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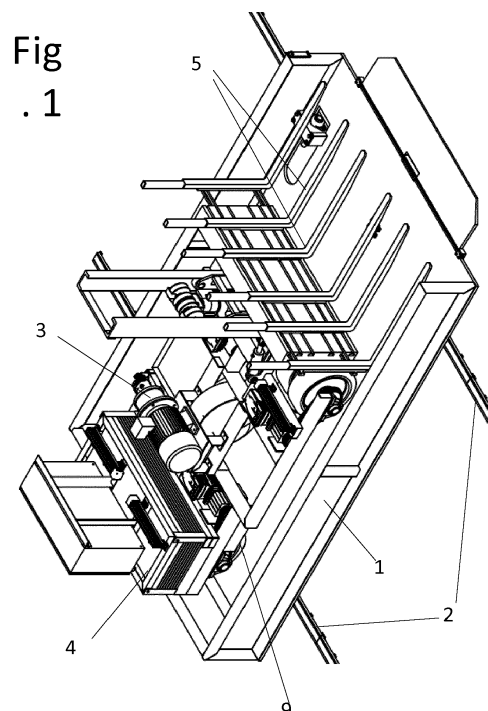
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(54) **GUIDE FOR LOADING AND UNLOADING EQUIPMENT**

(57) Guide system for loading/unloading equipment comprising a longitudinal trolley (4) with rolling elements (6, 7, 8, 9) arranged on both sides of the longitudinal trolley (4), which enters a truck trailer or container. The rotation speeds of the rolling elements (6, 7, 8, 9) on one side are independent from the rotation speeds of the rolling elements (6, 7, 8, 9) on the opposite side. It also

comprises one or more preferably contactless position sensors on the longitudinal trolley (4) to sense the inside walls of the trailer or container and a control system that sets the different speeds of the rolling elements (6, 7, 8, 9) according to the measurements taken by the position sensors in order to centralise the longitudinal trolley inside the trailer or container.



Description

SECTOR TO WHICH THE ART APPLIES

[0001] This invention relates to a guide system for equipment for loading and unloading trucks or standard containers. The equipment places pallets or any other type of unpalleted loads in the truck trailer or container and can supply several different loading bays.

STATE OF THE ART

[0002] EP2716591 is known as a system for loading and unloading trucks and its description is included in this application for reference. This system has a transfer system that runs on rails and aligns a longitudinal trolley with the trailer or container. The longitudinal trolley has forks to load and deposit the pallets in place and it is driven by a telescopic system.

[0003] Another system of interest is shown in US2005053451, where the trolley is independent and has guide wheels on the sides, which can be substituted by skis. This solution forces the contact of the wheels or skis with the walls of the trailer, causing potential wear or damage to them. Especially when the walls are made of canvas.

[0004] The applicant knows of no other solution similar to the invention.

BRIEF EXPLANATION OF THE INVENTION

[0005] The invention consists of a guide system for loading/unloading equipment according to the claims. This system adequately addresses the various problems of the state of the art and the embodiments thereof.

[0006] The guide system is specially prepared for loading and unloading systems with an autonomous trolley not connected mechanically to the frame that faces the truck or container. It can support a connection to transmit hydraulic or electrical power.

In other words, the guide system is intended for loading/unloading equipment comprising a mobile frame on one or more rails to move an independent longitudinal trolley mechanically. The longitudinal trolley has rolling elements arranged on both sides and is intended to be placed inside a truck trailer or a container. The rolling elements on one side have rotation speeds that are independent from the rolling elements on the opposite side and a control system sets the different speeds of the rolling elements based on measurements taken by one or more position sensors on the longitudinal trolley inside the trailer or container. Optionally, a position sensor will be oriented toward the front of the longitudinal trolley.

[0007] Preferably, the position sensors are contactless, e.g. laser rangefinders.

[0008] Each rolling element may be activated by a different motor.

[0009] In a preferred embodiment, the system has a

set of transmitters and receivers on the frame and longitudinal trolley so that it can be returned to the starting position.

[0010] In another preferred embodiment, the control system remembers the movements made by the longitudinal trolley when it enters the trailer or container to make the opposite movements when it exits.

DESCRIPTION OF THE DRAWINGS

[0011] For a better understanding of the invention, the following figures are included.

