

A CONTAINER COMBINATION AND A METHOD OF HANDLING CONTAINERS

5 This invention relates to a method of handling at least two
containers simultaneously with the loading device of a vehicle,
which is equipped with at least one engaging means (i.e. a hook)
for engaging with a least one grasping component (i.e. a hook
10 bar) at the front end of the container and for lifting the
container onto a vehicle and unloading it therefrom. The
invention also relates to a combination made up of at least two
containers, wherein each container is provided with at least one
hook bar and can be handled separately by the vehicle's load
15 handling system (LHS). As is known, e.g. from British Patent (EP)
No. 107892 or U.S. Patent No. 3984013, a LHS is equipped with at
least one hook for engaging with a hook bar at the front end of
the container for moving the container on and off vehicle.

20 Various garbage collection systems are known wherein the
garbage is compressed by using a piston. The garbage container is
located in the garbage transport vehicle. Small garbage bins
located at houses are emptied into the collecting container in
the vehicle and the garbage is compressed. The collecting
containers can be handled in the same way as exchangeable
platforms. Collecting vehicles equipped with compressing
25 equipment are used for short journeys between houses and separate
highway transporting vehicles are used for transporting the
collecting garbage containers to a dumping area or to a garbage
treatment plant. Collecting vehicles moving between houses are
advantageous for handling relatively short exchangeable
30 platforms. However such short exchangeable platforms, the length
of which may be 3m, cannot be handled by the LHS of bigger
vehicles which are intended for handling platforms of an
approximate length of 6 m. For longer distance transportation it
would be more advantageous to use bigger units.



A known LHS is described in the Finnish printed patent specification 63350. This LHS is a so-called hook-type device. It has an L-shaped member pivoting around a transverse shaft. A hook is located at the free end of the L-shaped member,

5 A method is known previously of loading two or several exchangeable containers or platforms or pallets into a longer exchangeable platform or exchangeable platform frame, which is provided with a hook bar. The truck's LHS engages with the hook bar of the longer exchangeable platform which acts as a
10 supporting base, and moves it onto the truck for transportation.

It is further known to connect rigidly together two sea containers end-to-end at their corner castings. In this known arrangement separate locking means are used which are attached manually in between the containers. The container combination is
15 then handled by a fork truck so that its forks support the containers from below.

The method according to this invention is characterised in that two containers, which can be handled separately by loading equipment and the end of which are to be placed against each other and are provided with at least one connecting means, are
20 connected together, and thus connected the containers are moved onto a vehicle or removed from a vehicle as one unit by making the hook of the loading equipment engage with the hook bar of the foremost container. The exchangeable platform of the invention is characterised in that the container ends, which are to be fitted
25 against each other, are provided with at least one connecting means which can be used for connecting the containers together so that the combination formed by the containers can be handled by the loading equipment as one unit. The connecting means
30 preferably comprises a locking component of a locking means attached to one container and a counterpart of the locking means attached to the other container. The locking component has a locking means which can be moved from a closed position to an opened position and which can be opened with the aid of a means



attached to the other container when pushing the containers against one another, and which is in the closed position when the containers are against one another.

5 In such a system according to this aspect of the invention no such separate bases are needed onto which the containers would be lifted, nor any loose additional connectors for connecting the containers together. The longer exchangeable container formed according to the invention can be lifted into a vehicle equipped with a suitable LHS. If required it can be moved from the vehicle
10 onto a full trailer.

The containers can be connected to each other simply by reversing the vehicle into position, whereby the vehicle pushes the container on the vehicle towards the other one and the opened locking means of the connecting means will close automatically.
15 For connecting, the driver of the vehicle need not leave the cab of the vehicle.

A container of length of e.g. 3 m. can be connected to a garbage collecting vehicle by a small LHS. Such a short container is light to move, and can be used in a housing estate for
20 collecting garbage. When two containers are connected together in accordance with the invention, a resulting composite container is formed of an approximate length of 6 m. This can be moved onto a 3-axle truck using a conventional LHS. Such a unit corresponds in terms of dimensions to a typical transporting unit for heavy 3-
25 axle vehicles.

Two double containers can be transported by a full trailer combination so that one 6 m. unit is on the towing vehicle while the other is on the full trailer. The first double unit is loaded onto the trailer by using the hook-type exchange platform device
30 of the towing vehicle by first lifting it on the vehicle into a horizontal position and then pushing it onto the trailer of the vehicle. The other double unit is then lifted onto the vehicle using the same hook-type exchange platform device. Even two double containers can be loaded onto a longer trailer one after



the other so that one is loaded from the leading end of the trailer and the other from the rear end. In this way very large transport units are achieved for longer transportations.

