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(54) Aerial platform to be mounted on a lifting and/or transporting apparatus including moving extensible means

(57) The platform according to this invention is mounted on an end of a lifting and/or transporting apparatus, an extensible structure being placed between the platform and the apparatus. The extensible structure permits to really improve the movement of the basket. As a result of this, the operator can work in a better way by utilizing the said platform.

In general, the aerial platform (1) includes a crate or basket (2) to lift and/or transport persons or things. The basket (2) is slideably and rotateably mounted on a bar (3). In turn, the bar (3) is slideably and rotateably (360°) mounted on an end of an arm (4). The arm (4) could be a telescopic arm or other type of arm and is included in the apparatus of the platform.

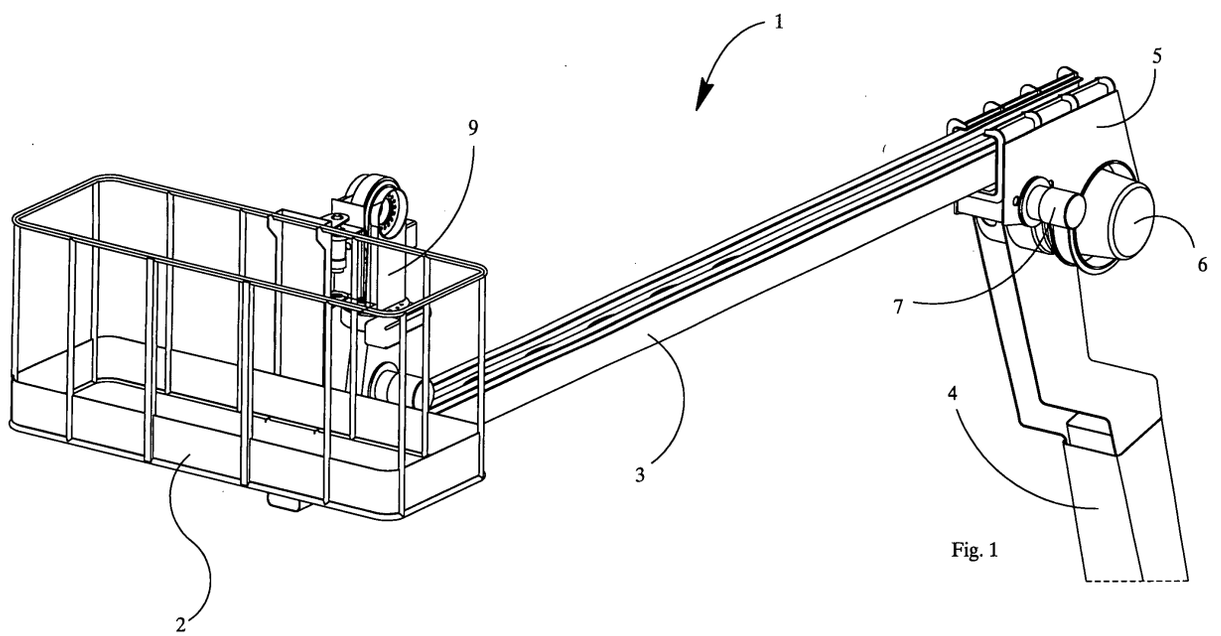

Fig. 1

EP 1 491 489 A2

Description

[0001] The present invention proposes a platform to be mounted on a lifting and/or transporting apparatus. The peculiarity of this platform apparatus is to include moving means provided with an extensible structure.

[0002] In particular, the platform according to this invention is mounted on an end of a lifting and/or transporting apparatus, an extensible structure being placed between the platform and the apparatus. The extensible structure permits to really improve the movement of the basket. As a result of this, the operator can work in a better way by utilizing the said platform.

[0003] The said lifting and/or transporting apparatus includes any fixed and movable apparatus, which may be extensible or not, such as telescopic arms or articulated arms, rotary and fixed apparatuses, vehicles of any kind, etc.

