

(19)



(11)

EP 3 142 945 B1

(12)

EUROPEAN PATENT SPECIFICATION

(45) Date of publication and mention of the grant of the patent:
05.07.2017 Bulletin 2017/27

(51) Int Cl.:
B65D 88/74 (2006.01)

(21) Application number: **15729951.2**

(86) International application number:
PCT/NL2015/050322

(22) Date of filing: **08.05.2015**

(87) International publication number:
WO 2015/174830 (19.11.2015 Gazette 2015/46)

(54) FREIGHT CONTAINER AND METHOD FOR TRANSPORTING CARGO

FRACHTBEHÄLTER UND VERFAHREN ZUM TRANSPORT VON GÜTERN

CONTENEUR DE FRET ET PROCÉDÉ PERMETTANT DE TRANSPORTER DES MARCHANDISES

(84) Designated Contracting States:
AL AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO PL PT RO RS SE SI SK SM TR

• **NOUWEN, Jan**
NL-3051 BP Rotterdam (NL)

(30) Priority: **16.05.2014 CN 201420250748 U**
12.06.2014 NL 2012992

(74) Representative: **V.O.**
P.O. Box 87930
Carnegieplein 5
2508 DH Den Haag (NL)

(43) Date of publication of application:
22.03.2017 Bulletin 2017/12

(56) References cited:
EP-A2- 2 689 944 **WO-A1-92/20542**
WO-A1-97/27128 **WO-A1-2012/045132**
WO-A2-2011/056642 **AU-A1- 2006 236 102**
DE-A1-102011 105 475 **US-A- 2 635 432**
US-A1- 2009 299 534

(73) Proprietor: **Unit 45 B.V.**
3051 BP Rotterdam (NL)

(72) Inventors:
• **KOOLEN, Johannes Baptistus**
NL-3051 BP Rotterdam (NL)

EP 3 142 945 B1

Note: Within nine months of the publication of the mention of the grant of the European patent in the European Patent Bulletin, any person may give notice to the European Patent Office of opposition to that patent, in accordance with the Implementing Regulations. Notice of opposition shall not be deemed to have been filed until the opposition fee has been paid. (Art. 99(1) European Patent Convention).

Description

TECHNICAL FIELD AND BACKGROUND

[0001] The present disclosure relates to a freight container for transporting cargo, especially temperature sensitive cargo. The disclosure further relates to a method for transporting cargo.

[0002] Modern society has become increasingly dependent on the long distance transport of cargo. Freight containers are widely used to transport such cargo, e.g. by boat, train, and/or truck. Some cargo, e.g. food, such as fruit, dairy products, meat, etc., but also electronics, may require a climate controlled environment to prevent their deterioration. Temperature and/or humidity sensitive cargo can be transported by a freight container comprising an air conditioning unit. For example, the air conditioning unit can be integrated into the container. To guarantee continuous temperature control, it is desirable to also integrate a power source/generator into the container or air conditioning unit. For example a diesel powered generator and fuel tank can be integrated into the container. However, the extra equipment may affect the available cargo space because the outer dimensions of the container are constrained by international standards. For example, a long range transport container may contain a relatively large fuel tank that occupies part of the cargo space. However, such a design runs counter to the general need for maximizing the cargo capacity of the freight container.

[0003] Therefore, a general need exists for a long range, climate controlled freight container or reefer having an increased cargo capacity. For example, a specific need exists to have sufficient cargo capacity to transport thirty-three or more Euro pallets (each with a size of 80 cm x 120 cm) arranged side by side, while keeping climate control for a journey lasting twenty days or more.

[0004] International patent application publication WO 92/20 542 discloses a refrigerated container having a top, a bottom, two oppositely disposed vertically extending sidewalls, an end wall and a closed entrance positioned opposite said end wall to thereby form an elongated enclosure for containing products while maintaining the products within a desired temperature range, wherein said refrigerated container comprises refrigeration means mounted adjacent said end wall and including a refrigeration compressor and an electrical motor operatively coupled thereto, wherein said refrigeration means include an electrical generator connected to said electrical motor, a diesel engine for driving said generator, and a fuel tank for storing diesel for use by said engine.

[0005] United States patent application publication US 2009/0 299 534 discloses an environmentally controlled shipping container including a storage space and a refrigeration system that includes a prime mover, a compressor driven by the prime mover and providing a flow of refrigerant, a condenser that receives the flow of refrigerant, and an evaporator in heat exchange relation

with the storage space, wherein a controller operates the refrigeration system in one of: a continuous mode in which the prime mover operates continuously; a standard start/stop mode; and a modulated start/stop mode in which the operating parameters of the refrigeration system may be modulated. Document DE10 2011 105 475 A1 discloses an interchangeable container having an air conditioning unit placed above a cargo floor of a cargo space. Document US 2,635,432 discloses a self-contained refrigerating freight car unit having an air conditioning unit placed above a cargo floor of a cargo space.

SUMMARY

[0006] To meet these or other challenges, one aspect of the present disclosure provides a freight container for transporting cargo, especially temperature sensitive cargo. The container comprises a container body enclosing a cargo space for storing the cargo. The container further comprises an air conditioning unit arranged for controlling a temperature and/or humidity in the cargo space. It is noted that the air conditioning unit may for instance be arranged for conditioning the temperature of air in the container, e.g. in order to facilitate that the temperature of goods transported by the container can be kept substantially below a predetermined maximum temperature and/or can be kept substantially above a predetermined minimum temperature, preferably said temperature can be kept substantially within a predetermined temperature range. For example, the air conditioning unit can be arranged for cooling air and/or can be arranged for heating air. The container further comprises a generator for powering the air conditioning unit. The container further comprises a fuel tank for supplying the generator with fuel, especially diesel. Part the air conditioning unit is suspended above a cargo floor of the cargo space and the air conditioning unit is arranged partially above the fuel tank. Advantageously, the present arrangement may allow cargo to be placed on the cargo floor below the air conditioning system. By arranging the air conditioning unit at or near a front side of the container opposite a back side provided with one or more doors, the unit can be placed against the front without affecting the doors. For example, at least a part of the air conditioning system can be provided against a top side of the container. By providing an outside of the container body with a cavity protruding inward into the container and accommodating at least part of the air conditioning unit in the cavity, the outer dimensions of the container can be kept within specification, while saving cargo space at least at the floor level. For example, a part of the air conditioning unit, e.g. condenser, may be sticking outside from the container body. By shaping the cavity as an inward step of the container body on the upper front side of the container, the air conditioning unit can be placed through a vertical side wall, yet stay within the constrained perimeter of the container. Advantageously, the cargo floor may extend below the step for allowing cargo to be placed

on the cargo floor below the step.

[0007] In one aspect, the design made available by the present disclosure can provide a container having an outer length corresponding with the sizes and dimensions of a standard freight container. For example, the freight container can be formed as a 45 foot container, preferably as a so-called 45 ft. pallet wide container. A relevant norm for the standard container dimensions would for example be an ISO standard, such as ISO 668 (1995) or an equivalent standard. The present design allows for a cargo floor that is at least 2.4 meter wide and at least 13.2 meter long, such as to accommodate at least 33 Euro-pallets or EPAL-pallets on the floor (each pallet typically has width x length = 80 cm x 120 cm). For example, 11 rows of 3 pallets (having their longitudinal direction extending in the longitudinal direction of the container/cargo floor) Alternatively, 1 row of 3 pallets (having their longitudinal direction extending in the longitudinal direction of the container/cargo floor) and 15 rows of 2 + 1 * 3 pallets having their longitudinal direction extending in the width direction of the container/cargo floor). The container can be provided with first fitting blocks of which the mutual spacing corresponds to the mutual spacing of a 40 foot container and/or second fitting blocks or so-called corner fittings of which the mutual spacing corresponds to the mutual spacing of the outermost placed fitting blocks of a 45 foot container. The air conditioning unit is arranged partially above the fuel tank, for instance to save further space. For example, the fuel tank can be arranged flat against an outer hull of the container. Further space can be saved by integrating components. For example the generator can be integrated as part of the air conditioning unit. Alternatively, or in addition to the generator, the container may comprise one or more batteries for feeding the air conditioning unit and/or starting the generator. Advantageously, the battery can be charged by the generator. To save further space, the fuel tank may comprises an L-shape, wherein the battery is accommodated in a cavity formed by the L-shape.

[0008] The container may comprise a sensor, especially a temperature sensor, associated with the cargo space, and a controller for controlling the air conditioning system. For example, the controller is arranged for determining whether an air property sensed by the sensor needs to be altered by examining whether the sensed air property is below a predetermined bottom threshold value and/or above a predetermined top threshold value, and for controlling the air conditioning unit such as to alter the air property accordingly.

[0009] Another or further problem associated with containers for transporting temperature sensitive cargo is that the batteries of such containers can run low, especially when the containers are transported through relatively cold areas with a relatively cold outdoor temperature (e.g. when being transported overland, for instance by train, e.g. from Europe through Russia to China, or vice versa).

[0010] Accordingly, in another or further aspect, the

present disclosure provides a freight container for transporting cargo, especially temperature sensitive cargo as described above, or otherwise. The container comprises a cargo space defining a cargo floor, and an air conditioning unit, preferably a cooling and/or heating unit, a battery for feeding the air conditioning unit, a generator, especially a diesel powered generator, for charging the battery at least partly, and a fuel tank for supplying the generator with fuel. The container further comprises a clock and a controller arranged for controlling the generator in order to charge the battery at least partly at a moment when a predetermined time interval has lapsed since the last time the battery is charged at least partly. Alternatively, or in addition, the container further comprises a voltage sensing device and a controller arranged for controlling the generator in order to charge the battery at least partly at a moment when is determined that the terminal voltage of the battery has dropped below a predetermined minimum voltage threshold value. Alternatively, or in addition, the container further comprises a receiver and a controller arranged for controlling the generator in order to charge the battery at least partly based on a control signal received by said receiver.

