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(54) **LIFTING SUPPORT EQUIPMENT FOR LOADING PROCESSES IN THE RAILWAY TRANSPORT**

(57) The invention relates to lifting support equipment that provides the loading processes of the rolling stock by taking trailers, tow trucks, and containers, which can't be lifted on their owns, on its own internal basin and transport ramp. The invention comprises a side wall sheet (1), which ensures limiting the width at which the entrance of the vehicle to be lifted could be the easiest depending on the train pocket, and which acts as lifting grip, a foldable sensor face sheet (2) providing the position data of the lifting support equipment catching mechanism found in the lifting vehicle in order to ensure lifting the loaded lifting support equipment, to make sure posi-

tioning of the tow truck transport ramps (11) constantly at a definite angle; at least two pieces of tow truck transport ramp pin (12), which are passed through two pieces of ramp pin slot (3), or the tow truck transport ramp pin (12), which is passed through the ramp pin slot (3) at the front of the tow truck transport ramp (11), and the fixed leg (15) providing support at the back, the entrance/exit ramp with 90 degrees hinge (7), which is used for vehicle entry and exit, and foldable when required, and when folded, saving space in the train, and the lifting lugs (9), which make sure that the lifting support equipment itself is lifted and transported.

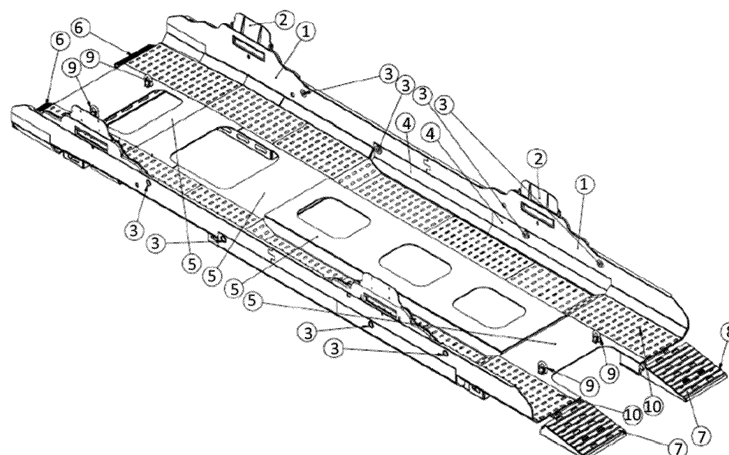


FIGURE 1

Description

Field of the Invention

[0001] The present invention relates to the lifting-unloading support equipment used for the procedures of lifting and loading loads such as a trailer, tow truck or container to and from the rolling stock, and unloading said loads from the railway vehicle at the point where they are required to be reached.

Background of the Invention

[0002] Railway conveyance is a preferred method against road transport. This is because it comprises many advantages such as reducing highway density, decreasing the emulsion values, and reducing negativities occurring human-induced.

[0003] Nowadays, trailer, container, and towing vehicles are transported overland as a whole, on their own, or also taking their similar ones on as a load. However, especially in the top-over-bottom loading procedure, the fact that the wheel diameters used in railway transport are smaller than the ones used in road transport provides some advantages. Because of the en-route height limit on highways, it causes disadvantage in case of top-over-bottom and on-vehicle loading, and causes the railway transport to be preferred.

[0004] The lifting support equipment is being used for lifting and loading processes of loads such as trailer, tow truck, or container to/from the rolling stock. These equipments generally include a base and two side walls. There are lifting grips on the side walls. In the present case, although the sidewalls of the lifting support equipment stay below the train pocket walls, holding pockets for the lifting support equipment stays over the train pocket walls. In this situation, especially when container loading is required to be performed while the lifting support equipment is on the coach, there is a collision possibility of the holding pockets for support equipment to the holding pockets of the containers, making such a loading difficult. This gives rise to lengthened operation time since the loading procedure is carried out with extra care or additional control assemblies, and sometimes damages to the containers.

[0005] The application with number EP3268257(A1) is "A removable conveyance equipment for taking on load to a rail vehicle by the means of a lifting unit" wherein the removable conveyance equipment includes at least one support unit for the load and receiving pockets for the lifting unit. In said support unit, the load has a receiving position where it is oriented horizontally usually. After loading, the load gets slanted when taking on the train. This situation is ensured thanks to the ramps, which are mobile between the two positions.

[0006] Said tow truck transport ramps can make free upwards rotary movement, a point being the centre and remains constant. Since there is no any delimiter and

fixing system to restrict this movement, the tow truck transport ramp can make angular movement freely in the situations of the wagon such as jerk, braking, acceleration, and materials forgotten at the loading point, etc. This situation would be the root cause of the problems, which may be caused by leakage of the oil in the crankcase, malfunction of the felts, or depletion or running out of the oil for the vehicles to be transported by exceeding the angle permitted for vehicles such as tow truck, truck, and trailer which are transported with ramps. Furthermore, damages suffered by the vehicles loaded head-to-head so that their windscreens face each other as a result of colliding each other, are also caused by the root cause. In the present case, the vehicle entrance/exit ramps are fixed at the base so as to be parallel to the ground plane during loading. The fixed ramps have the risk of hitting the hardware in the train pocket of the vehicle during vehicle loading on the base of the lifting support equipment because of the narrow space.

