driving, which takes lot of time or takes number of trucks where the one is driving empty to the site and another is driving back empty, making the whole interchanging process remarkably ineffective. Therefore there is a clear need for a system to enable an effective way to interchange the containers or the load units also in the site with limited space so that the unnecessary steps and driving can be avoided.

SUMMARY OF THE INVENTION

An object of the invention is to alleviate and eliminate the problems relating to the known prior art. Especially the object of the invention is to provide an arrangement and method for interchanging containers or other load units so that the interchanging process of the containers can be done on the site without a need for leaving the empty container somewhere other place at first, take the full container and transfer it somewhere else, take the empty container again and transfer it to the destination site and after this to take the original full container again on the vehicle. Especially the object of the invention is to provide an arrangement and method so that the containers can be replaced or interchanged without any need for moving the vehicle and so that the new container brought to the site is placed essentially on the same location than the container to be taken away.

The object of the invention can be achieved by the features of independent claims.

The invention relates to an arrangement for interchanging at least two load units. In addition the invention relates to a method for interchanging at least two load units, as well as also to a load unit and a vehicle comprising the interchanging arrangement.

According to an embodiment of the invention an interchanging arrangement is provided for interchanging at least first and second load units carried by a vehicle. The interchanging the load unit means e.g. unloading a first load unit from the vehicle on the ground and loading a second load unit to the same vehicle. The load unit is e.g. an interchangeable platform or container or the like having first and second ends. The arrangement is advantageously mountable on the vehicle or to the load unit, in particularly

Claims

1. An interchanging arrangement for interchanging at least first and second load units carried by a vehicle, both of said load units having first and second ends,
wherein the arrangement comprises:
- a landing device arranged between said the first end of the first load unit and the second end of the second load unit so that a first portion of said landing device is supported to the first end of the first load unit and a second portion of said landing device is supported to the second end of the second load unit,

wherein

- said landing device is configured to move said first end of said first load unit into the lower lever than the second end of the second load unit after said first end of the first load unit has met said second end of the second load unit.

2. The interchanging arrangement of claim 1, wherein said arrangement or said landing device comprises a braking member configured to slow down the landing of said first end of said first load unit.

3. The interchanging arrangement of claim 2, wherein said landing device comprises a first portion coupled to the end portion of the load unit and a second portion coupled, such as hinged, with said first portion of said landing device, and wherein said landing device comprises braking member arranged between said first and second portions of said landing device, said braking member configured to apply force resisting to move said first and second portions of said landing device farther from each other.

4. The interchanging arrangement of claim 3, wherein said braking member comprises a spring or a brake cylinder, such as a pneumatic or hydraulic cylinder or a cable the unwinding of which is controlled, the first end of said braking member being coupled with the first portion of said landing device and the second end of said braking member being coupled with the second portion of said landing device, or wherein the braking member comprises a friction brake.

5. The interchanging arrangement of any claims 3-4, wherein the first portion of the landing device is fixed:

- to the first end portion of the first load unit, whereupon the second portion of the landing device is configured to be coupled to the second end portion of the second load unit after said first end of the first load unit has met and passed said second end of the second load unit, or

- to the second end portion of the second load unit, whereupon the second portion of the landing device is configured to be coupled to the first end portion of the first load unit after said first end of the first load unit has met and passed said second end of the second load unit.

6. The interchanging arrangement of any previous claims, wherein said landing device is configured to be uncoupled after said first end of said first load unit is moved into the lower lever than the second end of the second load unit.

7. The interchanging arrangement of any previous claims, wherein the arrangement comprises a braking system configured to control the sliding speed of the first load unit when it slides on the top and along the second load unit during the loading said second load unit onto the vehicle.

8. The interchanging arrangement of claim 7, wherein the first end of the braking system is coupled to the second load unit or to the vehicle and the second end of the braking system is coupled to the first unit and in particularly to the first end of said first unit.

9. The interchanging arrangement of any claims 7-8, wherein the braking system comprises a spring or a brake cylinder, such as a pneumatic or hydraulic cylinder, configured to control the sliding speed by the spring force or via force induced by the brake cylinder, or wherein the braking system comprises a cable, with a fixed length or a cable the unwinding of which is controlled by a controllable motor or wherein the braking system comprises a friction brake or wherein the braking system is an elongated arm, such as a rod or bar.

