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(54) A STABILISING SYSTEM FOR SELF-PROPELLED WORK MACHINES

STABILISIERUNGSSYSTEM FÜR SELBSTFAHRENDE ARBEITSMASCHINEN

SYSTÈME DE STABILISATION POUR MACHINES DE TRAVAIL AUTO-PROPULSÉES

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Description

[0001] The present invention relates to a stabilising system for self-propelling work machines predisposed for lifting loads and / or persons, such as for example cranes, mobile cranes or the like.

[0002] Hydraulic cranes are known, comprising a respective articulated arm predisposed on a truck and mainly used for loading and unloading material from and onto a truck body on the truck.

[0003] With the aim of safely moving the load, the crane and the truck must be stabilised using appropriate devices, called "outriggers", predisposed on the crane itself and the support counterframe of the truck.

[0004] The outriggers are usually of the telescopic type, hydraulically activated, and have the aim of preventing a tipping of the machine during the operating steps.

[0005] In detail, two cross-members can be included, arranged perpendicular to the axis of the truck.

[0006] The cross-member associated to the crane or, generally speaking, the front cross member is joined to the back cross-member by a pair of longitudinal members, so as to defined said counterframe.

[0007] In each cross-member, two shafts are slidably inserted, which bear, at the distal ends, respective rest feet, vertically mobile.

[0008] One of the cross-members is located immediately behind the cabin, while the other cross-member is arranged behind the rear axle.

[0009] In this way, four telescopic outriggers are defined, two for each flank of the vehicle.

[0010] In practice, during driving condition, the outriggers are in a retracted configuration, in which they have a minimum lateral dimension with respect to the advancement direction of the truck.

[0011] Before the loading and unloading steps, the outriggers must be brought into an extended configuration, in which the respective shafts are extracted from the relative cross-member so as to project at the flanks of the vehicle and the feet are lowered down to the ground.

[0012] For some time it has been the case that the outrigger extraction and ground-resting steps can be commanded by the operator of the machine using a remote control, usually a radio command, in addition to the more usual control using means located on board.

[0013] In this way, the operator is enabled to actuate the stabilising even when moving away from the vehicle, enabling the operator to directly control, by viewing, that the steps of extraction and resting of each outrigger take place in the correct way.

[0014] WO 2010/028938 discloses a mobile working machine having a working or support member comprising a motor drive mechanism. The working machine further comprises a controller for actuating the drive mechanism, and a remote control device that wirelessly communicates with the controller. In order to increase operational safety, the remote control device and the working or support member have a first distance sensor for determining an inner zone threshold and a second distance sensor for determining an outer zone threshold. The controller responds to the remote control signals, thereby releasing the actuation signal for the drive mechanism, only if the remote control device is located within the range between the inner and the outer zone thresholds.

[0015] A first drawback of the present control system of the outriggers is the fact that the remote controls are complex and awkward, as they have to include a plurality of command levers, as well as some input means, such as buttons; most often, a command lever for each outrigger is provided.

[0016] In fact, as the extraction stroke of the shaft of each outrigger, as well as the lowering stroke of the relative foot, vary on the basis of the environmental conditions in which they are used, it is necessary for the operator to activate one outrigger at a time, so as to be able to determine by him or herself how much to extract the shaft and how much to lower the foot.

[0017] As a crane is usually provided with four outriggers, each provided with a shaft and a foot, the remote control usually has at least eight activation commands.

[0018] Further, the need has been felt to provide a system, which guarantees that the operators, when they activate a specific outrigger, are effectively observing the outrigger directly and free of obstacles.

[0019] In fact, it can happen that some operators activate the four outriggers in sequence while remaining always at a same point, or moving only slightly, which does not allow them to directly and closely watch the movements of each outrigger.

[0020] This circumstance is detrimental to the correct stabilising of the crane and therefore the safety of the persons or the vehicle during the loading and unloading operations.

[0021] The technical object underpinning the present invention is therefore to provide an improved stabilising system which obviates the drawbacks of the prior art.

[0022] This technical object is achieved by the stabilising system realised in accordance with claim 1.

[0023] Further characteristics and advantages of the present invention will become more apparent from the following indicative, and hence non-limiting, description of preferred, but not exclusive, embodiments of the system of the invention, as illustrated in the accompanying drawings, in which:

- figures 1-3 are axonometric views of a vehicle on which the system of the invention has been mounted, in various operating steps; and
- figure 4 is a diagram illustrating the processing unit of the invention; With reference to the accompanying figures, reference numeral 1 denotes in its entirety a work machine with which the system of the invention can be used.

[0024] In detail, the stabilising system of the invention

is especially destined for use with a self-propelling work machine 1 for lifting loads and or people, such as for example cranes, mobile cranes, etc.

[0025] The invention is preferably implemented on a hydraulic crane 10, provided with an articulated and/or extensible arm predisposed telescopically on the frame of the truck 1 and able to be used for loading and unloading material onto and from the truck body of the truck 1; for reasons of clarity of understanding of the figures, in the appended tables of drawings the truck body has not been illustrated.

[0026] The arm of the crane 10 is preferably mounted on a rotating turret located immediately behind the cabin and, in turn, at a distal end thereof has a lift hook or another lift means mounted.

[0027] The system of the invention includes a plurality of outriggers 2 mobile between a retracted rest configuration and at least an extended use configuration.

[0028] Further, the system comprises an activating apparatus 3, preferably of an electro-hydraulic type, such as for example a hydraulic distributor 3 mounted on the crane or on the vehicle frame 1 or other like apparatus, able to selectively actuate the outriggers 2.

