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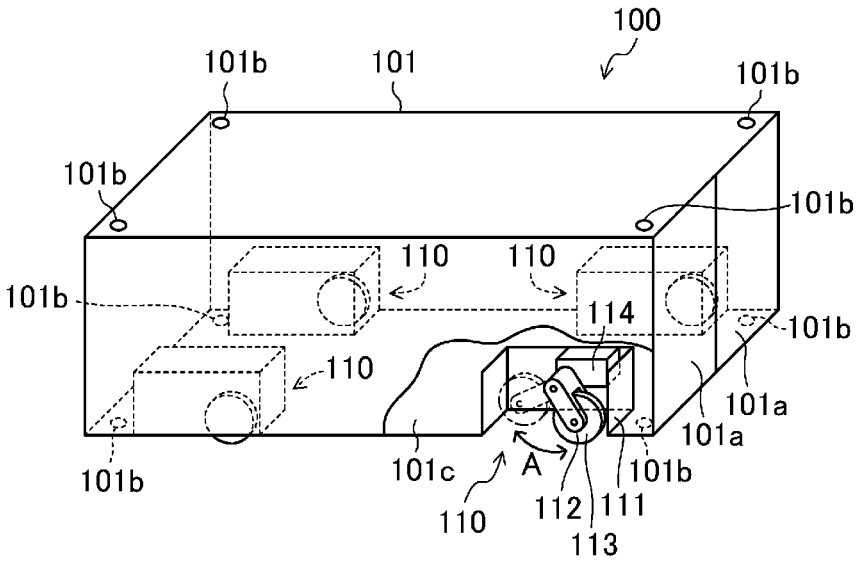
(54) **Title:** CARGO CONTAINER

(54) 発明の名称： 貨物コンテナ



(57) **Abstract:** In order to prevent or reduce the necessity of mounting a cargo container onto a container carrying car, etc., a cargo container 100 is provided with: engagement parts 101b that are arranged at four corners on each of the bottom surface and top surface of an outer shell 101 and that can be engaged with a spreader of a container crane; and wheels 113 that can support the cargo container 100 so as to be able to travel, wherein the wheels 113 are each provided so as be switchable between a travelable state where at least the lowest part is positioned lower than the bottom surface 101c of the

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cargo container 100 so that the wheels travelably support the cargo container 100 and a mounted state where the wheels move toward the inner side from the bottom surface 101c so that the bottom surface 101c can be brought into contact with the mounting surface of the cargo container 100.

(57) 要約:コンテナ搬送車等への貨物コンテナの搭載作業などの必要性を回避または低減するため、貨物コンテナ１００は、外郭１０１の上下面の４隅に配置され、コンテナクレーンのスプレッダに係合可能な係合部１０１ｂと、貨物コンテナ１００を走行可能に支持し得る車輪１１３とを備え、車輪１１３は、少なくとも最下部が貨物コンテナ１００の底面１０１ｃよりも下方に位置して貨物コンテナ１００を走行可能に支持する走行可能状態と、底面１０１ｃより内部側に向けて移動して底面１０１ｃが貨物コンテナ１００の載置面に接触し得る載置状態とに切り替え可能に設けられている。

DESCRIPTION

CARGO CONTAINER

TECHNICAL FIELD

The present invention relates to a cargo container that contains cargo therein for conveyance.

BACKGROUND ART

Container ships and the like perform transportation using standardized cargo containers. Conveyance of such cargo containers using a container port or the like uses container carrying vehicles for conveying container transportation pallets to which containers have been transported and integrated vehicles that travel on roads with containers loaded thereon (see, for example, Patent Documents 1 and 2).

CITATION LIST

PATENT DOCUMENTS

PATENT DOCUMENT 1: Japanese Patent Application Publication No. 2007-320727

PATENT DOCUMENT 2: Japanese Patent Application Publication No. 2011-153025

SUMMARY OF THE INVENTION

TECHNICAL PROBLEM

In the case of using, for example, container carrying vehicles as described above, it

is necessary to load and unload containers on/ from such vehicles as well as the necessity of using a plurality of container carrying vehicles in order to increase conveyance efficiency.

It is therefore an object of the present invention to avoid or reduce the necessity of, for example, loading cargo containers on container carrying vehicles and the like.

