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(71) Applicant: **Hangcha Group Co., Ltd.**
Hangzhou, Zhejiang 311305 (CN)

(72) Inventors:
• **ZHANG, Xiaolu**
Hangzhou, Zhejiang 311305 (CN)
• **GUAN, Wenjie**
Hangzhou, Zhejiang 311305 (CN)

- **YU, Fengbo**
Hangzhou, Zhejiang 311305 (CN)
- **SHANG, Le**
Hangzhou, Zhejiang 311305 (CN)
- **HU, Juyun**
Hangzhou, Zhejiang 311305 (CN)
- **WANG, Huaiyu**
Hangzhou, Zhejiang 311305 (CN)
- **DONG, Shulan**
Hangzhou, Zhejiang 311305 (CN)
- **MAO, Yexin**
Hangzhou, Zhejiang 311305 (CN)
- **MA, Yongliang**
Hangzhou, Zhejiang 311305 (CN)

(74) Representative: **Ström & Gulliksson AB**
P.O. Box 793
220 07 Lund (SE)

(54) **REACH FORKLIFT TRUCK CHASSIS AND REACH FORKLIFT TRUCK**

(57) A reach forklift truck chassis and a reach forklift truck are provided according to the present application. The reach forklift truck chassis includes a drive wheel bracket, an auxiliary wheel bracket, a drive wheel and an auxiliary wheel. A drive wheel compression spring is connected to an upper side of the drive wheel bracket. A middle part of the auxiliary wheel bracket is hinged to a first rotary shaft. A locking device is provided at a first end of the auxiliary wheel bracket, and the locking device is configured to control the first rotary shaft to be rigidly or rotationally connected to the auxiliary wheel bracket. An auxiliary wheel compression spring is connected between a second end of the auxiliary wheel bracket and the drive wheel bracket, and after compression deformation, the auxiliary wheel compression spring presses the auxiliary wheel bracket up and presses down the drive wheel bracket, and an input end of the locking device is electrically connected with an output end of the controller. By adding a locking device, the connection rigidity between the auxiliary wheel and the vehicle body and the connection rigidity between the auxiliary wheel bracket and the vehicle body can be adjusted, thereby adjusting the overall rigidity of the vehicle, which can effectively improve the safety of the vehicle, balance the advantages

of rigid suspension and elastic suspension, and improve comfort and stability.

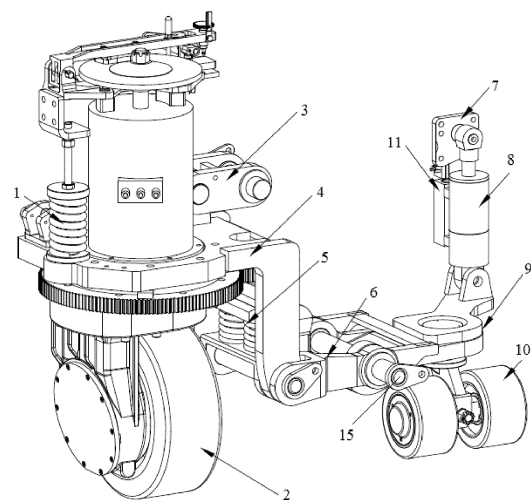


Figure 1

Description**FIELD**

- 5 **[0001]** The present application relates to the technical field of forklift trucks, and in particular to a reach forklift truck chassis and a reach forklift truck.

BACKGROUND

- 10 **[0002]** In a standing-drive reach forklift truck, a chassis adopts a four-wheel structure, and a spring is arranged between a drive wheel and a vehicle body and a spring is arranged between an auxiliary wheel and the vehicle body to buffer and absorb shock. The arrangement of the springs increases the comfort of operation, but at the same time also brings disadvantages. In some use cases, such as hydraulic operation, the vehicle shakes more seriously, and is more likely to tip over when turning.
- 15 **[0003]** Therefore, a technical issue to be addressed urgently by those skilled in the art is how to improve the operation safety of the reach forklift truck.

SUMMARY

- 20 **[0004]** In view of this, an object of the present application is to provide a reach forklift truck chassis, which improves the operation safety of the reach forklift truck. Another object of the present application is to provide a reach forklift truck including the aforementioned reach forklift truck chassis, the operation safety of which is improved.
- [0005]** In order to achieve the above object, the following technical solutions are provided according to the present application.
- 25 **[0006]** A reach forklift truck chassis includes a drive wheel bracket, an auxiliary wheel bracket, a drive wheel connected below the drive wheel bracket and an auxiliary wheel connected below the auxiliary wheel bracket. A drive wheel compression spring is connected to an upper side of the drive wheel bracket. A middle part of the auxiliary wheel bracket is hinged to a first rotary shaft, and the first rotary shaft is configured to connect to the vehicle body. A locking device is provided at the first end of the auxiliary wheel bracket, and the locking device is configured to control the first rotary shaft
- 30 to be rigidly or rotationally connected to the auxiliary wheel bracket, to allow the auxiliary wheel bracket and the vehicle body to be rigidly or elastically connected. An auxiliary wheel compression spring is connected between a second end of the auxiliary wheel bracket and the drive wheel bracket, and after compression deformation, the auxiliary wheel compression spring presses the auxiliary wheel bracket up and presses down the drive wheel bracket, and an input end of the locking device is electrically connected to an output end of the controller.
- 35 **[0007]** Preferably, a lower connecting rod is rotatably connected to the first rotary shaft, and a connecting rod at a first end of the lower connecting rod blocks the auxiliary wheel bracket from above. The drive wheel bracket includes a main bracket and a vertical bracket fixed below the main bracket, and a bottom end of the vertical bracket is pivotally connected to a second end of the lower connecting rod.
- [0008]** Preferably, the auxiliary wheel compression spring and the drive wheel compression spring are respectively
- 40 provided on both sides of the drive wheel.
- [0009]** Preferably, the locking device includes a locking oil cylinder and a solenoid valve provided on the locking oil cylinder to control an oil passage of the locking oil cylinder. The solenoid valve is electrically connected to the output end of the controller, and the solenoid valve correspondingly controls locking or floating of the locking oil cylinder by controlling on-off of the solenoid valve. One end of the locking oil cylinder is connected to the first end of the auxiliary
- 45 wheel bracket, and another end is configured to connect to the vehicle body.
- [0010]** A reach forklift truck includes the reach forklift truck chassis as described in any one of the above and a vehicle body connected to the reach forklift truck chassis.
- [0011]** Preferably, the reach forklift truck further includes a hydraulic system connected to the vehicle body, where the hydraulic system includes a fork lifting oil passage corresponding to a fork on the vehicle body. A pressure detection device is connected to the fork lifting oil passage, and an output end of the pressure detection device is connected to
- 50 an input end of the controller.
- [0012]** Preferably, the reach forklift truck further includes a gantry provided on the vehicle body, the gantry is provided with a height detection device for detecting a height of the gantry, and an output of the height detection device is electrically connected to the input of the controller.
- 55 **[0013]** Preferably, the reach forklift truck further includes a gantry provided on the vehicle body and an operating handle provided in the vehicle body for controlling a movement of the gantry. The operating handle is provided with a movement detection device for detecting whether the operating handle is in motion, and an output end of the movement detection device is electrically connected to an input end of the controller.