[0007] As it is seen, the system support unit is described as being movable between a receiving position for the load and a loaded position for the load, the load being slanted, and the load is oriented horizontally usually.

[0008] As a result, due to above-mentioned negativities, and shortcoming of the existing solutions on the subject matter, an improvement was needed in the related technical field.

The object of the Invention

[0009] Unlike the embodiments employed in the prior art, the invention aims to set forth a structure in this field having different technical characteristics, which brings forth a new evolution. The support units, which are used in the system of the invention, are not movable between the receiving position and the loaded position. The loads are loaded on the conveyance equipment at the directly loaded position of the support unit.

[0010] One purpose of the invention is to allow for problem-free loading the containers without having to make an extra effort or pay extra attention, by being folded outwards while loading the foldable sensor face sheet, and to enable the container variations can be transported problem-free with the result of the container returning to its vertical position with the spring pressure of its design.

[0011] One purpose of the invention is to ensure that the containers can be loaded faster, with minimum attention, and without requiring extra equipment.

[0012] Another purpose of the invention is to extend the life cycle of the container by preventing the damages caused by impacts.

[0013] Another purpose of the invention is to save space when deemed necessary because of the sensor faceplates' being foldable.

[0014] Another purpose of the invention is to make sure that the tow truck transport ramps will never go beyond the permitted angle.

[0015] Another purpose of the invention is to prevent the vehicles to be transported from going beyond the permitted angle, thus resolving the problems that could be caused by leakage of the oil in the crankcase, malfunction of the felts, or depletion or running out of the oil in the vehicles.

[0016] Another purpose of the invention is to prevent the vehicles loaded head-to-head from collide each other and being damaged.

[0017] Another purpose of the invention is to minimize the hit risk by making sure that ramps are folded on completion of the vehicle loading thanks to the entrance/exit ramps designed as hinged so that they make 90 degrees of angle with the floor.

[0018] In order to realize above-mentioned purposes, the present invention is lifting support equipment that provides the loading processes of the rolling stock by taking trailers, tow trucks, and containers, which can't be lifted on their owns, on its own internal basin and transport ramp, wherein it includes;

- A sidewall sheet which ensures limiting the width at which the entrance of the vehicle to be lifted could be the easiest depending on the train pocket, and acts as lifting grip,
- A foldable sensor face sheet providing the position data of the lifting support equipment catching mechanism found in the lifting vehicle in order to ensure lifting the loaded lifting support equipment,
- To make sure positioning of the tow truck transport ramps constantly at a definite angle;
 - At least two pieces of tow truck transport ramp pin, which are passed through at least two pieces of ramp pin slots, and make sure that the ramp is fixed by its part, on which it is loaded onto the coach, by the means of the container lock, or,
 - A tow truck transport ramp pin that is passed through the ramp pin slot at the front of the tow truck transport ramp, and a fixed leg providing support at the back,
- An entrance/exit ramp with 90 degrees hinge, which is used for vehicle entry and exit, and foldable when required, and saving space in the train when folded,
- The lifting lugs, which make sure that the lifting support equipment itself is lifted and transported.

[0019] Structural and characteristic features and all advantages of the invention will be understood clearer thanks to the figures provided below and the detailed explanation based on these figures. Therefore, assessment should be made by considering these figures and the detailed explanation.

Helpful Figures to Understand the Invention

[0020]

Figure 1 is the general view of the lifting support equipment of the invention.

Figure 2 is the side detailed view of the lifting support equipment of the invention.

Figure 3 is the view of the entrance ramp with 90 degrees hinge in the lifting support equipment of the invention.

Figure 4 is the view of the tow truck transport ramp and the elements on it.

Figure 5 is the detailed view of the ramp pin slot and the ramp pins.

Figure 6 is the view of fixing alternative with double-pinning of the tow truck transport ramps.

Figure 7 is the view of fixing alternative with double-pinning of the tow truck transport ramps.

Figure 8 is the view of the fixing alternative with front pin back fixed leg of the tow truck transport ramps.

Figure 9 is the view of the fixing alternative with front pin back fixed leg of the tow truck transport ramps.

Figure 10 is the detailed view of the pressure springs.

Figure 11 is the detailed view of the tow truck transport ramp pins.

[0021] The drawings absolutely need to be scaled, and details not required for understanding the present invention may have been ignored. In addition, the elements, which are at least substantially identical or having at least substantially identical functions, are represented with the same number.

Description of Part References

[0022]

1. Sidewall sheet
2. Foldable sensor face sheet
- 2.1 Pressure springs
3. Ramp pin slots
4. Wheel basin sheets
5. Middle carcass sheets
6. Fixed entrance/exit ramp
7. Entrance/exit ramp with 90 degrees hinge
8. Ramp serrations
9. Lifting lugs
10. Perforated base sheets
11. Tow truck transport ramp
12. Tow truck transport ramp pins
- 12.1 Train container locks
13. Wheel locking shims
14. Tow truck transport ramp pin levers
15. Fixed leg

Detailed Description of the Invention

[0023] In this detailed explanation, preferred embodiments of the invention are explained only to provide a further understanding of the subject matter of the invention without causing any limiting effect.

[0024] The lifting support equipment of the invention is used for loading processes of the rolling stock by taking trailers, tow trucks, and containers, which can't be lifted on their owns, on its own internal basin and transport ramp.

