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"Reversing Aid for a Vehicle"

Introduction

This invention relates to a reversing aid for a vehicle and in particular for an articulated truck and trailer vehicle.

This invention relates to the manoeuvring of vehicles, and in particular to the safe reversing of vehicles during manoeuvring without damage to persons or property. Articulated truck vehicles are widely used for the transport of goods. Many deliveries are made in darkness, either at night or early morning. Very often the vehicle has to be reversed up to or through an entrance to a storage yard or building. Safe reversing whilst manoeuvring the vehicle is difficult firstly due to poor illumination and secondly due to blind spots which occur particularly when the vehicle is turning.

The present invention is directed towards overcoming these problems.

Summary of the Invention

According to the invention there is provided a reversing aid for a vehicle including:

a support for mounting on the vehicle;

an arm mounted on the support, the arm being movable on the support between a stored position and an operative position in which the arm projects laterally outwardly at a side of the vehicle in use;

a lamp mounted on the arm with means for connection to a power supply for operation of the lamp to illuminate a side of the vehicle in use; and

a lamp switch which is operably connected to the lamp for controlling operation of the lamp.

In one embodiment of the invention a camera is mounted on the arm for viewing along

a side of the vehicle in use, the camera being connected to a remote viewing screen at a driving station for the vehicle.

In another embodiment of the invention a proximity sensor is mounted on the arm connected to an audible alarm for mounting at the driving station.

In another embodiment of the invention the arm is pivotally mounted on the support.

In another embodiment of the invention the arm is pivotally movable in a vertical plane.

In another embodiment of the invention the arm is pivotally movable between a vertical stored position and a horizontal operative position.

In an alternative embodiment of the invention the arm is pivotally movable in a horizontal plane.

In another embodiment of the invention the arm is slidably mounted on the support for movement between the stored position and the operative position.

In another embodiment of the invention the arm is telescopic.

In a further embodiment of the invention the arm has an associated drive for movement of the arm between the stored position and the operative position.

In another embodiment of the invention the arm drive is a motor mounted on the support and operably connected to the arm for moving the arm on the support.

In another embodiment of the invention the arm drive is a ram.

In another embodiment of the invention the ram is operable to extend and retract the arm on the support.

In a further embodiment of the invention the operation of the arm drive is regulated by a controller which is mounted at the drive station in use. It is also envisaged that an arm drive controller could be mounted on the support either instead of, or in addition to

an arm drive controller mounted at the drive station.

In another embodiment of the invention the support comprises a housing for reception of the arm when the arm is in the stored position, the housing having an opening in a side wall of the housing through which the arm is movable when travelling between the stored position and the operative position.

In another embodiment of the invention a seal is provided at the opening.

In a preferred embodiment of the invention, the seal is a brush-seal mounted about a periphery of the opening.

In another embodiment, the reversing aid includes a mounting bracket associated with the support, said mounting bracket for attachment to a vehicle in use, and the support being demountably engagable with the mounting bracket.

In another embodiment, complementary interengagable formations are provided on the mounting bracket and on the support for demountable engagement of the support on the mounting bracket.

In another embodiment, the complementary interengagable formations comprise a hinge channel on one of the mounting bracket and the support, and an associated hinge bar on the other of the mounting bracket and the support for engagement with the hinge channel, a locking tongue on one of the mounting bracket and the support which is engagable through an associated lock receiver slot on the other of the mounting bracket and the support with means for securing the locking tongue in engagement with the lock receiver slot.

In another embodiment the invention provides a reversing aid for a vehicle including a support for mounting on the vehicle, one or more of a lamp and a camera mounted on the support with means for connection to a power supply for operation of the lamp and/or camera to illuminate and/or view along a side of the vehicle in use; and a switch which is operably connected to the lamp and/or camera for controlling operation of the lamp and/or camera.

