(54) Title: METHOD AND SYSTEM FOR LEVEL ADJUSTMENT OF VEHICLE CONFIGURATION

(57) Abstract: The present invention concerns a method for level adjustment of a vehicle configuration (1, 2, 3, 4, 5) comprising the step of adjusting the tilt of a vehicle configuration to an essentially horizontal position by means of the level adjusting functions of the vehicle configuration, wherein the step of adjusting the tilt of the vehicle configuration comprises the steps of obtaining (S1) information about the tilt of the vehicle configuration (1, 2, 3, 4, 5) by means of tilt sensing devices; and adjusting (S2) the tilt of the vehicle configuration to an essentially horizontal position by means of level adjusting functions of the vehicle configuration on the basis of said information. The present invention also concerns a system for level adjustment of a vehicle configuration (1, 2, 3, 4, 5). The present invention further concerns a motor vehicle. The present invention also concerns a computer program and a computer program product.

Fig. 2
METHOD AND SYSTEM FOR LEVEL ADJUSTMENT OF VEHICLE CONFIGURATION

TECHNICAL FIELD OF THE INVENTION

5 The invention concerns a method for level adjustment of a vehicle configuration according to the preamble to claim 1. The invention also concerns a system for level adjustment of a vehicle configuration according to the preamble to claim 8. The invention further concerns a vehicle. The invention also concerns a computer program and a computer program product.

BACKGROUND

When loading and unloading cargo, it is a consideration that the load platform be as horizontal as possible. If the load platform is tilted and relatively heavy cargo such as a loading pallet is to be loaded or unloaded, the risk of damage is present, as the loading pallet could start to roll and it may be difficult to restrain it. Current distribution vehicles are usually equipped with air suspension on at least the rear axle, but often on the front axle as well. Using such a suspension, the driver can adjust the tilt of the vehicle relative to the horizontal plane. This is usually accomplished in that, so as to be better able to determine the tilt of the load platform, the driver stands outside the vehicle with a remote control and thereby manually adjusts the levels of the individual axles.

Distribution runs involving loading and unloading are often driven on tight schedules, which sometimes results in negligence in adjusting the level of the vehicle load platform. There is also a risk that the load platform level will be misjudged. In the case of heavier cargo, even small tilts will suffice to cause the cargo to start rolling when it is lifted.
When parking goods vehicles, and particularly parking them in cases where the driver intends to rest in the vehicle cab, it is necessary to adjust the vehicle on sloped terrain so that the vehicle will stand securely and the driver will be able to lie horizontally in comfort in the vehicle cab bunk while resting.

OBJECT OF THE INVENTION

One object of the present invention is to provide a method for level adjustment of a vehicle configuration that facilitates the level adjustment thereof.

One object of the present invention is to provide a system for level adjustment of a vehicle configuration that facilitates the level adjustment thereof.

SUMMARY OF THE INVENTION

These and other objects, which are specified in the description below, are achieved by means of a method and system and a vehicle, a computer program and a computer program product of the type identified above, and which further exhibit the features specified in the characterizing portion of accompanying independent claims 1, 8, 15, 16 and 17. Preferred embodiments of the method and the system are defined in accompanying non-independent claims 2-7 and 8-14.

According to the invention, these objects are achieved by means of a method for level adjustment of a vehicle configuration, which method comprises the step of adjusting the tilt of the vehicle configuration to an essentially horizontal position by means of the level adjusting functions of the vehicle configuration, wherein the step of adjusting the tilt of the vehicle configuration comprises the steps of: obtaining information about the tilt of the vehicle
configuration by means of tilt sensing devices, and of adjusting the tilt of the vehicle configuration to an essentially horizontal position by means of the level adjusting functions of the vehicle configuration on the basis of said information. Level adjustment of the vehicle configuration is hereby facilitated in that the operator need not carry out any necessary level adjustments himself. Furthermore, more accurate level adjustment is enabled in that the tilt of the vehicle configuration is adjusted to an essentially horizontal position without the operator having to adjust manually, with the appurtenant risk of misjudging the tilt. Because such adjustments can occur relatively quickly and without manual adjustment by the operator, the risk is reduced that the driver/operator will dispense with adjusting in order to save time even if a level adjustment is needed.