Figure 1 shows a general view of an embodiment of the invention.

Figure 2 shows a top view of a trolley according to the example embodiment.

EMBODIMENTS OF THE INVENTION

[0012] The following briefly describes an embodiment of the invention, as an illustrative and non-limiting example thereof.

[0013] The example embodiment of the figures consists of a guide system for loading or unloading equipment comprising a frame (1) that moves along one or more rails (2), to face the trailer of a truck or a container. The frame (1) is used to transport a longitudinal trolley (4) with a front part designed to take one or more pallets or one or more forks (5). The forks (5) will have any range of movement known for forklifts or similar equipment, without departing from the invention. The fact that they are capable of vertical movement is particularly useful.

[0014] The longitudinal trolley (4) will have rolling elements (6, 7, 8, 9) arranged in parallel pairs. The invention will distinguish between the left-side rolling elements (6, 8) and the right-side rolling elements (7, 9). The rolling elements (6, 7, 8, 9) may be wheels, wheel units, tracks or any type of rolling element and will not affect the invention.

[0015] As an essential part of the invention, the left-side rolling elements (6, 8) will be capable of varying their rotation speed with respect to the right-side rolling elements (7, 9). This change of angular velocity can be achieved by means of transmissions, clutches or by each rolling element (6, 7, 8, 9) having an individual motor (usually electric).

[0016] The longitudinal trolley (4) will also have a set of position sensors that identify the position of the longitudinal trolley (4) in the trailer or container. These position sensors may be a flexible rod that bends as it comes into contact with the wall of the trailer or container and identifies the position of the longitudinal trolley (4). However, it is preferable for them to be contactless laser rangefinders or similar technology because then no part of the longitudinal trolley (4) will have to come into contact with the walls of the trailer or container, avoiding the conse-

quential wear and damage. In a preferred embodiment the sensors will be laser or ultrasonic.

[0017] Preferably, one of the position sensors will be oriented toward the front of the longitudinal trolley (4) to mark the position of the back of the trailer or container or the pallets positioned previously. Then it will know where to place or pick up the pallet or pallets.

[0018] A control system (not shown), which may be located on the longitudinal trolley (4) itself or at a remote location, receives signals from the position sensors and adjusts the speed of the rolling elements (6, 7, 8, 9) to correct the trajectory. Thus, if the rotational speed of the left-side rolling elements (6, 8) increases, the longitudinal trolley (4) will turn to the right and vice versa.

[0019] It is recommendable to have a set of transmitters and receivers on the frame (1) and the longitudinal trolley (4) so that it can be returned to the starting position (e.g. radio beacons). A second option is to have position sensors oriented towards the rear of the longitudinal trolley (4). A third option is for the control system to have a memory so that it can return along the path followed towards the frame (1) or guides so that the longitudinal trolley (4) can return from the entrance of the trailer or container to the exact starting point.

[0020] Further explanation of the invention is not considered necessary, since the attached document EP2716591 provides sufficient details about the general mode of operation.

5. Guide system for loading/unloading equipment according to claim 1, where the control system remembers the movements made by the longitudinal trolley (4) as it enters the trailer or container.

