

PATENT SPECIFICATION

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(54) SHIPPING SYSTEM FOR LIQUIDS AND POWDERS

(71) We, UNIROYAL, INC., of 1230 Avenue of the Americas, New York, New York 10020, United States of America, a corporation organized under the laws of the State of New Jersey, one of the United States of America, do hereby declare the invention, for which we pray that a Patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

This invention relates to an apparatus and method for transporting liquids and dry powdered solids in collapsible containers and more particularly to a shipping harness for use with such collapsible containers which will allow them to be mounted in cargo boxes suitable for containerized use both on sea and land.

In general such collapsible containers, when used as transoceanic shipping containers, have had a fifty-five gallon capacity and have been shipped in the same fashion as fifty-five gallon metal drums. They are either wedged in place in a vertical position by use of sufficient containers to entirely fill the cargo area or are tied in position.

It would be highly desirable to use one or more much larger collapsible containers in a containerized cargo box which box would be suitable for positioning on ships fully loaded and which could also be moved from shipboard directly onto train or truck beds. However the use of such collapsible containers placed directly in containerized cargo boxes present serious problems. Shifts of weight during normal operation of a cargo vessel, truck or train would result in shifts in the position of the collapsible containers within the cargo box. Unless the cargo box was heavily reinforced, it would collapse due to such shifting. Such reinforcement would be impracticable because of the extra weight and expense. This problem is particularly

evident for shipboard use both because of the violent movement inherent in such travel and because, as a matter of economy, it is necessary that there be only minimal spacing of no more than several inches between the walls of the collapsible container and the cargo box in which it is mounted. This necessitates a system for mounting the collapsible container which allows essentially no movement of the collapsible container within its containerized cargo box.

According to the present invention a shipping harness for securing a non-rigid container against movement comprises a plurality of continuous flexible straps for encircling the non-rigid container, each of said encircling straps being spaced from the other by a plurality of flexible straps positioned across and attached to said encircling straps, at least one of said encircling straps having attached thereto an anchoring strap, the number and disposition of the anchoring straps being such that when connected to a support means the anchoring straps will hold the shipping harness in a fixed relation to the support means. Such a shipping harness may be used to hold a collapsible container in place even during violent movement of the transporting vehicle without rupturing the walls of its containerized cargo box and without allowing any major shift in the collapsible container's weight distribution or position in the cargo box.

The shipping harness is positioned on the collapsible container prior to its filling. The continuous flexible straps are positioned circumferentially around the collapsible container and the straps positioned across and attached to the continuous straps are positioned longitudinally along the collapsible container. The anchoring straps are attached to the floor of the containerized cargo box. The positioning

of the straps in any particular case is calculated to give maximum support to be loaded collapsible container and to eliminate any possibility of its movement.

5 The above and other features of the present invention will be more fully understood from the following description read in connection with the accompanying drawings wherein:

10 Figure 1 is a perspective view of a containerized cargo box containing two collapsible containers in accordance with the present invention;

Figure 2 is a perspective view of the 15 cargo box of Figure 1 rotated 180 degrees in a horizontal plane;

Figure 3 is a partial perspective view of the portion of the cargo box in Figure 1 closest to the cargo box access doors, 20 portions of the containerized cargo box being partly broken away to show a loaded collapsible container and shipping harness in accordance with the present invention;

Figure 4 is a partial perspective view of 25 the attaching means for securing the shipping harness to the cargo box and portions of the shipping harness of the present invention connected thereto;

Figure 5 is a perspective view of a 30 mounting wedge used with the shipping harness of the present invention;

Figure 6 is a partial top view of the portion of the containerized cargo box of Figure 1 closest to the cargo box access 35 doors; portions of the roof of the cargo box being broken away to show a loaded collapsible container and shipping harness in accordance with the present invention;

Figure 7 is a partial cross sectional view 40 of a cargo box having loaded collapsible containers mounted therein in accordance with the present invention, being taken substantially on the vertical plane of line 7-7 of Figure 6, looking in the direction of 45 the arrows.