[0011] By providing a wall separating the cargo space from a part of the air conditioning system located behind said wall, said wall can define a cavity for guiding air from the cargo space to the air conditioning unit or vice versa.

[0012] In a further aspect, the present disclosure provides a method for transporting cargo, especially temperature sensitive cargo, by means of a freight container. The method comprises providing a freight container, preferably a container as described herein. The container is provided with at least an air conditioning unit, preferably a cooling and/or heating unit. The container is further provided with a battery and a generator, especially a diesel powered generator. The method further comprises sensing an air property of air inside the container, especially the temperature of air inside the container. The method further comprises determining whether said air property needs to be altered by examining whether the sensed air property is below a predetermined bottom threshold value and/or above a predetermined top threshold value. The method further comprises altering said air property when the value of the sensed air property is below said predetermined bottom threshold value, such as to bring said air property above said predetermined bottom threshold value, or altering said air property when the sensed value of the air property is above said predetermined top threshold value, such as to bring said air property below said predetermined top threshold value. The method further comprises at least partly charging the battery by means of the generator at a moment when there is no need to alter the air property of the air inside the container. This may be advantageous for keeping the battery charged also during periods when the air conditioning is not strictly necessary. Otherwise, the battery may discharge which may also prevent the generator from starting.

[0013] In one embodiment, the step of charging the battery at a moment when there is no need to alter the air property of the air inside the container is initiated when a predetermined time interval has lapsed, e.g. when a predetermined time interval has lapsed since the last time the battery is charged at least partly. In another or further embodiment, the step of charging the battery at a moment when there is no need to alter the air property of the air inside the container is initiated when it is determined that the terminal voltage of the battery has dropped below a predetermined minimum voltage threshold value. In another or further embodiment, the freight container further is provided with a receiver, and wherein the step of charging the battery at a moment when there is no need to alter the air property of the air inside the container is initiated by means of a control signal received by said receiver of the freight container. In one embodiment, the air conditioning unit is activated while the air property does not need to be altered based e.g. on temperature. Alternatively, or in addition, the battery can be at least partly charged by means of the generator at a moment when there is a need to alter the air property of the air inside the container.

BRIEF DESCRIPTION OF DRAWINGS

[0014] These and other features, aspects, and advantages of the apparatus, systems and methods of the present disclosure will become better understood from the following description, appended claims, and accompanying drawing wherein:

- FIG 1 shows a schematic perspective bird's eye view of an embodiment of a container;
- FIG 2 shows a cross-section side view of a front of another embodiment of the container including placement of cargo;
- FIG 3 shows a schematic perspective drawing of the front part of the embodiment;
- FIG 4 shows a schematic front view of an embodiment of the embodiment;
- FIG 5 shows a schematic side view of an embodiment of the embodiment;
- FIG 6 shows a schematic top view of an embodiment of the embodiment;
- FIG 7 shows a schematic perspective view of an embodiment of a fuel tank.

DESCRIPTION OF EMBODIMENTS

[0015] Unless otherwise defined, all terms (including technical and scientific terms) used herein have the same meaning as commonly understood by one of ordinary skill in the art to which this invention belongs as read in the context of the description and drawings. It will be further understood that terms, such as those defined in commonly used dictionaries, should be interpreted as having a meaning that is consistent with their meaning in the

context of the relevant art and will not be interpreted in an idealized or overly formal sense unless expressly so defined herein. In some instances, detailed descriptions of well-known devices and methods may be omitted so as not to obscure the description of the present systems and methods. Terminology used for describing particular embodiments is not intended to be limiting of the invention. As used herein, the singular forms "a", "an" and "the" are intended to include the plural forms as well, unless the context clearly indicates otherwise. The term "and/or" includes any and all combinations of one or more of the associated listed items. It will be understood that the terms "comprises" and/or "comprising" specify the presence of stated features but do not preclude the presence or addition of one or more other features. It will be further understood that when a particular step of a method is referred to as subsequent to another step, it can directly follow said other step or one or more intermediate steps may be carried out before carrying out the particular step, unless specified otherwise. Likewise it will be understood that when a connection between structures or components is described, this connection may be established directly or through intermediate structures or components unless specified otherwise. All publications, patent applications, patents, and other references mentioned herein are incorporated by reference in their entirety. In case of conflict, the present specification, including definitions, will control.

[0016] The invention is described more fully hereinafter with reference to the accompanying drawings, in which embodiments of the invention are shown. This invention may, however, be embodied in many different forms and should not be construed as limited to the embodiments set forth herein. Rather, these embodiments are provided so that this disclosure will be thorough and complete, and will fully convey the scope of the invention to those skilled in the art. The description of the exemplary embodiments is intended to be read in connection with the accompanying drawings, which are to be considered part of the entire written description. In the drawings, the absolute and relative sizes of systems, components, layers, and regions may be exaggerated for clarity. Embodiments may be described with reference to schematic and/or cross-section illustrations of possibly idealized embodiments and intermediate structures of the invention. Relative terms as well as derivatives thereof should be construed to refer to the orientation as then described or as shown in the drawing under discussion. These relative terms are for convenience of description and do not require that the system be constructed or operated in a particular orientation unless these relative terms (e.g. above) are present in the claims which define the scope of protection. In the description and drawings, like numbers refer to like elements throughout. In particular, the following reference numbers may apply: 1 container front, 2 container ceiling, 3 cargo floor, 4 container bottom, 5 cargo, 6 corner pieces, 7 cooler, 8 container side, 9 battery, 10 solar panels, 11 cooler gate, 13 rein-

forced holes, 20 fuel tank, 21 remote control, 22 belt, 23 distribution sheet, 24 container body, 25 cargo space, 100 container.

[0017] FIG 1 shows a schematic perspective bird's eye view of an embodiment of a freight container 100. The container 100 is suitable for transporting cargo 5, especially temperature sensitive cargo. A freight container may also be referred to as an intermodal container, shipping container, e.g. a refrigerated container or a so-called reefer. The container, which preferably can be an intermodal container and/or an ISO container, can be arranged for intermodal freight transport which can involve the use of multiple modes of transportation, e.g. including rail transportation, transportation by truck, and/or ship transportation, without any handling of the freight itself when changing modes of transportation. Typically, on board ships, intermodal containers can be stacked up to seven units high. For instance therefore, the intermodal container can be arranged to be stackable, e.g. can be sufficiently strong and/or can be provided with bottom and top fittings, especially twistlock fittings. The container can be a so-called multimodal transport container, and may be arranged for multimodal transport, or so-called combined transport, wherein the transportation of goods can be under a single contract, but can nevertheless be performed with at least two different means of transport, e.g. rail, sea and/or road.

[0018] According to the embodiment shown, the container 100 comprises a container body 24 enclosing a cargo space 25 for storing the cargo 5. The container further comprises an air conditioning unit 7 arranged for controlling a temperature and/or humidity in the cargo space 25. Part the air conditioning unit 7 is suspended above a cargo floor 3 of the cargo space 25 for allowing cargo to be placed on the cargo floor 3 below the said part of the air conditioning unit 7. In another or further embodiment, the container 100 comprises a generator (not shown) for powering the air conditioning unit 7. For example, the generator may be external, or integrated into the air conditioning unit 7. The generator may be coupled to a fuel tank (not shown here) for supplying the generator with fuel, typically diesel. Alternatively, or in addition, the generator may be powered by other means, e.g. electricity

[0019] In one embodiment, at least the outer length of the container corresponds with the sizes and dimensions of a standard freight container, especially a 45 foot container. In another or further embodiment, the container is formed as a 45 foot container, preferably as a so-called 45 ft. pallet wide container. In one embodiment, the cargo floor 3 is at least 2.4 meter wide and at least 13.2 meter long, such as to accommodate at least 33 Euro-pallets, e.g. stored in the manner shown in FIG 1.

[0020] For example, in case the part of the air conditioning system 7 located above the cargo floor 3 is extending above the cargo floor for at most about 0.8 meter, it can be advantageous to place the first Euro-pallets with their longitudinal direction (e.g. two time 120 cm) extend-

ing in the width direction of the container (240 cm), such that only the loading height of two pallets (in stead of that of three 3 pallets) is restricted by said part of the air conditioning system located above the cargo floor.

[0021] In one embodiment (not shown here), the container is provided with first fitting blocks of which the mutual spacing corresponds to the mutual spacing of a 40 foot container and/or second fitting blocks or so-called corner fittings of which the mutual spacing corresponds to the mutual spacing of the outermost placed fitting blocks of a 45 foot container.

[0022] FIG 2 shows a cross-section side view of a front of another embodiment of the container 100 including cargo 5 place inside the cargo space 25.

[0023] In one embodiment, e.g. as shown, the air conditioning unit 7 is arranged at or near a front side 1 of the container 100. This may be opposite a back side provided with one or more doors (not shown). In another or further embodiment, at least a part of the air conditioning system is provided against or near a top side 2 of the container 100.

[0024] In one embodiment, e.g. as shown, the container body 24 comprises a cavity 17 protruding inward into the container. In another or further embodiment at least part of the air conditioning unit 7 is sticking out from the container body 24 and accommodated in the cavity 17. For example, a condenser part 7a of the air conditioning unit 7 may stick outside the container body 24 while an evaporator part 7b sticks inside the container body 24, in particular into the cargo space 25. In another or further embodiment, e.g. as shown, the cavity 17 is formed by an inward step of the container body 24 on the upper front side 1,2 of the container 100. In another or further embodiment, e.g. as shown, the cargo floor 3 extends below the step for allowing cargo 5 to be placed on the cargo floor 3 below the step.

