

DUAL LOCKING POSITION SYSTEM FOR ATTACHING CONTAINERS OR TANKS TO TRAILER CHASSIS

TECHNICAL FIELD

[0001] The present invention relates to the field of freight transportation. In particular, it relates to a novel system for providing a safety buffer at the rear end of the trailer chassis for ISO containers loaded onto the trailer chassis.

BACKGROUND

[0002] Containerisation is a system of freight transportation based on the use of freight containers. The containers are built to standardised dimensions in order to provide compatibility across the various transportation networks such as road, rail and sea, for example, the international standards of the International Standards Organisation (ISO).

[0003] The ISO freight container is commonly twenty feet or forty feet in length. For road transportation, each container is loaded or unloaded onto a trailer chassis of commensurate length. The trailer chassis is attached to a automotive prime mover, which moves the trailer chassis into position for loading and unloading, and to transport the loaded trailer chassis from one location to another.

[0004] A trailer chassis essentially comprises of beams fixed lengthwise across wheel axles, and secured by shorter cross beams fixed perpendicularly, including at both ends of the lengthwise beams. Along the lengthwise beams on the right side and the left side of the trailer chassis, including towards the front-end and the rear-end of the two beams, are fixed twist-locks.

[0005] When a container is loaded onto a trailer chassis, castings along the bottom of the container, on both the right-side and the left-side of the container, are secured to the corresponding twist-locks on the trailer chassis. At the minimum, the casting at the front right side of container is secured to the twist-lock at the front right-side of the trailer chassis, the casting at the front left side of container is secured to the twist-lock at the front left-side of the trailer chassis, the casting at the rear right side of container is secured to the twist-lock at the rear right-side of the trailer chassis, and the casting at the rear left side of container is secured to the twist-lock at the rear left-side of the trailer chassis. This is to secure the container on the trailer chassis, especially during transportation on the road.

[0006] The trailer chassis is moved in place for loading and unloading with its rear end parallel to and as close as possible to the front edge of the loading bay platform. A forklift is then used to move the container from the loading bay platform onto the trailer chassis. The height of the top surface of the trailer chassis and the height of the loading bay platform are approximately the same, so that loading and unloading can be effected smoothly.

[0007] As the positions of the twist-locks on the trailer chassis are fixed, the position in which a container loaded and secured on the trailer chassis is also fixed (the "Conventional Locking Position").

[0008] Under Singapore law, for ISO tanks used to transport certain types of chemicals, a buffer of a fixed width (the "Safety Width", currently 150 mm) is required between the rear end of the tank and the rear end of the trailer chassis for safety reasons (the "Buffer"). This is ordinarily achieved by attaching a detachable bumper of the Safety Width to the rear end of the trailer chassis.

[0009] The attachment of a bumper to the rear end of the trailer chassis creates a distance of unequal height between the trailer chassis and the loading bay platform, thus affecting the smooth loading and unloading of containers onto the trailer chassis.

DESCRIPTION OF THE INVENTION

[0010] The primary aspect of the invention is to allow for a Buffer of the Safety Width without the need for a bumper to be attached to the trailer chassis.

[0011] In addition to twist-locks fixed in the Conventional Locking Position, the invention is for additional twist-locks to be fixed on the trailer chassis offset from the Conventional Locking Position by a distance equivalent to the Safety Width, towards the front of the trailer chassis (the "Additional Locking Position").

[0012] When an ISO tank requiring a Buffer is loaded onto the trailer chassis, it is moved forward to the Additional Locking Position, and secured at the twist-locks of the Additional Locking Position.

[0013] An ISO tank secured in the Additional Locking Position is the Safety Width forward of the Conventional Locking Position, thus giving rise to a Buffer equivalent to the Safety Width between the rear end of the tank and the rear end of the trailer chassis, without the need to attach a bumper.

[0014] The Dual Locking Position System, comprising the Conventional Locking Position and the Additional Locking Position, allows an ISO tank to be secured to the trailer chassis with a Buffer of the Safety Width between the rear end of the tank and the rear end of the trailer chassis, without the need for a bumper to be attached to the rear of the trailer chassis.

[0015] As ISO tank can be placed in the Conventional Locking Position for loading and unloading, and moved along the even top surface of the trailer chassis into the Additional Locking Position to be secured to the twist-locks of the Additional Locking Position, giving rise to the Buffer equivalent to the Safety Width.

[0016] Under the Dual Locking Position System, a conventional container can continue to be secured to the twist-locks of the Conventional Locking Position, without a Buffer.

DESCRIPTION OF THE DRAWINGS

[0017] FIGURE 1 is a top view of an unloaded trailer chassis with the lengthwise beams and perpendicular cross beams, showing the minimum of two front end and two rear end twist-locks of the Conventional Locking Position marked as "A".

[0018] FIGURE 2 is a side view of a loaded trailer chassis showing the minimum front end and rear end twist-locks of the Conventional Locking Position on the near side marked as "A".

[0019] FIGURE 3 is a photograph of a twist-lock before it is fixed onto a trailer chassis.

[0020] FIGURE 4 is a photograph of a casting before it is fixed onto a container.

[0021] FIGURE 5 is a top view of an unloaded trailer chassis as in Figure 1, with a bumper of the Safety Width attached to the rear end of the trailer chassis.

[0022] FIGURE 6 is a side view of the loaded trailer chassis with a container secured in the Conventional Locking Position and an attached bumper at a loading bay platform, showing the distance of unequal height, equivalent to the Safety Width, caused by the attachment of the bumper.

[0023] FIGURE 7 is a top view of an unloaded trailer chassis showing the minimum of two front end and two rear end twist-locks of the Conventional Locking Position marked as "A"

and the minimum of two front end and two rear end twist-locks of the Additional Locking Position marked as **"B"**.

[0024] FIGURE 8 is a side view of a trailer chassis, with the Dual Locking System installed, loaded with an ISO tank secured in the Additional Locking Position giving rise to the Buffer equivalent to the Safety Width at the rear end without the need to attach a bumper.

[0025] FIGURE 9 is a rear view of a trailer chassis, with the Dual Locking System installed, loaded with an ISO tank, secured in the Additional Locking Position, with the two twist-locks at the rear end of the Additional Locking Position marked as **"B"**.

[0026] FIGURE 10 is a side view of a trailer chassis, with the Dual Locking System installed, loaded with an ISO tank at a loading bay platform showing the ability to move the ISO tank along the even top surface of the trailer chassis from the Additional Locking Position (shown by the front end and rear end twist-locks on the near side marked as **"B"**) to the Conventional Locking Position (shown by the front end and rear end twist-locks on the near side marked as **"A"**).

[0027] FIGURE 11 is a side view of trailer chassis, with the Dual Locking System installed, loaded with a container secured in the Conventional Locking Position. The front end twist-locks and the rear end twist-locks of the Conventional Locking Position on the near side are marked as **"A"**, without a Buffer. The Additional Locking Position, with the front end twist-locks and the rear end twist-locks on the near side marked as **"B"**, is unused.

[0028] FIGURE 12 is a rear view of trailer chassis, with the Dual Locking System installed, loaded with a container secured in the Conventional Locking Position, with the two twist-locks at the rear end of the Conventional Locking Position marked as **"A"**.

CLAIM

[0029] What is claimed is a system that provides additional twist-locks fixed on a trailer chassis so that containers or ISO tanks can be secured in two alternative positions, one which does not have a buffer between the rear end of a container and the rear end of the trailer chassis, and the other which provides a requisite safety buffer between the rear end of an ISO tank and the rear end of the trailer chassis.