

(43) **Pub. Date:** **May 6, 2010**

Fig. 2a

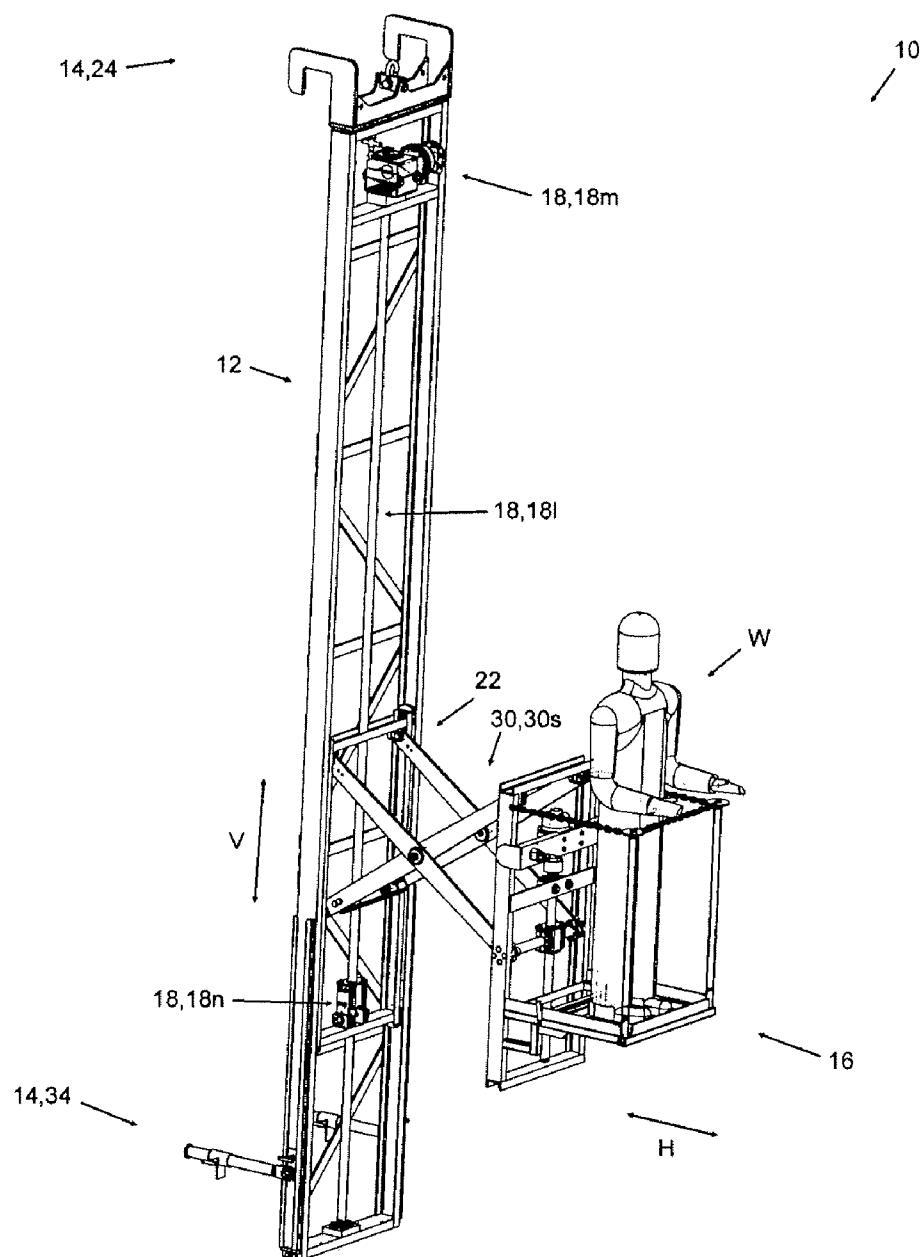
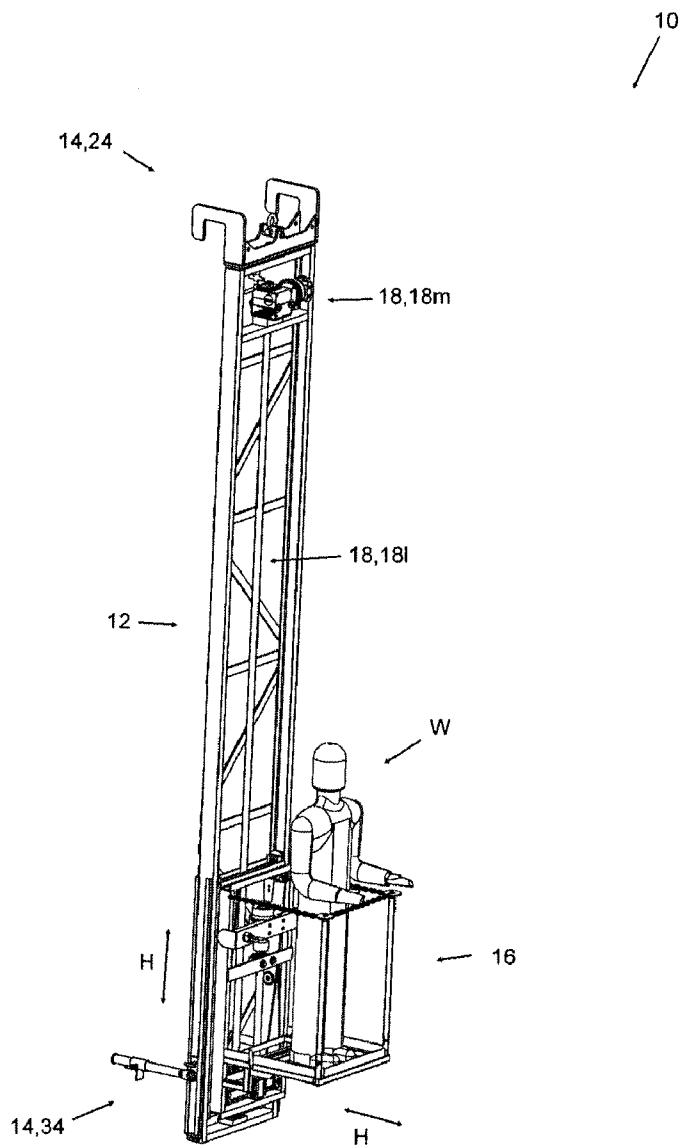


