ONE-WAY CARGO CONTAINER

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Appl. No.: 11/476,441
Filed: Jun. 27, 2006

Related U.S. Application Data

Provisional application No. 60/695,199, filed on Jun. 29, 2005.

Publication Classification

Int. Cl. B65D 88/00 (2006.01)
U.S. Cl. ........................................................................ 220/1.5

ABSTRACT

A single use one-way intermodal cargo container is disclosed which after a single use can be dismantled and its parts disposed by sale, recycling, or scrapping. The appearance of the container of the present invention and its dimensions can be typical of intermodal cargo containers configured as a high-cube, open-top, half-high platform, open side, or standard general cargo container. The interior and exterior of the container are made of metal, synthetic material, wood or canvas, and the exterior can maintain its value as saleable materials, and is constructed to accommodate the dismantling process. Both the front and back ends of the container can be separated from the longitudinal main frame, and the cost of special construction and dismantling will be offset by sale of the parts thereof.
ONE-WAY CARGO CONTAINER

[0001] This application claims the benefit of the filing date of U.S. Provisional Patent Application No. 60/695,199 filed Jun. 29, 2005, the disclosure of which is hereby incorporated herein by reference.

FIELD OF THE INVENTION

[0002] The present invention is directed to the field of cargo containers. In particular, the present invention discloses a single use cargo container.

BACKGROUND OF THE INVENTION

[0003] Presently, the shipping industry utilizes intermodal containers to ship goods long distances. Large cargo containers are thus used extensively in international trade. Ocean carriers using container ships transport millions of these intermodal containers between trading countries. Shipping companies must maintain a balance of equipment on these trade routes regardless of the actual balance of trade between countries and various ports. When an imbalance of cargo exists carriers are forced to reposition empty containers, which is costly and time consuming, but nevertheless necessary for continuing their operations. At present, there are certain trade routes that are chronically out of balance. The Asia to North America trade route is one of these. A huge amount of empty containers must be returned to their point of origin in order to maintain even a semblance of a balance. Often these empty containers cannot be returned promptly, causing them to be stored for long periods of time at U.S. ports, for example. This condition adds to the congestion and logistical problems presently existing at these ports. In addition, if more dense goods are returned, fewer containers are returned. This is the case in the USA, which typically exports more dense materials than it imports. As a result, once again empty containers will accumulate at shipping ports, creating additional space and logistical problems. In some instances, a port may receive five times the number of containers that it sends back. What is needed is a method of shipping goods that alleviates the buildup of intermodal containers. A one-way, disposable, intermodal container would offer significant relief to ocean carriers, container leasing companies and shippers if they therefore did not have to contend with the costly return of empty containers. Therefore, a container that is used just once under revenue load, then dismantled and disposed of at its destination, would be a practical alternative to shipping empty containers back to their point of origin.

[0004] There have been a number of patents directed to cargo containers in general. U.S. Pat. No. 6,739,468 discloses a freight container having a base and a roof wherein fittings for lifting the container and/or stacking a second container on the roof are provided, with a support strut movably mounted on the container such that the support strut can be moved from a load-bearing position in which the support strut transfers a load between the fittings and the base during lifting and stacking and a loading position in which the support strut does not substantially impede loading and unloading of the cargo container from a side of the container. The support strut is carried on one side of a gate structure hinged to a corner post of the container by a hinge at the opposite side.

[0005] U.S. Pat. No. 6,216,900 discloses a cargo container in the form of a tractor-trailer or intermodal container which is convertible for selectively carrying solid freight or bulk liquid freight, including a housing, a plurality of collapsible tanks in the housing, liquid outlets in the tanks and conduits in communication with the liquid outlets located entirely within the housing, and an opening in the housing proximate the outlets of the conduits. A liquid washing assembly is permanently mounted on the tanks both in the expanded and collapsed conditions of the tanks. Guide structure is provided in association with the frame of the collapsible tanks for guiding the frame in a perfectly vertical direction both when the tanks are being expanded, and when they are being collapsed. The upper and lower edges of the tank sides are bolted and clamped to their associated frames. Hot air ducts encircle the liquid conduits in the bases of the tanks.

[0006] U.S. Pat. No. 6,299,009 discloses a collapsible freight container for air transport, having on a base element a frame-type structure containing a) a front frame featuring an opening for loading, b) a rear frame which lies opposite and parallel to the front frame, c) an inner side frame and at least one outer side frame, and d) a roof frame which lies opposite and parallel to the base element. In the unfolded, operational state this freight container has a stable shape and is self-supporting. The rear and front frames are joined, by means of hinge-type connections with horizontal axes of rotation, at the lower longitudinal sides to the abutting longitudinal sides of the base element in a manner which allows them to be rotated. They are also joined by means of hinge-type connections with horizontal axes of rotation, at the upper longitudinal sides to the abutting longitudinal sides of the roof frame in a manner which allows them to be rotated and, the side frames are joined by means of hinge-type connections in a manner which allows them to be rotated, at one of their longitudinal sides to the longitudinal side of one of the abutting frames or the base element, the hinge-type connections being arranged such that the side frames can be tilted out of their operational positions.

[0007] U.S. Pat. No. 6,015,055 discloses a cargo container in the form of a tractor-trailer or intermodal container which is convertible for selectively carrying solid freight or bulk liquid freight, including a housing, a plurality of collapsible tanks in the housing, liquid outlets in the tanks and conduits in communication with the liquid outlets located entirely within the housing and an opening in the housing proximate the outlets of the conduits. A liquid washing assembly is permanently mounted on the tanks, both in the expanded and collapsed conditions of the tanks. Guide structure is provided in association with the frame of the collapsible tanks for guiding the frame in a perfectly vertical direction both when the tanks are being expanded and being collapsed. Also, the bases of the tanks include pipe structure which permits the bases to be of a relatively small depth.

