WHAT IS CLAIMED IS:

A crane (60) for moving a component (36) of a device (26), the crane (60) comprising:

a supporting mechanism (62) configured to be fixedly attached to the device (26);

an arm mechanism (70) connected to the supporting mechanism (62) and configured to move in a horizontal plane;

a sliding mechanism (80) connected to the arm mechanism (70) and configured to move substantially perpendicular to the horizontal plane; and

a grabbing mechanism (90, 92) configured to be removably attached to the sliding mechanism (80) and configured to grab the component (36) of the device (26).

2. The crane of Claim 1, wherein the sliding mechanism includes a plate having a slot and the grabbing mechanism includes a bolt like element configured to slide into the slot and a head of the bolt like element is larger than a width of the slot.

3. The crane of Claim 1, wherein the arm mechanism comprises:

first and second arms connected through a first joint such that the second arm is configured to move relative to the first arm and the first arm is connected through a second joint to the supporting mechanism and is configured to move relative to the supporting mechanism.

4. The crane of Claim 1, wherein the sliding mechanism comprises:

plural rails that extend substantially perpendicular to the horizontal plane.

5. The crane of Claim 1, further comprising:

a power source connected to the sliding mechanism for actuating the sliding mechanism substantially perpendicular to the horizontal plane.

6. The crane of Claim 1, wherein the arm mechanism extends substantially parallel to a piston rod of the device.

7. The crane of Claim 1, wherein the sliding mechanism includes a plate having a slot and the grabbing mechanism consists of a bolt having a head larger than the slot.

8. The crane of Claim 1, wherein

the sliding mechanism includes a plate having a slot, and

the grabbing mechanism comprises a bolt having a head larger than the slot and a tool connected to the bolt, the tool including,

an external circular frame,

plural bearings provided in the external circular frame and configured to rotationally hold a bonnet of the device;

an internal circular frame configured such that the plural bearings are sandwiched between the external circular frame and the internal circular frame, and

fixing parts attached to the external circular frame and configured to slide relative the external circular frame to fix the bonnet of the device.

9. A blowout preventer (BOP) crane system (60) for moving a component (36) of the BOP (26), the BOP crane system (60) comprising:

a body of the BOP having a horizontal chamber;

at least a ram block (30) provided in the horizontal chamber and configured to move in the horizontal chamber;

a bonnet (36) configured to close the at least a ram block (30) in the horizontal chamber;

a supporting mechanism (62) configured to be fixedly attached to the body of the BOP (26);

an arm mechanism (70) connected to the supporting mechanism (62) and configured to move in a horizontal plane;

a sliding mechanism (80) connected to the arm mechanism (70) and configured to move substantially perpendicular to the horizontal plane; and

a grabbing mechanism (90, 92) configured to be removably attached to the sliding mechanism (80) and configured to grab the component (36) of the device (26).

10. A method for handling a ram block (32) of a blowout preventer (BOP) (26), the method comprising:

grabbing a bonnet (36) of the BOP (26) with a first tool (90) attached to a crane (60), wherein the crane (60) includes a supporting mechanism (62) configured to be fixedly attached to a body of the BOP (26);

moving an arm mechanism (70) of the crane (60), which is connected to the supporting mechanism (62), in a horizontal plane to move the bonnet (36) to uncover the ram block (32);

storing the bonnet (36);

replacing the first tool (90) with a second tool (92), wherein the first and second tools (90, 92) are received by a sliding mechanism (80) connected to the arm mechanism (70);

connecting the second tool (92) to the ram block (32); and

lifting the ram block (32) by actuating the sliding mechanism (80), which is connected to the arm mechanism (70), the sliding mechanism (80) being configured to move substantially perpendicular to the horizontal plane.

CLAIMS

1. A crane for moving a component of a blowout preventer, the crane comprising:

a supporting mechanism configured to be fixedly attached to the blowout preventer;

an arm mechanism connected to the supporting mechanism and configured to move in a horizontal plane, the arm mechanism including a first arm configured to rotate in the horizontal plane;

a sliding mechanism connected to the arm mechanism and configured to move substantially perpendicular to the horizontal plane;

a grabbing mechanism configured to be removably attached to the sliding mechanism and configured to grab the component of the blowout preventer,

wherein the sliding mechanism includes a plate having a slot and the grabbing mechanism includes a bolt like element configured to slide into the slot and a head of the bolt like element is larger than a width of the slot, and

wherein the bolt like element is directly screwed into a ram block of the blowout preventer.

2. The crane of claim 1, wherein the arm mechanism further comprises:

a second arm connected through a first joint to the first arm such that the second arm is configured to move relative to the first arm and the first arm is connected through a second joint to the supporting mechanism.

3. The crane of claim 1, wherein the sliding mechanism comprises:

plural rails that extend substantially perpendicular to the horizontal plane.

4. The crane of claim 1, further comprising:

a power source connected to the sliding mechanism for actuating the sliding mechanism substantially perpendicular to the horizontal plane.

5. The crane of claim 1, wherein the arm mechanism extends substantially parallel to a piston rod of the blowout preventer.

6. The crane of claim 1, wherein the grabbing mechanism comprises a tool connected to the bolt, the tool including,

an external circular frame,

plural bearings provided in the external circular frame and configured to rotationally hold a bonnet of the device;

an internal circular frame configured such that the plural bearings are sandwiched between the external circular frame and the internal circular frame, and

fixing parts attached to the external circular frame and configured to slide relative the external circular frame to fix the bonnet of the device.