Fig. 2b



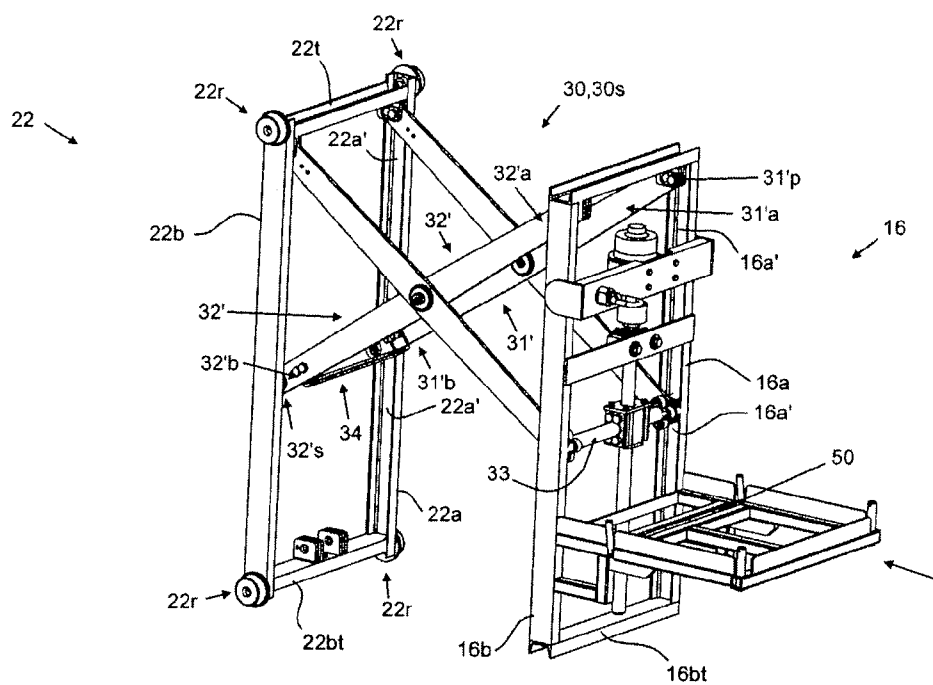


Fig. 5

