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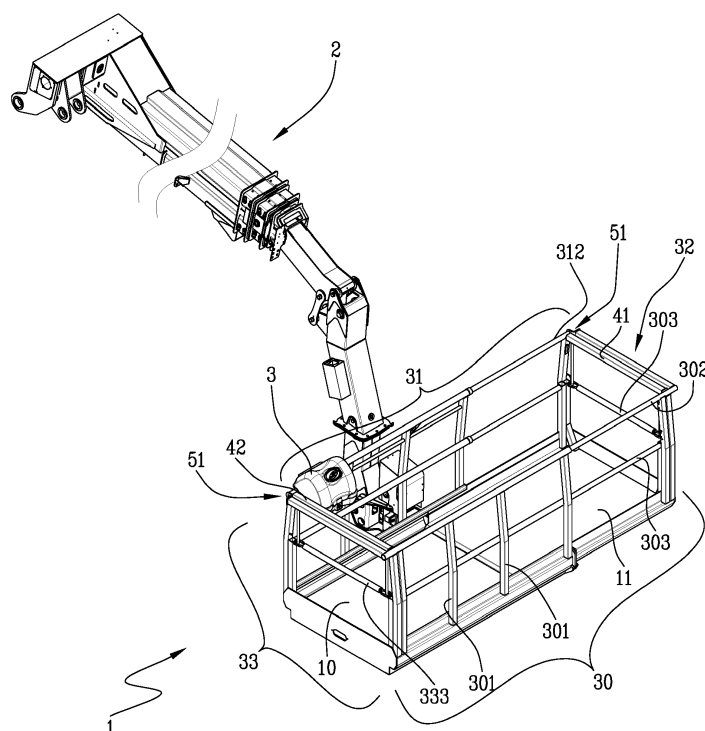
(54) **IMPROVED BASKET FOR AERIAL PLATFORM OF THE LIKE**

(57) A loading basket (1) for aerial platforms, telescopic handler or similar operating machines, comprising a support plane (10, 11) and a plurality of walls (30, 31, 32, 33).

A wall is movable (30) between a closed position,

wherein it forms one of the sides of said basket (1), and an open position wherein it leaves a lateral passage in the basket (1) which allows loading and unloading of the material.

Fig.1



## Description

**[0001]** The present invention has for an object a loading basket for aerial platforms, telescopic handlers or similar operating machines.

**[0002]** Loading baskets are known which comprise a rectangular flat bottom capable of supporting operators and equipment, around which there are arranged walls which have the function to prevent any accidental fall to the ground of the operators or of the equipment.

**[0003]** The baskets are arranged for being connected to a telescopic lifting arm by way of suitable coupling devices.

**[0004]** The known baskets work with great efficiency when used for work activities at height which require the manual intervention of operators, possibly implying use of portable tools which tools, as said, can be easily transported in the basket itself.

**[0005]** However, there are some types of activities which are not implementable through the use of known loading baskets, and which therefore may result complicated, ineffective and sometimes dangerous.

**[0006]** Consider for example the case of asbestos remediation, wherein the asbestos sheets forming the roofing are removed.

**[0007]** In this case one or more operators are required to walk on the roofs while performing their work and in so doing, they are duly secured to a fall arrest harness anchored to the roof.

**[0008]** The roofing sheets are removed by the operators and restingly placed onto a loading platform (for example a pallet), which is then lifted by a crane or the forks of a telescopic handler; such platform is lowered to the ground from time to time for transferring the removed asbestos sheets towards the flatbed of a truck or the like.

**[0009]** This solution can be extremely dangerous in that, if the asbestos sheets burden is not perfectly secured to the pallet, it could slip off while being handled and fall to the ground, thus resulting in asbestos dust being raised in the atmosphere.

**[0010]** The technical task underlying the present invention is therefore to propose a loading basket which overcomes the drawbacks of the prior art.