Figure 8 is a partial side view of the portion of the containerized cargo box of Figure 1 closest to the cargo box access door, portions of the side wall of the 50 cargo box partially broken away to show a loaded collapsible container and shipping harness in accordance with the present invention;

Figure 9 is a partial sectional view of 55 a containerized cargo box having a loaded collapsible container mounted therein in accordance with the present invention, being taken substantially on the vertical plane of line 9-9 of Figure 8, looking in 60 the direction of the arrows;

Figure 10 is a partial sectional view of a containerized cargo box having a loaded 65 collapsible container mounted therein in accordance with the present invention, being taken substantially on the vertical

plane of line 10-10 of Figure 8, looking in the direction of the arrows;

Figure 11 is a top view of a shipping harness in accordance with the present invention; 70

Figure 12 is a cross sectional view of a shipping harness in accordance with the present invention taken substantially on the vertical plane of line 12-12 of Figure 11, looking in the direction of the arrows; 75

Figure 13 is a bottom view of a shipping harness in accordance with the present invention;

Figure 14 is a top view of a restraining means for use in the present invention; 80

Figure 15 is a side view of a restraining means for use in the present invention.

Referring to the drawings and particularly Figures 1 and 2, a containerized cargo box 10 has mounted therein two 85 collapsible containers 11 having generally flexible cylindrical bodies formed from fabric of reinforcing cords embedded in rubber or similar plastic material. One end of the cargo box 10 has access doors 13 90 to allow entry onto the containerized cargo box 10 for positioning, harnessing and filling the collapsible container 11.

As can be seen more fully in Figures 3, 6, 7 and 8, the collapsible containers 11 95 are positioned on their sides in cargo box 10. Each collapsible container 11 has a metal primary anchoring means 15 centrally positioned on its face 20 closest to the cargo access door 13. Primary anchoring means 15 is mounted in an opening in and sealed to face 20 to provide a strong, fluid tight anchoring means for reinforcing 100 cables 14. Each of the reinforcing cables 14 is, at its other end, secured to one of the secondary anchoring means 16 dispersed about the face 20' of each collapsible container 11 opposite primary anchoring means 15. Each secondary anchoring means 16 105 consists of a metal anchoring plate mounted on and passing through the walls of the collapsible container 11. The secondary anchoring means 16 are attached to their respective collapsible container 11 with a fluid tight seal. Cables 14 act to limit the 115 maximum distance between the end faces 20 and 20' and thus maintain the shape of the collapsible container 11 when loaded.

The primary attaching means 15 may have an eyelet 17 exterior to the body of its 120 collapsible container 11 to allow the collapsible container 11 to be attached to a crane or the like for movement exterior of the cargo box when unloaded. When loaded with a liquid, the collapsible container 11 would be of insufficient strength 125 for such movement by a crane and would, in all likelihood, burst in such an attempt.

On the face 20' of each of the collapsible containers 11 opposite the primary attach- 130

ing means 15, is positioned a metal plate 17. Plate 17 is fluid tightly but detachably mounted on the collapsible container 11. Plate 17 allows entry for attachment and adjustment of cables 14 to primary anchoring means 15 and secondary anchoring means 16.

Mounted on face 20 is an inlet pipe 19 secured thereto in a fluid tight manner. The inlet pipe 19 is positioned near the floor 18 of the cargo box 10 and is in direct communication with the interior of its collapsible container 11 to allow the same to be filled or emptied. Inlet pipe 19 has a valve 19' attached to it for controlling the entry of fluid into the collapsible container 11.

