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(54) LAUNCH AND RECOVERY SYSTEM

(57) Launch and recovery system (1) comprising a base (2) mounted or mountable on a deck (4) of a ship, and two booms (3) pivotably mounted on the base (2), wherein the two booms (3) are connected at their extremities (12) distant from the base (2) with an upper beam (11), and wherein a load (13) is suspendable from the upper beam (11), wherein the upper beam (11) is separable in two independent parts without interconnection, and that with the upper beam (11) separated in two parts the two booms (3) are operable independent from each other, wherein each boom (3) is equipped to handle a load independent from the other boom (3).

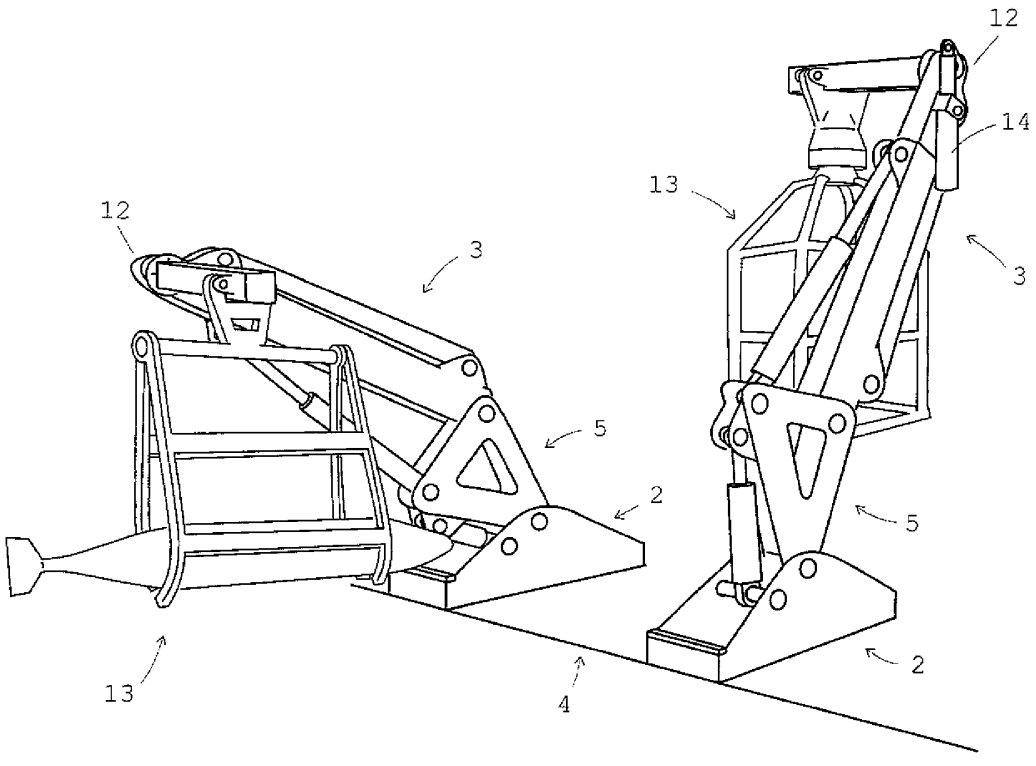

Fig. 6

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Description

[0001] The invention relates to a launch and recovery system comprising a base mounted or mountable on a deck of a ship, and two booms pivotably mounted on the base, wherein the two booms are connected at their extremities distant from the base with an upper beam, and wherein a load is suspendable from the upper beam.

[0002] Such a launch and recovery system is commonly known in the art and is used for getting a load from the deck of the ship into the ocean water, or the other way around getting a load out of the water onto the deck of the ship.

[0003] Usually the known launch and recovery system is restricted in the way it can be used, and most of the time it (necessarily) stands in the way in the limited space available on the deck of the ship.

[0004] It is an object of the invention to provide a launch and recovery system with increased versatility and which has further benefits as will become apparent from the following disclosure.

[0005] The launch and recovery system of the invention is embodied with the features of one or more of the appended claims.

[0006] In a first aspect of the invention the upper beam is removable and that with the upper beam removed, each boom is equipped to handle a load independent from the other boom. By applying the two booms independent from each other, the capacity of the launch and recovery system can be doubled, since the individually operable booms can be used to simultaneously handle different loads.

[0007] For the ease and versatility of their independent use the booms can be provided with two independent and disconnected upper beam parts.

[0008] When no independent use of the booms is envisaged the upper beam can be replaced. It is however also possible that the two independent and disconnected upper beam parts are connectable to each other so as to provide an upper beam that connects the extremities of the two booms.

[0009] A preferred feature of the launch and recovery system of the invention is that the upper beam and/or the respective upper beam parts is/are rotatable along their longitudinal axis perpendicular to the booms. This supports the ease of handling of the system of the invention while navigating a load that is suspended from (a part of) the upper beam between the water and the deck of the ship. The upper beam or the respective upper beam parts can thus automatically rotate to an optimal position while the booms are pivoting on their base.