[0025] In one embodiment, a sheet or sail 23 is provide at an outlet of the air conditioning unit 7 in the cargo space 25. By arranging the sheet 23, as shown suspended at the top side 2 of the container 100, the cool air from the air conditioning unit 7 may be distributed over the cargo space 25.

[0026] In one embodiment, e.g. as shown, the air conditioning unit 7 is arranged at least partially above the fuel tank 20. For example, in the embodiment shown, part of the condenser 7a is above the fuel tank 20. In another or further embodiment, e.g. as shown, the fuel tank 20 is arranged flat against an outer hull of the container. By providing a relatively flat fuel tank, cargo space 25 inside the container body 24 may be further increased.

[0027] In one embodiment, the container and/or air conditioning unit 7 comprises a sensor (not shown), e.g. a temperature sensor. The sensor may be associated with the cargo space. In another or further embodiment a controller is provided for controlling the air conditioning system. For example, the controller is arranged for determining whether an air property sensed by the sensor needs to be altered by examining whether the sensed air

property is below a predetermined bottom threshold value and/or above a predetermined top threshold value. The controller may be arranged for controlling the air conditioning unit such as to alter the air property accordingly.

[0028] In one embodiment, the container 100 comprises a separation wall being located at a distal end of the cargo floor and separating the cargo space at least partly from a second part of the air conditioning system located behind said wall. In the embodiment, the said wall defines a cavity for guiding air from the cargo space to the air conditioning unit or vice versa.

[0029] FIG 3 shows a schematic perspective drawing of the front part of the embodiment, e.g. similar to FIG 2. In one embodiment, e.g. as shown, the container 100 comprises a battery 9 for feeding the air conditioning unit, a generator (not specifically indicated), especially a diesel powered generator, for charging the battery at least partly, and a fuel tank 20 for supplying the generator with fuel. In one embodiment, e.g. as shown, the container 100 comprises a battery 9 for feeding the air conditioning unit 7 and/or starting the generator. In one embodiment, the battery is arranged to be charged by the generator.

[0030] In one embodiment, e.g. as shown, the fuel tank 20 comprises an L-shape, wherein the battery 9 is accommodate in a cavity formed by the L-shape. This, in combination with the suspended air conditioning unit 7, may provide a maximum capacity to the fuel tank 20 while allowing the placement of a battery 9, and without sacrificing cargo space.

[0031] In one embodiment, the container 100 as described herein, or otherwise, comprises a clock and a controller arranged for controlling the generator in order to charge the battery 9 at least partly at a moment when a predetermined time interval has lapsed since the last time the battery is charged at least partly. Alternatively, or in addition, the container 100 comprises a voltage sensing device and a controller arranged for controlling the generator in order to charge the battery at least partly at a moment when is determined that the terminal voltage of the battery has dropped below a predetermined minimum voltage threshold value. Alternatively, or in addition, the container further comprises a receiver 21 and a controller arranged for controlling the generator in order to charge the battery at least partly based on a control signal received by said receiver.

[0032] In another or further aspect of the disclosure, the figure may illustrate a method for transporting cargo, especially temperature sensitive cargo, by means of a freight container. In one embodiment, the method comprises providing a freight container, preferably a container 100 as described herein, said container being provided with at least an air conditioning unit 7, preferably a cooling and/or heating unit, a battery 9, and a generator, especially a diesel powered generator. In another or further embodiment, the method comprises sensing an air property of air inside the container, especially the temperature of air inside the container. In another or further embodiment, the method comprises determining whether said

air property needs to be altered by examining whether the sensed air property is below a predetermined bottom threshold value and/or above a predetermined top threshold value. In another or further embodiment, the method comprises altering said air property when the value of the sensed air property is below said predetermined bottom threshold value, such as to bring said air property above said predetermined bottom threshold value, or altering said air property when the sensed value of the air property is above said predetermined top threshold value, such as to bring said air property below said predetermined top threshold value. In another or further embodiment, the method comprises at least partly charging the battery 9 by means of the generator at a moment when there is no need to alter the air property of the air inside 25 the container.

[0033] In one embodiment, the step of charging the battery 9 at a moment when there is no need to alter the air property of the air inside 25 the container is initiated when a predetermined time interval has lapsed, e.g. when a predetermined time interval has lapsed since the last time the battery 9 is charged at least partly.

[0034] In one embodiment, the step of charging the battery 9 at a moment when there is no need to alter the air property of the air inside the container 100 is initiated when it is determined that the terminal voltage of the battery has dropped below a predetermined minimum voltage threshold value.

[0035] In one embodiment, the freight container 100 is provided with a receiver 21, e.g. on a top side 2 of the container as shown in FIG 6. For example the step of charging the battery 9 at a moment when there is no need to alter the air property of the air inside the container can be initiated by means of a control signal received by said receiver of the freight container.

[0036] In one embodiment, the method comprises the step of altering the air property of the air inside the container while the battery is charged at the moment when the air property does not need to be altered.

[0037] In one embodiment, the method comprises the step of at least partly charging the battery by means of the generator at a moment when there is a need to alter the air property of the air inside the container.

[0038] FIG 4 shows a schematic front view of an embodiment of the embodiment, e.g. similar to FIG 2 and 3. In the embodiment shown, the container 100 comprises on the front side 1, an air conditioning unit 7, a fuel tank 20, and a battery 9. The fuel tank 20 may be held fixed by belts 22.

[0039] FIG 5 shows a schematic view of the side 8 of an embodiment of the container 100, e.g. similar to FIGS 2-4. As visible in this view, the container 100 comprises an air conditioning unit 7 at or near the ceiling 2 of the container. The fuel tank 20 is arranged at the front side. As shown, the fuel tank 20 may be protected by extended corners 6. Also shown in this figure is the floor 3 at the bottom 4 of the container.

[0040] FIG 6 shows a schematic view of the top 2 of

the embodiment, e.g. similar to FIGs 2-5. The top view shows for example a roster 11, which may function as an outlet for the air conditioning unit (not visible here). Also shown on the top side is an optional transceiver 21, which may be used for receiving instructions and/or sending a status/location of the container or air conditioning unit. Finally, the top view shows an optional solar panel 10, which may be used to power equipment in the container. For example, the solar panel 10 may be used to charge the battery (not shown here).

[0041] FIG 7 shows a schematic perspective view of an embodiment of a fuel tank 20, e.g. as used in FIGs 2-6. The L-shape of the tank 20 may be advantageous to accommodate equipment, e.g. a battery. In the embodiment shown, the fuel tank 20 comprises a number of holes or tubes extending into the fuel tank. These may be advantageous e.g. to prevent or diminish slushing of the fuel inside the tank.

[0042] For the purpose of clarity and a concise description, features are described herein as part of the same or separate embodiments, however, it will be appreciated that the scope of the invention may include embodiments having combinations of all or some of the features described. Alternative, or in addition to providing a cooling function, the air conditioning unit may also provide heating when necessary. Alternatively, or in addition, the air conditioning unit may also provide other environmental control, e.g. humidity control. For example, while embodiments were shown for a specifically arranged air conditioning unit, also alternative ways may be envisaged by those skilled in the art having the benefit of the present disclosure for achieving a similar or equivalent function and result.

[0043] E.g. components such as the air conditioning unit, generator, battery, and/or fuel tank may be combined or split up into one or more alternative components. The various elements of the embodiments as discussed and shown offer certain advantages, such providing an air conditioned cargo space having maximizes capacity. Of course, it is to be appreciated that any one of the above embodiments or processes may be combined with one or more other embodiments or processes to provide even further improvements in finding and matching designs and advantages. It is appreciated that this disclosure offers particular advantages to transport of temperature sensitive cargo, and in general can be applied for any application wherein a maximum storage capacity for a climate controlled cargo container is desired.

[0044] While the present systems and methods have been described in particular detail with reference to specific exemplary embodiments thereof, it should also be appreciated that numerous modifications and alternative embodiments may be devised by those having ordinary skill in the art without departing from the scope of the present disclosure. For example, embodiments wherein devices or systems are disclosed to be arranged and/or constructed for performing a specified method or function inherently disclose the method or function as such and/or

in combination with other disclosed embodiments of methods or systems. Furthermore, embodiments of methods are considered to inherently disclose their implementation in respective hardware, where possible, in combination with other disclosed embodiments of methods or systems. Furthermore, methods that can be embodied as program instructions, e.g. on a non-transient computer-readable storage medium, are considered inherently disclosed as such embodiment.

[0045] Finally, the above-discussion is intended to be merely illustrative of the present systems and/or methods and should not be construed as limiting the appended claims to any particular embodiment or group of embodiments. The specification and drawings are accordingly to be regarded in an illustrative manner and are not intended to limit the scope of the appended claims. In interpreting the appended claims, it should be understood that the word "comprising" does not exclude the presence of other elements or acts than those listed in a given claim; the word "a" or "an" preceding an element does not exclude the presence of a plurality of such elements; any reference signs in the claims do not limit their scope; several "means" may be represented by the same or different item(s) or implemented structure or function; any of the disclosed devices or portions thereof may be combined together or separated into further portions unless specifically stated otherwise. The mere fact that certain measures are recited in mutually different claims does not indicate that a combination of these measures cannot be used to advantage. In particular, all working combinations of the claims are considered inherently disclosed.

