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(54) **Refrigerated container**

Kühlcontainer

Conteneur réfrigéré

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Description

Object of the Invention

[0001] The invention, a refrigerated container, more specifically relates to an intermodal 40 and 45 foot refrigerated container for carriage by road, by rail and by sea, manufactured with composite materials and which complies with the requirements of the ATP Agreement, i.e., the Agreement on the International Carriage of Perishable Foodstuffs and on the Special Equipment to be used in such Carriage. The present invention describes a refrigerated container with part of the metal structure embedded in the panels manufactured from composite materials.

[0002] This invention is comprised in the sector of the carriage of perishable goods in the field of food, pharmaceuticals, chemicals, among others, and whenever an effective control of the internal temperature is desired.

Background of the Invention

[0003] Today, refrigerated containers for the carriage of goods which comply with the requirements of the ATP Agreement are containers manufactured with sheet metal panels both internally and externally, which makes it difficult to assure a good heat transfer coefficient, so greater fuel consumption is required for one and the same internal temperature. These sheet metal containers are expensive to maintain and repair due to the greater difficulty required for the repair of sheet metal panels than for the repair of panels made of composite materials, since the latter can be repaired at the site where the container is located, either on the logistics platform or during the carriage thereof.

[0004] United States patent number US-5449081-B1 describes a container constructed primarily of lightweight non-metallic composite material, that includes a frame constructed substantially of pultruded composite frame components, and modular panels including pultruded composite panel members that are adhesively bonded together. This document does not describe a metallic frame integrated in the panels nor one side panels as the present invention does.

[0005] CN2587802 Y discloses a refrigerated container according to the preamble of claim 1.

[0006] The containers of the state of the art also do not allow stacking containers of different dimensions, however the present invention allows stacking up to three 40 and 45 foot containers due to the structural characteristics of the container object of the present invention, whereas the containers of the state of the art manufactured with sheet metal only allow stacking 2 containers of one or the other size, but not of both.

[0007] The possibility of stacking a larger number of containers is due to the integral metal structure of the container acting in combination with the panels, which not only provide the heat insulation feature, but also form part of the resistant structure of the container providing robustness and at the same time lightweight due to the materials used. This metal structure integrated in the panels made of a composite material is concealed such that from outside the panel, the only thing observed is a completely smooth outer surface of the sides and roof and with no visible reinforcements.

[0008] Due to its structure, the present invention has a higher load capacity.

[0009] An additional difference also existing between a container according to the present invention and a container of the state of the art manufactured with a GRP structure is that in the containers object of the present invention the sandwich panels are "monoblock" type, i.e., there are no prefabricated GRP structures placed inside the panels but rather these structures are manufactured at the same time the entire panel is manufactured.

[0010] No container with the structural features herein described and which is intermodal is known in the state of the art. The intermodal nature in a container means that it is suitable for carriage by road, by rail and by sea, and furthermore, according to the ATP agreement, Chapter II, Article 3, allows that, since it has ATP classification, the container can be loaded and unloaded the desired number of times in one or several trajectories and in any carriage system.

Summary of the Invention

[0011] Therefore, to allow the carriage of perishable goods according to the ATP Agreement as well as greater versatility in stacking, and of course in order to be used in identical conditions for the carriage by road, by rail or by sea, the object of the present invention is a refrigerated container for maintaining the goods under a controlled temperature, comprising a metal structure formed by at least two upper longitudinal beams which determine the length of the container separated from one another by a distance which determines the width of the container; two lower longitudinal beams parallel to the former and spaced therefrom by a distance which determines the height of the container; and four bents located at the ends of said beams in twos, the bents arranged at each end being separated from one another. There are fixed to said metal structure a number of panels made of a composite material which determine the walls of the container and which are made up of outer glass-reinforced plastic (GRP) sheets; rigid foam insulation boards, and inner glass-reinforced plastic (GRP) reinforcements. Likewise, the container has standard fixing elements or corners in each of the upper and lower corners of each of the bents the function of which is to secure the container to other containers, to elevation systems or to standard supports, among others.

[0012] According to the foregoing, the metal structure is formed by the upper and lower longitudinal beams, and the function of which, in addition to being structural, is to attach the side panels with the upper and lower panels.

Said beams house the corners which coincide with the corners of the bents, preferably located at 40 and at 45 feet. Two of the bents are each located at one end of the longitudinal beams, at 45 feet, and the other two bents are located at 40 feet, i.e., separated 2.5 feet or 762 mm from the bents located at the ends and inside the container. Said beams and bents are preferably manufactured with high-performance steel and protected by means of primers and zinc-rich paint.

