

(19)



(11)

EP 2 226 288 B1

(12)

EUROPEAN PATENT SPECIFICATION

(45) Date of publication and mention
of the grant of the patent:
29.05.2013 Bulletin 2013/22

(51) Int Cl.:
B66F 9/24 ^(2006.01) **B66F 17/00** ^(2006.01)
B66F 9/075 ^(2006.01)

(21) Application number: **10155329.5**

(22) Date of filing: **03.03.2010**

(54) Industrial truck with presence indication

Flurförderzeug mit Präsenzanzeige

Chariot de manutention avec indication de présence

(84) Designated Contracting States:
**AT BE BG CH CY CZ DE DK EE ES FI FR GB GR
HR HU IE IS IT LI LT LU LV MC MK MT NL NO PL
PT RO SE SI SK SM TR**

(30) Priority: **06.03.2009 SE 0950132**

(43) Date of publication of application:
08.09.2010 Bulletin 2010/36

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Description

TECHNICAL FIELD

[0001] The present invention relates to an industrial truck comprising a driver's compartment provided with controls for steering the truck and operate lifting means of the truck and security means for preventing operation of the controls if a driver is not present in the driver's compartment, said security means comprises a floor plate in the driver's compartment, which plate is movable between an upper and an lower position, a sensor emitting a signal indicating the position of the floor plate to a control unit in the truck, and a door element which is movable between an open and a closed state.

BACKGROUND OF THE INVENTION

[0002] It is known, in order to make it impossible for an industrial truck to be driven when a driver is outside the driver's compartment, to provide a floor plate in the floor of the driver's compartment, which must pushed down to make it possible to drive the truck. Such a solution functions well with regard to security but can lead to disturbances in the operation of the truck if the driver for some reason has to move around within the driver's compartment and then no longer can push the floor plate down. Furthermore, many drivers feel it to be uncomfortable and tiresome to always have to have a foot at the same spot on the floor of the driver's compartment when operating the truck and its lifting means. EP 1657212 A2 discloses an industrial truck where sensors check that the driver has both his hands on control sticks and both feet in appropriate positions on the floor of the driver's compartment.

[0003] The objective of the present invention is to eliminate said drawbacks by providing an industrial truck allowing the driver to move freely within the driver's compartment during use of the truck.

SUMMARY OF THE INVENTION

[0004] This objective is accomplished by an industrial truck comprising a driver's compartment provided with controls for operation of the truck and operation of lifting means of the truck and security means for preventing operation of truck and lifting means if a driver is not present in the driver's compartment, said security means comprises a floor plate in the driver's compartment, which plate is movable between an upper and an lower position, a sensor for sensing the position of the floor plate, said sensor emitting a signal indicating the position of the floor plate to a control unit in the truck, and a door element which is movable between an open and a closed state, characterized by a sensor for sensing the state of the door element, which sensor emits a signal to the control unit indicative of the state of the door element, and in that the control unit is arranged to only allow activation of the

truck, i.e. permit operation of drive means, steering means and lifting means, when the floor plate is in its lower position and the door element is in a closed state and arranged to after activation permit operation of truck and lifting means when the door element is in a closed state independent of the position of the floor plate, and arranged to interrupt the operation of the truck if the door element is opened, whereby the operation of the truck can not be resumed until after a reactivation of the truck. By the fact that the floor plate must be pushed down when activating the truck, the truck can not be activated if the driver is not present in the driver's compartment, and by the fact that the door element must be in closed state during use of the truck, it is ensured that the driver can not leave the driver's compartment without the truck being inactivated. By such a security arrangement, a driver can after activation be allowed to move freely within the driver's compartment without reduction of the security.

[0005] By "activation of the truck" is meant that operation of drive means, steering means and lifting means is permitted by the control unit.

[0006] In a preferred embodiment, the floor plate is spring biased towards its upper position. The door element can be a gate, bars, a swinging door, a sliding door or the like, and the driver's compartment can be constituted by a vertically adjustable driver's cab.

[0007] The above mentioned sensors can in their simplest form consist of electrical switches.

BRIEF DESCRIPTION OF THE DRAWINGS

[0008] The invention will now be described with reference to the enclosed figures, of which;

fig. 1 schematically discloses a side view of an industrial truck according to a preferred embodiment of the invention, and

fig. 2 discloses a schematic principal diagram of the drive system of the truck in figure 1.