[0008] U.S. Pat. No. 5,178,292 discloses a cargo container made of plastic composite material comprised of (1) an outer skin including a roof, floor and side walls and (2) a main frame structure. The frame structure includes longitudinally extending upper beams and lower beams which extend for the full length of the container. Upright beams connect the upper and lower longitudinal beams at selected locations. The container is also provided with connector regions for connecting two or more intermodal containers in a stacked arrangement and for being engaged by a crane to raise and lower the container. The connector regions are located at intersections of the upper and lower longitudinal beams.
respectively, with certain of the upright beams. The main longitudinal beams are of a tubular construction. Metal reinforcing members are located at each of the upper connector regions and these connectors are effectively incorporated in the hollow beams. Metal lock receiving members are disposed within the upper beams and secured to the reinforcing members. The design is unique in that the metal reinforcing members are effectively integrated into the reinforced plastic composite material construction.

[0009] U.S. Pat. No. 5,257,830 discloses a cargo or storage container consisting of two equal sized square or rectangular shaped planes, joined by the affixed ends of two pivotally mounted pendulum suspended support legs in each external corner edge of the upper plane, and by the opposite ends of respective support legs, which are inserted vertically and assigned to one of two groove tracks of the lower plane. This provides mobility and stability to the blocked shaped frame, to which accordion style side walls may be firmly affixed, and which collapses and opens to a plurality of different storage heights under control of a gear driven system, while keeping the platforms in parallel relation to each other.

[0010] U.S. Pat. No. 5,562,374 discloses a container system for one-level and two-level freight cars and double-deck coaches, especially for high-speed trains. The object thereof is to ensure safe shipping at high speeds along with simple and well conceived loading and unloading. The containers are stowed inside the car or coach and secured for shipment by stops. The fronts of the containers are coplanar with the outer surface of the car or coach and constitute a continuous surface with its side. The car or coach is provided with mechanisms that lock the container into position without compromising the continuity of the surface, and any residual gaps around the edges of the containers are occupied by sealing strips.

[0011] U.S. Pat. No. 5,076,457 discloses a folding crate including a bottom having a substantially planar support surface for receiving packages, a first side wall and a second side wall. A first hinge arrangement is provided for hingedly connecting the first side wall to the bottom and a second hinge arrangement is provided for hingedly connecting the second side wall to the bottom. The hinge arrangements permit the first and second side walls to be folded inwardly toward the bottom when packages are not located in the crate. The hinge axis of the first and second hinge arrangements are positioned at elevationally different positions so that the first and second side walls can be folded inwardly toward the bottom and positioned substantially parallel to one another.

[0012] U.S. Pat. No. 6,789,987 discloses an invention for a cargo container comprising four walls, a top and a bottom, which form an interior having an inner ceiling and an inner bottom. Between the inner ceiling and the inner bottom there is at least one load support, which is moveable against goods to be loaded in the container such that the goods can be supported against the load support at least in one direction.

[0013] U.S. Patent Publication No. 2001/0035410 discloses a freight transportation container which can accept standard-sized pallets and is suitable for transportation by land, sea, or air. The size and construction of the container permits the loading and removal of freight by a conventional fork lift truck through the container, and allows placement of the container in standard-sized trucks, rail cars, sea vessels, and aircraft. The cargo container is also part of a system and method for transportation whereby the freight can be loaded, inventoried, locked, and sealed at a customer’s premises, and remain under the custody of one entity throughout shipment of the freight to the consignee. The containers can be linked together to assist in placing several of the containers on the truck, trailer, or rail car, where they can remain linked for transportation. The containers can be brought to a customer’s premises on the truck, trailer, or rail car. The containers are then loaded. Afterwards, the containers can be taken to holding areas, other trucks, ships or aircraft, or directly to the ultimate destination. Transactional information regarding the freight and destination is stored in a computer, allowing a central system to track the freight and generate appropriate business and customer documentation.

[0014] U.S. Patent Publication No. 2004/0222219 discloses a liftable cargo container with a support frame mounted on hinges on a support strut to define a triangular structure, a stay being pivotally mounted at the apex and having its distal end releasably connected to the base of the container. This strengthens the container for lifting at its corner fittings. The stay can be folded back against the frame to allow the latter to be swung outwardly for loading/unloading.

[0015] U.S. Pat. No. 5,572,325 discloses an improved cargo container for use in intermodal freight transportation systems that includes lift castings having a top lift aperture located on the lift casting at an outboard position, such that when other containers are stacked on top of the improved container, loads are properly distributed through reinforcement beams on the improved container, thereby substantially reducing bending stresses in the container, substantially reducing the possibility of fatigue failure of the improved container, and reducing the cost of maintenance and inspection of the container.

[0016] None of the these patent documents discloses an intermodal container that can be assembled and disassembled with minimal effort and yields a set of materials that can be used, sold, or salvaged. The present invention thus provides a solution to the current problem in the shipping industry involving the overabundance of empty containers being stored at destination shipping ports.

[0017] The present invention provides an engineering design that allows a container to be assembled and taken apart with minimal effort. The present invention provides for the inclusion of specific useful materials in the construction of the container. The present invention provides for return shipment of both the front and back ends of the disposed container. This includes both intact end frames as well as the container doors, exterior panels, and the eight corner fittings which are attached to the four corner posts. The present invention provides for the return shipment of multiple (e.g., 30) end frame sets in the volume of a single 45-foot container.

[0018] It is one object of the present invention to provide a disposable container that is easily disassembled.

[0019] It is a further object of the present invention to provide a system for reducing the return volume of intermodal containers.
It is another object of the present invention to permit cargo normally moving in transport systems to act as structural components of the container.

It is a further object of the present invention to protect the high value items for import with an additional weather resistant layer of construction.

SUMMARY OF THE INVENTION

These and other objects have now been realized by the invention of a one-way shipping container for shipping products comprising a rigid frame comprising a plurality of rigidly interconnected frame sections and a preselected plurality of products to be shipped removably affixed to the plurality of interconnected frame sections to form at least a portion of the side, floor or roof of the shipping container for containing additional products therein, whereby upon completion of a one-way shipment of the shipping container, the preselected plurality of products can be removed from the shipping container and utilized commercially along with the additional products. Preferably, the preselected plurality of products forms at least a portion of each of the sides, floor and roof of the shipping container, and most preferably substantially all of the sides, floor and roof of the shipping container. In one embodiment, the plurality of rigidly interconnected frame sections are bolted together. In another embodiment, the plurality of rigidly interconnected frame sections are welded together. In accordance with one embodiment of the present invention, a one-way disposable container system is provided. After a new container in accordance with the present invention is manufactured and put into service, it is offered to a shipper for loading. After loading it is transported to a port, where the ocean carrier handles it as it would any other ocean cargo container. After the sea voyage, it is turned over to a land carrier for final delivery to the import receiver. The receiver then unloads the cargo, and the empty container is taken to a dismantling depot. At the depot the container is physically taken apart with relative ease because of the very nature of these containers. The depot facility can then arrange for disposal of the container parts, such as by sale, recycling, or scrapping. Certain steel frame parts and the like can thus be recycled for future use at the point of origin. In that event, these parts can be combined in a unique manner to allow for shipment of multiple frames or parts in a single container.