**[0011]** This technical task is attained by the loading basket realized according to claim 1.

**[0012]** Further characteristics and advantages of the present invention will become more apparent from the indicative, and therefore non-limiting description of a preferred but non-exclusive embodiments of the basket of the invention, as illustrated in the accompanying drawings in which:

- Figure 1 is an axonometric view of the basket of the invention in the closed configuration;
- Figure 2 is an axonometric view of the basket of Figure 1, in the open configuration; and
- Figure 3 is a front view of the basket.

**[0013]** With reference to the above figures, by the numeral 1 it is indicated a loading basket according to the invention.

**[0014]** The loading basket 1 herein provided, was specially devised for use in aerial work platforms, telescopic handlers or similar self-propelled machines.

**[0015]** In detail, the basket 1 of the invention is intended to be connected to the distal end of an articulated and/or telescopic arm 2 the operating machine is provided with.

**[0016]** The articulated arm 2 can be for example fixed to a rotating turret which is fitted on the frame of the machine itself.

**[0017]** Aboard the basket 1 there may be provided control means 3 for moving the handling arm 2, which control means 3 is operable by the operators; this shall be however better detailed in the explanation on how the invention operates.

**[0018]** The basket 1 of the invention includes a support or support plane 10, 11, preferably quadrangular and arranged to support both the operators, and a load to be lifted or lowered via the basket 1 itself.

**[0019]** The support plane 10, 11 is surrounded by a plurality of walls 30, 31, 32, 33 forming a protective barrier or parapet, in order to prevent the operators as well as the transported load or equipment from falling to the ground. In particular, each wall 30, 31, 32, 33 stands perpendicularly from a respective side of the bottom perimeter 10, 11, thereby closing the basket 1 laterally.

**[0020]** In other words, the walls 30, 31, 32, 33 are arranged consecutively relative to the periphery of the support plane 10, 11, thus forming a ring. Therefore, the basket 1 has a generally polyhedral and preferably parallelepiped shape, wherein the bottom and the walls 30, 31, 32, 33 constitute as many "faces."

**[0021]** In the present description, by the term "sides" of the basket 1, reference is made to the side panels thereof, which are formed by the walls 30, 31, 32, 33 already mentioned.

**[0022]** Preferably, while the bottom 10, 11 consists of one or more continuous portions, the walls 30, 31, 32, 33 exhibit a reticular or "lattice" configuration and may be formed by a plurality of profiles or rods joined together, or by other types of rigid and straight elements.

**[0023]** To be precise, each wall may comprise a plurality of uprights 301, 311, 321, 331 joined by at least one upper cross member 302, 312, 322, 332 and preferably by one or more central cross members 303, 304, 323, 333. In the example depicted in the appended figures, the support plane 10, 11 may be rectangular and the basket 1 has then two shorter and opposite walls 32, 33, defined by respective "shorter" walls 32, 33 that are placed on the short sides of the support plane 10, 11; in this case, relative to one or both shorter sides 32, 33, a passage for the operators can be obtained, which is defined for example by a gate or simply by a central cross member 323, 333 of the wall 32, 34 sliding along respective vertical guides, to which it is joined, for example, by means of suitable lashing eyes (see figures 1 and 2).

**[0024]** According to an important aspect of the invention, at least one of the walls 30 of the basket 1 is movable between a closed position (shown in Figure 1), wherein the wall 30 forms one of the sides of the basket 1, and an open position, wherein the wall 30 leaves a lateral loading passage within the basket 1 (see figure 2).

**[0025]** To be precise, when the movable wall 30 is in the open position thereof, the passage thus defined, allows input or output of the material into /from the basket 1 in a direction parallel to the support plane 10, 11, that is, in the horizontal direction.

**[0026]** On the other hand, when the movable wall 30 is in the closed position thereof, the movable wall 30, together with the other walls 32, 33, 34, constitutes a barrier which prevents incidental release of the load from the basket 1.

**[0027]** Hence, when the movable wall 30 is displaced and brought into its open position, a passage is defined that allows manual loading or unloading of the work equipment as well as of several materials, such as the asbestos sheets mentioned in the discussion on the prior art.