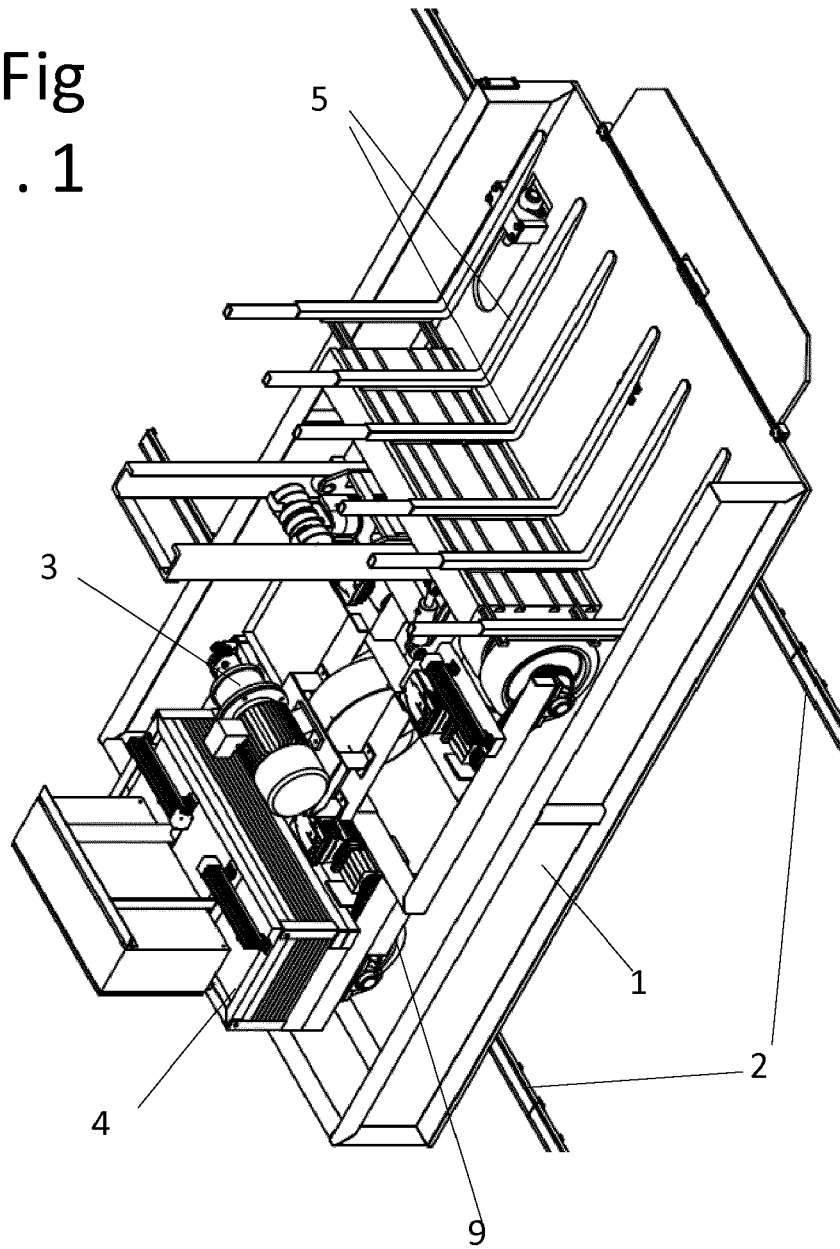
6. Guide system for loading/unloading equipment according to claim 1, which has a set of transmitters and receivers on the frame (1) and the longitudinal trolley (4) that allow it to return to the starting position.

7. Guide system for loading/unloading equipment according to claim 1, which has position sensors oriented towards the rear of the longitudinal trolley (4).

Claims

1. Guide system for loading/unloading equipment comprising a frame (1) that moves along one or more rails (2) to transport a mechanically independent longitudinal trolley (4), with rolling elements (6, 7, 8, 9) arranged on both sides of the longitudinal trolley (4), which enters a truck trailer or container, **characterized in that** the rolling elements (6, 7, 8, 9) on one side have rotation speeds that are independent from the rolling elements (6, 7, 8, 9) on the opposite side, and **in that** it comprises one or more sensors of the position of the longitudinal trolley (4) in the trailer or container and a control system that sets the different speeds of the rolling elements (6, 7, 8, 9) based on the measurements taken by the position sensors.
2. Guide system for loading/unloading equipment according to claim 1, where the position sensors are contactless.
3. Guide system for loading/unloading equipment according to claim 1, where each rolling element (6, 7, 8, 9) is activated by an independent motor (3).
4. Guide system for loading/unloading equipment according to claim 1, comprising a position sensor towards the front of the longitudinal trolley.