SOLUTION TO THE PROBLEM

To achieve the object, the present invention provides a cargo container for marine transportation of cargo, and the cargo container includes: engaging portions disposed at four corners of each of upper and lower surfaces of a shell, each of the engaging portions being engageable with a spreader of a container crane; and a wheel configured to support the cargo container such that the cargo container is allowed to run, wherein the wheel is switchable between a runnable state and a loaded state, in the runnable state, at least a lowermost portion of the wheel is located below a bottom surface of the cargo container and supports the cargo container such that the cargo container is allowed to run, and in the loaded state, the wheel moves inward from a bottom surface of the cargo container and the bottom surface is allowed to make contact with a mount surface of the cargo container.

With this configuration, the cargo container is capable of easily traveling on the ground without using a trailer, a carriage, or the like, for example, and efficiency of loading and availability of berths, for example, can be easily enhanced.

ADVANTAGES OF THE INVENTION

According to the present invention, it is possible to avoid or reduce the necessity of, for example, loading cargo containers on container carrying vehicles or the like.

BRIEF DESCRIPTION OF THE DRAWINGS

[FIG. 1] A perspective view illustrating a configuration of a cargo container according to a first embodiment.

[FIG. 2] A side view illustrating a configuration of a main portion of a cargo container according to a second embodiment.

[FIG. 3] A perspective view illustrating a configuration of a main portion of a cargo container according to a third embodiment.

[FIG. 4] A perspective view illustrating a configuration of a main portion of a cargo container according to a fourth embodiment.

[FIG. 5] A perspective view illustrating a configuration of a main portion of a cargo container according to a fifth embodiment.

DESCRIPTION OF EMBODIMENTS

Embodiments of the present invention will be described in detail with reference to the drawings. In the following embodiments and variations thereof, components identical or similar to those described in other embodiments will be denoted by the same or corresponding reference characters, and description thereof will not be repeated.

First Embodiment

As illustrated in FIG. 1, a cargo container 100 has a size and a shape conforming to, for example, the ISO standard, and is to be loaded on a container ship for marine transportation of cargo. A longitudinal end of the cargo container 100 is provided with a door 101a that is pivotable about a pivoting axis and configured to be opened and closed. Four corners of one or both of top upper and lower surfaces of a shell 101 of the cargo container 100 are provided with engaging portions 101b that are called twist locks and engaged with joint tools or a gantry crane, for example.

A wheel portion 110 having a wheel 113 and surrounded by a wheel partition 111 is provided near each of the four corners of a bottom surface 101c (floor surface) of the shell 101. Each wheel 113 is switchable between a runnable state and a and a loaded state. In the

runnable state, at least a lowermost part of the wheel 113 is located below the bottom surface 101c of the cargo container 100 and supports the cargo container 100 such that the cargo container 100 is allowed to run. In the loaded state, the wheel 113 moves inward (upward) from the bottom surface 101c of the cargo container 100 such that the bottom surface 101c of the cargo container 100 is allowed to make contact with the mount surface, such as ground, of the cargo container 100. More specifically, each wheel 113 is supported by a wheel support arm 112. The wheel support arm 112 is attached to a wheel state switching portion 114, and is, for example, driven to swing by, for example, an unillustrated electric motor of the wheel state switching portion 114, as indicated by arrows A in the drawing. That is, while each wheel 113 is at a position indicated by solid lines in the drawing, the cargo container 100 is supported and allowed to run, whereas while the wheel 113 is retracted to a position indicated by chain double-dashed lines, the cargo container 100 is allowed to be loaded on a container ship or the like or stacked with other cargo containers, in a manner similar to general cargo containers conforming to the standard or the like.

As described above, the wheels 113 allowed to be retracted or pushed, for example, toward the inside of the cargo container 100 enable transportation and storage as in general cargo containers, and can ease traveling of the cargo container 100 without using a trailer, a carriage, or the like before loading or after unloading on/from a container ship. That is, it is possible to avoid loading and unloading on/from a trailer or the like, and in addition, it is also possible to ease efficient movement of a plurality of cargo containers at the same time in parallel. Loading and unloading on/from barges and ships as shown in FIGS. 5 through 9 of Japanese Patent No. 6216094 and FIGS. 1, 2, and 5 and related portions of Japanese Patent No. 6144860 can be easily carried out without using carriages. Specifically, conveying cargo containers unloaded from a container ship or the like to another berth, for example, and unloading cargo containers from barges and loading cargo containers on trailers can be easily

carried out without using a container crane placed on a container port. Thus, availability of container cranes and berths can be easily enhanced.