DESCRIPTION OF EMBODIMENTS

[0009] In Figure 1, an industrial truck 1 according to a preferred embodiment of the invention is schematically disclosed. The truck 1 comprises a bottom plate 2, which carries two front wheels 3 and a rear wheel 4 that is drivable and steerable, a housing 5, which contains battery, drive motor, transmission and control motor for driving of the truck and a hydraulic system for operation of the lifting means of the truck. The housing 5 also contains a control unit for controlling the functions of the truck. The bottom plate 2 also carries a lifting frame 6, along which a driver's cab 7 and lifting forks 8 are moveable by the hydraulic system of the truck. A swingable gate 9 gives access to the driver's cab 7. In the driver's cab 7 controls 10 are provided for driving of the truck and movement of the driver's cab and lifting forks. The up to now described

structure of the truck 1 is conventional and the included components are also known per se.

[0010] To prevent the possibility of driving the truck when a driver is not present in the driver's cab 7, for example driven by a driver standing on the lifting forks 8, it is known to provide a floor plate being swingable upwards and downwards and being coupled to a sensor, which senses when the floor plate is swung down and then emits a signal to the control unit, which then permits driving of the truck and operation of the lifting forks. By such an arrangement it is accomplished that the truck can only be used when a driver is present in the driver's cab. It has, however, been proved that the driver sometimes has to move within the driver's cab, e.g. for changing his field of vision, which has led to operational disturbances if this movement caused the driver to no longer stand on the floor plate. Furthermore, many drivers experience it tiresome and uncomfortable not to have a possibility to change posture. According to the invention this problem is solved by a security arrangement which is schematically shown in figure 2.

[0011] In figure 2 the security arrangement according to the invention is shown very schematically. To the control unit 11 leads a circuit 12, in which an electrical switch 14 acted upon by the floor plate 13 is a part. A push down of the floor plate 13 causes the switch 14 to be pushed down and close the circuit 12. The switch 14 and the floor plate 13 are both spring biased towards an upper position which means that when a driver no longer stands on the floor plate 13, the circuit 12 is broken. A similar circuit 15 having an electrical switch 16 is in the same way coupled to the closing and opening movements of the gate 9.

[0012] As is schematically shown in figure 2, the control unit 11 is coupled to the operational controls 10 and receives commands from these controls. These commands are transferred to the drivable and steerable wheel 4 and to the lifting means for the forks 8, respectively if the conditions for operation of the truck associated to circuits 12 and 15 is fulfilled.

[0013] The control unit 11, which can be a computer or the like, is arranged or programmed so that the truck only can be activated when circuits 12 and 15 are closed, i.e. when the floor plate 13 is pushed down at the same time as the gate 9 is closed. The control unit is furthermore arranged so that driving of the truck and operation of the lifting forks 8 only can occur when the gate is closed. Thus, the state of the floor plate influences only the actual activation of the truck.

[0014] By such an arrangement, a driver has to be present within the driver's cab 7 and push the floor plate down when activating the truck 1. At the same time, the gate 9 must be closed. After the activating the driver can freely move around in the driver's cab without affecting the possibility to operate the truck or the lifting forks, which has the consequence that it will be less tiresome to operate the truck than if the driver had to stay put on the same spot during operation of the truck. Any operational disturbances due to movements of the driver within

the driver's cab will thus not occur in an arrangement according to the invention. The arrangement according to the invention will not lower the security. If the driver leaves the driver's cab, the gate 9 opens, which causes interruption of the operation of the truck which operation can not be resumed until after a reactivation of the truck. The control unit can also be arranged to automatically apply a brake when the truck is un-activated by opening of the gate 9 if this is not already done.

[0015] The described embodiment can of course be modified within the scope of the invention. The switch 16 could for example be arranged to break the current in circuit 15 when the gate 9 is closed. Furthermore, other types of position indicators than simple electrical switches, e.g. inductive sensors, can be used. The driver's cab can have two gates, one at each side thereof, each having a sensor coupled to the control unit. The invention can also be applied to other types of trucks having a fixed or movable driver's cab, which can be closed by one or two door elements that can be constituted by gates, bars, sliding doors or swinging doors. Such trucks can also have other types of drive and steering systems, e.g. a four wheel systems or articulated steering systems. The lifting frame can be longitudinally displaceable. The invention shall therefore only be limited by the wording of the enclosed patent claims.

Claims

1. An industrial truck (1) comprising a driver's compartment (7) provided with controls (10) for operation of the truck and operation of lifting means (8) of the truck and security means (12, 13, 14 and 15, 9, 16) for preventing operation of the truck and the lifting means if a driver is not present in the driver's compartment, said security means comprises a floor plate (13) in the driver's compartment, which plate is movable between an upper and an lower position, a sensor (14) for sensing the position of the floor plate, said sensor emitting a signal indicating the position of the floor plate to a control unit (11) in the truck, and a door element (9) which is movable between an open and a closed state and a sensor (16) for sensing the state of the door element (9), which sensor emits a signal to the control unit (11) indicative of the state of the door element, **characterized in that** the control unit is arranged to only allow activation of the truck (1), i.e. permit operation of drive means, steering means and lifting means, when the floor plate (13) is in its lower position and the door element (9) is in a closed state, and arranged to after activation permit operation of the truck (1) and lifting means (8) when the door element (9) is in a closed state independent of the position of the floor plate (13), and arranged to interrupt the operation of the truck if the door element is opened, whereby the operation of the truck can not be resumed until after a

rectivation of the truck.