[0025] The sidewall sheet (1) of the lifting support equipment acts as limiting the width (2640 mm) at which the entrance of the vehicle to be lifted could be the easiest depending on the train pocket, and lifting grip (max. 36 tons). The foldable sensor face sheet (2) is responsible for providing the position data of the lifting support equipment catching mechanism found in the lifting vehicle, which was specially designed to lift the loaded lifting support equipment. The lifting support equipment ensures that container variations can be smoothly loaded after foldable sensor face sheet (2) is folded outwards, and container variations can be transported smoothly as a result of the sensor face sheet's (2) returning to the vertical position with the thrust of the pressure spring (2.1).

[0026] The slots (3) of the tow truck transport ramp pins and the tow truck transport ramps (11) are positioned permanently at requested angle. The fixed-angle positioning process is carried out by inserting the ramp pins (12) in the pin slots (3). The tow truck transport ramps (2) can be fixed at an angle in two different ways. The first one is to provide fixing at an angle by passing two pieces of tow truck transport ramp pin (12) through two pieces of ramp pin slots (3) of the tow truck transport ramps (11) (Refer to Fig. 6 and Fig. 7). The second one is to make sure that the tow truck transport ramp pin (12) is passed through the front of tow truck transport ramp (11), and supporting it from the back with the fixed leg (15). (Refer to Fig. 8 and Fig. 9).

[0027] The wheel basin (4) is 2 pocket basins designed with due regard in order to keep the trailer entering in the lifting support equipment at the transverse and longitudinal optimal center of gravity, and at the suitable height limit in the top-over-bottom loading.

[0028] The middle carcass sheets (5) perform the task of setting up the middle carcass of the lifting support equipment, and providing the position where the lifting support equipment needs to be within the train pocket on the sub-floor depending upon the train pocket and train centres of gravity.

[0029] The fixed entrance ramp (6) and the entrance/exit ramp with 90 degrees hinge (7) are the ramps which are used for vehicle entrance and exit.

[0030] The ramp serrations (8) and the perforated sheets (10) take on the task of providing the vehicle wheels with extra hold, antipatinage in the course of vehicle entrance and exit into/from the lifting support equipment.

[0031] The lifting lugs (9) take on the task of lifting and transporting the lifting support equipment itself.

[0032] The tow truck transport ramps (11) found in the lifting support equipment, which are responsible for transporting the tow truck, carry out the duty of transporting the tow truck at an angle determined from two different points.

[0033] The wheel locking shims (13) prevent the vehicle on the ramp from moving by stopping the wheels of the vehicles on the tow truck transport ramp (11).

Claims

1. Lifting support equipment that provides the loading processes of the rolling stock by taking trailers, tow trucks, and containers, which can't be lifted on their owns, on its own internal basin and transport ramp, wherein it includes;

- A sidewall sheet (1) which ensures limiting the width at which the entrance of the vehicle to be lifted could be the easiest depending on the train pocket, and acts as lifting grip,

- A foldable sensor face sheet (2) providing the position data of the lifting support equipment catching mechanism found in the lifting vehicle in order to ensure lifting the loaded lifting support equipment,

- To make sure positioning of the tow truck transport ramps (11) constantly at a definite angle;

- At least two pieces of tow truck transport ramp pin (12), which are passed through at least two pieces of ramp pin slots (3), and make sure that the ramp is fixed by its part, on which it is loaded onto the coach, by the means of the container lock; or

- A tow truck transport ramp pin (12) that is passed through the ramp pin slot (3) at the front of the tow truck transport ramp (11), and a fixed leg (15) providing support at the back,

- An entrance/exit ramp with 90 degrees hinge (7), which is used for vehicle entry and exit, and foldable when required, and when folded, saving space in the train,

- The lifting lugs (9), which make sure that the lifting support equipment itself is lifted and transported.

2. The lifting support equipment according to claim 1, wherein it includes the wheel basin (4) designed with due regard in order to keep the trailer entering in the lifting support equipment at the transverse and longitudinal optimal centre of gravity, and at the suitable height limit in the top-over-bottom loading.