According to one embodiment of the method, said vehicle configuration includes at least one of the units consisting of a vehicle cab, vehicle load platform, vehicle chassis and rear liftgate unit.

According to one embodiment of the method, the step of adjusting the tilt of the vehicle configuration to an essentially horizontal position pertains to said vehicle load platform. This enables efficient loading and unloading in that the tilt of the vehicle load platform is hereby adjusted to an essentially horizontal position without the operator himself having to make this determination. Safe loading and unloading is further enabled in that the tilt of the vehicle load platform is adjusted to an essentially horizontal position without the operator having to adjust manually, with the appurtenant risk of misjudging the tilt, and in that adjustment can occur relatively quickly and without manual adjustment by the operator, which lowers the risk that the driver/operator will dispense with making an adjustment in order to save time. The risk of injury during loading and unloading is thus reduced.

According to one embodiment of the method, the step of adjusting the tilt of the vehicle configuration to an essentially horizontal position pertains to said vehicle cab. Level adjustment of the vehicle cab so that the vehicle cab is
essentially horizontal is hereby facilitated, which improves the comfort of the
driver while, for example, resting in the cab when the vehicle is parked on
sloped terrain.

According to one embodiment of the method, the step of adjusting the tilt of
the vehicle configuration to an essentially horizontal position pertains to said
vehicle chassis. Level adjustment of the vehicle chassis so that the vehicle
chassis is essentially horizontal is hereby facilitated, which can, for instance,
be advantageous in a goods vehicle with a crane where use of the crane is
facilitated if the vehicle chassis is essentially horizontal.

According to one embodiment of the method, the step of adjusting the tilt of
the vehicle configuration to an essentially horizontal position pertains to said
rear liftgate. Loading and unloading are hereby facilitated, and the safety
during loading and unloading increases.

According to one embodiment of the method, the step of adjusting said rear
liftgate to an essentially horizontal position is carried out in order to
compensate for imperfections in the horizontal adjustment of said load
platform. Loading and unloading is hereby facilitated and the safety during
loading and unloading increases in that the rear liftgate is adjusted to an
essentially horizontal position even if the slope of the terrain is such that the
load platform of the vehicle cannot be adjusted to a horizontal position but
rather exhibits a certain tilt despite having been adjusted.

According to the invention, these objects are achieved by means of a system
for level adjustment of a vehicle configuration, which system comprises
means for adjusting the tilt of the vehicle configuration to an essentially
horizontal position by means of the level adjusting functions of the vehicle,
wherein said means for adjusting the tilt of the vehicle configuration comprise
means for: obtaining information regarding the tilt of the vehicle configuration
from tilt sensing devices, and means for adjusting the tilt of the vehicle
configuration to an essentially horizontal position by means of the level
adjusting functions of the vehicle configuration on the basis of said information. Level adjustment of the vehicle configuration is hereby facilitated in that the operator need not carry out any needed level adjustments himself. Furthermore, more accurate level adjustment is enabled in that the tilt of the vehicle configuration is adjusted to an essentially horizontal position without the operator having to adjust manually, with the appurtenant risk of misjudging the tilt. Because such adjustment can occur relatively quickly and without manual adjustment by the operator, the risk is reduced that the driver/operator will dispense with an adjustment in order to save time even if a level adjustment is needed.

According to one embodiment of the system, said vehicle configuration comprises at least one of the units vehicle cab, vehicle load platform and rear liftgate.

