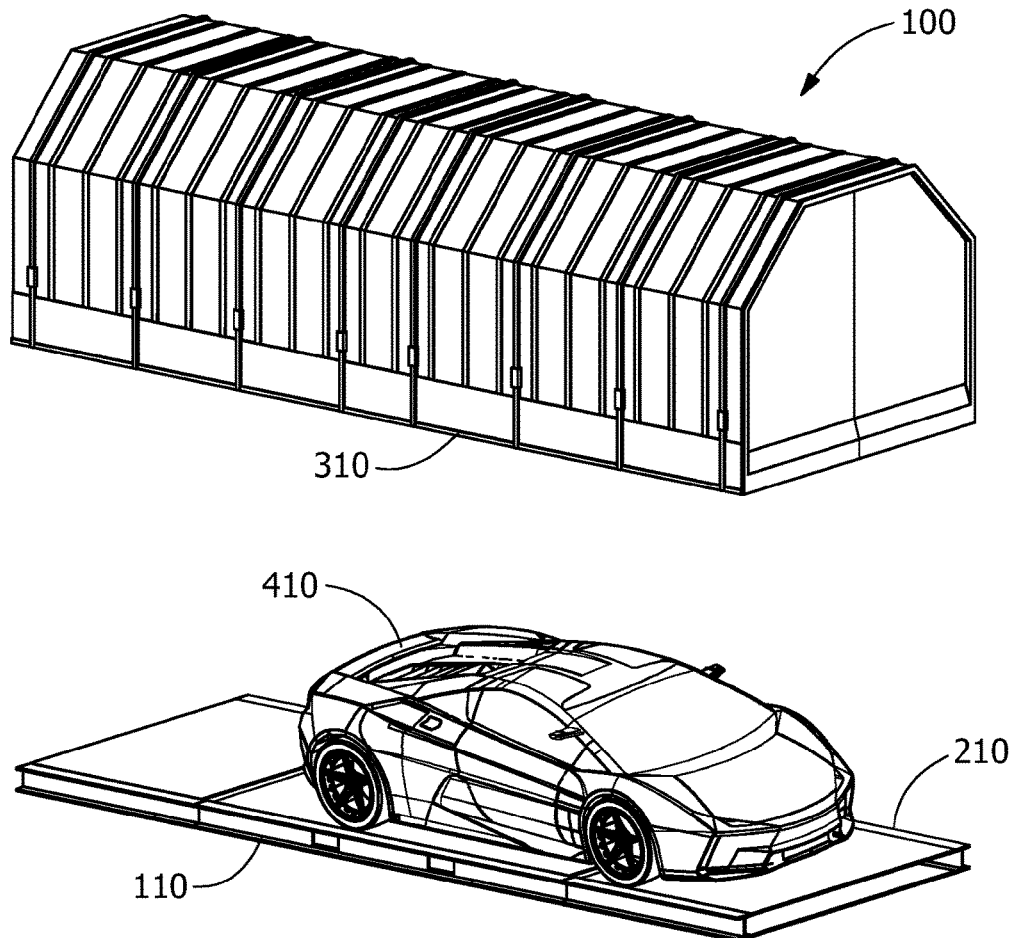




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MANUFACTURING, LLC, Lititz, PA
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B65D 88/24 (2006.01)(72) Inventors: **Leonard Ryan HEWLETT**, Lancaster,
PA (US); **Alex William RODRIGUEZ**,
Mount Joy, PA (US)(52) **U.S. Cl.**
CPC **B65D 85/68** (2013.01); **B65D 88/24**
(2013.01); **B65D 2585/6867** (2013.01)(21) Appl. No.: **15/262,321**(22) Filed: **Sep. 12, 2016****Related U.S. Application Data**(60) Provisional application No. 62/222,831, filed on Sep.
24, 2015.(57) **ABSTRACT**

A targeted protection assembly operable to protectively cover an item that is to be transported or stored. The targeted protection assembly includes a base and a cover delimiting an interior volume in which an item to be transported or stored can be disposed. The cover is at least partially configured with an inflatable portion in which an inflating medium can be disposed to expand the inflatable portion to, or maintain the inflatable portion at, an inflated disposition.



