A METHOD AND A SYSTEM FOR PLACING LIFTING PALLETS WITHIN A DOUBLE-DECKER CUPBOARD/CONTAINER USED IN OFFSHORE

TECHNICAL FIELD OF THE INVENTION

This invention relates in general to damage prevention assembly, and more particularly to a method and a system to load and unload lifting pallets into/out from a double-decker cupboard or container.

BACKGROUND OF THE INVENTION

A chronic problem in the loading and unloading of cargoes or equipment in offshore is the space limitation in the lifting process. There are regulatory requirements to comply in the loading and unloading process in offshore. In conventional practice, goods are often affixed to a pallet, typically made of wooden cross-members, and the pallet is then moved about and stored as a unit. The goods are usually affixed to the pallets by steel or plastic strapping which crisscrosses boxes of goods on top of the pallets. In one conventional method moving pallets of goods is by lifting the pallet one by one onto offshore platform. Due to the limited surface on a standard pallet, the number of items loaded and unloaded for lifting crane is normally very limited, and lifting of pallet in a specific period of time is laborious and therefore the efficiency of unloading and loading process is low.

In order to increase lifting efficiency, a cupboard which can contain two pallets is employed, where two plates are mounted within the storage cupboard horizontally, the pallet can be lifted out from the cupboard and the second pallet can also be lift up after the first pallet is lifted out. The first pallet will not affect the second pallet in the course of the lifting.

German Laid-Open Application DE 100 20 475 discloses the mechanical alignment of pallet stacks with the aid of a sheet-metal box provided with a funnel top. In this case, the pallet is loaded with the goods beforehand at another location. Then, with the aid of a fork lift truck for example, the (irregularly) loaded pallet is introduced into the aligning device and, once the goods have been “sorted” by the downwardly tapering funnel, it is removed again.

German Utility Model DE 299 21 226 U1 discloses a narrow plate which is surrounded by a border and is placed onto the pallet. Goods, such as for example cardboard boxes, are subsequently placed onto this plate. The border around the plate holds the cardboard boxes optimally on the plate. Onto the layer of goods thus produced is placed the next adapter plate, and this can then be followed by further layers of goods and adapter plates. The result is a vertically aligned stack of goods on the plate. However, this system only works when

the geometry of the goods to be stacked is designed such that the latter completely fill the stacking plate and have a uniform height which enables a further stacking plate to be placed onto the layer of goods thus formed.

German Utility Model G 93 04 124.1 with the title “Stacking support for pallets” describes stacking supports, which are attached close to the corners of the pallets in order to secure the goods. However, these supports provide the goods to be stacked with only inadequate protection from movement, since they are provided merely in the corners but not at the sides.

German Patent DE 44 03 743 C2 describes a flat pallet having two parallel lateral supporting areas for receiving goods for storage, whereby the stacking of goods on the pallet is to be facilitated. The supports are detachably designed, so that the pallets can be stacked directly on top of one another in the empty state, thereby greatly reducing the space requirement. However, there is still a risk of the goods to be stacked falling off the pallet laterally.

German Utility Model G 85 02 822.3 discloses a corner-angle profile with base plate, on which packages can be stacked in a directed manner.

U.S. Pat. No. 4,593,517 discloses a system which wraps the pallets when loading is complete. In this case, the pallets are loaded fully automatically. The loading in a straight aligned manner is in this case ensured by a height-adjustable guide frame. However, the pallets are in this case loaded with geometrically regular articles, such as for example cuboids, which can be stacked in layers.

A disadvantage of the above-described systems and devices is that the pallet may be unstable. This could give one the idea of delivering the pallet together with the attachable system, as has in fact already been proposed in some of the conventional attachable systems.