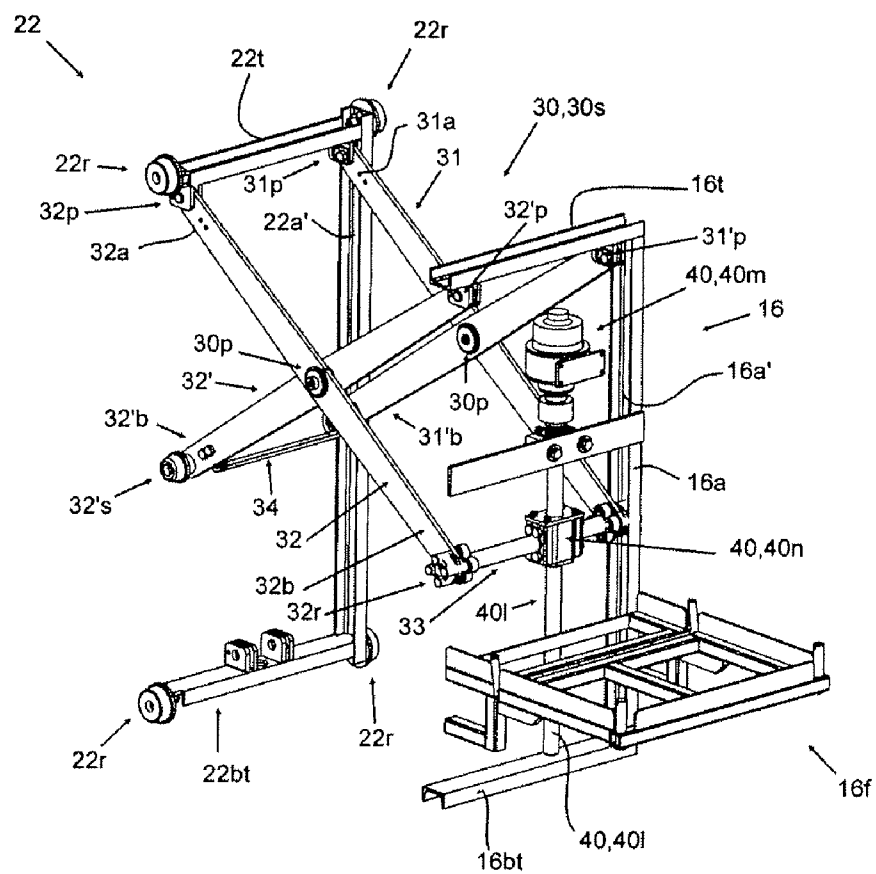


Fig. 6

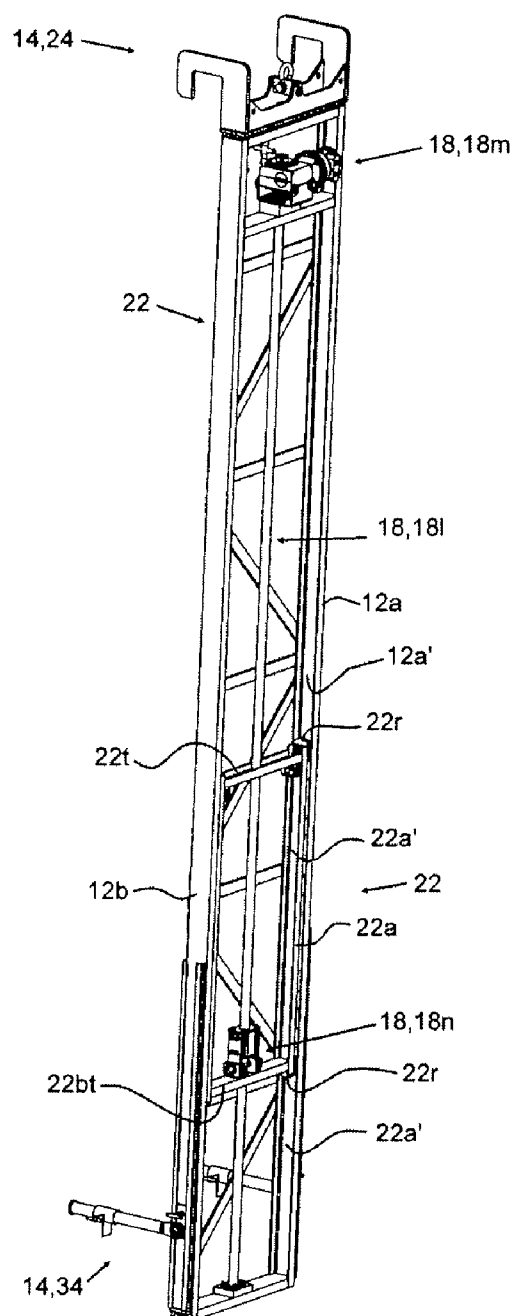