3. The lifting support equipment according to claim 1, wherein the lifting support equipment includes the middle carcass sheets (5), which perform the task of setting up the middle carcass of the lifting support equipment, and providing the position where the lifting support equipment needs to be within the train pocket on the sub-floor depending upon the train pocket and train centres of gravity. 5
4. The lifting support equipment according to claim 1, wherein it comprises the fixed entrance ramp (6) used for the vehicle entrance and exit. 10
5. The lifting support equipment according to claim 1, wherein it comprises ramp serrations (8) and perforated sheets (10), which take on the task of providing the vehicle wheels with extra hold, antipatinage in the course of vehicle entrance and exit into/from the lifting support equipment. 15
6. The lifting support equipment according to claim 1, wherein it comprises the pressure springs (2.1), which make sure that the foldable sensor face sheet (2) returns to the upright position. 20
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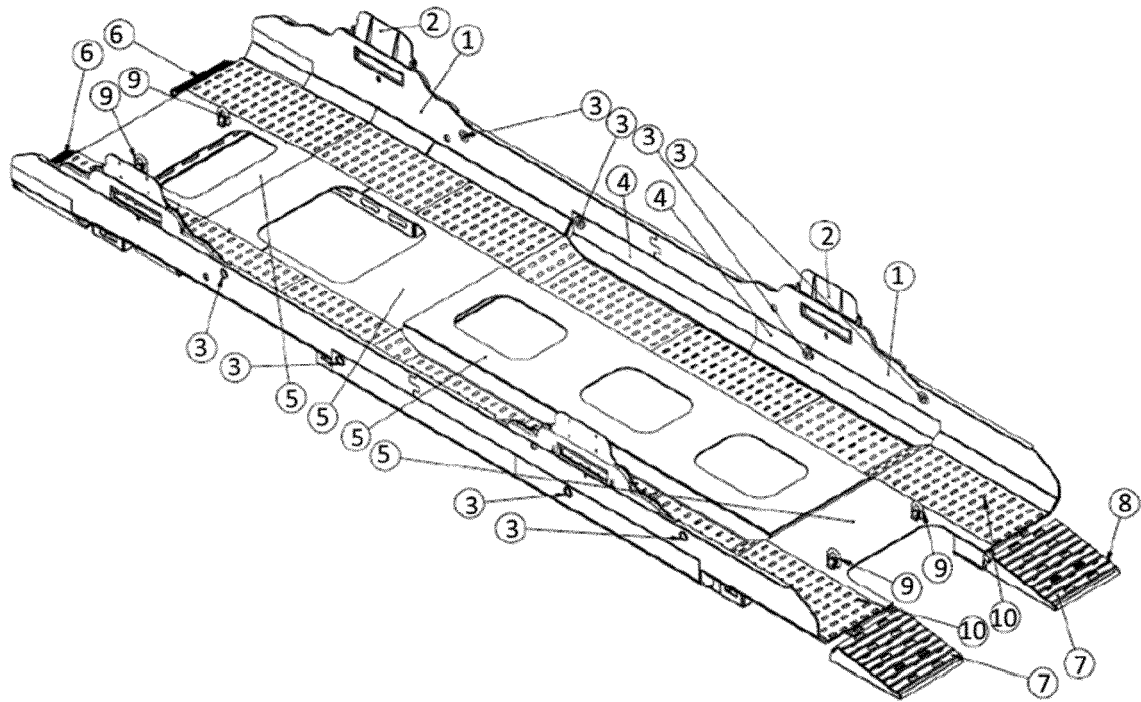


