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- (54) Title: A SELF-PROPELLED AERIAL PLATFORM

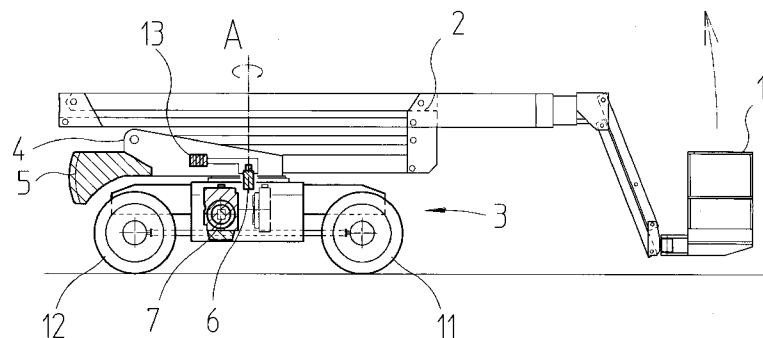


FIG.1

- (57) Abstract: A self-propelled aerial platform of the type including a work platform (1), provided at the end of an operating arm (2) which is constrained to and supported by a base or turret (4). The base or turret (4) is coupled, by means of a rotatable coupling around a vertical axis (A), on a mobile wheeled chassis or truck (3). At least one motor means, pumps and tanks of fluids are supported onto the mobile wheeled chassis or truck (3) and are arranged beneath the rotatable coupling. Hydraulic and electrical couplings (6), which cooperate with the rotatable coupling, are adapted to establish hydraulic and electrical connections between the motor means, pumps, tanks and the actuator means provided on the base or turret (4), the operating arm (2) constrained thereto and supported thereby and the aerial work platform (1).

A SELF-PROPELLED AERIAL PLATFORM

In the name of: MAGNI TELESCOPIC HANDLERS S.r.l.

based in: Castelfranco Emilia, via Magellano n. 22

DESCRIPTION OF THE INVENTION

The object of the present invention is a self-propelled aerial platform of the type including a work platform provided at the free end of an operating arm, by means of which it can be moved, upon command, in the space, not only transferred and handled to be moved from one working place to another.

There are known apparatuses suitable for this purpose, which however usually present a structure, often mounted on self-propelled operating machines, in which various members are mostly distributed in an operative part, comprising a telescopic and/or articulated arm, engines and other members grouped together and mounted to a base or turret, which is hinged on a usually vertical axis, on a truck or vehicle that moves on wheels.

In the specific application of the aerial platforms, such a conformation causes significant drawbacks mainly in connection with the relation between the weight of the apparatus and its stability during operation.

It is the object of the present invention to obviate the drawbacks and disadvantages of the prior art by providing a self-propelled aerial platform, comprising a work platform, provided at the end of an operating arm, which is constrained to and supported by a base or turret in turn coupled, by means of a rotatable coupling, to a mobile wheeled chassis or truck, which can support motor means, pumps and tanks of fluids, which are positioned beneath the rotatable coupling.

Besides the reduction of the height of the center of mass of the platform, the invention proposes a considerable improvement of the dynamic stability.

These objects are obtained by the present invention, as described and claimed hereinafter.

The characteristics of the present invention will become more evident from the following description of one embodiment illustrated by way of not limiting

example with the help of the enclosed figures, in which:

- figure 1 is a schematic side, vertical, elevation view, partially in section of the invention;

- figure 2 is a schematic, plan, top view of figure 1.

With reference to the enclosed figures, the reference numeral 1 indicates an aerial work platform as a whole, provided at the end of an operating arm 2, which is constrained to and supported by a mobile wheeled chassis or truck 3 and can be operated to perform, upon command, rotations on a vertical axis A. For this purpose, the operating arm 2 is supported by a base or turret 4 which is coupled to the mobile wheeled chassis or truck 3 by means of a coupling rotatable around the vertical axis A, formed by a "fifth wheel".

The whole forms a self-propelled aerial platform which can be typically used for transferring and lifting operators.

The base or turret 4 of the operating arm 2 is provided with a counterweight 5, placed in a position diametrically opposite to the aerial work platform 1. The counterweight 5 acts as a ballast.

The apparatus is provided with a motor, pumps and tanks of fluids, which are characterized by being supported onto the mobile wheeled chassis or truck 3 beneath the rotatable coupling between the base or turret 4 and the movable wheeled chassis or truck 3.

