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(54) HYBRID CONVERSION KIT

HYBRID-UMBAUSATZ

KIT DE CONVERSION HYBRIDE

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EP 3 412 836 B1

Description

TECHNICAL FIELD

[0001] The present invention concerns a hybrid conversion kit, in particular a hybrid conversion kit for vehicles equipped with an endothermic engine and an oil-hydraulic pump.

PRIOR ART

[0002] As known, work vehicles, like for example earth-moving vehicles, fork-lifts trucks and aerial work platforms, are generally equipped with an endothermic engine adapted for actuating an oil-hydraulic pump, which feeds a plurality of oil-hydraulic devices of the vehicle, like for example articulated arms, tools and traction means.

[0003] Propulsion by endothermic engine is particularly disadvantageous when the vehicle is working in closed environments, since the exhaust gases that it produces accumulate in the environment representing a serious risk to the health of operators.

[0004] In other cases, also in the presence of open spaces, devices that produce harmful exhaust gases and/or load noise could be banned from the work area, preventing the use of vehicles equipped with an endothermic engine.

[0005] In order to overcome such obstacles, a known solution foresees to make said vehicles equipped with, or also with, electric propulsion and hybrid conversion kit to add an electric propulsion means to the vehicles originally equipped only with an internal combustion engine.

[0006] Known hybrid conversion kits, as the one described in DE202009006525, comprise an electric motor that actuates a hydraulic pump adapted for feeding the various oil-hydraulic devices of the vehicle and a fastening group adapted for allowing the motor and the pump to be fixed to said vehicle. Such components of the kit, for reasons of space, must necessarily be installed outside of the vehicle on a mounting surface the configuration of which changes from one model to the next, thus obliging anchoring groups to be made *ad hoc* for every vehicle model.

[0007] A purpose of the present invention is to provide a hybrid conversion kit able to be installed on a large number of different vehicles.

[0008] Such purposes are accomplished by the characteristics of the invention given in the independent claim. The dependent claims outline preferred and/or particularly advantageous aspects of the invention.

SUMMARY OF THE INVENTION

[0009] The invention, particularly, provides a hybrid conversion kit for vehicles equipped with an endothermic engine and an oil-hydraulic pump, comprising: a support frame, an electric motor fixed to the support frame, an oil-hydraulic pump fixed to the support frame and actuated by the electric motor and an anchoring group of the support frame to the vehicle, wherein said anchoring group comprises: a first guide with which the support frame is slidably associated according to a first sliding axis, a second guide fixed to the first guide and provided with a pair of hooks, each of which is slidably associated with the second guide along a second sliding axis orthogonal to the first sliding axis, said hooks being configured to be fixed to a mounting surface made available on the vehicle.

[0010] Thanks to such a solution, by acting on the first guide and on the second guide, it is possible to position the hooks and the support frame so as to adapt the hybrid conversion kit to different types and models of vehicle, i.e. to different mounting surfaces.

[0011] In order to make this effect particularly effective, another aspect of the invention foresees that the hooks can be slidably associated with the mounting surface of the vehicle.

[0012] For example, the mounting surface can be a portion of a roll-bar of the vehicle.

[0013] Alternatively or additionally, the mounting surface can be a portion of a driver's cabin of the vehicle.

[0014] In this way the support frame is fixedly connected to the vehicle.

[0015] According to another aspect of the invention, the kit can comprise a cable-holding device connected to the support frame and adapted for keeping a portion of a cable adapted for connecting the kit to an electricity source raised from the ground and projecting externally with respect to the vehicle.

[0016] In this way, the supply cable of the electric motor is prevented from being able to hinder the movements of the vehicle, in particular the vehicle is prevented from running over the cable when it moves forwards or backwards along a straight line, given that the kit is fixed in the rear area of the vehicle.

[0017] According to a further aspect of the invention, the kit can comprise a delivery duct equipped with an end connected to the oil-hydraulic pump of the kit and an end connected to a delivery duct of the vehicle adapted for placing the oil-hydraulic pump of the vehicle in communication with an oil-hydraulic device of the vehicle, and wherein said kit comprises a first unidirectional valve arranged between the hydraulic pump of the kit and the delivery duct of the kit and a second unidirectional valve arranged between the oil-hydraulic pump of the vehicle and the delivery duct of the vehicle.

[0018] Thanks to such a solution, the pressurised fluid is prevented from entering into the oil-hydraulic pump of the vehicle and vice-versa when the oil-hydraulic pump connected to the electric motor is in operation.

[0019] Another aspect of the invention foresees that the kit can comprise a battery connected to the electric motor.

[0020] In this way, the vehicle can be actuated by the electric motor of the kit without being connected by cable

to an electrical energy source.

[0021] Advantageously, the kit can comprise a control station configured to selectively prevent the endothermic engine of the vehicle from turning on.

[0022] In this way it is possible to use the native controls of the vehicle without the endothermic engine being turned on.

[0023] A further aspect of the invention foresees that the control station can be configured to recharge a battery of the vehicle.

[0024] Thanks to such a solution, given that during use of the vehicle the inner battery of the vehicle is exploited to supply all of the components of the vehicle that need electrical energy, such a battery is prevented from running out.

[0025] Preferably, the kit can comprise a remote control device of the electric motor and of the oil-hydraulic pump of the kit.

[0026] In this way, the operator of the vehicle can activate and deactivate the electric motor of the kit while staying in the control station.

[0027] The invention also provides a vehicle equipped with an endothermic engine, an oil-hydraulic pump and a hybrid conversion kit, which comprises: a support frame, an electric motor fixed to the support frame, an oil-hydraulic pump fixed to the support frame and actuated by the electric motor and an anchoring group of the support frame to the vehicle, wherein said anchoring group comprises: a first guide with which the support frame is slidably associated according to a first sliding axis, a second guide fixed to the first guide and provided with a pair of hooks, each of which is slidably associated with the second guide along a second sliding axis orthogonal to the first sliding axis, said hooks being configured to be fixed to a mounting surface made available on the vehicle.

BRIEF DESCRIPTION OF THE DRAWINGS

[0028] Further characteristics and advantages of the invention will become clear from reading the following description provided as a non-limiting example, with the help of the figures illustrated in the attached tables.

Figure 1 is a schematic side view of a vehicle on which a hybrid conversion kit according to the invention is installed.