[0004] The present apparatus has been conceived to improve the operation of lifting structures for persons and/or things, such as aerial platforms that may be fixed and/or movable, translating or non-translating, positioned on vehicles and/or land structures or ships or aircrafts.

[0005] As is known, in the field of the movable structures for persons and/or things and lifting structures in general, there are provided several solutions and equipments that permit to reach considerable heights and depths in respect of the supporting surface in the inside and/or outside of buildings, bridges, viaducts, reservoirs, dry docks or other.

[0006] One of the most utilized apparatus in this field is the aerial platform that may be used in many cases such as in building field: restoration of building fronts, balconies, frontals and cornices, treatment of frameworks, reinforcements and scaffoldings, wall painting, waterproofing process, specific utilization of mortar, urgent demolitions of tottering parts, change and/or repair of channels and drain-pipes, internal and/or external upkeep or maintenance of silos, reservoirs and so on.

[0007] Other uses of the aerial platforms: interventions on high trees, transport of packets or parcels in places difficult to reach, the loading of the aerial platform being done in compliance with the provisions of the rules regulating the transport of loads.

[0008] Basically, the aerial platforms consist of a crate or basket that is mounted on an end of a lifting and/or transport apparatus. Most lifting and/or transport apparatuses are provided with a telescopic arm or an articulated arm or the like. For the utilization of the basket it is necessary that an operator gets in and uses the basket instruments to reach the operative position. The operator must use the wires of the telescopic or articulated arm and/or the other instruments provided on the basket.

[0009] A problem of the said conventional systems consists in a limited range of the movements to be actuated by the operator because the lateral or vertical displacement of the basket is obtained by moving the whole telescopic or articulated arm or the whole lifting equipment. As a result of this, there are practical, mechanical and operative difficulties and the wear and tear of the components of the said apparatus is very high.

[0010] In addition, the movements of the known equipments provided with a telescopic or articulated arm are limited and it is not possible, for instance, to reach difficult places unless expensive complex equipments provided with multiple arms are utilized. However, these equipments do not guarantee a good result.

[0011] The object of the present invention is to conceive and carry out a new system to lift and move a basket or crate of an aerial platform and adjust the operative positions of the basket.

[0012] The said system is provided with a bar showing a fixed and/or adjustable length which accomplishes translating and angular movements and is mounted on an end of a telescopic or articulated arm. The bar supports slideably a basket or crate for the operator and therefore, the basket is translated in any direction without intervening on the telescopic or articulated arm or the lifting and/or transporing apparatus.

[0013] The said moving system permits a complete operation of 360 degrees of the basket and therefore, the resulting working area is 50% larger than the working area of the existing equipments on permitting to reach positions and sectors that the prior art apparatuses did not reach.

[0014] All the above objects and advantages are reached according to the present invention through an aerial platform which is mounted on a movable arm or lifting and/or transporting apparatus, characterized in that it comprises moving means which consist of an extensible bar which is mounted in such a way as to accomplish translating and angular movements and is mounted on an end of a telescopic or articulated arm, and that the said bar has slide guides in which a carriage slides, which supports a basket in which persons or things are lifted or transported.

[0015] Further features and details of the invention will be better understood from the following specification, which is set forth as a non-limiting embodiment with reference to the accompaying drawings wherein:

Fig. 1 is a perspective, schematic view of an aerial platform according to the invention, including moving means showing an extensible structure;
Fig. 2 is a schematic, lateral view of the basket bar mounted on an end of the lifting apparatus;
Fig. 3 is a schematic detailed view showing the slide system of the basket carriage; and
Fig. 4 is a schematic detailed view showing the structure of the slide system of the bar.

[0016] With reference to the accompanying drawings, number 1 denotes an aerial platform on the whole to be mounted on a lifting and/or transporting apparatus,

which platform includes the moving means according to the present invention which show an extensible structure.