FIGURE 1

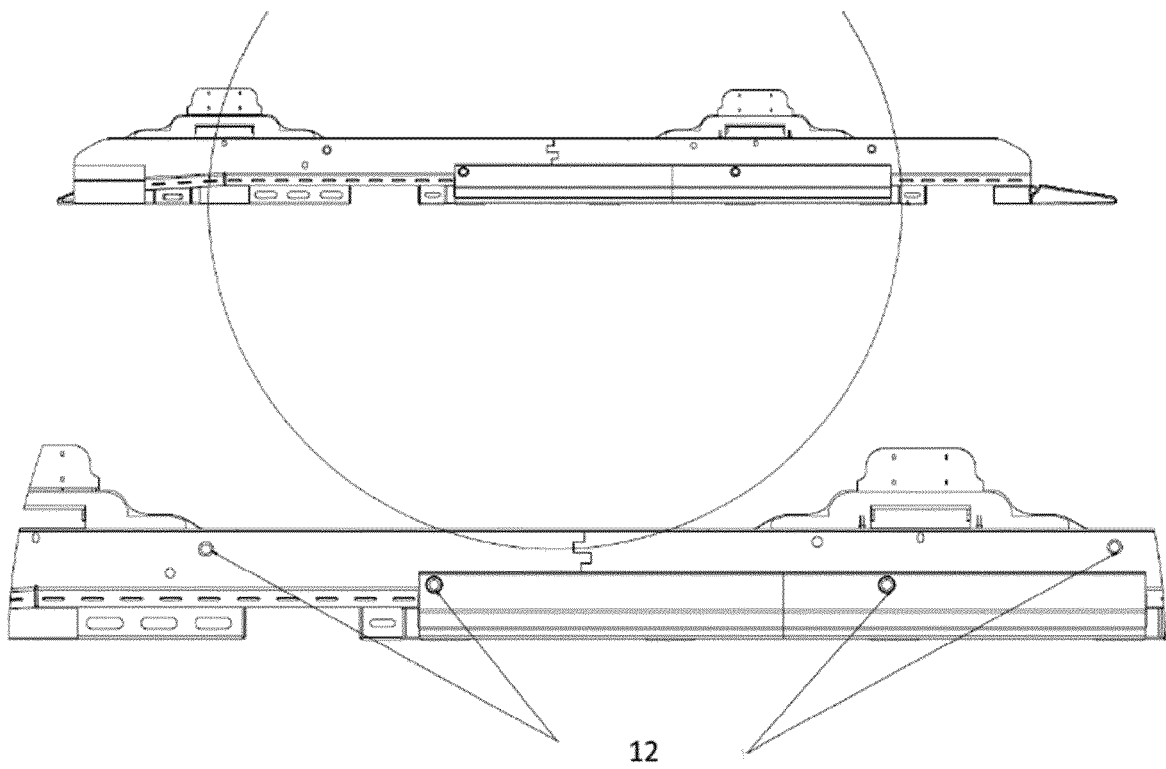


FIGURE 2

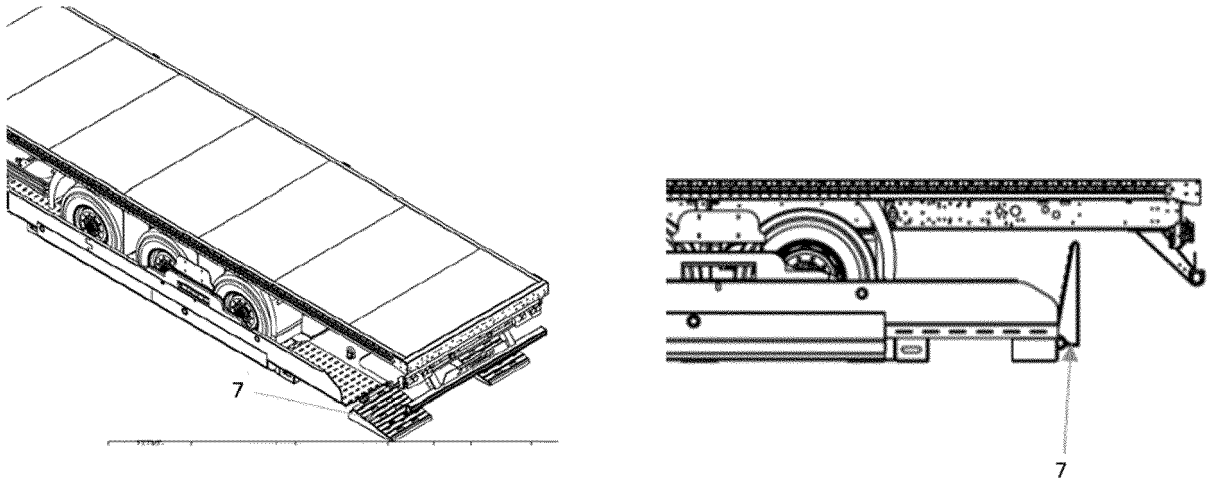


FIGURE 3

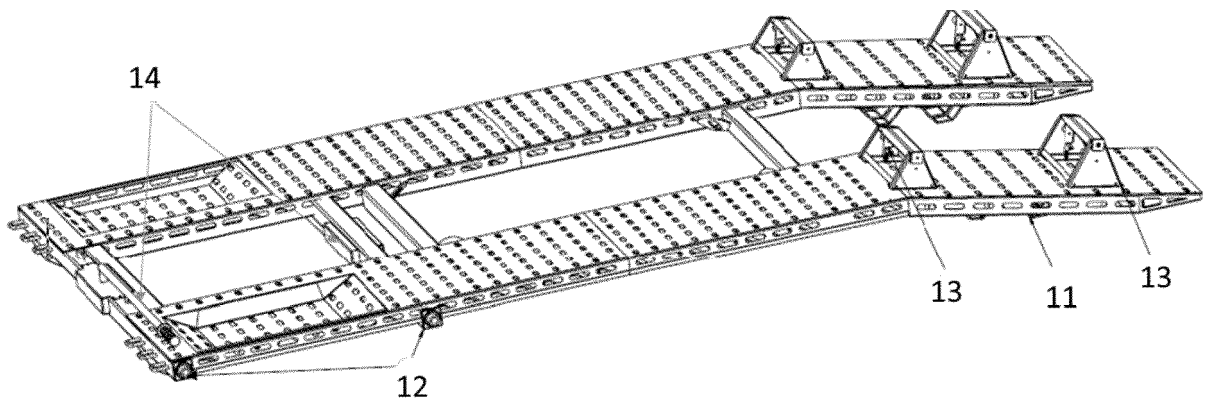


FIGURE 4

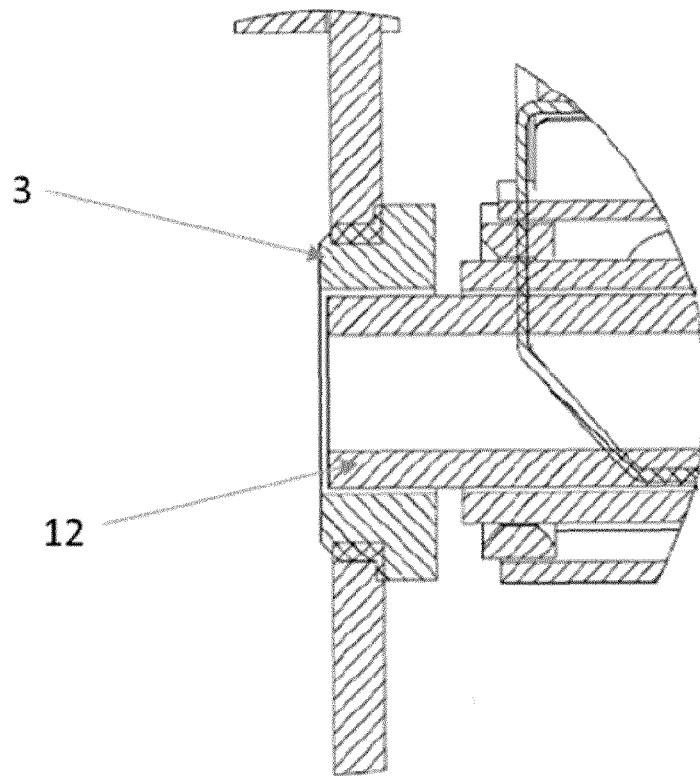


FIGURE 5

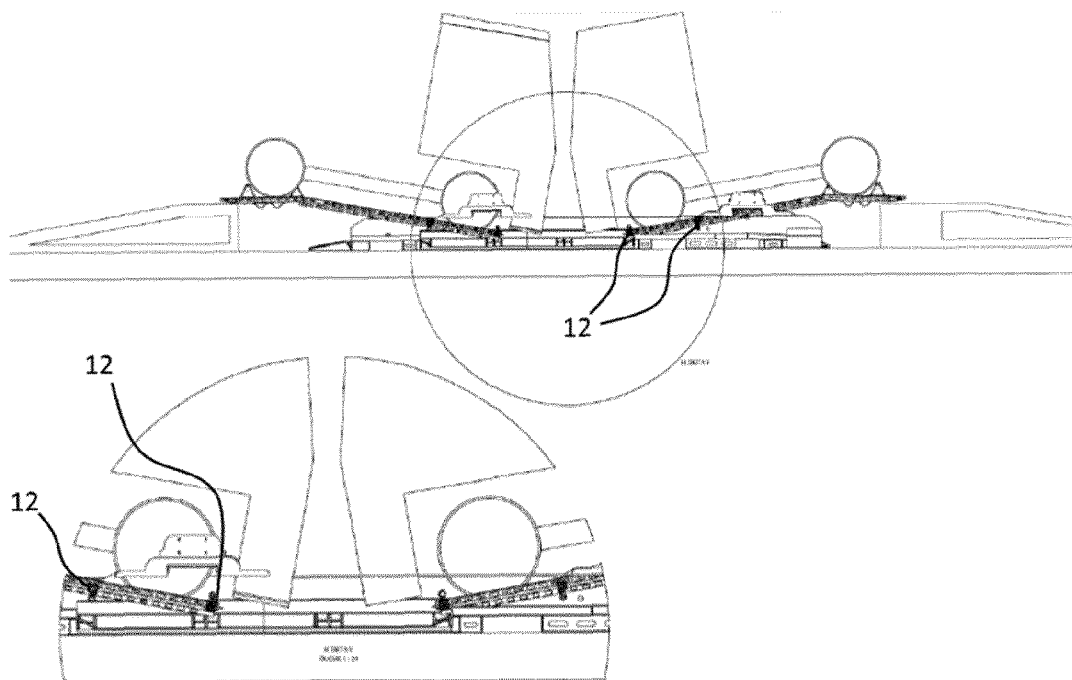