In accordance with another embodiment of the one-way shipping container of the present invention, the plurality of rigidly interconnected frame sections comprises four longitudinally extending frame sections, four vertically extending frame sections, and eight corner sections providing a rectangular frame for the shipping container.

In accordance with another embodiment of the one-way shipping container of the present invention, the preselected plurality of products comprises building materials. Preferably, the new and reusable building materials include wood, plastic, metal, and laminates, with metals such as steel, aluminum or copper being used therein.

In accordance with another embodiment of the one-way shipping container of the present invention, the plurality of rigidly interconnected frame sections comprise a metal such as steel or aluminum.

In accordance with another embodiment of the one-way shipping container of the present invention, the shipping container includes dunnage for preventing shifting of the plurality of interconnected frame sections. Preferably, the dunnage comprise plastic or synthetic material.

In accordance with another embodiment of the one-way shipping container of the present invention, the roof comprises plastic sheeting or aluminum tubing covering the preselected plurality of products. Preferably, the one-way shipping container includes a pair of layers of the plastic sheeting or aluminum tubing surrounding the preselected plurality of products. Most preferably, the preselected plurality of products comprise lengths of rectangular-shaped aluminum tubing, aluminum sheets, copper sheets, copper gutters, and/or fiberglass products of various shapes. In another embodiment of the one-way shipping container of the present invention, the roof and/or the sides comprise heavy tarpaulin covering the preselected plurality of products and acting as weatherproofing theretofore.

In accordance with the present invention, a method has also been discovered for one-way shipping of products comprising providing a rigid frame for a shipping container composed of a plurality of rigidly interconnected frame sections, preselecting a plurality of the products to be shipped, removably affixing the preselected plurality of products to the plurality of rigidly interconnected frame sections to form at least a portion of the walls, floor or roof of the shipping container for containing additional products therein, and removing the preselected plurality of products from the rigid frame after the one-way shipment for commercial use thereof. Preferably, the method includes removably affixing the preselected plurality of products to form at least a portion of each of the sides, floor and roof of the shipping container, and preferably substantially all of the sides, floor and roof of the shipping container. In one embodiment, the providing of the rigid frame comprises bolting the interconnected frame sections together. In another embodiment, the providing of the rigid frame comprises welding the interconnected frame sections together, or preferably both bolting and welding the interconnected frame sections together.

In accordance with another embodiment of the method of the present invention, providing of the rigid frame comprises rigidly interconnecting four longitudinally extending frame sections, four vertically extending frame sections, and eight corner sections to provide a rectangular frame for the shipping container.

In accordance with another embodiment of the method of the present invention, the preselected plurality of products comprises both new and reusable building materials.

In accordance with another embodiment of the method of the present invention, the method includes covering the floor with plastic or fiberglass sheets, aluminum or steel sheets, or marine plywood.

In accordance with another embodiment of the method of the present invention, the method includes providing dunnage to prevent shifting of the plurality of rigidly interconnected frame sections.

In accordance with another embodiment of the method of the present invention, the method includes covering the roof sections with heavy duty tarpaulin or plastic...
and/or aluminum panels. Preferably, this method include encasing the roof in a pair of layers of plastic and/or aluminum panels.

[0034] In accordance with the present invention, a novel construction for one-way intermodal containers is provided. A one-way container can now be constructed with imported materials that can be used and sold as materials or parts of products, or imported goods themselves. In accordance with the present invention, a system is also provided for making a container utilizing wood, metal and synthetic material items that originate in the same region from which the container is to be shipped.

BRIEF DESCRIPTION OF THE DRAWINGS

[0035] The present invention may be more fully appreciated with reference to the accompanying drawings, wherein like numerals refer to like parts throughout.

[0036] FIG. 1 is a side, perspective view of the frame of a container in accordance with the present invention;

[0037] FIG. 2 is a side, perspective, partial, exploded view of the frame of the bottom of a container and floor joist assembly in accordance with the present invention;

[0038] FIG. 3 is a top, perspective, enlarged partial view of a partially disassembled roof of a container of the present invention;

[0039] FIG. 4 is a side, perspective, partial, exploded view of the connection of the roof assembly to the rear of the frame of a container in accordance with the present invention;

[0040] FIG. 5 is a side, perspective, partial, enlarged view of a corner of the roof of a container frame in accordance with the present invention;

[0041] FIG. 6 is a front, perspective, partial, enlarged view of a corner of the roof of a container with spacers in accordance with the present invention;

[0042] FIG. 7 is a side, perspective, partial, exploded view of a side panel construction in accordance with the present invention;

[0043] FIG. 8 is a side, perspective, exploded view of the composite layers of a composite side panel in accordance with the present invention;

[0044] FIG. 9 is a side, perspective view of another alternate configuration of a composite side panel for use in accordance with the present invention;

[0045] FIG. 10 is a front, perspective view of yet another alternate configuration of a composite side panel for use in accordance with the present invention;

[0046] FIG. 11 is a side, perspective, exploded view of the right side panels assembled to the frame of a container in accordance with the present invention;

[0047] FIG. 12 is a side, perspective view of the side panel covers of a container in accordance with the present invention;

[0048] FIG. 13 is a side, perspective, partial, exploded view of the assembly of a composite floor panel to the floor of a container in accordance with the present invention;

[0049] FIG. 14 is a side, perspective view of the cross members of the frame of a container in accordance with the present invention;

[0050] FIG. 15 is a side, perspective, partial, enlarged view of the attachment of a roof joist to a frame member of a container in accordance with the present invention;