[0029] In practice, each outrigger 2 can be gradually and singly actuated, and adjusted as will be more fully explained in the following.

[0030] According to the invention, the distributor 3 (or other apparatus) is able to receive movement signals and is able to cause passage of the outriggers 2 from one configuration to another according to said movement signals received.

[0031] In general, the system of the invention can include a plurality of hydraulic actuators, for example hydraulic cylinders, predisposed for moving the outriggers 2 and for moving the arm, subjected to at least an hydraulic distributor 3, in turn subjected to a processing unit 4, of which more in the following.

[0032] In the illustrated preferred embodiment, the system includes the use of four outriggers 2 predisposed on the support frame of the truck body, subdivided into a front pair and a rear pair, thus providing two outriggers 2 for each flank of the machine 1.

[0033] In detail, two cross-members 20 can be included, arranged perpendicular to the axis of the truck 1 and reciprocally joined by a pair of longitudinal members 200, defining a counterframe fixed above the chassis of the truck 1.

[0034] Two telescopic shafts 21 are slidably inserted in each of the cross-members 20, preferably with two segments, which bear, at the distal ends, respective rest feet 22, which are vertically mobile.

[0035] To be precise, the shafts 21 are preferably located horizontally and the rest feet 22 are borne by telescopic uprights 23, preferably vertical and preferably having one segment, located at the distal ends of the respective shafts 21.

[0036] The extraction of the shafts 21 and the descent of the feet 22 are clearly produced by the above-mentioned actuators, on activating the distributor 3.

[0037] As is visible in the appended figures, which illustrate a preferable but not limiting embodiment of the invention, a cross-member 20 is located immediately behind the cabin 100, while the other cross-member 20 is preferably arranged behind the rear axle.

[0038] During the movement of the vehicle 1, the outriggers 2 are in a retracted rest configuration, in which they have a minimum lateral dimension with respect to the advancement direction of the truck 1, while, in use, the outriggers 2 are in one of the extended working configurations.

[0039] In an important aspect of the invention, the stabilising system includes a positioning apparatus able to detect at least a relative position of an operator 5 with respect to at least one of the outriggers 2.

[0040] Further, the positioning apparatus is able to produce position signals according to the detections made.

[0041] In practice, thanks to this apparatus, which will be better specified in the following detailed and non-limiting embodiments, information is collated on the whereabouts of the operator 5 with respect to the outriggers 2, making it possible, among other things, to determine which particular outrigger 2 is nearest to him or her.

[0042] To be precise, the positioning apparatus is able to detect, instant by instant, the current position of the operator 5, who has left the cabin 100 and is stationary or mobile in the environs of the machine 1.

[0043] The position apparatus can be constrained to a certain range of action with respect to one or more points of the work machine 1.

[0044] The invention further has a portable command device 6, such as a remote control (preferably a radio command) comprising an interface which enables selection of commands by the operator 5.

[0045] Further, the radio command 6 (or other device) is able to produce and transmit command signals according to the selections made by the operator 5.

[0046] In general terms, the interface of the portable command device 6 is configured for enabling a setting of at least a command parameter representing a variation of the configuration of at least an outrigger 2 of the system.

[0047] In a case where the command device is a radio command 6 (or the like), the interface can comprise at least a command lever and, for example, one or more buttons; it does not exclude the possibility that the interface is constituted by a touchscreen display alternatively or in addition to levers and buttons.

[0048] In the following, for reasons of clarity of illustration and without departing from the general description, reference will be made by way of non-limiting example to a case in which the command device is a radio command 6 equipped with at least a command lever for the operation of the outriggers 2.

[0049] In detail, in a particular embodiment of the invention, the radio command 6 comprises a single lever for commanding all of the outriggers 2; this advantageous

characteristic of the radio command 6 is made possible by technical specifications which will be illustrated in the following during the description of the processing unit 4 included in the proposed system.

[0050] In more general terms, the command device 6 comprises a single command element for the outriggers 2, which can be manually moved in a continuous fashion into a multiplicity of positions; instead of the lever, the single command element might be an interactive index represented via a touchscreen display.

[0051] The command device 6 can thus be configured for transmitting a signal able to vary the configuration of an outrigger 2 at a time, selected with the aid of the positioning apparatus.

[0052] The positioning apparatus preferably includes at least a portable positioning device, which can for example be included or integrated in the radio command 6.

[0053] In general, this device is portable so that the operator 5 can carry it with him.

[0054] Further, the positioning apparatus comprises an identifying device 7 associated to each outrigger 2, which identifying device 7 (schematically represented in figure 4) is connected to the positioning device, preferably via radio frequencies.

[0055] For example, the positioning device can include a transponder, possibly of the RFID type, while the identifying device includes a relative reader, or vice versa.

[0056] In general, at or in proximity of each outrigger 2 a device can be mounted which is able to localise the presence of an operator 5, which device can include various sensors at present available on the market.

[0057] For example, the device in question might be physically mounted on the cross-member 20 of the relative outrigger 2 or on the beam 21, etc.

[0058] It is further possible for the positioning apparatus to include a single sensor able to scan the outline of the vehicle 1 or possibly include one or more satellite positioning devices (for example GPS), for example one on-board the vehicle 1 and one installed in the radio command 6.

[0059] In any case, as mentioned, the positioning apparatus detects at least the position of the operator 5 relative to at least one of the outriggers 2 and consequently produces position signals transmitted to a processing unit 4. At least a processing unit 4 is advantageously able to transmit movement signals to the distributor 3 and is able to receive said radio command signals 6 and said position signals from the position apparatus.

[0060] The transmission and receiving of these signals can take place for example at the radio-frequencies, using appropriate transceivers.