[0013] Located in one of the bents, specifically in the front bent, i.e., the one located at the end which corresponds with the front part of the container, opposite the back end where the access door or doors to the inside of the container are located, is the front panel, where the cooling equipment, fuel tank, electronic equipment, etc., are housed. Said panel is internally provided with air recirculation channels. Likewise, the access door or doors are located in the rear bent, opposite the front bent.

[0014] The corners located in the bents at 45 feet, i.e., the ends, are ISO corners for the rear bent and special beveled corners adapted to the radius of curvature for the front bent.

[0015] This arrangement allows the container to adapt to the maximum measurements of 45 feet, providing the container with a chiller which allows adapting to the same radius of curvature required by regulation in carriage by road. ISO containers of the state of the art do not have corners of this type.

[0016] The bents arranged at 40 feet, i.e., those located inside the container, are embedded in the side panels, so they are completely protected against external agents and at the same time allow using the maximum outer width since additional space is not required. Likewise, the lower part of the bent is embedded in the same structure forming the metal base of the container. These bents house the 40 foot corner which is in turn connected with the upper and lower longitudinal beams.

[0017] The base of the container is formed by the lower longitudinal beams connected to the 40 and 45 foot bents with their corresponding corners. The main beams are attached to one another by means of Z sections manufactured with the same material as the rest of the metal structure. Said sections are separated from one another and serve as the base for the floor panel, increasing the resistance thereof. The front part of the floor is provided with a housing with a height of 120 mm in order to be able to house the gooseneck of the chassis and thus reduce the total height of container plus chassis.

[0018] The panels made of a composite material are formed by GRP (glass-reinforced plastic) sandwich or laminated panels, which have an inner rigid polyurethane foam insulation and inner GRP reinforcements, also embedding the metal structure in said panels. The inner GRP reinforcements are preferably Z sections and separated from one another along the side walls of the container. Said panels are manufactured in hot-plate presses in a continuous manner, such that each panel is a complete part. The panels are assembled with materials having the same properties as the raw material used in the manufacture thereof so there is continuity between the attachment and the panels without material incompatibility problems. These panels will be fixed to the outer metal structure by chemical and mechanical means.

[0019] The sheets of the sandwich panel located in the outer/inner part of the container have a coating that is resistant to chemical and atmospheric agents referred to as gel coat, which material has properties that are highly resistant to ultraviolet rays, such that the resin is protected, neither its mechanical nor chemical properties being altered by the action of the sun and other chemical products. Likewise, and for the purpose of resistance against blows/scrapes, the outer part of the panels has a reinforcement in the form of phenolic plywood panel. Likewise, to protect the panels from scrapes and blows during handling, they can be provided with protective veneers perfectly attached to the panels.

[0020] The front panel, located in the front bent, is internally reinforced with a plywood panel and glass-fiber to assemble cooling equipment, a fuel tank, electronic equipment, etc., in its outer part. The inner GRP surface has a special design to facilitate the air return of the cooling equipment.

[0021] The floor panel, in turn, also includes phenolic plywood panel reinforcements formed by different sheets of pressed wood with water resistant phenolic resins, and the arrangement of which allows supporting the loads derived from the passage of trolleys inside the container.

[0022] There are placed on the outer edges of the container perimetric structures with standardized corners both at 40 feet and at 45 feet, both in the upper part and lower part, preferably made of carbon steel. Said corner pieces serve as a reinforcement in the attachment of the panels and protect against surface scrapes. There are also placed in the inner corners, both longitudinally and in the front part, other reinforcing GRP corner pieces, in the attachment of the sides and floor there will be provided aluminum or GRP base boards.

[0023] It is evidently possible to provide the different panels, both internally and externally, with different layers covering them with different properties, and the inside of the container can be provided with different devices, in some or in all its panels, such as soffits for lighting, guides for partitioning panels, guides, load-bearing tracks, cold air piping or evaporators, load fastening elements (embedded or superficial), double floor vertical guides for loading on different levels (manually, mechanically or hydraulically operated), compartments with rigid or mobile separators, any element currently used in the carriage of perishable or dry goods, among others. Some of the superficial layers which can be applied are non-slip layers in the floor panel, special paints of different colors, etc.

[0024] The container can have doors on the sides, being able to be 1- or 2-leaf doors, in addition to the rear doors, said doors being able to have the necessary ventilation windows of any dimension.

[0025] The container object of the present invention

complies with Directive 96/53/EC on road traffic.

Description of the Drawings

[0026] To complement the description being made and for the purpose of aiding to better understand the features of the invention, a set of drawings is attached to the present specification as an integral part thereof with an illustrative and non-limiting character.

Figure 1 shows a perspective view of the rear part of the container object of the present invention.

Figure 2 shows a perspective view of the front part of the container object of the present invention.

Figure 3 shows a perspective view of the stacking of three containers.

Figure 4 shows a section of the complete container.