Brief Description of the Drawings

The invention will be more clearly understood by the following description of some embodiments thereof, given by way of example only with reference to the accompanying drawings, in which:

Fig. 1 is a perspective view of a reversing aid for a vehicle according to the invention;

Fig. 2 is a schematic plan view illustrating the reversing aid in use mounted on a vehicle;

Fig. 3 is a view similar to Fig. 2 illustrating the vehicle in another manoeuvring position;

Fig. 4 is a perspective view of another reversing aid according to a second embodiment of the invention;

Fig. 5 is an exploded perspective view of a reversing aid according to a third embodiment of the invention;

Fig. 6 is a side elevational view of a mounting bracket portion of the reversing aid shown in Fig. 6; and

Fig. 7 is a perspective view of an articulated tractor and trailer.

Detailed Description of the Preferred Embodiments

Referring to the drawings, and initially to Figs. 1 to 3 thereof, there is illustrated a reversing aid for a vehicle according to the invention indicated generally by the reference numeral 1. The reversing aid 1 comprises a support 2 for mounting on a vehicle such as an articulated trailer 3 connected to a tractor vehicle 4 (Fig. 2). An arm 5 is mounted on the support 2 and is pivotally movable between an upright stored position and a horizontal operative position as shown in Fig. 1 in which the arm 5

projects laterally outwardly at a side of the trailer 3 in use. A lamp 6 is mounted at an outer end of the arm 5 and is connected to the power supply of the tractor vehicle 4 for operation of the lamp 6 to illuminate a side 7, 8 of the trailer 3 in use. A lamp switch 9 which is operably connected to the lamp 6 for controlling operation of the lamp 6 is mounted within the tractor vehicle 4 at a driving station within a cab of the tractor vehicle 4. Alternatively the lamp switch 9 could be mounted on the support 2, such that when the arm 5 moves into the deployed operative position it actuates the switch 9 to switch on the lamp 6.

Optionally, a camera 10 may also be mounted at an outer end of the arm 5 and is directed rearwardly for viewing along a side 7, 8 of the trailer 3 in use. The camera 10 is connected to a remote viewing screen 19 at the driving station within the cab of the tractor vehicle 4.

Proximity sensors 11, 12 may also be mounted at an outer end of the arm 5 and connected to an audible alarm at the driving station within the cab of the tractor vehicle 4 to alert the driver if the arm 5 is about to hit the sides of an opening through which the trailer 3 is being driven, or the tractor vehicle 4 when turning to manoeuvre the trailer 3.

The support 2 in this case comprises a box-like housing 14 with outwardly projecting mounting flanges 15 for attachment to a front end of the trailer 3. Through-holes 16 are provided in the mounting flanges 15 for reception of mounting bolts to secure the housing 14 on the trailer 3. An opening 17 in a side wall of the housing 14 allows through-passage of the arm 5 between a stored position within the housing 14 and an outwardly extending operative positon as shown in Fig. 1. A brush-seal 18 extends around a periphery of the opening 17. The brush-seal 18 allows through-passage of the arm 5 while excluding dirt, tyre spray, etc. from an interior of the housing 14.

The arm 5 is of tubular construction and has an inner end 20 pivotally mounted within the housing 14. The inner end 20 is mounted on a pivot shaft journaled within the housing 14 and projecting outwardly through a side wall 22 of the housing 14 for connection to an electrical drive motor 23 which is operable to pivot the arm 5 on the housing 14 between the stored position and the operative positon. In this case the motor 23 is shown mounted on an exterior of the side wall 22, however it will be

appreciated that the motor 23 could be mounted within the housing 14 if desired.

A mounting plate 25 is provided at an outer end 26 of the arm 5. The lamp 6 is mounted on one side of the mounting plate 25, in this case forming the upper face when the arm 5 is in the horizontal operative position. The camera 10 is mounted on the opposite side (lower face) of the mounting plate 25. Both the lamp 6 and camera 10 are rearwardly facing when in use i.e. when mounted at the front end of the trailer 3 they face rearwardly along the side 7, 8 of the trailer 3 for illuminating and/or viewing the side 7, 8 of the trailer 3. The proximity sensors 11, 12 are also mounted on the mounting plate 25, one facing rearwardly and the other facing forwardly. Cabling for these devices 6, 10, 11, 12 is conveniently routed through the hollow interior of the arm 5 for connection to the power supply of the tractor vehicle 4. Suitable connectors may be provided on the mounting plate 25 for mounting and removal of these devices on the arm 5.