[0017] The aerial platform 1 includes a basket 2 which is to carry persons or things. The basket is mounted slideably on a bar 3 which in turn is mounted slideably and with the possibility of rotating angularly on an end of an arm 4. The arm 4 is a telescopic arm or an articulated arm and is a part of a vehicle on which the system according to this invention is mounted.

[0018] More precisely, the bar 3 is mounted on a support 5 which is provided with a motorized pivot 6 applied on an end of the telescopic or articulated arm in order to rotate angularly according a complete turn of 360°.

[0019] The support 5 is provided with a guide in which a bar 3 slides according to movements caused by a system which includes a motorized pinion 7. At least a chain 8 is applied through suitable chain wheel gears on the motorized pinion 7. The ends of the chain are fixed to the respective ends of the bar.

[0020] The motion of the chain is caused by the motorized pinion 7 and permits a complete movement of the bar in both directions while the motorized pivot 6 causes a complete angular displacement.

[0021] The bar 3 is provided with suitable slide guides along which a carriage 9 (Fig. 3) is translated. The basket 2 is mounted on the carriage 9 to carry persons or things.

[0022] The carriage 9 may be translated for the whole length of the bar through a mechanism of displacement which includes a motorized pinion 10 on which a chain 11 is winded, the ends of the chain 11 being fixed to the bar through return pulleys 12.

[0023] The basket 2 is mounted on the carriage 9 through a joint 13 and an articulation 14. The joint is to adjust the basket on a horizontal axis while the articulation 14 is to adjust the basket on a vertical axis. In this way, it is possible to guarantee the maximum possibility of levelling and rotation of the basket according to the movement of the arm.

[0024] In addition, the carriage 9 is provided with a thrust ring or similar articulation 15 which permits to obtain a complete angular vertical adjustment of the carriage of 360° about itself.

[0025] In this connection, the system is provided with sensors to detect the position of the basket and adjust constantly the position of the basket in respect of the ground so that the basket always maintains a perfect horizontal position. The movements of carriage 9 and bar 3 may be independent and/or synchronized.

[0026] For a utilization of the so-described system it is sufficient for the operator to get on the basket 2 and lift the apparatus 4 in order to reach the working area. Then, the operator adjusts the position of the basket by simply actuating the bar 3 or the carriage 9, the arm 4 of the vehicle being always let in the same position.

[0027] In this way, it is possible to move the basket with the greatest agility in any directions and reach positions that could not be reached with the conventional systems.

[0028] Advantageously, the described moving elements could be also of another type such as rack pinions, winches with ropes, hydraulic jacks, electric actuators, pneumatic systems and so on.

[0029] A skilled artisan of this field can modify the so-described aerial platform and obtain solutions that are to be considered as included in the scope of protection of the invention as further defined, in its peculiarites, in the following claims.

Claims

1. Aerial platform mounted on a lifting and/or transporting apparatus, **characterized in that** it comprises moving means which consist of an extensible bar (3) which is mounted in such a way as to accomplish translating and angular movements and is mounted on an end (4) of a telescopic or articulated arm, and that the said bar (3) has slide guides in which a carriage (9) slides, which supports an operative basket (2) in which persons or things are lifted or transported.

2. Aerial platform mounted on a lifting and/or transporting apparatus, **characterized in that** the bar (3) is mounted on a support (5) which is provided with a motorized pivot (6) applied on an end of the telescopic or articulated arm in order to rotate angularly according a complete turn of 360°.

3. Aerial platform mounted on a lifting and/or transporting apparatus, **characterized in that** the support (5) is provided with a guide in which a bar (3) slides according to movements caused by a system which includes a motorized pinion (7), at least a chain (8) being applied through suitable chain wheel gears on the motorized pinion (7), the ends of the chain being fixed to the respective ends of the bar.

4. Aerial platform mounted on a lifting and/or transporting apparatus, **characterized in that** the motion of the chain (8) is caused by the motorized pinion (7) and permits a complete movement of the bar in both directions while the motorized pivot (6) causes a complete angular displacement of 360°.