According to one embodiment of the system, said means for adjusting the tilt of the vehicle configuration to an essentially horizontal position pertain to means for adjusting said vehicle load platform. This enables efficient loading and unloading in that the tilt of the vehicle load platform is hereby adjusted to an essentially horizontal position without the operator himself having to make this determination. Safe loading and unloading is further enabled in that the tilt of the vehicle load platform is adjusted to an essentially horizontal position without the operator having to adjust manually, with the appurtenant risk of misjudging the tilt, and in that adjustment can occur relatively quickly and without manual adjustment by the operator, which lowers the risk that the driver/operator will dispense with making an adjustment in order to save time.

The risk of injury during loading and unloading is thus reduced.

According to one embodiment of the system, said means for adjusting the tilt of the vehicle configuration to an essentially horizontal position pertain to means for adjusting said vehicle cab. Level adjustment of the vehicle cab so that the vehicle cab is essentially horizontal is hereby facilitated, which
improves the comfort of the driver while, for example, resting in the cab when
the vehicle is parked on sloped terrain.

According to one embodiment of the system, said means for adjusting the tilt
of the vehicle configuration to an essentially horizontal position pertain to
means for adjusting said vehicle chassis. Level adjustment of the vehicle
chassis so that the vehicle chassis is essentially horizontal is hereby
facilitated, which can, for instance, be advantageous in a goods vehicle with
a crane where use of the crane is facilitated if the vehicle chassis is
essentially horizontal.

According to one embodiment of the system, said means for adjusting the tilt
of the vehicle configuration to an essentially horizontal position pertain to
means for adjusting said rear liftgate. Loading and unloading are hereby
facilitated, and the safety during loading and unloading increases.

According to one embodiment of the system, said means for adjusting said
rear liftgate to an essentially horizontal position are arranged so as to
compensate for imperfections in the horizontal adjustment of said load
platform. Loading and unloading are hereby facilitated and the safety during
loading and unloading increases in that the rear liftgate is adjusted to an
essentially horizontal position even if the slope of the terrain is such that the
load platform of the vehicle cannot be adjusted to a horizontal position but
rather exhibits a certain tilt despite having been adjusted.

DESCRIPTION OF THE FIGURES

The present invention will be better understood with reference to the
following detailed description read in conjunction with the accompanying
drawings, wherein the same reference designations refer to the same parts
throughout the many views, and wherein:
Fig. 1 schematically illustrates a motor vehicle according to one embodiment of the present invention;

Fig. 2 schematically illustrates a system for level adjustment of a vehicle configuration according to one embodiment of the present invention;

Figs. 3a-e schematically illustrate the vehicle in Fig. 1 in various tilt, loading and unloading situations;

Fig. 4 schematically illustrates a block diagram of a method for level adjustment of a vehicle configuration according to one embodiment of the present invention; and

Fig. 5 schematically illustrates a computer according to one embodiment of the present invention.

DESCRIPTION OF EMBODIMENTS

The term "link" refers herein to a communication link, which can be a physical line, such as an opto-electronic communication line, or a non-physical line, such as a wireless connection, for example a radio or microwave link.

Fig. 1 schematically illustrates a motor vehicle 1 according to one embodiment of the present invention. The exemplary vehicle 1 consists of a heavy vehicle in the form of a goods vehicle. The vehicle comprises a system 1 for level adjustment of a vehicle configuration according to the present invention.

Fig. 2 schematically illustrates a system for level adjustment of a vehicle configuration according to one embodiment of the present invention.

The system 1 comprises an electronic control unit 100 for said level adjustment of a vehicle configuration of the vehicle.
The system further comprises tilt sensing devices 110 for obtaining information about the tilt of the vehicle configuration and consequently configured so as to obtain information about the tilt of the vehicle configuration.

Said vehicle configuration comprises at least one of the units consisting of a vehicle cab, vehicle load platform, vehicle chassis or rear liftgate of said vehicle.

According to one variant, said tilt sensing devices 110 are arranged so as to obtain information about the tilt of said vehicle cab. According to one variant, said tilt sensing devices 110 are arranged so as to obtain information regarding the tilt of said vehicle load platform. According to one variant, said tilt sensing devices 110 are arranged so as to obtain information regarding the tilt of said vehicle chassis. According to one variant, said tilt sensing devices 110 are arranged so as to obtain information regarding the tilt of said rear liftgate.