Figure 2 is a schematic side view of another embodiment of the vehicle on which the hybrid conversion kit is installed.

Figure 3 is an axonometric view from above of the kit of the previous figures.

Figure 4 is a side view of the kit of the previous figures.

Figure 5 is an axonometric view from below of the kit of the previous figures.

BEST EMBODIMENT OF THE INVENTION

[0029] With particular reference to the figures, a hybrid conversion kit adapted for being installed on a vehicle 10, for example an excavator, which comprises a frame 15 to which a traction group 20 is articulated, has been globally indicated with 1.

[0030] This does not rule out the possibility that the vehicle 10 can be a fork-lift truck or an aerial work platform or any work vehicle equipped with an endothermic engine and an oil-hydraulic pump.

[0031] In the embodiment illustrated in the figures, the traction group 20 is equipped with tracks.

[0032] The vehicle 10 comprises an endothermic engine 25 fixed to the frame 15 and an oil-hydraulic pump 30 fed by a tank T and actuated by the endothermic engine 25.

[0033] The oil-hydraulic pump 30 is equipped with di at least one delivery mouth and with a delivery duct 35 connected to said delivery mouth to feed a plurality of oil-hydraulic devices 40 of the vehicle 10.

[0034] The oil-hydraulic devices 40 comprise the traction group 20 and, for example, a plurality of oil-hydraulic cylinders of an arm of the vehicle 10.

[0035] Preferably, the pump 30 is equipped with a plurality of delivery ducts 35 to feed the oil-hydraulic devices 40.

[0036] The vehicle 10 comprises a control station 45 equipped with a seat and a group of controls 50 for controlling the vehicle 10.

[0037] In the embodiment illustrated in fig. 1, the vehicle 10 is equipped with a cabin 55, which has a pair of rear uprights 60, fixed to the frame 15.

[0038] It should be specified that in this document the term "rear" is meant to indicate the portion of the vehicle 10 arranged behind an operator correctly position in the control station 45 or in any case arranged at the opposite end with respect to a tool of the vehicle.

[0039] In such an embodiment the control station 45 is contained inside the cabin 55.

[0040] For example, the uprights 60 have a substantially vertical longitudinal axis when the vehicle 10 is on substantially horizontal ground.

[0041] However, in other embodiments that are not represented, the longitudinal axes of the uprights 60 can be inclined with respect to the vertical to the ground when the vehicle 10 is on substantially horizontal ground.

[0042] In the embodiment illustrated in figure 2, the vehicle 10 comprises a roll-bar 65 fixed to the frame 15 and equipped with a pair of uprights 70 fixed to the frame 15.

[0043] For example, the uprights 70 have a substantially vertical longitudinal axis when the vehicle 10 is on substantially horizontal ground.

[0044] However, in other embodiments that are not represented, the longitudinal axes of the uprights 70 can be inclined with respect to the vertical to the ground when the vehicle 10 is on substantially horizontal ground.

[0045] Preferably, the roll-bar 65 is positioned behind

the control station 45.

[0046] The vehicle 10 comprises a management station 75 connected to the group of controls 50 and a battery 80 for the electric power supply of the vehicle itself.

[0047] Moreover, the vehicle 10 comprises a protective case 85, which partially surrounds the control station 45 and contains at least the endothermic engine 25 and the oil-hydraulic pump 30 inside it.

[0048] The hybrid conversion kit 1 comprises a support frame 90, which is for example configured like a framework, i.e. it is equipped with a lower side member and an upper side member, parallel to one another, which are connected at the ends by a pair of mutually parallel vertical uprights.

[0049] The kit 1 also comprises an electric motor 95 fixed to the support frame 90 and an oil-hydraulic pump 100 actuated by the electric motor 95.

[0050] The electric motor 95 is for example of the type powered by a voltage of 380V.

[0051] However, this does not rule out this possibility that it can be of the type powered by a voltage of 220V.

[0052] Preferably, the electric motor has a power of 7.5Hp.

[0053] The kit 1 can also comprise a battery B for powering the electric motor 95 (schematically illustrated in figure 4).

[0054] The oil-hydraulic pump 100 of the kit 1 comprises an intake mouth 105, which is connected through an intake duct 110 of the kit 1 to the tank T of the vehicle 10.

[0055] The oil-hydraulic pump 100 also comprises a delivery mouth 115, which is adapted for being connected through a delivery duct 120 of the kit 1 to the delivery duct 35 of the vehicle 10.

[0056] Preferably the oil-hydraulic pump 100 comprises a plurality of delivery mouths 115, for example one for every delivery mouth of the oil-hydraulic pump 30 of the vehicle 10, and the kit 1 comprises one delivery duct 120 for every delivery duct 35 of the oil-hydraulic pump 30 of the vehicle 10.

[0057] The kit 1 comprises a first unidirectional valve 125 arranged between every delivery mouth 115 and the respective delivery duct 120.

[0058] Moreover, the kit 1 comprises a second unidirectional valve 130 arranged between every delivery mouth of the oil-hydraulic pump 30 of the vehicle 10 and the respective delivery duct 35 of the vehicle 10.

[0059] With particular reference to figures 1 and 2, the kit 1 comprises a control station 135 configured to selectively prevent the endothermic engine 25 of the vehicle 10 from turning on.

[0060] For example, the kit 1 comprises a connection cable adapted for connecting the control station 135 of the kit 1 with the management station 75 of the vehicle to selectively prevent the endothermic engine 25 of the vehicle 10 from turning on.

[0061] The control station 135 is also configured to recharge the battery 80 of the vehicle 10, for example the control station comprises an AC-DC transformer to recharge the battery 80 of the vehicle 10.

[0062] Preferably, the kit 1 comprises a recharging cable adapted for connecting the control station 135 to the battery 80 of the vehicle to recharge said battery 80.

[0063] Moreover, the control station 135 comprises a control panel 140, for example fixedly connected to the support frame 90, equipped with a plurality of controls for actuating the kit itself, i.e. the electric motor 95, the pump 100 and the control station 135.

[0064] Advantageously, the kit 1 comprises a remote control device 145 of the kit itself, i.e. equipped with a plurality of controls for actuating the electric motor 95, the pump 100 and the control station 135.