[0010] Using the two parts of the upper beam to connect the booms of the launch and recovery system supports the normal way of operation wherein the load is suspended from the upper beam. This also applies when the upper beam is not rotatable along its longitudinal axis between the two booms. Any load can be transferred from the deck of the ship to the water or vice versa while passing in between the two booms.

[0011] Anyway, when the (two parts of the) upper beam connects the two booms it is preferable that the two booms are concertedly operable to make handling of the load easy and well-defined. Advantageously the two booms are then movable as each other's mirror image. It is however also possible to operate the two booms concertedly without being in synchronicity as each other's mirror image, particularly when specific loads with for instance bulky dimensions need to be handled.

[0012] Preferably the booms are extendible. This feature enables that the two booms can be pre-programmed to follow a predetermined path when navigating a load between the ship and the sea so that it will not be required to lift the load to an appreciable height but it will suffice to lift the load only slightly in order to enable it to pass the railing of the ship. Accordingly it is possible to maintain a low point of gravity of any load, improving stability of both the load and the ship on which the launch and recovery system is mounted.

[0013] One thing and another promotes thus the reach and versatility of the launch and recovery system of the invention. For the same reason it is desirable that the base supports a frame or frames that is or are pivotably mounted on the base, and that the frame or frames pivotably support the boom or booms.

[0014] It is further preferable that with plural frames each frame is supported by an individual base so that each boom is entirely independent from the other boom and can be individually manipulated.

[0015] The invention will hereinafter be further elucidated with reference to the drawing of an exemplary embodiment of an apparatus according to the invention that is not limiting as to the appended claims.

[0016] In the drawing:

- figure 1 shows in side view a launch and recovery system according to the invention;
- figure 2 shows a perspective view at the launch and recovery system of figure 1;
- figures 3, 4 and 5 show further perspective views of the launch and recovery system of figure 1;
- figure 6 shows the launch and recovery system of figure 1 with two separately operable booms;
- figures 7 and 8 show the launch and recovery system of figure 1 with different suspended loads;
- figure 9 shows the launch and recovery system of figure 1 highlighting the option to extend the two booms.

[0017] Whenever in the figures the same reference numerals are applied, these numerals refer to the same parts.

[0018] Making reference first to figure 1 it shows in side view a launch and recovery system 1 of the invention comprising a base 2 mounted on a deck 4 of a ship (not further shown), and a boom 3 directly or indirectly and pivotably mounted on the base 2. As will be shown and

discussed further in this description a load is suspendable from said boom 3.

[0019] In the embodiment shown in figure 1 the boom 3 is pivotably mounted on a frame 5, wherein in turn said frame 5 is pivotably mounted on the base 2. Arrows 'a' indicate that the frame 5 can swivel back-and-forth around a pivot 6 that pivotably connects the frame 5 with the base 2. Pivoting of the frame 5 is done by actuating a hydraulic cylinder 7. Likewise a pivot 8 connects the boom 3 to the frame 5, and actuation of a hydraulic cylinder 9 causes that the boom 3 may pivot back-and-forth according to arrows 'b' around the pivot 8.

[0020] Figure 1 further shows that the boom 3 is extendable and is embodied with a first part 3" that connects with the pivot 8 to the frame 5, and a second part 3' that is telescopically extendable from the first part 3" by actuation of a hydraulic cylinder 10.

[0021] Figures 2, 3, 4 and 5 show the launch and recovery system 1 in a perspective view which reveals that the system 1 comprises two similar or identical booms 3. Figures 2 - 5 all show that there is an individual base 2 for each frame 5 that is pivotably mounted on the base 2, and that each frame 5 pivotably supports a boom 3. The operation of each boom 3, frame 5, and base 2 is consistent with what has been discussed above with reference to figure 1. In accordance with the invention the booms 3 are preferably jointly operable wherein a removable upper beam 11 connects or is connectable to the two booms 3 at extremities 12 of the booms 3 distant from the base 2 and distant from the deck 4 of the ship.

[0022] Desirably the two booms 3 are concertedly operable which makes handling a load 13 as shown in figure 7 and figure 8 easy. It shows in figures 7 and 8 that the load 13 is suspended from the upper beam 11. Figures 7 and 8 show the load 13 at slightly different altitudes from which it will nevertheless be clear that the two booms 3 are movable as each other's mirror image. At the same time the upper beam 11 is rotatable along its longitudinal axis between the two booms 3 to accommodate for the change of angular position that the load 13 assumes with reference to the booms 3.