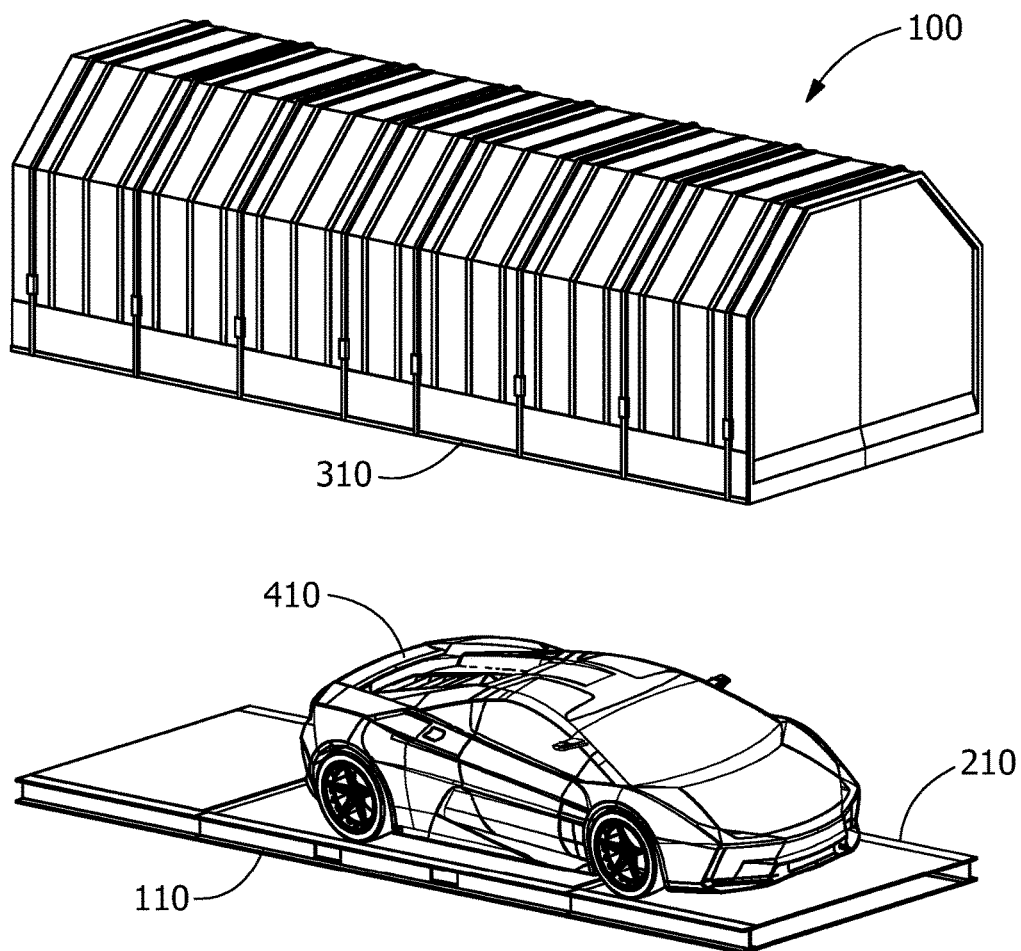


FIG. 1A

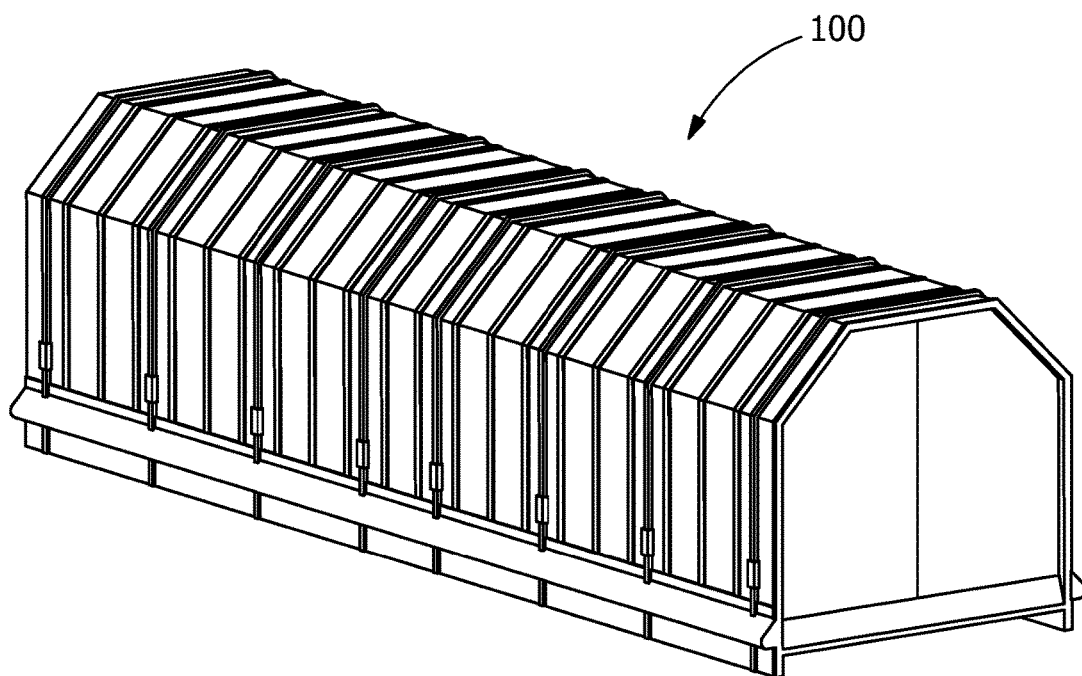


FIG. 1B

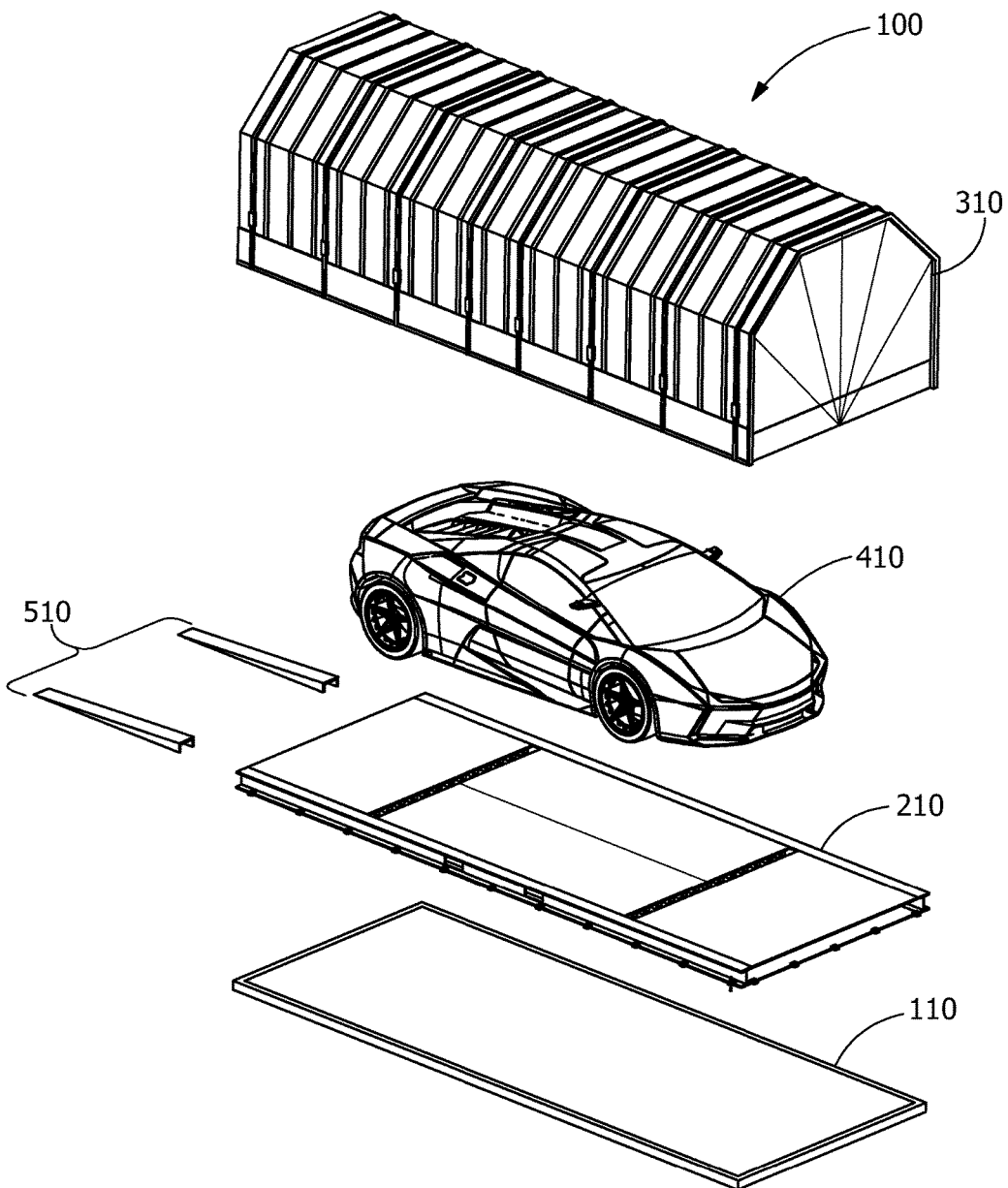


FIG. 2

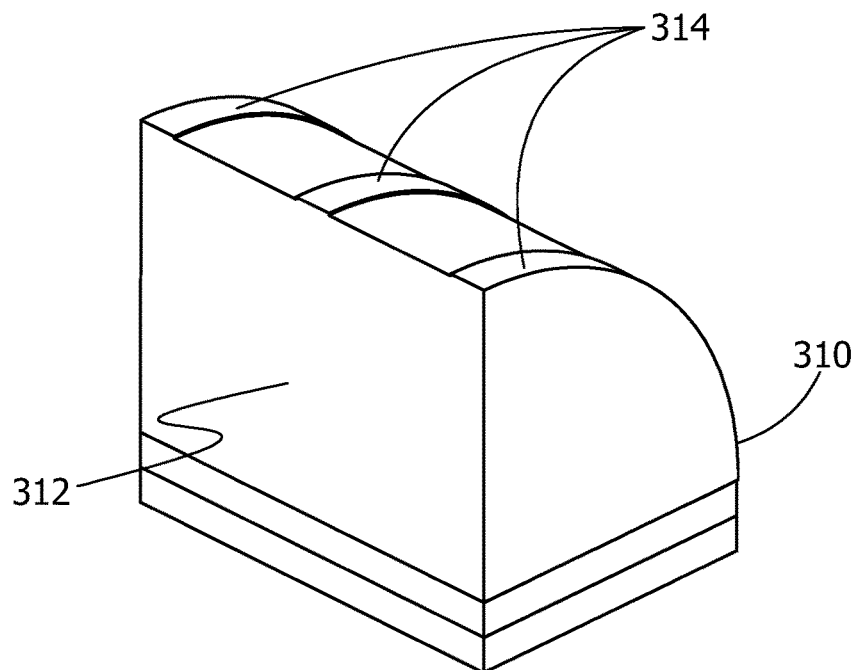


FIG. 3

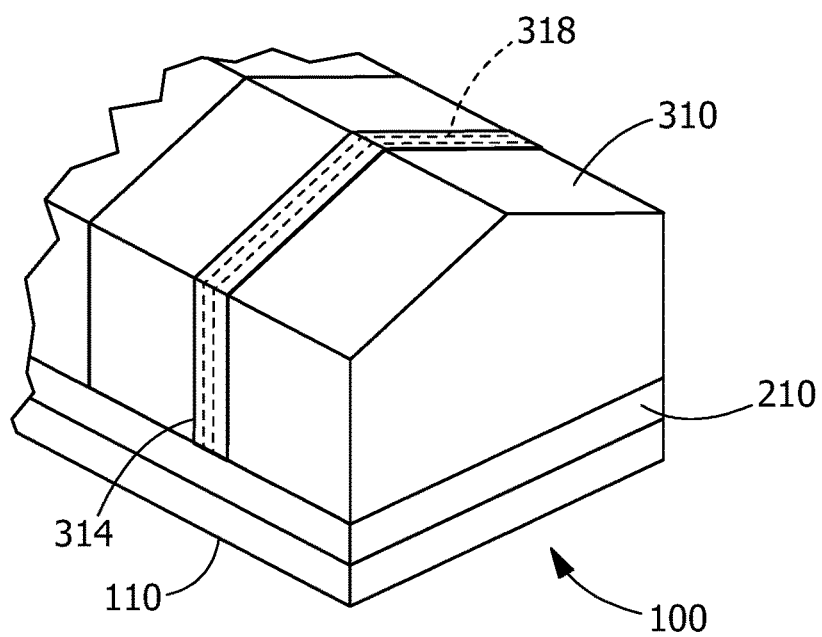


FIG. 4