Claims

1. Freight container (100) for transporting cargo (5), especially temperature sensitive cargo, the container (100) comprising:
 - a container body (24) enclosing a cargo space (25) for storing the cargo (5);
 - an air conditioning unit (7), preferably a cooling and/or heating unit (7), arranged for controlling a temperature and/or humidity in the cargo space (25);
 - a generator for powering the air conditioning unit (7); and
 - a fuel tank (20) for supplying the generator with fuel, especially diesel; **characterised in that**
 - the air conditioning unit (7) is arranged partially above the fuel tank (20) and **in that** part of the air conditioning unit (7) is suspended above a cargo floor (3) of the cargo space (25) for allowing cargo to be placed on the cargo floor (3) below the said part of the air conditioning unit (7).
2. Freight container according to claim 1, wherein the container is an intermodal container or a so-called

- multimodal transport container, especially an ISO container.
3. Freight container according to claim 1 or 2, wherein the air conditioning unit (7) is arranged at or near a front side (1) of the container (100) opposite a back side provided with one or more doors.
 4. Freight container according to any one of the preceding claims, wherein an outside of the container body (24) comprises a cavity (17) protruding inward into the container, and at least part of the air conditioning unit (7) is sticking out from the container body (24) and accommodated in the cavity (17), preferably wherein the cavity (17) is formed by an inward step of the container body (24) on the upper front side (1,2) of the container (100), more preferably wherein the cargo floor (3) extends below the step for allowing cargo (5) to be placed on the cargo floor (3) below the step.
 5. Freight container according to any one of the preceding claims, wherein the fuel tank (20) is arranged flat against an outer hull of the container.
 6. Freight container according to any one of the preceding claims, wherein the generator is part of the air conditioning unit (7).
 7. Freight container according to any one of the preceding claims, comprising a battery (9) for feeding the air conditioning unit (7) and/or starting the generator, the battery being arranged to be charged by the generator, preferably wherein the fuel tank (20) comprises an L-shape, and the battery (9) is accommodated in a cavity formed by the L-shape.
 8. Freight container according to any one of the preceding claims, wherein said at least a part of the air conditioning unit (7) is provided against a top side (2) of the container.
 9. Freight container according to any one of the preceding claims, wherein at least the outer length of the freight container corresponds with the sizes and dimensions of a standard freight container, especially a 45 foot container, or wherein the freight container is formed as a 45 foot container, preferably as a so-called 45 ft. pallet wide container, or wherein the cargo floor (3) is at least 2.4 meter wide and at least 13.2 meter long, such as to accommodate at least 33 Euro-pallets.
 10. Freight container according to any one of the preceding claims, wherein the container is provided with first fitting blocks of which the mutual spacing corresponds to the mutual spacing of a 40 foot container and/or second fitting blocks or so-called corner fittings of which the mutual spacing corresponds to the mutual spacing of the outermost placed fitting blocks of a 45 foot container.
 11. Freight container according to any one of the preceding claims, further comprising a sensor, especially a temperature sensor, associated with the cargo space, and a controller for controlling the air conditioning unit, wherein said controller is arranged for determining whether an air property sensed by the sensor needs to be altered by examining whether the sensed air property is below a predetermined bottom threshold value and/or above a predetermined top threshold value, and for controlling the air conditioning unit such as to alter the air property accordingly.
 12. Freight container according to any one of the preceding claims, comprising a battery (9) for feeding the air conditioning unit (7), wherein the generator, especially a diesel powered generator, is for charging the battery (9) at least partly, wherein the container (100) further comprises a clock and a controller arranged for controlling the generator in order to charge the battery (9) at least partly at a moment when a predetermined time interval has lapsed since the last time the battery is charged at least partly, and/or wherein the container (100) further comprises a voltage sensing device and a controller arranged for controlling the generator in order to charge the battery at least partly at a moment when is determined that the terminal voltage of the battery has dropped below a predetermined minimum voltage threshold value, and/or wherein the container further comprises a receiver (21) and a controller arranged for controlling the generator in order to charge the battery at least partly based on a control signal received by said receiver.
 13. Freight container according to any one of the preceding claims, further comprising a separation wall being located at a distal end of the cargo floor and separating the cargo space at least partly from a second part of the air conditioning unit (7) located behind said wall, wherein said wall defines a cavity for guiding air from the cargo space to the air conditioning unit or vice versa.
 14. Method for transporting cargo, especially temperature sensitive cargo, by means of a freight container, the method comprising:
 - providing a freight container (100) according to any one of the preceding claims;

- sensing an air property of air inside the container, especially the temperature of air inside the container;

- determining whether said air property needs to be altered by examining whether the sensed air property is below a predetermined bottom threshold value and/or above a predetermined top threshold value;

- altering said air property when the value of the sensed air property is below said predetermined bottom threshold value, such as to bring said air property above said predetermined bottom threshold value, or altering said air property when the sensed value of the air property is above said predetermined top threshold value, such as to bring said air property below said predetermined top threshold value; and

- at least partly charging the battery (9) by means of the generator at a moment when there is no need to alter the air property of the air inside (25) the container.

15. Method according to claim 14,

wherein the step of charging the battery (9) at a moment when there is no need to alter the air property of the air inside (25) the container is initiated when a predetermined time interval has lapsed, e.g. when a predetermined time interval has lapsed since the last time the battery (9) is charged at least partly; or wherein the step of charging the battery (9) at a moment when there is no need to alter the air property of the air inside the container (100) is initiated when it is determined that the terminal voltage of the battery has dropped below a predetermined minimum voltage threshold value; and/or wherein the freight container further is provided with a receiver (21), and wherein the step of charging the battery (9) at a moment when there is no need to alter the air property of the air inside the container is initiated by means of a control signal received by said receiver of the freight container; and/or wherein the method further comprises the step of altering the air property of the air inside the container while the battery is charged at the moment when the air property does not need to be altered; and/or wherein the method further comprises the step of at least partly charging the battery by means of the generator at a moment when there is a need to alter the air property of the air inside the container.

Patentansprüche

1. Frachtcontainer (100) zum Transportieren einer Ladung (5), insbesondere einer temperaturempfindlichen Ladung, wobei der Container (100) umfasst:
 - einen Containerkörper (24), der einen Lade-

raum (25) zum Lagern der Ladung (5) umschließt;

- eine Klimatisierungseinheit (7), vorzugsweise eine Kühl- und/oder Heizeinheit (7), die zum Steuern einer Temperatur und/oder Luftfeuchtigkeit in dem Laderaum (25) ausgelegt ist;
- einen Generator zum Versorgen der Klimatisierungseinheit (7) mit Strom; und
- einen Kraftstofftank (20) zum Versorgen des Generators mit Kraftstoff, insbesondere Diesel;

dadurch gekennzeichnet, dass

- die Klimatisierungseinheit (7) teilweise über dem Kraftstofftank (20) angeordnet ist und dass ein Teil der Klimatisierungseinheit (7) über einem Ladeboden (3) des Laderaumes (25) aufgehängt ist, um es zu ermöglichen, Ladung auf dem Ladeboden (3) unter dem Teil der Klimatisierungseinheit (7) zu platzieren.

2. Frachtcontainer nach Anspruch 1, wobei der Container ein intermodaler Container oder ein sogenannter multimodaler Transportcontainer, insbesondere ein ISO-Container, ist.
3. Frachtcontainer nach Anspruch 1 oder 2, wobei die Klimatisierungseinheit (7) an oder in der Nähe einer Vorderseite (1) des Containers (100) entgegengesetzt einer Rückseite, die mit einer oder mehreren Türen ausgestattet ist, angeordnet ist.
4. Frachtcontainer nach einem der vorhergehenden Ansprüche, wobei eine Außenseite des Containerkörpers (24) einen Hohlraum (17) umfasst, der nach innen in den Container hineinragt, wobei mindestens ein Teil der Klimatisierungseinheit (7) aus dem Containerkörper (24) herausragt und in dem Hohlraum (17) untergebracht ist, wobei der Hohlraum (17) vorzugsweise durch eine gestufte Einbuchtung des Containerkörpers (24) an der vorderen oberen Seite (1, 2) des Containers (100) gebildet wird, wobei der Ladeboden (3) sich unter die gestufte Einbuchtung erstreckt, um es zu ermöglichen, dass Ladung (5) unterhalb der gestuften Einbuchtung auf dem Ladeboden (3) abgelegt werden kann.
5. Frachtcontainer nach einem der vorhergehenden Ansprüche, wobei der Kraftstofftank (20) flach gegen eine äußere Hülle des Containers angeordnet ist.
6. Frachtcontainer nach einem der vorhergehenden Ansprüche, wobei der Generator Teil der Klimatisierungseinheit (7) ist.
7. Frachtcontainer nach einem der vorhergehenden Ansprüche, umfassend eine Batterie (9) zum Spei-