SUMMARY OF THE INVENTION

The present invention provides a method for loading and unloading of lifting pallets to and from a double-decker cupboard used in offshore comprising the steps of:

providing a double-decker cupboard having a pivotal side door, a pivotal top cover, a bottom platform and a plurality of enclosed side wall, wherein a pair of spaced apart rails are mounted onto the bottom platform of the cupboard, and a pair of side support on the inner side of the wall, wherein the height of the side support is at the middle of the cupboard,

placing loads or goods onto a top lifting pallet and a bottom pallet which are then secured with securing aids, wherein the pallets and the cupboard can be hoisted by crane;

loading the bottom pallet vertically into the cupboard in such a way that the width of the bottom pallet allows the pallet to go through the space of the cupboard without being blocked by the side supports, and reach the rails on the bottom platform of the cupboard;

loading the top pallet vertically into the cupboard in such a way that the width of the top pallet allows the pallet to be supported by the side support; and

closing the pivotal top cover and the side door of the cupboard.

It is therefore an object of the present invention to provide a method for loading and unloading lifting pallets, wherein the top and bottom pallets are hoisted vertically from the cupboard thereof in either loading or unloading.

Yet another object of the present invention is to provide a method for loading and unloading lifting pallet, wherein the side support on the inner side of the wall of the cupboard are mounted in parallel to provide a horizontal support of the top pallet that places on the supports.

Still a further object of the present invention is to provide a method for loading and unloading lifting pallets, wherein the top pallet is guided by a pair of elongated bar mounted each onto the side support at the edge thereof.

A further object of the present invention is to provide a method for loading and unloading lifting pallets, wherein in the process of lifting the top and bottom pallet, the direction of the pallet being lowered into the cupboard can be effected by rotating.

Yet a further object of the present invention is to provide a method for loading and unloading lifting pallets, wherein the height of the top pallet shall be increased with increasing height of the stack of goods on the bottom pallet.

Further objects, features and advantages of the present invention will become clearer from the following description together with the attached drawings, in which:

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 shows a perspective view of a lifting pallet for securing goods thereon for loading into a double-decker cupboard/container for deliver to offshore in accordance with the present invention.

FIG. 2 is a top view of the lifting pallets within double-decker cupboard/container in accordance with the present invention.

FIG. 3 is a perspective view schematically showing the mounting of two pallets into a double-decker cupboard/container ready for delivery in accordance with the present invention.

FIG. 4 is a perspective view schematically showing the mounting of a top pallet and turning a bottom pallet to 90 degree for mounting into the bottom platform of the cupboard /container in accordance with the present invention.

FIG. 5 is a perspective view schematically showing the insertion of the bottom pallet onto the rail of the cupboard/ container of the present invention.

FIG. 6 is a perspective view showing the lifting pallets within double-decker cupboard/container, wherein the top pallet shall be lifted from the cupboard/container in accordance with the present invention.

FIG. 7 is a perspective view showing the lifting of the top pallet out from the double-decker cupboard/container in accordance with the present invention.

FIG. 8 is a perspective view showing how the bottom pallet being lifted and unloaded from the double-decker cupboard/container in accordance with the present invention.

FIG. 9 is a perspective view showing the loading of the pallets into the double-decker cupboard/container in accordance with the present invention, wherein the pallet has turned to a certain direction to ensure that the pallets exactly fitted into the storage cupboard.

FIG. 10 is a perspective view showing the bottom pallet being lowered to the bottom of the storage cupboard vertically along the direction as shown in arrow in accordance with the present invention.

FIG. 11 is a perspective view showing the loading of the top pallet to the double-decker cupboard/container vertically along the direction shown by the arrow in accordance with the present invention.

FIG. 12 is a perspective view showing the two pallets being loaded into the double-decker cupboard/container having a pivotal door to be locked in accordance with the present invention.

FIG. 13 is a perspective view showing the locking of the pivotal top door of the double-decker cupboard/container in accordance with the present invention.

FIG. 14 is a perspective view showing the double-decker cupboard/container prepared to be hoisted by crane in accordance with the present invention.

DETAILED DESCRIPTION OF THE INVENTION

In FIG. 1 there is seen a pallet 10 for goods to be transported offshore, on which have been placed and to be placed into a cupboard/container such as a double decker cupboard/container 60. The four corners of the pallet 10 allow crane hoisting. The detailed structure of the lifting pallets has been filed for patent under PCT Patent Application No. PCT/SG2015/050403 filed on 21.10.2015. The application is incorporated herewith by reference.