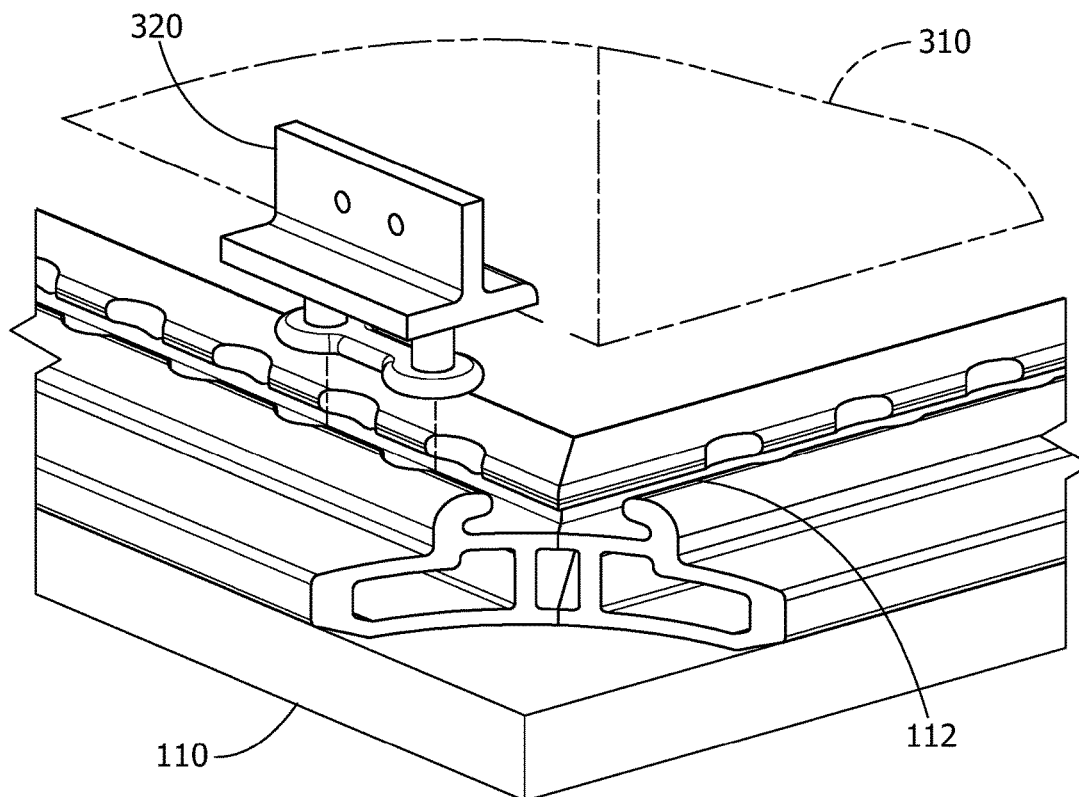


FIG. 5

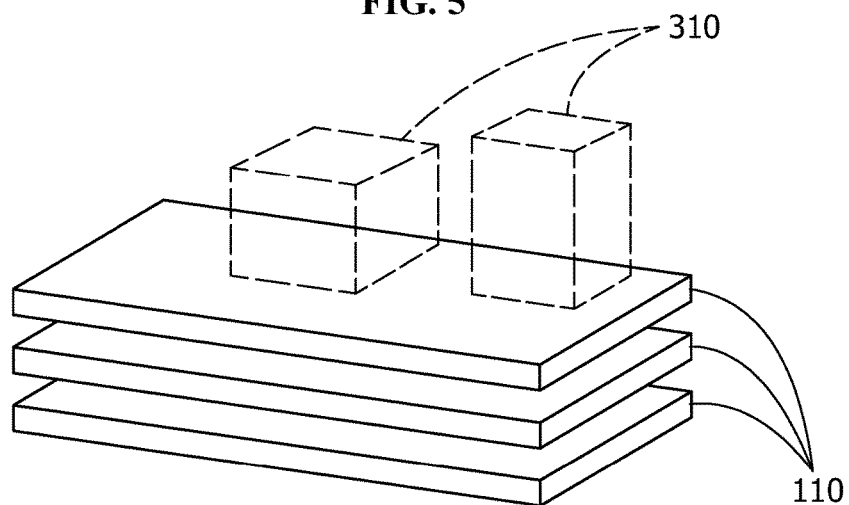


FIG. 6

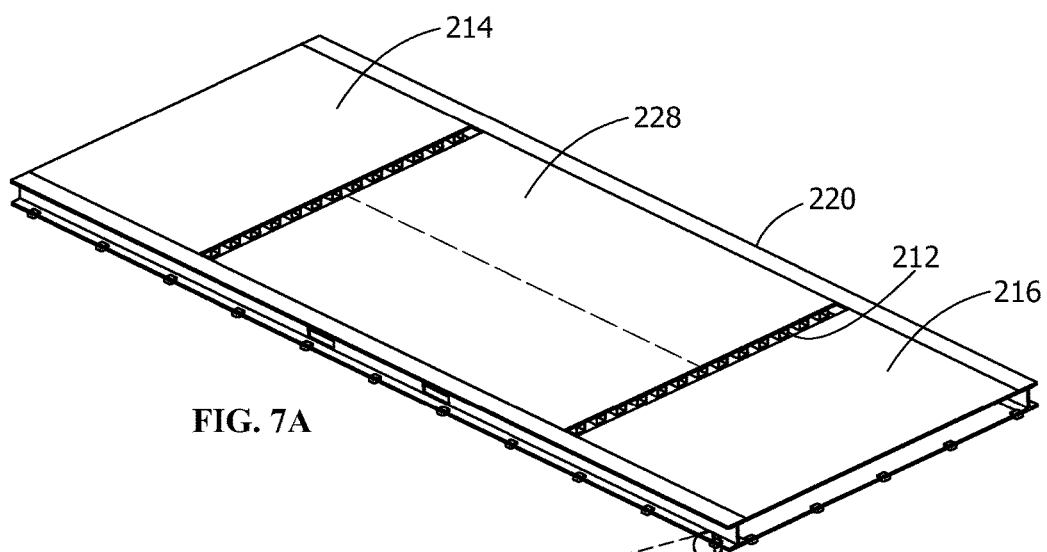


FIG. 7A

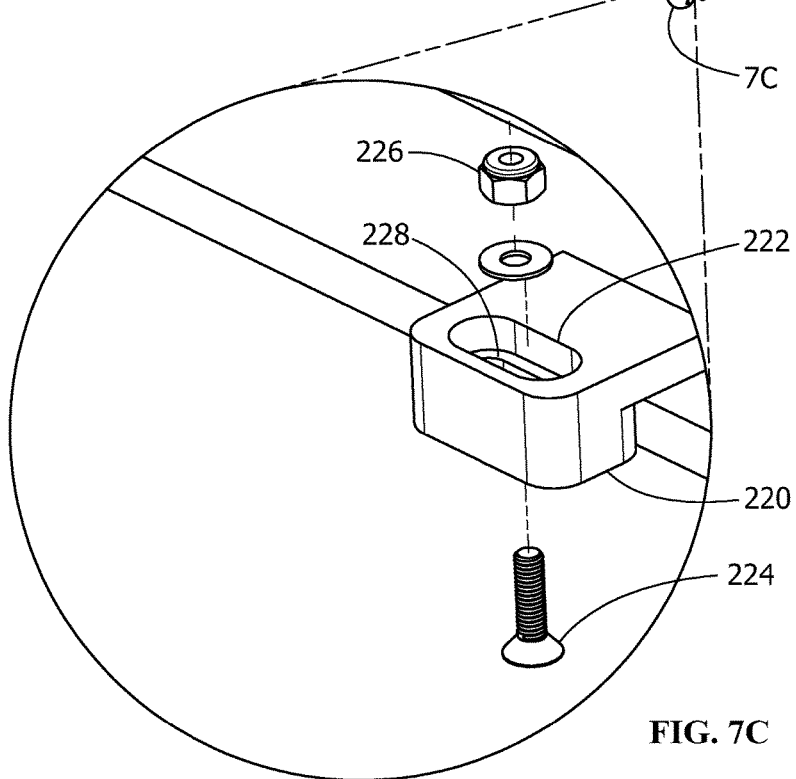


FIG. 7C

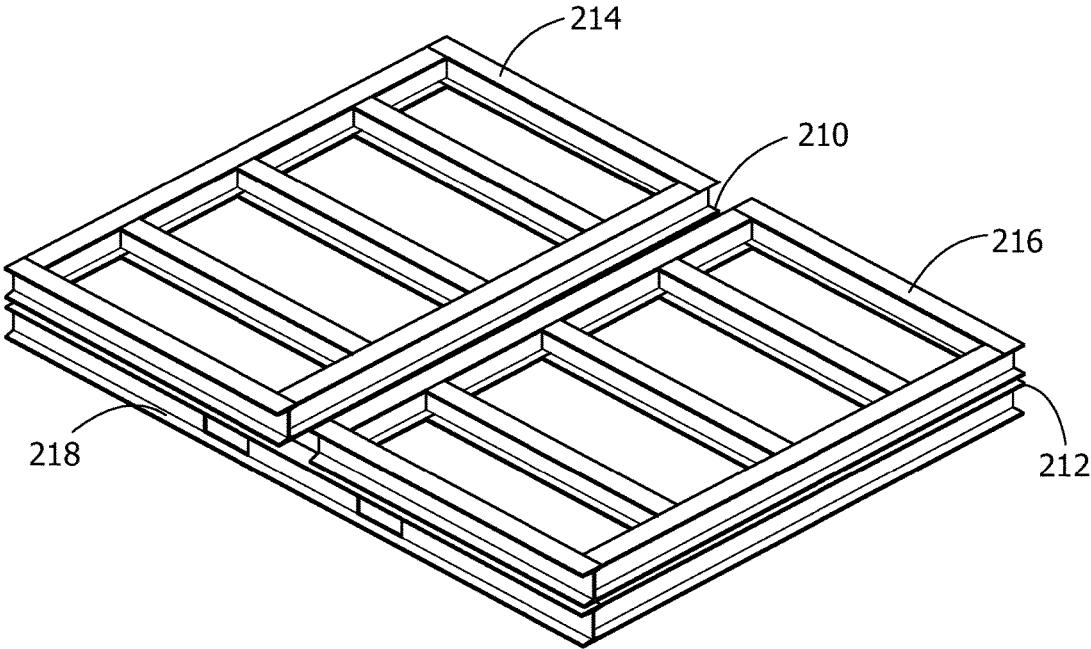


FIG. 7B