- sen der Klimatisierungseinheit (7) und/oder zum Starten des Generators, wobei die Batterie so angeordnet ist, dass sie von dem Generator geladen wird, wobei der Kraftstofftank (20) vorzugsweise eine L-Form umfasst, wobei die Batterie (9) in einem von der L-Form gebildeten Hohlraum untergebracht ist.
8. Frachtcontainer nach einem der vorhergehenden Ansprüche, wobei der mindestens eine Teil der Klimatisierungseinheit (7) gegen eine Oberseite (2) des Containers vorgesehen ist.
9. Frachtcontainer nach einem der vorhergehenden Ansprüche, wobei mindestens die äußere Länge des Frachtcontainers den Größen und Abmessungen eines standard-mäßigen Frachtcontainers, insbesondere eines 45-Fuß-Containers, entspricht oder wobei der Frachtcontainer als ein 45-Fuß-Container, vorzugsweise als ein sogenannter palettenbreiter 45-Fuß-Container, ausgebildet ist oder wobei der Ladeboden (3) mindestens 2,4 Meter breit und mindestens 13,2 Meter lang ist, um so mindestens 33 Europaletten aufzunehmen.
10. Frachtcontainer nach einem der vorhergehenden Ansprüche, wobei der Container mit ersten Beschlagblöcken, deren gegenseitiger Abstand dem gegenseitigen Abstand eines 40-Fuß-Containers entspricht, und/oder zweiten Beschlagblöcken oder sogenannten Eckbeschlägen, ausgestattet ist, deren gegenseitiger Abstand dem gegenseitigen Abstand der am weitesten außen angeordneten Beschlagblöcke eines 45-Fuß-Containers entspricht.
11. Frachtcontainer nach einem der vorhergehenden Ansprüche, ferner umfassend einen Sensor, insbesondere einen Temperatursensor, verbunden mit dem Laderaum, und eine Steuerung zum Steuern der Klimatisierungseinheit, wobei die Steuerung dazu ausgelegt ist festzustellen, ob eine von dem Sensor erfasste Lufteigenschaft geändert werden muss, durch Prüfen, ob die erfasste Lufteigenschaft unterhalb eines vorbestimmten unteren Schwellenwerts und/oder über einem vorbestimmten oberen Schwellenwert ist, und zum Steuern der Klimatisierungseinheit derart, dass die Lufteigenschaft entsprechend geändert wird.
12. Frachtcontainer nach einem der vorhergehenden Ansprüche, umfassend eine Batterie (9) zum Speisen der Klimatisierungseinheit (7), wobei der Generator, insbesondere ein mit Diesel betriebener Generator, dazu dient, die Batterie (9) zumindest teilweise zu laden, wobei der Container (100) ferner eine Zeituhr und eine Steuerung umfasst, die dazu ausgelegt ist, den Generator zu steuern, um die Batterie (9) zu einem Zeitpunkt, an dem ein vorbestimmtes Zeitintervall seit der letzten Zeit verstrichen ist, zu der die Batterie mindestens teilweise geladen wurde, mindestens teilweise zu laden, und/oder wobei der Container (100) ferner eine Spannungserfassungsvorrichtung und eine Steuerung umfasst, die dazu ausgelegt ist, den Generator zu steuern, um die Batterie zu einem Zeitpunkt, an dem festgestellt wird, dass die Klemmenspannung der Batterie unter einen vorbestimmten Mindest-Spannungsschwellenwert gefallen ist, mindestens teilweise zu laden, und/oder wobei der Container ferner einen Empfänger (21) und eine Steuerung umfasst, die so ausgelegt ist, dass sie den Generator auf der Grundlage eines von dem Empfänger empfangenen Steuerungssignals steuert, um die Batterie mindestens teilweise zu laden.
13. Frachtcontainer nach einem der vorhergehenden Ansprüche, ferner umfassend eine Trennwand, die an einem distalen Ende des Ladebodens angeordnet ist und den Laderaum mindestens teilweise von einem zweiten Teil der Klimatisierungseinheit (7) trennt, der hinter der Wand angeordnet ist, wobei die Wand einen Hohlraum definiert, um Luft vom Laderaum zur Klimatisierungseinheit oder umgekehrt zu leiten.
14. Verfahren zum Transportieren von Gütern, insbesondere einer temperaturempfindlichen Ladung, mittels eines Frachtcontainers, das Verfahren umfassend:
- die Bereitstellung eines Frachtcontainers (100) nach einem der vorhergehenden Ansprüche;
 - das Erkennen einer Lufteigenschaft von Luft in dem Container, insbesondere der Lufttemperatur in dem Container;
 - das Bestimmen, ob die Lufteigenschaft geändert werden muss, indem untersucht wird, ob die wahrgenommene Lufteigenschaft unter einem vorbestimmten unteren Schwellenwert und/oder über einem vorbestimmten oberen Schwellenwert ist;
 - das Ändern der Lufteigenschaft, wenn der Wert der wahrgenommenen Lufteigenschaft unter dem vorbestimmten unteren Schwellenwert ist, um die Lufteigenschaft über den vorbestimmten unteren Schwellenwert zu bringen, oder das Ändern der Lufteigenschaft, wenn der wahrgenommene Wert der Lufteigenschaft über dem wahrgenommenen oberen Schwellenwert ist, um die Lufteigenschaft unter den vorbestimmten oberen Schwellenwert zu bringen; und
 - das mindestens teilweise Laden der Batterie (9) mithilfe des Generators zu einem Zeitpunkt, an dem keine Notwendigkeit besteht, die Lufteigenschaft der Luft im Inneren (25) des Con-

tainers zu ändern.

15. Verfahren nach Anspruch 14, wobei der Schritt des Ladens der Batterie (9) zu einem Zeitpunkt, an dem keine Notwendigkeit besteht, die Lufteigenschaft der Luft im Inneren (25) des Containers zu ändern, ausgelöst wird, wenn ein vorbestimmtes Zeitintervall verstrichen ist, d. h., wenn ein vorbestimmtes Zeitintervall verstrichen ist, seit die Batterie (9) zum letzten Mal mindestens teilweise geladen wurde; oder
- wobei der Arbeitsschritt des Ladens der Batterie (9) zu einem Zeitpunkt, wenn keine Notwendigkeit besteht, die Lufteigenschaft der Luft im Inneren des Containers (100) zu ändern, ausgelöst wird, wenn festgestellt wird, dass die Klemmenspannung der Batterie unter einen vorbestimmten Mindest-Spannungsschwellenwert gefallen ist; und/oder wobei der Frachtcontainer ferner mit einem Empfänger (21) versehen ist und wobei der Schritt des Ladens der Batterie (9) zu einem Zeitpunkt, wenn keine Notwendigkeit besteht, die Lufteigenschaft der Luft im Inneren des Containers zu ändern, mittels eines Steuerungssignals, empfangen von dem Empfänger des Frachtcontainers, ausgelöst wird; und/oder wobei das Verfahren ferner den Schritt umfasst, die Lufteigenschaft der Luft im Inneren des Containers zu ändern, während die Batterie zu dem Zeitpunkt geladen wird, an dem die Lufteigenschaft nicht geändert werden muss; und/oder wobei das Verfahren ferner den Arbeitsschritt umfasst, die Batterie mindestens teilweise mithilfe des Generators zu einem Zeitpunkt zu laden, wenn eine Notwendigkeit besteht, die Lufteigenschaft der Luft in dem Container zu ändern.

Revendications

1. Conteneur de fret (100) destiné au transport de marchandises (5), en particulier de marchandises sensibles à la température, le conteneur (100) comprenant :
- un corps de conteneur (24) contenant un compartiment à marchandises (25) destiné à stocker les marchandises (5) ;
 - une unité de climatisation (7), de préférence une unité de refroidissement et/ou de chauffage (7), prévue pour réguler la température et/ou l'humidité dans le compartiment à marchandises (25) ;
 - un générateur destiné à alimenter l'unité de climatisation (7) ; et
 - un réservoir de carburant (20) destiné à alimenter le générateur en carburant, principalement en diesel ; **caractérisé en ce que**
 - l'unité de climatisation (7) est placée partielle-

ment au-dessus du réservoir de carburant (20), et **en ce qu'**une partie de l'unité de climatisation (7) est suspendue au-dessus d'un plancher pour marchandises (3) du compartiment à marchandises (25) afin de permettre aux marchandises d'être placées sur le plancher pour marchandises (3) en-dessous de ladite partie de l'unité de climatisation (7).

2. Conteneur de fret selon la revendication 1, dans lequel le conteneur est un conteneur intermodal ou un conteneur dit de transport multimodal, et en particulier un conteneur ISO.
3. Conteneur de fret selon la revendication 1 ou 2, dans lequel l'unité de climatisation (7) est placée au niveau ou près d'un côté avant (1) du conteneur (100) opposé à un côté arrière muni d'une ou plusieurs portes.
4. Conteneur de fret selon l'une quelconque des revendications précédentes, dans lequel un côté extérieur du corps de conteneur (24) comprend une cavité (17) dépassant vers l'intérieur dans le conteneur, et au moins une partie de l'unité de climatisation (7) qui sort du corps de conteneur (24) et est placée dans la cavité (17), dans lequel, de préférence, la cavité (17) est formée par un rebord intérieur du corps de conteneur (24) sur le côté avant supérieur (1, 2) du conteneur (100), dans lequel, encore plus de préférence, le plancher pour marchandises (3) s'étend sous le rebord afin de permettre aux marchandises (5) d'être placées sur le plancher pour marchandises (3), sous le rebord.
5. Conteneur de fret selon l'une quelconque des revendications précédentes, dans lequel le réservoir de carburant (20) est placé à plat contre une coque externe du conteneur.
6. Conteneur de fret selon l'une quelconque des revendications précédentes, dans lequel le générateur fait partie de l'unité de climatisation (7).
7. Conteneur de fret selon l'une quelconque des revendications précédentes, comprenant une batterie (9) destinée à alimenter l'unité de climatisation (7) et/ou à démarrer le générateur, la batterie étant prévue pour être chargée par le générateur, dans lequel, de préférence, le réservoir de carburant (20) comprend une forme en L, et la batterie (9) est placée dans une cavité constituée par la forme en L.
8. Conteneur de fret selon l'une quelconque des revendications précédentes, dans lequel ladite au moins une partie de l'unité de climatisation (7) est prévue contre un côté supérieur (2) du conteneur.