[0014] Preferably, the movement detection device includes a front-back movement switch, a lifting switch and a lowering switch, each of which is electrically connected to the controller.

[0015] Preferably, the vehicle body is connected to a front wheel and a steering wheel. The front wheel and the drive wheel are connected to a speed sensor. The steering wheel is connected to an angle sensor. An output end of the speed sensor and an output end of the angle sensor are electrically connected to the input end of the controller, respectively.

[0016] The reach forklift truck according to the present application includes a drive wheel bracket, an auxiliary wheel bracket, a drive wheel connected below the drive wheel bracket and an auxiliary wheel connected below the auxiliary wheel bracket. A drive wheel compression spring is connected to the upper side of the drive wheel bracket. The middle part of the auxiliary wheel bracket is hinged to the first rotary shaft. A locking device is provided at the first end of the auxiliary wheel bracket, and the locking device is configured to control the first rotary shaft to be rigidly or rotationally connected to the auxiliary wheel bracket. An auxiliary wheel compression spring is connected between the second end of the auxiliary wheel bracket and the drive wheel bracket, and after compression deformation, the auxiliary wheel compression spring presses the auxiliary wheel bracket up and presses down the drive wheel bracket, and the input end of the locking device is electrically connected with the output end of the controller.

[0017] By adding a locking device, the connection rigidity between the auxiliary wheel and the vehicle body and the connection rigidity between the auxiliary wheel bracket and the vehicle body can be adjusted, thereby adjusting the overall rigidity of the vehicle. During the turning and hydraulic operation of the vehicle, the locking device is locked to improve the connection rigidity between the auxiliary wheel and the vehicle body and the connection rigidity between the auxiliary wheel bracket and the vehicle body, which can effectively improve the operation safety of the vehicle. It is also possible to unlock the locking device in other situations to improve the comfort of the vehicle operation, balance the advantages of rigid suspension and elastic suspension, and improve comfort and stability.

[0018] The reach forklift truck including the above reach forklift truck chassis according to the present application has improved operation safety.

BRIEF DESCRIPTION OF THE DRAWINGS

[0019] For clearer illustration of the technical solutions according to the embodiments of the present application or in the conventional technology, drawings referred to for describing the embodiments or the conventional technology will be briefly described hereinafter. The drawings in the following description are only some embodiments of the present application, and for those skilled in the art, other drawings may be obtained based on the provided drawings without any creative efforts.

Figure 1 is a structural view of a reach forklift truck chassis according to the present application viewed from a first direction;

Figure 2 is a structural view of a reach forklift truck chassis according to the present application viewed from a second direction;

Figure 3 is structural view of a reach forklift truck chassis according to the present application viewed from a third direction;

Figure 4 is structural view of a reach forklift truck chassis after being connected to a vehicle body according to the present application viewed from the first direction;

Figure 5 is structural view of a reach forklift truck chassis after being connected to the vehicle body according to the present application viewed from the first direction;

Figure 6 is a side view of a reach forklift truck according to the present application, wherein, the dotted line shows the position of a gantry after backward movement;

Figure 7 is a rear view of a reach forklift truck according to the present application; and

Figure 8 is a top view of a reach forklift truck according to the present application.

[0020] Reference numerals in Figures 1 to 8:

1 drive wheel compression spring 2 drive wheel

(continued)

	3	upper connecting rod	4	drive wheel bracket
	5	auxiliary wheel compression spring	6	lower connecting rod
5	7	first connecting block	8	locking oil cylinder
	9	auxiliary wheel bracket	10	auxiliary wheel
	11	solenoid valve	12	connecting rod
	13	main bracket	14	vertical bracket
10	15	first rotary shaft	16	second rotary shaft
	17	second connecting block	18	height detection device
	19	speed sensor	20	controller
	21	front-back movement switch	22	lifting switch
	23	lowering switch	24	pressure detection device
15	25	operating handle	26	angle sensor
	27	fork	28	gantry
	29	steering wheel	30	vehicle body

DETAILED DESCRIPTION

[0021] Technical solutions according to embodiments of the present application are clearly and completely described hereinafter in conjunction with the drawings of the embodiments according to the present application. Apparently, the embodiments described are only part embodiments of the present application, rather than all embodiments. Any other embodiments obtained by those skilled in the art based on the embodiments in the present application without any creative work fall in the scope of protection of the present application.

[0022] A core of the present application is to provide a reach forklift truck chassis, which improves the operation safety of reach forklift truck. Another core of the present application is to provide a reach forklift truck including the aforementioned reach forklift truck chassis, the operation safety of which is improved.

[0023] In the description of the present application, it should be understood that the orientation or positional relationships indicated by terms "up", "down", "left", "right" and the like are based on the orientation or positional relationships shown in the drawings, and are merely for the convenience of describing the present application and the simplification of the description, and do not indicate or imply that the device or element referred to must be in a particular orientation, or be constructed and operated in a particular orientation, and therefore should not be construed as a limit to the scope of the present application. In addition, the terms "first", "second" and the like are for purpose of description, and should not be interpreted as indicating or implying relative importance.

[0024] In an embodiment, the reach forklift truck chassis according to the present application, referring to Figures 1 to 8, includes a drive wheel bracket 4, an auxiliary wheel bracket 9, a drive wheel 2 connected below the drive wheel bracket 4 and an auxiliary wheel 10 connected below the auxiliary wheel bracket 9. The reach forklift truck chassis can be specifically used in a standing-drive reach forklift truck.

[0025] A drive wheel compression spring 1 is connected to the upper side of the drive wheel bracket 4. In the reach forklift truck, the upper end of the drive wheel compression spring 1 is connected to the vehicle body 30. The drive wheel is used to absorb shock between the vehicle body 30 and the drive wheel 2. After compression deformation, the drive wheel compression spring 1 presses the vehicle body 30 up and presses down the drive wheel bracket 4.