Figs. 2 and 3 show the trailer 3 being manoeuvred by the tractor vehicle 4 through an entrance 30 in a wall 31 with pillars 32 forming an entrance 30 to a premises or building behind the wall 31.

In use, the reversing aid 1 is provided at a front end of the trailer 3 on a front face of the trailer 3. Typically two reversing aids 1 are provided, one reversing aid 1 being mounted at each side of the trailer 3. It will be noted that the housing 14 is mounted flush with or inboard of the sides 7, 8 of the trailer 3. Thus, the arm 5 when in the stored position within the housing 14 is inboard of the sides 7, 8 of the trailer 3. When required to assist in reversing manoeuvres, the arm 5 is pivoted by the motor 23 from the vertical stored position within the housing 14 to a horizontal laterally extending operative position as shown in Figs. 2 and 3 projecting laterally outwardly at each side 7, 8 of the trailer 3. With the lamp 6 switched on, each side 7, 8 of the trailer 3 is well illuminated so the driver within the cab of the tractor 4 has a clear view to ensure no one is standing alongside the vehicle and facilitate lining up of the trailer 3 with the entrance 30 through which the trailer 3 is to be driven. As the trailer 3 moves back through the entrance 30, the rearwardly facing proximity sensors 11 will give warning if the arm 5 is about hit the pillars 32 so that the arms 5 can be folded into the stored position before driving the front end of the trailer 3 through the entrance 30.

The cameras 10 also provide views back along each side 7, 8 of the trailer 3 displayed on a split screen 19 within the cab of the tractor vehicle 4 at the driving position. The cameras 10 are particularly beneficial when turning the trailer 3 into the entrance 30 as shown in Fig. 3 in which position the tractor vehicle 4 and trailer 3 are angled relative to each other and thus the driver of the tractor vehicle 4 cannot use the mirrors on the tractor vehicle 4 to see back along one side 7 of the trailer 3.

It will be appreciated that the system of the invention allows the driver to have a clear view of the trailer wheels on the blindside of the vehicle when manoeuvring the vehicle which is particularly advantageous from a safety point of view.

Referring now to Fig. 4, there is shown another reversing aid for a vehicle according to a second embodiment of the invention indicated generally by the reference numeral 40. Parts similar to those described previously are assigned the same reference numerals. In this case the arm 5 is slidably movable between a retracted stored position within the housing 14 and an extended operative position as shown in Fig. 4 extending outwardly of the housing 14. A double-acting ram 41 mounted within the housing 14 is operable to extend and retract the arm 5.

Referring now to Fig. 5 and Fig. 6, there is shown another reversing aid for a vehicle according to a third embodiment of the invention, indicated generally by the reference numeral 50. Parts similar to those described previously are assigned the same reference numerals. In this case, the reversing aid 50 includes a mounting bracket 51 associated with a support 52. The mounting bracket 51 is for attachment to a vehicle and the support 52 is demountably engagable with the mounting bracket 51. Thus, conveniently, a number of mounting brackets 51 may be provided for mounting on different vehicles such as trailers and the support 52 may be moved from vehicle to vehicle as required.

The mounting bracket 51 comprises a rectangular mounting plate 53 with a plurality of through holes 54 for attachment of the mounting plate 53 to the front end of a trailer or other vehicle as previously described. A hinge channel 56 is provided at a lower end of the mounting plate 53 projecting outwardly of a front face 57 of the mounting plate 53. A locking tongue 58 is centrally mounted above the hinge channel 56 on the front face 57 and projects forwardly of the front face 57. A through hole 59 in the locking

tongue 58 receives a locking bolt or padlock.