[0023] Turning now to figure 6 the feature of the launch and recovery system 1 of the invention is shown that the upper beam 11 is removed and replaced by two independent upper beam parts without interconnection, and that with the upper beam 11 removed, each boom 3 is equipped to handle a load independent from the other boom 3. The load can then be suspended from the upper beam part that has been connected to the concerning boom 3.

[0024] Although not shown in the figures it is also possible that instead of replacing the upper beam 11 for reconnecting the extremities 12 of the booms 3, the two independent and disconnected upper beam parts are made to be connectable to each other so as to provide in this way the upper beam that connects the extremities 12 of the two booms 3.

[0025] Finally Figure 9 shows the launch and recovery system 1 of the invention, wherein the booms 3 are shown in both solid lines and broken lines to depict that the booms 3 are extendible.

[0026] Although the invention has been discussed in the foregoing with reference to an exemplary embodiment of the launch and recovery system of the invention, the invention is not restricted to this particular embodiment which can be varied in many ways without departing from the invention. The discussed exemplary embodiment shall therefore not be used to construe the appended claims strictly in accordance therewith. On the contrary the embodiment is merely intended to explain the wording of the appended claims without intent to limit the claims to this exemplary embodiment. The scope of protection of the invention shall therefore be construed in accordance with the appended claims only, wherein a possible ambiguity in the wording of the claims shall be resolved using this exemplary embodiment.

Claims

1. Launch and recovery system (1) comprising

   a base (2) adapted to be mountable on a deck (4) of a ship,
   and two booms (3) pivotably mounted on the base (2), wherein the two booms (3) are connected at their extremities (12) distant from the base (2) with an upper beam (11), and wherein a load (13) is suspendable from the upper beam (11),
   characterized in that the upper beam (11) is removable and that with the upper beam (11) removed, each boom (3) is equipped to handle a load independent from the other boom (3).

2. Launch and recovery system according to claim 1, **characterized in that** the booms (3) can be provided with two independent and disconnected upper beam parts.

3. Launch and recovery system according to claim 2, **characterized in that** the two independent and disconnected upper beam parts are connectable to each other so as to provide an upper beam (11) that connects the extremities (12) of the two booms (3).

4. Launch and recovery system according to claim 1, 2 or 3, **characterized in that** the upper beam (11) and/or the respective upper beam parts is/are rotatable along their longitudinal axis perpendicular to the booms (3).

5. Launch and recovery system according to any one of claims 1 - 4, **characterized in that** the two booms (3) are extendable.

6. Launch and recovery system according to any one of claims 1 - 5,
characterized in that the base (2) supports a frame (5) or frames that is or are pivotably mounted on the base (2), and that the frame (5) or frames pivotably support a boom (3) or the booms.

7. Launch and recovery system according to claim 6, **characterized in that** with plural frames (5) each frame is supported by an individual base (2).