Preferred Embodiment of the Invention

[0027] One of the possible refrigerated containers according to the object of the present invention will be described below.

[0028] As has been described, the refrigerated container is formed by a metal structure and panels made of a composite material partially embedding elements of said metal structure. The outer dimensions of the container object of this preferred embodiment are a height of 3040 mm, a width of 2600 mm and a length of 13716 mm. In addition, the dimensions of the inside of the container are a height of 2738 mm, a width of 2464 mm and a length of 13351 mm. These dimensions can evidently be modified according to needs.

[0029] The main metal structure is formed by four beams (6), bents at 45 feet (9), bents at 40 feet (10) and a floor structure (11).

[0030] The beams (6) are the parts which form the attachment between the panels made of a composite material and the actual structure, by means of rivets both in the side part and in the upper part in their attachment with the ceiling. Four beams are arranged parallel to one another, two upper beams separated from one another by a distance which determines the width of the container and two lower beams which determine, together with the upper beams, the height of the container. It likewise houses the corners (7) both at 40 feet and at 45 feet in the upper and lower parts. It also connects the rear part of the container with the front part. Said beams are manufactured with high-performance steel and protected by means of primers and zinc-rich paint.

[0031] The bents at 45 feet (9) are formed by a rectangular metal structure. The front panel (4) made of a composite material is placed in the front bent and it is where the cooling equipment is housed, said panel being internally provided with air recirculation channels. The rear bent houses the access doors (5). Said bents are manufactured from the same material as the main beams (6) and are treated with the same primers and zinc-rich paint to prevent the formation of rust. The 45 feet corners are housed in these bents (6), the corners (7) of the rear bent being ISO corners and the corners of the front bent being special beveled corners adapted to the radius of curvature, in compliance with the corresponding regulation, such that any structural or auxiliary element is within the radius of gyration of 2040 mm the center of gyration of which is in the king-pin or semi-trailer coupling device.

[0032] The bents at 40 feet (10) are formed by a rectangular metal structure. These bents are manufactured with high-performance steel and a highly resistant section, being embedded in the same side panels (2) made of a composite material having a thickness of 60 mm, such that they are completely protected against external agents and at the same time have the advantage of using the maximum outer width since additional space is not required. This feature allows offering a container with a maximum outer width of 2600 mm, such as a refrigerated vehicle which complies with the ATP regulation, which allows maximum widths of up to 2600 mm, whereas general carriage vehicles have a maximum width of 2550 mm. The upper part of the bents is embedded in the same 90 mm panel. Like the former, this bent houses the 40 foot corner which is in turn connected with the main beams (6).

[0033] The structure of the base or floor structure (11) is what supports the floor panel and serves as a housing for the side panels (2) and front panel (4). It is formed by the main lower longitudinal beams (6) and both the 40 foot and the 45 foot corners (7). Both lower longitudinal beams are also attached with Z sections manufactured from the same material as the rest of the metal structure in order to serve as a base for the floor panel and to increase the strength of the base. In the front part, where the front panel and the cooling equipment are located, there is a housing with a height of 120 mm for housing the gooseneck of the chassis to thus reduce the total height of container plus chassis.

[0034] The panels which form the container together with the structure and delimit the inner capacity of the container itself have different thicknesses. In particular, and for the present example, their thicknesses are 125 mm for the floor panel (1), 60 mm for the side panel (2), 90 mm for the ceiling panel (3), 105 mm for the front panel (4) and 90 mm for the rear panel (5). Evidently all these thicknesses may vary according to needs and requirements necessary for the customer or according to the ATP Agreement.

[0035] The mentioned panels made of a composite material or sandwich panels are preferably formed by outer glass-reinforced plastic (GRP) sheets, 40 kg/m^3 rigid polyurethane foam insulation boards and inner GRP reinforcements.

[0036] The sheets of the sandwich panel located in the outer/inner part of the container have a special white gelcoat, also of polyester, which in addition to being resistant to chemical and atmospheric agents, is also resistant to ultraviolet rays, such that neither the mechanical nor

chemical properties of the resin and other internal products are altered by the action of the sun. The outer part the panels will have a phenolic plywood panel reinforcement for protecting against blows/scrapes with other containers.

[0037] The front panel (4) internally has reinforcements with plywood panel and glass-fiber for assembling cooling equipment and a fuel tank in the outer surface. The inner GRP surface has a special design to facilitate the air return of the cooling equipment, not requiring barriers which would reduce the internal longitudinal load capacity.

[0038] The floor panel (1) internally has phenolic plywood panel reinforcements formed by different sheets of pressed wood with water resistant phenolic resins. This panel also complies with the relevant regulation on loads to be supported in the passage of trolleys.