FIGURE 6

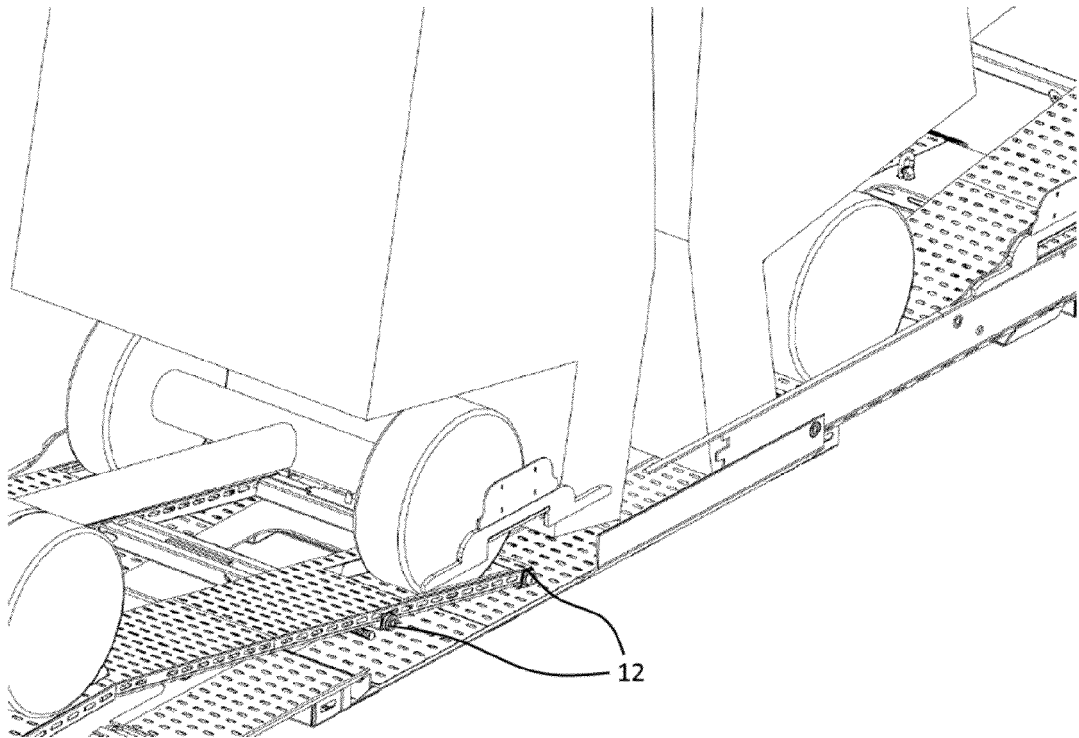


FIGURE 7

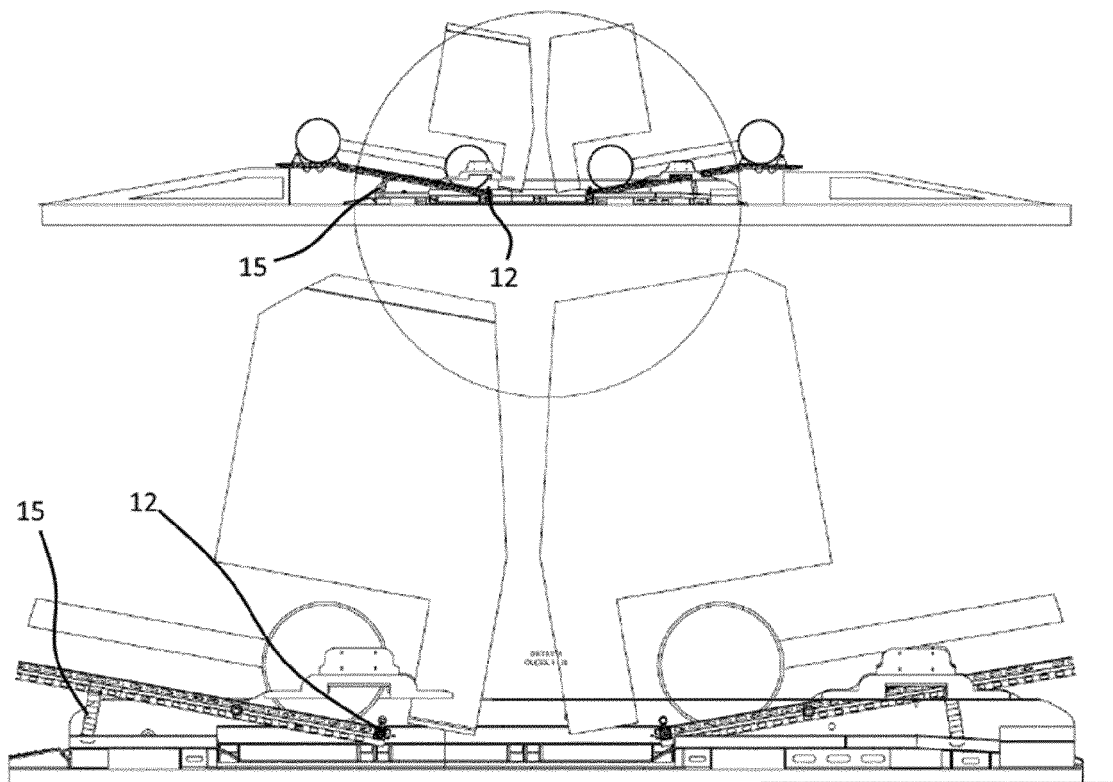


FIGURE 8

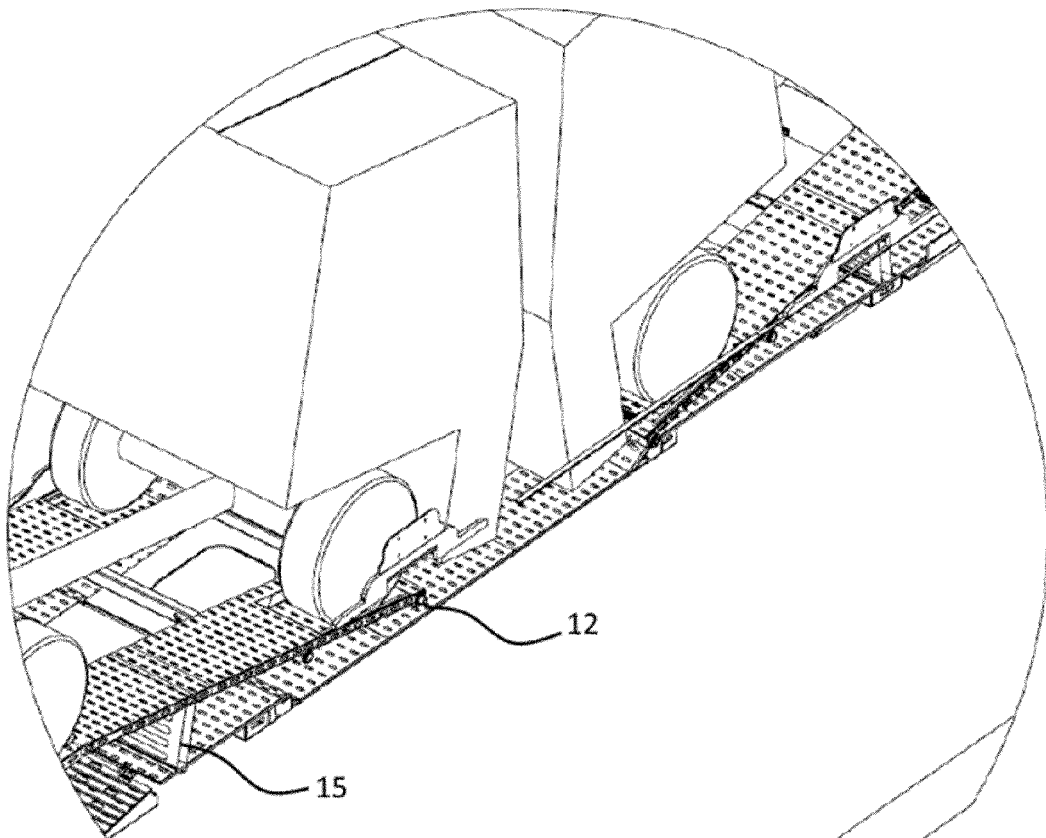


FIGURE 9

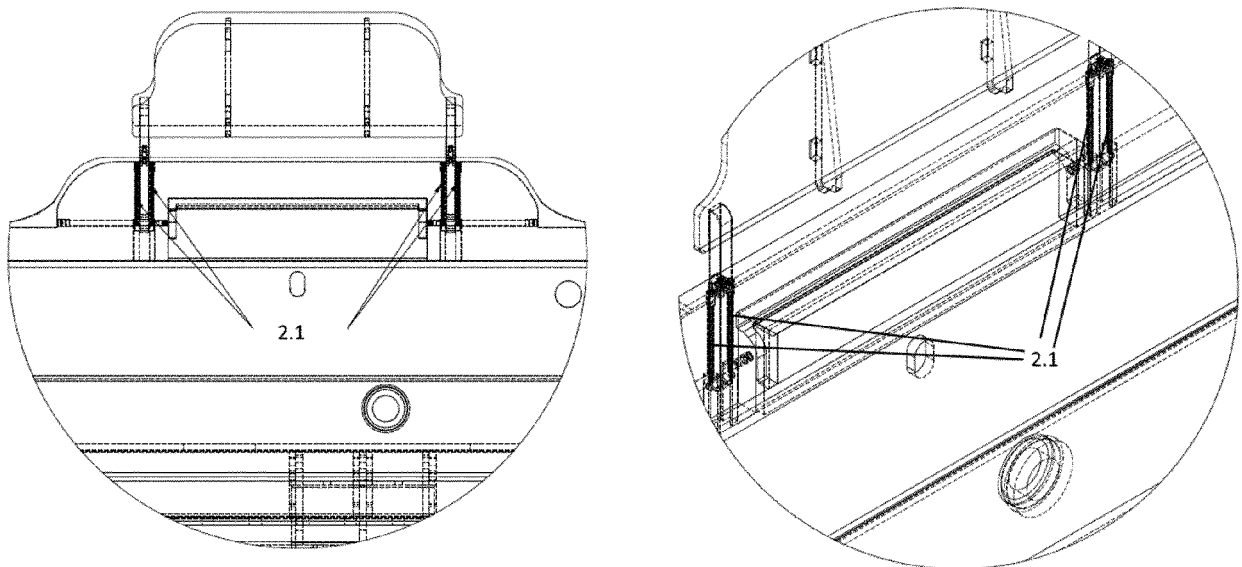


FIGURE 10

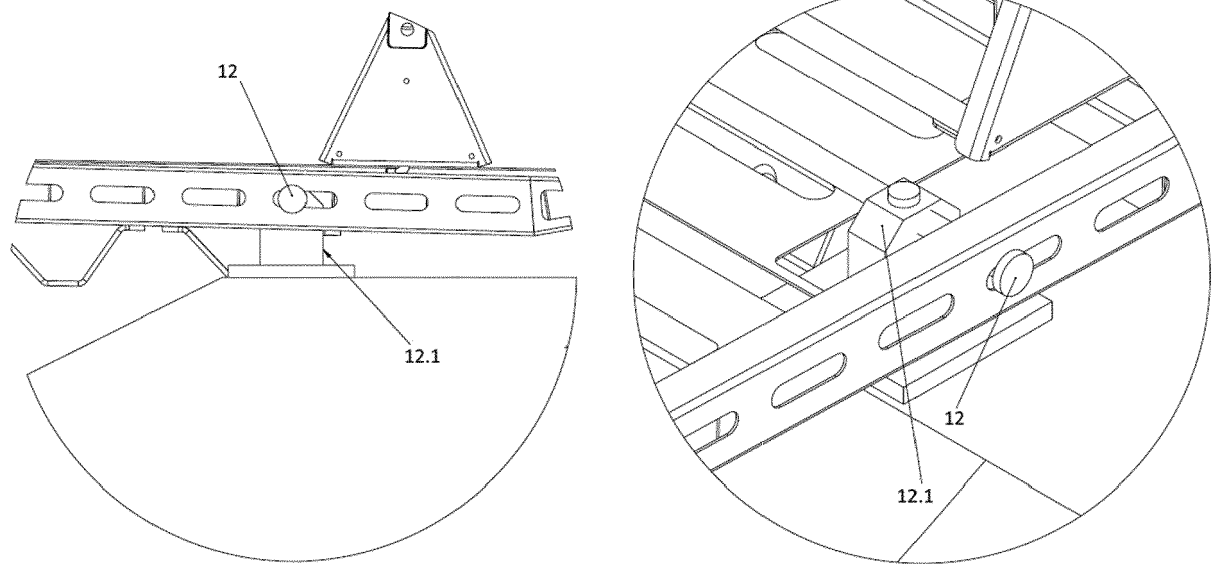


FIGURE 11



EUROPEAN SEARCH REPORT

 Application Number
 EP 19 18 6806

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The present search report has been drawn up for all claims			
Place of search Munich		Date of completion of the search 7 February 2020	Examiner Awad, Philippe
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 19 18 6806

5 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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07-02-2020

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