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(54) **FREIGHT CONTAINER**

(57) A freight container includes a container body (1) and corner fittings (2) provided at each corner of the container body. The container body (1) includes a bottom (10), a top (20), two side portions (30) and two end portions (40, 50), and at least one end portion is provided with locking devices (60) or corrugated plates (70). The locking devices (60) or corrugated plates (70) protrude beyond the outer edges of the corner fittings (2), and the position of each corner fitting and the distance therebetween accord with ISO standards. The inner length of the container is enlarged by extending outwards the rear end and/or the front end to the outer edges of the locking

devices (60) or corrugated plates (70) beyond the corner fittings. The position of the corner fittings in the container and the relative distance therebetween are constant and accord with ISO standards, hence without influencing the alignment of the sling fitting and the corner fittings. Therefore, the inner space of the improved container is enlarged and the improved container still adapts to the existing standard products. Compared with the prior containers provided with locking bars having special structure, the present container is easy to implement and the manufacturing difficulty is small.

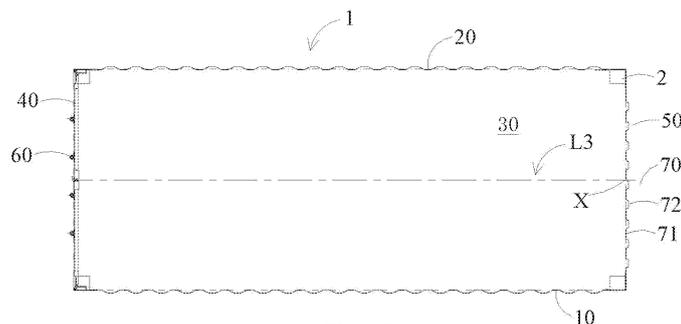


Fig.5

**EP 3 098 184 A1**

**Description**

## TECHNICAL FIELD

[0001] The present disclosure relates to the field of freight container.

## BACKGROUND

[0002] Generally, a main body of an ordinary freight container includes a container body enclosed by a bottom portion, a top portion, two side portions, a rear end and a front end, as well as a corner fitting at each corner of the container body. Fig. 1 is a top view of an existing 20' container 200; Fig. 2 is a side view of the container shown in Fig. 1; and Fig. 3 is another side view thereof. As shown in Figs. 1, 2 and 3, a front end 22 is provided with a corrugated plate 24, and concave and convex portions of the corrugated plate 24 are arranged symmetrically relative to a central line of the front end 22. A rear end 23 is provided with a locking device 25, and locking bars 251 of the locking device 25 are provided symmetrically on two doors. A corner fitting 26 is positioned at each corner of the container. The position of each corner fitting and the distance therebetween accord with the ISO requirement, such that a sling fitting may be mounted for lifting.

[0003] According to the ISO requirement, a 20' container should have an outer container length of 6058mm, i.e., an outer distance between two corner fittings along a longitudinal direction is 6058mm, and an inner container length generally smaller than 6 meters. According to the ISO requirement, a 40' container should have an outer container length of 12192mm and an inner container length generally smaller than 12.05 meters. According to the ISO requirement, a 45' container should have an outer container length of 13716mm and an inner container length generally smaller than 13.6 meters. Taking a pallet container as an example, in which a plurality of pallet rows are placed longitudinally, the outer size of a pallet is determined by a standard, and a typical pallet has a size of 1200 x 1200mm or 1200 x 800mm. Thus, if the above-mentioned ordinary freight container is still used for shipping the pallets, the ISO 20' container may not contain five rows of pallets. Further, though ten rows of pallets may be theoretically arranged in the ISO 40' container, that will, however, cause a waste to the inner container space when the ISO container is used for shipping pallets, that is because, in practice, the ten rows of pallets have to be arranged with enough space intervals left between the pallets (a general inner length has to be greater than 12060mm). Similarly, there are difficulties to arranged seventeen rows of pallets when the ISO 45' container is used for shipping 1200 x 800mm pallets. Therefore, when the existing containers in accordance to the ISO requirements is used to contain the pallets, since the sizes of the pallet and inner container are not rationally designed, the pallets cannot be arranged as

much as possible, resulting a waste to the inner container space.

[0004] To maximize the inner container size, a special structure of a container door is introduced in a patent document (publication No. CN2213134A). In this door, a locking bar is kept in the door frame, increasing the volume of the inner container as much as possible. However, there are difficulties in manufacturing of such structure, and the increase to the inner container length is limited.

[0005] Therefore, there is a need to improve the structure of the existing freight container, i.e., to increase the inner container size and decrease the improvement difficulties while keeping the position and relative distance of the corner fittings accord with the ISO standard.

## SUMMARY

[0006] In view of the above problems, the present invention provides a freight container, so as to enlarge the inner container size.

[0007] To achieve the above purpose, the present invention provides a freight container, comprising a container body and corner fittings provided at each corner of the container body, the container body comprising a bottom portion, a top portion, two side portions and two end portions, wherein at least an end portion is provided with locking devices or corrugated plates, the locking devices or corrugated plates protrude beyond an outer edges of the corner fittings, and the position of each corner fitting and the distance therebetween accord with ISO standards.

[0008] The present invention has the advantageous effect of compared with the prior art: in the present invention, the inner container length is enlarged by extending outwards the rear end and/or front end to the outer edges of the locking device and/or corrugated plate protruding beyond the corner fittings. As for the pallet container, increased number of pallets can be placed, and the cabin space can be fully used. In addition, in the present invention the position of the corner fitting and relative distance therebetween are kept unchanged and accord with the ISO standard, hence the alignment of the sling fitting and corner fitting are not influenced, and there will not be interference between the container corner fitting and the T-shaped bar inside the cabin when the container is placed into the cabin. Therefore, in the present invention the improved container may have the enlarged inner space while adapting shape requirements of the existing standard products, such as a standard pallet or T-shaped bar. Further, compared with the containers provided with locking bars having special structure presented in the background section, the present invention can be easily implemented and has smaller manufacturing difficulty.

## BRIEF DESCRIPTION OF THE DRAWINGS

[0009]

Fig. 1 is a top view of an existing container.

Fig. 2 is a side view of the existing container.

Fig. 3 is another side view of the existing container.

Fig. 4 is a schematic view showing the existing container arranged in the cabin.