5. Aerial platform mounted on a lifting and/or transporting apparatus, **characterized in that** the bar (3) is provided with suitable slide guides along which a carriage (9) is translated, the basket (2) being mounted on the carriage (9) to carry persons or things.

6. Aerial platform mounted on a lifting and/or trans-

porting apparatus, **characterized in that** the said carriage (9) may be translated for the whole length of the bar through a mechanism of displacement which includes a motorized pinion (10) on which at least a chain (11) is winded, the ends of the chain (11) being fixed to the bar through return pulleys (12).

7. Aerial platform mounted on a lifting and/or transporting apparatus, **characterized in that** the basket (2) is mounted on the carriage (9) through a joint (13) and an articulation (14), the joint is to adjust the basket on a horizontal axis while the articulation (14) is to adjust the basket on a vertical axis in order to guarantee the maximum possibility of levelling and rotation of the basket according to the movement of the arm.

8. Aerial platform mounted on a lifting and/or transporting apparatus, **characterized in that** the carriage (9) is provided with a thrust ring or similar articulation (15) which permits to obtain a complete angular vertical adjustment of the carriage of 360° about itself.

9. Aerial platform mounted on a lifting and/or transporting apparatus, **characterized in that** the system is provided with sensors to detect the position of the basket and adjust constantly the distance of the basket from the ground in such a way that the basket always maintains a perfect horizontal position.

10. Aerial platform mounted on a lifting and/or transporting apparatus, **characterized in that** the movements of carriage (9) and bar (3) are independent.

11. Aerial platform mounted on a lifting and/or transporting apparatus, **characterized in that** the movements of carriage (9) and bar (3) are synchronized.

12. Aerial platform mounted on a lifting and/or transporting apparatus, **characterized in that** the described moving elements are rack pinions.

13. Aerial platform mounted on a lifting and/or transporting apparatus, **characterized in that** the described moving elements are winches with ropes.

14. Aerial platform mounted on a lifting and/or transporting apparatus, **characterized in that** the described moving elements are hydraulic jacks.

15. Aerial platform mounted on a lifting and/or transporting apparatus, **characterized in that** the described moving elements are electric actuators.

16. Aerial platform mounted on a lifting and/or transporting apparatus, **characterized in that** the described moving elements are pneumatic systems or others.