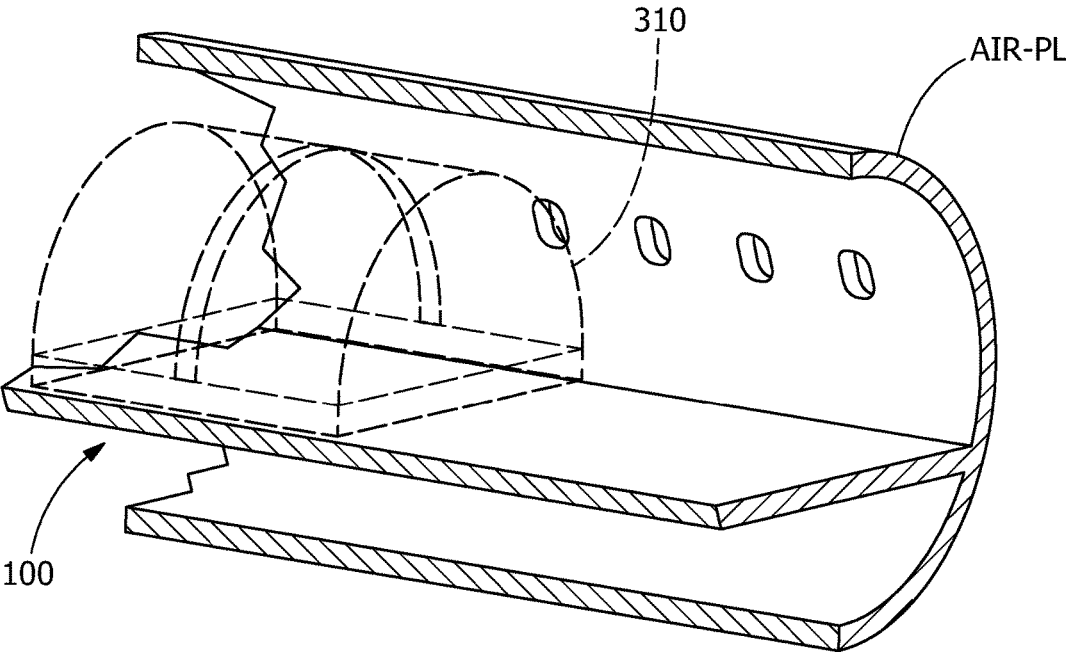


FIG. 8

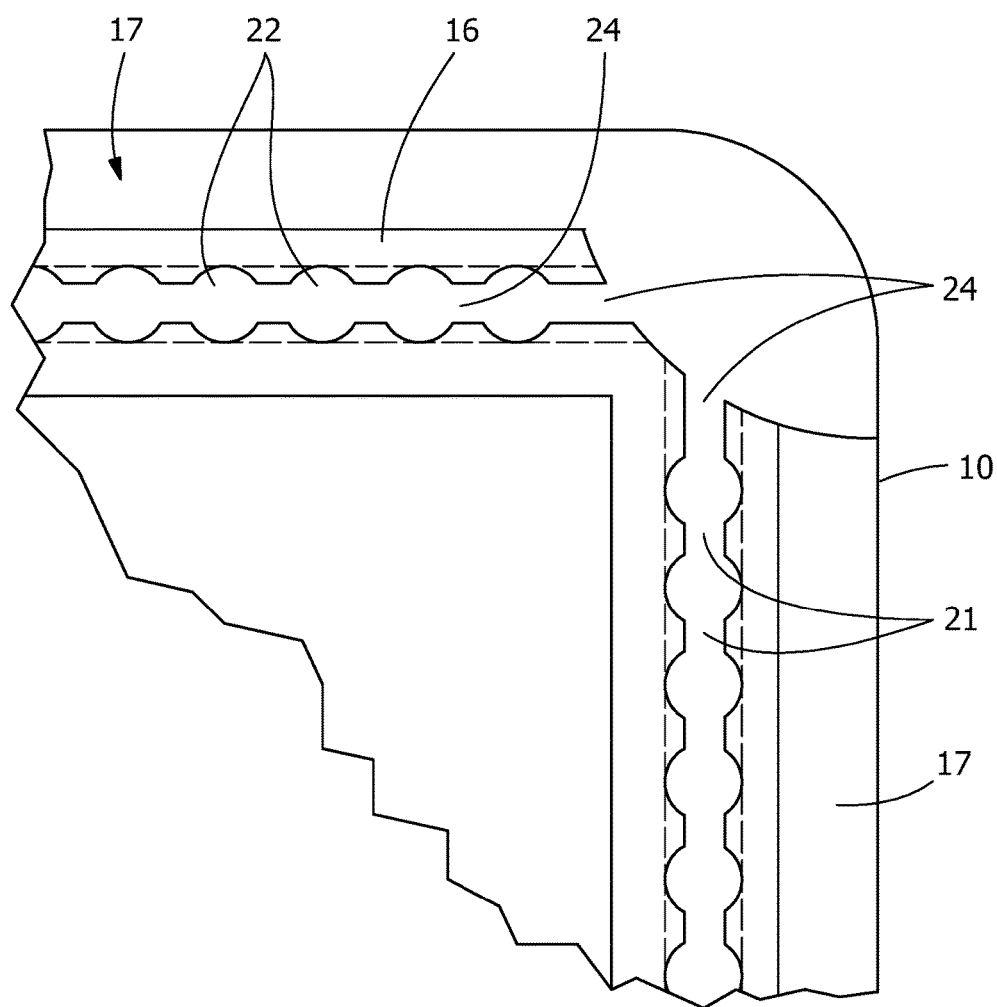


FIG. 9
Prior Art

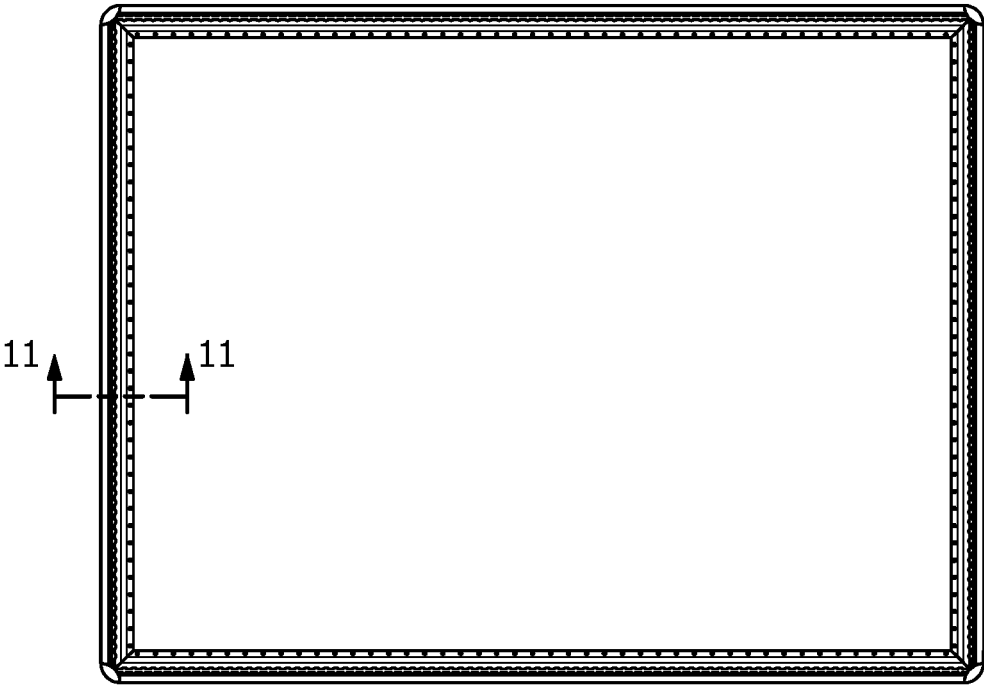


FIG. 10

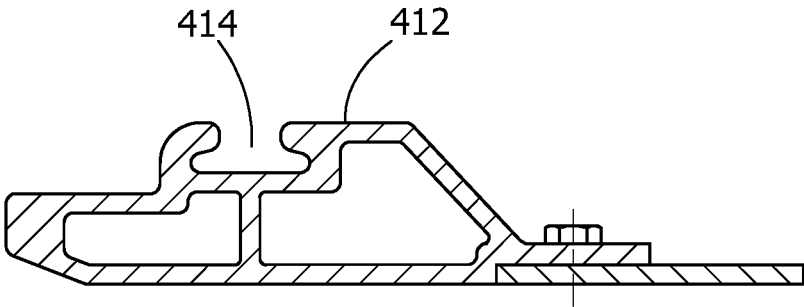


FIG. 11

TARGETED PROTECTION ASSEMBLY

CROSS-REFERENCE TO RELATED APPLICATION

[0001] This application claims priority from and the benefit of U.S. Provisional Patent Application No. 62/222,831, entitled "TARGETED PROTECTION ASSEMBLY" filed Sep. 24, 2015, which is hereby incorporated by reference.