7. A blowout preventer (BOP) crane system for moving a component of the BOP, the BOP crane system comprising:

a body of the BOP having a horizontal chamber;

at least a ram block provided in the horizontal chamber and configured to move in the horizontal chamber;

a bonnet configured to close the at least a ram block in the horizontal chamber,

a supporting mechanism configured to be fixedly attached to the body of the BOP;

an arm mechanism connected to the supporting mechanism and configured to move in a horizontal plane;

a sliding mechanism connected to the arm mechanism and configured to move substantially perpendicular to the horizontal plane; and

a grabbing mechanism configured to be removably attached to the sliding mechanism and configured to grab the component of the device,

wherein the sliding mechanism includes a plate having a slot and the grabbing mechanism comprises a bolt having a head larger than the slot and a tool connected to the bolt, and wherein the tool includes:

an external circular frame,

plural bearings provided in the external circular frame and configured to rotationally hold the bonnet of the BOP,

an internal circular frame configured such that the plural bearings are sandwiched between the external circular frame and the internal circular frame, and

fixing parts attached to the external circular frame and configured to slide relative the external circular frame to fix the bonnet of the BOP.

8. The BOP crane system of claim 7, wherein the arm mechanism comprises:

first and second arms connected through a first joint such that the second arm is configured to move relative to the first arm and the first arm is connected through a second joint to the supporting mechanism and is configured to move relative to the supporting mechanism.

9. The BOP crane system of claim 7, wherein the arm mechanism extends substantially parallel to a piston rod of the at least a ram block.

10. The BOP crane system of claim 7, wherein the bolt is configured to screw into the at least a ram block of the BOP.

11. The BOP crane system of claim 7, further comprising: other BOPs forming a BOP stack with the BOP.

12. The BOP crane system of claim 11, further comprising: plural cranes, each fixed to a corresponding BOP of the BOP stack.

13. A method for handling a ram block of a blowout preventer (BOP), the method comprising:

grabbing a bonnet of the BOP with a first tool attached to a crane, wherein the crane includes a supporting mechanism configured to be fixedly attached to a body of the BOP;

moving an arm mechanism of the crane, which is connected to the supporting mechanism, in a horizontal plane to move the bonnet to uncover the ram block;

storing the bonnet;

replacing the first tool with a second tool, wherein the first and second tools are received by a sliding mechanism connected to the arm mechanism;

connecting the second tool to the ram block; and

lifting the ram block by actuating the sliding mechanism, which is connected to the arm mechanism, the sliding mechanism being configured to move substantially perpendicular to the horizontal plane.

14. The method of claim 13, further comprising:

rotating a part of the first tool to rotate the bonnet such that the bonnet is unscrewed from the body of the BOP.

15. A blowout preventer (BOP) having a crane for moving a component of BOP, the BOP comprising:

a ram body having a horizontal chamber containing a movable ram block; the crane comprising:

a supporting mechanism fixedly attached to the ram housing;

an arm mechanism connected to the supporting mechanism and configured to move in a horizontal plane, the arm mechanism including a first arm configured to rotate in the horizontal plane;

a sliding mechanism connected to the arm mechanism and configured to move substantially perpendicular to the horizontal plane, and

a ram block tool configured to be removably attached to the sliding mechanism and configured to engage and remove the ram block from the horizontal chamber,

wherein the sliding mechanism comprises at least one rail that extends substantially perpendicular to the horizontal plane.

16. A blowout preventer (BOP) having a crane for moving a component of the BOP, the BOP comprising:

a ram body having a horizontal chamber containing a movable ram block;

a bonnet assembly releasably mounted to the ram body for closing the horizontal chamber; the crane comprising:

a supporting mechanism fixedly attached to the ram body;

an arm mechanism connected to the supporting mechanism and configured to move in a horizontal plane, the arm mechanism including a first arm configured to rotate in the horizontal plane;

a sliding mechanism connected to the arm mechanism and configured to move substantially perpendicular to the horizontal plane;

a circular bonnet tool configured to be removably attached to the sliding mechanism and configured to grab and support the bonnet assembly for service, and

a ram block tool configured to removably attach the ram block to the sliding mechanism in lieu of the circular bonnet tool to remove the ram block from the ram body for service.

17. A crane for moving a component of a device, the crane comprising:

a supporting mechanism configured to be fixedly attached to the device;

an arm mechanism connected to the supporting mechanism and configured to move in a horizontal plane;

a sliding mechanism connected to the arm mechanism and configured to move substantially perpendicular to the horizontal plane; and

a grabbing mechanism configured to be removably attached to the sliding mechanism and configured to grab the component of the device,

wherein the sliding mechanism includes a plate having a slot, and the grabbing mechanism comprises a bolt having a head larger than the slot and at tool connected to the bolt, and

wherein the tool includes,

an external circular frame,

plural bearings provided in the external circular frame and configured to rotationally hold a bonnet of the device,

an internal circular frame configured such that the plural bearings are sandwiched between the external circular frame and the internal circular frame, and

fixing parts attached to the external circular frame and configured to slide relative the external circular frame to fix the bonnet of the device.