[0061] However, the processing unit 4 can be constituted by a single electronic device, including of the type commonly present on this type of machine, suitably programmed for carrying out the functions described.

[0062] Alternatively, the processing unit 4 can be "distributed" and therefore constituted by a plurality of electronic devices.

[0063] In general, the processing unit 4 can make use of one or more microprocessors or microcontrollers for carrying out the instructions contained in memory modules and the functional modules thereof can further be distributed over a plurality of local or remote calculators that can also constitute a network.

[0064] The processing unit 4 comprises a localising module 41 configured for determining instant by instant at least which is the nearest outrigger 2 to the operator 5, on the basis of the position signals received.

[0065] Based on the type of positioning device, the localising module 41 can define a maximum detection area or range within which the operator 5 must be located with respect to each outrigger 2 or a unique reference system, for example located at the centre of the vehicle 1 or in another place.

[0066] Thus, at any moment, the localising module 41 calculates the relative position of the operator 5 and identifies the outrigger 2 nearest to him or her.

[0067] The processing unit 4 further includes an adjustment module 42 configured for producing movement signals according to the nearest outrigger 2 determined and of the command signals received.

[0068] In practice, with the processing of the adjustment module 42, the outrigger 2 to be moved is identified and also the extension of the movements that will be operated by the distributor 3 in accordance with the commands of the operator 5 acting on the lever or levers (or other command element).

[0069] In detail, according to how much the lever is moved, or how long it is maintained in one position, it will be possible to determine by how much the beam 21 of the outrigger 2 extends and by how much the foot 22 lowers; this aspect will be more fully explained during the operating description of the invention.

[0070] In is however mentioned that as the system enables identifying the nearest outrigger 2 to the operator 5, the invention therefore enables making available a radio command 6 which does not require the levers dedicated to the various outriggers 2, so that the levers can in fact be limited to one only.

[0071] In fact, and primarily, if the stabilisation requires the beam 21 to be fully extracted, for the lowering of the foot 22, the operator 5 does not have to do more than continue to actuate the lever after the beam 21 has reached the maximum extension thereof.

[0072] If instead the beam 21 is to extend for a shorter stroke that the maximum, an input device, such as a button, can be provided which switches the command of the beam 21 to the foot 22 or vice versa, or it can be decided that if the lever is moved into a position opposite the activating position, i.e. beyond the central stop position, this act causes the above-mentioned switching; the listed activations are partial and representative examples of how the system of the invention can be commanded by means of a single lever adapted to the activating of all the outriggers 2.

[0073] Note also that even if the processing unit 4 is configured for determining at least the nearest outrigger 2 and for activating it in accordance with the commands of the operator 5, special embodiments are possible in which a plurality of outriggers 2 can also be operated together and/or in a hierarchical sequence, in accordance with a predefined program.

[0074] In particular, it is possible to have an embodiment in which, if the operator 5 is sufficiently close to two outriggers 2, for example because he or she is able to comfortably position him or herself on the flank of the vehicle 1, he or she can act on both outriggers 2 by using two levers on the radio command 6, and then can move onto the other side and complete the stabilisation.

[0075] Alternatively, the processing unit 4 can be programmed to move two or more outriggers 2 in sequence, starting from the nearer to the operator 5 and progressively proceeding towards the more distant ones, or based on other criteria.

[0076] Therefore, in general, the localising module 41 can be configured for determining respective degrees of proximity of the operator 5 to the different outriggers 2, on the basis of position signals received; in this case the adjustment module 42 is able to transmit command signals that are a function of the degrees of position and is consequently able to activate one or more outriggers 2.

[0077] The stabilising program, memorised in a memory module 43 of the processing unit 4, can be selected by the operator 5 via a display present on the radio command 6 or in other ways, such as for example by moving a small knob, etc.

[0078] In a particular embodiment of the invention, the stabilising program is at least in part provided in an internet-based remote computing and storage unit, e.g. using cloud-computing technology.

[0079] Preferably, according to the sensitivity of the positioning device, the localising module 41 can be configured so as to generate a warning to the operator 5 who informs him of the fact that he is in a more or less equidistant position with respect to two outriggers 2 and that the system is not able to discriminate in terms of which outrigger 2 is nearer to him or her.

[0080] For example, the localising module 41 can generate a warning signal, which is for example received and processed by the radio command 6, which in turn can produce a sound or a visual indication on the display, if present, or an indication by means of a warning light.

[0081] Moreover, the localising module 41 can be configured to provide the operator 5 with further information relating to his position relative to the outriggers 2; for example, the operator 5 can be warned that he is too far from the outriggers to be able to correctly observe the stabilization procedure.

[0082] The functioning of the invention is illustrated in the following.

[0083] Once the machine 1 has been brought to the site where the crane 10 has to carry out the lifting or loading/unloading operations, the operator 5 exits the cabin, taking the radio command 6 with him other and approaches the outrigger 2 which he or she first wishes to extract and rest on the ground, so as to be able to directly observe it in an obstruction-free view.

[0084] The processing unit 4 recognises the greater proximity of the operator 5 to the above-mentioned outrigger 2 using technical means indicated in the foregoing and thus enables the operator 5 to activate the outrigger 2 without having to carry out any type of selection using the command means.

[0085] As illustrated in figure 1, by acting on the radio command 6, the operator 5 extracts the beam 21 of the nearest outrigger 2 and proceeds with the resting of the foot 22.

[0086] The operating steps are reiterated for each of the outriggers 2 which the machine is provided (see figures 2 and 3), to the full advantage of ease of use, and also the safety, since the system obliges the operator 5 to position him or herself in such a way that the system recognises the relative proximity thereof to a specific outrigger 2 that is to be operated.