5 The invention will be better understood from the following non-limiting description given with reference to the accompanying drawings, in which:

Figures 1a - 1d are side views, views from one end and from above respectively of an embodiment of a container in accordance with the invention,

10 Figure 2 is a side view of two containers shown in Figures 1a - 1d connected to one another,

Figures 3a - 3c are side views, views from one end and from above respectively of another embodiment of the container in accordance with the invention,

15 Figure 4 is a view from above of two containers shown in Figures 3a - 3c connected to one another,

Figures 5a - 5c are side views and views from both ends of a third embodiment of the container according to the invention,

20 Figure 6 is a side view of three containers shown in Figures 5a - 5c connected to one another,

Figures 7a and 7b are side views of an example of how two containers are connected together, and

Figures 8a and 8b are side views of the handling of two containers connected to one another.

25 In the container 1 shown in Figures 1a - 1d end wall has a hook bar 2, which may be engaged by the hook of the LHS. In a recess in the middle of the top part of the same end wall there is a connecting link 3, and on the sides in the lower part there are pins 4, which act as components of the connecting means.

30 In this specification the terms hook and hook bar have been used. By hook is to be understood any hooking or grasping element which can be engaged with a hook bar to permit lifting thereof. By hook bar is meant any bar or rod suitable for engagement by a hook as above defined, or suitable to be grasped or otherwise



secured to a hook as above defined to permit safe lifting or shifting of heavy loads.

5 A connecting hook 5 with its hook extending downwards is fixed to and located in the middle of the top part of the other end wall of the container 1. In the middle of the same end wall and level with the hook bar 2 there is a recess 6, which will receive the hook bar 2 of the second container which us to be connected with the first container 1. Catches, herein called clasps, 7 are provided as locking components on the sides of the lower part of this end wall.

10 Each clasp 7 is mounted pivotally on a shaft 8. The clasp part extending from the container has a hook 9 extending downwards and pressing against a counterpart 10 when pulled by a spring 11 which is mounted between the opposite end of the clasp and the container wall. The clasp has a handle 12 between the shaft 8 and the spring 11.

15 Figure 2 shows two containers 1, 1', the ends of which are fitted against each other so that the connecting hook 5 of the first container 1 has engaged with the connecting link 3 of the other container and the clasps 8 of the first container have engaged with the pins 4 of the other container. When connected together the containers form a rigid combination which can be handled as one unit.

20 Figures 3a - 3c show an embodiment where on one side of one end of the container approximately midway vertically there is a link 13 working as a counterpart for the connecting means. A locking component 14 is fitted into a recess on the other side of the same end at the corresponding height. The other end of the container is provided with a hook bar 2, but it has no connecting means.

30 The connecting means used in this embodiment is similar to the pulling hooks mentioned above, which are used for connecting the trailer to the vehicle.

Figure 4 shows a combination of two containers shown in



Figures 3a - 3c, so that the locking component 14 of the first container 1 has engaged with the link 13' of the second container 1' and the locking component 14' of the second container has engaged with the link 13 of the first container. The hook bar 2 of the left-hand container is at the outermost end of the combination.

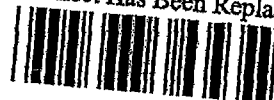
The embodiment shown in Figures 5a - 5c is similar to the embodiment shown in figures 3a - 3c. The difference, however, is that in one end of container 1 there are links 13 on both sides and in the other end on both sides there are locking means 14 fitted into recesses. One end has a hook bar 2 and the other end has a recess 6 for the hook bar. More than two such containers may be fitted one after the other as is shown in Figure 6.

Figures 7a and 7b show how the two containers of Figures 1a - 1c are connected to each other with the aid of a collecting vehicle 15 having an LHS. Container 1' is on the ground and container 1 is on vehicle 15. Figure 7a shows how lowering of container 1 is begun in order to place it on the ground in front of container 1'. Figure 7b shows the next step where connecting hook 5 of container 1 has lowered to rest on top of connecting link 3 of container 1'. Using the loading device, container 1 is then lowered further, whereby it turns in the direction shown by the arrow round an axis formed by connecting link 3, and clasps 7 of container 1 come against pins 4 of container 1'. As container 1 turns further, pins 4 press the hook parts 9 of clasps 7 upwards against the force of springs 11 and the clasps will open. In this way the pins enter the hook parts of the clasps, whereupon the spring force will again close the clasps.

The connected containers 1, 1' can then be moved onto the longer transport vehicle 15' in the way shown in Figures 8a and 8b.

The containers of Figures 3 - 6, which have no connecting hook 5 or connecting link 3 in the top part of the container, are connected together by a horizontal pushing motion. A vehicle

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carrying a container is driven into position in front of a container resting on the ground. The container on the vehicle is lowered to rest on the ground and using the vehicle's loading device it is pushed against the other container on the ground, whereby the connecting means will first open in the final stage of the pushing motion and will finally close as the containers are against one another.

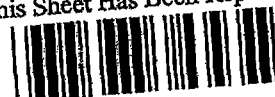
The invention is not limited only to the embodiments present above, but it may vary in different ways within the scope of the claims.

Other devices than the hook-type device described with reference to the drawings may be used as the loading device. For example, a so-called winch and cable device or a so-called endless chain lifting device may be used, in both of which there is an engaging a hook or an equivalent thereof, attached to a flexible means, such as a cable or a chain.