According to one variant, said tilt sensing devices 110 comprise accelerometer devices 112. According to one variant, said accelerometer devices 112 are included in the customary vehicle accelerometer configuration of the anti-skid system of the vehicle and/or the customary vehicle accelerometer configuration for a clutch actuator. Said accelerometer devices are configured so as to determine the tilt of the vehicle configuration based on a given assumption regarding a gravitational constant.

Said accelerometer devices are configured so as to determine the tilt of the vehicle cab using a given assumption regarding a gravitational constant. Said accelerometer devices are configured so as to determine the tilt of the vehicle load platform using a given assumption regarding a gravitational constant. Said accelerometer devices are configured so as to determine the tilt of the vehicle chassis using a given assumption regarding a gravitational constant. Said accelerometer devices are configured so as to determine the
tilt of the rear liftgate vehicle cab using a given assumption regarding a gravitational constant.

According to one variant, said tilt sensing devices 110 comprise pressure sensing devices 114 in the air suspension system of the vehicle. Said pressure sensing devices 114 comprise pressure sensing devices arranged in respective air suspension devices. Said pressure sensing devices 114 are arranged so as to sense pressures in connection with each respective vehicle axle/vehicle wheel, i.e. the pressure in each respective air suspension device in the air suspension system.

According to one variant, said tilt sensing devices 110 comprise a pendulum device 116. The pendulum device 116 is arranged so as to sense the angle at which the vehicle configuration of the vehicle is inclined relative to the horizontal plane.

The system I further comprises level adjusting means 120 for adjusting the tilt of the vehicle configuration to an essentially horizontal position. According to one variant, said level adjusting means 120 are contained in the vehicle configuration. Said level adjusting means 120 have level adjusting functions for said adjusting of the tilt of the vehicle configuration to an essentially horizontal position.

According to one variant, said vehicle configuration comprises an air suspension system for a vehicle. According to one embodiment, said level adjusting means 120 consist of an air suspension system of a vehicle configuration, which system comprises air suspension devices, such as bellows devices, for adjusting the tilt of the vehicle to an essentially horizontal position. The air suspension devices of the air suspension system can have any suitable design whatsoever, depending on, for example, whether the vehicle is equipped with a bogie and/or additional wheel axles in which a plurality of air suspension devices are present, for example, an additional pair.
The system further comprises adjustment activating means 130 for activating said adjustment of the tilt of the vehicle to an essentially horizontal position. According to one variant, said adjustment activating means comprise a control device 130. According to one variant, said adjustment activating means consist of a control device 130.

According to one embodiment, said control device 130 is vehicle-born and, according to one variant, arranged in connection to the driver seat for easy access by the driver prior to said adjustment. According to one variant, said control device comprises a pushbutton, a rotary device or the equivalent for activating said adjustment.

According to one embodiment, said control device 130 is spring-loaded and, according to one variant, contained in a spring unit that the driver/operator can carry with him to thereby obtain access prior to said adjustment. According to one variant, said control device 130 comprises a pushbutton, a rotary device or the equivalent for activating said adjustment.

The electronic control unit 100 is signal-connected to said tilt sensing devices 110 so as to obtain information about the tilt of the vehicle configuration via a link 10a. The electronic control unit 100 is arranged via the link 10a so as to receive a signal from said tilt sensing devices 110 representing tilt data for the tilt of the vehicle configuration.