Claims

1. A stabilising system for a lifting work machine (1), comprising:

a plurality of outriggers (2) mobile between a rest configuration and at least a use configuration;
at least an activating apparatus (3) able to selectively activate said outriggers (2), able to receive movement signals and able to make the outriggers (2) pass from a configuration to another, according to said movement signals received;
at least a positioning apparatus able to detect at least a position of an operator (5) relative to at least one of the outriggers (2) and able to produce position signals according to the detections made;
at least a portable command device (6), comprising an interface adapted to enable selection of commands by said operator (5) and able to produce command signals according to said selections carried out by the operator (5); and
at least a processing unit (4) able to transmit movement signals to said activating apparatus (3) and able to receive said command signals and said position signals, **characterised in** comprising:

at least a localising module (41) configured for determining which is the nearest outrigger (2) on the basis of the position signals received; and
at least an adjustment module (42) config-

ured for producing movement signals according to said nearest outrigger (2) determined and to the command signals received.

2. The system according to the preceding claim, wherein said adjustment module (42) is configured for producing a command signal able to activate only the nearest outrigger (2), the activating apparatus (3) being able to move an outrigger (2) according to the command signal received.

3. The system according to at least one of the preceding claims, wherein said command device (6) comprises a single command element for the outriggers (2), continuously manually movable into a plurality of positions, the command device being configured for transmitting a signal able to vary the configuration of said nearest outrigger (2) according to the position assumed by said single command element.

4. The system according to claim 1 , wherein said localising module (41) is configured for determining respective degrees of proximity of the operator (5) to the different outriggers (2), on the basis of position signals received, the adjustment module (42) being able to transmit a command signal that is a function of said degrees of position and consequently able to activate one or more outriggers (2).

5. The system according to at least one of the preceding claims, wherein the positioning apparatus includes at least a portable positioning device.

6. The system according to the preceding claim, wherein said positioning device is integrated into said command device (6).

7. The system according to at least one of the preceding claims, wherein the command device is a radio command (6).

8. The system according to at least one of claims 5 to 7, wherein the positioning apparatus comprises at least an identifying device associated to each outrigger (2), each identifying device being connectable to the positioning device.

9. The system according to the preceding claim, wherein the positioning device and each identifying device respectively comprise a transponder and a radiofrequency reader or vice versa.

10. The system according to at least one of the preceding claims, comprising at least four outriggers (2) able to pass from a retracted rest configuration to a plurality of extended working configurations, each comprising a beam (21) that is extensible and retractable telescopically at distal end of which a terminal upright (23) is fixed that is able to extend and retract telescopically, so as to be able to contact a ground, said extensions and retractions of said beam (21) and said upright (23) being controlled by said activating apparatus (3).

11. A self-propelling lifting work machine (1), comprising a stabilising system according to at least one of the preceding claims.

12. The machine (1) according to the preceding claim, comprising: a hydraulic crane (3) provided with an articulated arm on which a lift means is provided.

Patentansprüche

1. Stabilisierungssystem für eine Hubarbeitsmaschine (1), umfassend:

eine Vielzahl von Auslegern (2), die zwischen einer Ruhekonfiguration und mindestens einer Verwendungskonfiguration bewegbar sind;
mindestens eine Aktivierungsvorrichtung (3), die die Ausleger (2) selektiv aktivieren, Bewegungssignale empfangen und die Ausleger (2) gemäß den empfangenen Bewegungssignalen aus einer Konfiguration in eine andere überführen kann;
mindestens eine Positioniereinrichtung, die mindestens eine Position eines Bedieners (5) in Bezug auf mindestens einen der Ausleger (2) erfassen und Positionssignale gemäß den Erfassungen erzeugen kann;
mindestens eine tragbare Befehlseinrichtung (6), die eine Schnittstelle umfasst, die dazu eingerichtet ist, die Auswahl von Befehlen durch den Bediener (5) zu ermöglichen, und die Befehlssignale gemäß den durch den Bediener (5) vorgenommenen Auswahlen erzeugen kann; und
mindestens eine Verarbeitungseinheit (4), die Bewegungssignale an die Aktivierungsvorrichtung (3) übertragen und die Befehlssignale und Positionssignale empfangen kann, **dadurch gekennzeichnet, dass** sie umfasst:

mindestens ein Lokalisierungsmodul (41), das dazu ausgelegt ist, basierend auf den empfangenen Positionssignalen zu bestimmen, welches der nächstgelegene Ausleger (2) ist; und
mindestens ein Einstellmodul (42), das dazu ausgelegt ist, Bewegungssignale gemäß dem ermittelten nächstgelegenen Ausleger (2) und den empfangenen Befehlssignalen zu erzeugen.

2. System gemäß dem vorhergehenden Anspruch, wobei das Einstellmodul (42) dazu ausgelegt ist, ein Befehlssignal zu erzeugen, das nur den nächstgelegenen Ausleger (2) aktivieren kann, wobei die Aktivierungsvorrichtung (3) einen Ausleger (2) gemäß dem empfangenen Befehlssignal bewegen kann.

3. System gemäß mindestens einem der vorhergehenden Ansprüche, wobei die Befehlseinrichtung (6) ein einzelnes Befehlselement für die Ausleger (2) umfasst, das kontinuierlich manuell in eine Vielzahl von Positionen bewegbar ist, wobei die Befehlseinrichtung dazu ausgelegt ist, ein Signal zu übertragen, das die Konfiguration des nächstgelegenen Auslegers (2) gemäß der durch das einzelne Befehlselement eingenommenen Position verändern kann.