[0065] For example, the remote control device 145 is connected to the control station 135 through a connection cable.

[0066] However, this does not rule out the possibility that in an alternative embodiment the remote control device 145 can be connected to the control station 135 through wireless connection means.

[0067] With particular reference to figure 3, the kit 1 comprises a cable-holding device 150, connected to the support frame 90 and adapted for keeping a power supply cable 155, which is adapted for connecting the kit 1, i.e. an electrical socket of the kit 1, to an electricity source, for example to the electrical mains, raised from the ground and projecting externally with respect to the vehicle 10.

[0068] In particular, the cable-holding device 150 comprises a holding element of a section of the cable 155 adapted for keeping said section of the cable 155 raised from the ground.

[0069] The holding element 160 is mobile between a work position, in which it is distal from the support frame 90 and is eccentric in plan to the vehicle 10, arranged laterally thereto with respect to a rectilinear direction of forward motion of the vehicle 10, and a rest position, in which it is proximal to the support frame 90.

[0070] The holding element 160 can for example comprise a ring 160, preferably a pair of rings 160, adapted for supporting the section of the cable 155.

[0071] In the embodiment represented in the figures, the cable-holding device 150 comprises a rod with one end of which the holding element is associated and that is slidably inserted in a tubular rod fixed to the support frame 90 with respect to a sliding axis substantially perpendicular to the rectilinear direction of forward motion of the vehicle 10.

[0072] However, this does not rule out the possibility that in an alternative embodiment that is not depicted the cable-holding device 150 can comprise a rod with an end of which the holding element 160 is associated and that at the opposite end is hinged to the support frame 90.

[0073] The kit 1 comprises an anchoring group 165 for anchoring the support frame 90 to the vehicle 10, i.e. to a mounting surface made available on the vehicle 10.

[0074] In the embodiment illustrated in fig. 1, the mounting surface consists of a portion of the cabin 55,

i.e. the uprights 60.

[0075] In the embodiment illustrated in fig. 2, the mounting surface consists of a portion of the roll-bar 65, i.e. the uprights 70.

[0076] The anchoring group 165 comprises a first guide 170 with which the support frame 90 is slidably associated according to a first sliding axis X.

[0077] Such a first sliding axis X lies on a substantially horizontal plane.

[0078] For example, the lower side member of the support frame 90 is slidably associated with the first guide 170.

[0079] Advantageously, the kit comprises two first guides 170, for example both connected to the lower side member of the support frame 90.

[0080] Through the first guide 170 the support frame 90, i.e. the lower side member, is mobile between a first position in which the distance between the support frame 90, i.e. the lower side member, and the mounting surface is the minimum, and a second position, in which said distance is the maximum. The kit 1 also comprises locking means adapted for preventing the relative sliding of the support frame 90 with respect to the first guide 170.

[0081] In the embodiment illustrated in the figures, every first guide 170 comprises a plate equipped with an elongated slot that defines the first sliding axis X, and the locking means comprise a bolt associated with the support frame.

[0082] Said bolt is equipped with a screw partially inserted and slidably associated with the elongated slot according to the first sliding axis X, so as to also act as a slider for the first guide 170.

[0083] The kit 1 is equipped with a second guide 180, which is fixed to the first guide 170 and defines a second sliding axis Y perpendicular to the first sliding axis X.

[0084] Preferably, said second sliding axis Y lies on the same horizontal plane as the first sliding axis X.

[0085] The second guide 180 comprises for example a bar having a C-shaped cross section, the concavity of which faces towards the vehicle 10.

[0086] The second guide 180 has a pair of sliders, slidably associated with it according to the second sliding axis Y, and locking means of the relative sliding of the sliders with respect to the second guide 180.

[0087] The second guide 180 comprises a pair of hooks 185 slidably associated with the second guide itself, i.e. each sliding as a unit with a respective slider, and configured to be fixed to the mounting surface of the vehicle 10.

[0088] Preferably, such hooks 185 project canti-levered with respect to the support frame 90, towards the vehicle 10.

[0089] Such hooks 185 are also slidably associated with said mounting surface, which defines a sliding axis Z, incident with respect to the plane on which the first sliding axis X and the second sliding axis Y lie.

[0090] For example, said sliding axis Z is perpendicular to the sliding axis X and to the sliding axis Y.

[0091] In the embodiment illustrated in figure 1, each hook 185 is fixed to a respective upright 60 of the driver's cabin 55.

[0092] In the embodiment illustrated in figure 2, each hook 185 is fixed to a respective upright 70 of the roll-bar 65.

[0093] The hooks 185 each comprise a first portion and a second portion configured to wrap around and clamp the mounting surface, i.e. the respective upright 60,70.

[0094] For example, the hooks 185 each comprise a flat plate and a pair of U-shaped bars so as to wrap around the respective upright 60,70.

[0095] The anchoring group 165 also comprises a further pair of hooks 190 slidably associated with the support frame 90 according to a sliding axis W parallel and eccentric to the sliding axis Y.

[0096] This does not rule out the possibility that in an alternative embodiment the further pair of hooks 190 can be slidably associated with the support frame 90 also with respect to a sliding axis parallel to the sliding axis X.

[0097] For example, said further pair of hooks 190 is positioned at a greater height with respect to the second guide 180, and preferably it is slidably associated with a guide 200 fixed to the upper side member of the support frame 90. The kit 1 comprises a casing 195 fixed to the support frame 90 and adapted for protecting the electric motor 95, the oil-hydraulic pump 100 and the control station 135.

[0098] The kit 1 also comprises a holding element, not illustrated in the drawings, adapted for allowing the kit 1 to be gripped by a crane to lift the support frame 90 to the necessary height to allow it to be fixed to the mounting surface of the vehicle.

[0099] Such a holding element can for example comprise a pair of eyelets fixed to the upper side member and/or a bar fixed to said side member and arranged with longitudinal axis substantially parallel to the longitudinal axis of said side member.

[0100] The operation of the kit 1 according to the invention is as follows.

[0101] The kit 1, i.e. the support frame 90, is installed on the vehicle by adjusting the position of the hooks 185,190 with respect to the corresponding guides so as to adapt the position thereof to the configuration of the uprights 50,60 and thereafter lifting it to the height of the uprights 60,70 of the vehicle 10 to proceed to the fixing to the vehicle 10.