Fig. 5 is a top view of a container of the present invention.

Fig. 6 is a side view of the container of the present invention.

Fig. 7 is another side view of the container of the present invention.

Fig. 8 is a section view taken along the BB line in Fig. 7.

Fig. 9 is a section view taken along the CC line in Fig. 6.

Fig. 10 is a schematic view of an embodiment of a rear end of the freight container of the present invention.

Fig. 11 is a top view of the embodiment of the rear end of the freight container of the present invention.

Fig. 12 is a schematic view of an embodiment of a front end of the freight container of the present invention.

Fig. 13 is a top view of the embodiment of the front end of the freight container of the present invention.

Fig. 14 is a schematic view showing the container of the present invention arranged in the cabin.

Fig. 15 is another schematic view showing the container of the present invention arranged in the cabin.

Fig. 16 is a further schematic view showing the container of the present invention arranged in the cabin.

## DETAILED DESCRIPTION

**[0010]** Exemplary embodiments will be described more completely with reference to the accompanying drawings. However, the exemplary embodiment can be implemented in various manners, and may not be limited to the embodiments illustrated herein; instead, these embodiments are provided for comprehensive and completeness of the present invention, and to fully communicate the concept of the illustrative embodiments to those skilled in the art. In the drawings, for clarity, the thicknesses of the areas and layers may be exaggerated. Same or similar structures will be indicated by same reference numbers in the drawings, and detailed descriptions thereof will be thus omitted.

**[0011]** In addition, the described feature, structure or characteristic can be combined with one or more embodiments in any suitable manner. In the following description, a lot of details are provided for fully understanding the embodiments of the present invention. However, those skilled in the art will appreciate, a technical solution of the present invention may be implemented without one or more of said specific details, or other manners, elements, materials and etc. may be adopted. In other situations, well known structures, materials or operations will not be shown or described, so as to avoid blurring

the main technical idea of the present invention.

**[0012]** As shown in Fig. 5, the present invention provides a freight container comprising a container body 1 and corner fittings 2 provided at each corner of the container body 1. The container body comprises a bottom portion 10, a top portion 20, two side portions 30 and two end portions 40, 50. Wherein at least one end portion is provided with a locking device 60 or a corrugated plate 70. The locking device or corrugated plate protrudes beyond the outer edge of the corner fitting 2, and the position of each corner fitting and the distance therebetween accord with ISO standard. This embodiment is described with reference to a 20' freight container. As shown in Fig. 5, the distance between two corner fittings along a longitudinal direction of the container is 6058mm, which distance is the same as that of the existing corner fitting and accord with the ISO standard of the 20' container. An outer edges of the locking device 60 or corrugated plate 70 on the at least one end portion protrudes beyond an outer edges of the corner fittings at a distance of larger than 21mm. The inner container length is larger than 6000mm, while the existing ordinary container has an inner container length of smaller than 6000mm. Thus, compared with the existing container, the container of the present invention is able to contain more pallets. Preferably, the locking devices and corrugated plates each protrudes beyond the outer edges of the corner fittings at a distance of 50mm.

**[0013]** Therefore, in the present invention, the inner container length is enlarged by extending outwards the rear end and/or the front end to the outer edge of the locking device or corrugated plate at this end beyond the corner fittings. Taking the pallet container as example, the number of pallets to be placed is increased (taking the 20' container as an example, the number of pallets to be placed is increased by 1 in comparison with the prior 20' container). In the present invention the position of the corner fitting and the distance therebetween is unchanged, hence the alignment of the sling fitting and corner fitting is not influenced. Further, in a typical transport ship for containers, the containers in the cabin are typically arranged between T-shaped bars (T-BAR) 3 corresponding to the corner fitting at the ISO standard position in the cabin. Since the position of the corner fitting in the present invention are unchanged, they can be still placed correspondingly between the T-shaped bars 3, and there is no interference between the T-shaped bars 3 and the locking device and/or corrugated plate beyond the bound of the corner fitting. As shown in Fig. 14, in the present embodiment, when the freight containers are placed in the cabin, two adjacent sides of two containers are imbedded with each other, breaking the distance limit between the corner fitting of the container and the T-shaped bar. The outwards extending portion of the container may be filled into the relatively larger gap between the ends of the containers when the containers are arranged, and do not interference with the T-shaped bar. Thus the space in the cabin may be used effectively.

**[0014]** Description will be made with reference to an exemplary container having two ends, i.e., a front end and a rear end, wherein the front end is provided with a corrugated plate and the rear end is provided with a locking device. As for other types of containers, such as a container having locking devices or corrugated plates provided at both its front end and rear end, it would be included within the protection scope of the invention if it has the structure according to the concept of the present invention.

**[0015]** As shown in Figs. 5 and 6, in an embodiment, concave portions 71 and convex portions 72 of the corrugated plate 70 are arranged asymmetrically relative to a central line L1 of the front end. In an embodiment, the concave portions 71 and convex portion 72 of the corrugated plate 70 are arranged such that, as shown in Fig. 5, when the corrugated plate 70 is rotated at 180 degrees around an intersection point X of the corrugated plate 70 and the longitudinal central line L5 of the container body, the concave portions 71 of the corrugated plate 70 after rotating correspond to the convex portions 72 of the corrugated plate 70 before rotating, and the convex portions 72 of the corrugated plate 70 after rotating correspond to the concave portions 71 of the corrugated plate 70 before rotating. The corrugated plate 70 is substantially central-symmetrical relative to the intersection point X.

**[0016]** As shown in Figs. 5 and 7, in another embodiment, the locking device 60 comprises a plurality of locking bars 61, said locking bars 61 being mounted asymmetrically on two doors of the rear end 40. As shown in Fig. 7, the number of the locking bars 61 is 4, and the locking bars 61 each has a distance D1, D2, D3 and D4 from a central line L2 of the rear end 40, the above distances being different from each other.

**[0017]** By means of the asymmetrical structure design for the front end and/or rear end, the convex portions of the front end and/or rear end of adjacent containers may be staggered when a plurality of containers are arranged, so as to avoid an impact.

**[0018]** As shown in Fig. 14, when two 20' containers are joined, the rear end is adjacent to the front end, and the locking bar of the rear end corresponds to the concave portion of the corrugated plate.