FIELD OF THE DISCLOSURE

[0002] The present disclosure relates to a targeted protection assembly operable to protectively cover an item that is to be transported or stored. Additionally, the present invention relates to a cover for providing targeted protection in relation to an item that is to be transported or stored.

BACKGROUND OF THE DISCLOSURE

[0003] According to U.S. Pat. No. 7,540,390, special containers are used on aircraft for storing fragile parcels containing breakable or perishable goods, or for storing passenger luggage. As set forth in U.S. Pat. No. 7,540,390, due to the limited space available in aircraft cargo holds, the shape of such a container is generally designed to fit the shape of the walls of the aircraft cargo hold or luggage compartment. Thus, according to U.S. Pat. No. 7,540,390, one of the most important factors airlines use in selecting a suitable container for use in an aircraft cargo hold is gross weight. The heavier the container, the heavier the airplane and the more fuel that must be used to fly a predetermined distance.

[0004] U.S. Pat. No. 7,540,390 further notes that, in order to reduce the space occupied by such a container once it has been emptied, such a container has been designed to collapse. For example, according to U.S. Pat. No. 7,540,390, U.S. Pat. No. 5,890,612 discloses a collapsible aircraft container which has a rigid base frame supporting an accordion folding frame. The collapsible container has sides made of canvas and sheet metal plates. The frames are made of steel. Therefore, the container is heavy, even when empty.

[0005] U.S. Pat. No. 7,540,390 notes that another collapsible aircraft container is disclosed in U.S. Pat. No. 5,941,405 and this collapsible aircraft container has a base, support posts and roof made of aluminum and flexible side walls formed from light weight fabric. According to U.S. Pat. No. 7,540,390, due to the support posts, this container is heavy, even when empty.

[0006] U.S. Pat. No. 7,540,390 asserts that, in each of the noted collapsible aircraft containers, the less the weight the better, as long as the container is sturdy enough to handle normal wear and tear of such use. Consequently, according to U.S. Pat. No. 7,540,390, there is a need for a light weight, collapsible airline container which does not include a frame or support posts, thereby reducing its weight.

SUMMARY OF THE DISCLOSURE

[0007] One aspect of the disclosure relates to a targeted protection assembly operable to protectively cover an item that is to be transported or stored. The targeted protection assembly includes a base and a cover delimiting an interior volume in which an item to be transported or stored can be disposed, the cover being at least partially configured with an inflatable portion in which an inflating medium can be

disposed to expand the inflatable portion to, or maintain the inflatable portion at, an inflated disposition.

[0008] Another aspect of the disclosure relates to a cover for providing targeted protection in relation to an item that is to be transported or stored. The cover includes a structure delimiting an interior volume in which an item to be transported or stored can be disposed, the cover being at least partially configured with an inflatable portion in which an inflating medium can be disposed to expand the inflatable portion to, or maintain the inflatable portion at, an inflated disposition, the cover being disposable relative to a base on which the item to be transported or stored is located so as to provide targeted protection to the item.

[0009] An advantage of the present disclosure is that the targeted protection assembly provides a light weight, collapsible airline container.

[0010] Further aspects of the present invention are disclosed herein. The features as discussed above, as well as other features and advantages of the present disclosure, will be appreciated and understood by those skilled in the art from the following detailed description and drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

[0011] FIG. 1A is a partially exploded front perspective view of the targeted protection assembly of the present invention, showing a cargo pallet, a liaison member mounted on the cargo pallet, and a representative item of cargo in the form of an automobile disposed on the liaison member and additionally showing a cover, shown separate from the other components, that is configured to provide a cover function;

[0012] FIG. 1B is a front perspective view of the targeted protection assembly of the present invention shown in FIG. 1A and showing the cover providing a cover function over the cargo pallet, the liaison member mounted on the cargo pallet, and the automobile disposed on the liaison member;

[0013] FIG. 2 is a fully exploded front perspective view of the targeted protection assembly shown in FIG. 1A and FIG. 1B;

[0014] FIG. 3 is a front perspective view of a hybrid version of the cover of the present invention, wherein the cover is formed of partially inflated components and partially formed of non-inflated soft textile components;

[0015] FIG. 4 is a front perspective view of a further version of the targeted protection assembly;

[0016] FIG. 5 is an enlarged, partial front perspective view of one version of a locking channel of a cargo pallet and showing an exemplary version of an interconnecting piece for interconnecting the cover with the channel lock of the cargo pallet;

[0017] FIG. 6 is a front perspective view of a plurality of air cargo pallets and showing a stack of collapsed covers disposed on the topmost one of the stacked pallets;

[0018] FIG. 7A is a front perspective view of one version of a liaison member in its deployed condition;

[0019] FIG. 7B is a front perspective view of the one version of a liaison member shown in FIG. 7A and showing the liaison member in its non-deployed condition;

[0020] FIG. 7C is an enlarged front perspective view taken from region 7C of FIG. 7A;

[0021] FIG. 8 is a front perspective view of the targeted protection assembly shown in FIG. 1A and FIG. 1B and showing the targeted protection assembly in dashed lines in a cargo transport disposition on an airplane;

[0022] FIG. 9 is a view of FIG. 2 shown in U.S. Pat. No. 5,772,369;

[0023] FIG. 10 is a plan view of an air cargo pallet; and
[0024] FIG. 11 is a cross-section taken along the line 11-11 of the pallet shown in FIG. 10.

DESCRIPTION OF THE DISCLOSURE

[0025] In the following description, numerous specific details are set forth in order to provide a more thorough description of the present invention. It will be apparent, however, to one skilled in the art, that the present invention may be practiced without these specific details. In other instances, well-known features have not been described in detail so as not to obscure the invention.

[0026] The present invention provides, in one aspect thereof, a targeted protection assembly operable to protectively cover an item that is to be transported or stored. Additionally, the present invention provides, in another aspect thereof, a cover for providing targeted protection in relation to an item that is to be transported or stored. With reference to FIG. 1A, FIG. 1B, and FIG. 2, additional details of the targeted protection assembly will now be provided. The targeted protection assembly, generally designated as the targeted protection assembly 100, includes a base exemplarily configured as an air cargo pallet 110, a liaison member 210, and a cover 310. The components of the targeted protection assembly 100 cooperate together to protectively cover an item of cargo that is to be transported via a mode of transportation such as, for example, via airplane, via rails such as on a train, via a road system such as, for example, via a truck, or via a sea vessel. The pallet 110 by itself, or in combination with the liaison member 210, may additionally provide a relative stabilization platform for the item of cargo in that the cargo, such as an automobile 410, can be removably secured to the pallet 110, the liaison member 210, or both, and thereby be restrained from moving from its disposition on the liaison member 210 in the event of the occurrence of certain forces exerted upon, or impacts against, the targeted protection assembly 100 within a prescribed range.