[0039] The panels are assembled with a polyester putty with the same properties as the raw material used in the manufacture thereof so there is continuity between the attachment and the panels without material interference problems. These panels will be fixed to the outer metal structure by chemical and mechanical means.

[0040] There are placed on the outer edges of the truck perimetric structures (6, 9) with standardized corners both at 40 feet and at 45 feet (7) and both in the upper part and in the lower part, made of carbon steel, serving as a reinforcement in the attachment of the panels and protecting against surface scrapes. There are placed in the longitudinal inner corners other reinforcing GRP corner pieces, in the attachment of the sides and floor there will be provided aluminum or GRP base boards.

[0041] The floor panel (1) can be provided with a non-slip layer manufactured with polyester resin with corundum and subsequently painted in the desired color, or with an aluminum plate, the latter being able to cover the length of the floor completely or partially.

[0042] The ceiling panel (3) can also be provided with soffits for the inner lighting and with guides for partitioning panels, guides for meat, load-bearing tracks, cold air piping or evaporators, etc.

[0043] The side panels (2) can be provided with both embedded and superficial load fastening elements and they can also be provided with double floor vertical guides for loading on different levels, these systems being able to be manual, mechanical or hydraulic.

[0044] It can internally be compartmentalized with rigid separating partitions made of the same material as the longitudinal and transverse panels or they can be movable mattype separating partitions. It can also be provided with 1- or 2-leaf side doors on both sides in any position.

[0045] Particularly the front panels (4) and the doors (5) can be provided with the necessary ventilation windows of any dimension.

[0046] It could also be provided with any element currently used in the carriage of perishable or dry goods.

[0047] The hinges and locks (8) will be made of galvanized carbon steel as will the aperture closures, fittings, antiraking bridges and bars, the screws thereof are also made of galvanized carbon steel.

[0048] The fixing elements or corners (7) for introducing the securing twist locks comply with the relevant regulations. They are made of highly resistant cast iron, treated with grit-blasting and with a subsequent primer coat. These elements are welded to the main steel structure.

[0049] Having sufficiently described the nature of the present invention as well as the manner of putting it into practice, it is not considered necessary to further explain it so that any person skilled in the art can understand its scope and the advantages derived from it, hereby stating that, within its essential nature, it can put into practice in other embodiments which differ in detail from the one indicated by way of example, and which would also be under the protection that is sought provided that its essential principle is neither altered, changed nor modified.

Claims

1. A refrigerated container, of the type intended for carriage by road, by rail and by sea of goods under a controlled temperature, **characterized in that** it comprises:

a metal structure formed by at least:

- two upper longitudinal beams (6) which determine the length of the container separated from one another by a distance which determines the width of the container,
- two lower longitudinal beams (6) parallel to the former and spaced therefrom by a distance which determines the height of the container, and
- four bents (9, 10) located at the ends of said beams (6) in twos, the bents (9, 10) arranged at each end being separated from one another, one bent being a front bend (9) located at one end of the beams (6), a rear bent (9) located at the opposite end of the beams (6), an inner bent (10) located inside the container at a determined distance from the front bent (9), and another inner bent (10) located inside the container at a determined distance from the rear bent (9), wherein fixing elements (7) for securing the container are arranged in each of the upper and lower corners of the four bents (9, 10), **characterised in that** the two inner bents (10) are embedded in two side and one upper monoblock panels that are fixed to said metal structure, said monoblock panels determining the side walls and ceiling of the container and being made of a

composite material which is made up of:
- outer glass-reinforced plastic (GRP) sheets,
- rigid foam insulation boards, and
- inner glass-reinforced plastic (GRP) reinforcements.

2. The container according to claim 1, **characterized in that** the front bent (9) has a front panel (4) for housing in its outer part at least the cooling equipment of the container, the fuel tank and electronic equipment.

3. The container according to claim 1, **characterized in that** the rear bent (9) comprises access doors (5) to the inside of the container.

4. The container according to claim 1, **characterized in that** it comprises a base located between the lower beams (6) of the container which are attached to one another by means of Z sections manufactured in the same material as said beams (6).

5. The container according to claim 1, **characterized in that** the inner GRP reinforcements are Z sections separated from one another along the side panels of the container.

6. The container according to the previous claims, **characterized in that** the outside of the container has a length of 13716 mm 45 feet, a width of 2600 mm and a height of 3040 mm.

7. The container according to the previous claims, **characterized in that** the inner bents (10) are located at a distance of 762 mm 2.5 feet from the front and rear bents (9).

8. The container according to claim 1, **characterized in that** the inside of the container has a length of 13351 mm, a width of 2464 mm and a height of 2738 mm.