A hinge bar 60 at a bottom of the housing 14 of the support 52 is engagable with the hinge channel 56 and when engaged the hinge bar 60 sits within the hinge channel 56. A lock receiver slot 61 above the hinge bar 60 receives the hinge tongue 58 when the hinge bar 60 is engaged with the hinge channel 56. A locking bolt or padlock (not shown) within the housing 14 can be used to engage the slot 59 in the locking tongue 58 to secure the support 52 on the mounting bracket 51. In this case the arm and motor are mounted within the housing and in Fig. 5 the arm is shown in the stored position within the housing 14.

It will be appreciated that this embodiment allows a single set of supports 52 to be used with a number of different trailers or implements drawn at different times by a single tractor unit. An appropriate wiring loom for connection to the various devices on the arm 5 and the motor 23 may be supported on or adjacent the mounting bracket 51 for easy connection and disengagement when mounting the support 52 on the mounting bracket 51 and subsequently removing it therefrom.

Fig. 7 shows an articulated tractor 4 and associated trailer 3 combination showing a number of possible mounting points 73 on a front face 74 of the trailer 3 at a forward end of the trailer at which a reversing aid 1, 40, 50 might be mounted, with a second reversing aid 1, 40, 50 being mounted in similar fashion at an opposite side of the front face 74 of the trailer 3.

For trailers designed to carry container boxes, the reversing aids would be mounted at a front end of the trailer chassis.

It will be appreciated that the arm of the reversing aid can be deployed to a side of the vehicle when required and when not needed can be returned to a stored position inboard of the vehicle sides so as not to exceed the maximum legal limit for vehicle width on public roads. When in the operative position, it allows for safe reversing and illuminates blind spots at a side of the vehicle when reversing to park or unload the vehicle, particularly in confined spaces. Because of the lamp and/or camera, the driver of the vehicle can clearly view along each side of the vehicle.

It is envisaged that a "break-away" system may be incorporated into the arm so that it will fold back if it comes into contact with an obstacle such as a wall to prevent damage to the lamp, or camera.

While the reversing aid has been described above in use on an articulated trailer, it could also be used on fixed bed trucks and other vehicles to improve safety whilst reversing the vehicle. It is mounted adjacent a front end of the vehicle for illuminating and/or viewing along a side of the vehicle.

Various different mechanisms for deploying and retracting the arm can be employed such as motors, rams, rack and pinion mechanisms for example.

It is also envisaged that the reversing aid might be temporarily deployed in transit for checking the blind sports before turning into entrances, roundabouts and making right or left turns. Dropping down or extending the arm 5 would allow the driver of the tractor vehicle 4 to see and confirm that the trailer 3 is not going to collide with a wall, another vehicle, cyclist or pedestrian during this manoeuvre.

In an alternative arrangement the arm could be dispensed with and one or more of the lamp, camera and proximity sensors could be directly mounted at a side of the vehicle instead.

Further, while the preferred mounting position for the reversing aid is at a front side of the trailer, it could alternatively be mounted on the tractor vehicle, for example on the rear mudguard of the tractor vehicle. On this and on other vehicles, such as agricultural tractors, caravans, fixed bed lorries etc., the reversing aid can be mounted at any suitable location which illuminates or displays the side of the vehicle, and in particular the blind spots, for the driver manoeuvring the vehicle.

In the specification the terms "comprise, comprises, comprised and comprising" or any variation thereof and the terms "include, includes, included and including" or any variation thereof are considered to be totally interchangeable and they should all be afforded the widest possible interpretation and vice versa.

The invention is not limited to the embodiments hereinbefore described which may be

varied in both construction and detail within the scope of the appended claims.

CLAIMS

1. A reversing aid for a vehicle including:

a support for mounting on the vehicle;

an arm mounted on the support, the arm being movable on the support between a stored position and an operative position in which the arm projects laterally outwardly at a side of the vehicle in use;

a lamp mounted on the arm with means for connection to a power supply for operation of the lamp to illuminate a side of the vehicle in use; and

a lamp switch which is operably connected to the lamp for controlling operation of the lamp.

2. The reversing aid as claimed in claim 1 wherein a camera is mounted on the arm for viewing along a side of the vehicle in use, the camera being connected to a remote viewing screen at a driving station for the vehicle.