**[0019]** As shown in Fig. 15, when two 20' containers are joined, the concave portion of the corrugated plate of one container is aligned to the convex portion of the corrugated plate of the adjacent container, such that the convex portions of the two adjacent containers can be staggered.

**[0020]** As shown in Fig. 16, when two 20' containers are joined, the locking bar of the corrugated plate of one container is staggered with the locking bar of the adjacent container.

**[0021]** Therefore, when two 20' containers are joined, whatever a rear end joining the front end, the front end joining the front end, or the rear end joining the rear end, the distance between adjacent corner fittings is always 76mm. There is a staggered arrangement between the

locking bar and corrugated plate, the corrugated plate and corrugated plate, or the locking bar and locking bar. The 20' inner container length is maximized by fully using the space staggering.

5 **[0022]** In the present embodiment, the handles 62 on the two doors are at different heights. When the rear ends of two containers are adjacent, the handle positions can be staggered, avoiding collision between the handles at the same height.

10 **[0023]** As shown in Figs. 8 and 9, in the present embodiment, the freight container further comprises an end lintel which may be a door lintel 81 or a front lintel 82. The door lintel 81 is provided on an upper side of the rear end along a transverse direction of the container, and a side of the door lintel 81 is extended outwards the container and beyond the locking bar 61. The front lintel 82 is provided on an upper side of the front end along the transverse direction of the container, and a side of the front lintel 82 is extended outwards the container and beyond the corrugated plate 70. Preferably, along the transverse direction of the container, at the side of the corrugated plate 70, the door lintel 81 or front lintel 82 has an edge shape corresponding to that of the corrugated plate 70; and at the side of the locking bar 61, the edge of the door lintel 81 or front lintel 82 is recessed at a position where it is not corresponding to the locking bar 61, such that the interference between the closely adjacent containers may be avoided when they are lifted up and down.

20 **[0024]** As shown in Figs. 8 and 9, in another embodiment, the freight container further comprises an end sill which may be a door sill 91 or a front sill 92. The door sill 91 is provided on a lower side of the rear end along a transverse direction of the container, and a side of the door sill 91 is extended outwards the container and beyond the locking bar 61. The front sill 92 is provided on a lower side of the front end along the transverse direction of the container, and a side of the front sill 92 is extended outwards the container and beyond the corrugated plate 70. Preferably, along the transverse direction of the container, at the side of the corrugated plate 70, the door sill 91 or front sill 92 has an edge shape corresponding to that of the corrugated plate 70; and at the side of the locking bar 61, the edge of the door sill 91 or front sill 92 is recessed at a position where it is not corresponding to the locking bar 61, such that the interference between the closely adjacent containers may be avoided when they are lifted up and down.

30 **[0025]** As shown in Figs. 10-13, in another embodiment, the freight container further comprises an anti-collision portions 100 provided on a corner columns of the rear end 40 and front end 50 of the container. The anti-collision portions 100 protrude outwards from the rear end and front end. Preferably, the anti-collision portion 100 of the rear end 40 or front end 50 is provided asymmetrically relative to that end, avoiding interference between adjacent containers when arranged.

40 **[0026]** Since the container is provided with a structure

protruding outwards the container from the front end and/or rear end and beyond the locking bar or corrugated plate, even if a collision occurs in future, only the protruded structure is impacted, and the damage to the corrugated plate or locking device may be prevented.

**[0027]** The present embodiment is described with reference to the 20' container. However, the concept of the present invention may be adapted to other types of containers. For example, by extending outwards the rear end and/or front end to the outer edges of the locking device and/or corrugated plate protruding beyond the corner fittings, the inner container length of the 40' freight container may be enlarged to more than 12060mm or 12090mm, and the inner container length of the 45' freight container may be enlarged to more than 13600mm.

**[0028]** In view of the above, in the present invention, the inner container length is enlarged by extending outwards the rear end and/or front end to the outer edges of the locking device and/or corrugated plate protruding beyond the corner fittings. As for the pallet container, increased number of pallets can be placed, and the cabin space can be fully used. In addition, in the present invention the positions of the corner fittings and relative distances therebetween are kept unchanged and accord with the ISO standard, hence the alignment of the sling fitting and corner fitting is not influenced, and there will not be interference between the container corner fitting and the T-shaped bar inside the cabin when the container is placed into the cabin. Therefore, in the present invention the improved container may have the enlarged inner space while adapting shape requirements of the existing standard products, such as a standard pallet or T-shaped bar. Further, compared with the containers provided with locking bar having special structure presented in the background section, the present invention can be easily implemented and has a small manufacturing difficulty.

**[0029]** Though the present invention has been described with reference to several typical embodiments, it should be understood that the terms used are illustrative and exemplary, rather than limiting terms. Since the present invention may be implemented in various manners without departing the spirit or essence of the present invention, it should be appreciated that the above embodiments are not limited to any of the foregoing details, and should be interpreted broadly in the spirit and scope defined by the accompanying claims. Therefore, all the variations and modifications within the scope of the claims and equivalent thereof should be covered by the accompanying claims.

## Claims

1. A freight container, comprising a container body and corner fittings positioned at each corner of the container body, the container body comprising a bottom portion, a top portion, two side portions and two end portions, wherein:

at least one end portion is provided with a locking device or corrugated plate which are protruded beyond outer edges of the corner fittings, and the positions of the corner fittings and distance therebetween accord with ISO standard.

2. The freight container according to claim 1, wherein the two end portions are a front end and a rear end, the front end is provided with the corrugated plate, and the rear end is provided with the locking device.
3. The freight container according to claim 2, wherein concave portions and convex portions of the corrugated plate are arranged asymmetrically relative to a central line of the front end.
4. The freight container according to claim 3, wherein the corrugated plate is central-symmetrical relative to an intersection point of the corrugated plate and a longitudinal central line of the container body.
5. The freight container according to claim 2, wherein the locking device comprises locking bars mounted asymmetrically on two doors of the rear end.
6. The freight container according to claim 5, wherein the locking device further comprises handles mounted on the two doors of the rear end, and the handles are at different heights on the two doors.
7. The freight container according to claim 5, wherein the freight container further comprises an end lintel provided on an upper side of the end portion along a transverse direction of the container, and a side of the end lintel is extended outwards the container and beyond the locking device and/or corrugated plate.
8. The freight container according to claim 7, wherein at the front end along the transverse direction of the container, the end lintel has an edge shape corresponding to that of the corrugated plate, and at the rear end along the transverse direction of the container, the edge of the end lintel is recessed where it is not corresponding to the locking bars.
9. The freight container according to claim 5, wherein the freight container further comprises an end sill provided on a lower side of the end portion along a transverse direction of the container, and a side of the end sill is extended outwards the container and beyond the locking device and/or corrugated plate.
10. The freight container according to claim 9, wherein at the front end along the transverse direction of the container, the end sill has an edge shape corresponding to that of the corrugated plate, and at the rear end along the transverse direction of the container, the edge of the end sill is recessed at a posi-

tion where it is not corresponding to the locking bars.