**[0028]** In the following, several aspects of the embodiment of the invention are being disclosed, however in broad terms one can state that having the movable wall 30 of the basket 1 open, means that the basket 1 has one side less in that the open side comes to form a passage for the material. Preferably, the basket 1 herein proposed includes a single movable wall 30, which forms one of its major sides (when closed, of course), whilst the remaining walls 32, 33, 34 are "fixed" i.e. they do not allow opening of loading passages; however this is not a mandatory configuration, in that several movable walls can be provided which are placed in different locations of the basket 1.

**[0029]** Preferably, the movable wall 30 defines the front side of the basket 1 which is the one placed opposite to the back side facing the articulated arm 2 previously mentioned.

**[0030]** As shown in Figure 1, when the movable wall 30 is in its closed position, the movable wall 30 is inferiorly joined to the support plane 10, 11 while coming in contact, from opposite sides, with the further two sides 32, 33 arranged consecutively to the former.

**[0031]** Once brought in its open position, the movable wall 30 is then spaced apart from the support plane 10, 11 as visible in figure 2.

**[0032]** The aforementioned load passage essentially is comprised of a passage that is defined by the support plane 10, 11 and laterally by the two walls 32, 33 that are located alongside the movable wall 30, wherein said walls 32, 33 preferably represent the "shorter walls" as previously mentioned, which are placed at the opposite longitudinal ends of the basket 1.

**[0033]** In the preferred embodiment of the invention, the movable wall 30 is capable of rotating between the two aforementioned positions, particularly it is able to rise when switching from the closed position to the open po-

sition, and vice versa to lower when passing from the open position to the closed position.

**[0034]** Alternative embodiments of the invention are however also possible, wherein the movable wall 30 is adapted to translate between the closed position and the open position or to roto-translate between these two positions.

**[0035]** In addition, although the lifting of the movable wall 30 into its open position is preferably of the manual type whereas lowering thereof into the closed position takes place by gravity alone, further embodiments are possible in which the switching of the movable wall 30 between the two above positions, is assisted by special devices such as gas springs or pneumatic or hydraulic cylinders or the like.

**[0036]** Preferably, the invention provides that opening and closing of the movable wall 30 is constrained by hinge means 51, 52, through which the axis of rotation of the wall 30 itself is passing.

**[0037]** In this case, the axis of rotation may be arranged on a plane parallel to the movable wall 30.

**[0038]** From the constructive point of view, as shown in the appended drawings, one or more rotation arms 41, 42 may be provided, which are fixed to the movable wall 30 and connected to at least one stationary wall 31, 32, 33 via one or more hinges 51, 52.

**[0039]** In detail, the rotation arms 41, 42 may be hinged to the fixed wall 31 of the basket 1, which fixed wall 31 is located opposite the movable wall 30 or opposite the two "shorter" walls 32, 33 previously mentioned, thereby allowing the movable wall 30 to be opened as a treasure chest or a luggage compartment.

**[0040]** In detail, in the embodiment of the invention depicted in the appended tables, the hinges 51, 52 of the two rotatable arms 41, 42 are located at the corners defined between said stationary wall 31 opposite to the movable wall 30, and the two end walls 32, 33 perpendicular to the former.

**[0041]** The rotation arms 41, 42 may be two in number, perpendicular to the movable wall 30 and parallel one to another, and fixed to the movable wall 30 at its opposite longitudinal ends.

**[0042]** In other words, as mentioned above, the movable wall 30 as well as the remaining sides of the basket 1, may include a respective plurality of vertical uprights 301, 311, 321, 331 joined by at least a respective upper cross member; in this case, the rotation arms 41, 42 connect the upper cross member 302 of the movable wall 30 to that of the opposite stationary wall 31 and/or to those of the remaining other two walls 32, 33.

**[0043]** The axis of rotation of the movable wall 30 in any case coincides with, or is parallel to the one through which the upper cross member 312 of the stationary "greater wall" 31 is passing, that is to say, of the basket 1 wall opposite to the movable one.