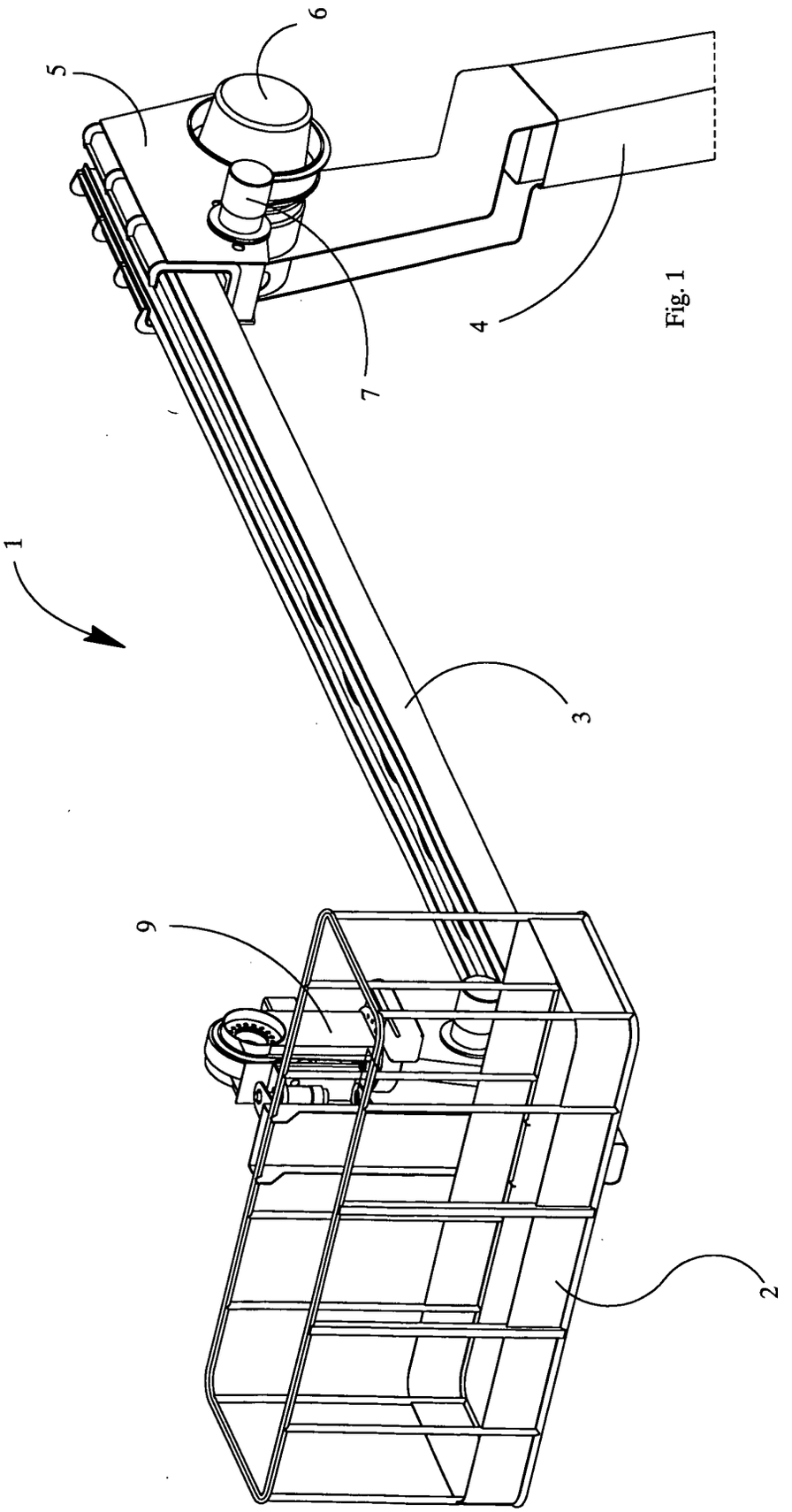

Fig. 1

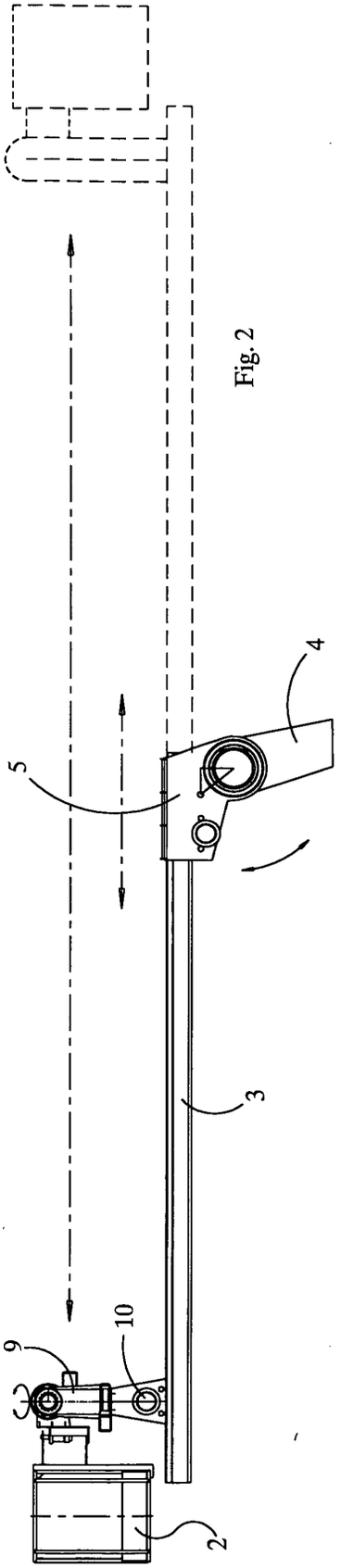

Fig. 2