[0051] FIG. 16 is a top, perspective, partial, enlarged view of a roof deck and clips used in a container in accordance with the present invention;

[0052] FIG. 17 is a side, perspective, partial view of another container in accordance with the present invention;

[0053] FIG. 18 is a side, perspective view of the frame of a container in accordance with another embodiment of the present invention;

[0054] FIG. 19 is a partial, enlarged, exploded view of detail A from FIG. 17 showing the roof beams attached thereto;

[0055] FIG. 20 is a side, perspective view of the frame of another container in accordance with the present invention;

[0056] FIG. 21 is a front, perspective, partial view of the attachment mechanism between the corner members of a portion of the container shown in FIG. 20;

[0057] FIG. 22 is a front, perspective, partial view of another attachment mechanism from that shown in FIG. 21;

[0058] FIG. 23 is a front, perspective, partial view of another attachment mechanism from that shown in FIG. 22;

[0059] FIG. 24 is an enlarged, partial, side, perspective view of a corner casting of detail B from FIG. 17; and

[0060] FIG. 25 is a partial, side, enlarged, perspective view of an intermediate casting shown in detail C of FIG. 17.

DETAILED DESCRIPTION

[0061] There are many embodiments which fall within the scope of the present invention. An effective example of one construction in accordance herewith is to use a steel frame to construct the outline of the container. This provides the structural support and strength to maintain the integrity of the container shape. The remainder of the container itself is then provided for by utilizing materials of value which themselves are intended to be shipped along with the container. These will provide at least parts of and preferably substantially all or all of the floor, roof and walls of the container itself for shipment purposes. Thus, additional product can then be placed inside the finished shipping container, as is the case under normal circumstances.

[0062] As an example of how products which are intended to be shipped can be used to construct at least part of the floor, walls and/or roof of the shipping container, an under floor can be constructed of valuable materials, such as teak wood or other material. In another embodiment wooden, fiberglass, steel or copper doors, such as home or business doors, can be laid as part of the floor, such as side by side along the length of the container. The doors can be covered by plastic or fiberglass sheets, or metal sheets, such as aluminum or steel, or marine plywood, or other such durable materials to both provide for structural support and to prevent abrasion of the doors or other materials used therefor. The doors can be protected by a 1/4" sheet of plastic or
any other of these listed materials on their undersides. In this manner, a container floor can be constructed with three layers of useful materials, the most valuable of which is sandwiched in the middle to prevent abrasion. A one-way container, upon arrival, yields not only the contents of the container, but also a number of doors of various materials or other such products of exotic origin, which can thus be sold for significant value.

As another example, the roof of a one-way container can similarly be constructed of an imported material such as an imported metal, for example copper. In an alternative embodiment, the container will be configured as an open top container. The structural cross members or bows used to support the roof of the container can consist of multiple pieces of extruded aluminum shapes, such as eight-foot lengths of rectangular tubing. These cross bows can form the basis of support for sheets of fiberglass or synthetic materials that can form the exterior roof panels. The outside skin of the roof can consist of a heavy duty tarpaulin material. Copper gutters in 20-foot lengths, for example, can also be used to span between the steel frame at either end and a midway divider. Copper gutters can be alternatively stacked in two layers. The gutters assist in providing structural support to the roof of the container, as well as yielding a valuable commodity upon arrival of the container. In order to protect the surface of the gutters, a ¼" plastic sheet is inserted into the frame, preferably both above and below the gutters. This prevents wear and abrasion to the gutters as well as shielding the gutter and the contents of the container from the elements. Plastic spacers can be inserted to span any gap that might exist between these structural import materials and the metal frame. In an alternate embodiment, the container can have an open top with structural members merely being covered by canvas.

As another example, the sides of the container can be constructed from other useful materials or products including building materials. Fiberglass and mineral core doors, as well as solid wood doors of exotic varieties can be incorporated into the manufacture of the container sides. In addition to various sizes and shapes of building materials, products such as fiberglass countertops, tabletops, drafting tables, hand carved panels, aluminum work platform, telescopic aluminum ladders, outdoor bulletin boards, outdoor signs, hurricane shutters, panels of aluminum fencing, fiberglass and synthetic laminated garage doors, full size garage doors of various materials, and pre-made outdoor decking can be utilized, just to name a few of the available and useful products for incorporation herein. In addition, sections of prefabricated outdoor buildings, interior wall panels and solar panels can also be used, as well as unasssembled parts of a multitude of products. Wooden doors made of a locally available wood may be of particular interest. The doors can be constructed from solid wood, or fire rated mineral core doors, or synthetic doors. The doors can be lined up side by side to span the length of a container. They are also advantageously covered by a ¼" sheet of plastic or similar material to prevent wear and provide a weather seal. It should be noted that the floor, roof, and walls of the container can be constructed of a vast number of building materials that are of a suitable size and strength. It is useful to use standard industry sizes such as 4 foot by 8 foot building materials or 3 foot by 5 foot building materials. The present invention contemplates that many useful materials can be utilized to construct a container and also yield valuable items that might otherwise be exported to the same region as that of the container destination.

It is therefore yet another aspect of the present invention to maximize the imported value of the materials used to construct the container.

Reference will now be made in detail to the presently preferred embodiments of the present invention, with specific reference to the accompanying drawings, wherein like reference numerals refer to like elements throughout.

The present invention is directed towards a single-use, disposable ocean cargo container. An intermodal container, loaded at origin by the shipper, transported by ocean carrier, delivered and unloaded by the receiver, then dismantled and disposed of after a single use; or disassembled to yield parts and/or products of value and/or returned to the port of origin.

Referring to the figures, FIG. 1 shows a frame for such a one-way container. The basic rigid frame for such a container as shown in FIG. 1 includes four longitudinally extending frame members, 132, 133, 162 and 163, four vertically extending frame members, 131, 134, 161 and 167, along with eight corner sections at the eight intersecting corners of the rectangular structure of the container as represented by corner section 202. These rigid steel or aluminum elements are rigidly affixed together by bolts or welding or the like to provide a frame for the container hereof. In addition, roof joist frame assembly 136 is made up of 9 roof joists labeled 136a to 136i and each spans the gap between top left longitudinal beam 132 to top right longitudinal beam 133. Rear left beam 121 and rear right beam 122 support top rear frame member 131. Top front beam 134 is supported by front left beam 123 and front right beam 124. Right panel support frames 140 and 141 support top right longitudinal beam 133. Left panel support frames 150 and 151 support top left longitudinal beam 132. Bottom right longitudinal beam 163 is located on the right side of the container and bottom left longitudinal beam 162 is located on the left side. Floor joist assembly 166 is attached to and spans the gap between bottom right longitudinal beam 163 and bottom left longitudinal beam 162. The floor joist assembly 166 is made up of floor joists 166a to 166o that span from the right side to the left side of the container and provide support.