FIG. 2 shows a top view of the pallets being arranged in different direction, with an angle of 90 degree between the two pallets. The two pallets 10 are to be placed into the double-decker container 60 in such a way that the hoisting for loading and unloading is simple and the process of hoisting is expedited.

As shown in FIG. 3, there is shown the mounting of two pallets 10, the top pallet and the bottom pallet 10, into the double-decker cupboard/container 60 ready for delivery goods to offshore in accordance with the present invention. After the goods 90 have been secured to the pallets 10, the pallets 10 have to be loaded into the double decker cupboard/container 60. The double decker cupboard/container 60 can hold two pallets 10, referenced as top pallet and bottom pallet. The first pallet or the top pallet 10 is first loaded into the container 60 with the wider edge of the pallet 10 being moved in and sat along the edge supports 62 mounted at the inner wall of the container 60. The first pallet or the top pallet 10 is being moved in the direction as shown by the arrow 64.

FIG. 4 is a perspective view schematically showing the mounting of the top pallet 10 and turning a second or bottom pallet 10 to 90 degree for mounting into the bottom platform of the cupboard/ container 60. After the first or top pallet 10 has been loaded into the cupboard/container 60, a second or bottom pallet 10 is to be placed into the cupboard/container 60 at the bottom platform of the cupboard/container 60. As compared to the direction of entrance for the top pallet 10, the second or bottom pallet 10 is rotated for 90 degree (indicated by the arrow 44 of FIG. 4) such that the narrower width of the pallet 10 is being moved in first and guided by the rails 68 of the cupboard/container 60. At this

case, the two pallets 10 are not in aligned viewing from the top of the pallets 10, and FIG. 2 shows the top view of the two pallets 10 within the cupboard/container 60. FIG. 5 is a perspective view schematically showing the insertion of the second or bottom pallet 10, in the direction of the arrow 55, guided by the rails 68 of the cupboard/container 60 of the present invention. As shown in FIGs. 3, 4, and 5, there is shown a rail 30 being formed on the side support 62 for guiding the top pallet 10 when the top pallet 10 is placed onto the side support 62.

FIG. 6 is a perspective view showing the lifting pallets 10 within the cupboard/container 60, wherein the first or top pallet 10 shall be lifted from the cupboard/container 60. In order to lift out the pallet 10 from the cupboard/container 60. The top or first pallet 10 is lifted up first in the direction shown by the arrow 66. As the width of the cupboard/container 60 is wider than the width of the pallet 10, the lifting process is simple and expedited. FIG. 7 is a perspective view showing the lifting of the first or top pallet 10 out from the cupboard/container 60 in accordance with the present invention. Similarly, the second or bottom pallet 10 is lifted out as that of the first or top pallet 10, in the direction as shown in arrow 77. Referring to FIG. 8, there is shown a perspective view showing how the second or pallet being is lifted and unloaded from the cupboard/container in accordance with the present invention.

FIG. 9 is a perspective view showing the loading of pallet 10 into the cupboard/container 60 in accordance with the present invention, wherein the pallet 10 has turned to a certain direction to ensure that the pallet 10 is exactly fitted into the cupboard/container 60. The crane hoisted the second or bottom pallet 10 is to be lowered to the bottom platform of the cupboard/container 60. The second or bottom pallet 10 makes a turning of 90 degree such that the pallet 10 moves through the top portion of the cupboard/container 60 without being blocked by the side support 62 and guided by the rails 68. FIG. 10 is a perspective view showing the second or bottom pallet 10 being lowered to the bottom of the storage cupboard vertically along the direction as shown in arrow 110 in accordance with the present invention.

FIG. 11 is a perspective view showing the loading of a second or bottom pallet 10 to the double-decker cupboard or container 60 vertically along the direction shown by the arrow 66 in accordance with the present invention. At this instance, the pallet 10 is lowered in such a way that the two edges of the wider side of the pallet 10 sit onto the side support 62 of the cupboard/container in accordance with the present invention.