9. Conteneur de fret selon l'une quelconque des revendications précédentes, dans lequel au moins la longueur externe du conteneur de fret correspond aux tailles et aux dimensions d'un conteneur de fret standard, et particulièrement un conteneur de 45 pieds, ou
5
dans lequel le conteneur de fret est formé comme un conteneur de 45 pieds, de préférence comme un conteneur 45 pieds dit Pallet wide, ou
10
dans lequel le plancher pour marchandises (3) mesure au moins 2,4 mètres de large et au moins 13,2 mètres de long, afin d'accueillir au moins 33 euro-palettes.
10. Conteneur de fret selon l'une quelconque des revendications précédentes, dans lequel le conteneur est muni de premiers blocs de fixation dont l'espacement mutuel correspond à l'espacement mutuel d'un conteneur de 40 pieds et/ou de seconds blocs de fixation ou de ferrures de coin dont l'espacement mutuel correspond à l'espacement mutuel des blocs de fixation placés le plus à l'extérieur d'un conteneur de 45 pieds.
15
20
11. Conteneur de fret selon l'une quelconque des revendications précédentes, comprenant en outre un capteur, et en particulier un capteur de température, associé au compartiment à marchandises, et un appareil de contrôle destiné à contrôler l'unité de climatisation, ledit appareil de contrôle étant prévu pour déterminer si une propriété de l'air détectée par le capteur doit être modifiée ou non en examinant si la propriété de l'air détectée est inférieure à la valeur de seuil minimale prédéterminée et/ou supérieure à une valeur de seuil maximale prédéterminée, et pour contrôler l'unité de climatisation afin de modifier en conséquence la propriété de l'air.
25
30
35
12. Conteneur de fret selon l'une quelconque des revendications précédentes, comprenant une batterie (9) destinée à alimenter l'unité de climatisation (7), dans lequel le générateur, et en particulier un générateur alimenté au diesel, est destiné à charger la batterie (9) au moins partiellement,
40
dans lequel le conteneur (100) comprend en outre une horloge et un appareil de contrôle prévu pour contrôler le générateur afin de charger la batterie (9) au moins partiellement quand un intervalle de temps prédéterminé s'est écoulé depuis la dernière fois que la batterie a été chargée au moins partiellement, et/ou
45
50
dans lequel le conteneur (100) comprend en outre un dispositif de détection de tension et un appareil de contrôle prévu pour contrôler le générateur afin de charger la batterie au moins partiellement quand il est déterminé que la tension terminale de la batterie a chuté en-dessous d'une valeur de seuil de tension minimale prédéterminée, et/ou
55
- dans lequel le conteneur comprend en outre un récepteur (21) et un appareil de contrôle prévu pour contrôler le générateur afin de charger la batterie au moins partiellement sur la base d'un signal de commande reçu par ledit récepteur.
13. Conteneur de fret selon l'une quelconque des revendications précédentes, comprenant en outre une paroi de séparation située au niveau d'une extrémité distale du plancher pour marchandises et séparant au moins partiellement le compartiment à marchandises d'une seconde partie de l'unité de climatisation (7) située derrière ladite paroi, dans lequel ladite paroi définit une cavité destinée à guider l'air entre le compartiment à marchandises et l'unité de climatisation ou inversement.
14. Procédé de transport de marchandises, et en particulier de marchandises sensibles à la température, au moyen d'un conteneur de fret, le procédé comportant :
- le fait de prévoir un conteneur de fret (100) selon l'une quelconque des revendications précédentes ;
 - la détection d'une propriété de l'air contenu à l'intérieur du conteneur, et plus particulièrement de la température de l'air à l'intérieur du conteneur ;
 - la détermination du fait que ladite propriété de l'air doit être modifiée ou non en examinant si la propriété de l'air détectée est inférieure à une valeur de seuil minimale prédéterminée et/ou supérieure à une valeur de seuil maximale prédéterminée ;
 - la modification de ladite propriété de l'air lorsque la valeur de la propriété de l'air détectée est inférieure à ladite valeur de seuil minimale prédéterminée, afin de ramener ladite propriété de l'air au-dessus de ladite valeur de seuil minimale prédéterminée, ou la modification de ladite propriété de l'air lorsque la valeur détectée de la propriété de l'air est supérieure à ladite valeur de seuil maximale prédéterminée, afin de ramener ladite propriété de l'air en-dessous de ladite valeur de seuil maximale prédéterminée ; et
 - le chargement au moins partiel de la batterie (9) à l'aide du générateur à un moment auquel il n'est pas nécessaire de modifier la propriété de l'air contenu à l'intérieur (25) du conteneur.
15. Procédé selon la revendication 14, dans lequel l'étape de chargement de la batterie (9) à un moment auquel il n'est pas nécessaire de modifier la propriété de l'air contenu à l'intérieur (25) du conteneur est déclenchée lorsqu'un intervalle de temps prédéterminé s'est écoulé, comme par exemple lorsqu'un intervalle de temps prédéterminé s'est

écoulé depuis la dernière fois où la batterie (9) a été chargée au moins partiellement ; ou
dans lequel l'étape de chargement de la batterie (9) à un moment auquel il n'est pas nécessaire de modifier la propriété de l'air contenu à l'intérieur du conteneur (100) est déclenchée lorsqu'il est déterminé que la tension terminale de la batterie a chuté en-dessous de la valeur de seuil de tension minimale prédéterminée ; et/ou
dans lequel le conteneur de fret est en outre muni d'un récepteur (21), et dans lequel l'étape de chargement de la batterie (9) à un moment auquel il n'est pas nécessaire de modifier la propriété de l'air contenu à l'intérieur du conteneur est déclenchée à l'aide d'un signal de commande reçu par ledit récepteur du conteneur de fret ; et/ou
dans lequel le procédé comprend en outre l'étape de modification de la propriété de l'air contenu à l'intérieur du conteneur pendant que la batterie est chargée au moment auquel la propriété de l'air n'a pas besoin d'être modifiée ; et/ou
dans lequel le procédé comprend en outre l'étape qui consiste à charger au moins partiellement la batterie à l'aide du générateur au moment auquel il est nécessaire de modifier la propriété de l'air contenu à l'intérieur du conteneur.