11. The freight container according to claim 2, wherein the freight container further comprises an anti-collision portions provided on corner columns of the rear end and front end of the container, and the anti-collision portions protrude outwards from the corner columns of the rear end and front end. 5

12. The freight container according to claim 11, wherein the anti-collision portion is arranged asymmetrically relative to a central line of the rear end or front end. 10

13. The freight container according to claim 1, wherein the corner fitting of the freight container has a position matching with that of the corner fitting of the ISO 20' standard container, and the locking device and/or corrugated plate protrudes beyond the outer edge of the corner fitting at a distance larger than 21mm, and the inner container length is larger than 6000mm. 15 20

14. The freight container according to claim 13, wherein the locking device and corrugated plate each protrudes beyond the outer edge of the corner fitting at a distance of 50mm. 25

15. The freight container according to claim 1, wherein the corner fitting of the freight container has a position matching with that of the corner fitting of the ISO 40' standard container, and the inner container length is larger than 12060mm. 30

16. The freight container according to claim 1, wherein the corner fitting of the freight container has a position matching with that of the corner fitting of the ISO 40' standard container, and the inner container length is larger than 12090mm. 35

17. The freight container according to claim 1, wherein the corner fitting of the freight container has a position matching with that of the corner fitting of the ISO 45' standard container, and the inner container length is larger than 13600mm. 40

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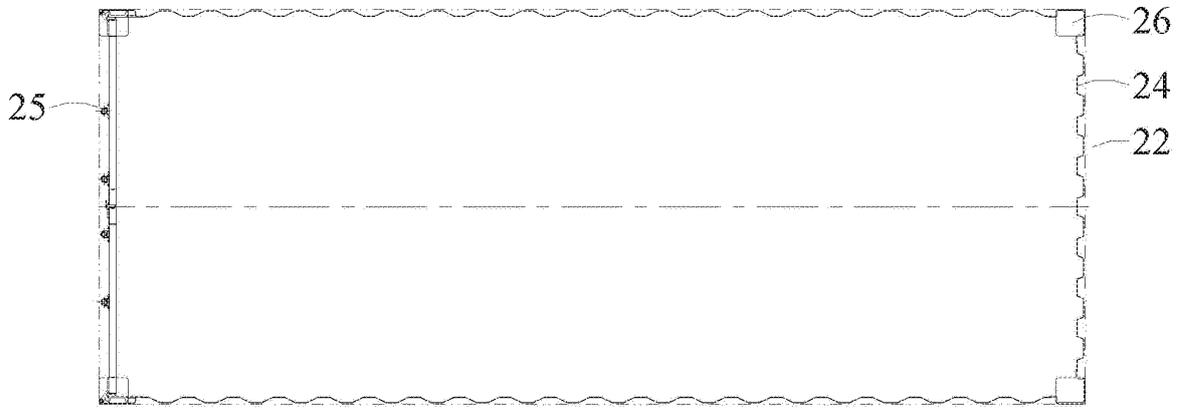