8. A ship having a deck, wherein the launch and recovery system of any preceding claims in mounted on said deck.

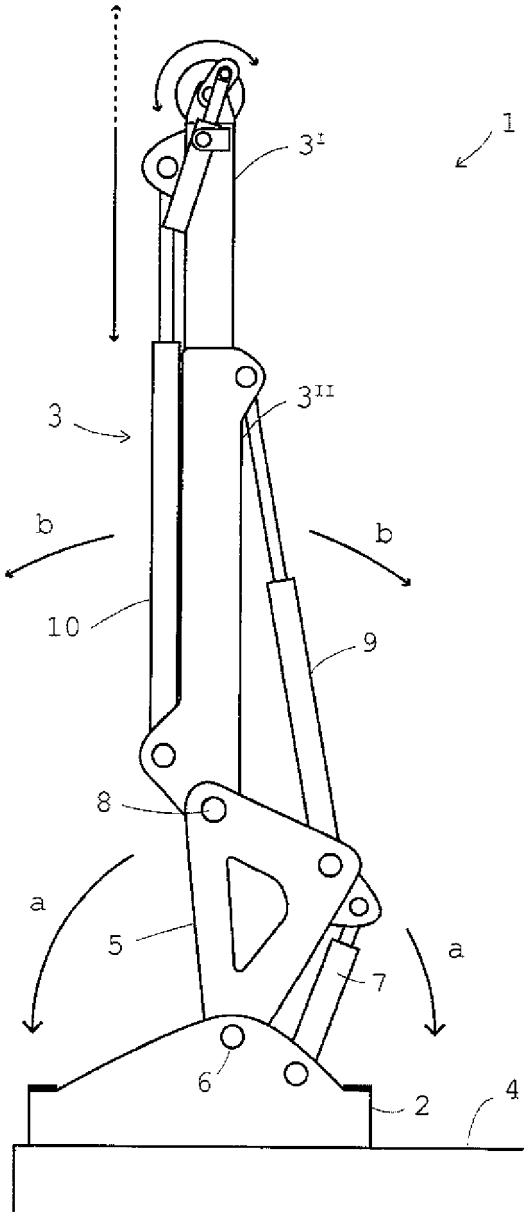

Fig. 1

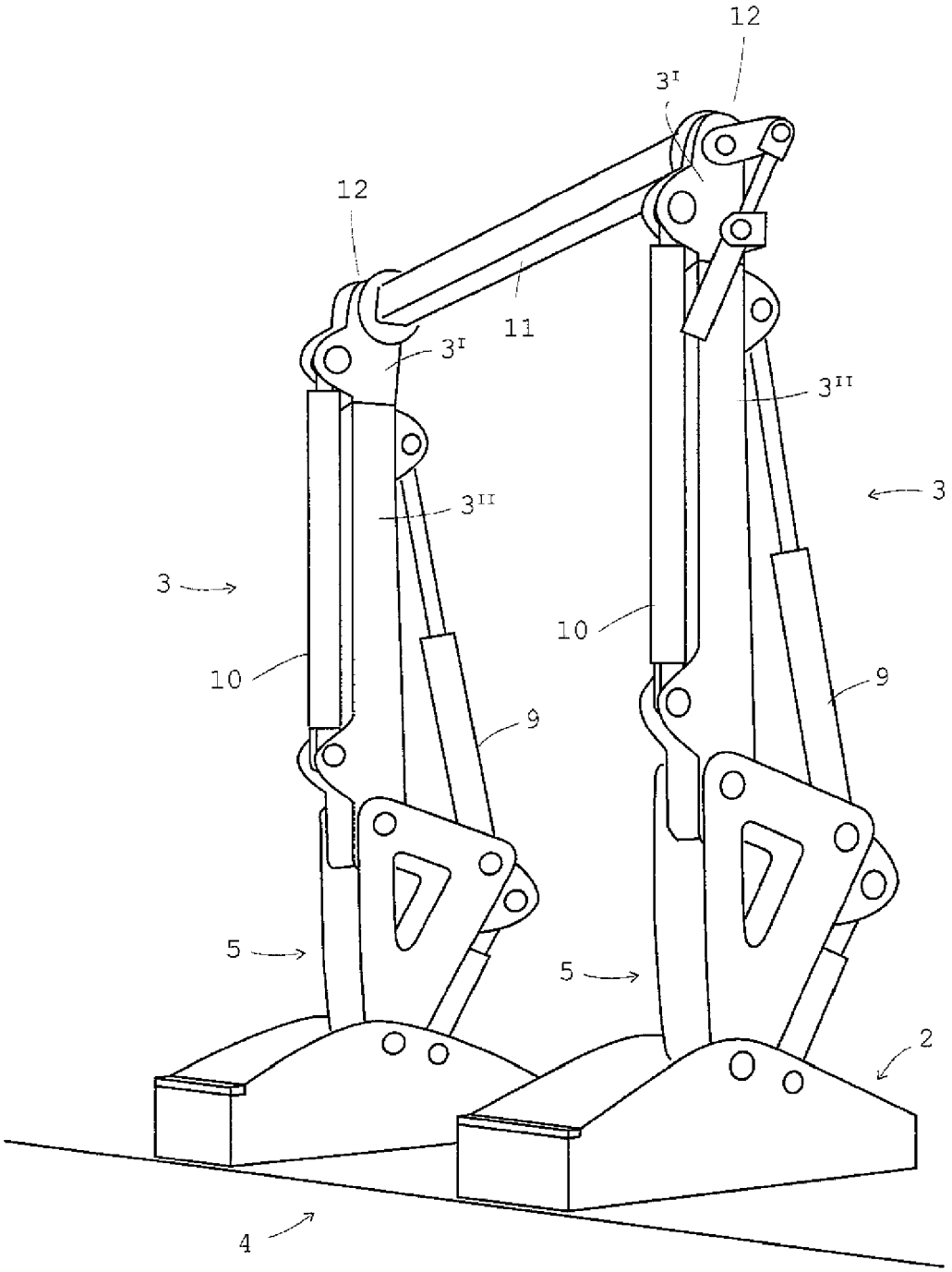

Fig. 2

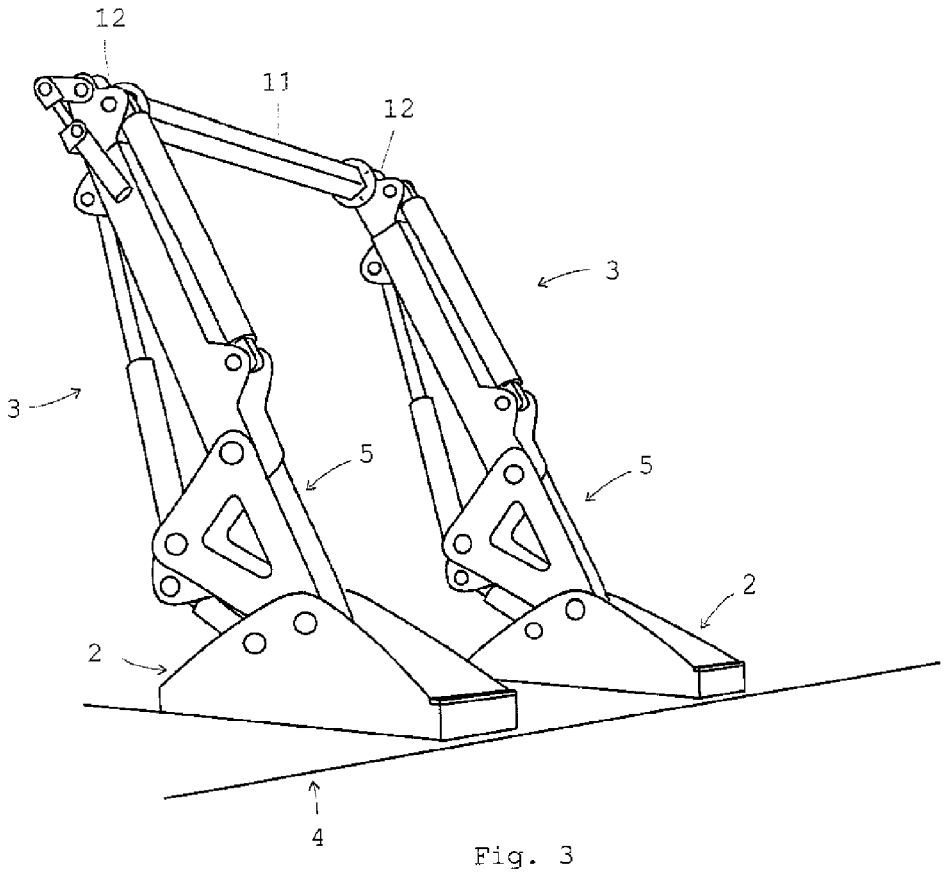

Fig. 3