Second Embodiment

Various configurations are also applicable to switching of positions of the wheels 113. As illustrated in FIG. 2, for example, the wheel support arm 121 may be supported to be linearly movable vertically (top-bottom directions), and a rack 121a provided to the wheel support arm 121 may be driven by a pinion 122 that is driven to be rotatable by the wheel state switching portion 114. In this case, it is relatively easy to reduce a lateral size of the wheel portion 110, for example.

Third Embodiment

As illustrated in FIG. 3, for example, the wheel 113 may be supported by a frame-shaped wheel support arm 131, and pivoting axes 131a and 131b that are orthogonal to a rotation axis of the wheel 113 and disposed at both sides of the wheel support arm 131 may be pivotably supported by bearings 132 as indicated by arrows B. In this case, it is relatively easy to reduce a height of the wheel portion 110 to a small dimension, for example.

Fourth Embodiment

As illustrated in FIG. 4, for example, a female thread 141a may be formed on the wheel support arm 141 so that the wheel 113 can be pulled and retracted by positively and reversely rotating, with a motor 143, a rotation shaft 142 provided with a male thread 142a to be screwed to the female thread 141a.

Fifth Embodiment

The state of the wheel portion 110 may be switched by vertically moving the cargo container 100 with a gantry crane or a forklift, for example. Specifically, as illustrated in FIG. 5, for example, a pin 151a is provided in an upper portion of the wheel support arm 151, and a cam plate 153 is disposed in a slide window 152a of a slide frame 152 to be horizontally

(laterally) slidable so that the pin 151a of the wheel support arm 151 is movable along a cam groove 153a formed in the cam plate 153 as illustrated in the drawing. The wheel support arm 151 may be biased downward by a spring 154 when necessary. Accordingly, every time the wheel 113 moves downward to a predetermined distance from the runnable state, the pin 151a is locked in the runnable state at a position indicated by the solid line in the drawing or the wheel 113 is allowed to be pushed upward such that the cargo container is in the loaded state at a position indicated by the chain double-dashed line. A mechanism for enabling such switching is not limited to the example described above, and various latch mechanisms or the like of the same type may be applied in such a manner that a cylindrical member having one or more developed shapes such as the cam plate 153 is rotatably provided.

Other Components

The wheels 113 are not specifically limited to a specific material, and rubber tires may be used, or solid rubber wheels or iron wheels, for example, may be used.

To switch the state of the wheels 113, the electric motor is not necessarily used, and other drivers such as a hydraulic motor or an air motor may be used, or the switching may be performed by manually operating a lever, a wheel, or the like, or a combination thereof. Alternatively, retraction of the wheels may be locked or unlocked when the wheels come to the runnable state by, for example, self-weight due to simple upward movement of the cargo container. Specifically, with a configuration similar to that of the fifth embodiment, instead of the cam plate 153, a plate having a wedge or stepped shape may be used such that the plate is manually caused to slide horizontally, for example, to lock or unlock upward movement of the pin 151a.

Each of the wheels 113 may be capable of transferring a driving force with, for example, a link, a chain, a rotation shaft, or the like to enable the switching in mechanical cooperation with other wheels. Alternatively, each the wheel portion 110 may include an

electric motor such that the state can be switched mechanically independently of the other wheels. In the case of the cooperation, a driving device, an operation device, and other components can be easily shared by the wheel portions 110, and thus, configurations of the wheel state switching portion 114 and other components can be easily simplified and fabrication costs can be easily reduced. On the other hand, in the case of performing the switching independently, no space is needed for a link and other components for coupling the wheel portions 110, and thus, internal space of the cargo containers 100 can be easily kept.

The cargo container 100 may run by its self-power by providing a driving unit for driving and rotating the wheels 113. A steering mechanism may be provided to easily change the traveling direction. A suspension may also be provided to enable suppression and reduction of, for example, vibrations with respect to unevenness and steps on road surfaces.