FIG. 2 shows the configuration of the floor joist assembly. Left floor joist 566 is suited for bolted attachment to bottom left longitudinal beam 162. Right floor joist 567 is suited for bolted attachment to bottom right longitudinal beam 163. Attachment bracket 263, extending from corner section 202, is suited for bolted attachment to bottom right longitudinal beam 163. Attachment bracket 262 is suited for bolted attachment to bottom left longitudinal beam 162. Floor cross member 165 is suited for bolted attachment to both bottom left and right longitudinal beams 162 and 163. In this manner, the several pieces of the frame and floor joist assembly can be assembled as needed.

FIG. 3 shows a view of a roof deck installed in the frame of the container. Spacer 72 and spacer jack 74 maintain the position of the roof deck within the container. That is, the spacer jack 74 spans a space between the top rear frame member 131 and the space 72, which corresponds to the end of the roof framing members (products) themselves.
FIG. 4 shows a view of the assembled roof joist assembly and its attachment to the rear of the container. Left roof joist 136L is suited for bolted attachment to beam 132 through holes 320. Right roof joist 136R (not shown) is suited for bolted attachment to beam 133 through holes 321. Roof joist 136L spans the gap between the left and right roof joints 136L and 136R, and provides support for container materials not shown in this figure. Attachment bracket 232, again extending from corner section 202, is suited for bolted attachment to top left longitudinal beam 132. Attachment bracket 233 is suited for bolted attachment to top right longitudinal beam 133.

FIG. 5 shows a close up view of the rear right top corner of the container, ISO Corner fitting or section 202 has been welded to beams 133, 131, and 122. Corner piece 139b is affixed to attachment bracket 233 and provides guidance for horizontal materials placed over or below corner piece 139b. Bolts, for example 301, are used to attach attachment bracket 233 to beam 133. Door hinge 245 is shown fixedly attached to beam 122 and is preferably welded. Thus, a conventional container door can be attached to the end of the container for entry thereinto.

FIG. 6 shows a close up of the rear left corner of the roof of the container. Corner piece 139a provides guidance for other parts of the container that sit either above or below front roof metal layer 34, which can be provided by many types of metal, but which is shown in this case as copper gutters. Front roof metal layer 34 is kept in place by spacer 72. Spacer 72 is buttressed by spacer jack 74 to maintain the proper distance between spacer 72 and front top beam 131, and prevent shifting of the roof with respect to the frame during shipment thereof.

FIG. 7 shows a view of the details of panel joiner. Structural materials 405 and 406 are joined by interior joiner 412. Top joiner 414 is used to span the structural materials 405 and 406, and maintain their alignment. End joiner 410 intersects top joiner 414 to keep the entire panel both flat and intact. Many of the panels and panel assemblies are held together using the panel joiners. The panel joiners can be formed in numerous different sizes in order to accommodate a variety of structural materials and container parts to form useful, standard sized wall, roof, and/or floor panels for container construction. The flexibility of the panel joiners is useful, but not essential to practicing the present invention, as panel assemblies can be formed of large slabs of wood or composite material without the need for panel joiners.

FIG. 8 shows panel assembly 444 with six pieces of structural materials as part of a composite assembly. Side spacer 450 makes up the difference between the combined dimensions of structural materials and the desired size of composite panel 444, which most preferably matches the size of the other side panels and panel assemblies in the container. Any number of other panel assemblies can be used to form the container walls. Interior plastic cover 47 is shown on a first side of composite panel 444, and an exterior plastic cover 41 is shown on a second side of composite panel 444. Container plastic cover 41, composite panel 444, and interior plastic cover 47 are preferably attached with threaded fasteners. The plastic covers 41 and 47 are preferably formed of 1/8 inch plastic sheeting.

FIG. 9 shows an alternate configuration for a side panel assembly 454. In this embodiment, the structural materials are vertically oriented, and five pieces are utilized to make up side panel assembly 454. This is only one of a large variety of these configurations of these structural materials which can be used to produce panel assemblies. For example, a container front end wall can be produced with three of these structural elements, for example, which are joined together with the jointer pieces, 410, 412, and 414, discussed above in connection with FIG. 7. Similarly, a larger number of these pieces of structural material, for example, seven such pieces or more, can be joined together to make up the under floor.

FIG. 10 shows yet another alternate configuration for a side panel assembly 464. In this embodiment, the structural materials are both vertically and horizontally oriented, and seven structural materials are utilized to make up side panel assembly 464. In this embodiment, two kinds of structural materials are used to make up the side panel 464. Structural materials 308a, 308b, and 308c are placed in a vertical orientation. Structural material 309a, 309b, 309c, and 309d are placed in a horizontal orientation. They are held together by panel joiners.

FIG. 11 shows a view of the assembly of an entire container side, in this case using three different panel assemblies. Rear side panel 44 is covered on the inside with plastic cover 47 and on the outside with plastic side cover 41. Middle side panel 45 is shown exposed. Front side panel 46 is shown exposed with vertical configuration of container parts. Right wall rear panel assembly 44 is supported by right wall rear cross bracing 142. Right wall middle panel assembly 45 is supported by right wall middle cross bracing 143. Right wall front panel assembly 46 is supported by right wall front cross bracing 144. Cross bracing 143 is connected to right panel support frames 140 and 141 on the right side of the container. Support frames 150 and 151 are located on the left side of the container. Top right longitudinal beam 133 is located on the right side of the container and top left longitudinal beam 132 is located on the left side. Top rear beam 131 is located at the rear of the container while top front beam 134 is located at the front of the container.