[0102] When the operator of the vehicle 10 must actuate the hybrid conversion kit 1, he/she proceeds by connecting the power supply cable 155 to an electrical socket of the kit and taking the holding element 160 of the cable-holding device 150 into the work position.

[0103] Thereafter, by acting on the controls of the control panel 140 or of the remote control device 145, the operator prevents the endothermic engine 25 of the vehicle 10 from turning on to then start the electric motor 95 of the kit 1.

[0104] The electric motor 95 actuates the oil-hydraulic

pump 100 of the kit that feeds the oil-hydraulic devices 40 of the vehicle, which are then controlled through the group of controls 50 of the control station 45 of the vehicle.

[0105] The invention thus conceived can undergo numerous modifications and variants, all covered by the inventive concept.

[0106] Moreover, all of the details can be replaced by other technically equivalent elements.

[0107] In practice, the materials used, as well as the contingent shapes and sizes, can be whatever according to requirements without for this reason departing from the scope of protection of the following claims.

Claims

1. A hybrid conversion kit (1) for vehicles (10) equipped with an endothermic engine (25) and an oil-hydraulic pump (30), comprising:

   - a support frame (90),
   - an electric motor (95) fixed to the support frame (90),
   - an oil-hydraulic pump (100) fixed to the support frame (90) and actuated by the electric motor (95) and
   - an anchoring group (165) of the support frame (90) to the vehicle (10),

   characterized by the fact that said anchoring group (165) comprises:

   - a first guide (170) with which the support frame (90) is slidably associated according to a first sliding axis (X),
   - a second guide (180) fixed to the first guide (170) and provided with a pair of hooks (185), each of which is slidably associated with the second guide (180) along a second sliding axis (Y) orthogonal to the first sliding axis (X), said hooks (185) being configured to be fixed to a mounting surface (60,70) made available on the vehicle (10).

2. The kit (1) according to claim 1, wherein the hooks (185) are slidably associated with the mounting surface (60,70) of the vehicle (10).

3. The kit (1) according to any one of the previous claims, wherein the mounting surface (70) is a portion of a roll-bar (65) of the vehicle (10).

4. The kit (1) according to claim 1 o 2, wherein the mounting surface (60) is a portion of a cabin (55) of the vehicle (10).

5. The kit (1) according to claim 1, comprising a cable-carrying device (150) connected to the support frame (90) and adapted for keeping a portion of a cable (155), adapted for connecting the kit (1) to an electrical source, raised from the ground and projecting externally with respect to the vehicle (10).

6. The kit (1) according to claim 1, comprising a delivery duct (120) equipped with an end connected to the oil-hydraulic pump (100) of the kit (1) and an end connected to a delivery duct (35) of the vehicle (10) adapted for putting the oil-hydraulic pump (30) of the vehicle (10) in communication with at least one oil-hydraulic device (40) of the vehicle (10), and wherein said kit (1) comprises a first one-way valve (125) arranged between the oil-hydraulic pump (100) of the kit (1) and the delivery duct (120) of the kit (1) and a second one-way valve (130) arranged between the oil-hydraulic pump (30) of the vehicle (10) and the delivery duct (35) of the vehicle (10).

7. The kit (1) according to claim 1, comprising a battery (B) connected to the electric motor (95).

8. The kit (1) according to claim 1, comprising a control station (135) configured to selectively inhibit the switching on of the endothermic engine (25) of the vehicle (10).

9. The kit (1) according to claim 8, wherein the control station (135) is configured to recharge a battery (80) of the vehicle (10).

10. The kit (1) according to claim 1, comprising a remote control device (145) of the kit itself.

11. A vehicle (10) equipped with an endothermic engine (25), an oil-hydraulic pump (30) and a hybrid conversion kit (1), as defined in one of claims 1 to 10.

Patentansprüche

1. Hybridumwandlungsausrüstung (1) für Fahrzeuge (10), die mit einem endothermen Motor (25) und einer Öl-Hydraulikpumpe (30) ausgestattet sind, Folgendes umfassend:

   - einen Tragrahmen (90),
   - einen Elektromotor (95), der an dem Tragrahmen (90) befestigt ist,
   - eine Öl-Hydraulikpumpe (100), die an dem Tragrahmen (90) befestigt ist und durch den Elektromotor (95) betätigt wird, und
   - eine Gruppe (165) zum Verankern des Tragrahmens (90) an dem Fahrzeug (10),
   dadurch gekennzeichnet, dass die Verankerungsgruppe (165) Folgendes umfasst:

   - eine erste Führung (170), an welche der

Tragrahmen (90) gemäß einer ersten Gleitachse (X) gleitfähig angegliedert ist,
- eine zweite Führung (180), die an der ersten Führung (170) befestigt und mit einem Paar Haken (185) versehen ist, von denen jeder entlang einer zweiten Gleitachse (Y), die senkrecht zur ersten Gleitachse (X) liegt, gleitfähig an die zweite Führung (180) angegliedert ist, wobei die Haken (185) dafür gestaltet sind, an einer Montagefläche (60, 70) befestigt zu werden, die an dem Fahrzeug (10) zur Verfügung steht.

2. Ausrüstung (1) nach Anspruch 1, wobei die Haken (185) gleitfähig an die Montagefläche (60, 70) des Fahrzeugs (10) angegliedert sind.

3. Ausrüstung (1) nach einem der vorhergehenden Ansprüche, wobei die Montagefläche (70) ein Abschnitt eines Überrollbügels (65) des Fahrzeugs (10) ist.

4. Ausrüstung (1) nach Anspruch 1 oder 2, wobei die Montagefläche (60) ein Abschnitt einer Kabine (55) des Fahrzeugs (10) ist.

5. Ausrüstung (1) nach Anspruch 1, eine kabeltragende Vorrichtung (150) umfassend, die mit dem Tragrahmen (90) verbunden und dafür eingerichtet ist, einen Abschnitt eines Kabels (155), das dafür eingerichtet ist, die Ausrüstung (1) mit einer elektrischen Quelle zu verbinden, über den Boden angehoben und im Verhältnis zum Fahrzeug (10) nach außen hervorstehend zu halten.