Hydraulic and electrical couplings 6 are provided, which cooperate with the rotatable coupling, to establish hydraulic and electrical connections between the motor means, pumps, tanks and the actuator means provided on the base or turret 4, the operating arm 2 being constrained thereto and supported thereby, and the aerial work platform 1.

In particular, it comprises a motor means 7, arranged in a median position, which has a rotation axis transverse to the longitudinal axis B of the mobile wheeled chassis or truck 3.

The motor means 7 operates a first hydraulic pump 8 for controlling the movements of the self-propelled platform and a second hydraulic pump 10 adapted to supply the driving means for moving the work platform.

In this case, the first hydraulic pump 8 is a hydrostatic pump and is situated in

axis with the second hydraulic pump 10.

The first hydraulic pump 8 controls a hydraulic transmission 9, which is provided to operate the front wheels 11 of the mobile wheeled chassis or truck 3.

The illustrated embodiment provides also a mechanical transmission 14, adapted to transmit motion also to the rear wheels 12 of the mobile wheeled chassis or truck 3.

In particular, the hydraulic transmission 9 is composed by a hydrostatic motor.

All the hydraulic actuations are controlled by a hydraulic distributor 13.

Motors and pumps are situated on one side of the mobile wheeled chassis or truck 3 between a front wheel and the corresponding rear wheel so as to remain within the outline of the vehicle.

The tanks 15 are placed at the opposite side, between the corresponding front wheel and rear wheel, likewise in a way to remain within the outline of the vehicle.

The layout, distribution and support of the means like motor, pumps, tanks and other additional members, not pointed out within the outline, at least in height, of the mobile wheeled chassis or truck 3 and in particular, beneath the rotatable coupling between the base or turret 4 and the mobile wheeled chassis or truck 3 allow to obtain considerable advantages in comparison with the prior art, deriving from the low barycentre and lowering of the ballast, which in this case, is the counterweight 5.

Actually, positioning all the cited means and parts beneath the rotatable coupling, formed by a "fifth wheel", by means of which the base or turret 4 can rotate with respect to the underlying movable wheeled chassis or truck 3, allows to obtain and position the ballast, formed by the counterweight 5 in such a manner that it is, at least partially, the outermost one, below the plane of the rotatable coupling. For this purpose the counterweight is suitably shaped.

Moreover, a better ergonomic use is obtained, due to an easier access to the various means and mechanical parts that are situated in positions which can be reached without difficulty. This allows an easy maintenance of the platform and of its various components.

CLAIMS

- 1). A self-propelled aerial platform including a work platform provided at the end of an operating arm which is supported by a base or turret which is in turn joined to a mobile wheeled chassis or to a truck with the possibility to rotate with respect thereto, characterized in that the base or turret (4) of said operating arm (2) is coupled to said mobile chassis with a coupling rotatable about a vertical axis (A), it being provided that at least one motor means, pumps and tanks of fluids and other means are supported onto said mobile wheeled chassis or truck (3) beneath said rotatable coupling, hydraulic and electrical couplings (6) being also provided, which cooperate with said rotatable coupling to establish hydraulic and electrical connections between said at least a motor means, pumps and tanks and actuator means provided on the base or turret (4), the operating arm (2) constrained thereto and supported thereby and the aerial work platform (1).
- 2). A self-propelled aerial platform according to claim 1 characterized in that it comprises a motor means (7), placed in a median position, which has a rotation axis transverse to the longitudinal axis of the mobile wheeled chassis or truck (3).
- 3). A self-propelled aerial platform according to claim 2 characterized in that said motor means (7) drives a hydraulic pump (8) for controlling the movements of the platform and a hydraulic pump (10) adapted to feed the driving means for moving the working platform.
- 4). A self-propelled aerial platform according to claim 3 characterized in that said hydraulic pump (8) is a hydrostatic pump.
- 5). A self-propelled aerial platform according to claim 3 characterized in that said mobile wheeled chassis or truck (3) is operated to move by means of at least one hydraulic transmission (9).
- 6). A self-propelled aerial platform according to claim 5 characterized in that said at least one hydraulic transmission (9) is a hydrostatic motor.
- 7). A self-propelled aerial platform according to one of the previous claims characterized in that a counterweight (5) is fastened to the base or turret (4) of said operating arm (2) and is shaped and positioned so as to be, at least in

part, beneath the plane of the rotatable coupling of said base or turret (4) for connection to said mobile wheeled chassis or truck (3).