9. The container according to the previous claims, **characterized in that** the floor panel (1) forming the base of the container has a thickness of 125 mm, the side panels (2) have a thickness of 60 mm, the upper panel (3) forming the ceiling of the container has a thickness of 90 mm, the front panel (4) located in the front bent (9) has a thickness of 105 mm and the rear panel (5) located in the rear bent (9) has a thickness of 90 mm.

10. The container according to claim 1, **characterized in that** the rigid foam boards of the panels are 40 kg/m^3.

Patentansprüche

1. Kühlcontainer der Art, um Güter auf der Straße, mit der Eisenbahn und auf See mit einer kontrollierten Temperatur befördert zu werden, **dadurch gekennzeichnet, dass** er Folgendes umfasst:

   eine Metallstruktur gebildet aus mindestens:

   - zwei oberen longitudinalen Balken (6), welche die Länge des Containers bestimmen und durch einen Abstand voneinander getrennt sind, der die Breite des Containers bestimmt,
   - zwei unteren longitudinalen Balken (6), die zu den obigen parallel sind und durch einen Abstand von denselben getrennt sind, der die Höhe des Containers bestimmt, und
   - vier Sektionen (9, 10), welche zu zweit an den Enden der genannten Balken (6) angebracht sind, wobei die Sektionen (9, 10), die an jedem Ende angeordnet sind, voneinander getrennt sind, wobei eine Sektion eine Vordersektion (9) ist, der an einem Ende der Balken (6) angebracht ist, eine Hintersektion (9) an dem entgegengesetzten Ende der Balken (6) angebracht ist, eine innere Sektion (10) innerhalb des Containers mit einem bestimmten Abstand von der Vordersektion (9) angebracht ist, und eine andere innere Sektion (10) innerhalb des Containers mit einem bestimmten Abstand von der Hintersektion (9) angebracht ist, wobei Befestigungselemente (7) für die Halterung des Containers in jeder der oberen Ecke und unteren Ecke der vier Sektionen (9, 10) angeordnet sind, **dadurch gekennzeichnet, dass** die beiden inneren Sektionen (10) in zwei seitlichen und einem oberen Monoblockpaneel eingebettet sind, die an der genannten Metallstruktur befestigt sind, wobei die genannten Monoblockpaneele die Seitenwände und die Decke des Containers bestimmen und aus einem Verbundmaterial hergestellt sind, welches aus Folgendem besteht:
     - äußeren Folien aus glasfaserverstärktem Kunststoff (GRP),
     - steifen Schaumstoffdämmplatten, und
     - inneren Verstärkungen aus glasfaserverstärktem Kunststoff (GRP).

2. Container gemäß Anspruch 1, **dadurch gekennzeichnet, dass** die Vordersektion (9) ein Vorderpaneel (4) aufweist, um in seinem äußeren Teil mindestens das Kühlgerät des Containers, den Kraftstoffbehälter und die elektronischen Geräte aufzunehmen.

3. Container gemäß Anspruch 1, **dadurch gekennzeichnet, dass** die Hintersektion (9) Zugangstüren (5) zum Inneren des Containers umfasst.

4. Container gemäß Anspruch 1, **dadurch gekennzeichnet, dass** er eine Basis umfasst, die zwischen den unteren Balken (6) des Containers angebracht ist, welche durch Z-Abschnitte miteinander verbunden sind, die aus demselben Material wie die genannten Balken (6) hergestellt sind.

5. Container gemäß Anspruch 1, **dadurch gekennzeichnet, dass** die inneren Verstärkungen aus GRP Z-Abschnitten sind, welche entlang der seitlichen Paneele des Containers voneinander getrennt sind.

6. Container nach den vorhergehenden Ansprüchen, **dadurch gekennzeichnet, dass** das Äußere des Containers eine Länge von 13716 m, 45 Füßen, eine Breite von 2600 mm und eine Höhe von 3040 mm aufweist.

7. Container nach den vorhergehenden Ansprüchen, **dadurch gekennzeichnet, dass** die inneren Sektionen (10) mit einem Abstand von 762 mm, 2,5 Füßen, von der Vorder- und der Hintersektion (9) angebracht sind.

8. Container nach Anspruch 1, **dadurch gekennzeichnet, dass** das Innere des Containers eine Länge von 13351 mm, eine Breite von 2464 mm und eine Höhe von 2738 mm aufweist.

9. Container nach den vorhergehenden Ansprüchen, **dadurch gekennzeichnet, dass** das Bodenpaneel (1), welches die Basis des Containers bildet, eine Dicke von 125 mm aufweist, die seitlichen Paneele (2) eine Dicke von 60 mm aufweisen, das obere Paneel (3), welches die Decke des Containers bildet, eine Dicke von 90 mm aufweist, das Vorderpaneel (4), welches in der Vordersektion (9) angebracht ist, eine Dicke von 105 mm aufweist und das Hinterpaneel (5), welches in der Hintersektion (9) angebracht ist, eine Dicke von 90 mm aufweist.