2. The Industrial truck according to claim 1, wherein the floor plate (13) is spring biased towards its upper position.
3. The Industrial truck according to claim 1 or 2, wherein the door element (9) is a gate.
4. The Industrial truck according to claim 1, 2 or 3, wherein the driver's compartment is constituted by a vertically adjustable driver's cab (7).
5. The Industrial truck according to any one of the preceding claims, wherein said sensors (14, 16) consist of electrical switches.

Patentansprüche

1. Flurförderfahrzeug (1) mit:

einer Fahrerkabine (7), die versehen ist mit Steuerungen (10) zum Betrieb des Fahrzeugs und zum Betrieb der Hubeinrichtung (8) des Fahrzeugs und Sicherheitseinrichtungen (12, 13, 14 und 15, 9, 16) zum Verhindern des Betriebs des Fahrzeugs und des Hubmittels, wenn kein Fahrer in der Fahrerkabine anwesend ist, wobei die Sicherheitseinrichtungen eine Bodenplatte (13) in der Fahrerkabine umfassen, wobei die Platte zwischen einer oberen und einer unteren Position beweglich ist, einem Sensor (14) zum Erfassen der Position der Bodenplatte, wobei der Sensor ein Signal ausgibt, das einer Steuereinheit (11) in dem Fahrzeug die Position der Bodenplatte anzeigt; und einem Türelement (9), das zwischen einer offenen und einer geschlossenen Position beweglich ist; und einem Sensor (16) zum Erfassen des Zustands des Türelements (9), wobei der Sensor ein Signal an die Kontrolleinheit (11) ausgibt, die den Zustand des Türelements anzeigt, **dadurch gekennzeichnet dass** die Steuereinheit eingerichtet ist, um eine Aktivierung des Fahrzeugs (1), d.h. den Betrieb der Fahreinrichtung, Lenkeinrichtung und Hubeinrichtung zuzulassen, nur dann zu gestatten, wenn sich die Bodenplatte (13) in ihrer unteren Position befindet und wenn sich das Türelement (9) in einem geschlossenen Zustand befindet; und eingerichtet ist, um nach der Aktivierung den Betrieb des Fahrzeugs (1) und der Hubeinrichtung (8) zuzulassen, wenn sich das Türelement (9), unabhängig von der Position der Bodenplatte (13), in einem geschlossenen Zu-

stand befindet; und eingerichtet ist, um den Betrieb des Fahrzeugs zu unterbrechen, wenn das Türelement geöffnet ist, wodurch der Betrieb des Fahrzeugs bis zur Reaktivierung des Fahrzeugs nicht wiederaufgenommen werden kann.

2. Flurförderfahrzeug gemäß Anspruch 1, wobei die Bodenplatte (13) durch eine Feder in Richtung ihrer oberen Position beaufschlagt ist.
3. Flurförderfahrzeug gemäß Anspruch 1 oder 2, wobei das Türelement (9) ein Tor ist.
4. Flurförderfahrzeug gemäß Anspruch 1, 2 oder 3, wobei die Fahrerkabine durch ein vertikal einstellbares Fahrerhaus (7) gebildet wird.
5. Flurförderfahrzeug gemäß einem der vorangegangenen Ansprüche, wobei die Sensoren (14, 16) aus elektrischen Schaltern bestehen.

Revendications

1. Chariot de manutention (1) comprenant un compartiment conducteur (7) doté de commandes (10) destinées au fonctionnement du chariot et au fonctionnement des moyens de levage (8) du chariot, et des moyens de sécurité (12, 13, 14 et 15, 9, 16) pour empêcher le fonctionnement du chariot et des moyens de levage si un conducteur n'est pas présent dans le compartiment conducteur, lesdits moyens de sécurité comprennent une plaque de plancher (13) dans le compartiment conducteur, laquelle plaque est mobile entre une position supérieure et une position inférieure, un détecteur (14) pour détecter la position de la plaque de plancher, ledit détecteur émettant un signal indiquant la position de la plaque de plancher vers une unité de commande (11) dans le chariot, et un élément de porte (9) qui est mobile entre un état ouvert et un état fermé, et un détecteur (16) pour détecter l'état de l'élément de porte (9), lequel détecteur émet vers l'unité de commande (11) un signal indicatif de l'état de l'élément de porte, **caractérisé en ce que** l'unité de commande est agencée de façon à permettre seulement l'activation du chariot (1), à savoir permettre le fonctionnement des moyens d'entraînement, des moyens de direction et des moyens de levage, lorsque la plaque de plancher (13) se trouve dans sa position inférieure et lorsque l'élément de porte (9) se trouve dans un état fermé, et est agencée de façon à permettre, après l'activation, le fonctionnement du chariot (1) et des moyens de levage (8) lorsque l'élément de porte (9) se trouve dans un état fermé indépendant de la position de la plaque de plancher (13), et est agencée de façon à interrompre le fonctionnement du chariot si l'élément de porte est ouvert, grâce à quoi le fonc-