[0026] The middle part of the auxiliary wheel bracket 9 is hinged to the first rotary shaft 15. In the reach forklift truck, the first rotary shaft 15 is connected to the vehicle body 30, and the vehicle body 30 can radially position the first rotary shaft 15 and is usually fixedly connected. A locking device is provided at the first end of the auxiliary wheel bracket 9 (the right end of the auxiliary wheel bracket 9 in the orientation shown in Figure 2). The locking device is used to control the first rotary shaft 15 to be rigidly or rotationally connected to the auxiliary wheel bracket 9. In the locked state of the locking device, the locking device limits the auxiliary wheel bracket 9, so that the auxiliary wheel bracket 9 cannot rotate relative to the first rotary shaft 15, thereby achieving a rigid connection between the auxiliary wheel bracket 9 and the vehicle body 30. In the unlocked state of the locking device, the locking device does not restrict the auxiliary wheel bracket 9, and the auxiliary wheel bracket can rotate relative to the first rotary shaft 15, thereby achieving the elastic connection of the auxiliary wheel bracket 9 and the vehicle body 30. An auxiliary wheel compression spring 5 is connected between the second end of the auxiliary wheel bracket 9 (the left end of the auxiliary wheel bracket 9 in the orientation shown in Figure 2) and the drive wheel bracket 4, so that the drive wheel 2 and auxiliary wheel 10 are connected in association. After compression deformation, the auxiliary wheel compression spring 5 presses the auxiliary wheel bracket 9 up and presses down the drive wheel bracket 4. The auxiliary wheel compression spring 5 can absorb shock between

the auxiliary wheel 10 and the vehicle body 30 and between the drive wheel 2 and the vehicle body 30. The suspension system of the chassis includes the auxiliary wheel compression spring 5 and the drive wheel compression spring 1.

[0027] The input end of the locking device is electrically connected to the output end of the controller 20, and the controller 20 can control the operating parameters such as the opening and closing of the locking device. The locking device enters a locking state after being started and enters an unlocking state after being closed.

[0028] For the standing-drive reach forklift truck using the reach forklift truck chassis provided in this embodiment, when the vehicle is hydraulically operated (e.g., lifting, lowering, moving forward and backward, tilting, etc.), the impact is large. If the locking device is in the unlocked state, the whole vehicle shakes obviously, wherein, the auxiliary wheel 10 always touches the ground, the auxiliary wheel bracket 9 rotates relative to the first rotary shaft 15, and the downward pressure of the auxiliary wheel compression spring 5 on the drive wheel bracket 4 is greatly affected by the shaking of the auxiliary wheel bracket 9. If the locking device is locked, the auxiliary wheel bracket 9 will not shake relative to the first rotary shaft 15 and the vehicle body 30, and the top end of the auxiliary wheel compression spring 5 is fixed relative to the vehicle body 30, and can be completely used to absorb shock between the vehicle body 30 and the drive wheel 2. When the pressure of the vehicle body 30 on the drive wheel bracket 4 is the same, compared with the unlocked state, the auxiliary wheel compression spring 5 can more stably share a part of the load of the drive wheel compression spring 1 when the locking device is locked, so that the floating range of the drive wheel compression spring 1 can be reduced, and the shaking degree and shaking times of the vehicle body 30 can be reduced.

[0029] In addition, when the vehicle turns, the vehicle will tilt to one side due to centrifugal force. Taking the turning of the vehicle with the auxiliary wheel 10 inside and the drive wheel 2 outside as an example, that is, turning right in the orientation shown in Figure 2, the load on the side of the auxiliary wheel 10 gradually decreases, the load on the side of the drive wheel 2 gradually increases, and the vehicle body 30 rotates counterclockwise. When the locking device is unlocked, the auxiliary wheel 10 will always touch the ground, the auxiliary wheel 10 is equivalent to driving the auxiliary wheel bracket 9 to rotate clockwise around the first rotary shaft 15, the left end of the auxiliary wheel bracket 9 is raised relative to the drive wheel bracket 4, and since the elastic force of the wheel compression spring 5 is reduced, the compression deformation of the drive wheel compression spring 1 is increased. When the locking device is locked, the auxiliary wheel bracket 9 rotates counterclockwise with the vehicle body 30, and the left end of the auxiliary wheel bracket 9 is lowered relative to the drive wheel bracket 4. Under the condition that the force applied to the drive wheel 2 is the same as that during unlocking, the deformation degree of the compression of the drive wheel compression spring 1 will be correspondingly reduced due to the increase of the elastic force of the auxiliary wheel compression spring 5, so that the deformation of the vehicle body 30 is smaller than that when the locking device is unlocking, which improves the connection rigidity between the drive wheel 2 and the vehicle body 30, and reduces the possibility of overturning.

[0030] In addition, after the gantry 28 is lifted over a certain height, as the center of gravity of the whole vehicle rises, the locking device should be locked when turning or going straight to improve the safety of the vehicle.

[0031] In this embodiment, by adding a locking device, the connection between the auxiliary wheel and the vehicle body and the connection between the auxiliary wheel bracket and the vehicle body can be adjusted, and thus the overall rigidity of the vehicle can be further adjusted. In the process of turning, hydraulic operation of the vehicle and the like, the connection rigidity between the drive wheel 2 and the vehicle body 30 and the connection rigidity between the auxiliary wheel 10 and the vehicle body 30 can be improved by locking the locking device, so that the safety of the operation of the whole vehicle can be effectively improved, and the locking device can be unlocked under other conditions, so as to improve the comfort of the operation of the vehicle, balance the advantages of rigid suspension and elastic suspension, and improve the comfort and the stability.

[0032] Further, as shown in Figures 1 to 3, the first rotary shaft 15 is also rotatably connected to a lower connecting rod 6. A connecting rod 12 at a first end of the lower connecting rod 6 blocks the auxiliary wheel bracket 9 from above. The drive wheel bracket includes a main bracket 13 and a vertical bracket 14 fixed below the main bracket 13. The bottom end of the vertical bracket 14 is pivotally connected to the second end of the lower connecting rod 6.

[0033] The lower connecting rod 6 and the auxiliary wheel bracket 9 are pivotally connected to the first rotary shaft 15. The lower connecting rod 6 and the auxiliary wheel bracket 9 form an X-shaped structure. When the two are relatively rotated, the connecting rod 12 of the lower connecting rod 6 blocks the auxiliary wheel bracket 9, so that the first end of the auxiliary wheel bracket 9 can no longer move upwards relative to the first end of the lower connecting rod 6, thereby limiting the floating range of the auxiliary wheel bracket 9 and further improving the operation safety.

[0034] Further, the auxiliary wheel compression spring 5 and the drive wheel compression spring 1 are respectively arranged on both sides of the drive wheel 2, specifically on both sides in the axial direction of the drive wheel 2, so as to further improve the stability between the drive wheel 2 and the vehicle body 30.