Instead of being of the type opening on a counterpart of the opposite container, the locking component may also be similar to the trailer towing hook described above, that is, of a type first opened manually and locked in an opened position, from which it will close when the releasing means is moved. The locking means can be opened or released to close either on the said counterpart of the other container or on a separate pushing component. Release may also take place as the end wall of one container is pushed against a separate pushing means in the locking component.

A counterweight and gravity may also be used instead of spring force.

Thus, the connecting means can be designed in many different ways. Nor is it necessary for the connection to be entirely rigid. The essential thing is that the connection is sufficiently rigid and strong so that the combination can be supported by the hook of the loading device from the hook bar of the foremost container even when only the bottom edge of the rear



end of the combination is resting on the ground or when the combination is inclined and rests on a rear roller.

When using a chain or cable device only bottom container edges need to be connected to one another by a hinge-type connection.

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Claims

1. A method of handling at least two containers (1, 1') simultaneously with a vehicle's loading device equipped with at least one engaging means (17) for engaging with at least one grasping component (2) at the front end of one container (1, 1') and for lifting the container onto the vehicle and for removing it from the vehicle, so that two containers (1, 1'), which can be handled separately by the loading device are connected to each other, the ends of the containers to be fitted against one another being equipped with at least one connecting means (7, 4; 13, 14), and the containers thus connected to each other are lifted onto the vehicle (15, 15') and removed from the vehicle as one unit by making the engaging means (17) of the loading device engage with the grasping component (2) of the foremost container, characterized in that the unit formed by the containers is lifted onto the vehicle and removed from the vehicle in such a way that both at the initial stage of the lifting and at the final stage of the removal, the unit formed by the containers is supported from a grasping member in the front edge of the foremost container while the rear lower edge of the rearmost container is supported on the ground, and the bottoms of the containers are separated from any support surface.

2. A method as claimed in claim 1, characterized in that the containers (1, 1') are connected to each other by pushing them against one another using a vehicle, whereby a means (4, 13) attached to one container (1') makes the locking component (7, 14) of a connecting means attached to the other container (1) move, and in that after the counterpart (4, 13) of a connecting means attached to one container (1') has been fitted into the locking component (7, 14), the locking component (7, 14) will close.

3. A combination formed by at least two containers (1, 1'), wherein both containers are provided with at least one grasping component (2) and each container can be handled separately by the loading device of a vehicle (15, 15'), which is equipped with at least one engaging means for engaging with the grasping component (2) at the front end of the container and for lifting the container onto the vehicle and for removing



it from the vehicle, the container (1, 1') ends fitted against each other being equipped with at least one connecting means (7, 4; 13, 14) for connecting the containers to each other so that the combination formed by the containers can be handled
5 as one unit by the loading device, **characterized** in that the unit formed by the containers can be supported from a grasping member in the front edge of the foremost container while the rear lower edge of the rearmost container is supported on the ground, and the bottoms of the containers are separated off
10 from any support surface.

4. A combination as claimed in claim 3, **characterized** in that the connecting means comprises a locking component (7, 14) of a connecting means attached to one container (1 or 1') and a counterpart (4, 13) of a connecting means attached to
15 the other container (1' or 1), the counterpart being complementary to the locking component, the locking component (7, 14) having a locking means movable between a closed and an open position and movable with the aid of a means (4, 13) attached to one container when pushing the containers (1, 1')
20 against one another, the locking means being set into the closed position when the containers are against one another.

5. A combination as claimed in claim 3 or 4, **characterized** in that the means moving the locking means (7) is said counterpart (4) of the connecting means which is pushed against
25 the locking means (7) when the containers (1, 1') are pushed against one another.

6. A combination as claimed in any one of claims 3 - 5, **characterized** in that the locking means of the locking component (7, 14) is movable pivotably or axially.

30 7. A combination as claimed in any one of claims 3 - 6, **characterized** in that closing of the locking means of the locking component (7, 14) is effected with the aid of spring force or gravity.

35 8. A combination as claimed in any one of claims 3 - 7, **characterized** in that at least some of the components (7, 4; 13, 14) of the connecting means are located in a recess in one end or one side of the container (1, 1').

9. A combination as claimed in any one of claims 3 - 8, **characterized** in that in the top part of one container (1)



there is a fixed connecting hook (5) extending downwards and at the corresponding place in the top part of the other container (1') there is a connecting rod or bar (3) to which the connecting hook can be fitted.

- 5 10. A container (1, 1'), which is equipped with at least one grasping component (2) and which can be handled by a vehicle's (15, 15') loading device which is provided with at least one engaging means for engaging with the grasping component (2) located at the front end of the container and for
10 lifting the container onto the vehicle and for removing it from the vehicle, one end of the containers (1, 1') being provided with at least one connecting means (7, 4; 13, 14) for connecting it to the other container so that the combination formed by the containers can be handled as one unit by the
15 loading device, **characterized** in that the unit formed by the containers can be supported from a grasping member in the front edge of the foremost container while the rear lower edge of the rearmost container is supported on the ground, and the bottoms of the containers are separated off from any support
20 surface.

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