6. Ausrüstung (1) nach Anspruch 1, eine Zufuhrleitung (120) umfassend, die mit einem Ende ausgestattet ist, das mit der Öl-Hydraulikpumpe (100) der Ausrüstung (1) verbunden ist, und mit einem Ende, das mit einer Zufuhrleitung (35) des Fahrzeugs (10) verbunden ist, dafür eingerichtet, die Öl-Hydraulikpumpe (30) des Fahrzeugs (10) in Verbindung mit mindestens einer Öl-Hydraulikvorrichtung (40) des Fahrzeugs (10) zu bringen, und wobei die Ausrüstung (1) ein erstes Rückschlagventil (125) umfasst, das zwischen der Öl-Hydraulikpumpe (100) der Ausrüstung (1) und der Zufuhrleitung (120) der Ausrüstung (1) angeordnet ist, und ein zweites Rückschlagventil (130), das zwischen der Öl-Hydraulikpumpe (30) des Fahrzeugs (10) und der Zufuhrleitung (35) des Fahrzeugs (10) angeordnet ist.

7. Ausrüstung (1) nach Anspruch 1, eine Batterie (B) umfassend, die mit dem Elektromotor (95) verbunden ist.

8. Ausrüstung (1) nach Anspruch 1, eine Steuerstation (135) umfassend, die dafür gestaltet ist, das Einschalten des endothermen Motors (25) des Fahrzeugs (10) wahlweise zu unterbinden.

9. Ausrüstung (1) nach Anspruch 8, wobei die Steuerstation (135) dafür gestaltet ist, eine Batterie (80) des Fahrzeugs (10) wieder aufzuladen.

10. Ausrüstung (1) nach Anspruch 1, eine Fernsteuervorrichtung (145) der Ausrüstung selbst umfassend.

11. Fahrzeug (10), ausgestattet mit einem endothermen Motor (25), einer Öl-Hydraulikpumpe (30) und einer Hybridumwandlungsausrüstung (1) nach einem der Ansprüche 1 bis 10.

Revendications

1. Kit de conversion hybride (1) pour véhicules (10) équipé d'un moteur endothermique (25) et une pompe oléo-hydraulique (30), comprenant :

- un châssis de support (90),
- un moteur électrique (95) fixé au châssis de support (90),
- une pompe oléo-hydraulique (100) fixée au châssis de support (90) et actionnée par le moteur électrique (95) et
- un groupe d'ancrage (165) du châssis de support (90) du véhicule (10),

caractérisé en ce que ledit groupe d'ancrage (165) comprend :

- un premier guide (170) avec lequel le châssis de support (90) est associé de manière coulissante suivant un premier axe coulissant (X),
- un deuxième guide (180) fixé au premier guide (170) et équipé d'une paire de crochets (185), chacun des crochets étant associé de manière coulissante au deuxième guide (180) le long d'un deuxième axe coulissant (Y) orthogonal au premier axe coulissant (X), lesdits crochets (185) étant configurés pour être fixés à une surface de montage (60,70) rendue disponible sur le véhicule (10).

2. Kit (1) selon la revendication 1, dans lequel les crochets (185) sont associés de manière coulissante avec la surface de montage (60,70) du véhicule (10).

3. Kit (1) selon l'une quelconque des revendications précédentes, dans lequel la surface de montage (70) est une partie d'un arceau de sécurité (65) du véhicule (10).

4. Kit (1) selon la revendication 1 ou 2, dans lequel la surface de montage (60) est une partie d'une cabine (55) du véhicule (10).

5. Kit (1) selon la revendication 1, comprenant un dispositif porte-câbles (150) relié au châssis de support (90) et adapté pour maintenir une partie d'un câble (155), adapté pour connecter le kit (1) à une source électrique, soulevé du sol et faisant saillie extérieurement par rapport au véhicule (10).

6. Kit (1) selon la revendication 1, comprenant un conduit de refoulement (120) équipé d'une extrémité reliée à la pompe oléo-hydraulique (100) du kit (1) et d'une extrémité reliée à un conduit de refoulement (35) du véhicule (10) adapté pour mettre la pompe oléo-hydraulique (30) du véhicule (10) en communication avec au moins un dispositif oléo-hydraulique (40) du véhicule (10), et dans lequel ledit kit (1) comprend un premier clapet anti-retour (125) disposé entre la pompe oléo-hydraulique (100) du kit (1) et le conduit de refoulement (120) du kit (1) et un deuxième clapet anti-retour (130) disposé entre la pompe oléo-hydraulique (30) du véhicule (10) et le conduit de refoulement (35) du véhicule (10).

7. Kit (1) selon la revendication 1, comprenant une batterie (B) connectée au moteur électrique (95).

8. Kit (1) selon la revendication 1, comprenant un poste de commande (135) configuré pour inhiber de manière sélective la mise en marche du moteur endothermique (25) du véhicule (10).

9. Kit (1) selon la revendication 8, dans lequel le poste de commande (135) est configuré pour recharger une batterie (80) du véhicule (10).

10. Kit (1) selon la revendication 1, comprenant un dispositif de commande à distance (145) du kit lui-même.

11. Véhicule (10) équipé d'un moteur endothermique (25), d'une pompe oléo-hydraulique (30) et d'un kit de conversion hybride (1) tel que défini dans l'une des revendications 1 à 10.