[0035] Further, the locking device includes a locking oil cylinder 8 and a solenoid valve 11 provided on the locking oil cylinder 8. The locking oil cylinder 8 is locked or floated by the control of the solenoid valve 11. The solenoid valve 11 is electrically connected to the output end of the controller 20. The controller 20 controls on and off of the solenoid valve 11 to correspondingly open and close the locking oil cylinder 8 to lock or float the locking oil cylinder 8. The locking oil cylinder 8 is used to facilitate the operation and reliable locking when adjusting the rigidity of the suspension system

according to the vehicle condition. In the reach forklift truck, one end of the locking oil cylinder 8 is connected to the first end of the auxiliary wheel bracket 9, and another end is connected to the vehicle body 30.

[0036] Preferably, the locking device is of an integral structure without an external oil passage.

[0037] In addition to the above-mentioned reach forklift truck chassis, the present application further provides a reach forklift truck including a reach forklift truck chassis and a vehicle body connected to the reach forklift truck chassis. The reach forklift truck chassis may specifically be the reach forklift truck chassis according to any of the above embodiments, and the beneficial effects can refer to each of the above embodiments. The reach forklift truck chassis can be specifically a standing-drive reach forklift truck, which adopts standing-drive operation and has a four-wheel structure.

[0038] Further, the reach forklift truck also includes a hydraulic system connected to the vehicle body 30. The hydraulic system includes a fork lifting oil passage corresponding to the fork on the vehicle body 30, and the fork lifting oil passage is connected to a pressure detection device 24, which may be a pressure switch or a pressure sensor. The output end of the pressure detection device 24 is electrically connected to the input end of the controller 20. According to the detection of the fork lifting oil passage, the load condition of the fork 27 can be correspondingly determined, and then the full load and empty load conditions of the vehicle can be determined. When the controller determines that the load is full, the controller 20 controls the rigidity of the suspension system to be increased to reduce or eliminate the impact and shaking during the lifting, lowering, forward movement and backward movement of the gantry 28.

[0039] Further, the reach forklift truck includes a gantry 28 provided on the vehicle body 30, a fork 27 is specifically provided on the gantry 28. The gantry 28 can move up and down, and back and forth. The gantry 28 is provided with a height detection device 18 for detecting the height of the gantry 28, which may specifically be a sensor capable for detecting the height, such as a photoelectric sensor. The output end of the height detection device 18 is electrically connected to the input end of the controller 20. The controller 20 can control the opening and closing of the locking device according to the detection result of the height detection device 18. Specifically, when the gantry 28 is lifted to a preset height, especially in a full load state, the forklift is easy to tip over due to the increased center of gravity of the forklift, and the controller 20 controls the locking device to be locked to improve the stability of the vehicle.

[0040] Further, the reach forklift truck includes an operating handle 25 provided in the vehicle body 30 for controlling the movement of the gantry 28. The operating handle 25 is provided with a movement detection device for detecting whether the operating handle 25 is in motion, and may specifically be a photoelectric switch or a photoelectric sensor. Since the operation of the operating handle 25 is in correspondence with the operation of the gantry 28, whether the gantry 28 moves in the corresponding direction can be determined according to whether the operating handle 25 moves. The output end of the movement detection device is electrically connected to the input end of the controller 20, and the controller 20 can control the opening and closing of the locking device according to the detection result of the movement detection device. During the starting and closing moments when the gantry 28 moves back and forth, the impact is large, and the controller 20 controls the locking device to start to be locked, thereby improving the connection rigidity of the suspension system. During the movement, the impact is small, the center of gravity of the rear axle changes, and the controller 20 controls the locking device to be closed to unlock and improve the elasticity of the suspension system. The movement detection device is provided on the operating handle 25 instead of directly on the gantry 28, which is convenient for installation.

[0041] In one embodiment, the movement detection device includes a front-back movement switch 21, a lifting switch 22 and a lowering switch 23. The front-back movement switch 21 is used to detect the movement of the operating handle 25 during controlling the forward and backward movement of the gantry 28, the lifting switch 22 is used to detect the movement of the operating handle 25 during controlling the lifting of the gantry 28, and the lowering switch 23 is used to detect the movement of the operating handle 25 during controlling the lowering of the gantry 28.

[0042] Further, the vehicle body 30 is further connected to a front wheel and a steering wheel, the front wheel and the drive wheel 2 are connected to a speed sensor 19, and the steering wheel is connected to an angle sensor 26. The output end of the speed sensor 19 and the output end of the angle sensor 26 are electrically connected to the input end of the controller 20, respectively. The speed sensor 19 can detect the speed of the corresponding wheel. Specifically, it can be considered in combination with the pressure detection device 24 and the angle sensor 26. The angle sensor 26 can reflect the turning speed of the forklift. When the full-load turning speed is small, the controller 20 controls the rigidity of the suspension system in the chassis to increase. When the no-load turning speed is large, the controller 20 controls the elasticity of the suspension system in the chassis to increase. In addition, according to the vehicle speed and turning speed, the vehicle condition is comprehensively judged and then the opening and closing control of the locking device is carried out to reduce the possibility of the vehicle tipping and improve the stability of the vehicle. In addition, an acceleration sensor may be provided on the drive wheel 2 and/or the front wheel.

[0043] It should be noted that, for sensors and other devices connected to the input end of the controller to control the opening and closing of the locking device, in order to solve the problem of mutually exclusive instructions and avoid contradiction of instructions, priority levels for these devices are usually preset in the controller, and control signals are output to the locking device according to the priority levels.

[0044] Further, the locking device includes a locking oil cylinder 8 connected between the first end of the auxiliary

wheel bracket 9 and the vehicle body 30 and a solenoid valve 11 provided on the locking oil cylinder 8. The locking oil cylinder 8 is locked or floated by the control of the solenoid valve 11. The solenoid valve 11 is electrically connected to the output end of the controller 20. The controller 20 controls the solenoid valve 11 to open and close the locking oil cylinder 8, so that the rigidity degree of the suspension system is adjusted according to the vehicle, the operation is convenient, and the locking is reliable. As shown in Figure 4 and Figure 5, the drive wheel bracket 4 is pivotally connected to one end of the upper connecting rod 3, and another end of the upper connecting rod 3 is pivotally connected to the vehicle body 30. The top end of the drive wheel compression spring 1 is fixed to the vehicle body 30 through the second connecting block 17. The top end of the locking oil cylinder 8 is pivotally connected to the vehicle body 30 through the first connecting block 7 and the bottom end is pivotally connected to the first end of the auxiliary wheel bracket 9. The first rotary shaft 15 is fixed to the vehicle body 30.