[0027] The item of cargo is representatively shown in the form of the automobile 410 and the liaison member 210 is configured with a mass and size in coordination with the mass and size of the automobile 410 such that the liaison member 210 is preferably not plastically deformed when the automobile 410 is disposed on it and such that the four tires of the automobile are in contact with the liaison member 210 and preferably do not extend outwardly of the outer periphery of the liaison member 210.

[0028] As an example of the mass and dimension considerations that can be taken into account among the pallet 110, the liaison member 210, and the automobile 410, the pallet 110 may have a length dimension of, for example, 125 inches, and a width dimension of, for example, 96 inches, and the liaison member 210 may have corresponding length and width dimensions such that the pallet 110 extends under the entirety of the liaison member 210 and extends as well under the entirety of the automobile 410.

[0029] The liaison member 210 can be secured via any suitable means to the pallet 110 such as, for example, via a latching system or a tie-down system. A tie-down system, for example, may include cables, chains, or other flexible members of suitable strength that are removably attached to a location on the liaison member 210 at one end and, at

another end, are removably attached to the pallet 110. In one embodiment, the liaison member 210 can be at least partially secured to the pallet 110 by non-flexible members, including, for example, mechanical fasteners.

[0030] In accordance with one cover approach of the present invention, the cover 310 may be connected to the liaison member 210 and, in turn, the liaison member 210 may be connected to the pallet 110, wherein the cover 310 is thereby indirectly connected to the pallet 110. According to an alternate cover approach of the present invention, the cover 310 may be connected directly to the pallet 110 via, for example, suitable latching or tie-down mechanisms while, as noted, the liaison member 210 is itself directly connected to the pallet 110. With respect to both approaches to securing the cover 310 to the pallet 110, the objective is to secure the cover 310 relative to the automobile 410 such that the cover 310 creates a protective volume in which the cover provided targeted protection to the automobile 410 as the automobile is transported and/or stored while supported by the targeted protection assembly 100.

[0031] Once the automobile 410 has been disposed on the liaison member 210, the automobile 410 can be secured by any suitable securement means to the pallet 110, the liaison member 210, or both. For example, a plurality of separate tie-down mechanisms can be provided, each engaging a location at a respective wheel of the automobile such as a tie rod or a tire mounted on the wheel, and each being removably secured to the pallet 110, the liaison member 210, or both. The objective in securing the automobile 410 to the pallet 110, the liaison member 210, or both is to ensure that the automobile cannot shift beyond tolerable limits during its transport or storage when forces are exerted upon the targeted protection assembly 100 or impacts against the targeted protection assembly 100 occur within a prescribed range. For example, forces created due to accelerations or decelerations of the transport aircraft or vehicle may occur and the automobile should nonetheless be maintained in its disposition in the targeted protection assembly 100.

[0032] With further reference now to the deployment, non-deployment, and configuration of the cover 310, the cover 310 can be configured, in one version, with an inflatable structure having suitable compartments into which compressed air or another inflating medium can be injected to inflate the inflatable structure. Preferably, the cover 310 is self-standing—that is, once an inflating medium has been disposed in the inflatable structure of the cover 310, the cover can stand in a 3-dimensional form (3-D) in which it delimits an interior volume of sufficient size for accommodating the automobile 410. The thus-delimited interior volume need not mandatorily be a volume that is either fully enclosed by the cover 310 itself or by the cover 310 and the liaison member 210 in combination.

[0033] As desired, the longitudinal ends of the cover 310 can be formed entirely or substantially entirely of inflatable components or, alternatively, may be formed of a mix of inflatable components and non-inflating components such as, for example, soft textile components. Additionally, as desired, one longitudinal end of the cover 310 may be provided with an opening flap wherein the entire longitudinal end is formed with a hinge or other securement member that permits the entire longitudinal end to be displaced to an out-of-the-way position, whereupon the automobile 410 can be driven into or out of the interior volume formed by the cover 310. Alternatively or additionally, a door or a door-like

structure may be configured in the one longitudinal end of the cover **310** that allows access into the interior volume once the cover **310** has been disposed on the liaison member **210** and the pallet **110**.

[0034] The cover **310** is in complete, or substantially complete, non-contact relationship to the automobile **410**. That is, the cover **310** does not contact any surface of the automobile **410**, at least while the inflatable portion of the cover **310** is in its inflated condition.

[0035] With further reference to FIG. 3, a hybrid version of the cover **310** may include a soft textile lengthwise wall portion **312** that extends from one longitudinal end of the cover to the other longitudinal end of the cover and that does not comprise any inflatable components. In addition, a plurality of inflatable ribs **314** can be provided on the remainder portion of the cover **310** that cooperate with the non-inflatable portion **312** to together form the interior volume of the cover **310**. Preferably, this hybrid version of the cover **310** is also self-standing when the ribs **314** are inflated.

[0036] With reference now to FIG. 4, which is a front perspective view of a further version of the targeted protection assembly, the targeted protection assembly **100** can be configured to include a soft textile portion secured to a plurality of spaced apart reinforcing ribs each formed of an inflatable air tube such as, for example, the rib **314** described with respect to FIG. 3. The cover **310** can optionally be provided with non-inflatable support components such as, for example, a plurality of hollow tubes **316** each having a resiliently biased support **318**, such as cord extending there-through. In one embodiment, the support **318** can be resilient members, such as interconnected segments of fiberglass rods. Each hollow tube **316** can be inserted through a series of laterally spaced mounting sleeves (not shown) extending from the soft textile portion.

[0037] With further reference to FIG. 5, the pallet **110** is provided with a locking channel **112** that extends along a top surface of the pallet adjacent the periphery of the pallet. The channel is configured to receive therein securement devices that are secured to the liaison member **210**, the cover **310**, or both. For further details about one possible configuration of the locking channel **112** of the pallet **110**, reference is now had to FIG. 9, which is a view of FIG. 2 shown in U.S. Pat. No. 5,772,369. It is to be understood that the pallet **110** of the targeted protection assembly **100** of the present invention may be configured as one known type of air cargo pallet as is described in U.S. Pat. No. 5,772,369. FIG. 2 shown in U.S. Pat. No. 5,772,369 illustrates a corner section of a flat sheet metal pallet **10**, such as commonly used in air cargo shipping. According to U.S. Pat. No. 5,772,369, the pallet **10** has a track **16** which extends along edge portions **17** of the pallet **10**, and the track **16** serves to permit releasable mounting of a suitably configured anchor fitting.

[0038] FIGS. 10 and 11 show some details of an air cargo pallet having a locking channel feature. As seen in FIG. 10, which is a plan view of an exemplary embodiment of the pallet, the pallet may have a length dimension of 125 inches and a width dimension of 96 inches. As shown in FIG. 11, which is a cross-section taken along line 11-11 of a portion of the pallet shown in FIG. 10, the locking channel **412** of the pallet is shown as having an open top slot **414**.

[0039] With continuing reference to FIG. 5, the cover **310** is provided with a plurality of interconnect elements **320** spaced along the lower periphery of the inflatable (or hybrid

inflatable and non-inflatable) portion of the cover. FIG. 5 shows one of these interconnect elements **320** and each interconnect element **320** is configured to be removably inserted into a locking channel **112** and to be received therein in a manner in which the locking channel **112** limits the movement of the interconnect element **320** in a height direction perpendicular to the length and width dimensions of the cover **310**.