FIG. 12 shows a view of the container with the right side panel assemblies 44, 45, and 46 connected to the frame of the container. Once again, this is only one of a number of possible configurations, each of which can be used to provide all of the walls of the container.

FIG. 13 shows one half of under floor 62 raised to show floor spacer 63. Floor spacer 63 is used to fill the gap or space between a combination of standard sized wood pieces and the interior dimensions of a container. The most desirable pieces may combine to yield a floor 62 that is of non-standard size. Floor spacer 63 is used to make up the difference therebetween, and to yield a standard size. Rear floor plastic cover 65 is placed below the under floor 62 to prevent abrasion or damage from the elements to under floor 62.

FIG. 14 shows the cross bracing of the container of the present invention. Rear side bracing 142 is installed to provide support to other panels (not shown) that would otherwise be prone to bowing or flexing. Middle side bracing 143 is similarly installed in the middle right side panel, and front side bracing 144 is installed in the right front side panel. In a preferred embodiment, the cross member is
installed exterior to a composite side panel and interior to the plastic side cover. This allows the cross member to provide support to the composite side panel while still allowing the plastic side cover to be smooth for ease of handling and transport.

[0082] FIG. 15 shows a close-up view of a roof joist attachment. Roof joist 136c is welded to joist hanger 236e. Bolt 306 is threaded through joist hanger 236e and left wall middle panel assembly 55. Bolt 305 attaches joist frame assembly 136c to top left long beam 132. Bolt 307 attaches 135 to top left long beam 132.

[0083] FIG. 16 shows a view of the construction of the roof of the container of the present invention. Front roof metal layer 34 is shown composed of a layer of gutters. Where a smooth back end of a gutter 275 meets another smooth end of gutter 276, flat clip 271 is used to secure gutter 275 to gutter 276. A channel clip 272 is used to secure gutter 276 to gutter 277. For an entire roof deck, preferably copper type K rain gutters are used to make up the middle section of the roof of the container. A deck can be composed, for example, of 44 copper rain gutters in a K style with a height of four inches and a length of twenty feet. This configuration results in a deck 240 inches long and 88 inches wide.

[0084] FIG. 17 shows another embodiment of a one-way container for use in connection with the present invention. In this case, the roof and longitudinal sides of the container are covered by a heavy tarpaulin 273, which can be temporarily affixed to the frame by any conventional means.

[0085] FIG. 18 shows another embodiment of a one-way container for use in connection with the present invention. In this case, the container is prepared from tubular frame pieces as opposed to solid or steel pieces, such as those depicted in FIG. 1. In this case, the hollow tubular pieces can be attached to the two door frames at the ends of the container, such as door frames 4 and 5 shown in FIG. 18. The two doors 6 and 7 are attached to the remaining structure in the following manner. That structure includes longitudinally extending frame members, 8, 9, 10, and 11 which comprise two longitudinal base frame members, 8 and 9 and two longitudinal roof frame members, 10 and 11. These are tubular frame pieces, preferably made of aluminum or the like. They are attached to the corner members of the door frames, 4 and 5. The corner members include similar top and bottom castings 15 as shown in FIG. 24. Thus, each such casting 15 is attached, for example, to side walls, 16 and 17, and top and bottom walls, 18 and 19, respectively, of the door member 4. The casting blank 15 includes an extending male member 20 so that for each door frame such as door 4 four of these male members 20 will extend rearwardly from the four front corners respectively by castings 15. Thus, each of the longitudinally extending frame members, 8, 9, 10, and 11, can be attached to each one of these four male members 20 in the manner shown in FIG. 24. The male members 20 can include screw holes 22, and upon insertion of the hollow tubular, longitudinally extending frame members, 8, 9, 10, and 11, into the male members 20, attachment can be effected by bolts 24 with attendant washers 26 and nuts 28 after the bolts have been extended through corresponding bolt holes 30 in the longitudinally extending frame members corresponding to the screw holes 22 in the male members 20 affixed thereto. The same is true with respect to the rear door 5, so that in this case again four of the same corner castings, 15, are attached to the other ends of the hollow tubular, longitudinally extending frame members, 8, 9, 10, and 11. For further support purposes, it is also possible to include intermediate longitudinally extending wall members 30 and 32 extending from an intermediate position on the upstanding side walls, 16 and 17, of the front door 4 and the rear door 5. These hollow longitudinally extending frame members are attached to intermediate portions by means of intermediate castings 34 as shown in FIG. 25. Thus, intermediate of the upstanding sidewalls 16 and 17 in the front door 4 and in the rear door 5, additional male members 20 extend therefrom. Once again, it is thus possible to attach longitudinally extending hollow frame members, 30 and 32, to these male members at the opposite ends of the frame in the same manner as is discussed above. Thus, screws 24 and washers 26 extend through corresponding screw holes 30 in the frame member 31, and screw hole 22 in the male member 20 to be fastened by means of bolts 28 after passing therethrough.

[0086] In addition to the above, the overall frame can be strengthened, and utilized for purposes of shipping additional product in the form of a conventional rectangular tube such as eight-foot rectangular aluminum tube members which can constitute part or all of the floor and/or the roof for each such container. This is accomplished by utilizing removably attachable anchors, 40 and 42, as shown in FIG. 19 for attachment by merely placement above each of longitudinally extending frame members, 10 and 11, shown therein. Each of these anchor members 40 and 42 can thus carry within them a rectangular tubular member 50 shown in exploded view in FIG. 19. Thus, as is shown in FIG. 18, each of these combinations can extend across the roof and/or the floor panels at regular intervals, or continuously therealong. This is accomplished by each of the anchors, 40 and 42, comprising a tubular section with a top surface 44, side walls, 46 and 48, and a front wall 50, as well as an opening 52 facing downwardly from top wall 44. This opening 52 is sized to fit slidable onto the surface of the longitudinally extending frame member 8, 9, 10, or 11. The inner end of the anchor includes an opening 54 which is sized to retain the rectangular tubular member 50 therewithin. Two of these anchor members are included on either end of the construction for maintaining the tubular member therebetween. While FIG. 18 shows a number of these members, it is quite possible to construct an entire floor and/or an entire roof by placing contiguously therealong these members. Upon arrival at port, the anchor members 40 and 42 can be recycled, and each of the tubular members 50, which thus formed part of the floor or roof of the container during shipment, can then be removed and sold separately.