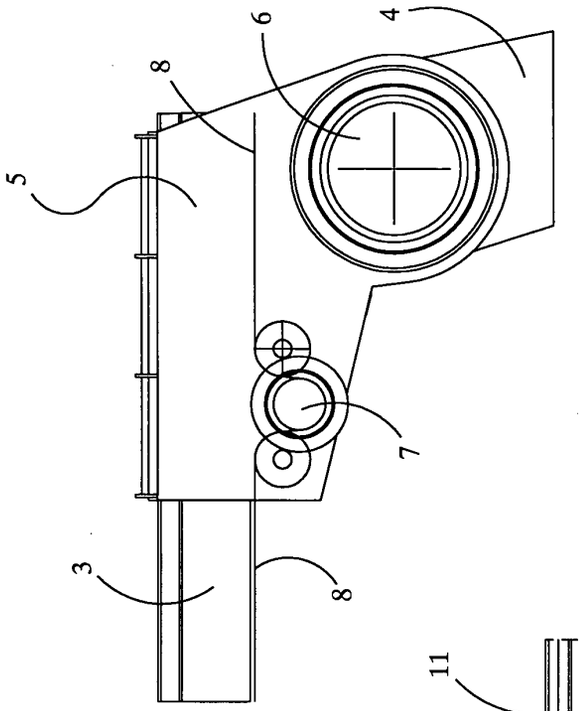

Fig. 4

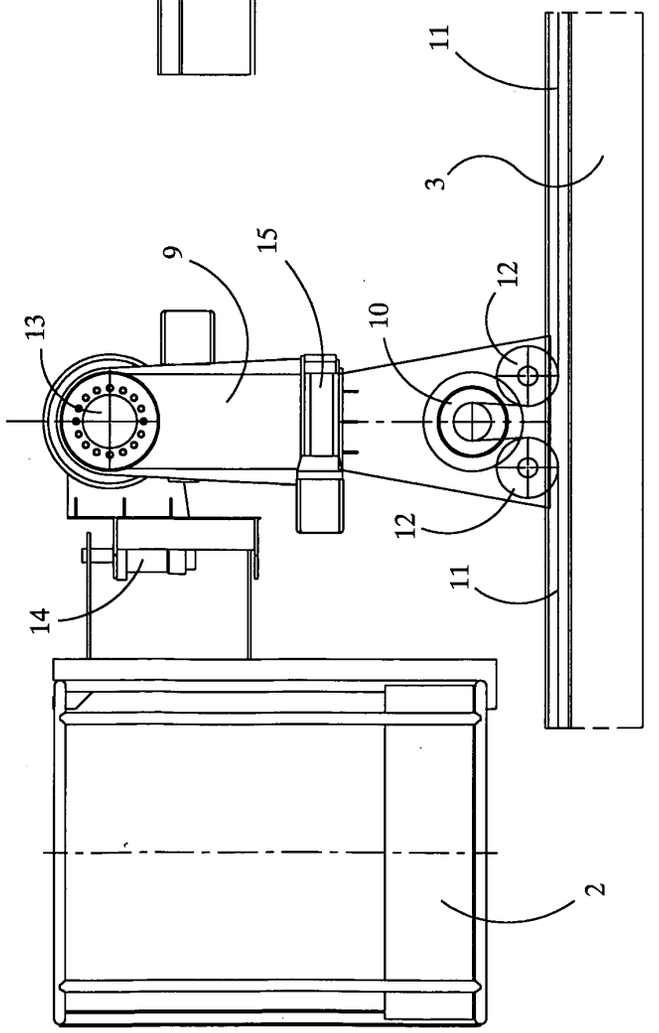

Fig. 3