Fig. 7

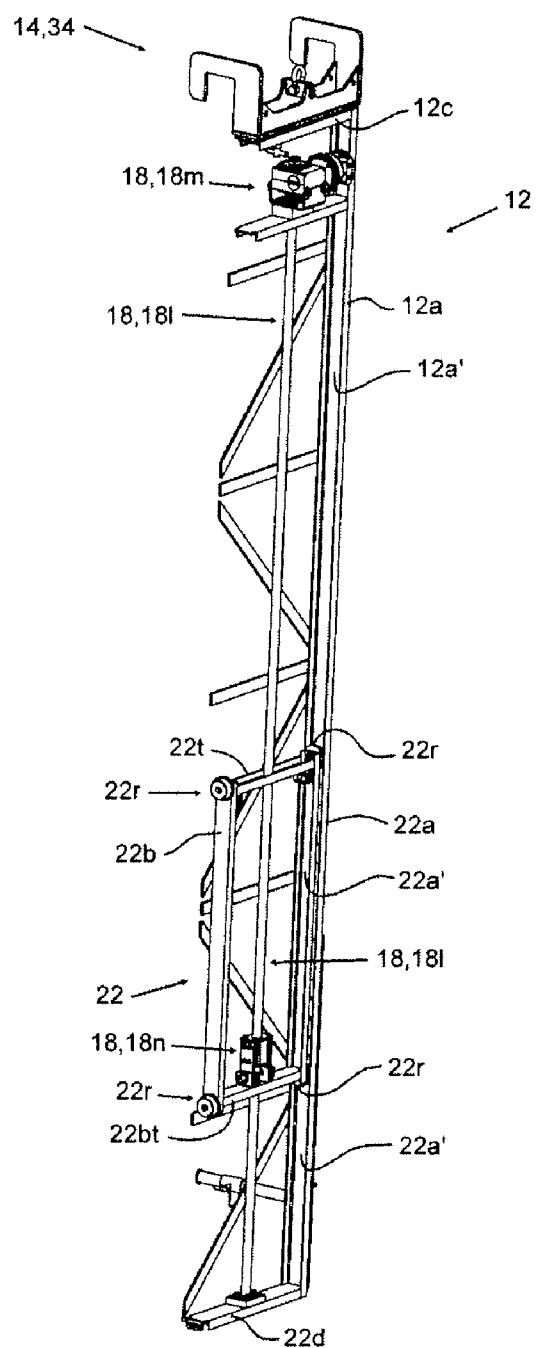