The configurations described above are applicable to containers to be loaded on freight cars, aircrafts, and the like and used for transporting cargo vessels.

DESCRIPTION OF REFERENCE CHARACTERS

100	cargo container
101	shell
101a	door
101b	engaging portions
101c	bottom surface
110	wheel portion
111	wheel partition
112	wheel support arm
113	wheel
114	wheel state switching portion

121 wheel support arm

121a rack

122 pinion

131 wheel support arm

131a, 131b pivoting axis

132 bearing

141 wheel support arm

141a female thread

142 rotation shaft

142a male thread

143 motor

151 wheel support arm

151a pin

152 slide frame

152a slide window

153 cam plate

153a cam groove

154 spring

CLAIMS

1. A cargo container for marine transportation of cargo, and the cargo container comprising:

engaging portions disposed at four corners of each of upper and lower surfaces of a shell, each of the engaging portions being engageable with a spreader of a container crane; and

a wheel configured to support the cargo container such that the cargo container is allowed to run, wherein

the wheel is switchable between a runnable state and a loaded state, in the runnable state, at least a lowermost portion of the wheel is located below a bottom surface of the cargo container and supports the cargo container such that the cargo container is allowed to run, and in the loaded state, the wheel moves inward from a bottom surface of the cargo container and the bottom surface is allowed to make contact with a mount surface of the cargo container.

2. The cargo container according to claim 1, wherein

the wheel comprises a plurality of wheels, and at least one of the wheels is capable of switching between the states mechanically independently of other wheels.

3. The cargo container according to claim 1, wherein

the wheel comprises a plurality of wheels, and at least two of the wheels are capable of switching between the states mechanically in cooperation with the other wheels.

4. The cargo container according to claim 1, wherein

the wheel switches between the runnable state and the loaded state every time the wheel moves downward to a predetermined distance from the runnable state.

5. The cargo container according to any one of claims 1 to 4, further comprising a driving unit configured to drive and rotate the wheel.