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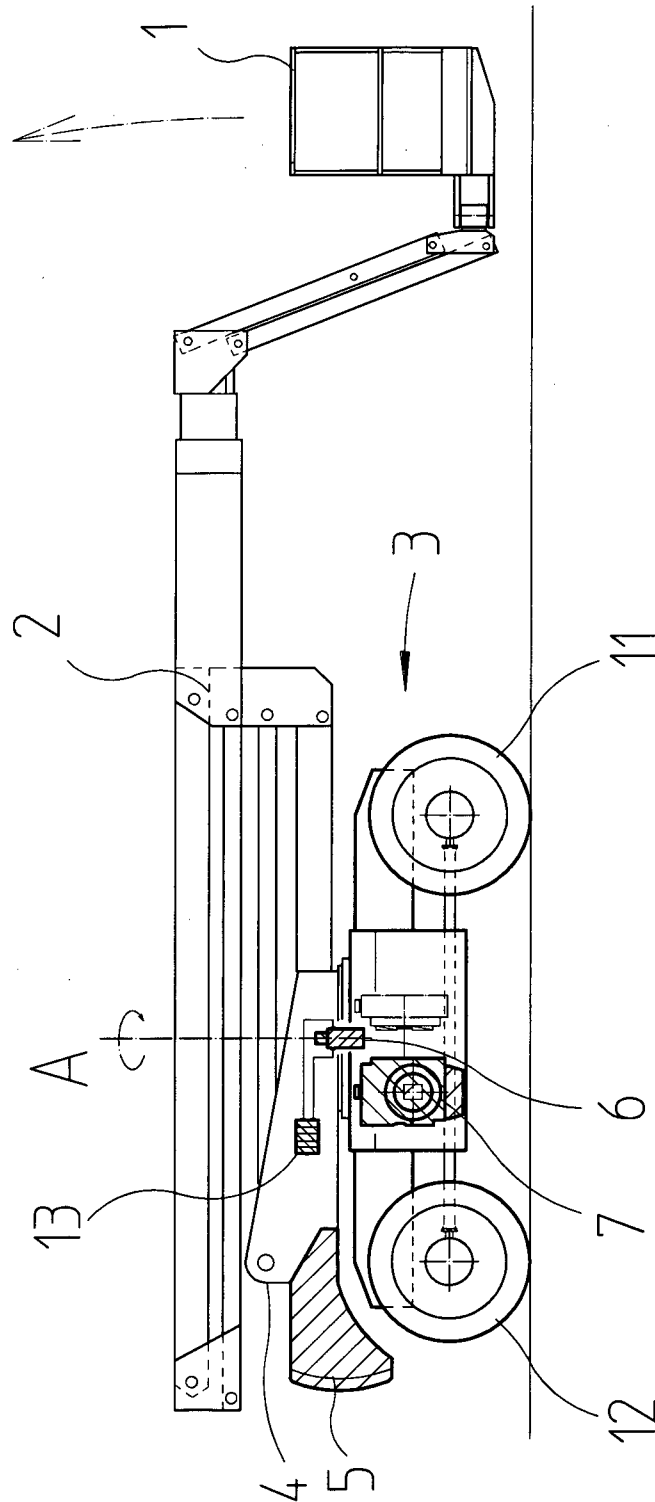