Fig
. 1



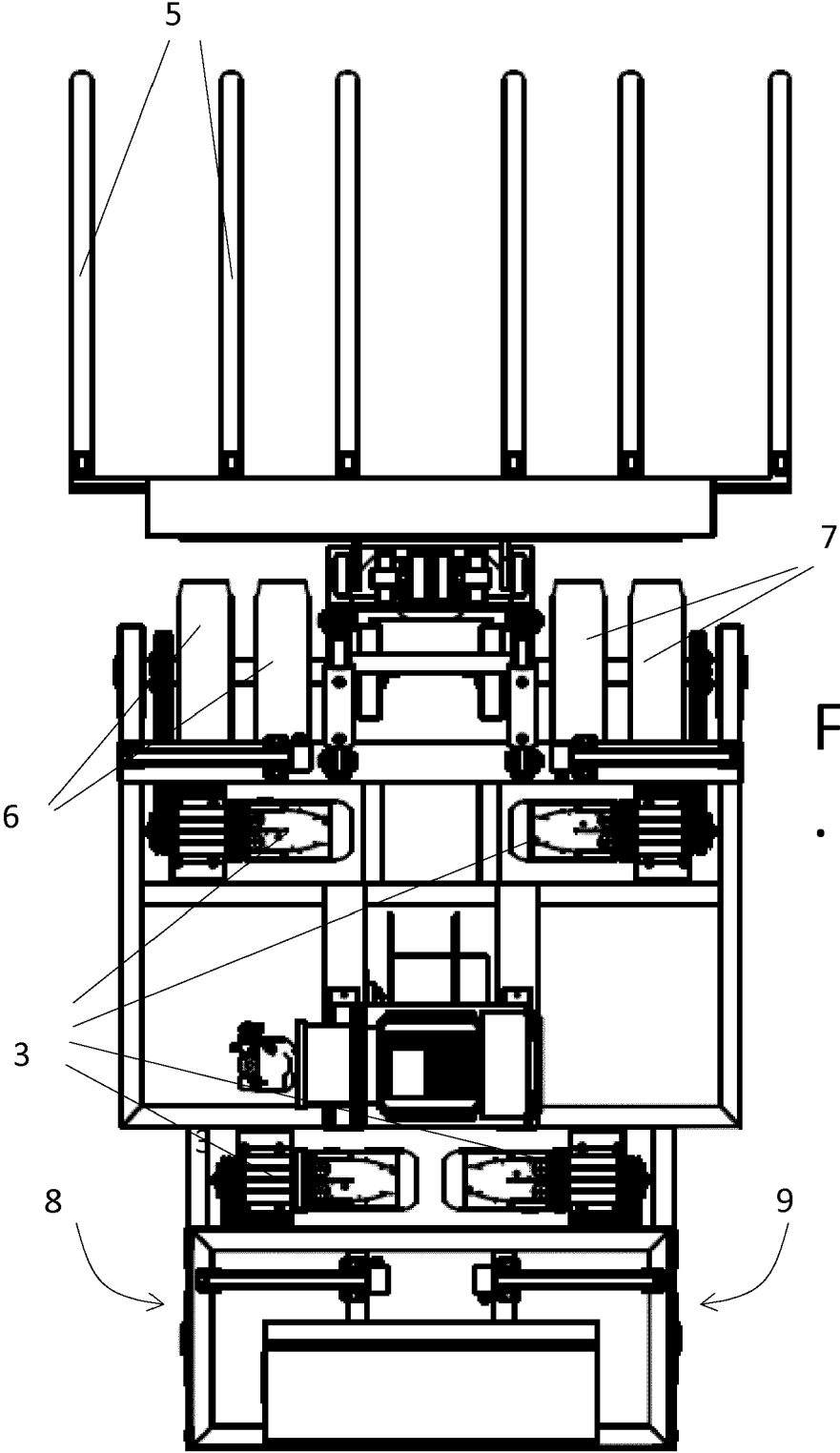


Fig
. 2



EUROPEAN SEARCH REPORT

Application Number
EP 15 19 5052

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A,D	EP 2 716 591 A1 (MONTAJES DE MAQUINARIA DE PREC S A [ES]) 9 April 2014 (2014-04-09) * abstract *	1	TECHNICAL FIELDS SEARCHED (IPC) B66F B65G
The present search report has been drawn up for all claims			
Place of search The Hague		Date of completion of the search 9 May 2016	Examiner Sheppard, Bruce
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document		T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document	

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**ANNEX TO THE EUROPEAN SEARCH REPORT
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EP 15 19 5052

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This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
The members are as contained in the European Patent Office EDP file on
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EPO FORM P0459

For more details about this annex : see Official Journal of the European Patent Office, No. 12/82

REFERENCES CITED IN THE DESCRIPTION

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- US 2005053451 A [0003]