[0045] Of course, in other embodiments, the locking device may be provided with other settings. For example, the locking device may be a linear motor, and one end of the linear motor is fixed to the vehicle body 30, and another end is not directly connected to the auxiliary wheel bracket 9. When the output shaft of the linear motor retracts, the rotation of the auxiliary wheel bracket 9 relative to the first rotary shaft 15 is not affected, but the auxiliary wheel bracket 9 is locked after the output shaft of the linear motor extends out and is clamped and fixed on the auxiliary wheel bracket 9.

[0046] Of course, in other embodiments, a second locking device may be further provided between the drive wheel bracket 4 and the vehicle body 30, and the drive wheel bracket 4 and the vehicle body 30 may be relatively fixed together when locked, and the vehicle body 30 and the drive wheel bracket 4 can move relatively when unlocked, thereby directly adjusting the rigidity of the connection between the drive wheel bracket 4 and the vehicle body 30.

[0047] The embodiments in this specification are described in a progressive manner. Each embodiment is focused on describing the differences from other embodiments, and reference may be made one to another for the same or similar parts among the embodiments.

[0048] The reach forklift truck and the reach forklift truck chassis according to the present application are described in detail hereinbefore. The principle and the embodiments of the present application are illustrated herein by specific examples. The above description of examples is only intended to help the understanding of the method and the spirit of the present application. It should be noted that, for those skilled in the art, many improvements and modifications may be made to the present application without departing from the principle of the present application, and these improvements and modifications are also deemed to fall into the protection scope of the present application defined by the claims.

Claims

1. A reach forklift truck chassis, comprising:

a drive wheel bracket (4),
 an auxiliary wheel bracket (9),
 a drive wheel (2) connected below the drive wheel bracket (4),
 an auxiliary wheel (10) connected below the auxiliary wheel bracket (9), and
 a drive wheel compression spring (1) connected to an upper side of the drive wheel bracket (4),
 wherein a middle part of the auxiliary wheel bracket (9) is hinged to a first rotary shaft (15), and the first rotary shaft (15) is configured to connect to a vehicle body (30);
 a locking device is provided at a first end of the auxiliary wheel bracket (9), and the locking device is configured to control the first rotary shaft (15) to be rigidly or rotationally connected to the auxiliary wheel bracket (9), to allow the auxiliary wheel bracket (9) and the vehicle body (30) to be rigidly or elastically connected;
 an auxiliary wheel compression spring (5) is connected between a second end of the auxiliary wheel bracket (9) and the drive wheel bracket (4), and after compression deformation, the auxiliary wheel compression spring (5) presses the auxiliary wheel bracket (9) up and presses down the drive wheel bracket (4), and
 an input end of the locking device is electrically connected to an output end of the controller (20).

2. The reach forklift truck chassis according to claim 1, wherein,
 a lower connecting rod (6) is rotatably connected to the first rotary shaft (15), and
 a connecting rod (12) at a first end of the lower connecting rod (6) blocks the auxiliary wheel bracket (9) from above;
 the drive wheel bracket (4) comprises a main bracket (13) and a vertical bracket (14) fixed below the main bracket (13), and
 a bottom end of the vertical bracket (14) is pivotally connected to a second end of the lower connecting rod (6).

3. The reach forklift truck chassis according to claim 1, wherein,
 the auxiliary wheel compression spring (5) and the drive wheel compression spring (1) are respectively provided

on both sides of the drive wheel (2).

4. The reach forklift truck chassis according to any one of claims 1 to 3, wherein,
the locking device comprises a locking oil cylinder (8) and a solenoid valve (11) provided on the locking oil cylinder
(8) to control an oil passage of the locking oil cylinder (8);
the solenoid valve (11) is electrically connected to the output end of the controller (20), and the solenoid valve (11)
correspondingly controls locking or floating of the locking oil cylinder (8) by controlling on-off of the solenoid valve
(11); and
one end of the locking oil cylinder (8) is connected to the first end of the auxiliary wheel bracket (9), and another
end of the locking oil cylinder (8) is configured to connect to the vehicle body (30).
5. A reach forklift truck, comprising the reach forklift truck chassis according to any one of claims 1 to 4 and a vehicle
body (30) connected to the reach forklift truck chassis.
6. The reach forklift truck according to claim 5, further comprising a hydraulic system connected to the vehicle body (30),
wherein the hydraulic system comprises a fork lifting oil passage corresponding to a fork on the vehicle body (30),
a pressure detection device (24) is connected to the fork lifting oil passage, and an output end of the pressure
detection device (24) is connected to an input end of the controller (20).
7. The reach forklift truck according to claim 5, further comprising a gantry (28) provided on the vehicle body (30),
the gantry (28) is provided with a height detection device (18) for detecting a height of the gantry (28), and
an output of the height detection device (18) is electrically connected to an input of the controller (20).
8. The reach forklift truck according to claim 5, further comprising a gantry (28) provided on the vehicle body (30) and
an operating handle (25) provided on the vehicle body (30) for controlling a movement of the gantry (28),
wherein the operation handle (25) is provided with a movement detection device for detecting whether the operating
handle (25) is in motion, and
an output end of the movement detection device is electrically connected to an input end of the controller (20).
9. The reach forklift truck according to claim 8, wherein,
the movement detection device comprises a front-back movement switch (21), a lifting switch (22) and a lowering
switch (23), each of which is electrically connected to the controller (20).
10. The reach forklift truck according to claim 9, wherein,
the vehicle body (30) is connected to a front wheel and a steering wheel,
the front wheel and the drive wheel (2) are connected to a speed sensor (19),
the steering wheel is connected to an angle sensor (26), and
an output end of the speed sensor (19) and an output end of the angle sensor (26) are electrically connected to the
input end of the controller (20), respectively.