FIG.1

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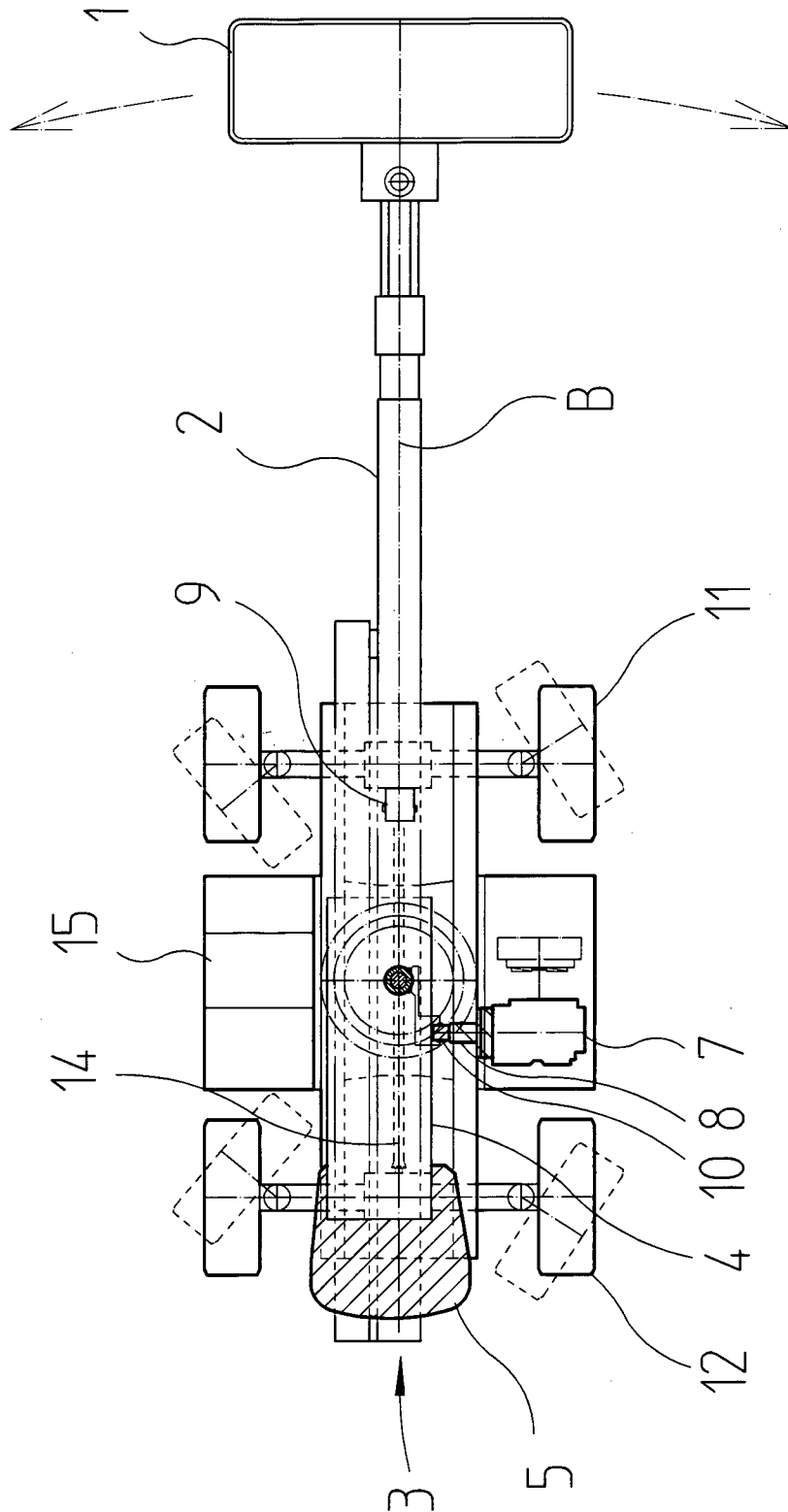


FIG.2

INTERNATIONAL SEARCH REPORT

International application No PCT/IB2016/001625

A. CLASSIFICATION OF SUBJECT MATTER INV. B66F11/04 ADD.		
According to International Patent Classification (IPC) or to both national classification and IPC		
B. FIELDS SEARCHED		
Minimum documentation searched (classification system followed by classification symbols) B66F		
Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched		
Electronic data base consulted during the international search (name of data base and, where practicable, search terms used) EPO-Internal		
C. DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	EP 0 921 094 A2 (GROVE US LLC [US]) 9 June 1999 (1999-06-09) abstract paragraph [0010] - paragraph [0023]; figures 1-3 -----	1,7
A	CN 1 724 335 A (HUACHENG SPECIAL MACHINERY ENG [CN]) 25 January 2006 (2006-01-25) abstract; figure 1 -----	1,7
A	JP H10 330094 A (SHOWA AIRCRAFT IND) 15 December 1998 (1998-12-15) abstract -----	1,7
<input type="checkbox"/> Further documents are listed in the continuation of Box C. <input checked="" type="checkbox"/> See patent family annex.		
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"A" document defining the general state of the art which is not considered to be of particular relevance "E" earlier application or patent but published on or after the international filing date "L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified) "O" document referring to an oral disclosure, use, exhibition or other means "P" document published prior to the international filing date but later than the priority date claimed	"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention "X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone "Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art "&" document member of the same patent family	
Date of the actual completion of the international search	Date of mailing of the international search report	
21 February 2017	02/03/2017	
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INTERNATIONAL SEARCH REPORT

Information on patent family members

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Patent document cited in search report	Publication date	Patent family member(s)	Publication date	
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