4. System gemäß Anspruch 1, wobei das Lokalisierungsmodul (41) dazu ausgelegt ist, basierend auf empfangenen Positionssignalen den jeweiligen Nähegrad des Bedieners (5) zu den verschiedenen Auslegern (2) zu bestimmen, wobei das Einstellmodul (42) ein Befehlssignal übertragen kann, das von den Positionsgraden abhängt und folglich einen oder mehrere Ausleger (2) aktivieren kann.

5. System gemäß mindestens einem der vorhergehenden Ansprüche, wobei die Positioniereinrichtung mindestens eine tragbare Positioniereinrichtung enthält.

6. System gemäß dem vorhergehenden Anspruch, wobei die Positioniereinrichtung in die Befehlseinrichtung (6) integriert ist.

7. System gemäß mindestens einem der vorhergehenden Ansprüche, wobei die Befehlseinrichtung ein Funkbefehl (6) ist.

8. System gemäß mindestens einem der Ansprüche 5 bis 7, wobei die Positioniereinrichtung mindestens eine jedem Ausleger (2) zugeordnete Identifiziereinrichtung umfasst, wobei jede Identifiziereinrichtung mit der Positioniereinrichtung verbindbar ist.

9. System gemäß dem vorhergehenden Anspruch, wobei die Positioniereinrichtung und jede Identifiziereinrichtung einen Transponder beziehungsweise einen Hochfrequenzleser oder umgekehrt umfassen.

10. System gemäß mindestens einem der vorhergehenden Ansprüche, umfassend mindestens vier Ausleger (2), die aus einer eingefahrenen Ruhekonfiguration in eine Vielzahl von ausgefahrenen Arbeitskonfigurationen übergehen können, wobei jeder einen teleskopisch aus- und einfahrbaren Querträger (21) umfasst, an dessen fern gelegenem Ende ein abschließender Vertikalträger (23) befestigt ist, der teleskopisch aus- und einfahren kann, sodass er den Boden berühren kann, wobei das Aus- und Einfahren des Querträgers (21) und des Vertikalträgers (23) durch die Aktivierungsvorrichtung (3) gesteuert wird.

11. Selbstfahrende Hubarbeitsmaschine (1), umfassend ein Stabilisierungssystem gemäß mindestens einem der vorhergehenden Ansprüche.

12. Maschine (1) gemäß dem vorhergehenden Anspruch, umfassend einen Hydraulikkran (3), der mit einem Gelenkarm versehen ist, an dem ein Hubmittel vorgesehen ist.

Revendications

1. Système de stabilisation pour un engin de chantier élévateur (1), comprenant :

   une pluralité de stabilisateurs (2) mobiles entre une configuration de repos et au moins une configuration d'utilisation ;
   au moins un appareil d'activation (3) capable d'activer sélectivement lesdits stabilisateurs (2), capable de recevoir des signaux de mouvement et capable de faire passer les stabilisateurs (2) d'une configuration à une autre, selon lesdits signaux de mouvement reçus ;
   au moins un appareil de positionnement capable de détecter au moins une position d'un opérateur (5) relativement à au moins un des stabilisateurs (2) et capable de produire des signaux de position selon les détections effectuées ;
   au moins un dispositif de commande portatif (6), comprenant une interface adaptée pour permettre la sélection de commandes par ledit opérateur (5) et capable de produire des signaux de commande selon lesdites sélections réalisées par l'opérateur (5) ; et
   au moins une unité de traitement (4) capable de transmettre des signaux de mouvement audit appareil d'activation (3) et capable de recevoir lesdits signaux de commande et lesdits signaux de position, **caractérisé en ce qu'**il comprend :

      au moins un module de localisation (41) configuré pour déterminer le stabilisateur qui est le stabilisateur (2) le plus près, sur la base des signaux de position reçus ; et
      au moins un module de réglage (42) configuré pour produire des signaux de mouvement selon ledit stabilisateur (2) le plus près déterminé et selon les signaux de commande reçus.

2. Système selon la revendication précédente, dans lequel ledit module de réglage (42) est configuré pour

produire un signal de commande capable d'activer seulement le stabilisateur (2) le plus près, l'appareil d'activation (3) étant capable de mettre en mouvement un stabilisateur (2) selon le signal de commande reçu.

3. Système selon au moins une des revendications précédentes, dans lequel ledit dispositif de commande (6) comprend un élément de commande unique pour les stabilisateurs (2), pouvant être mis en mouvement manuellement en continu dans une pluralité de positions, le dispositif de commande étant configuré pour transmettre un signal capable de varier la configuration dudit stabilisateur (2) le plus près, selon la position adoptée par ledit élément de commande unique.

4. Système selon la revendication 1, dans lequel ledit module de localisation (41) est configuré pour déterminer des degrés respectifs de proximité, de l'opérateur (5), des différents stabilisateurs (2), sur la base de signaux de position reçus, le module de réglage (42) étant capable de transmettre un signal de commande qui est une fonction desdits degrés de position et par conséquent capable d'activer un ou plusieurs stabilisateurs (2).

5. Système selon au moins une des revendications précédentes, dans lequel l'appareil de positionnement inclut au moins un dispositif de positionnement portatif.

6. Système selon la revendication précédente, dans lequel ledit dispositif de positionnement est intégré dans ledit dispositif de commande (6).

7. Système selon au moins une des revendications précédentes, dans lequel le dispositif de commande est une commande radio (6).