10. The interchanging arrangement of any claims 7-9, wherein the landing device is configured to release the braking system from the first unit at the latest after said first end of the first load unit has met and passed said second end of the second load unit.

11. The interchanging arrangement of any previous claims 1-2, wherein

said braking member comprises a cable, where the first portion of said cable is supported or coupled to the second end of the second load unit and the second portion of said cable is supported or coupled to the first end of the first load unit.

12. The interchanging arrangement of claim 11, wherein the braking member comprises a controllable motor, which is configured to control the unwinding of the cable and thereby slow down the landing of said first end of said first load unit.

13. The interchanging arrangement of claim 11, wherein said cable is in addition configured to function as a braking system for controlling the sliding speed of the first load unit when it slides on the top and along the second load unit during the loading said second load unit onto the vehicle, and after said first end of the first load unit has met and passed said second end of the second load unit said cable is in addition configured to function as said braking member for slowing down the landing of said first end of said first load unit.

14. The interchanging arrangement of any previous claims, wherein the load unit comprises a sliding path to receive and allow another load unit to slide along said sliding path during loading or unloading said load unit onto or from the vehicle.

15. The interchanging arrangement of claim 14, wherein the second load unit comprises the sliding path and a locking member arranged in connection with the sliding path, and the first load unit comprises a sliding member configured to slide along said sliding path, wherein said locking member is configured to stop the sliding of the first load unit via an interaction with said sliding member of the first load unit, when it slides on the sliding path.

16. The interchanging arrangement of claim 15, wherein the locking member comprises a wedge ramp for deflecting the sliding member of the first load unit against a stopping member when the first load unit slides on the sliding path.

17. The interchanging arrangement of claim 16, wherein the stopping member comprises a shock absorption mechanism for absorbing kinetic energy of the first load unit when stopping the movement of said first load

unit.

18. The interchanging arrangement of any previous claims, wherein the second load unit comprises an introduction member at an end portion of the second end of the second load unit, where said introduction member is configured to introduce the first end of said first load unit to the landing device after said first end of the first load unit has met said second end of the second load unit and thereby allowing the moving of said first end of said first load unit into the lower lever than the second end of the second load unit.

19. The interchanging arrangement of claim 1, wherein the arrangement additionally comprises

- a moving device arranged for

    - moving and unloading the first load unit from the vehicle in a first direction and onto the top of the second load unit locating next to the vehicle,
    - releasing the first load unit,
    - gripping the second load unit below the first load unit and moving and loading said second load unit onto the vehicle so that said first load unit is still on the top of the second load unit at the beginning of the moving of the second load unit and so that said first load unit slides on the top and along the second load unit in said first direction during loading said second load unit onto the vehicle until the first end of the first load unit meets the second end of the second load unit.

20. A load unit, wherein the load unit comprises an interchanging arrangement, said interchanging arrangement comprising:

- a landing device arranged between said the first end of the first load unit and the second end of the second load unit so that a first portion of said landing device is supported to the first end of the first load unit and a second portion of said landing device is supported to the second end of the second load unit,

wherein

- said landing device is configured to move said first end of said first load

unit into the lower lever than the second end of the second load unit after said first end of the first load unit has met said second end of the second load unit.

21. A vehicle comprising an interchanging arrangement for interchanging at least first and second load units carried by the vehicle, wherein said interchanging arrangement comprises:

- a landing device arranged between said the first end of the first load unit and the second end of the second load unit so that a first portion of said landing device is supported to the first end of the first load unit and a second portion of said landing device is supported to the second end of the second load unit,

wherein

- said landing device is configured to move said first end of said first load unit into the lower lever than the second end of the second load unit after said first end of the first load unit has met said second end of the second load unit.

22. A method for interchanging at least first and second load units carried by a vehicle, both of said load units having first and second ends,
wherein the method comprises steps of:

- supporting a first portion of a landing device to the first end of the first load unit and a second portion of said landing device to the second end of the second load unit, and
- moving the first end of said first load unit into the lower lever than the second end of the second load unit after the first end of the first load unit has met said second end of the second load unit.