FIG. 1

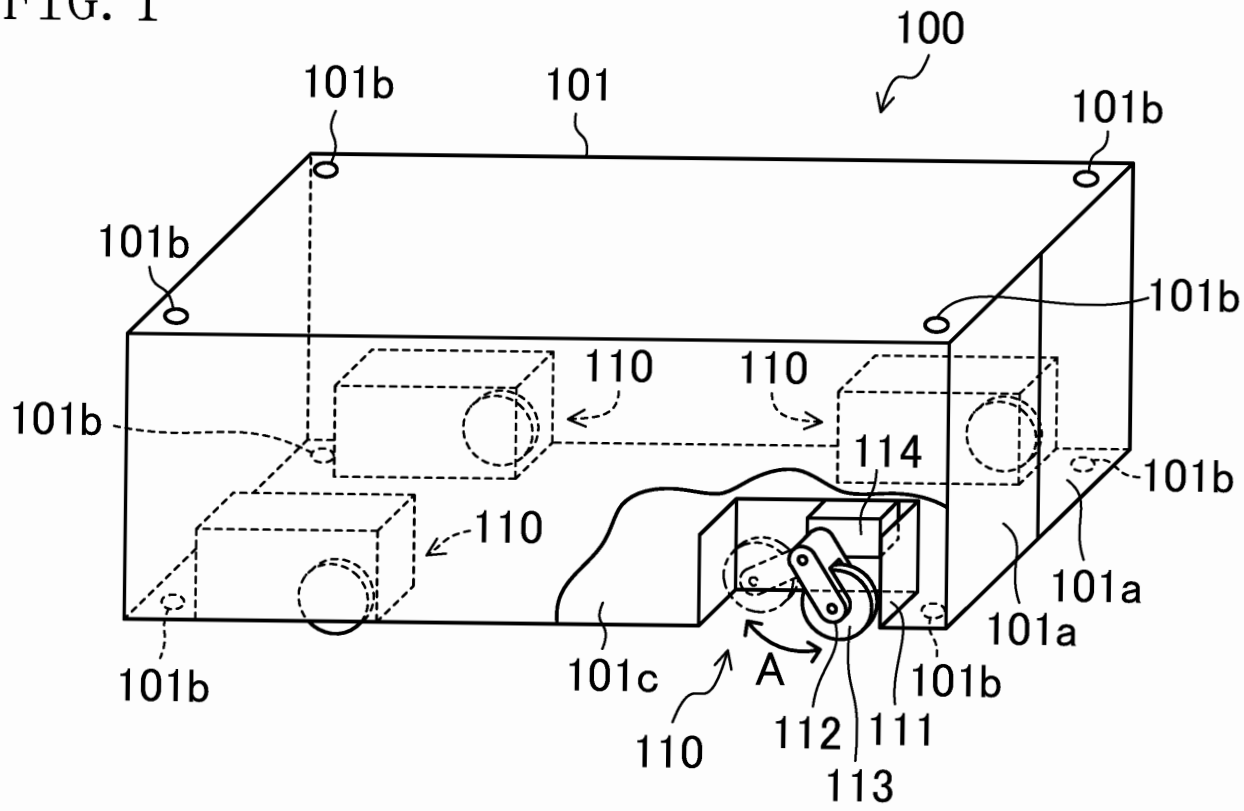

100
101b
101
101b
101b
101b
101b
110
110
114
101b
110
101b
101a
101a
101b
101c
A
101b
110
112
111
113