10. Container gemäß Anspruch 1, **dadurch gekennzeichnet, dass** die steifen Schaumstoffplatten der Paneele eine Dichte von 40 kg/m^3 aufweisen.

Revendications

1. Conteneur réfrigéré, du type destiné au transport routier, par chemin de fer et maritime de marchandises à une température contrôlée, **caractérisé en ce qu'**il comprend :

une structure métallique formée d'au moins :

- deux poutres longitudinales supérieures (6) qui déterminent la longueur du conteneur séparées l'une de l'autre d'une distance qui détermine la largeur du conteneur,
- deux poutres longitudinales inférieures (6) parallèles aux précédentes et séparées de celles-ci d'une distance qui détermine la hauteur du conteneur, et
- quatre sections (9, 10) situées aux extrémités desdites poutres (6) deux à deux, les sections (9, 10) disposées à chaque extrémité étant séparées l'une de l'autre, une section étant une section frontal (9) située à une extrémité des poutres (6), une section arrière (9) située à l'extrémité opposée des poutres (6), une section intérieure (10) située à l'intérieur du conteneur à une distance déterminée de la section frontale (9), et une autre section intérieure (10) située à l'intérieur du conteneur à une distance déterminée de la section arrière (9), où des éléments de fixation (7) pour attacher le conteneur sont disposés dans chacun des coins supérieurs et inférieurs des quatre sections (9, 10), **caractérisé en ce que** les deux sections intérieures (10) sont incorporées dans deux panneaux monoblocs latéraux et un supérieur qui sont fixés à ladite structure métallique, lesdits panneaux monoblocs déterminant les parois latérales et le plafond du conteneur et étant fabriqués en un matériau composite qui est constitué de :
- feuilles extérieures en plastique renforcé de verre (GRP),
- planches d'isolation rigides en mousse, et
- renforts intérieures en plastique renforcé de verre (GRP).

2. Conteneur selon la revendication 1, **caractérisé en ce que** la section frontale (9) a un panneau frontal (4) pour loger dans sa partie extérieur au moins l'équipement de refroidissement du conteneur, le réservoir à carburant et l'équipement électronique.

3. Conteneur selon la revendication 1, **caractérisé en ce que** la section arrière (9) comprend des portes d'accès (5) à l'intérieur du conteneur.

4. Conteneur selon la revendication 1, **caractérisé en ce qu'**il comprend une base situé entre les poutres inférieures (6) du conteneur qui sont unies l'une à l'autre au moyen de segments en z fabriqués dans le même matériau que lesdites poutres (6).

5. Conteneur selon la revendication 1, **caractérisé en ce que** les renforts intérieurs en GPR sont segments en z séparés l'un de l'autre le long des panneaux

latéraux du conteneur.

6. Conteneur selon les revendications précédentes, **caractérisée en ce que** l'extérieur du conteneur possède une longueur de 13.716 mm, 45 pieds, une largeur de 2.600 mm et une hauteur de 3.040 mm.

7. Conteneur selon les revendications précédentes, **caractérisé en ce que** les sections intérieures (10) sont situées à une distance de 762 mm, 2,5 pieds, des sections frontale et arrière (9).

8. Conteneur selon la revendication 1, **caractérisé en ce que** l'intérieur du conteneur possède une longueur de 13351 mm, une largeur de 2464 mm e une hauteur de 2738 mm.

9. Conteneur selon les revendications précédentes, **caractérisé en ce que** le panneau de sol (1) formant la base du conteneur possède un épaisseur de 125 mm, les panneaux latéraux (2) possèdent une épaisseur de 60 mm, le panneau supérieur (3) formant le plafond du conteneur possède une épaisseur de 90 mm, le panneau frontal (4) situé dans la section frontal (9) possède une épaisseur de 105 mm et le panneau arrière (5) situé dans la section arrière (9) possède une épaisseur de 90 mm.

10. Conteneur selon la revendication 1, **caractérisé en ce que** les planches rigides de mousse des panneaux sont de 40 kg/m^3.