Fig. 8

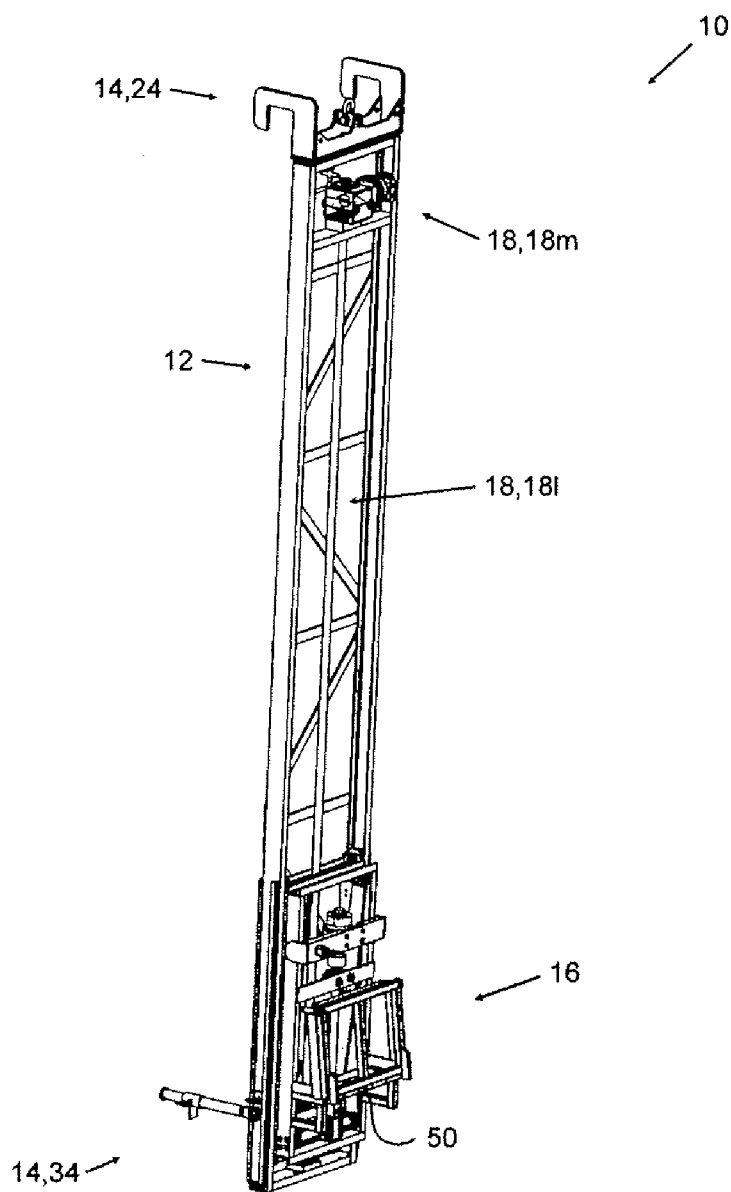


Fig. 9