When fully loaded, a collapsible container 11 is held in position in the cargo box 10 by a shipping harness 21 which is in turn fixedly attached to the cargo box floor 18. As can be seen most clearly in Figures 11, 12 and 13, each shipping harness 21 consists of five continuous circumferential straps 22, 23, 24, 25 and 26 made from suitable webbing of natural or synthetic material of sufficient strength to withstand the stresses developed due to movement of the cargo box in transit. For example, four inch strips of nylon are commercially available having a rated level of six thousand pounds per inch of width at eighteen percent elongation more than sufficient for use in the shipping harness 21. The five circumferential straps 22-26 are each made by sewing together or otherwise attaching strapping material at their respective ends 22', 23', 24', 25' and 26' to form closed loops. The straps 22-26 are of just sufficient length to securely encircle and hold a fully loaded collapsible container 11 in position. Accordingly circumferential straps 22-26 should have an overall length slightly less than the circumference of the fully loaded collapsible container to aid the circumferential straps 22-26 to grip the flexible walls of its collapsible container 11. For example, when the circumferential straps 22-26 are formed from four inch strips of nylon, the circumferential straps 22-26 should be six percent less than the circumference of a loaded container 11.

Each of the five circumferential straps 22-26 are held in position parallel to each other by two long longitudinal straps 27 and 29 and four shorter longitudinal straps 28, 30, 31 and 32 positioned across and exterior to the outer surface of each of the circumferential straps 22-26.

As can be seen from Figures 11 and 13, short longitudinal straps 28, 30, 31 and 32 are of a length to exactly fit across and be in contact with each of the circumferential straps 22-26.

In Figures 11-13 longitudinal strap 28 is shown positioned in the center of the folded shipping harness 21. When the shipping harness is in position on a loaded collapsible container 11, longitudinal strap 28 is positioned along a longitudinal line at the highest point of the loaded collapsible container 11. Directly opposite and underneath longitudinal strap 28, is positioned longitudinal strap 31. When the shipping harness is in use this would correspond to the longitudinal strap 31 being positioned along the longitudinal center line of cargo box floor 18. Longitudinal straps 30 and 32 are positioned approximately one fourth the distance between longitudinal straps 31 and 28 on either side of longitudinal strap 31.

Longitudinal straps 27 and 29 are so positioned that when they are in place on a loaded collapsible container 11, they will be along a geodesic line of the collapsible container 11. Accordingly longitudinal straps 27 and 29 are positioned approximately one third the distance between longitudinal straps 28 and 31 on either side of longitudinal strap 28.

At the intersection of each of the longitudinal straps 27-37 with circumferential straps 22-26, the intersecting straps are attached to each other by sewing, stapling or like means. Additionally each intersection may be reinforced by the addition of a metal plate or additional strapping material.

One end of anchoring straps 33, 34 and 35 are attached to their respective circumferential straps 22, 24 and 26 at a point between longitudinal straps 29 and 30. Correspondingly, anchoring straps 33', 34' and 35' have one of their ends attached to circumferential straps 22, 24 and 26 between longitudinal straps 27 and 32. The other end of the anchoring straps 33-35, and 33'-35' are attached to triangular anchoring loops 36-38, and 36'-38' by any suitable means. For example, each anchoring loop 36-38 and 36'-38' may have one of its sides encircled by the appropriate end of its respective anchoring strap 33-35, and 33'-35'.

As can be most clearly seen in Figures 7 and 9, anchoring straps 33-35 and 33'-35' and their corresponding anchoring loops 36-38 and 36'-38' are so positioned of such a length as to allow them to be attached to the cargo box floor 18.