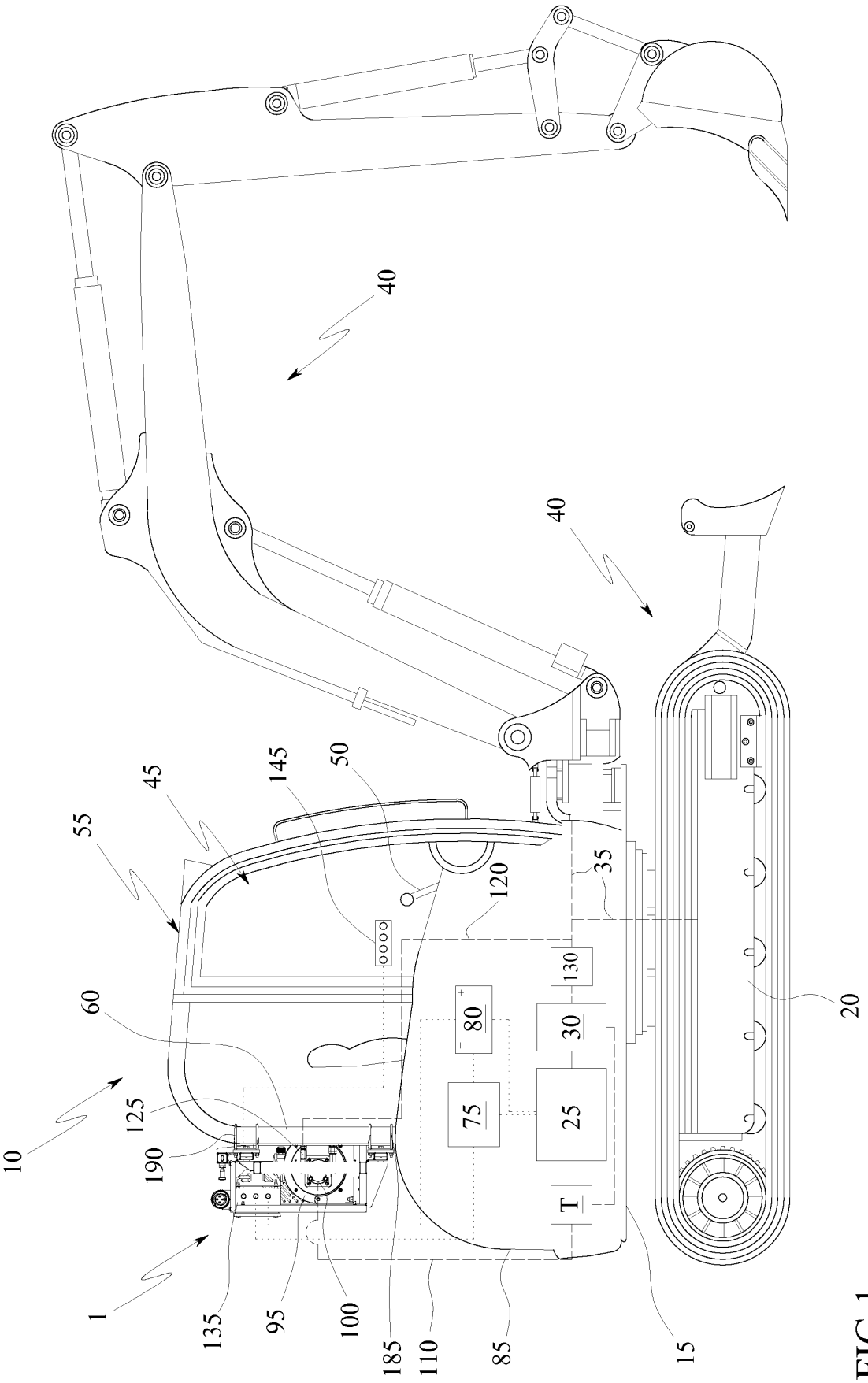
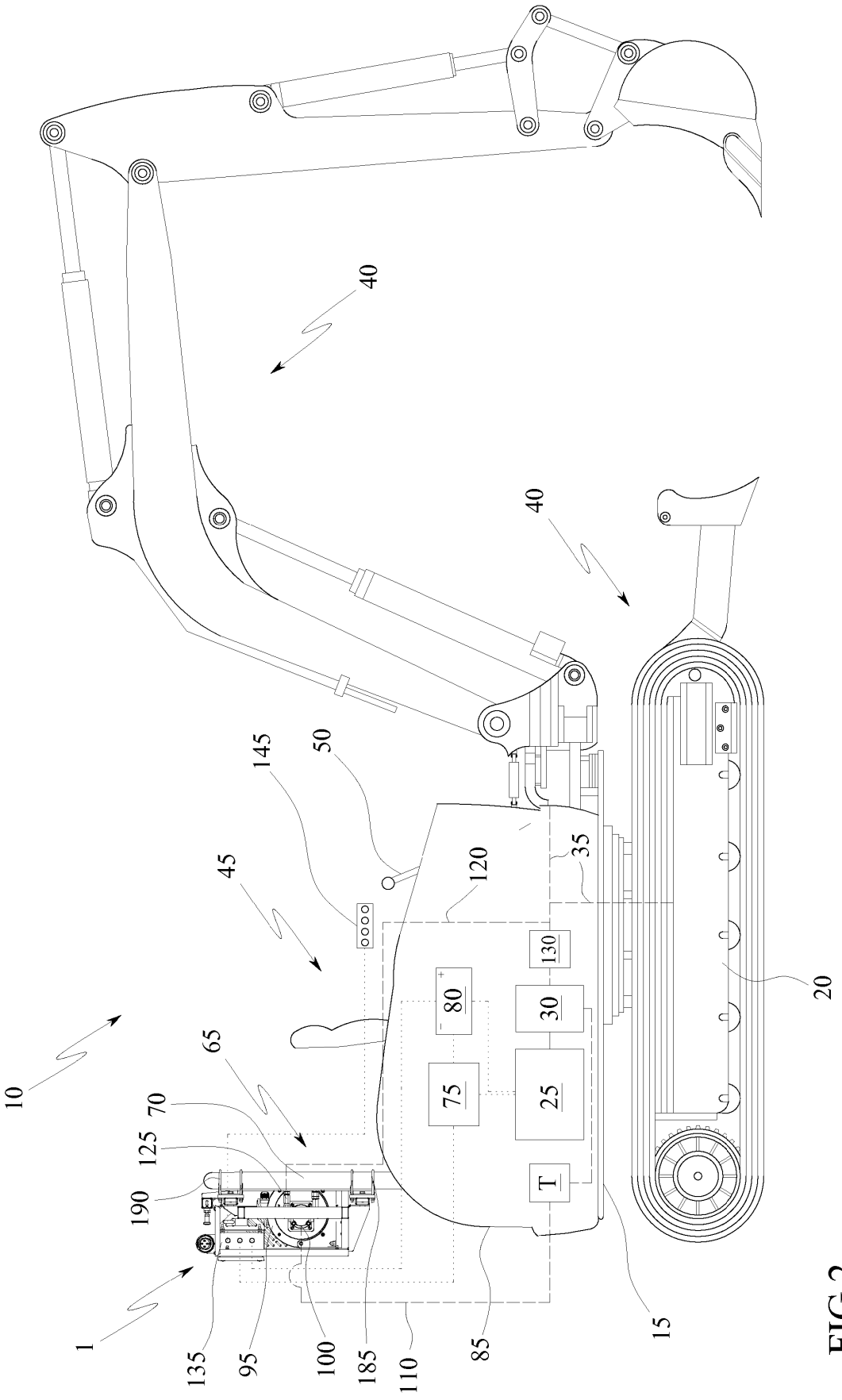