tionnement du chariot ne peut pas reprendre avant une réactivation du chariot.

2. Chariot selon la revendication 1, dans lequel la plaque de plancher (13) est sollicitée par un ressort vers sa position supérieure. 5
3. Chariot selon la revendication 1 ou 2, dans lequel l'élément de porte (9) est une barrière. 10
4. Chariot selon la revendication 1, 2 ou 3, dans lequel le compartiment conducteur est constitué par une cabine de conducteur réglable verticalement (7). 15
5. Chariot selon l'une quelconque des revendications précédentes, dans lequel lesdits détecteurs (14, 16) se composent de commutateurs électriques. 20

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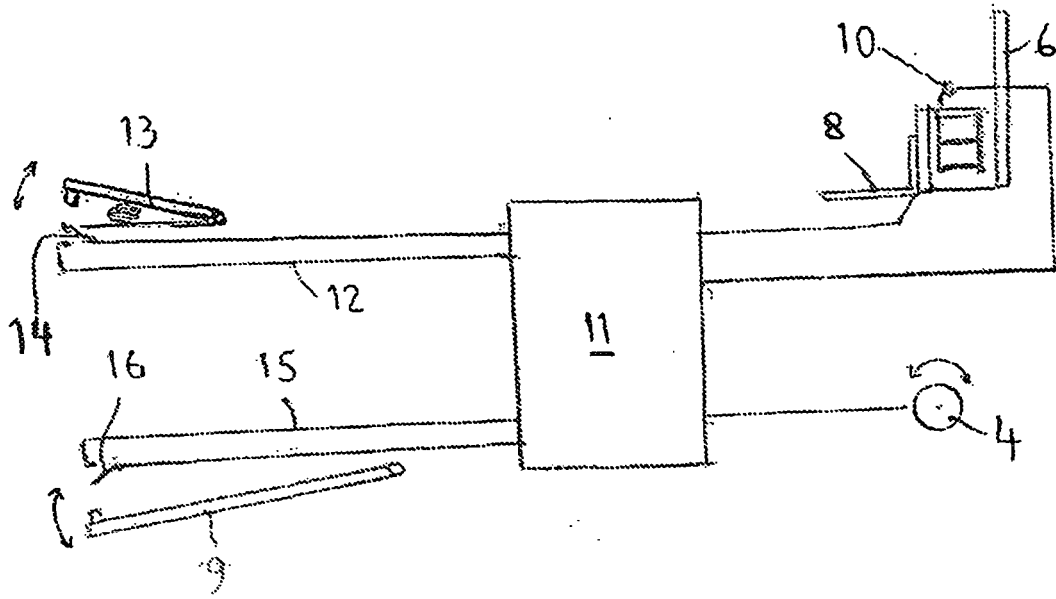


FIG. 2

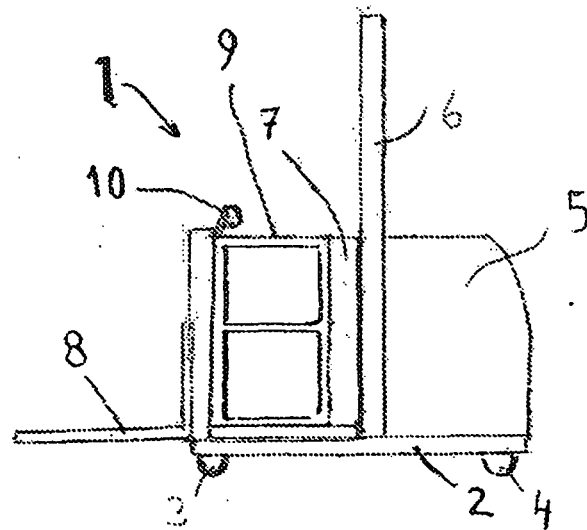


FIG. 1

REFERENCES CITED IN THE DESCRIPTION

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