Fig.1

200

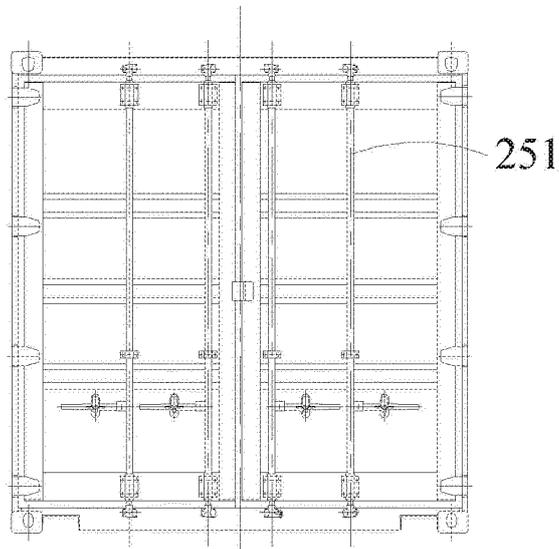


Fig.2

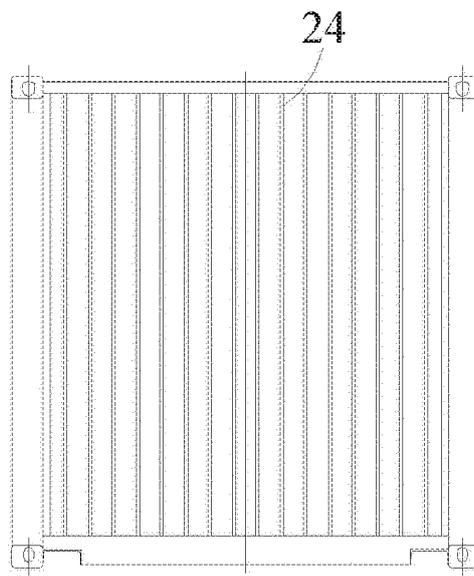


Fig.3

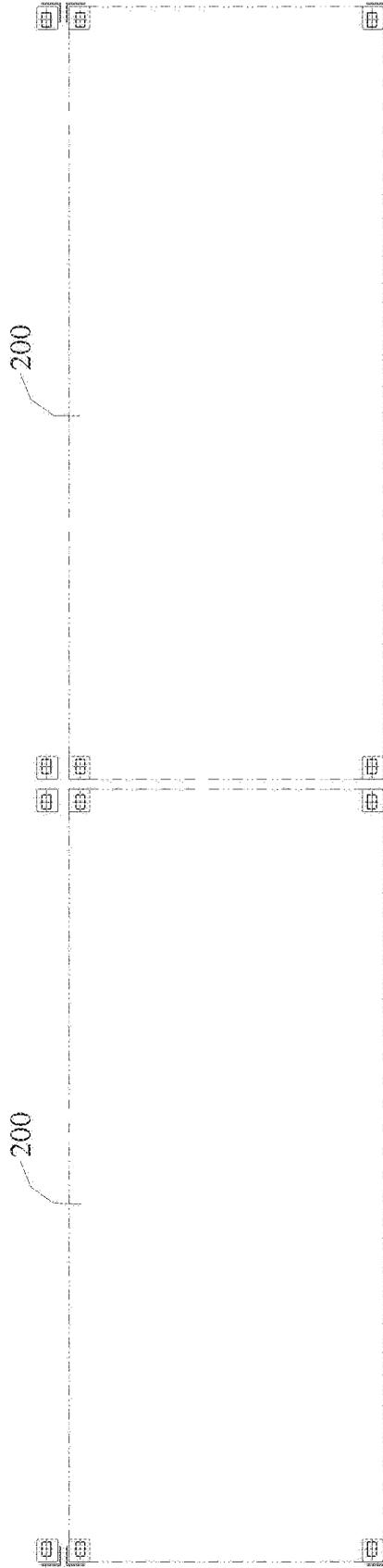


Fig.4

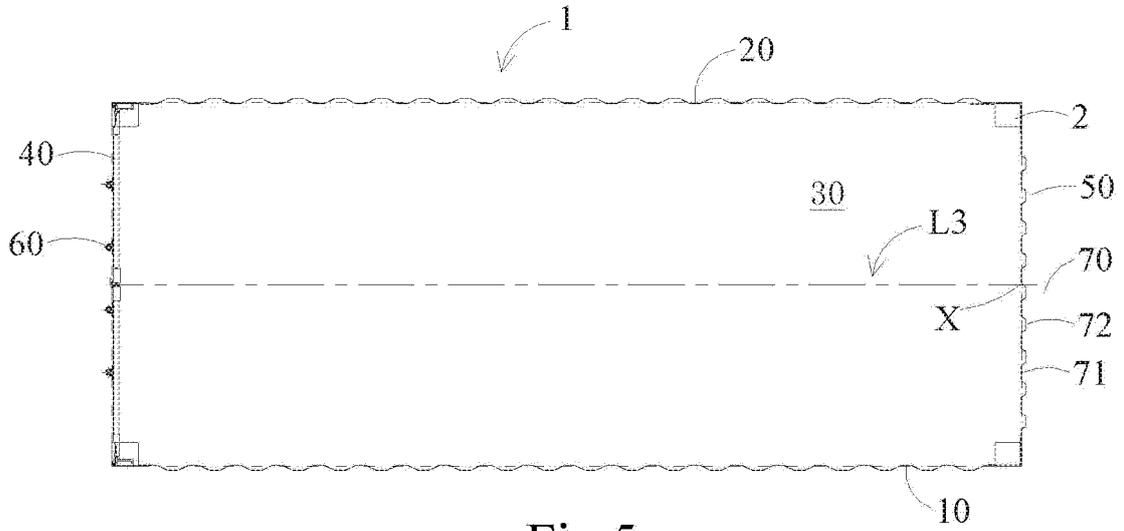


Fig.5

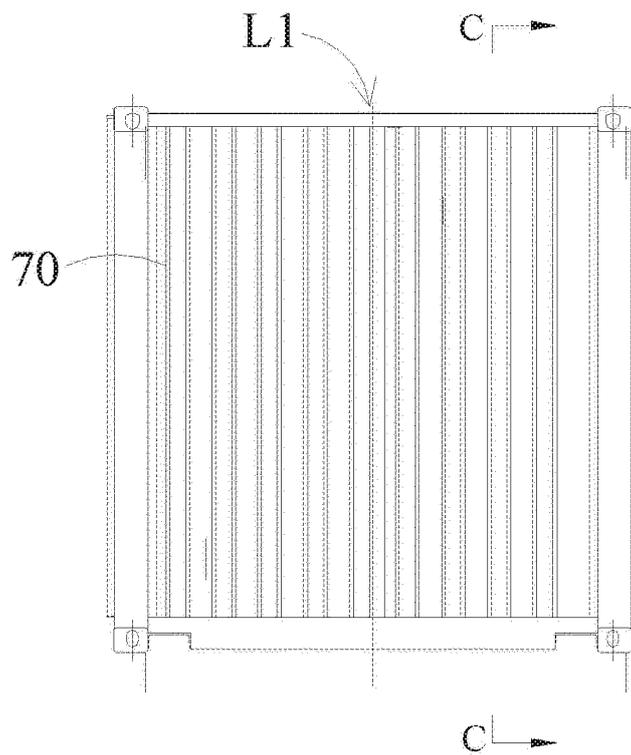


Fig.6

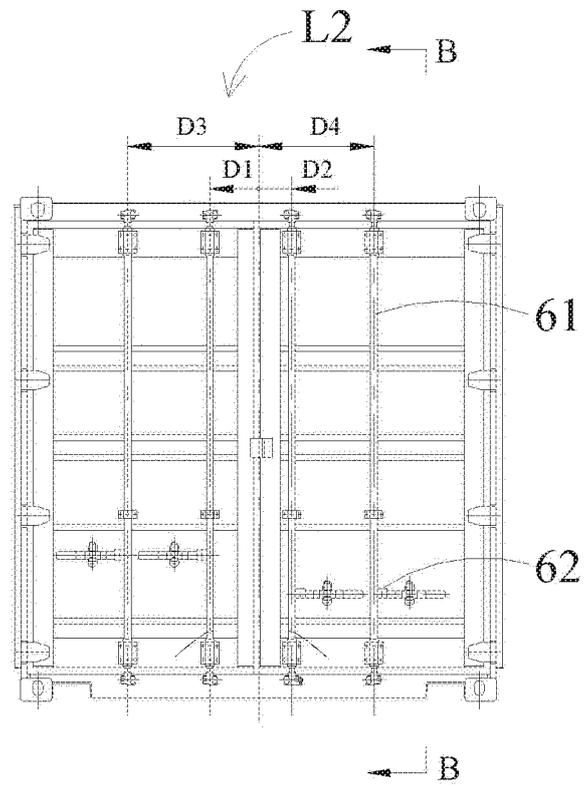


Fig.7

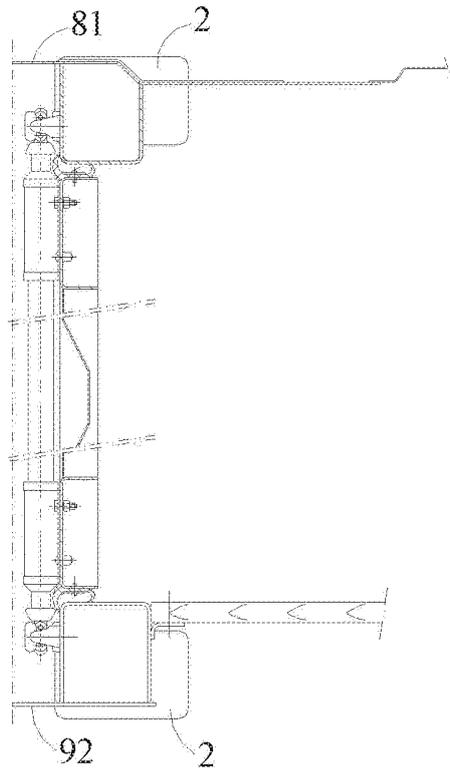


Fig.8

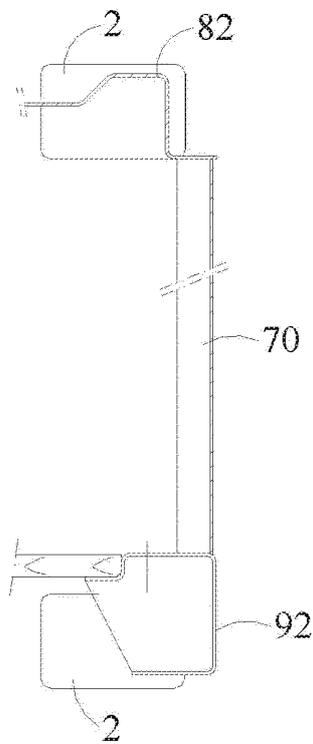


Fig.9

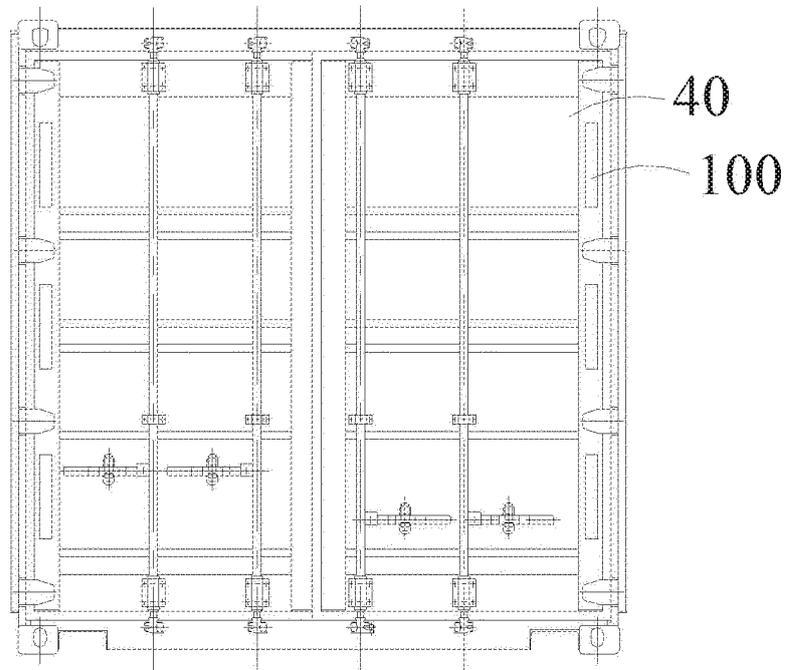


Fig.10

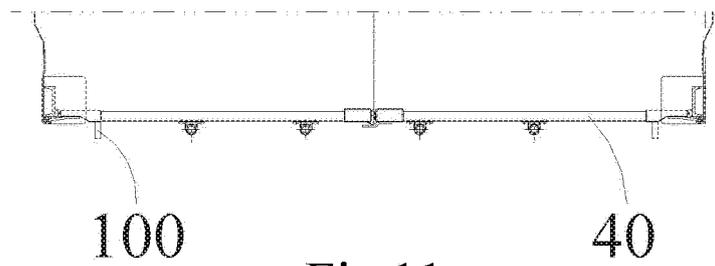


Fig.11

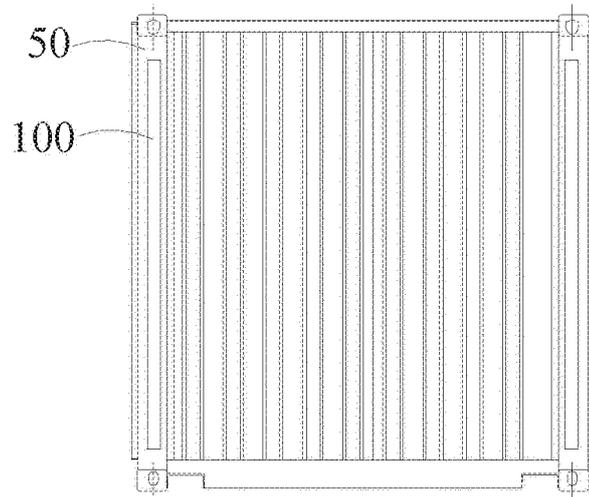


Fig.12

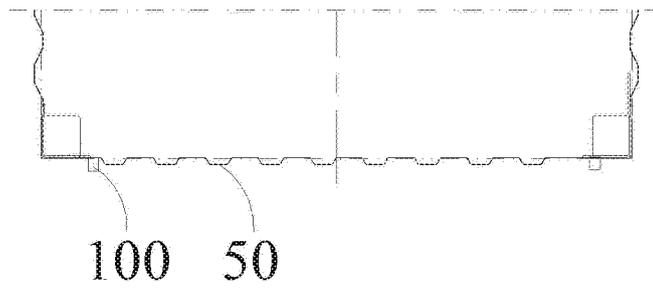


Fig.13

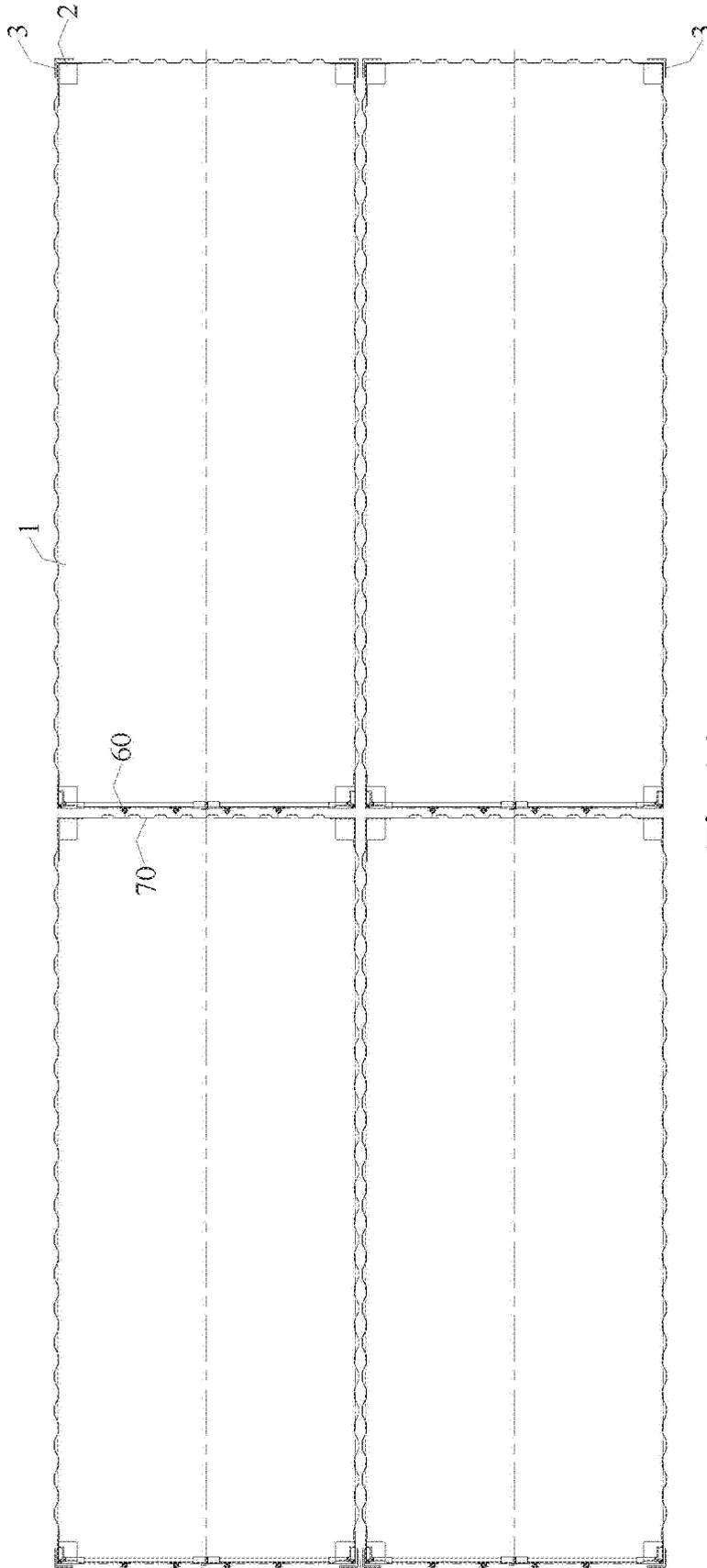


Fig.14