[0087] As an alternative, the anchor members 40 and 42, instead of having the configuration shown in FIG. 19, can be wider than a single tubular member 50; for example, they can be as wide as two or three of these members. It is known that a single anchor member 40 or 42 can retain multiple tubular members 50 therewithin. This, of course, renders it even easier to construct the overall container roof and/or floor in the first instance.

[0088] Turning to FIG. 20, another embodiment of a one-way container for use in connection with the present invention is shown. In this case, the basic frame is similar to that shown in FIG. 18, but in this case the longitudinally
extending frame members 8, 9, 10 and 11 are once again attached to the door frames 4 and 5 for doors 6. Once again, these are preferably tubular frame pieces, preferably made of aluminum or the like. The structure of the container, however, differs from that in FIG. 18 in a number of ways. Firstly, the door frames 4 and 5 are attached to the bottom frame members 8 and 10 by means of angular braces 29. Additional support for the overall frame in this case is provided by a series of upstanding support members 21 disposed along the length of longitudinally extending frame members 8, 9, 10 and 11. The attachment of these upstanding support members 21 to the frame, and to the rectangular tubular members 50 employed in the roof and floor thereof is shown in detail in FIGS. 21-23. Turning to FIG. 21, rectangular tubular member 50 is, in this case, inserted into an anchor member 40, which includes a tubular section 44 which is attached to a rectangular collar 43 through which the longitudinally extending frame members 8, 9, 10 and 11 can extend. From the lower face of rectangular collar 43 extends a protrusion 45, which is of a size and configuration to fit within the hollow inner portion of the upstanding support member 21. The protrusion 45 thus includes apertures 47, corresponding to similar apertures 47 in the end of upstanding support member 21, so that when these elements are fitted together, they can be attached by screws 53 extending through both apertures 47 and 47', and then being secured by nuts 57 affixed thereto.

Alternate methods of affixing the upstanding support members 21 to the protrusion 45 from rectangular collar 43 are shown in FIGS. 22 and 23. In FIG. 22, instead of the hollow, rectangular upstanding support member 21, a planar support member 21" is utilized. In this case, the rectangular collar 43 does not need to include a protrusion, but merely includes apertures 47 on its outer face 51. The surface of planar support member 21" includes corresponding apertures 47", so that it can be affixed to the outer surface 51 of the rectangular collar 43 by means of screws 53" and nuts 57". In another alternative shown in FIG. 23, the upstanding support member is a three-sided support member 21". In this case, the rectangular collar 43 and protrusion 45 are identical with those shown in FIG. 21, but the three-sided support member 21" is affixed to protrusion 45 by means of corresponding aperture 47 in protrusion 45 and aperture 47" on the outside face of three-sided support member 21". Once again, screws 53" are inserted through these two sets of apertures, and affixed thereto by means of nuts 57".

While this discussion of the containers shown in FIGS. 18 and 20 provide alternatives to the structure such as that shown in FIG. 1, it will be understood that, in addition to this overall construction of a frame, it is possible to combine elements of the containers discussed above, such as placement of a floor and/or roof above the constructions shown in FIG. 18, covering the floor or the roof with plastic or other synthetic materials, as well as heavy tarpaulin, copper gutter material, or the like.

In addition to the embodiments shown in the figures, there are additional aspects of the present invention. The exterior shell, which includes the front, back, both sides, floor and/or roof, and/or any portions thereof, can be made of various materials or "products" as described herein, including steel, aluminum, laminated material, plastic, or wood. These parts can be single pieces or sectional pieces.
stability sufficient to contain shipped goods that can also serve as intrinsically marketable materials.

[0098] Container construction materials may include: Copper sheeting construction materials, 6 inch shapes, 20 feet long (Dual Roof Deck); 30 or 36, 1 1/2 inch thick wood slabs (6 Side Panel Assemblies); and three 30 1/2 inch by 80 1/2 inch wood slabs (Floor Deck). Other materials include plastic covers and structural members of steel. Aluminum can be used. All frame shapes are either structural steel or hollow aluminum tubes in these drawings.

[0099] Floor and roof joist frames are preferably welded, bolted or locked in place by the character of all these proportions. Salvage of steel or aluminum materials can be "economically feasible" if these frames can be reduced to scrap metal lengths of four feet or less with a minimal amount of labor. These frames, like the Panel Support Frames, can be salvaged and shipped back to a port of origin for reuse in one-way container construction.

[0100] The entire front and rear sections of the container comprising the front and rear end frames, including the container's doors, can be shipped back to the port of origin for reuse. The welded steel Front and Rear Frames are preferably disassembled and shipped to a port of origin for reuse.

[0101] The longitudinal members can be metal, such as steel or aluminum, in extruded, flat or rolled profiles. They are used without any welded brackets attached, which makes them easier to salvage. Beams can be used as construction materials, like beams used as columns in small buildings or in airplane hangar construction. They can be stacked and recycled or cut up into four foot pieces for metal scrapping. It can be configured in size to be a twenty foot, forty foot, or forty-five foot ocean container. It can be configured in type to be a Hi-Cube, Open Top, Half High or Standard general cargo container.

[0102] In a preferred embodiment, a container, including a platform or open-side container, 40 feet in length is produced. The floor is made with solid fiberglass doors as an underfloor and marine grade plywood sheets for the upper floor layer. Thirteen doors can be laid that are of dimension approximately 1/2" thick, 36" wide and 90" high.

[0103] Copper gutters in 20-foot lengths can be used to make the interior layer of the roof. One half of the roof can be made of a first set of gutters laid lengthwise and side by side. Another set of gutters is then laid side by side to form the second half of the roof. Each set of gutters engages a cross member at the middle of the container. The first set of gutters also engages a cross member at a first end of the container. The second set of gutters engages a cross member at a second end of the bottom of the container. Fourteen gutters laid side by side provide adequate width to cover the top of the container. The roof can be finished with a fiberglass roof cover, or the other materials discussed above, including a heavy tarpaulin, or the like.