**[0044]** For the purposes of holding the closed position of the movable wall 30 required during rotation of the basket 1, it is provided that the lower ends of the uprights

301 of the movable wall 30 can be removably coupled to the bottom of the basket 1, i.e. to the support plane 10, 11. In detail, if the uprights of the movable wall 30 are tubular, it is possible to provide as many shaped inserts, which are placed relative to the upper surface of the bottom 10, 11 of the basket 1 and can be inserted to fit into the openings of the free lower ends of the uprights 301 themselves. The invention may however provide further fastening means removable from the movable wall 30 to the support plane 10, 11 or to the two walls 32, 33 which are placed longitudinally alongside the movable wall 30 in the closed position thereof.

**[0045]** The basket 1 herein proposed is preferably capable of varying telescopically its dimensions in length.

**[0046]** The basket 1 is substantially constituted by two sub-units that include respective components slidably inserted in the ones of the other sub-unit. More precisely, such support plane 10, 11 comprises two planar elements 10, 11 that are slidably inserted one into the other.

**[0047]** A first planar element 10 may constitute the fixed portion, whereas a second planar element 11 can be the movable portion.

**[0048]** The extension and shortening of the support plane 10, 11, and accordingly of the basket 1, may be actuated by linear actuators for example of the hydraulic type.

**[0049]** In the extendable embodiment of the basket 1 proposed, the upper cross member 302 of the movable wall 30 and the upper cross member 312 of the opposite wall 31 are telescopically extendable.

**[0050]** Even more in detail, the upper cross member 302 of the movable wall 30 comprises at least two linear rigid elements being slidable one into the other, each of which elements is connected to a respective rotatable arm 41, 42 hinged to a respective linear rigid element comprised within the telescopic cross member 312 of the opposite fixed wall 31.

**[0051]** In the preferred embodiment of the invention, it is provided at least one position device for detecting the position of the movable wall 30. The position device may be constituted by a sensor or a switch or other device, capable of sensing the presence or proximity or motion of the movable wall 30.

**[0052]** In particular, the position device may be of the type adapted to detect if the movable wall 30 is in the closed position thereof.

**[0053]** To be precise, there may be provided one or more position devices relative to the zone of contact between the movable wall 30 and the support plane 10, 11; in the case in which the coupling between the former and the latter occurs via aforesaid shaped inserts, each of these shaped inserts may be functionally associated with a respective position device. The utility arising from use of position devices will become more clear in the following description of some further aspects of the invention.

**[0054]** As said, the basket 1 is intended to be supported and moved by an articulated arm 2 which articulated arm 2, together with a possible rotatable turret placed on the

operating machine and possible further rotating and/or tilting parts of the basket 1 placed between the latter and the arm 2 itself, form a lifting apparatus operated by hydraulic actuators or other handling means.

**[0055]** Such moving means are subject to the control of an electronic control unit whereon the operator may take action if necessary by way of aforesaid control means 3 placed on the basket 1.

**[0056]** The control unit is connected to the position devices and is advantageously so configured as to prevent the moving means from actuating the lifting apparatus 2 if the movable wall 30 is not in the closed position thereof.

**[0057]** In detail, the control unit may comprise a safety module that is capable of blocking the moving means in the operating state wherein the moving means is found as a result of the detection that the movable wall 30 ceases to be in the closed position thereof, and of allowing actuation of the handling means only with the movable wall 30 in its closed position.

**[0058]** Here below, operation of the basket 1 of the invention is being disclosed in reference to the case of example in which the basket 1 must be used to remove an insulating or fire-resistant roof covering.

**[0059]** The operators board the basket 1 laid on the ground by entering from a passage disposed at one of the shorter walls 32, 33.

**[0060]** Then, the basket 1 is lifted and placed to the desired height relative to the roof.

**[0061]** At this point, the movable wall 30 is raised so that the load passage of the basket 1 can be opened; the opening of the movable wall 30 is immediately detected and the control unit promptly locks the articulated arm 2 as well as the means or organs associated therewith, so as to ensure that the basket 1 will remain stationary in the reached position.

**[0062]** Operators can now get off the basket 1 and go up on the roof and begin removing the roofing elements, such as sheets.

**[0063]** The sheets are loaded onto the basket 1 through the load passage, e.g. stacked one on the other on the support plane 10, 11.