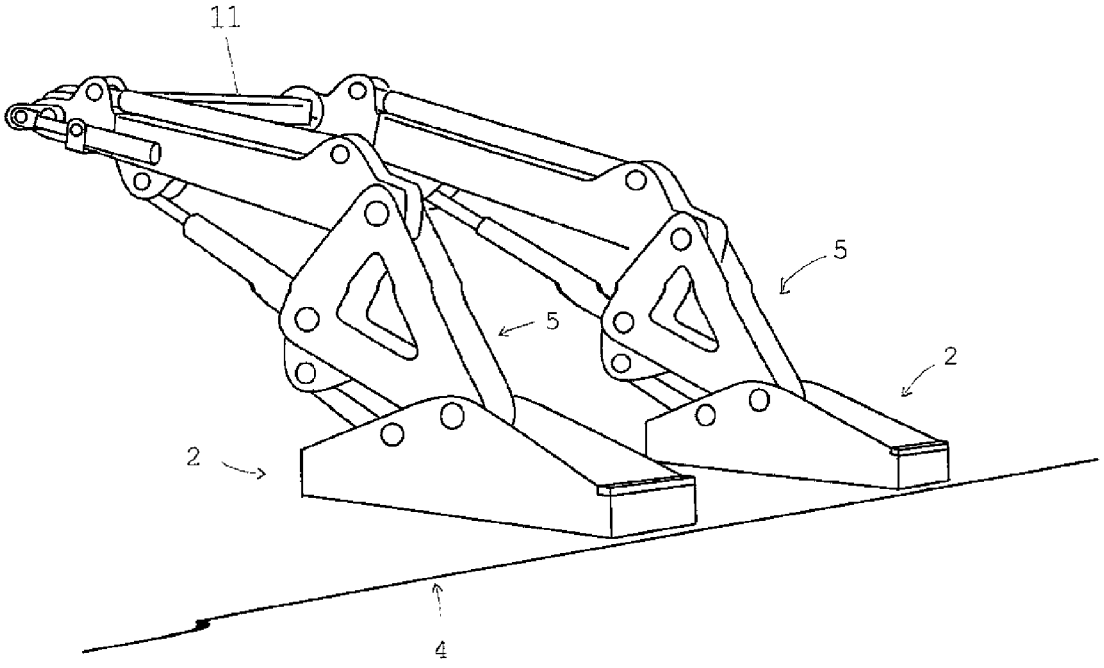

Fig. 4

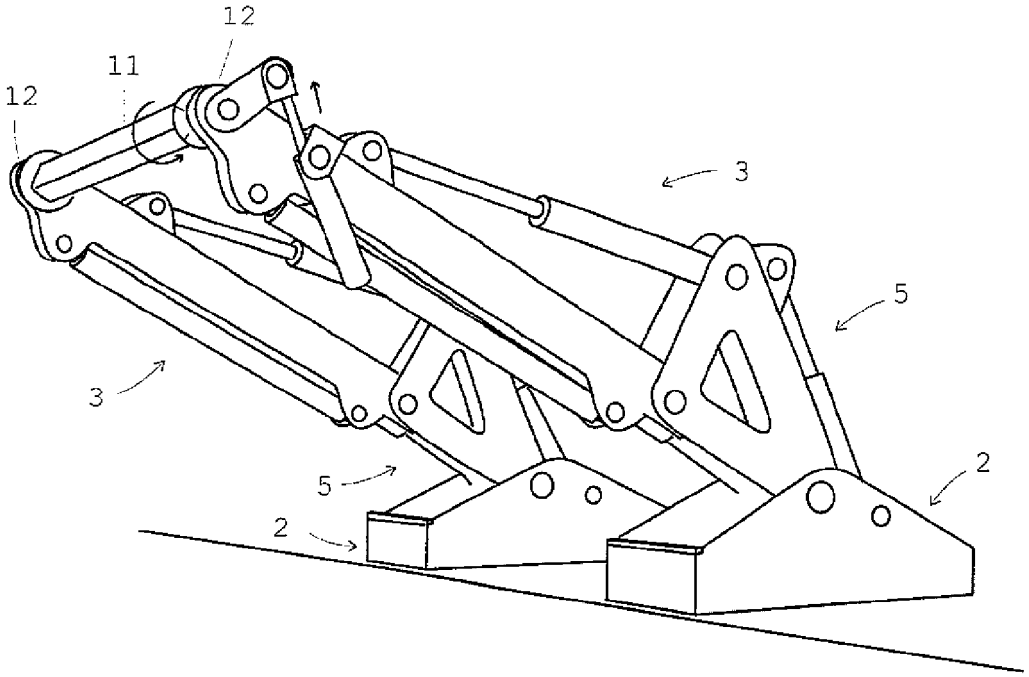

Fig. 5

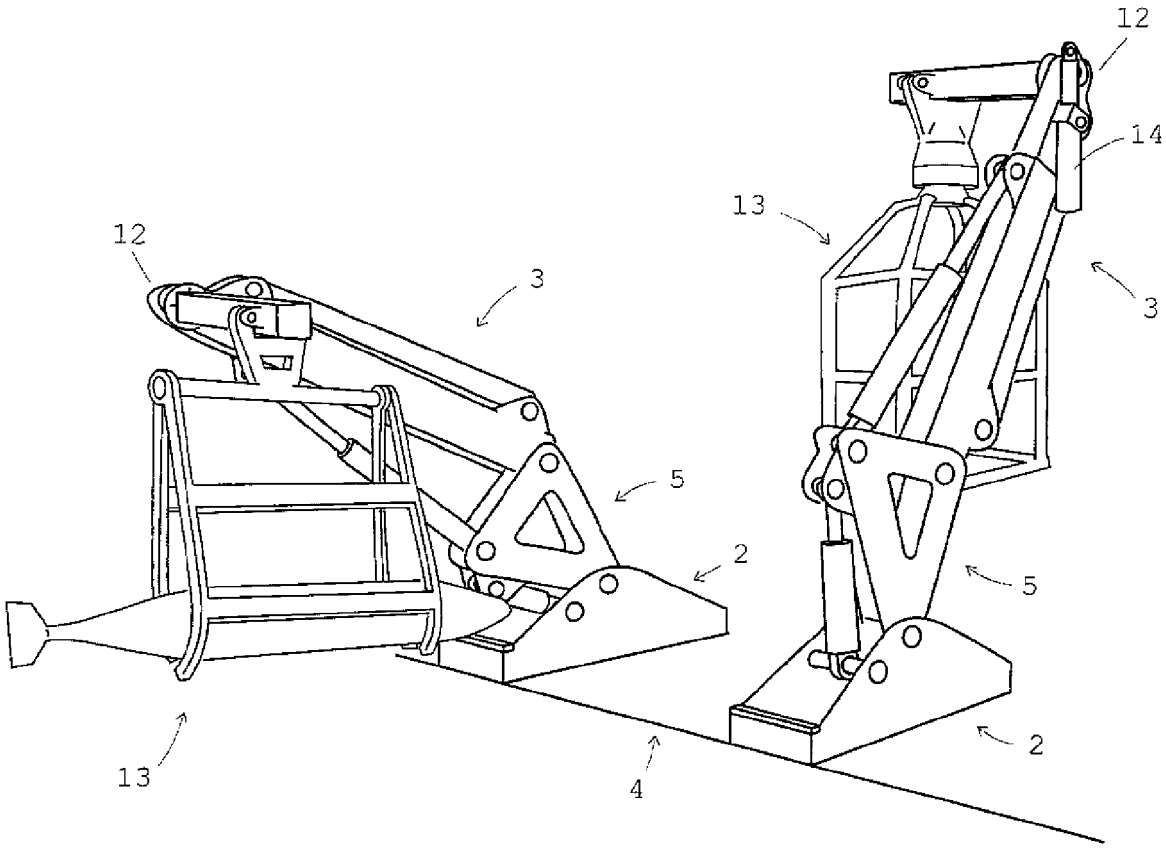

Fig. 6

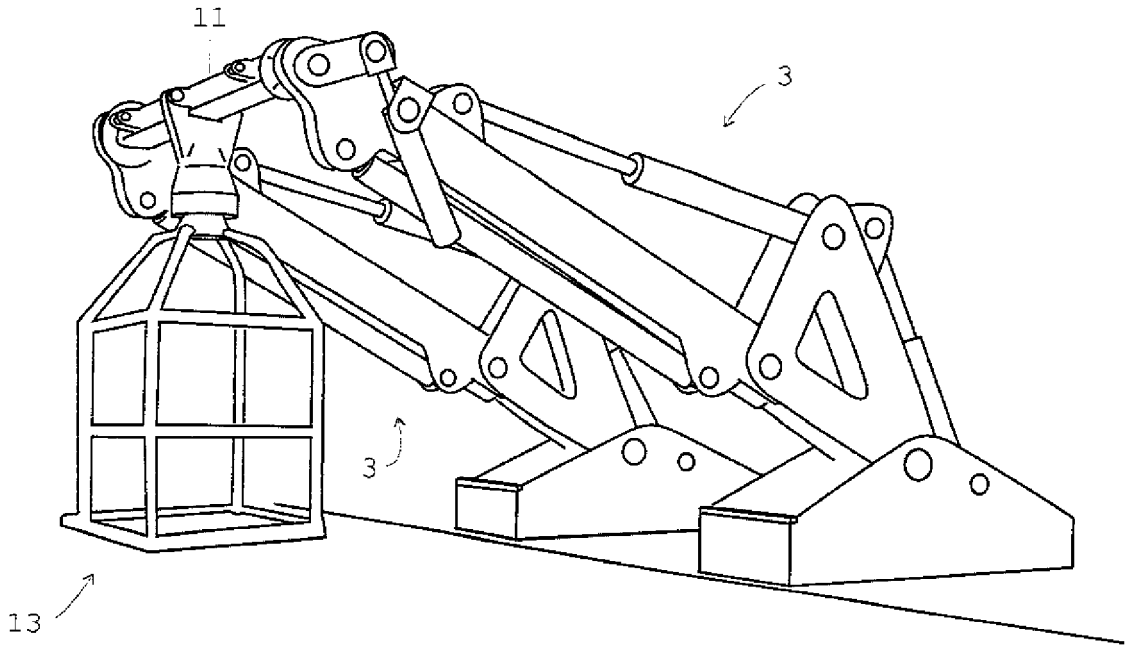

Fig. 7

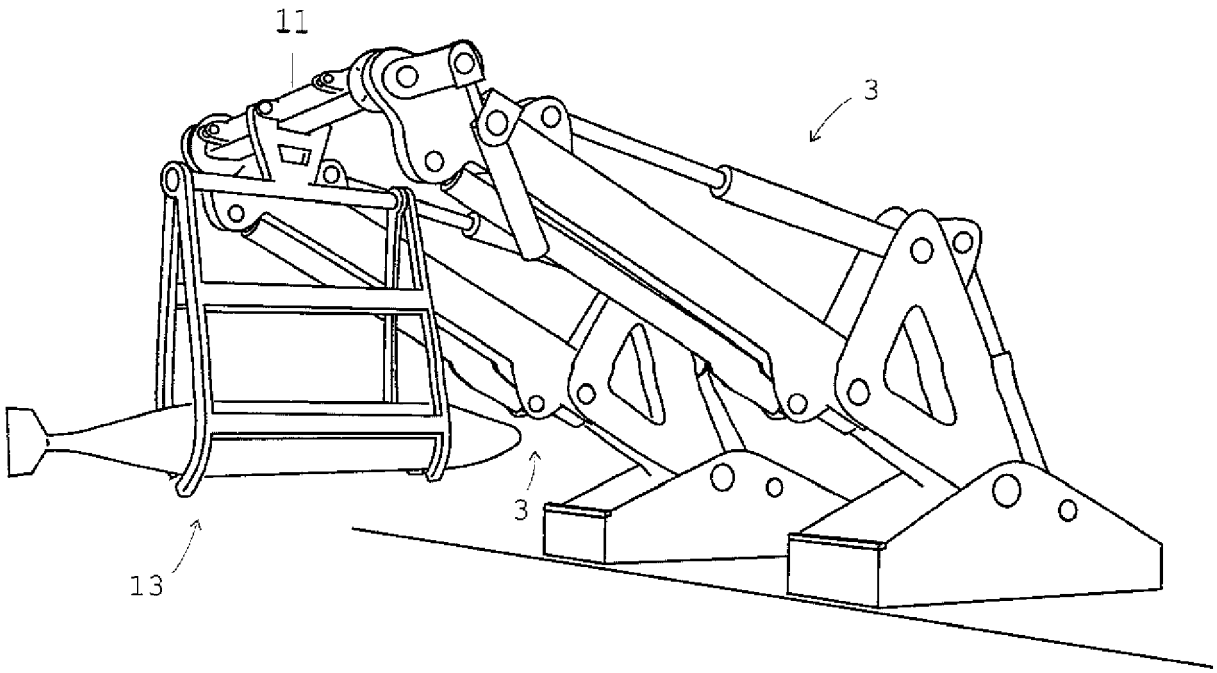

Fig. 8