The electronic control unit 100 is signal-connected to said adjustment activating means 130 for activating adjustment of the tilt of the vehicle via a link 30. The electronic control unit 100 is arranged via the link 30 so as to receive a signal from said adjustment activating means 130 representing activating data for activating adjustment of the tilt of the vehicle configuration. According to one variant, said activating data comprise data for activating adjustment of the tilt of the vehicle cab and/or the tilt of the vehicle load platform and/or the tilt of the vehicle chassis and/or the tilt of the rear liftgate unit.
The electronic control unit 100 is signal-connected to said level adjusting means 120 for adjusting the tilt of the vehicle configuration via a link 20a. The electronic control unit 100 is arranged via the link 20a so as to send a signal to said level adjusting means 120 representing adjustment data for adjusting the tilt of the vehicle configuration. According to one variant, said adjustment data comprise height data for the respective air suspension devices in said air suspension system. According to one variant, said adjustment data comprise data for adjusting the tilt of the vehicle cab and/or the tilt of the vehicle load platform and/or the tilt of the vehicle chassis and/or the tilt of the rear lift gate unit.

The electronic control unit 100 is signal-connected to said level adjusting means 120 via a link 20b. The electronic control unit 100 is arranged via the link 20b so as to receive a signal from said level adjusting means 120 representing level data for the current level of said level adjusting means, i.e. the height of the respective air suspension devices, according to one variant.

The electronic control unit 100 is signal-connected to said tilt sensing devices 110 via a link 10b. The electronic control unit 100 is arranged via the link 10b so as to send a signal to said tilt sensing devices representing tilt sensing device activation data for activating the retrieval of information regarding the tilt of the vehicle configuration.

The electronic control unit 100 is arranged so as to process said activation data from said adjustment activating means 130, i.e. from said control device 130 according to one variant, for said activation. According to one variant, said tilt sensing device 110 is thereby activated, whereupon the electronic control 100 receives and processes tilt data for the tilt of the vehicle configuration from said tilt sensing device 110. The electronic control unit 100 receives and processes tilt data for the tilt of the vehicle cab and/or the vehicle load platform and/or the vehicle chassis and/or the rear liftgate unit from said tilt sensing device 110.
According to an alternative variant, the electronic control unit 100 is arranged so as, upon receiving said activation data, to process said tilt data for the tilt of the vehicle configuration, and on the basis of said tilt data, to send adjustment data to said level adjusting means 120 for adjusting the tilt of the vehicle configuration, according to one variant, for adjusting the tilt of the vehicle cab and/or the tilt of the vehicle load platform and/or the tilt of the vehicle chassis and/or the tilt of the rear liftgate unit.

According to one embodiment of the system I, the tilt of the vehicle configuration is arranged so as to be adjusted in both the longitudinal direction of the vehicle and transversely thereto by means of front and/or rear air suspension devices in the air suspension system of the vehicle and/or by means of right and/or left air suspension devices in the air suspension system of the vehicle.

According to one variant, said adjustment is achieved by means of an iterative process in order to thereby achieve an essentially horizontal position of the vehicle configuration, according to one variant the vehicle cab and/or the vehicle load platform and/or the vehicle chassis and/or the rear liftgate unit.

Said level adjusting means for adjusting said rear liftgate unit to an essentially horizontal position are arranged so as to compensate for imperfections in the horizontal adjustment of said load platform. Loading and unloading are thereby facilitated, and safety during loading and unloading is increased in that the rear liftgate unit is adjusted to an essentially horizontal position even if the slope of the terrain is such that the load platform of the vehicle cannot be adjusted to a horizontal position but exhibits a certain tilt despite having been adjusted.

Figs. 3a-e schematically illustrate the vehicle in Fig. 1 in connection with various slopes of the road/ground G and various loading and unloading situations. The vehicle has a vehicle cab 2, a vehicle load platform 3, a
vehicle chassis 4 and a rear liftgate unit 5, which can be folded toward and away from the rear end piece of the vehicle and raised and lowered between the load platform L of the vehicle and a ground level G. The vehicle could also be designed as a vehicle that does not have a load platform.

Fig. 3a schematically illustrates the vehicle 1 on an uphill grade with an angle $\alpha_1$ prior to level adjustment for, for example, loading/unloading.