8. Système selon au moins une des revendications 5 à 7, dans lequel l'appareil de positionnement comprend au moins un dispositif d'identification associé à chaque stabilisateur (2), chaque dispositif d'identification étant connectable au dispositif de positionnement.

9. Système selon la revendication précédente, dans lequel le dispositif de positionnement et chaque dispositif d'identification comprennent respectivement un transpondeur et un lecteur radiofréquence ou vice versa.

10. Système selon au moins une des revendications précédentes, comprenant au moins quatre stabilisateurs (2) capables de passer d'une configuration de repos rétractée à une pluralité de configurations de fonctionnement étendues, chacun comprenant une poutre (21) qui est extensible et rétractable de façon télescopique à une extrémité distale de laquelle un montant terminal (23) est fixé qui est capable de s'étendre et de se rétracter de façon télescopique, afin d'être capable d'entrer en contact avec un sol, lesdites extensions et rétractions de ladite poutre (21) et dudit montant (23) étant contrôlées par ledit appareil d'activation (3).

11. Engin de chantier élévateur automoteur (1), comprenant un système de stabilisation selon au moins une des revendications précédentes.

12. Engin (1) selon la revendication précédente, comprenant : une grue hydraulique (3) pourvue d'un bras articulé sur lequel un moyen élévateur est prévu.