40
40
45
55
145
50
120
35
60
125
190
10
1
135
95
100
185
110
85
15
20
130
30
80
75
25
T

FIG.1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40
145
50
45
120
35
130
80
30
75
25
T
65
70
125
190
10
1
135
95
100
185
110
85
15
20

FIG.2

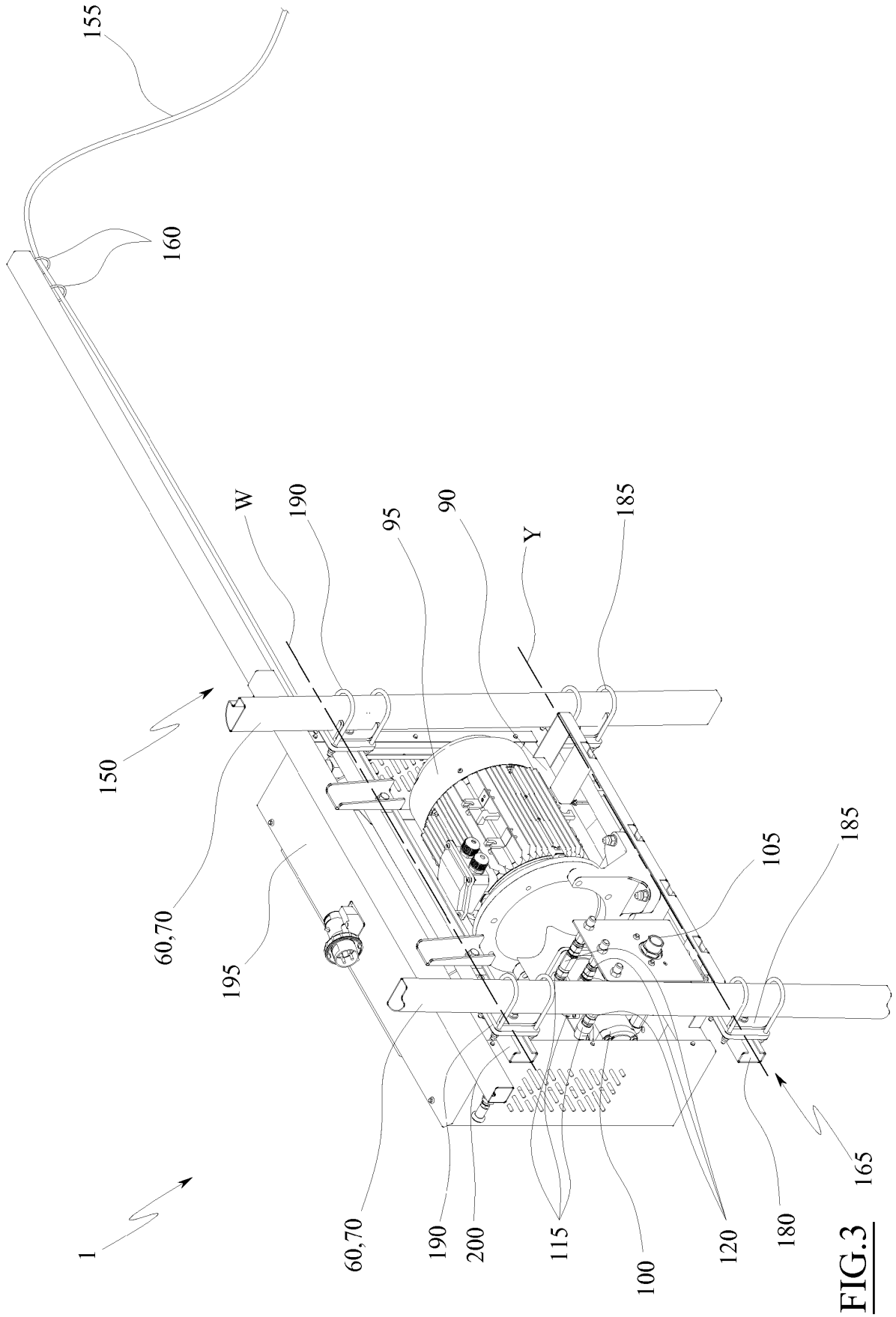
155
160
W
190
95
90
Y
185
150
60,70
195
105
185
1
60,70
190
200
115
100
120
180
165