3. The reversing aid as claimed in claim 1 or claim 2 wherein a proximity sensor is mounted on the arm connected to an audible alarm for mounting at the driving station.

4. The reversing aid as claimed in any preceding claim, wherein the support comprises a housing for reception of the arm when the arm is in the stored position, the housing having an opening in a side wall of the housing through which the arm is movable when travelling between the stored position and the operative position.

5. The reversing aid substantially as hereinbefore described with reference to the accompanying drawings.

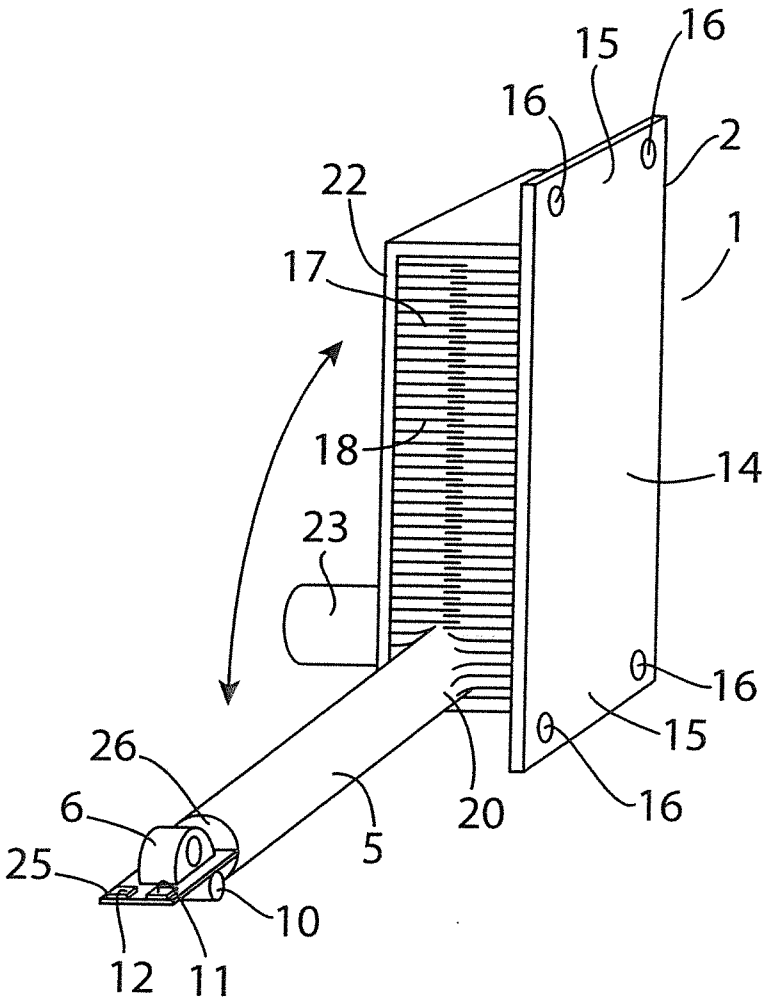