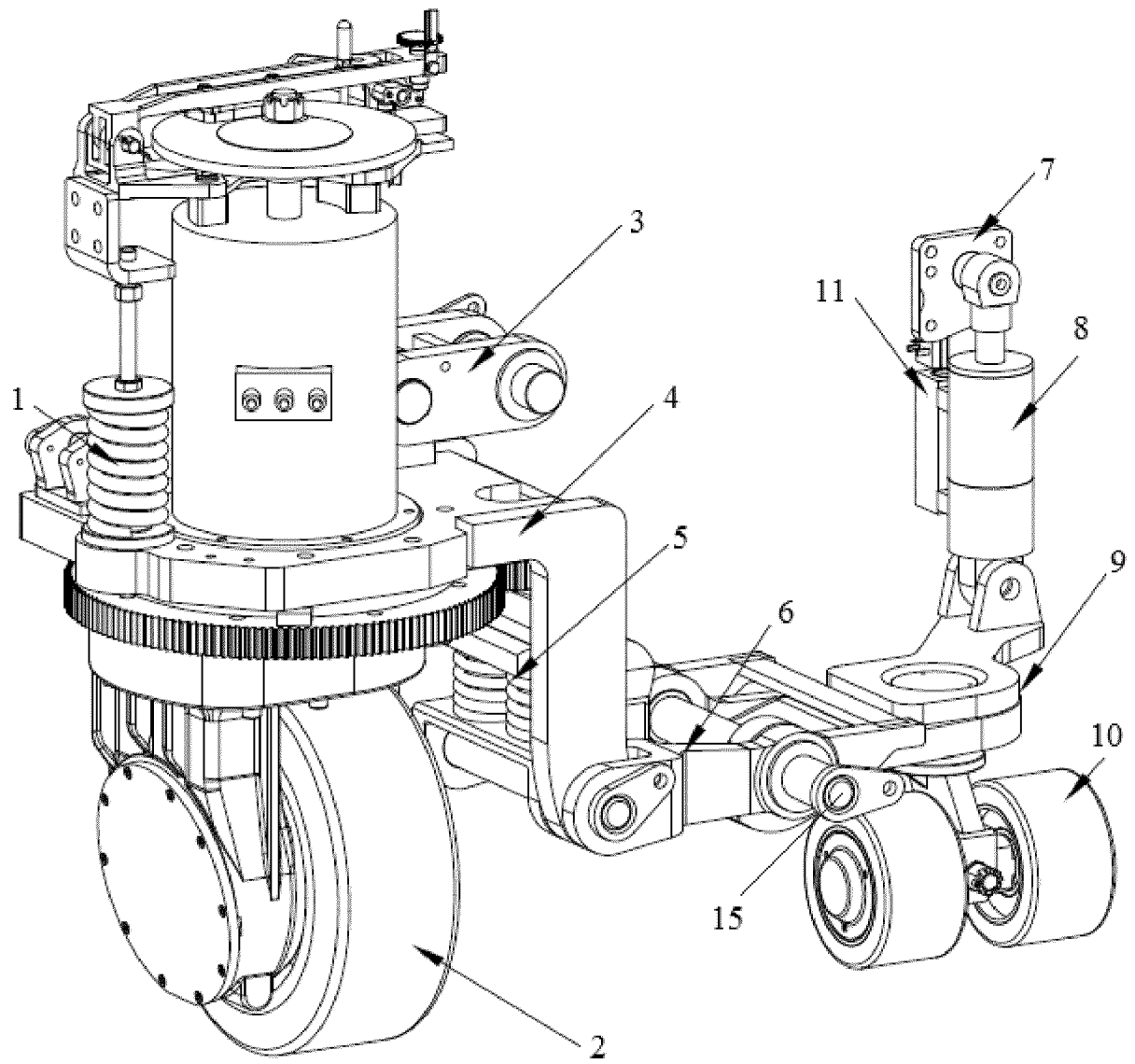


Figure 1

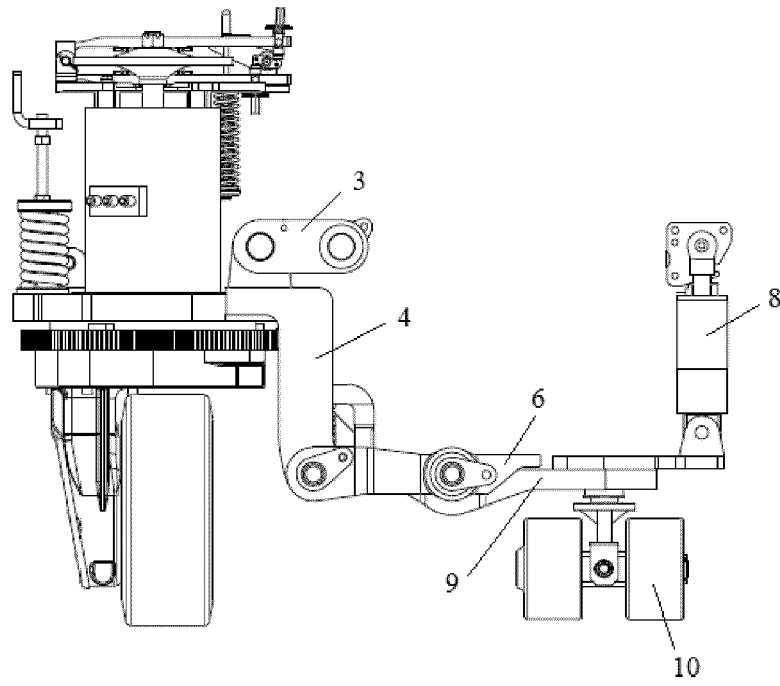


Figure 2

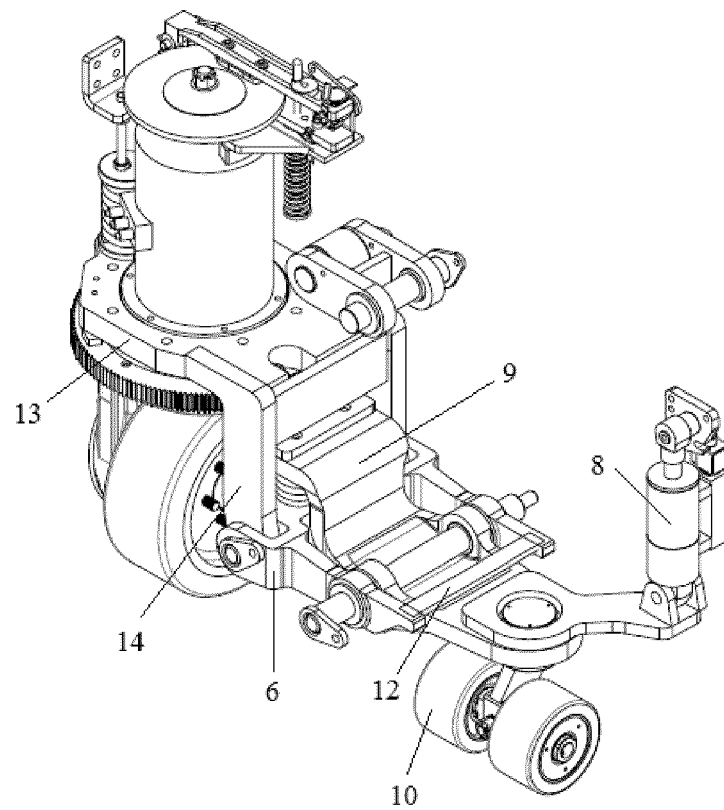


Figure 3

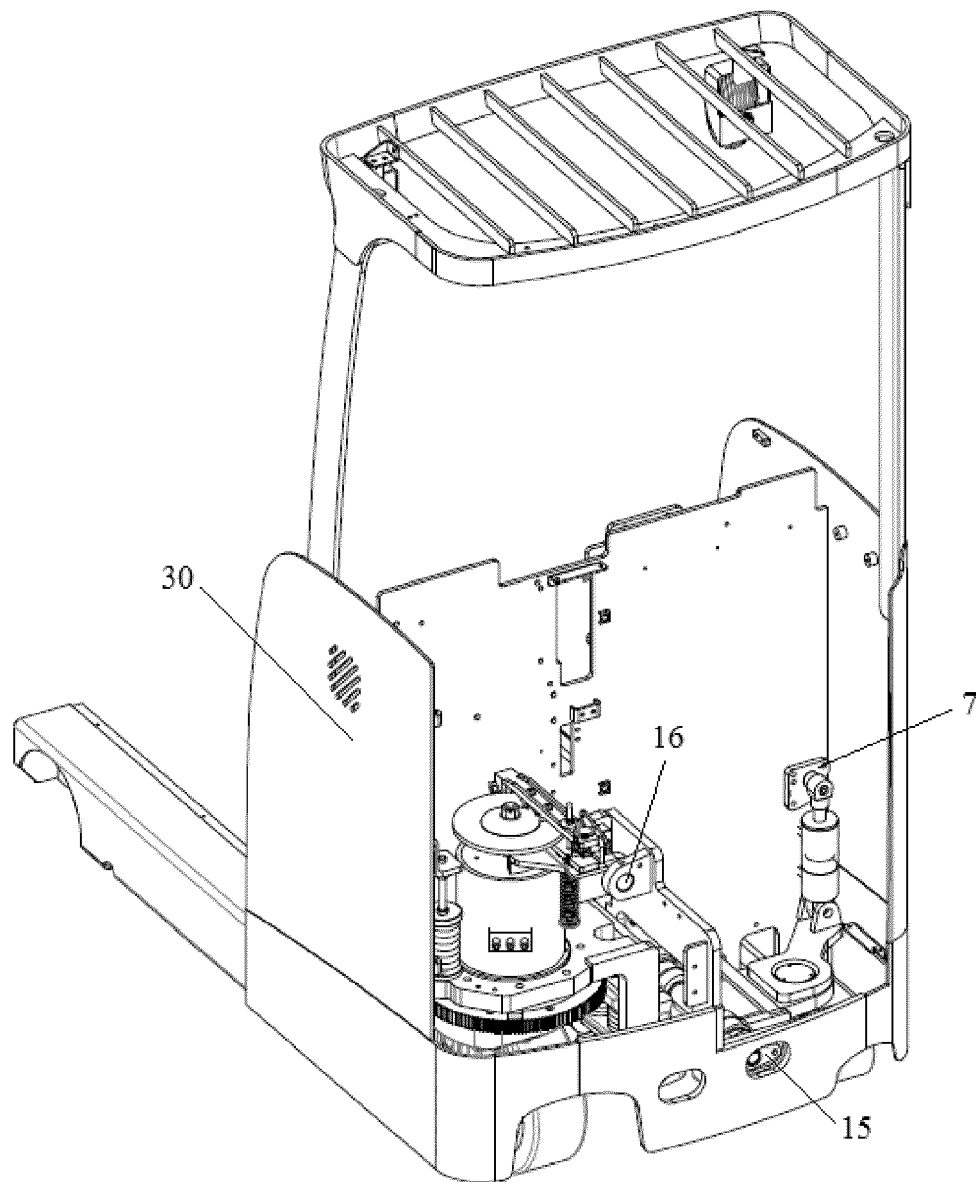


Figure 4

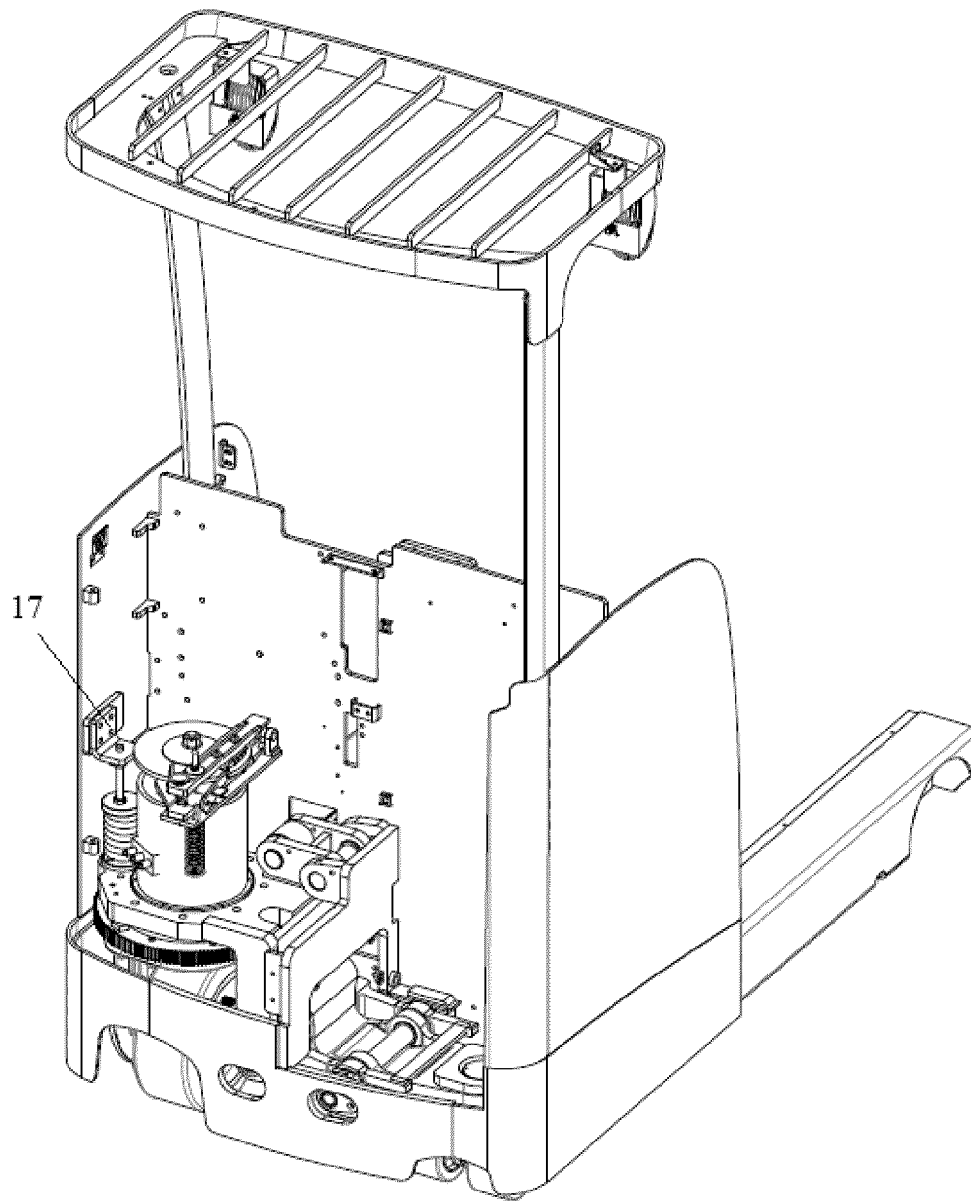


Figure 5

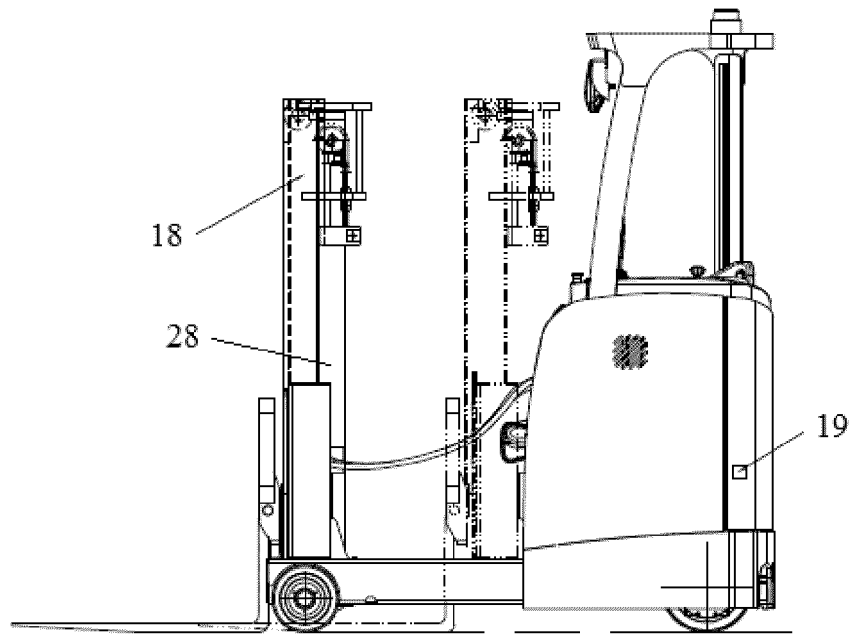