FIG. 2

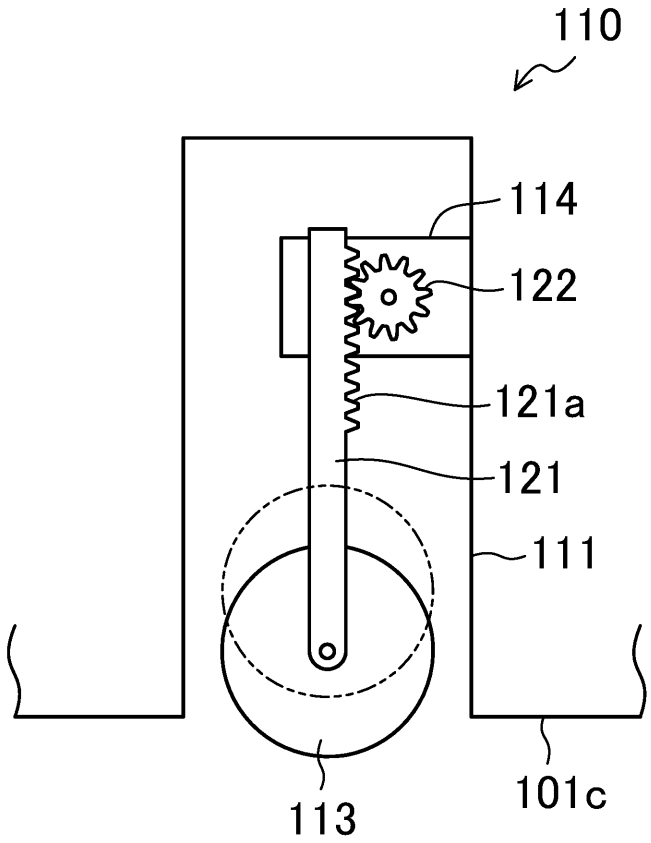

110
114
122
121a
121
111
113
101c

FIG. 3

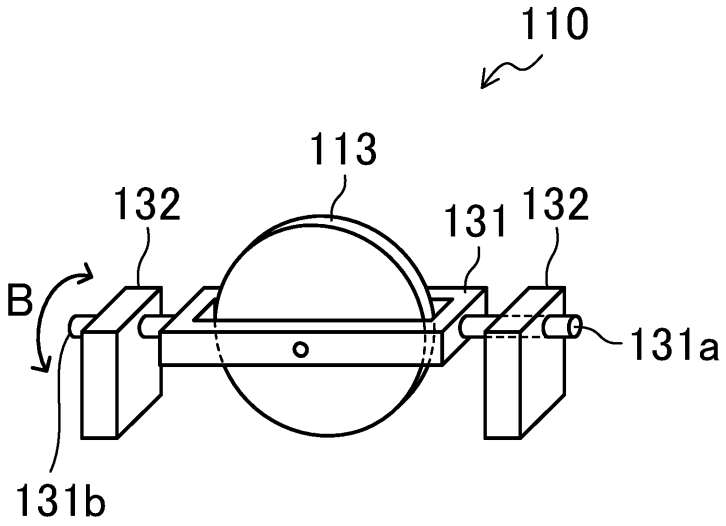

110
113
132
131
132
B
131a
131b

FIG. 4

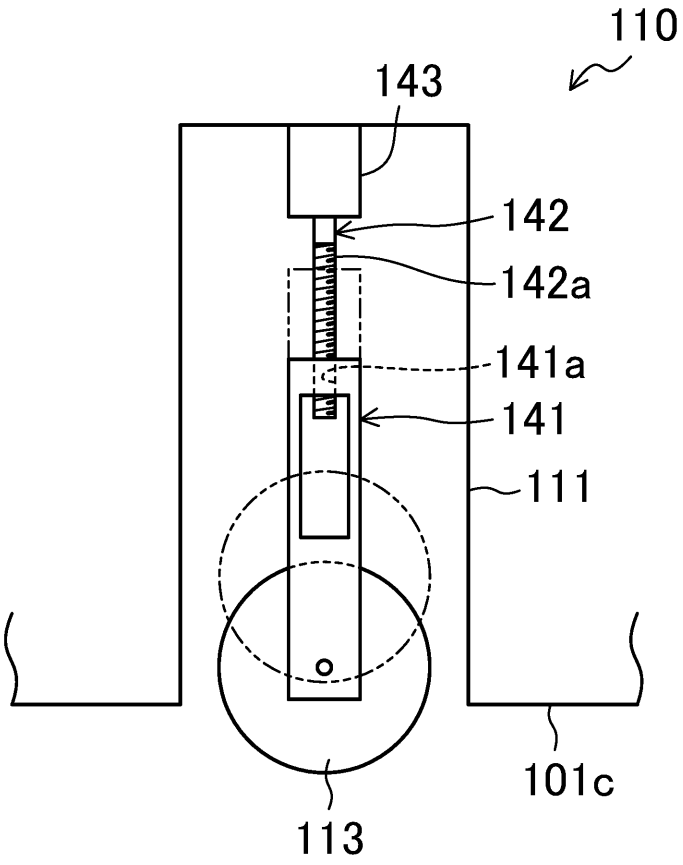
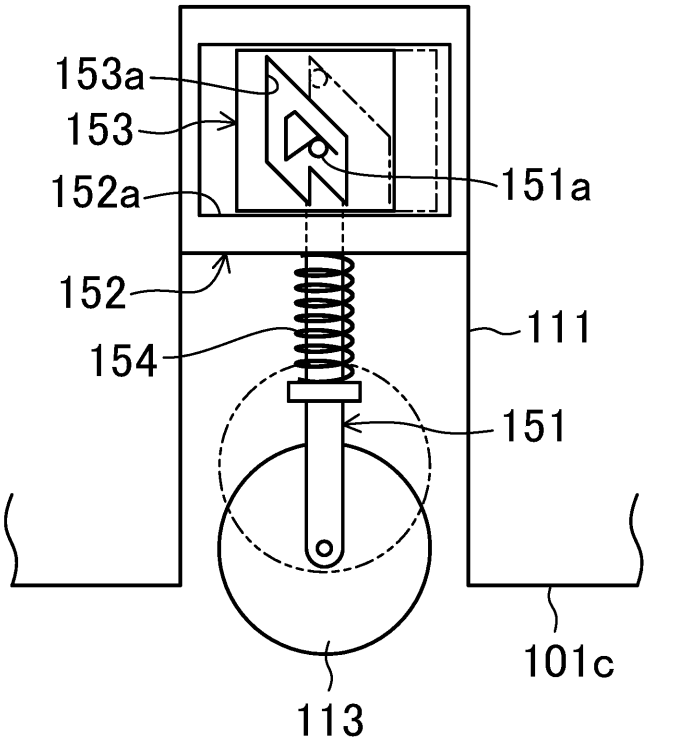

110
143
142
142a
141a
141
111
101c
113

FIG. 5


153a
153
152a
151a
152
154
111
151
101c
113