Fig. 3b schematically illustrates the vehicle 1 on an uphill slope as in Fig. 3a following adjustment by means of the system 1 according to the present invention, wherein the rear liftgate unit 5 is folded down.

Fig. 3c schematically illustrates the vehicle 1 in connection with a loading ramp L, wherein the vehicle is on a slight downhill slope with an angle $\alpha_2$, and wherein the tilt of the load platform 3 of the vehicle is adjusted by means of the system 1 according to the present invention.

Fig. 3d schematically illustrates the vehicle 1 on an uphill slope with an angle $\alpha_3$ following adjustment by means of the system 1 according to the present invention, wherein the adjustment of the horizontal tilt of said load platform is imperfect due to a limitation of the level adjusting means, according to one variant a limitation in the height adjustment of the air suspension devices of the air suspension system of the vehicle, so that the load platform 3 of the vehicle tilts at an angle $\alpha_4$ that is smaller than the angle $\alpha_3$ of the uphill slope. Here the system is arranged so as, by means of said level adjusting means, to adjust said rear liftgate unit to an essentially horizontal position, so that the rear liftgate unit is essentially horizontal despite the fact that the load platform of the vehicle tilts.

Fig. 3e schematically illustrates a frontal view of the vehicle cab 2 of the vehicle 1 on a lateral slope with an angle $\alpha_5$, wherein the tilt of the vehicle cab is adjusted to an essentially horizontal position by means of the system 1 according to the present invention.
Fig. 4 schematically illustrates a block diagram of a method for level adjustment of a vehicle configuration according to one embodiment of the present invention.

According to one embodiment, the method for level adjustment of a vehicle configuration comprises a first step S1. Information about the tilt of the vehicle configuration is obtained in this step by means of a tilt sensing devices.

According to one embodiment, the method for level adjustment of a vehicle configuration comprises a second step S2. In the step the tilt of the vehicle configuration is adjusted by means of the level adjusting functions of the vehicle to an essentially horizontal position on the basis of said information.

A diagram of an embodiment of an apparatus 500 is shown with reference to Fig. 5. In one embodiment, the control unit 100 that is described with reference to Fig. 2 can comprise the apparatus 500. The apparatus 500 comprises a non-volatile memory 520, a data-processing unit 510 and a read/write memory 550. The non-volatile memory 520 has a first memory section 530 in which a computer program, such as an operating system, is stored to control the function of the apparatus 500. The apparatus 500 further comprises a bus controller, a serial communication port, I/O devices, an A/D converter, the time and date input and transfer unit, an event counter and a termination controller (not shown). The non-volatile memory 520 also has a second memory section 540.

A computer program P is provided that contains routines for adjusting a vehicle configuration according to the innovative method. The program P contains routines for obtaining information about the tilt of a vehicle configuration by means of the tilt sensing devices. The program P contains routines for adjusting the tilt of a vehicle configuration by means of the lift adjusting functions of the vehicle configuration to an essentially horizontal position on the basis of said information. The program P can be stored in an
executable form or in a compressed form in a memory 560 and/or in a read/write memory 550.

When it is stated that the data-processing unit 510 performs a given function, it is to be understood that the data-processing unit 510 executes a certain part of the program that is stored in the memory 560, or a certain part of the program that is stored in the read/write memory 550.

The data-processing device 510 can communicate with a data port 599 via a data bus 515. The non-volatile memory 520 is intended to communicate with the data-processing unit 510 via a data bus 512. The separate memory 560 is intended to communicate with the data-processing unit 510 via a data bus 511. The read/write memory 550 is arranged so as to communicate with the data-processing unit 510 via a data bus 514. For example, the links appurtenant with the control unit 100 can be connected to the data port 599.

When data are received at the data port 599, they are stored temporarily in the second memory section 540. Once received input data have been stored temporarily, the data-processing unit 510 is arranged so as to execute code in a manner as described above. The signals received at the data port 599 can be used by the apparatus 500 to obtain information about the tilt of a vehicle configuration by means of tilt sensing devices. The signals received at the data port 599 can be used by the apparatus 500 to adjust the tilt of a vehicle configuration by means of the level adjusting functions of the vehicle configuration to an essentially horizontal position on the basis of said information.