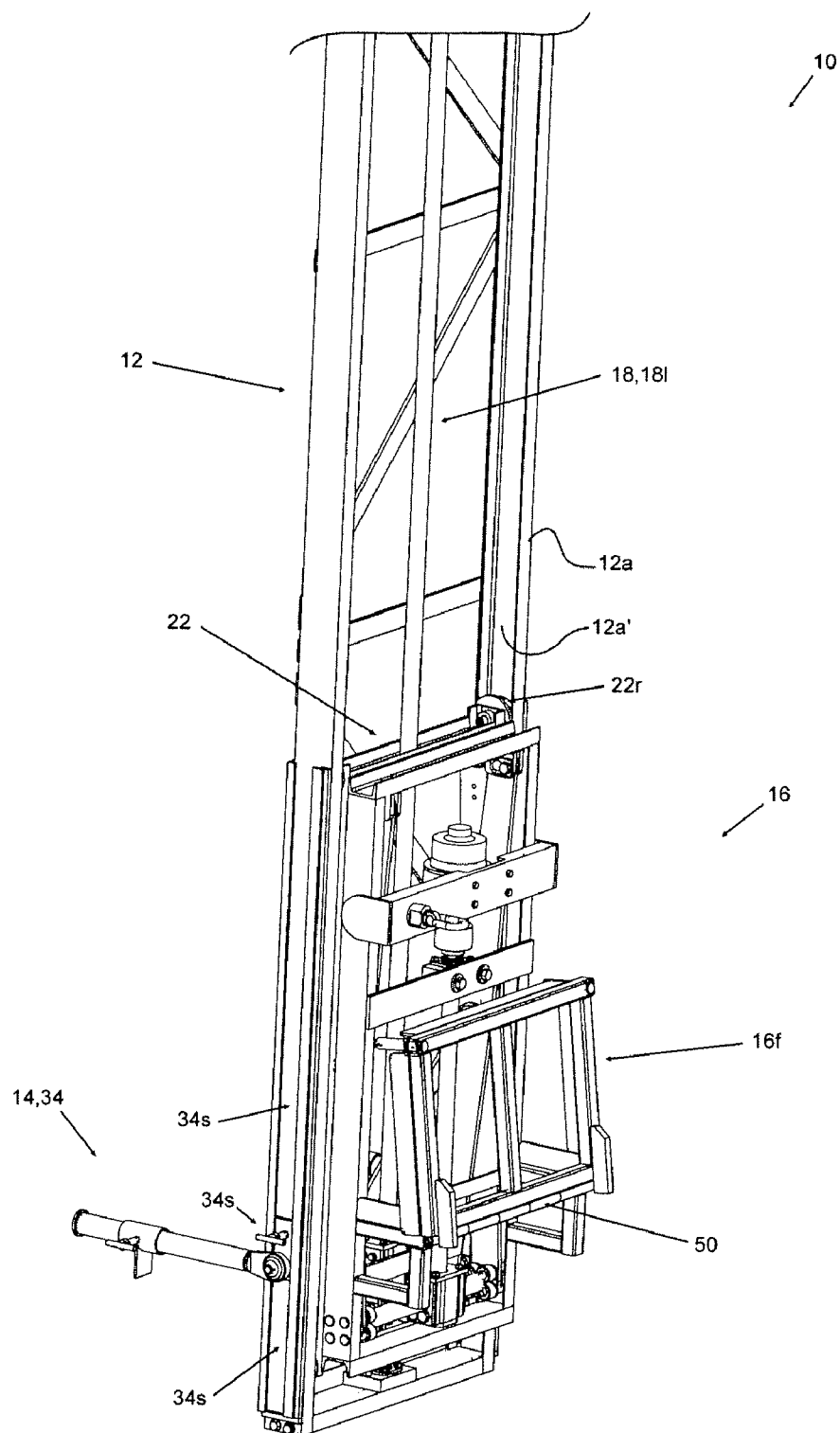
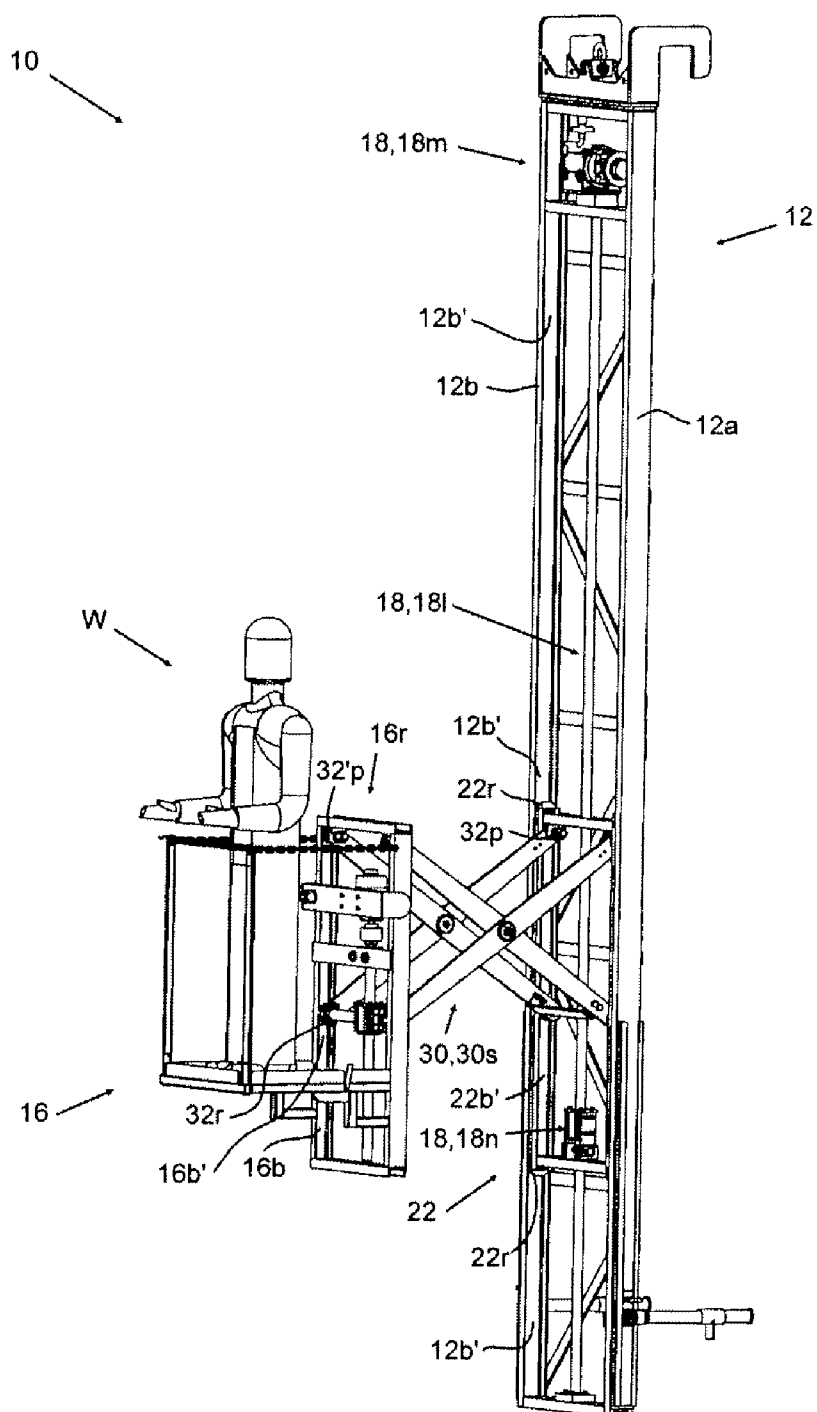