**[0064]** Once the expected amount of material is accumulated, the movable wall 30 is brought again in the closed position thereof, thereby defining a continuous containment side barrier 30, 31, 32, 33 in the basket 1 owing to which the material is prevented from falling to the ground.

**[0065]** After closing of the movable wall 30, the lifting apparatus 2 is released by the control unit, and then the basket 1 is lowered to the ground with its load therein.

## Claims

1. A loading basket (1) for aerial platforms, telescopic handlers or similar operating machines, comprising a support plane (10, 11) and a plurality of lateral walls (30, 31, 32, 33), **characterized in that** it comprises

at least one movable wall (30) between a closed position, in which the movable wall (30) forms one of the sides of said basket (1), and an open position in which the movable wall (30) leaves a lateral load passage in the basket (1), through which loading and unloading of material is enabled .

2. A loading basket (1) according to the preceding claim, wherein, in said closed position, said movable wall (30) is joined to the support plane (10, 11) and contacts two of said lateral walls (32, 33), consecutively disposed with the movable wall (30). 10
3. A loading basket (1) according to at least one of the preceding claims, wherein the movable wall (30), in said open position, is spaced apart from said support plane (10, 11). 15
4. A basket (1) according to at least one of the preceding claims, in which said load passage, opened with the movable wall (30) in its open position, is constituted by a passage which is inferiorly defined by the support plane (10, 11) and laterally by two walls (31, 32) that are placed alongside the movable wall (30) in its closed position. 20  
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5. A basket (1) according to at least one of the preceding claims, wherein said support plane (10, 11) is rectangular and wherein said lateral walls (30, 31, 32, 33) are four in number and stand each from a respective side of the support plane (10, 11) perimeter, the movable wall (30) standing from one of the major sides of the perimeter of the support plane (10, 11) in its closed position. 30  
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6. A basket (1) according to at least one of the preceding claims, wherein the movable wall (30) is able to rotate and/or translating between the close position and the open position thereof. 40
7. A basket (1) according to at least one of the preceding claims, wherein the movable wall (30) is able to rise up when switching from the closed position to the open position thereof. 45
8. A basket (1) according to at least one of the preceding claims, wherein the movable wall (30) is able to switch from the open to the closed position by gravity. 50
9. A basket (1) according to at least one of the preceding claims, comprising hinge means (51, 52) connected to the movable wall (30) in order to allow movement of the latter between the closed position and the open position. 55
10. A basket (1) according to the preceding claim, comprising one or more rotation arms (41, 42) fixed to the movable wall (30) and connected to at least one

fixed wall (31, 32, 33) via at least one hinge (51, 52).

11. A basket (1) according to the preceding claim, in which said fixed wall (31) is opposite to the movable wall (30), in the closed position of the latter. 5
12. A basket (1) according to claim 10 or claim 11, wherein said rotation arms (41, 42) are perpendicular to the movable wall (30). 10
13. A basket (1) according to at least one of the preceding claims, wherein said movable wall (30) has a truss structure configuration and comprises a plurality of uprights (301) joined by at least one cross member (302) which is telescopically extendable, said uprights (301) comprising respective lower ends removably coupled to the support plane (10, 11). 15
14. A basket (1) according to at least one of the preceding claims, which is able to telescopically vary its length. 20
15. A basket (1) according to the preceding claim, wherein said support plane comprises a first flat element (10) and a second flat element (11), slidably inserted one into the other. 25
16. A basket (1) according to claim 13 and claim 14, wherein said cross member (302) is telescopically extendable. 30
17. A basket (1) according to the preceding claim and at least one of claims 10 to 15, wherein said cross member (302) comprises two linear rigid elements that are slidable one into the other, each of which is connected to a respective rotation arm (41, 42) hinged to a respective linear rigid element comprised in a telescopic crossmember (312) of said fixed wall (31). 35  
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18. A basket (1) according to at least one of the preceding claims, comprising at least one position device for detecting the position of the movable wall (30). 45
19. A lifting system for aerial platforms comprising a basket (1) according to the previous claim, a lifting apparatus that includes an articulated arm (2) that supports the basket (1), moving means for operating said lifting apparatus (2) and a control unit, connected to said position device and configured so as to prevent the moving means from operating the apparatus (2) if the movable wall (30) is not in the closed position thereof. 50  
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Fig.1