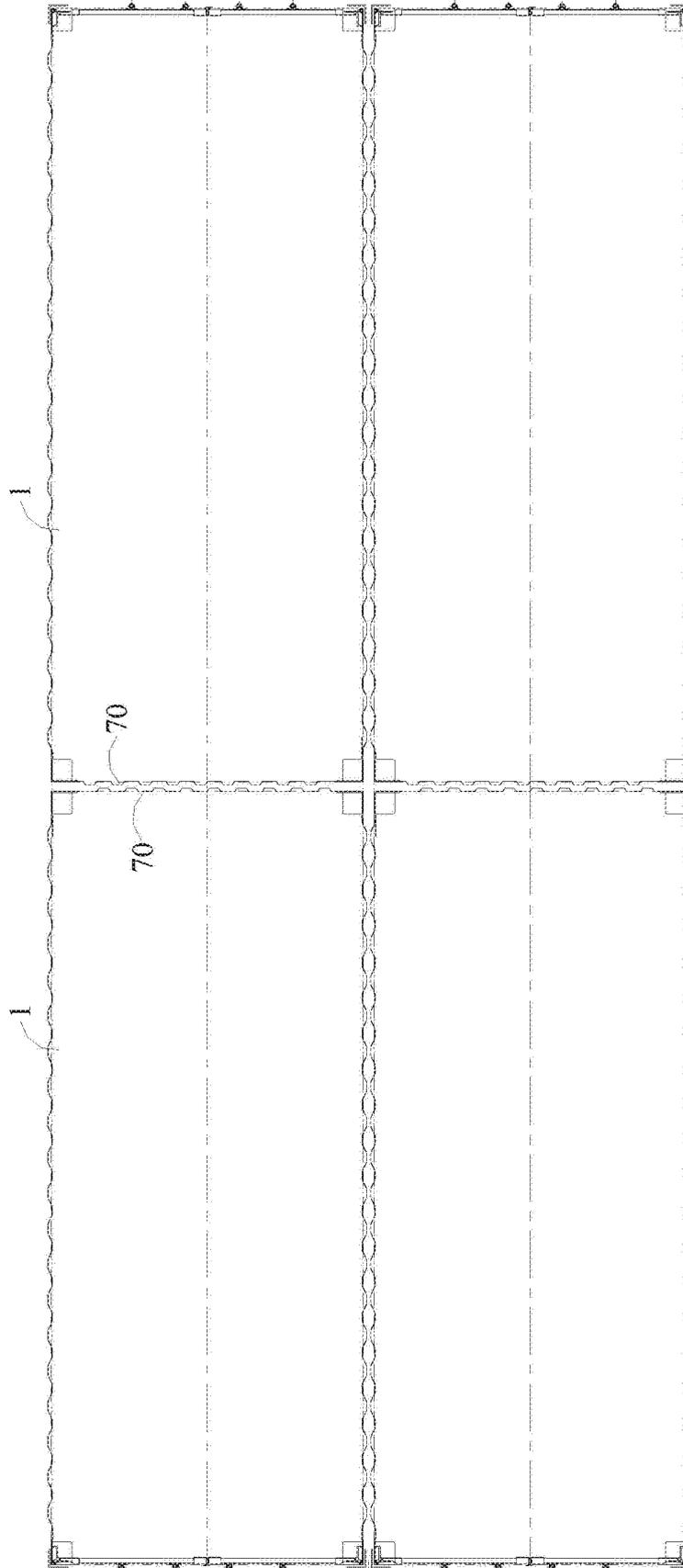


Fig.15

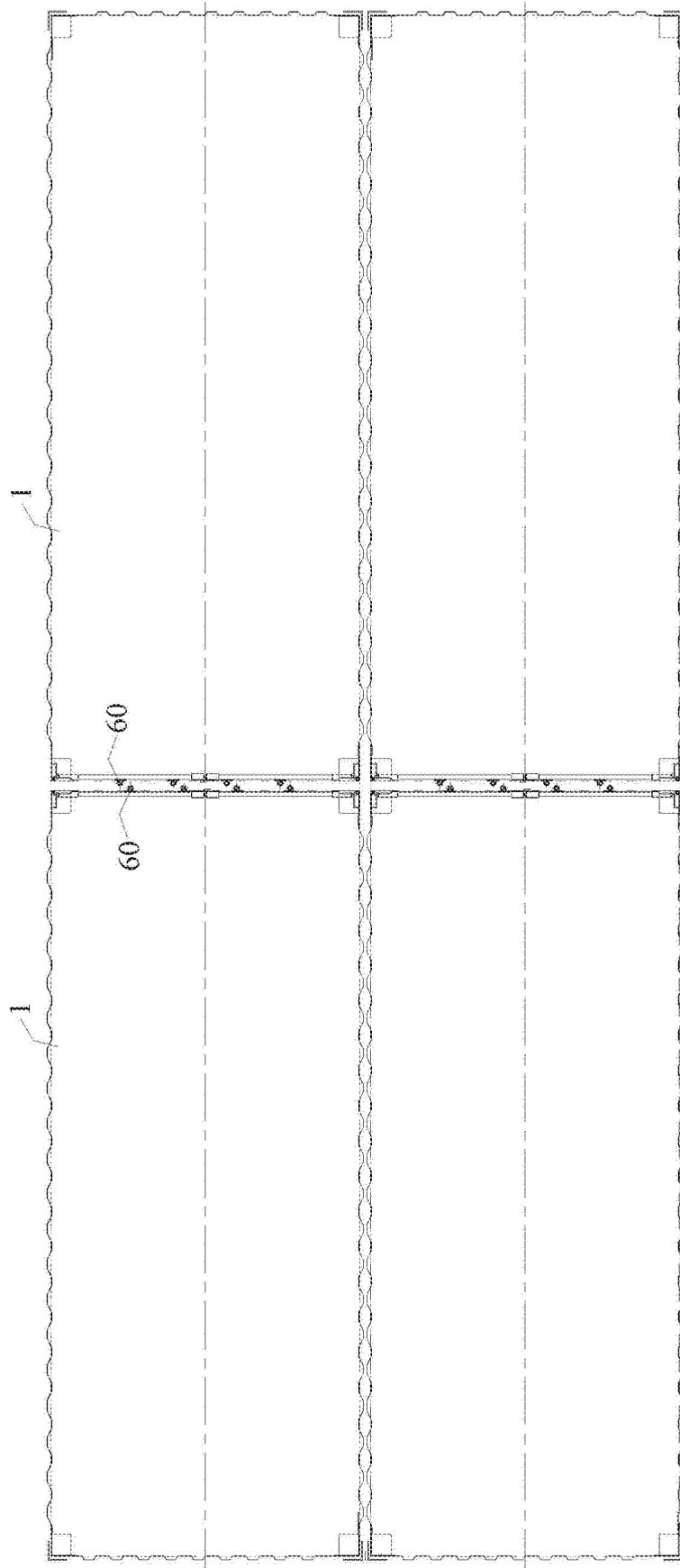


Fig.16

## INTERNATIONAL SEARCH REPORT

International application No.

PCT/CN2014/095354

## A. CLASSIFICATION OF SUBJECT MATTER

B65D 90/02 (2006.01) i

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

B65D

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

CPRSABS; CNABS; SIPOABS; VEN: internal, corrugated plate, door, plate, container, spac+, volume+, increase, end, wall?,

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	CN 101254849 A (CHINA INTERNATIONAL MARINE CONTAINERS (GROUP) LTD. et al.), 03 September 2008 (03.09.2008), description, pages 4-5, and figures 5-14	1-17