Fig. 1

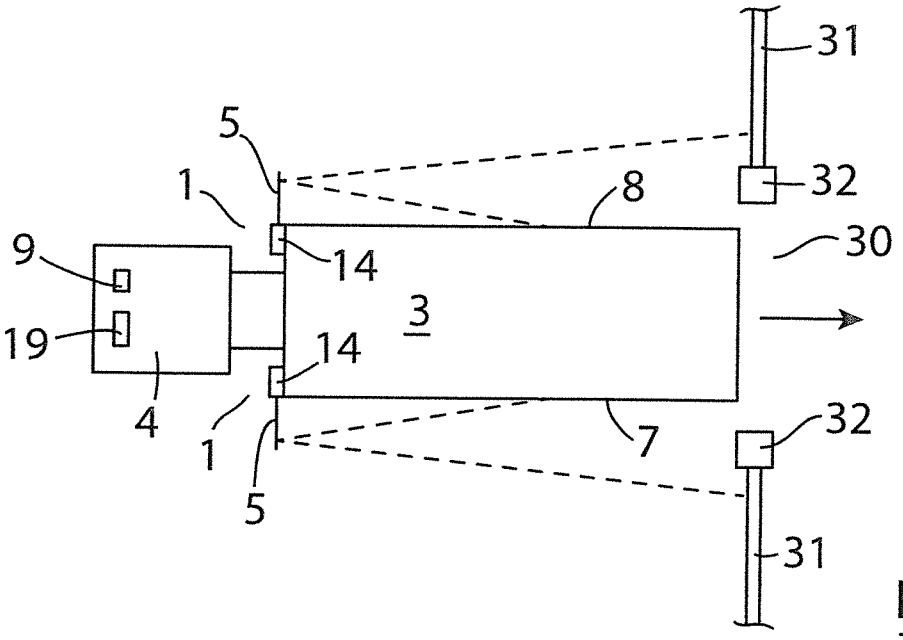

31
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Fig. 2

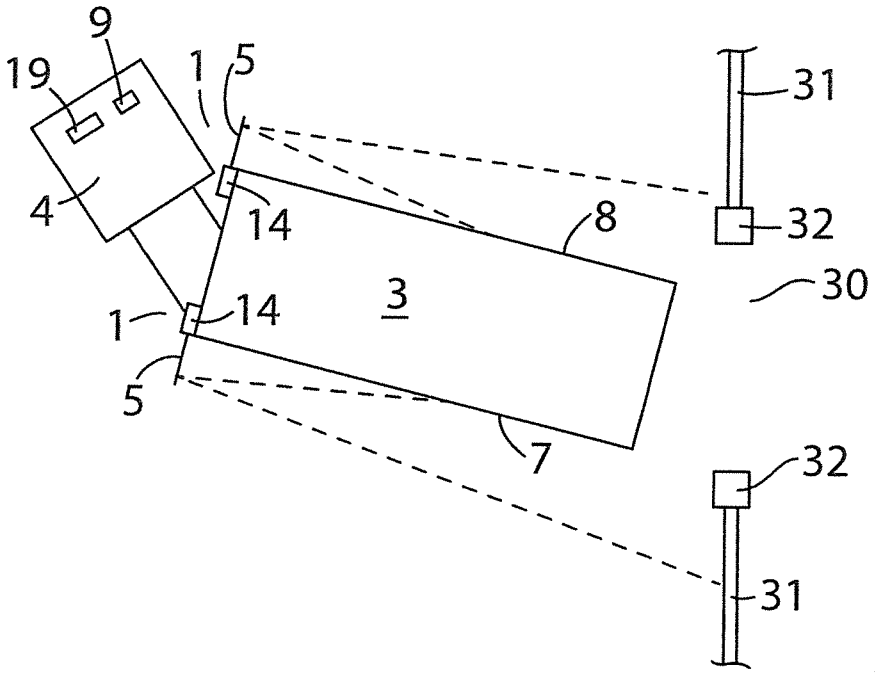

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Fig. 3

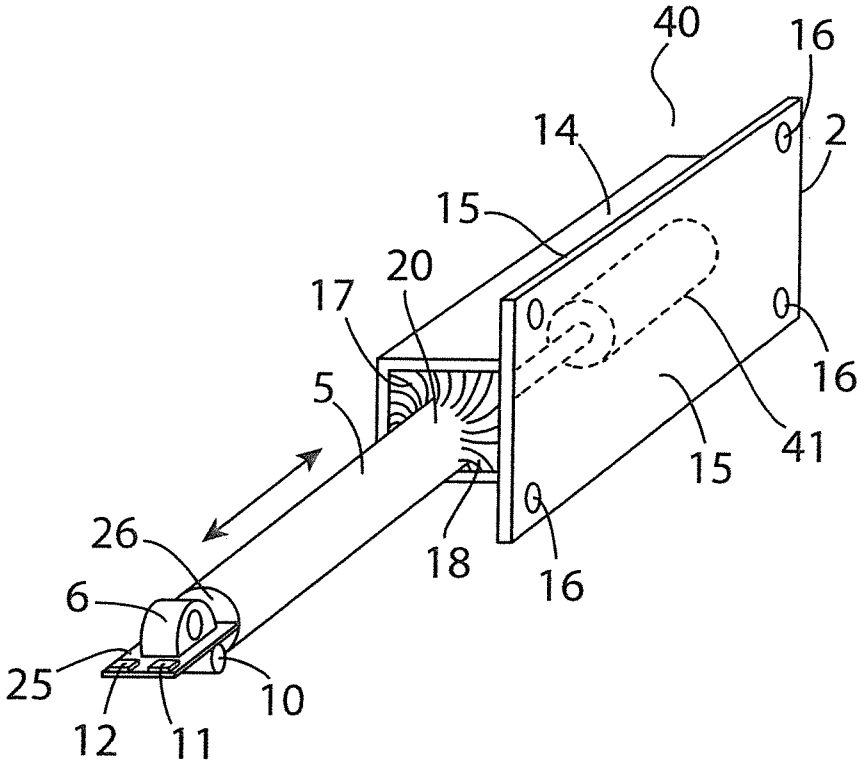
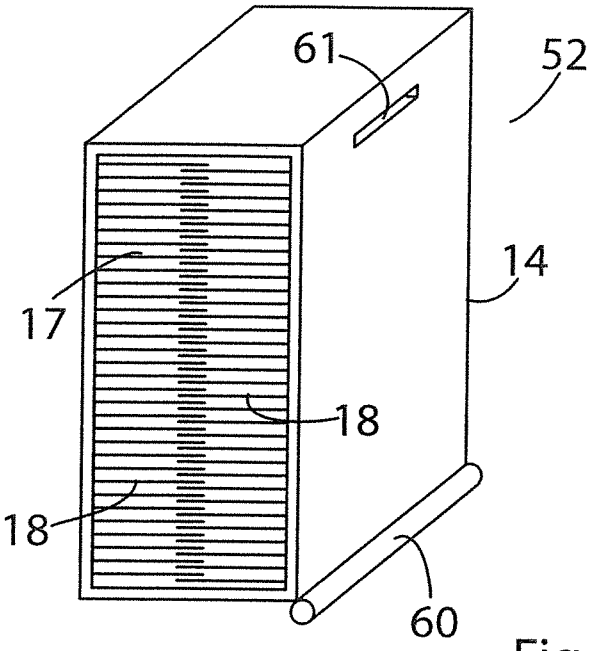