5

10

15

20

25

30

35

40

45

50

55

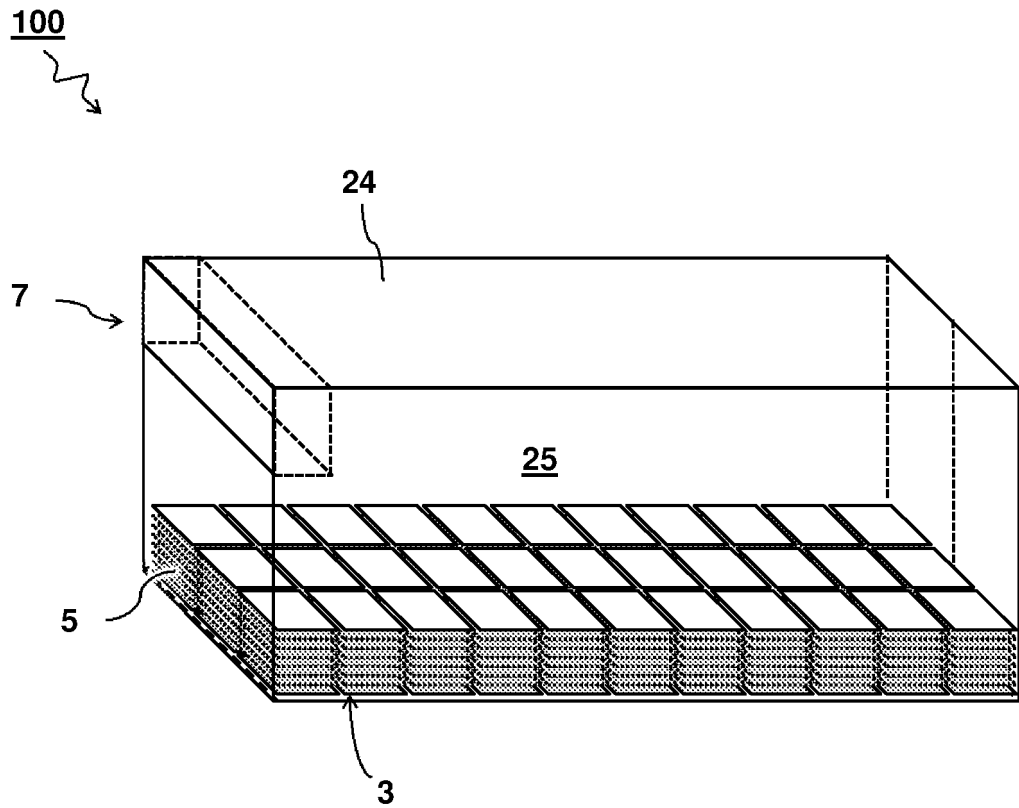


FIG 1

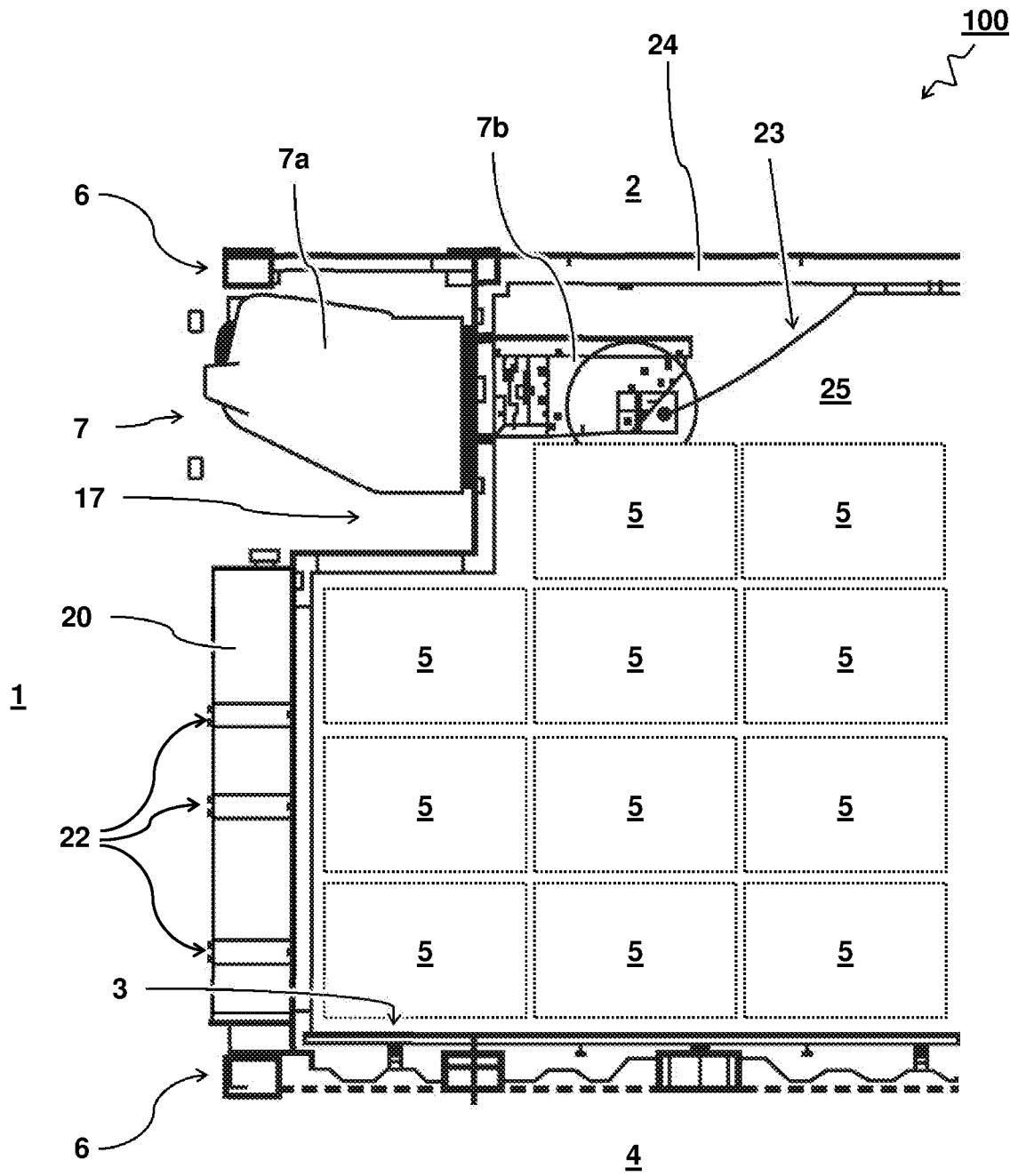


FIG 2

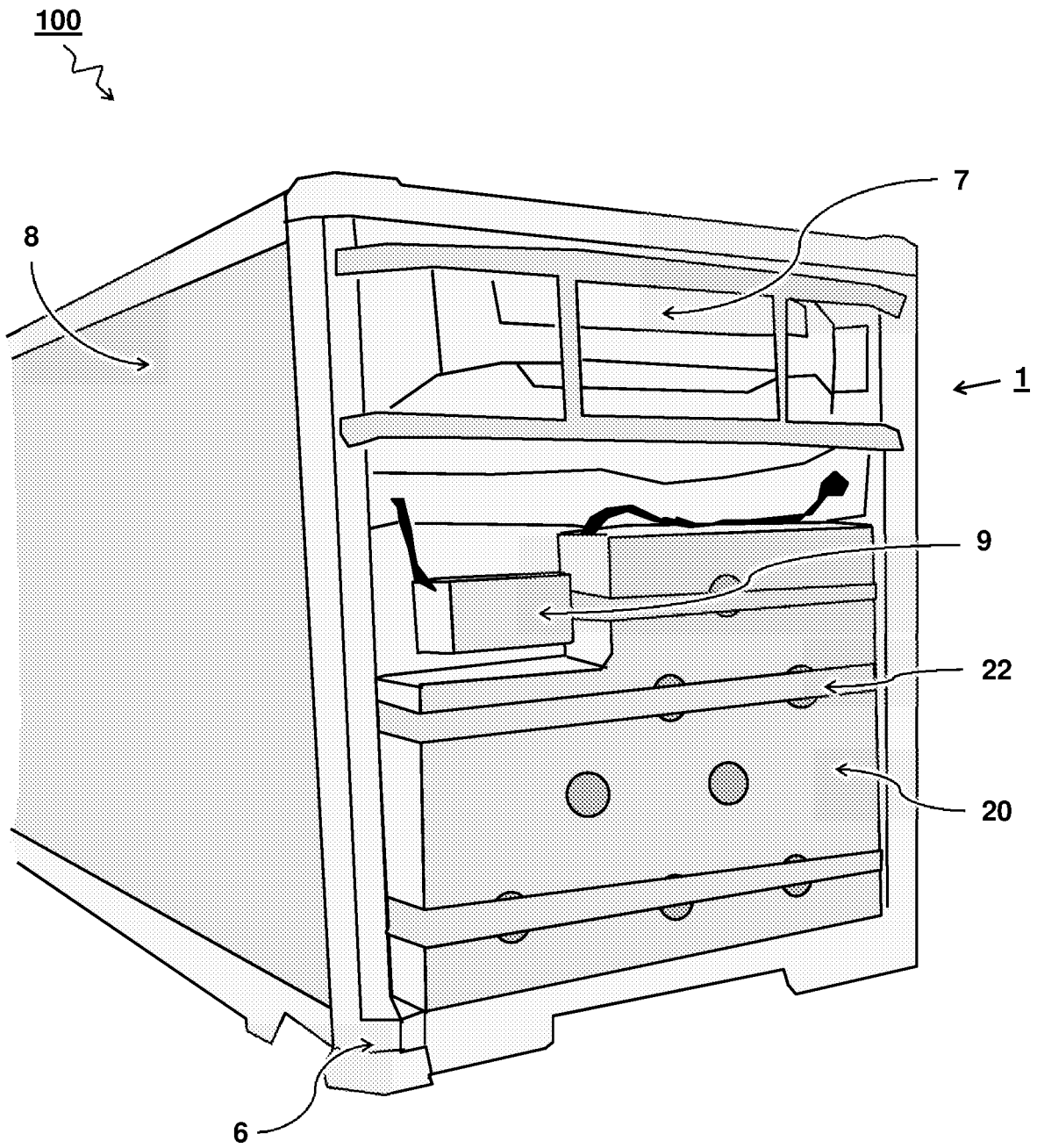


FIG 3

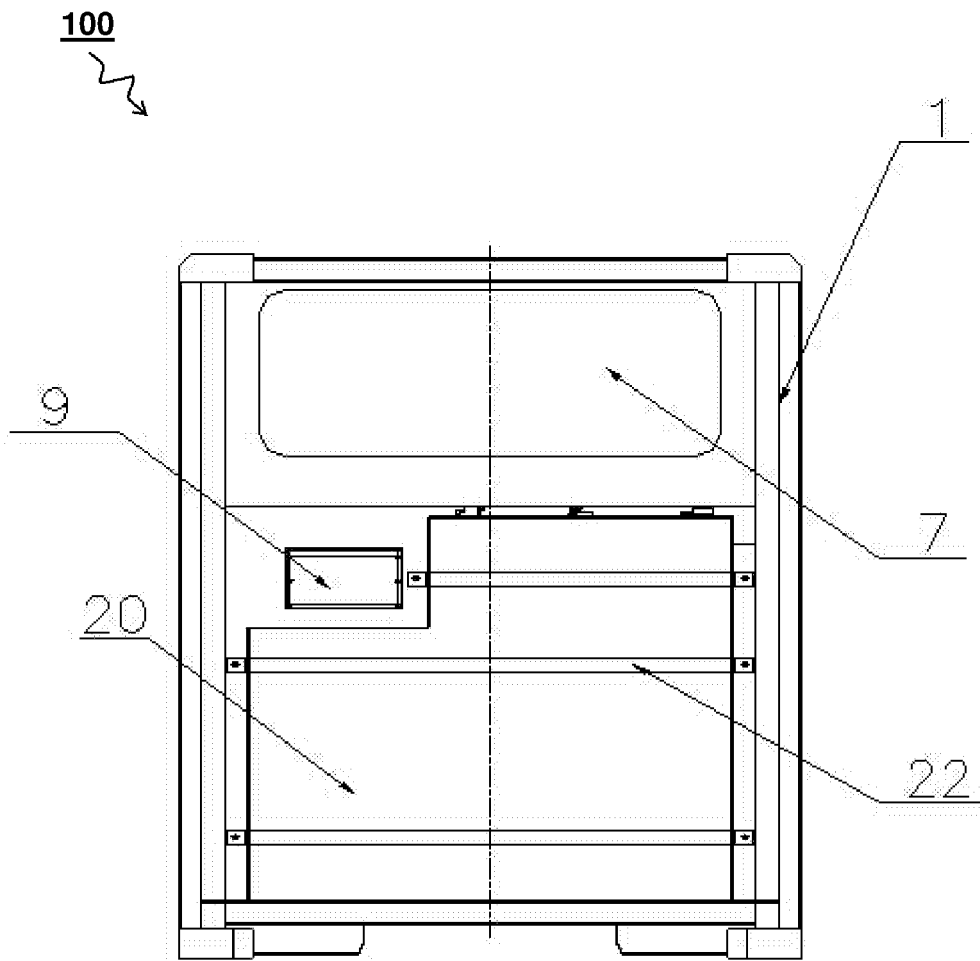


FIG 4

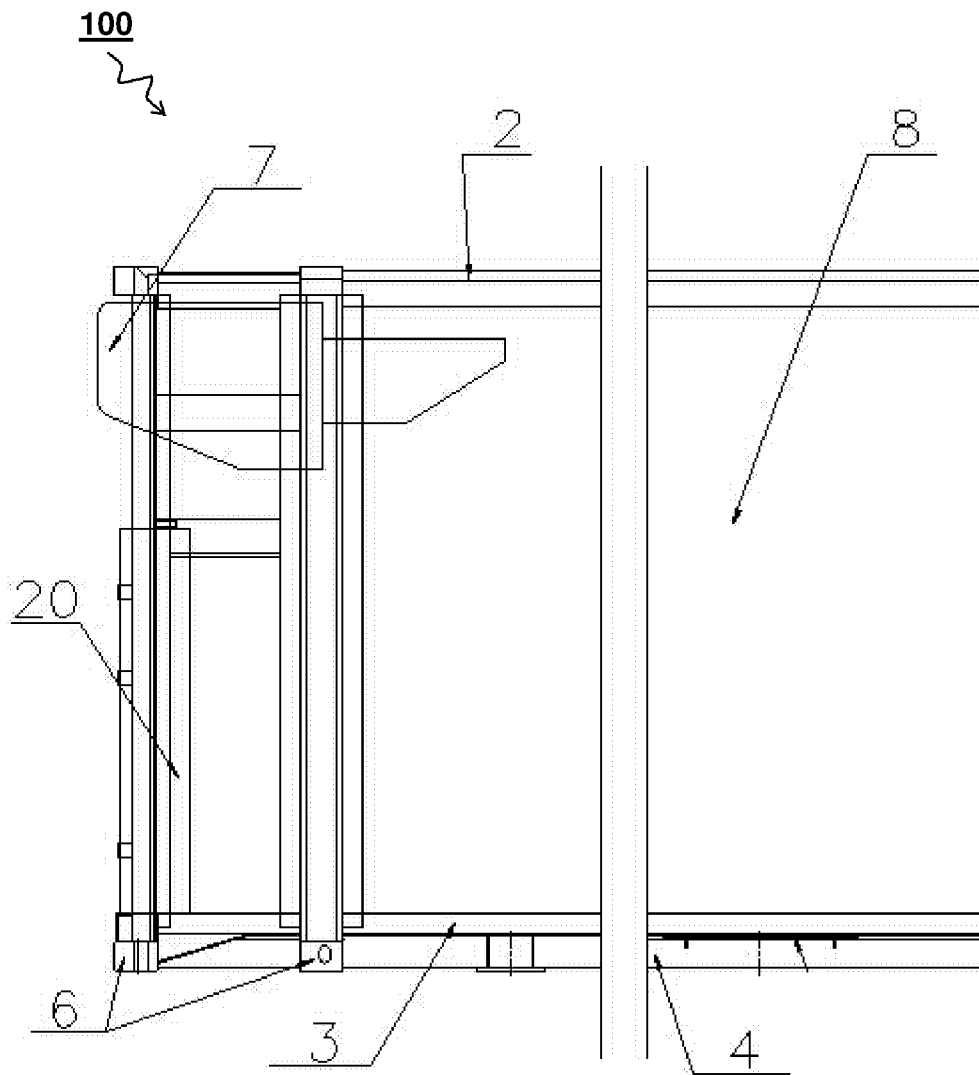


FIG 5

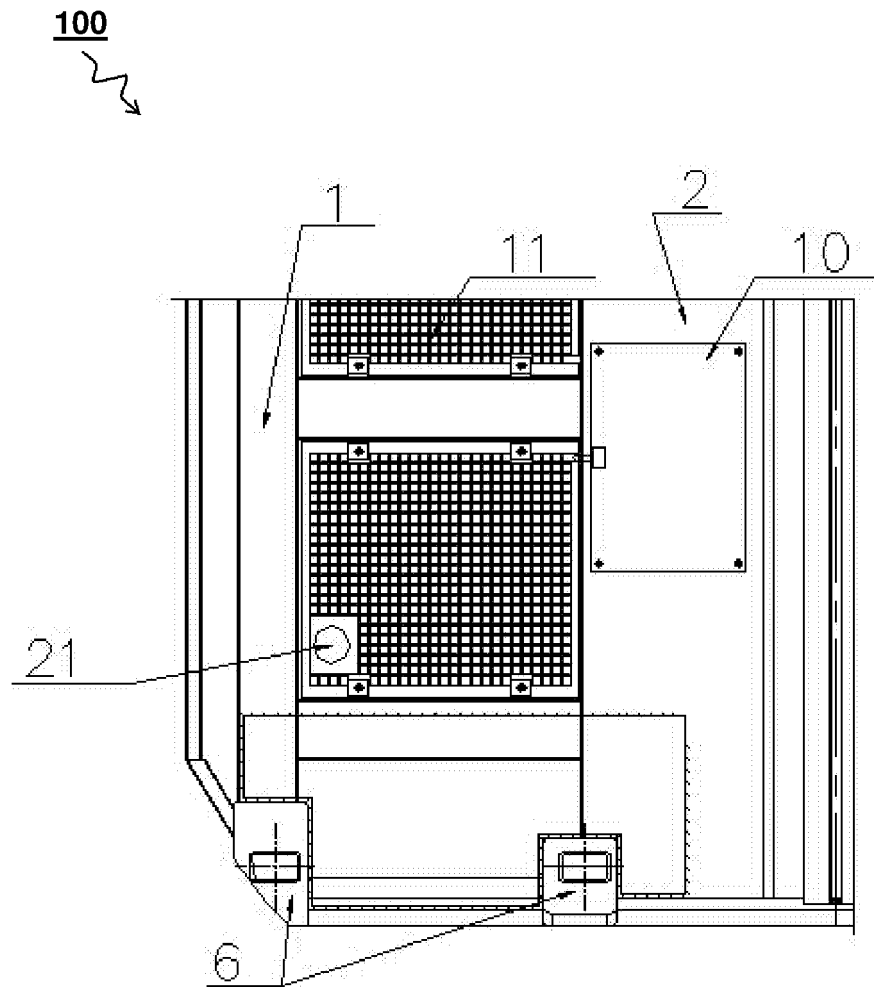


FIG 6

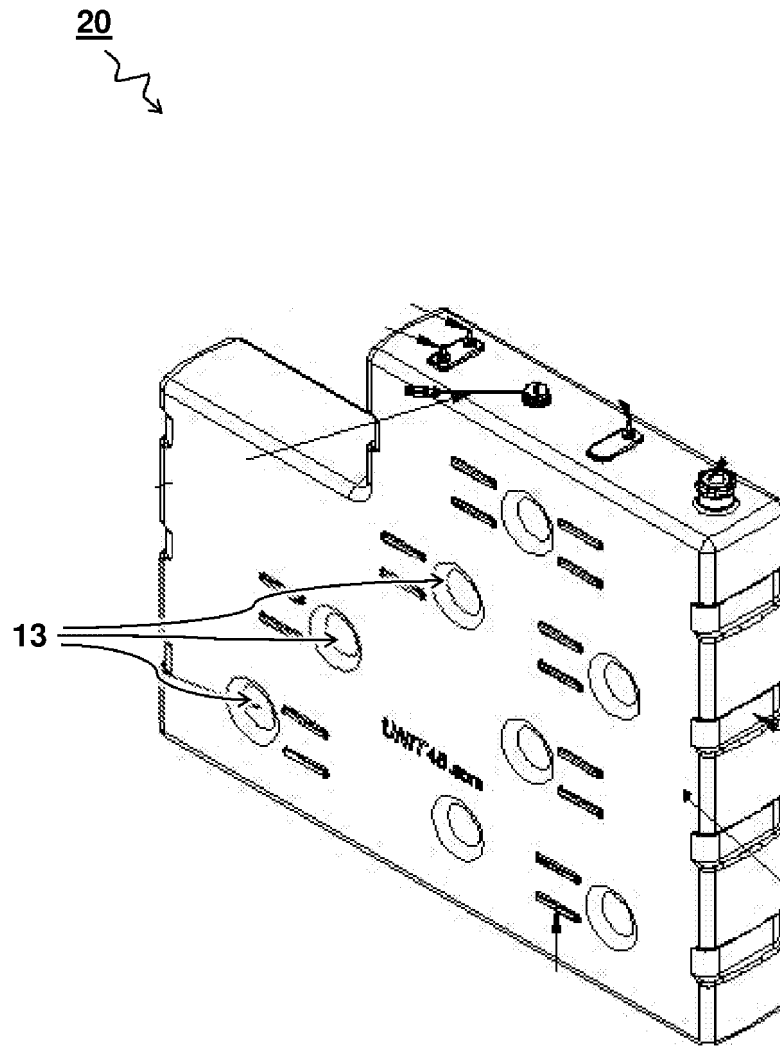


FIG 7

REFERENCES CITED IN THE DESCRIPTION

This list of references cited by the applicant is for the reader's convenience only. It does not form part of the European patent document. Even though great care has been taken in compiling the references, errors or omissions cannot be excluded and the EPO disclaims all liability in this regard.

Patent documents cited in the description

- WO 9220542 A [0004]
- US 20090299534 A [0005]
- DE 102011105475 A1 [0005]
- US 2635432 A [0005]