A	CN 2640976 Y (CHINA INTERNATIONAL MARINE CONTAINERS (GROUP) LTD.), 15 September 2004 (15.09.2004), the whole document	1-17
A	CN 203006203 U (MILITARY TRANSPORTATION RESEARCH INSTITUTE OF PLA GENERAL LOGISTICS DEPARTMENT et al.), 19 June 2013 (19.06.2013), the whole document	1-17
A	CN 2823180 Y (YANGZHOU TONGLEE REEFER CONTAINER CO., LTD.), 04 October 2006 (04.10.2006), the whole document	1-17
A	GB 2271375 A (ADAMSON MODULAR SYSTEMS LIMITE), 13 April 1994 (13.04.1994), the whole document	1-17

 Further documents are listed in the continuation of Box C.
  See patent family annex.

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Date of the actual completion of the international search 13 March 2015 (13.03.2015)	Date of mailing of the international search report <b>27 March 2015 (27.03.2015)</b>
Name and mailing address of the ISA/CN: State Intellectual Property Office of the P. R. China No. 6, Xitucheng Road, Jimenqiao Haidian District, Beijing 100088, China Facsimile No.: (86-10) 62019451	Authorized officer <b>LI, Weiwei</b> Telephone No.: (86-10) <b>62085325</b>

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**INTERNATIONAL SEARCH REPORT**  
 Information on patent family members

International application No.

**PCT/CN2014/095354**

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