Parts of the methods described herein can be performed by the apparatus 500 with the help of the data-processing unit 510, which runs the program stored in the memory 560 or the read/write memory 550. When the apparatus 500 runs the program, the methods described herein are executed.

The foregoing description of the preferred embodiments of the present invention has been furnished for illustrative and descriptive purposes. It is not
intended to be exhaustive, or to limit the invention to the variants described. Many modifications and variations will obviously be apparent to one skilled in the art. The embodiments have been chosen and described in order to best explicate the principles of the invention and its practical applications, and to thereby enable one skilled in the art to understand the invention in terms of its various embodiments and with the various modifications that are applicable to its intended use.
CLAIMS

1. A method for level adjustment of a vehicle configuration (1, 2, 3, 4, 5) comprising the step of adjusting the tilt of the vehicle configuration to an essentially horizontal position by means of a level adjusting function of the vehicle configuration, characterized in that the step of adjusting the tilt of the vehicle configuration by means of adjustment activating means comprises the steps of: obtaining (S1) information about the tilt of the vehicle configuration (1, 2, 3, 4, 5) by means of tilt sensing devices; and adjusting (S2) the tilt of the vehicle configuration by means of level adjusting functions of the vehicle configuration to an essentially horizontal position on the basis of said information.

2. A method according to claim 1, wherein said vehicle configuration (1, 2, 3, 4, 5) comprises at least one of the units consisting of a vehicle cab (2), vehicle load platform (3), vehicle chassis (4) or rear liftgate unit (5).

3. A method according to claim 2, wherein the step of adjusting the tilt of the vehicle configuration (1, 2, 3, 4, 5) to an essentially horizontal position pertains to said vehicle load platform (3).

4. A method according to claim 2, wherein the step of adjusting the tilt of the vehicle configuration (1, 2, 3, 4, 5) to an essentially horizontal position pertains to said vehicle cab (2).

5. A method according to claim 2, wherein the step of adjusting the tilt of the vehicle configuration (1, 2, 3, 4, 5) to an essentially horizontal position pertains to said vehicle chassis (4).

6. A method according to claim 2, wherein the step of adjusting the tilt of the vehicle configuration (1, 2, 3, 4, 5) to an essentially horizontal position pertains to said rear liftgate unit (5).

7. A method according to claim 6, wherein the step of adjusting said rear liftgate unit (5) to an essentially horizontal position is performed to
compensate for imperfections in the horizontal adjustment of said load platform (3).

8. A system (I) for level adjustment of a vehicle configuration (1, 2, 3, 4, 5) comprising means for adjusting the tilt of the vehicle configuration to an essentially horizontal position by means of a level adjusting function of the vehicle configuration, characterized in that adjustment activating means (130) are arranged so as to adjust the tilt of the vehicle configuration and comprise means (100, 110) for: obtaining information about the tilt of the vehicle configuration by means of tilt sensing devices (110); and means (100, 120, 130) for adjusting the tilt of the vehicle configuration to an essentially horizontal position by means of the level adjusting functions of the vehicle configuration on the basis of said information.

9. A system according to claim 8, wherein said vehicle configuration (1, 2, 3, 4, 5) comprises at least one of the units consisting of a vehicle cab (2), vehicle load platform (3), vehicle chassis (4) or rear liftgate unit (5).

10. A system according to claim 9, wherein said means (100, 120) for adjusting the tilt of the vehicle configuration (1, 2, 3, 4, 5) to an essentially horizontal position pertain to means (100, 120) for adjusting said vehicle load platform (3).

11. A system according to claim 9, wherein said means (100, 120) for adjusting the tilt of the vehicle configuration (1, 2, 3, 4, 5) to an essentially horizontal position pertain to means (100, 120) for adjusting said vehicle cab (2).