As can be seen most clearly in Figure 13, circumferential straps 23 and 25 have anchoring straps 39 and 40 attached thereto. Anchoring straps 39 and 40 extend parallel to their respective circumferential straps 23 and 25 for an equal distance on either side of strap 31. Anchoring strap 39 is attached to longitudinal strap 31 and cir-

cumferential strap 23 at their point of intersection by sewing or other suitable means. In like manner circumferential strap 25, anchoring strap 40 and longitudinal strap 31 are attached at their intersection. For added reinforcement, anchoring straps 39 and 40 may be attached to their respective circumferential straps 23 and 25 for a distance on either side of their intersection with longitudinal strap 31. Anchoring straps 39 and 40 have triangular anchoring loops 41, 41', 42 and 42' respectively attached to their extremities. As will be more fully discussed hereinafter, anchoring straps 39 and 40 are of a length and so positioned that their respective anchoring loops 41, 41', 42 and 42', may be attached to the cargo box floor 18 near the side walls 49 of the cargo box 10. Longitudinal straps 27 and 29 have triangular anchoring loops 43 and 44, and 45 and 46, respectively, attached to their extremities. Longitudinal straps 27 and 29 with their respective anchoring loops 43-46 are each of sufficient length to allow them to be positioned along a geodesic line in the upper portion of the collapsible container 11 and across both its end faces 20 and 20' for attachment to the cargo box floor 18 as shown. Since it is desired that longitudinal straps 27 and 29 firmly grip the collapsible container 11, their overall length should be slightly less than the distance along a geodesic line of container 11 between their respective anchoring point in the cargo box floor 18. For example when the longitudinal straps 27 and 29 are formed from four inch strips of nylon, then each of the longitudinal strips 27 and 29 should be one and one half percent shorter.

When the shipping harness 21 is in use restrain movement of a loaded collapsible container 11 positioned on its side in a cargo box 10, each of the circumferential straps 22-26 is positioned about the collapsible container 11 progressively along the container's length. Short longitudinal straps 28-31 are positioned longitudinally along the highest and lowest portions of the collapsible container 11. Longitudinal straps 27 and 29 are positioned longitudinal along the upper portion of the collapsible container 11 and across both faces 20 and 20' of the collapsible container 11. Short longitudinal straps 30 and 32 are positioned longitudinally between the lower portion of the sides of the collapsible container and respectively wedges 47 and 47' which act to help hold the collapsible container 11 in place.

As can be seen most clearly in Figures 3 and 4, each of the circumferential straps 22-26 is held in position against movement by anchoring straps 33-35 and 33'-35', 39

and 40 by their attachment to attaching rails 60 and 60'. Attaching rails 60 and 60' are bolted to the cargo box floor 18 on either side of each collapsible container 11 by means of bolts 61. Looking only at the anchoring straps positioned closest to attaching rail 60, anchoring straps 33-35 when attached to rail 60 are positioned almost vertically between circumferential straps 22, 24 and 26 and the attaching rail 60. Anchoring loops 36-38 of the anchoring straps 33-35 are respectively attached to vertical support plates 50, 51 and 52 by means of mounting eyes 53, 54 and 55 attached to the support plates 50-52. Mounting eyes 53-55 are detachably mounted on plates 50-52 by bolts or other suitable means which would allow the triangular anchoring loops 36, 37 and 38 to be positioned therein. Plates 50, 51 and 52 may be attached to the anchoring rail 60 by bolting, welding or any other suitable method.

Anchoring straps 39 and 40, attached to circumferential straps 23 and 25 respectively, are positioned underneath each collapsible container 11. The anchoring straps are attached by means of triangular anchoring loops 41 and 42 to mounting eyes 58, 59 which are in turn detachably mounted to horizontal support plates 56 and 57. Support plates 56 and 57 are also attached to attaching rail 60 by bolting, welding, or other suitable means.

Circumferential straps 22-26 are attached to rail 60' by anchoring straps 33'-35', 39 and 40 in a like manner.

Longitudinal strap 27 is held in position by its triangular anchoring loops 43 and 44 which are interconnected respectively to detachable eyes 61 and 62 mounted on support plates 63 and 64. Plates 63 and 64 are attached to attaching rail 60 by any suitable means. Equally the ends of longitudinal strap 29 are held in position by the interconnection of triangular anchoring loops 45 and 46 with detachable eyes 61' and 62' of attaching plates 63' and 64' connected to attaching rail 60'.