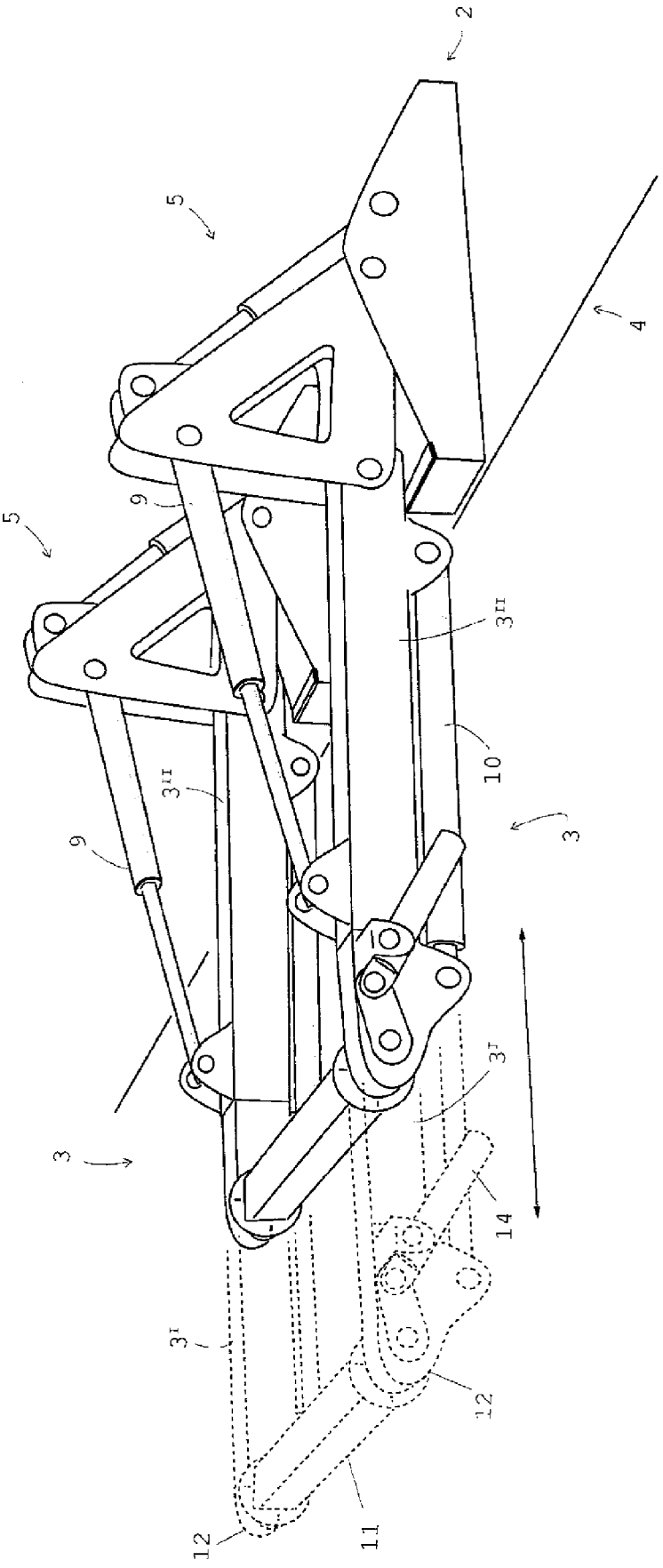

Fig. 9

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EUROPEAN SEARCH REPORT

Application Number
EP 18 18 5704

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	EP 1 052 214 A1 (MERLO IND METALMECC [IT]) 15 November 2000 (2000-11-15) * figures 1, 4 * * paragraph [0019] *	1-8	INV. B63B27/16 B66C13/02
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TECHNICAL FIELDS SEARCHED (IPC)

B63B
B66C

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
The Hague	6 September 2018	Freire Gomez, Jon

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
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06-09-2018

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For more details about this annex : see Official Journal of the European Patent Office, No. 12/82