12. A system according to claim 9, wherein said means (100, 120) for adjusting the tilt of the vehicle configuration (1, 2, 3, 4, 5) to an essentially horizontal position pertain to means (100, 120) for adjusting said vehicle chassis (4).
13. A system according to claim 9, wherein said means (100, 120) for adjusting the tilt of the vehicle configuration (1, 2, 3, 4, 5) to an essentially horizontal position pertain to means (100, 120) for adjusting said rear liftgate unit (5).

14. A system according to claim 13, wherein said means (100, 120) for adjusting said rear liftgate unit (5) to an essentially horizontal position are arranged so as to be performed to compensate for imperfections in the horizontal adjustment of said load platform (3).

15. A motor vehicle (1) comprising a system (I) according to claims 8-14.

16. A computer program (P) for level adjustment of a vehicle configuration, which computer program (P) comprises program code which, when run by an electronic control unit (100) or another computer (500) connected to the electronic control unit (100), enables the electronic control unit (100) to perform the steps according to claims 1-7.

17. A computer program product comprising a digital storage medium that stores the computer program (P) according to claim 16.
START

S1

OBTAIN INFORMATION ABOUT TILT OF THE VEHICLE CONFIGURATION BY MEANS OF TILT SENSING DEVICES

S2

ADJUST THE TILT OF THE VEHICLE CONFIGURATION TO AN ESSENTIALLY HORIZONTAL POSITION BY MEANS OF LEVEL ADJUSTING FUNCTIONS OF THE VEHICLE CONFIGURATION ON THE BASIS OF SAID INFORMATION

END

Fig. 4
INTERNATIONAL SEARCH REPORT

A. CLASSIFICATION OF SUBJECT MATTER
IPCl see extra sheet
According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED
Minimum documentation searched (classification system followed by classification symbols)
IPC: B60G, B60P, B62D

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched
SE, DK, FI, NO classes as above

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)
EPO-Internal, PAJ, WPI data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

<table>
<thead>
<tr>
<th>Category</th>
<th>Citation of document, with indication, where appropriate, of the relevant passages</th>
<th>Relevant to claim No.</th>
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<td>X</td>
<td>US 201100468484 A1 (STENDER AXEL), 24 February 2011 (2011-02-24); abstract, paragraphs [0004], [0005], [0008]-[0011], [0019]-[0026], [0039]-[0041]; figures 5,6</td>
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<td>X</td>
<td>US 6273203 B1 (PAGGI BRUNO ET AL), 14 August 2001 (2001-08-14); abstract; claim 1</td>
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<td>X</td>
<td>US 20100030425 A1 (HOLBROOK GREGORY A ET AL), 4 February 2010 (2010-02-04); abstract; paragraphs [0002], [0013], [0014], [0056]; figure 2</td>
<td>1-17</td>
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Further documents are listed in the continuation of Box C.

See patent family annex.

Date of the actual completion of the international search
21-01-2014

Date of mailing of the international search report
22-01-2014

Name and mailing address of the ISA/SE
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Form PCT/ISA/210 (second sheet) (July 2009)
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<th>Category</th>
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<th>Relevant to claim No.</th>
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<tr>
<td>X</td>
<td>US 20050161891 A1 (TRUEDEAU CURTIS A ET AL), 28 July 2005 (2005-07-28); abstract; paragraphs [0030], [0031], [0037], [0038]; figures 6,7</td>
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<td>X</td>
<td>US 20040061293 A1 (BARBISON JAMES M), 1 April 2004 (2004-04-01); abstract; paragraph [0028]; claim 2</td>
<td>1, 8, 15-17</td>
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<tr>
<td>X</td>
<td>US 20080211254 A1 (MAIER PETER ET AL), 4 September 2008 (2008-09-04); abstract; paragraph [0029]</td>
<td>1, 8, 15-17</td>
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<tr>
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B60G 17/017 (2006.01)
B60P 1/02 (2006.01)
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