Referring to FIG. 12, there is shown two pallets 10 being loaded into the cupboard/container 60 ready to be transported from one place to another. The cupboard/container 60 has a pivotal door 70 which can be closed and locked after the pallets 10 are loaded to the cupboard/container 60. The bottom pallet 10 is mounted exactly between two guiding rails 68 along the edge such that the bottom pallet 10 is exactly fitted thereto with no or very little tolerance.

FIG. 13 is a perspective view showing the locking of the top door 94 of the cupboard/container 60 in accordance with the present invention. After the pivotal side door 70 has been locked, the top door 94 of the cupboard/container 94 is then closed and locked as shown in the direction indicated by the arrow 33.

FIG. 14 is a perspective view showing the double-decker cupboard/container 60 containing the two lifting pallets 10 being prepared to be hoisted by crane in accordance with the present invention. In this case, the lifting pallets 10 within the cupboard/container 60 are safely hoisted to the destined place of delivery.

In accordance with the preferred embodiment of the present invention, there is provided a method for loading and unloading of lifting pallets 10 to and from a double-decker cupboard 60 used in offshore comprising the steps of:

providing a double-decker cupboard 60 having a pivotal side door 70, a pivotal top cover or door 94, a bottom platform and a plurality of enclosed side wall, wherein a pair of spaced apart rails 68 are mounted onto the bottom platform of the cupboard/container 60, and a pair of side support 62 on the inner side of the wall, wherein the height of the side support 62 is at the middle of the cupboard/container 60,

placing loads or goods 90 onto a top lifting pallet 10 and a bottom pallet 10 which are then secured with securing aids (not shown), wherein the pallets 10 and the cupboard/container 60 can be hoisted by crane;

loading the bottom pallet 10 vertically into the cupboard/container 60 in such a way that the width of the bottom pallet allows the pallet 10 to go through the space of the cupboard/container 60 without being blocked by the side support 62, and reach the rails 68 on the bottom platform of the cupboard/container 60;

loading the top pallet 10 vertically into the cupboard/container 60 in such a way that the width of the top pallet 10 allows the pallet 10 to be supported by the side support 62; and

closing the pivotal top door 94 and the side door 70 of the cupboard/container 60 for delivery.

In accordance to the preferred embodiment of the present invention, during the process of lifting the top and bottom pallet 10, the direction of the pallet 10 being lowered into the cupboard can be effected by rotating, and the height of the top pallet 10 shall be increased with increasing height of the stack of goods on the bottom pallet.

The foregoing detailed description is given for clearness of understanding only, and no unnecessary limitations should be understood therefrom, as modifications within the scope of the invention will be apparent to those skilled in the art.

Claims

1. A method for loading and unloading of lifting pallets to and from a double-decker cupboard used in offshore comprising the steps of:

providing a double-decker cupboard having a pivotal side door, a pivotal top cover, a bottom platform and a plurality of enclosed side wall, wherein a pair of spaced apart rails are mounted onto the bottom platform of the cupboard, and a pair of side support on the inner side of the wall, wherein the height of the side support is at the middle of the cupboard,

placing loads or goods onto a top lifting pallet and a bottom pallet which are then secured with securing aids, wherein the pallets and the cupboard can be hoisted by crane;

loading the bottom pallet vertically into the cupboard in such a way that the width of the bottom pallet allows the pallet to go through the space of the cupboard without being blocked by the side supports, and reach the rails on the bottom platform of the cupboard;

loading the top pallet vertically into the cupboard in such a way that the width of the top pallet allows the pallet to be supported by the side support; and

closing the pivotal top cover and the side door of the cupboard.

2. The method for loading and unloading lifting pallets according to claim 1, wherein the top and bottom pallets are hoisted vertically from the cupboard thereof in either loading or unloading.

3. The method for loading and unloading lifting pallets according to claim 1, wherein the side support on the inner side of the wall of the cupboard are mounted in parallel to provide a horizontal support of the top pallet that places on the supports.

4. The method for loading and unloading lifting pallets according to claim 3, wherein the top pallet is guided by a pair of elongated bar mounted each onto the side support at the edge thereof.

5. The method for loading and unloading lifting pallets according to claim 1, wherein in the process of lifting the top and bottom pallet, the direction of the pallet being lowered into the cupboard can be effected by rotating.