Figure 6

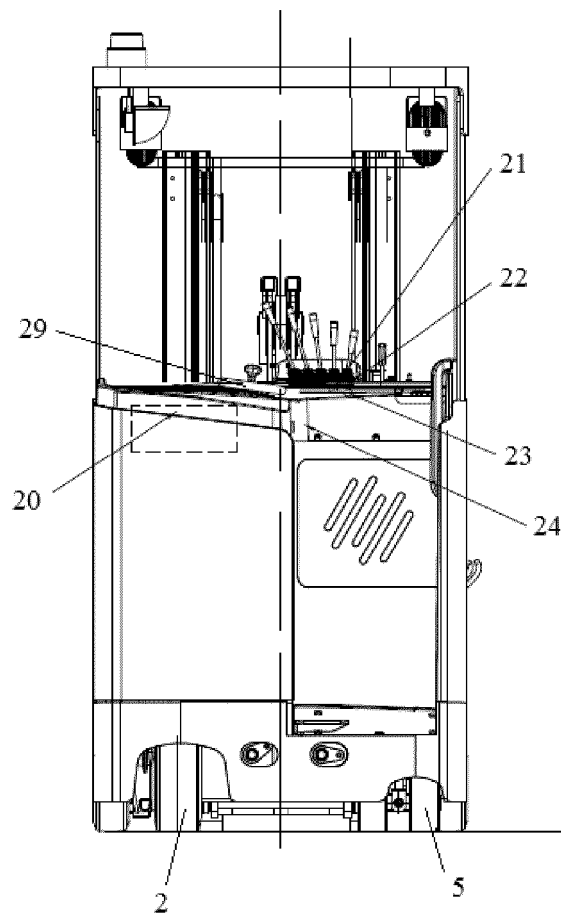


Figure 7

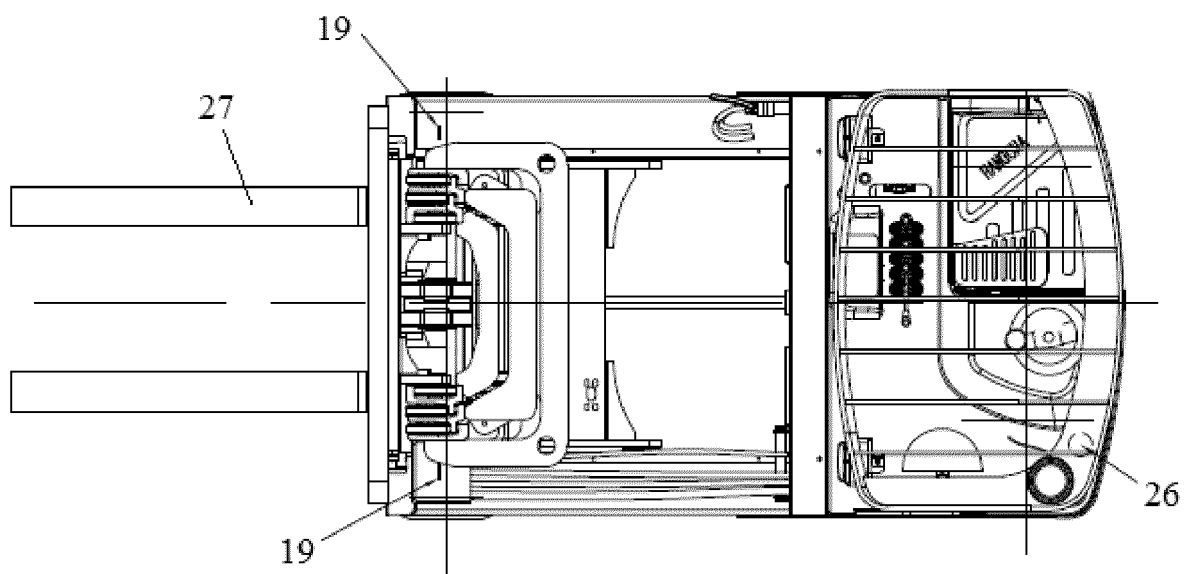


Figure 8



EUROPEAN SEARCH REPORT

Application Number
EP 20 18 5908

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			B66F B60G
The present search report has been drawn up for all claims			
Place of search The Hague		Date of completion of the search 4 December 2020	Examiner Rupcic, Zoran
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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5 This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
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