The cross-sectional configuration of supporting wedges 47 and 47' is that of a right triangle. Supporting wedges 47 and 47' each have a core 70 of a rigid material, such as wood, surrounded by a shock absorbent material 71, such as resilient rubber or plastic. Alternatively the supporting wedges 47 and 47' may be formed entirely of a slightly resilient material such as hard rubber or the like. In use, supporting wedge 47 is positioned between the collapsible container 11 and anchoring straps 33-35 and supporting wedge 47' between the side of collapsible container 11 and anchoring straps 33'-35'. Supporting wedge 47 has two passageways 72 and 73 across

its bottom surface to allow the passage of anchoring means 39 and 40 between the collapsible container 11 and the anchoring rail 60. Similar supporting wedges 47' has passage 72' and 73' for entry to anchoring rail 60'. Anchoring strap 30 is so positioned on the shipping harness 21 that it falls between the walls of collapsible container 11 and the angled surface 75 of supporting wedge 47. Equally anchoring strap 32 lies between surface 75' of wedge 47' and the surface of the collapsible containers.

Since encircling straps 22-26 are of a similar circumference than that of a loaded collapsible container 11, the straps 22-26 are in tight engagement with the collapsible container 11 sufficient to prevent any relative movement between them. Accordingly since circumferential straps 22-26 are prevented from both rotational, longitudinal and side movement by anchoring straps 33-35, 33'-35', 39 and 40, in conjunction with anchoring rails 60 and 60', the collapsible container 11 is also prevented from such movement. Longitudinal straps 27 and 29 also act to prevent movement of both the shipping harness 21 and collapsible container 11 both by their attachment to the shipping harness 21 and their tight engagement with the collapsible container 11.

However when collapsible container 11 is less than full, for example during unloading or loading, the shipping harness 21 would not be in tight engagement with its collapsible container 11. This would, of course, allow movement of the collapsible container 11 relative both to the shipping harness 21 and to the cargo box 10. To prevent such movement each collapsible container 11 has positioned thereon restraining means 80-89 which cooperate with the shipping harness 21 to hold the collapsible container 11 in a relatively fixed position, even when such container is emptied or only partially filled.

Each of the restraining means 80-89 are constructed in the same manner. As can be seen most clearly in Figure 14 with regard to restraining means 80, the restraining means 80 is composed of two elements 90 and 91, each having a slightly enlarged end portion 90' and 91' and a slightly narrower strap or tongue portion 90'' and 91''. The enlarged end portions 90' and 91' are fixedly attached to the body of the collapsible container 11 by vulcanization or by the use of adhesive. The thinner portions 90'' and 91'' are connected to the collapsible container 11 by enlarged portions 90' and 91'. The ends of each of the thinner portions 90'', and 91'' can be attached to each other by means, such as snaps, buttons, zippers or fabric fasteners which

allow them to be opened and closed. In use, restraining means 80 has its two elements 90 and 91 affixed permanently to collapsible container 11 on either side of circumferential strap 22 near longitudinal strap 28. The two narrower or tongue elements 90' and 91'' are positioned across circumferential strap 22 so that they may be opened or closed around said strap 22 to retain the strap in position. The restraining means 81 is similarly positioned about circumferential strap 26. Longitudinal strap 27 has associated with its restraining means 86 and 87 on face 20 and 88 and 89 on face 20'.