[0104] The sides of the container are made of three sections on each side of the container. Each section is made of a sandwich layer of wood and fiberglass. Each section is approximately 15 feet long and made of a first layer of wood or composite suitable for use as a building material. The second layer is made of fiberglass and is weather resistant by nature. At the first end, the side of the container is covered by a layer of wood and fiberglass. In a preferred embodiment, three doors are utilized with a 103° side horizontally oriented and a 30 1/2° side vertically oriented. At the second end of the container, two metal doors of conventional construction are used to provide access to the container. The doors are hingedly attached to the metal frame of the container. Attachment bolts are used to attach composite panels, panel support frame and joist frame assemblies. A top longitudinal beam is attached to the joist frame assembly with the use of a conventional bolt. The use of bolts allows for the threaded attachment of the various pieces of the invention. Thus, the container can be disassembled with the use of conventional tools or an air wrench for more rapid disassembly.

[0105] Other materials can be used in the construction of the one-way container. For example, doors of various widths, such as 30, 34, 36 and 42 inches can be used. Outdoor bulletin boards, tarp wood, exterior wooden door slabs, finished and unfinished door panels, counter tops, table tops, table deck, composite deck, counter tops and table tops can also be utilized. Wooden and composite materials of 2 ft by 4 ft, 4 ft by 4 ft, 3 ft by 8 ft, 4 ft by 8 ft, and other standard sizes and compositions can be utilized in the construction of the one-way container hereof.

[0106] The many features and advantages of the present invention are apparent from the detailed specification and, thus, it is intended by the appended claims to cover all such features and advantages of the invention that fall within the true spirit and scope 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 illustrated and described, and accordingly all suitable modifications and equivalents may be resorted to, falling within the scope of the invention.

1. A one-way shipping container for shipping products comprising a rigid frame comprising a plurality of rigidly interconnected frame sections and a preselected plurality of products to be shipped removably affixed to said plurality of interconnected frame sections to form at least a portion of the side, floor or roof of said shipping container containing additional products therein, whereby upon said one-way shipment of said shipping container said preselected plurality of products can be removed from said shipping container and utilized commercially along with said additional products.

2. The one-way shipping container of claim 1 wherein said preselected plurality of products form at least a portion of each of said side, floor and roof of said shipping container.

3. The one-way shipping container of claim 1, wherein said preselected plurality of products form substantially all of said side, floor and roof of said shipping container.

4. The one-way shipping container of claim 1 wherein said plurality of rigidly interconnected frame sections are bolted together.

5. The one-way shipping container of claim 1 wherein said plurality of rigidly interconnected frame sections are welded together.

6. The one-way shipping container of claim 1 wherein said plurality of rigidly interconnected frame sections comprises four longitudinally extending frame sections, four
7. The one-way shipping container of claim 6 wherein said plurality of rigidly interconnected frame sections comprise a metal selected from the group consisting of steel and aluminum.

8. The one-way shipping cartons of claim 7 wherein such metal comprising aluminum, and said rigidly interconnected frame sections are hollow.

9. The one-way shipping container of claim 1 wherein said preselected plurality of products comprises reusable building materials.

10. The one-way shipping container of claim 9 wherein said reusable building materials comprise building materials selected from the group consisting of wood, plastic, metal, and laminates.

11. The one-way shipping container of claim 10 wherein said metal is selected from the group consisting of steel, aluminum and copper.

12. The one-way shipping container of claim 1 wherein said floor comprises an upper floor comprising plywood disposed over said preselected plurality of products comprising a lower floor.

13. The one-way shipping container of claim 1 including damage for preventing shifting of said plurality of interconnected frame sections.

14. The one-way shipping container of claim 13 wherein said damage comprise plastic or other synthetic material.

15. The one-way shipping container of claim 1 wherein said roof comprises material selected from the group consisting of plastic sheeting, aluminum tubing, and heavy tarpaulin covering said preselected plurality of products.

16. The one-way shipping container of claim 15 including a pair of layers of said material selected from the group consisting of plastic sheeting, aluminum tubing, and heavy tarpaulin surrounding said preselected plurality of products.

17. The one-way shipping container of claim 1 wherein at least a portion of said roof or sides comprises heavy tarpaulin surrounding said preselected plurality of products.

18. The one-way shipping container of claim 16 wherein said preselected plurality of products comprises products selected from the group consisting of lengths of aluminum tubing, aluminum sheets, copper sheets, cooper gutters, and fiberglass.

19. A method for one-way shipping of products comprising providing a rigid frame for a shipping container composed of a plurality of rigidly interconnected frame sections, preselecting a plurality of said products to be shipped, removably affixing said preselected plurality of products to said plurality of rigidly interconnected frame sections to form at least a portion of the sides, floor or roof of said shipping container for containing additional products therein, and removing said preselected plurality of products from said rigid frame after said one-way shipment for commercial use thereof.

20. The method of claim 19 including removably affixing said preselected plurality of products to form at least a portion of said sides, floor and roof of said shipping container.

21. The method of claim 20 including removably affixing said preselected plurality of products to form substantially all of said walls, floor and roof of said shipping container.

22. The method of claim 18 wherein said providing of said rigid frame comprises bolting said interconnected frame sections together.

23. The method of claim 19 wherein said providing of said rigid frame comprises welding of said interconnected frame sections together.

24. The method of claim 19 wherein said providing of said rigid frame comprises bolting and welding of said interconnected frame sections together.

25. The method of claim 19 wherein said providing of said rigid frame comprises rigidly interconnecting four longitudinally extending frame sections, four vertically extending frame sections, and eight corner sections to provide a rectangular frame for said shipping container.

26. The method of claim 19 wherein said preselected plurality of products comprises new or reusable building materials.

27. The method of claim 19 including covering said floor with a material selected from the group consisting of plastic, fiberglass, aluminum sheets, steel sheets, and plywood.

28. The method of claim 19 including providing damage to prevent shifting of said plurality of rigidly interconnected frame sections.

29. The method of claim 19 including covering said roof with a layer of a material selected from the group consisting of heavy duty tarpaulin, plastic panels, and aluminum panels.

30. The method of claim 29 including enclosing said roof in a pair of layers of said material selected from the group consisting of heavy duty tarpaulin, plastic panels, and aluminum panels.

31. The method of claim 19 including covering at least a portion of said roof or side with a layer of heavy duty tarpaulin.

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