Fig. 1

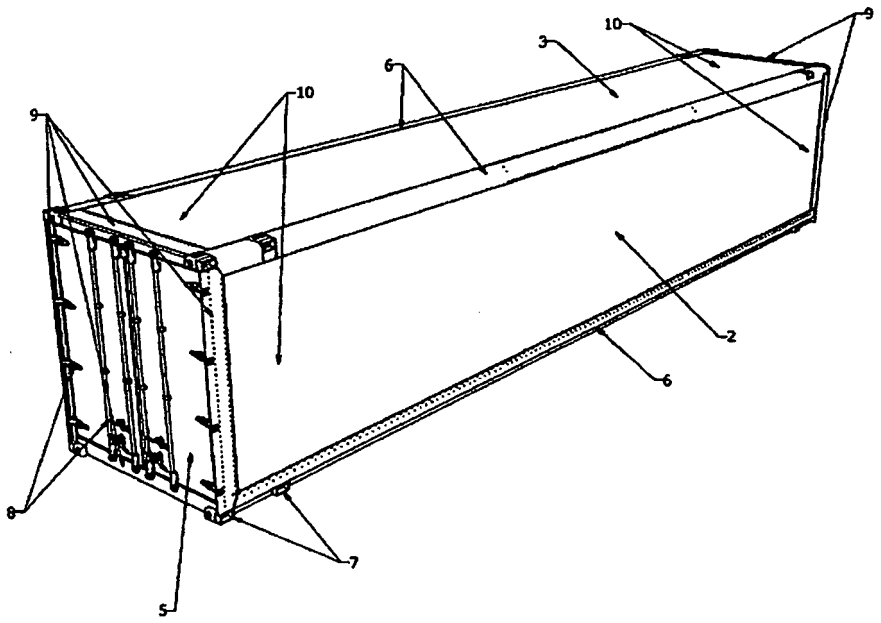


Fig. 2

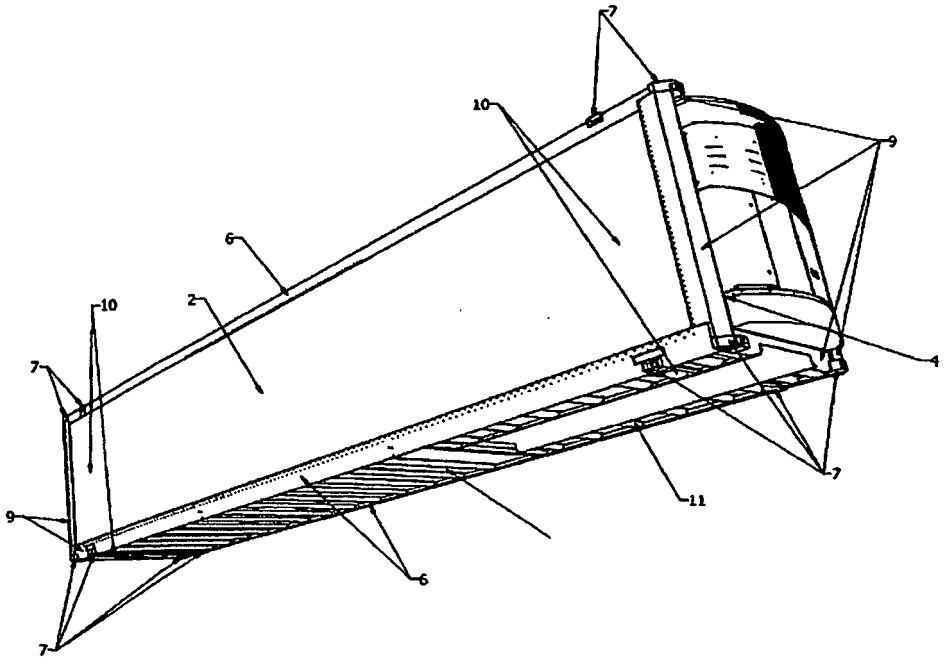


Fig. 3

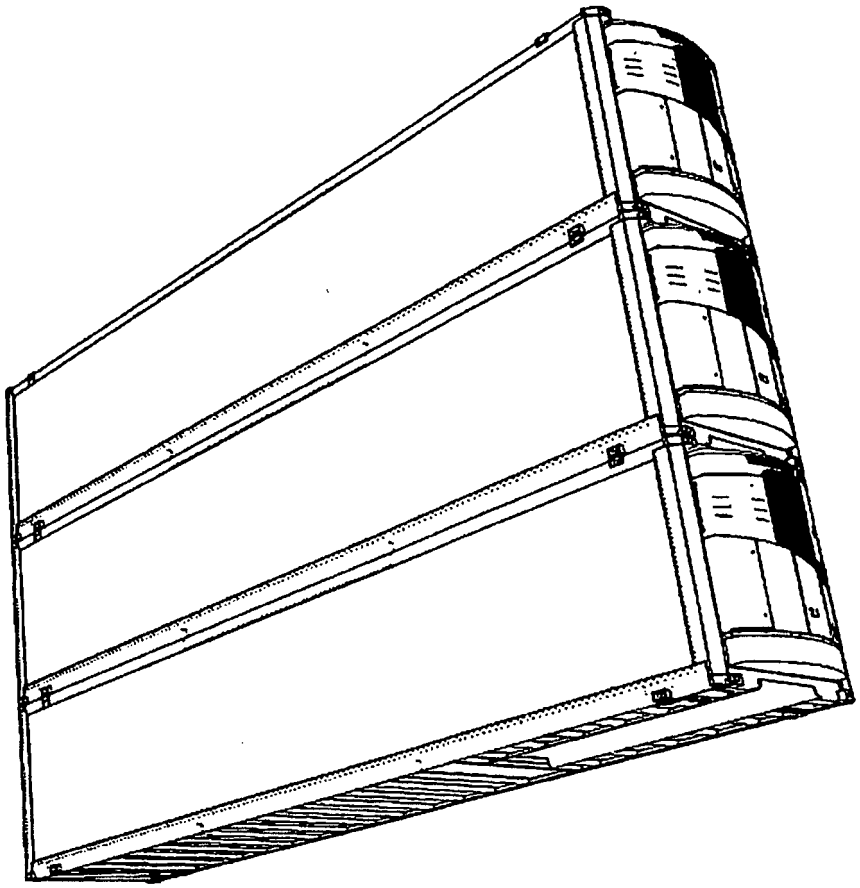
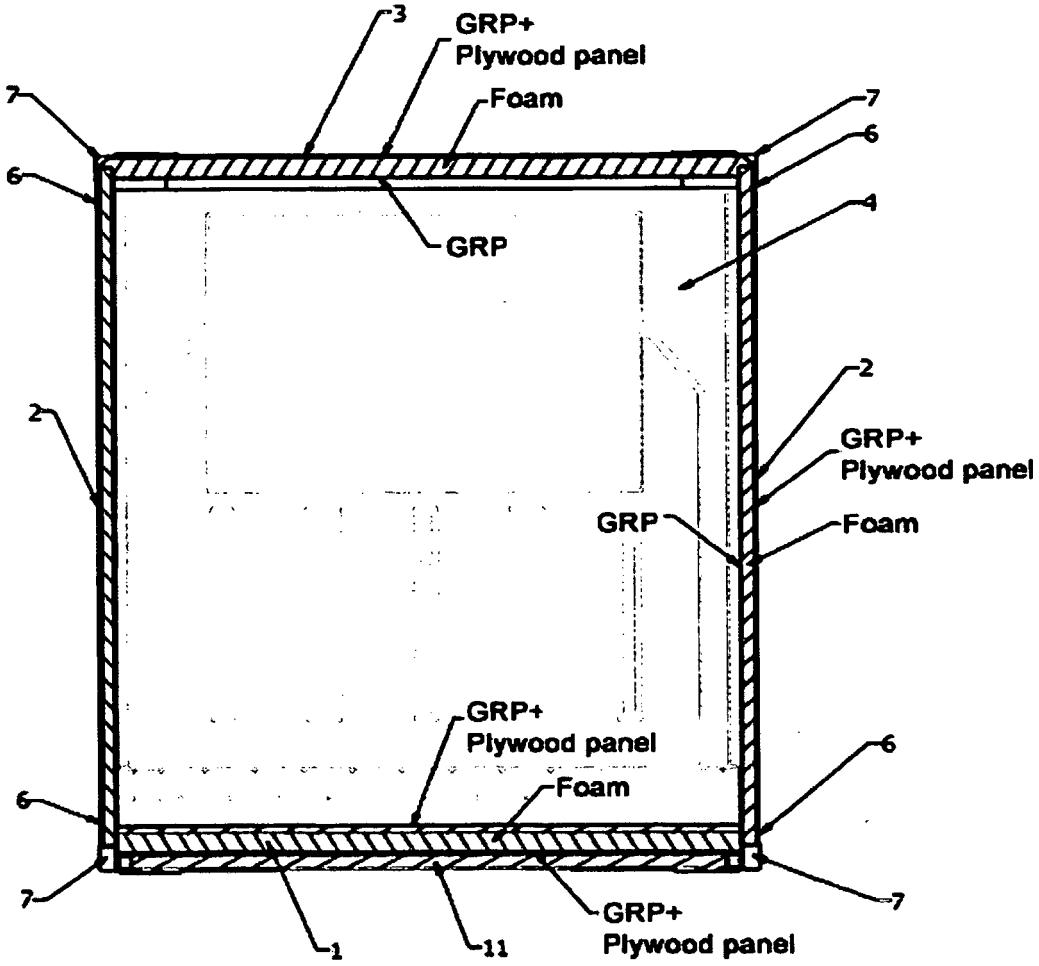


Fig. 4


3
GRP+
Plywood panel
Foam
7
6
GRP
4
2
GRP+
Plywood panel
GRP
Foam
GRP+
Plywood panel
Foam
6
7
1
11
GRP+
Plywood panel

REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

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- CN 2587802 Y **[0005]**