To load cargo box 10, two collapsible containers 11 are mounted in their harnesses 21. Their restraining means 80-89 are closed to hold the harness in fixed relationship to their respective empty collapsible containers 11. Supporting wedges 47 and 47' are positioned against respective anchoring rails 60 and 60'. Each of the collapsible containers 11, with its respective harness 21, is then placed on its side between one of the sets of the supporting wedges 47 and 47' with face 20 closest to the cargo access door 13. Thereupon the various triangular anchoring loops 36-38, 36'-38', 41-42, 41'-42' and 43-46 are attached to the attaching rails 60 and 60' as described above. After all attachments have been made to attaching rail 60 and 60', both containers 11 are evacuated, and sealed by closing valves 19'. An inlet hose is attached to inlet pipe 19 of the collapsible container 11 furthest from the cargo access door 13. Valve 19 is opened and the liquid to be shipped is pumped under pressure into the evacuated collapsible container 11 until a preset pressure is reached. Valve 19' is then closed and the process is repeated with regard to the collapsible container 11 nearest cargo box access door 13.

In unloading the collapsible containers, the same process is followed in reverse, with the collapsible container 11 closest to the access door 13 being unloaded first and then the collapsible container 11 furthest from said access door 13 being emptied.

Evacuating the container before loading insures that there will be no air bubble remaining in the collapsible container and eliminates the need for a venting system for use during loading. Since, after the initial evacuation, the valve 19' will only be open when inlet pipe 19 is receiving or unloading liquid, it is possible to continue to load and unload collapsible container 11 without further evacuations.

When it is necessary to return the collapsible container 11 for refilling, the collapsible containers 11 and the shipping harnesses 21 from many cargo boxes 10

(12)

may be packed into one cargo box 10. The remaining cargo boxes may then be used for transportation of other cargo.

Since the collapsible containers 11 are to be filled to the same pressure on each strip, the various straps forming the shipping harness can be cut to the exact length necessary to insure that they will be under the required tension in use. If however it is impossible to maintain such constant pressure because of the nature of the cargo or for other reasons, turnbuckles or the like can be connected between each of the anchoring loops 36-38, 36'-38', 41-42, 41'-42' and 43-46 and attaching rails 60 and 60' to allow slight alterations in the effective length of the straps 27, 29, 33-35, 33'-35', 39-40 and accordingly adjust the tensions in the straps.

While the shipping harness of the present invention has been shown in connection with containerized cargo boxes, it may be used to position and hold flexible containers to the beds of trucks and railroad cars, to shipping pallets, or for permanent mounting of such containers in warehouses and the like locations.

WHAT WE CLAIM IS:—

1. A shipping harness for securing a non-rigid container against movement, comprising a plurality of continuous flexible straps for encircling the non-rigid container, each of said encircling straps being spaced from the others by a plurality of flexible straps positioned across and attached to said encircling straps, at least one of said encircling straps having attached thereto an anchoring strap, the number and disposition of the anchoring straps being such that when connected to a support means the anchoring straps will hold the shipping harness in a fixed relation to the support means.

2. A shipping harness according to claim 1, in which at least one end of at least one of the flexible straps positioned across said encircling straps extends beyond said encircling straps a sufficient distance to be used to hold the shipping harness on and in fixed relation to a support means.

3. A shipping harness according to claim 1 or claim 2, in which several of the encircling straps have anchoring straps attached thereto, and wherein at least one of the anchoring straps is attached at a relative position along its encircling strap different from the positioning of another of the anchoring straps along its encircling strap.

4. A shipping harness according to claim 3 in which each of the anchoring straps

has means for attaching said anchoring strap to a support means.

5. A shipping harness according to claim 2 in which the flexible strap which has at least one of its ends extending beyond the encircling straps, has at that end, means for attaching said extending strap to a support means.

6. A shipping harness according to any one of the preceding claims, in which there are two anchoring straps on at least one of said encircling straps.

7. A shipping harness substantially as herein described with reference to the accompanying drawings.

8. The combination of a shipping harness according to any one of the preceding claims together with a non-rigid container encircled by the shipping harness.

9. A combination according to claim 8 in which the circumference of each of the encircling straps is slightly less than the corresponding circumference of the non-rigid container along which the encircling strap is to be positioned.

10. A combination according to claim 8 in which the non-rigid container is generally cylindrical in configuration and wherein the circumference of each of the encircling straps is slightly less than the circumference of said cylinder.

