against the delivery door. The device will make the driver activity more productive during unload, lower the overall time spent at each delivery point, and reduce or eliminate the possibility of returning full bottles to base. Use of the device will improve driver safety in multiple dimensions while reducing injuries, lost time, and workman's compensation expenses for delivery truck operations. Use of the device will reduce the incidence and payment of consumer claims from broken or leaking bottles. Bottle life and functionality will be vastly improved through the use of this device. Overall, the device will deliver a quantum reduction in transit damage and the resulting extension of asset life for bottlers, and open new geography. Use of the device will enable unprecedented design flexibility for bottlers and convenience to their customers.

Although the present invention has been described in considerable detail with reference to certain preferred versions thereof, other versions are possible. Therefore, the point and scope of the appended claims should not be limited to the description of the preferred versions contained herein.

As to a further discussion of the manner of usage and operation of the present invention, the same should be apparent from the above description. Accordingly, no further discussion relating to the manner of usage and operation will be provided.

With respect to the above description, it is to be realized that the optimum dimensional relationships for the parts of the invention, to include variations in size, materials, shape, form, function and manner of operation, assembly and use, are deemed readily apparent and obvious to one skilled in the art, and all equivalent relationships to those illustrated in the drawings and described in the specification are intended to be encompassed by the present invention.

Therefore, the foregoing is considered as illustrative only of the principles of the invention. Further, since numerous modifications and changes will readily occur to those skilled in the art, it is not desired to limit the invention to the exact construction and operation shown and described, and accordingly, all suitable modifications and equivalents that may be resorted to fall within the scope of the invention.

What is claimed is:

1. A device comprising: a rack where said rack has vertical, lateral and side supports, a trombone means which is comprised of a long pole with a hook on one end and a pull knob on the other end in a track which is connected to the supports of said rack, a locking means connected to the supports of said rack and a closing means connected to the supports of said rack, where said trombone means connected to said rack is actuated by said pull knob and by which said hook moves a water bottle from the rear to the front of said rack positioning it so that the water bottle can be removed from the rack, where said closing means applies tension to a water bottle through a plurality of buffers to prevent damage to the water bottle and restrict the movement of the water bottle along the axis defined by the vertical, lateral and side supports of the rack, where said locking means is a plurality of cushioned tubes that are attached to the locking means which is attached to said rack frame and where said locking means is brought into contact with water bottles by said closing means.

2. A device as in claim **1** further comprising: being used to transport water bottles.

3. A device as in claim **1** further comprising: a closing means which applies tension to water bottles in said rack.

4. A device as in claim **1** further comprising: a closing means which applies tension to water bottles where said closing means s a hinging mechanism.

5. A device as in claim **1** further comprising: where said rack has a plurality of posts and where said closing means runs through a post and is attached to said rack.

6. device as in claim **1** further comprising: where said closing means provides a downward force that is transferred to the water bottles to hold them in place.

7. A device as in claim **1** further comprising: where said closing means applies tension to water bottles and where said locking means retains the tension via said cushioned tubes where closing means and locking means are attached to said rack frame.

8. A device as in claim **1** further comprising: where said locking means has a handle which pivots the locking means into either a tensioned or un-tensioned position.

9. A device as in claim **1** further comprising: where said hook extends from said poles at a ninety degree angle and extends inside the circumference of the bottom of the water bottle.

10. A device as in claim **9** further comprising: where said pole has pull knob attached to said pole on the opposite end to which said hook is attached.

11. A device as in claim **10** further comprising: where said buffering means consists of a plurality of tubes that conform to the diameter of the container when the handle on the rack is lowered into the locked position thereby restricting movement of the container.

12. A device comprising: a rack being used to transport water bottles where said rack has vertical, lateral and side supports, a trombone means which is comprised of a long pole with a hook in a track which is connected to the supports of said rack, a locking means connected to the supports of said rack and a closing means connected to the supports of said rack, where said trombone means connected to said rack is actuated by said pull knob and by which said hook moves a water bottle from the rear to the front of said rack positioning it so that the water bottle can be removed from the rack, where said closing means applies tension to a water bottle through a plurality of buffers to prevent damage to the water bottle and restrict the movement of the water bottle along the axis defined by the vertical, lateral and side supports, where said locking means is a plurality of cushioned tubes that are

attached to the locking means which is attached to said rack frame and where said locking means is brought into contact with water bottles by said closing means and where the cushioned tubes are attached to the locking means and where the said locking means is brought into contact with the water bottles in said rack by said closing means where said closing means is a hinging mechanism which is attached to said rack which applies tension to water bottles in said rack and where the locking means is actuated by a handle which pivots the locking means into a tensioned or un-tensioned position.

13. A device as in claim **12** further comprising: where said rack has a plurality of posts and where said closing means runs through a post and is attached to said rack.

14. A device as in claim **12** further comprising: where said hook extends from said pole at a ninety degree angle and extends inside the circumference of the bottom of the water bottle.

15. A device as in claim **14** further comprising: where said pole has a pull knob attached to said pole on the opposite end to which said hook is attached.

16. A device as in claim **15** further comprising: where said buffering means consists of a plurality of tubes that conform to the diameter of the container when the handle on the rack is lowered into the locked position thereby restricting movement of the container.

17. A device comprising: a rack being used to transport containers where said rack has vertical, lateral and side supports of the rack, a trombone means which is comprised of a long pole with a hook in a track which is connected to the supports of said rack, a locking means connected to the supports of said rack and a closing means connected to the supports of said rack, where said trombone means connected to said rack is actuated by said pull knob and by which said hook moves a container from the rear to the front of said rack positioning it so that the container can be removed from the rack, where said closing means applies tension to a container through a plurality of buffers to prevent damage to the container and restrict the movement of the container along the axis defined by the vertical, lateral and side supports of the rack, where said locking means is a plurality of cushioned tubes that are attached to the locking means which is attached to said rack frame and where said locking means is brought into contact with containers by said closing means and where the cushioned tubes are attached to the locking means and where the said locking means is brought into contact with the containers in said rack by said closing means where said closing means is a hinging mechanism which is attached to said rack which applies tension to containers in said rack and where the locking means is actuated by a handle which pivots the locking means into a tensioned or un-tensioned position.

18. A device as in claim **17** further comprising: where said rack has a plurality of posts and where said closing means runs through a post and is attached to said rack.

19. A device as in claim **18** further comprising: where said pole has a pull knob attached to said pole on the opposite end to which said hook is attached.

20. A device as in claim **19** further comprising: where said buffering means consists of a plurality of tubes that conform to the diameter of the container when the handle on the rack is lowered into the locked position thereby restricting movement of the container.

21. A device as in claim **17** further comprising: where said container is a bottle, can, drum, or keg.

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