Fig. 4



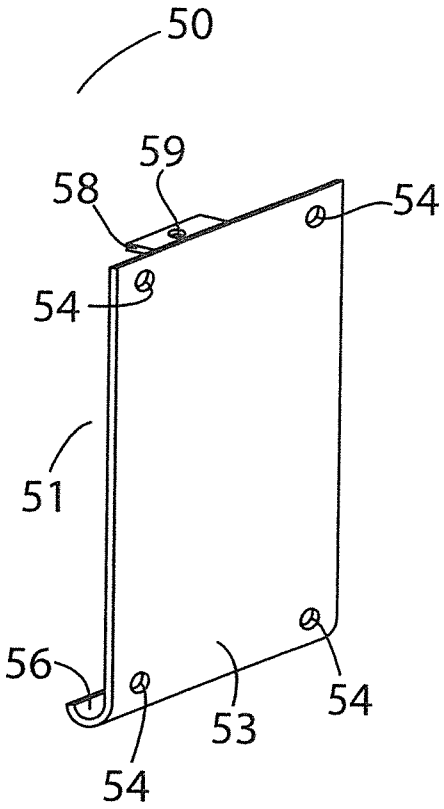


Fig. 5

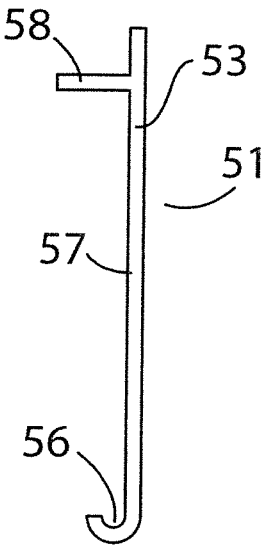


Fig. 6

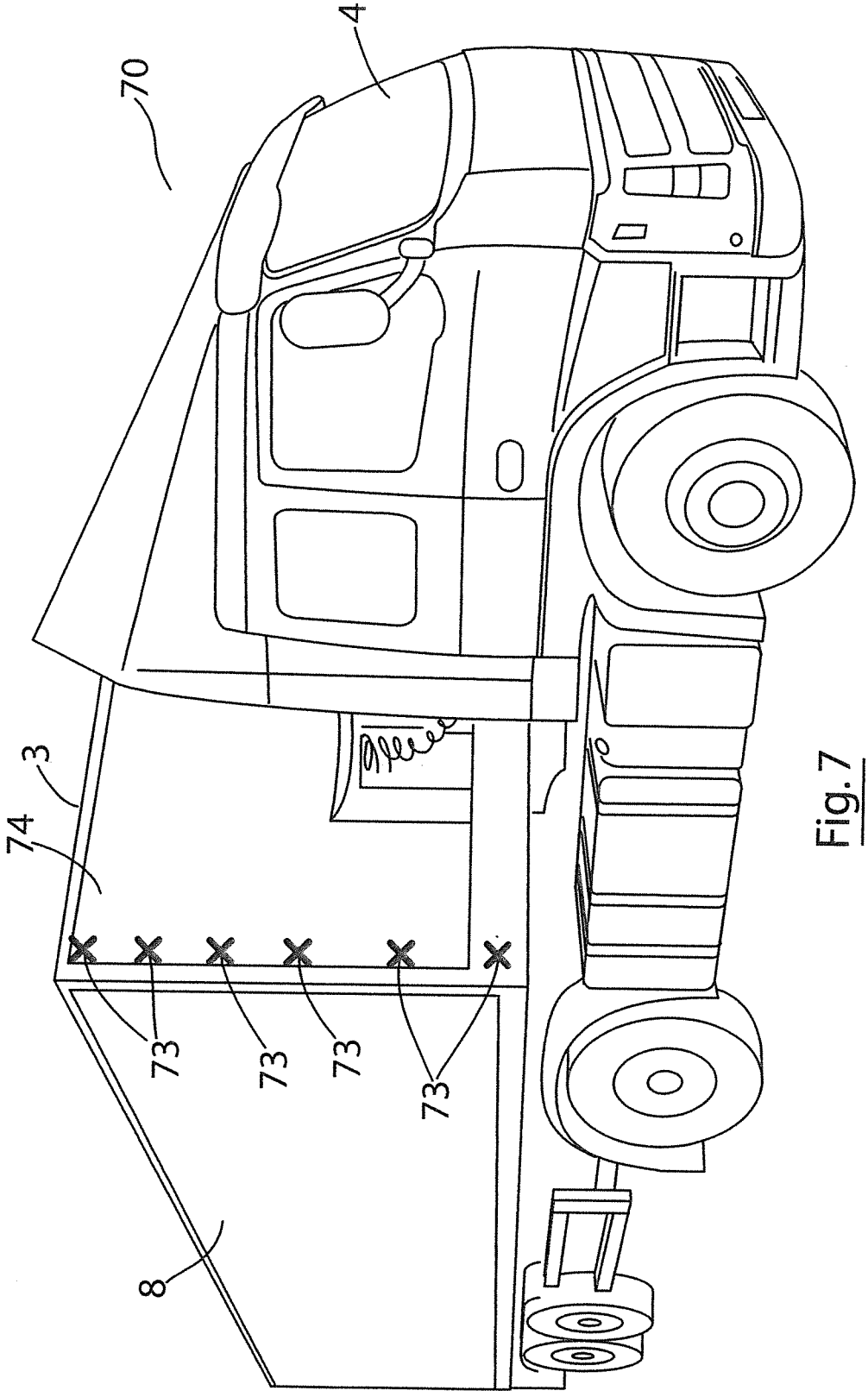


Fig. 7