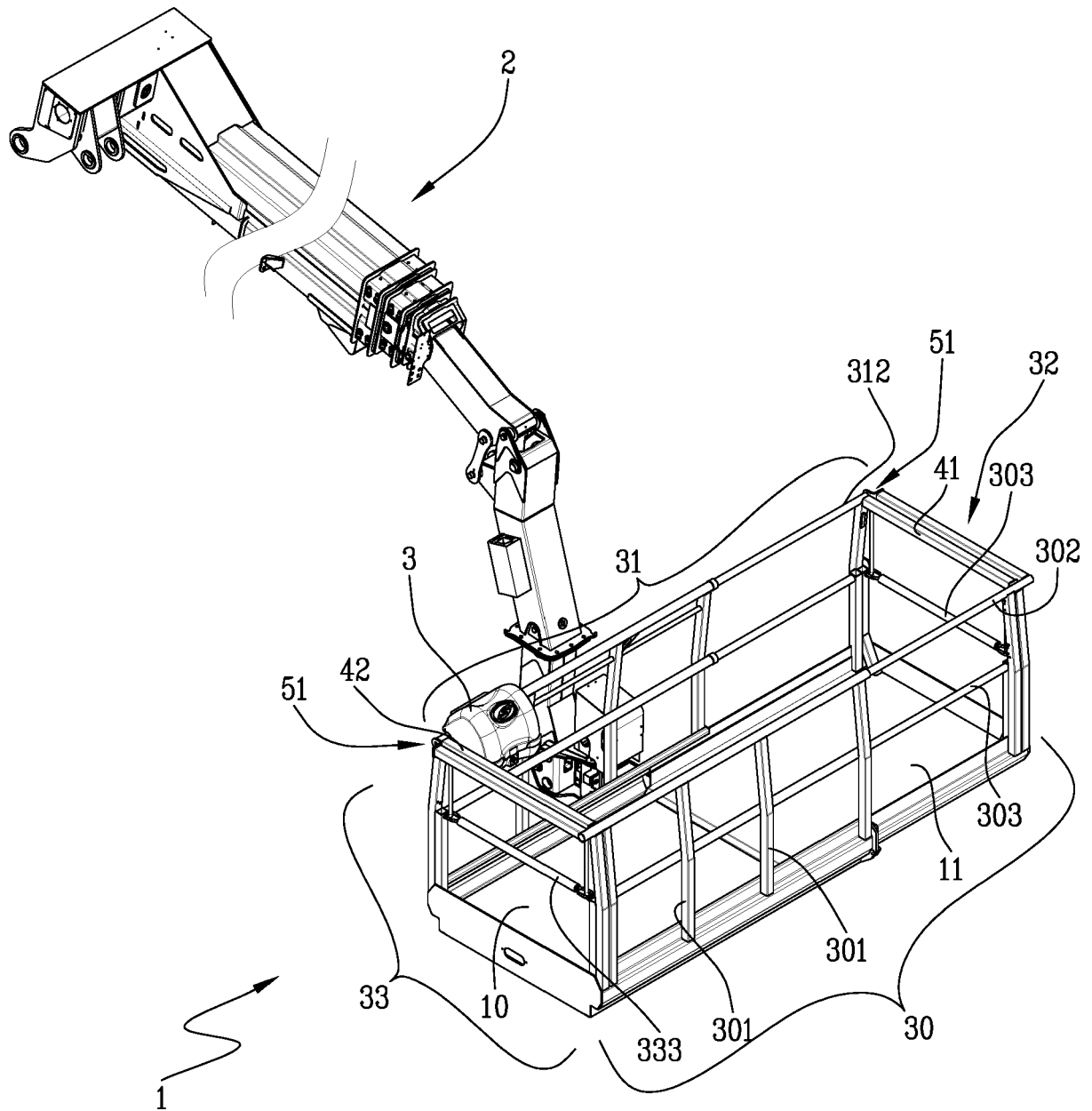


Fig.2

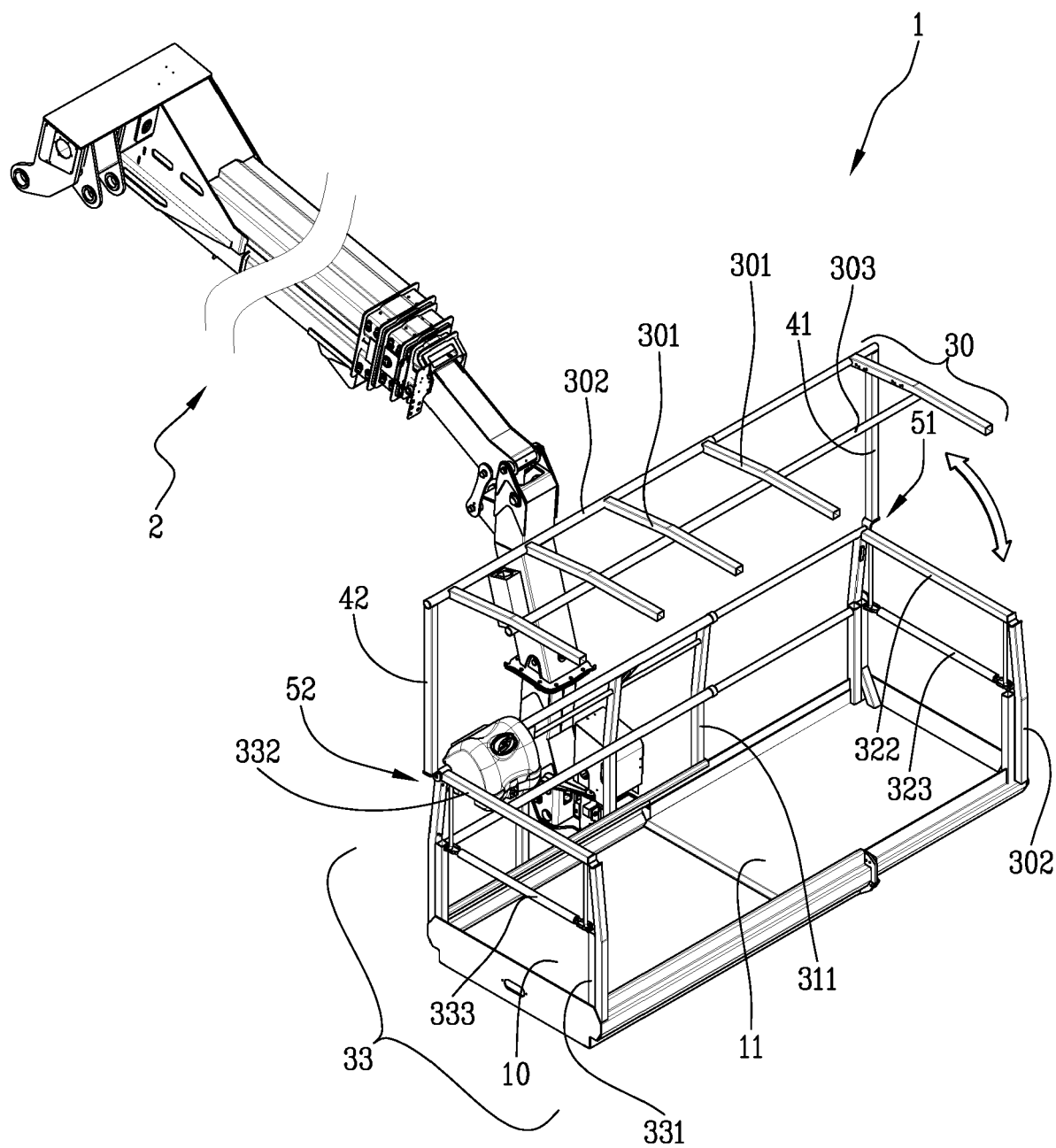
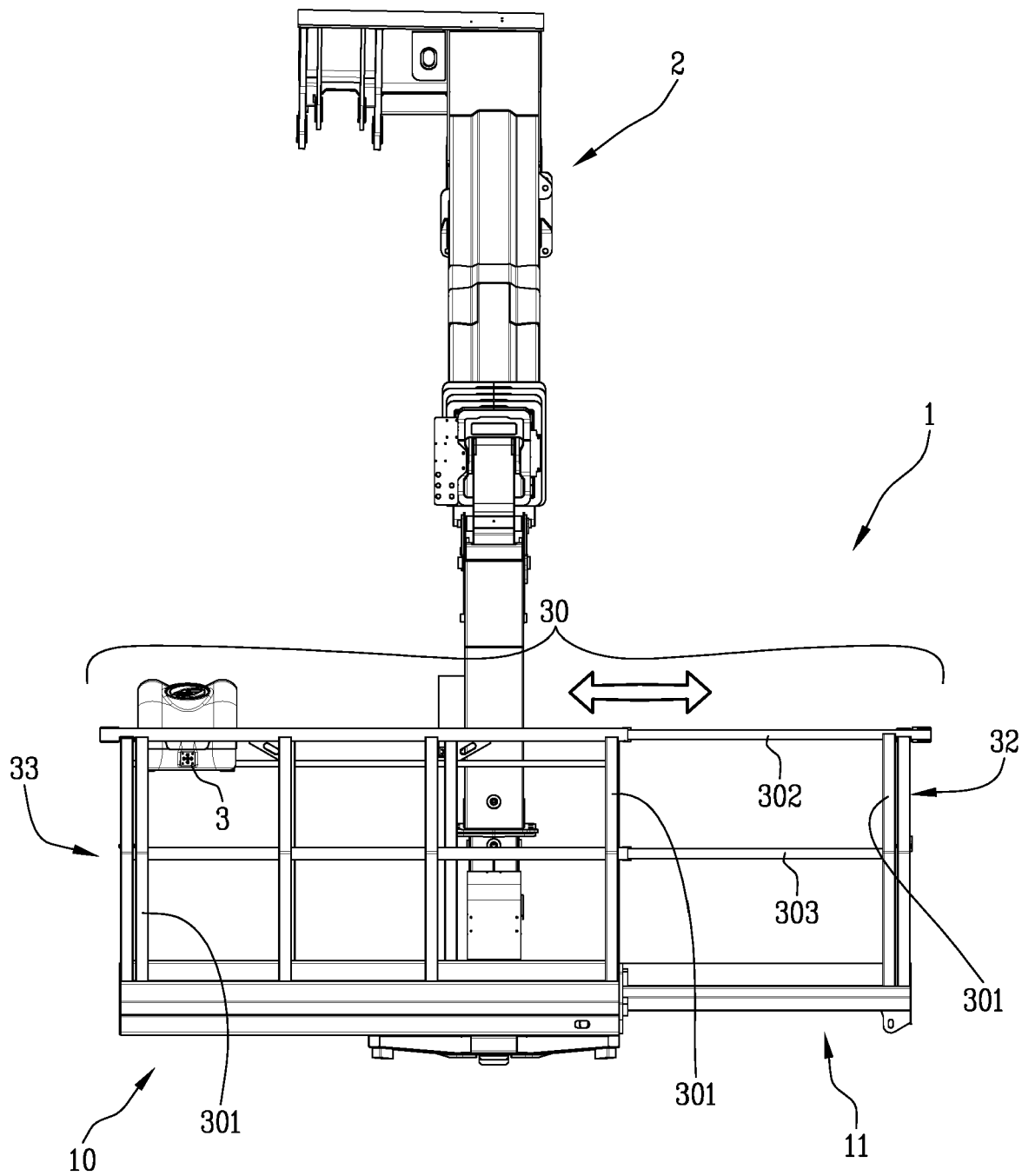


Fig.3





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Application Number  
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X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document		T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons ..... & : member of the same patent family, corresponding document	

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**ANNEX TO THE EUROPEAN SEARCH REPORT  
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5 This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.  
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