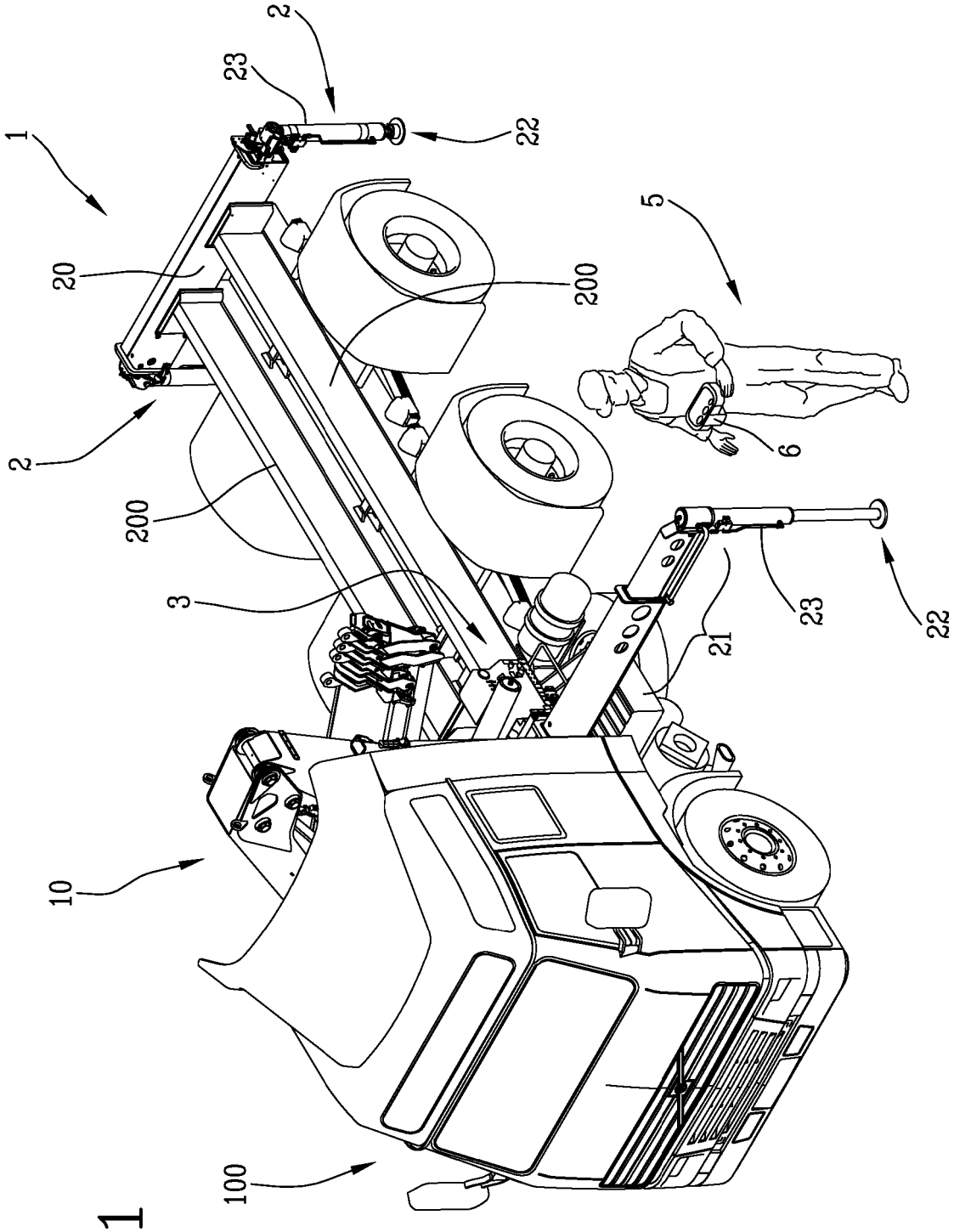


Fig.1

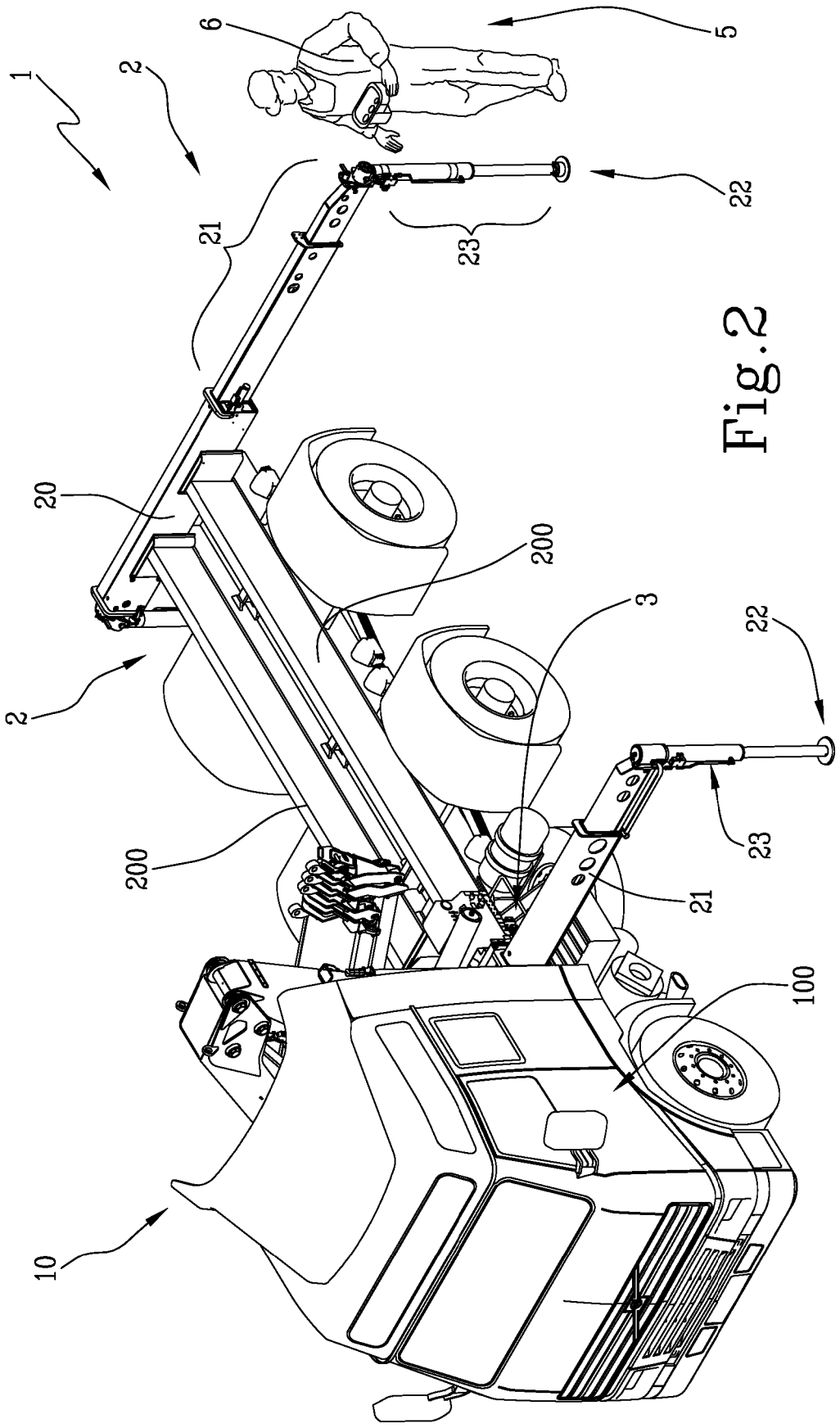


Fig.2

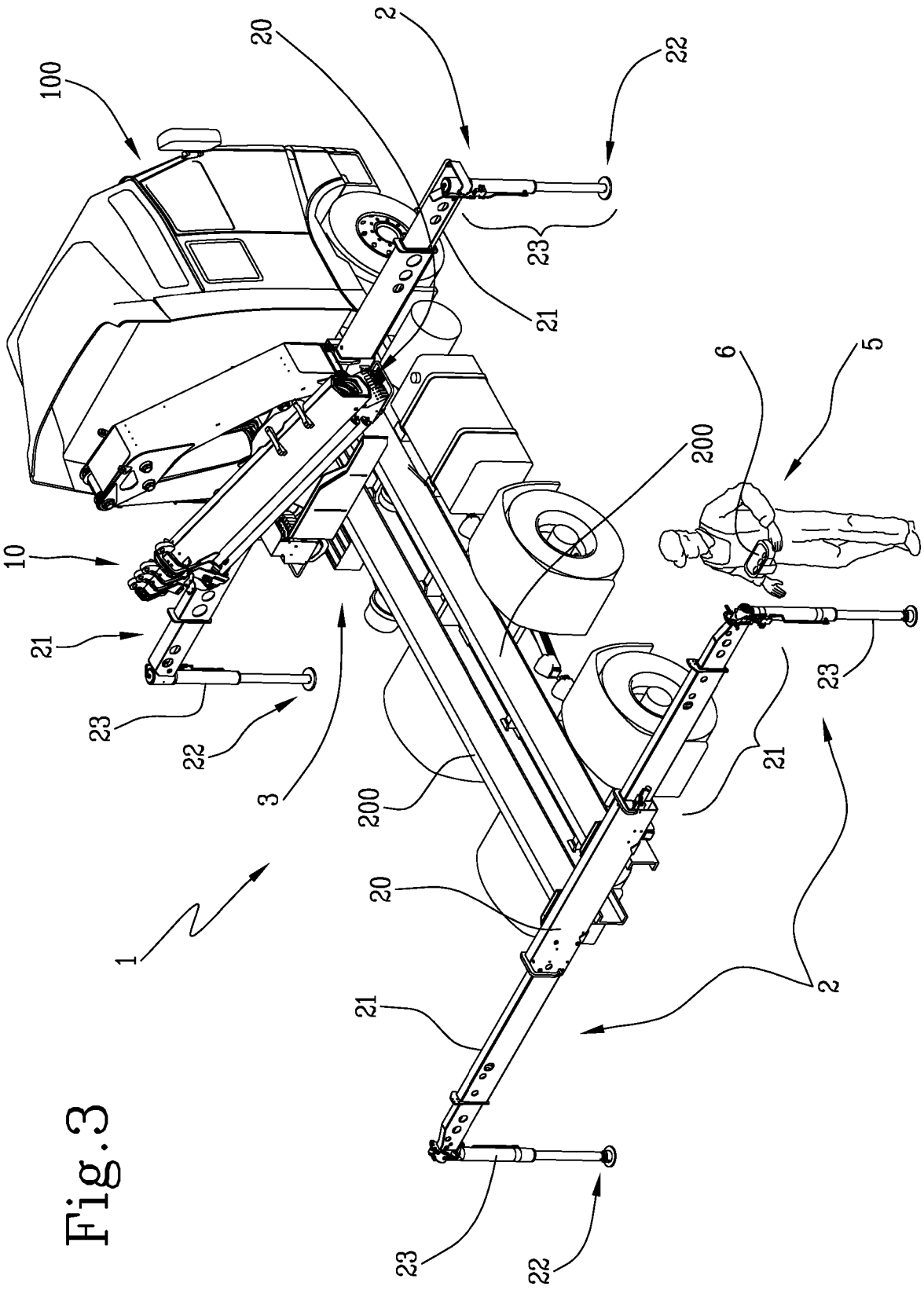
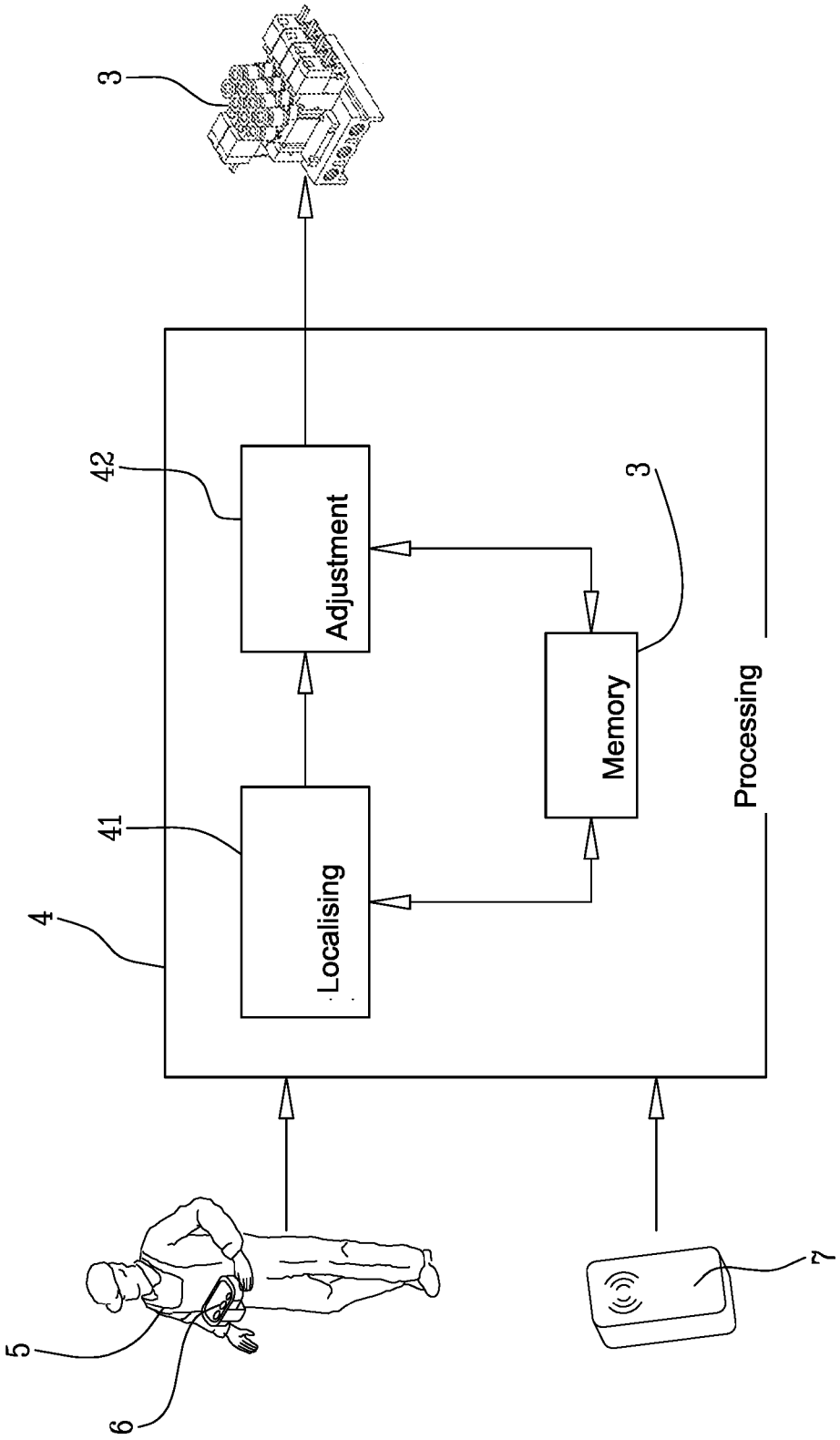


Fig.3

Fig.4



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Patent documents cited in the description

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