[0040] With reference now to further details of the liaison member **210**, the liaison member may include interior volumes in which, for example, inflation control and regulating equipment (not shown) can be disposed. Additionally, the liaison member **210** may have a suitable surface such as, for example, a corrugated surface, that enhances the ability of the liaison member to properly retain the automobile **410** disposed thereon. The liaison member **210** can be formed of a lightweight alloy or aluminum. The liaison member **210** preferably has an outer periphery that does not extend outwardly of the outer periphery of the pallet **110** and, if desired, the liaison member can be formed with a tapered or inclined surface at one end to facilitate the loading of the automobile **410** thereon. In this regard, as seen in FIG. 2, a pair of ramps **510** can be provided that facilitate the loading of the automobile **410** onto the liaison member **210**. The pair of ramps **510** may be formed of a lightweight alloy or aluminum material and may be removably detachable to one end of the pallet **110** or the liaison member **210** so that the ramps can be removed and optionally stored in the aircraft or within or proximate to the interior volume of the cover **310**.

[0041] FIG. 6 is a front perspective view of a plurality of the air cargo pallets **110** stacked one on another and showing a stack of collapsed covers **310** disposed on the topmost one of the stacked pallets. The arrangement illustrated in FIG. 6 is an example of one possible configuration of an approach for shipping several assemblies **100** from a first location to a second location after the respective items of cargos (not shown) that have been transported while supported on the assemblies **100** have been unload at the first location. The present invention allows a user to reap the benefits of reducing the footprint or space requirements needed to ship the now-unloaded assemblies **100** from the first location to the second location in that the pallets **110** can be stacked upon one another—whereby the stacked pallets **110** require only a single pallet footprint on a floor surface such as, for example, a floor surface in a cargo bay of an aircraft—and a number of collapsed covers **310**—each of which has been collapsed to a substantially smaller size than in its deployed condition—can be, arrayed on the topmost one of the stacked pallets **110** or otherwise stowed elsewhere in the shipment aircraft or vehicle. A collapsed cover **310** may be, for example, a cover in which some or all of the inflatable portions thereof have been partially or fully deflated. It can be understood that the capability to ship or store a cover **310** while in a collapsed condition beneficially permits a user to avoid the need to dedicate the use of a shipping volume or storage volume that would otherwise be required for the cover in its deployed condition.

[0042] With further reference to reaping the benefits of reducing the footprint or space requirements needed to ship the now-unloaded assemblies **100** from the first location to the second location, the liaison members **210** can also be arranged and/or configured to enhance these benefits. For example, FIGS. 7A and 7B illustrate one version of a liaison

member **210** that provides space-reducing benefits. As seen in FIG. 7A, which is a front perspective view of one version of a liaison member **210** in its deployed condition, the liaison member **210** is configured with a pair of lateral hinges **212** that are longitudinally spaced from another. As shown in FIG. 7B, which is a front perspective view of the one version of an liaison member **210** shown in FIG. 7A and showing the liaison member **210** in its non-deployed condition, the lateral hinges **212** permit respective end portions **214** and **216** to be folded upon a center portion **218** of the liaison member **210**, thereby effectively reducing the footprint of the liaison member **210** to approximately one-half of its footprint in its deployed condition.

[0043] An enlarged detail view 7C of FIG. 7A illustrates a securement aspect of the liaison member **210** via which the liaison member **210** can be removably secured to a pallet **110**. As shown in FIG. 7C, which is an enlargement taken from view 7C of FIG. 7A, the periphery of the liaison member **210** has a plurality of spaced flanges **220** each extending outwardly from the respective one of the end portions **214**, **216** or center portion **218** to which it is secured. Each flange **220** includes a bore **222** having a counterbore portion **228** configured to permit the shaft portion of a bolt **224** to extend therethrough while the counterbore portion **228** forming the top of the bore **222** is configured to receive a threaded nut **226** that can be removably threaded onto the bolt **224**. The threaded nut **226** can be threaded onto the bolt **224**, once the bolt has been inserted through a bore (not shown) formed in the pallet **110** that is so located as to be in registry with a respective bore **222** of a flange **220** of the liaison member **210** when the liaison member **210** is in its deployed position on the pallet **110**, whereupon the arrangement of the flanges **220**, the bolts **224**, and the threaded nuts **226** removably secure the liaison member **210** to the pallet **110**.

[0044] FIG. 8 is a front perspective view of the targeted protection assembly shown in FIG. 1A and FIG. 1B and showing the targeted protection assembly **100** in dashed lines in a cargo transport disposition on an airplane AIR-PL. It can be seen that the inflated portion or portions of the cover **310** are in their respective inflated conditions and this inflating task can be accomplished before the automobile **410** (FIGS. 1A, 1B) has been disposed on the liaison member **210** (FIGS. 1A, 1B) or after the automobile **410** has been disposed on the liaison member **210**.

[0045] While the disclosure has been described with reference to an embodiment, it will be understood by those skilled in the art that various changes may be made and equivalents may be substituted for elements thereof without departing from the scope of the disclosure. In addition, many modifications may be made to adapt a particular situation or material to the teachings of the disclosure without departing from the essential scope thereof. Therefore, it is intended

that the disclosure not be limited to the particular embodiment disclosed as the best mode contemplated for carrying out this disclosure, but that the disclosure will include all embodiments falling within the scope of the appended claims.

What is claimed is:

1. A targeted protection assembly operable to protectively cover an item that is to be transported or stored, the targeted protection assembly comprising:

a base; and

a cover delimiting an interior volume in which an item to be transported or stored can be disposed, the cover being at least partially configured with an inflatable portion in which an inflating medium can be disposed to expand the inflatable portion to, or maintain the inflatable portion at, an inflated disposition.

2. The targeted protection assembly according to claim 1, wherein the inflatable portion comprising a rib.

3. The targeted protection assembly according to claim 1 and further comprising a liaison member disposed intermediate the base and the cover, the liaison member being operably disposed to contact the item.

4. The targeted protection assembly according to claim 3, wherein the liaison member is operable to support a motor vehicle.

5. The targeted protection assembly according to claim 4, wherein the cover is in non-contact relationship to the item.

6. The targeted protection assembly according to claim 1, wherein the base includes a deployed condition and a non-deployed condition, the non-deployed condition having a reduced footprint relative to the deployed condition.

7. The targeted protection assembly according to claim 6, wherein the base comprising a hinge interconnecting a first portion and a second portion of the base, the first portion being folded over the second portion about the hinge when the base is in the non-deployed condition.

8. A cover for providing targeted protection in relation to an item that is to be transported or stored, the cover comprising:

a structure delimiting an interior volume in which an item to be transported or stored can be disposed, the cover being at least partially configured with an inflatable portion in which an inflating medium can be disposed to expand the inflatable portion to, or maintain the inflatable portion at, an inflated disposition, the cover being disposable relative to a base on which the item to be transported or stored is located so as to provide targeted protection to the item.

9. The cover according to claim 8, wherein the cover is in non-contact relationship to the item.

10. The cover according to claim 8, wherein the inflatable portion comprising a rib.

* * * * *