Fig. 10



ADJUSTABLE WORK PLATFORM FOR PIPE AND CASING STABBING OPERATIONS

FIELD OF THE INVENTION

[0001] The present invention relates generally to a handling board or platform and, more particularly, to a stabbing board assembly mountable on a well derrick for supporting a worker while stabbing joints of pipe or casing during running operations.

BACKGROUND OF THE INVENTION

[0002] It is common practice in the oil and gas well drilling art to provide some form of support or platform for accommodating an operator or worker at a position above the floor of the derrick, particularly during a running of pipe or tubulars into the well, in order to assist in properly axially aligning the tubulars during the stabbing operation. Typically this is accomplished through the use of casing stabbing boards, which are hung or suspended on wirelines held within the derrick or drilling rig.

[0003] Additionally, in the prior art, a number of devices have been developed to improve upon such hung or suspended stabbing boards. For example, U.S. Pat. No. 4,326,602 to Bryant, which is herein incorporated by reference in its entirety, teaches a portable stabbing board adapted to be attached to a rig which includes a frame member mountable with the rig and a platform adapted for vertical movement along the frame member for supporting a worker during running operations. However, the stabbing board of Bryant does not provide for any horizontal movement of the platform to allow an operator to be placed in sufficient proximity to the pipe or tubulars during stabbing operations and to easily and quickly allow the platform to move away from the pipe or tubulars when the operator has completed his task of stabbing the tubular.