11. A combination according to any one of claims 8 to 10 when the harness is according to claim 2, in which said strap which extends beyond said encircling strap is positioned along a geodesic line on the surface of the non-rigid container.

12. The combination of a support means together with a non-rigid container encircled by a shipping harness according to any one of claims 8 to 11.

13. A combination according to claim 12 in which the shipping harness is attached to the support means by two elongated members to which the anchoring straps are detachably mounted, said elongated members being positioned along and on either side of said non-rigid container.

14. A combination according to claim 13 substantially described and as shown in the accompanying drawings.

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may be packed into one cargo box 10. The remaining cargo boxes may then be used for transportation of other cargo.

Since the collapsible containers 11 are to be filled to the same pressure on each strip, the various straps forming the shipping harness can be cut to the exact length necessary to insure that they will be under the required tension in use. If however it is impossible to maintain such constant pressure because of the nature of the cargo or for other reasons, turnbuckles or the like can be connected between each of the anchoring loops 36-38, 36'-38', 41-42, 41'-42' and 43-46 and attaching rails 60 and 60' to allow slight alterations in the effective length of the straps 27, 29, 33-35, 33'-35', 39-40 and accordingly adjust the tensions in the straps.

While the shipping harness of the present invention has been shown in connection with containerized cargo boxes, it may be used to position and hold flexible containers to the beds of trucks and railroad cars, to shipping pallets, or for permanent mounting of such containers in warehouses and the like locations.

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1. A shipping harness for securing a non-rigid container against movement, comprising a plurality of continuous flexible straps for encircling the non-rigid container, each of said encircling straps being spaced from the others by a plurality of flexible straps positioned across and attached to said encircling straps, at least one of said encircling straps having attached thereto an anchoring strap, the number and disposition of the anchoring straps being such that when connected to a support means the anchoring straps will hold the shipping harness in a fixed relation to the support means.

2. A shipping harness according to claim 1, in which at least one end of at least one of the flexible straps positioned across said encircling straps extends beyond said encircling straps a sufficient distance to be used to hold the shipping harness on and in fixed relation to a support means.

3. A shipping harness according to claim 1 or claim 2, in which several of the encircling straps have anchoring straps attached thereto, and wherein at least one of the anchoring straps is attached at a relative position along its encircling strap different from the positioning of another of the anchoring straps along its encircling strap.

4. A shipping harness according to claim 3 in which each of the anchoring straps

has means for attaching said anchoring strap to a support means.

5. A shipping harness according to claim 2 in which the flexible strap which has at least one of its ends extending beyond the encircling straps, has at that end, means for attaching said extending strap to a support means.

6. A shipping harness according to any one of the preceding claims, in which there are two anchoring straps on at least one of said encircling straps.

7. A shipping harness substantially as herein described with reference to the accompanying drawings.

8. The combination of a shipping harness according to any one of the preceding claims together with a non-rigid container encircled by the shipping harness.

9. A combination according to claim 8 in which the circumference of each of the encircling straps is slightly less than the corresponding circumference of the non-rigid container along which the encircling strap is to be positioned.

10. A combination according to claim 8 in which the non-rigid container is generally cylindrical in configuration and wherein the circumference of each of the encircling straps is slightly less than the circumference of said cylinder.

11. A combination according to any one of claims 8 to 10 when the harness is according to claim 2, in which said strap which extends beyond said encircling strap is positioned along a geodesic line on the surface of the non-rigid container.

12. The combination of a support means together with a non-rigid container encircled by a shipping harness according to any one of claims 8 to 11.

13. A combination according to claim 12 in which the shipping harness is attached to the support means by two elongated members to which the anchoring straps are detachably mounted, said elongated members being positioned along and on either side of said non-rigid container.

14. A combination according to claim 13 substantially described and as shown in the accompanying drawings.

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