FIG.3

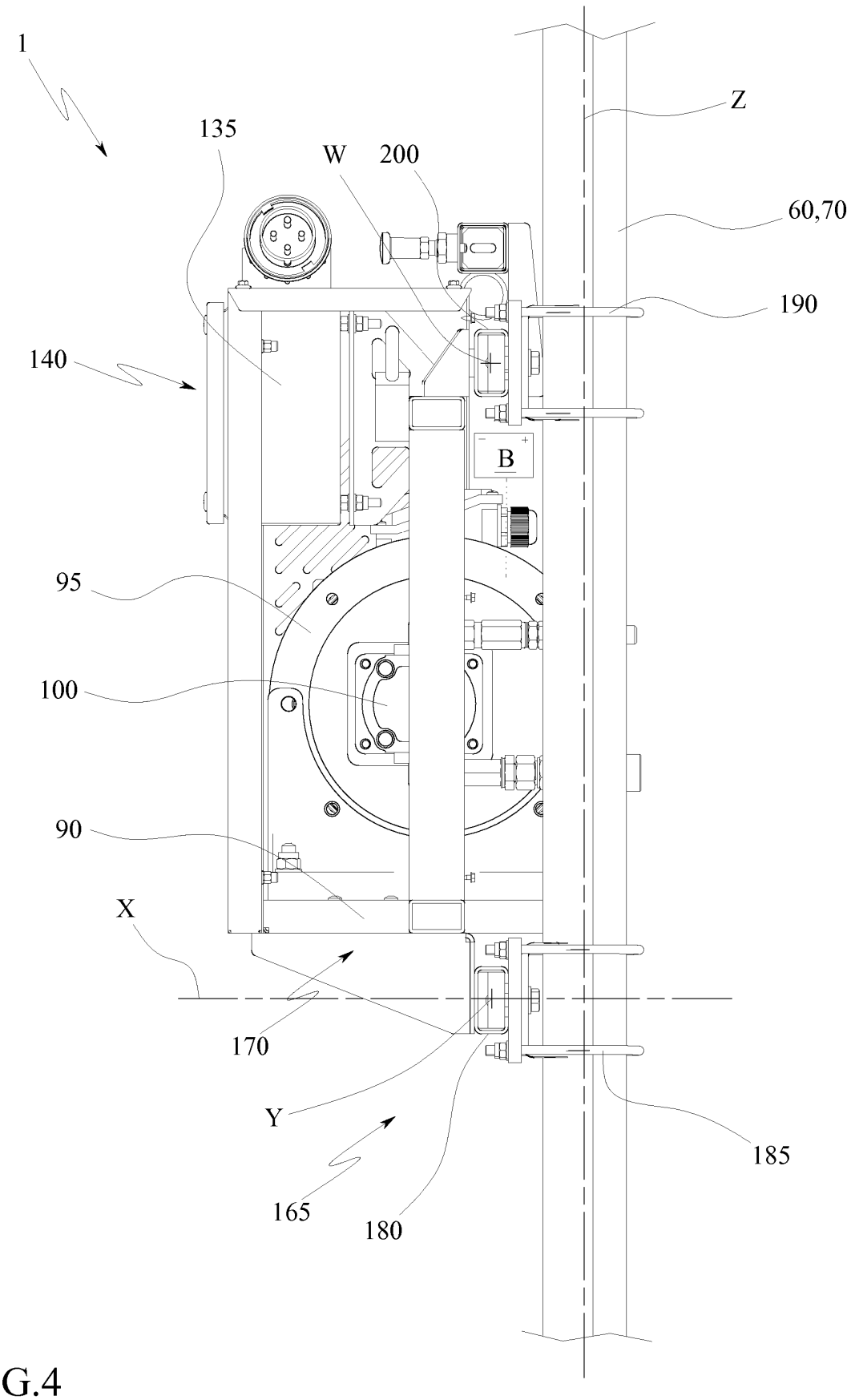

FIG.4

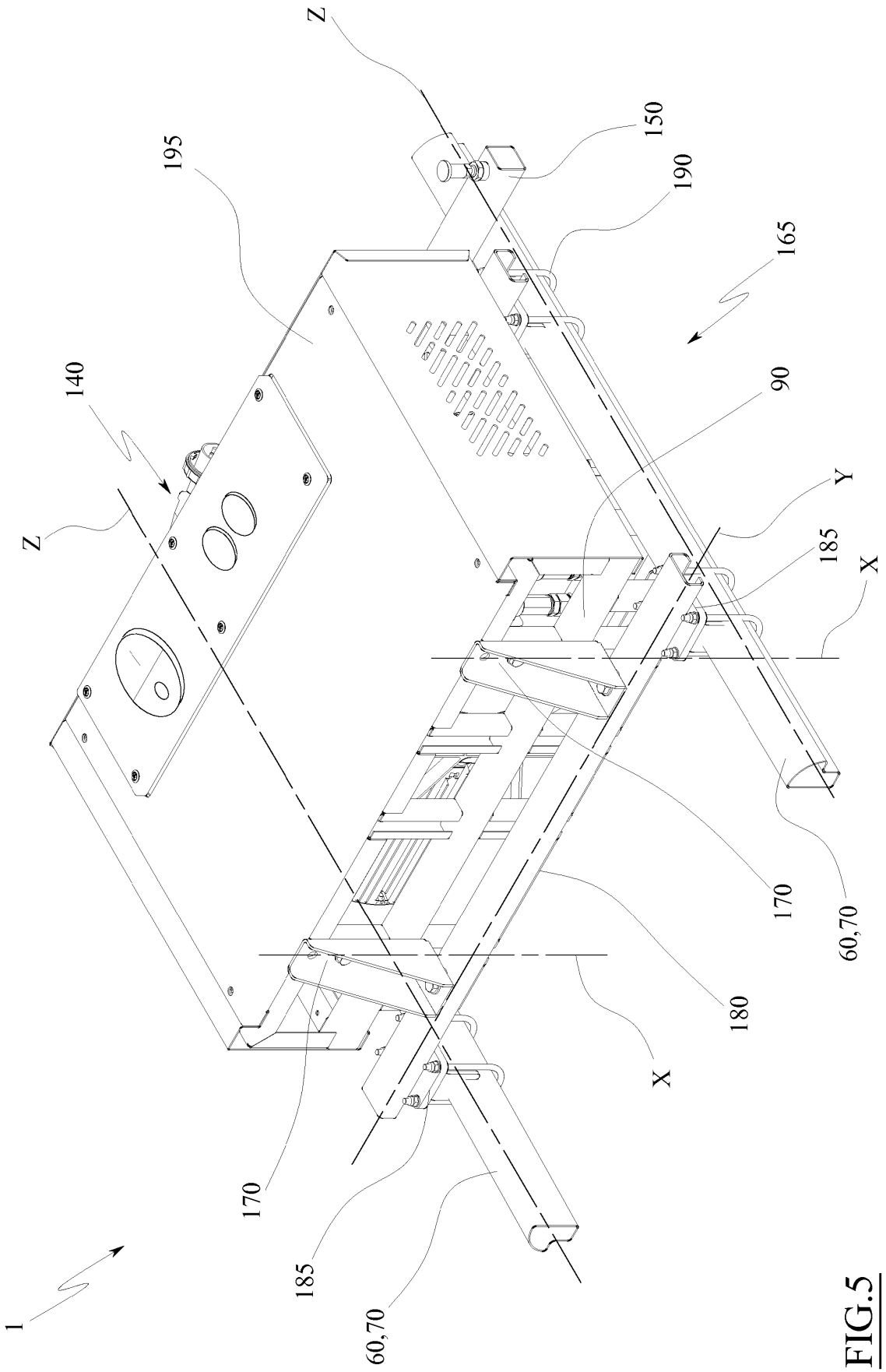

FIG.5

REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

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