[0004] U.S. Pat. No. 2,425,302 to Calhoun, which is herein incorporated by reference in its entirety, teaches a more permanently mounted stabbing board which can be adjusted in a horizontal manner. However, the stabbing board of Calhoun is designed to be kept or locked in a fixed horizontal relation through the use of bolts (55) positioned through aligned openings (53) in both the telescoping sleeve (42) and hanger rail (40), as well as through the use of a bar (58) the end of which are receivable in eyes (60) and (62). As such, the stabbing board of Calhoun cannot easily and quickly move the platform away from the pipe or tubulars when the operator has completed the stabbing operations so as to reduce the risk of the operator being hit or injured by the moving blocks or other equipment within the derrick.

[0005] Accordingly, there still exists a need to for an improved stabbing board that will provide ease of platform movement in both the horizontal and vertical directions, that is stable and which is simple in design.

SUMMARY OF THE INVENTION

[0006] The present invention provides improvements to stabbing boards and stabbing baskets.

[0007] In one embodiment, the present invention provides a stabbing board for a rig and for supporting a worker while stabbing joints of tubular members together during running operations, comprising a frame member, a platform to support the worker, a carriage, vertical power means for moving the carriage vertically with respect to the frame member, a

linkage to connect the platform to the carriage and to facilitate horizontal movement of the platform relative to the carriage and the frame member and horizontal power means for moving the platform horizontally with respect to the frame member.

[0008] In another aspect of the invention the linkage of the stabbing board is a scissors linkage and the vertical power means comprises a leadscrew mounted within the frame member, a motor to drive the leadscrew and a nut mounted on the carriage to receive the leadscrew.

BRIEF DESCRIPTION OF THE DRAWINGS

[0009] Embodiments of the invention will now be described, by way of example only, with reference to the accompanying drawings, wherein:

[0010] FIG. 1 is a side perspective view of a stabbing board according to a preferred embodiment of the invention, shown with the linkage in an extended state, the platform moved away from the frame member and with the carriage and platform having moved some distance vertically up along the frame member;

[0011] FIG. 2a is a side perspective view of a stabbing board of FIG. 1, also shown with the linkage in an extended state, the platform moved away from the frame member, the carriage and platform having moved some distance vertically up along the frame member and further with a worker being supported by the platform;

[0012] FIG. 2b is a side perspective view of a stabbing board of FIG. 1, now shown with the linkage in a collapsed state, the platform moved adjacent the frame member, the carriage and platform having moved vertically down along the frame member and with a worker being supported by the platform;

[0013] FIG. 3 is a side perspective view of the carriage, linkage, platform (showing also the safety barrier assembly) and horizontal power means of the stabbing board of FIG. 1, shown with the linkage in an extended state;

[0014] FIG. 4 is a side perspective view of the carriage, linkage, platform and horizontal power means as shown in FIG. 3, but with the safety barrier assembly no longer being shown;

[0015] FIG. 5 is a side perspective view of the carriage, linkage, platform and horizontal power means as shown in FIG. 4, but with further components being hidden to more clearly illustrate certain other components thereof;

[0016] FIG. 6 is a side perspective view of the frame member, vertical power means and carriage, of the stabbing board of FIG. 1, shown with the carriage having moved some distance vertically up along the frame member;

[0017] FIG. 7 is a side perspective view the frame member, vertical power means and carriage as shown in FIG. 6, but with components being hidden to more clearly illustrate certain other components thereof;

[0018] FIG. 8 is a side perspective view of the stabbing board of FIG. 1, shown with the carriage at a lower most position along the frame member, with the linkage in a collapsed state, with the platform adjacent the frame member and with the platform floor being pivoted (upwardly) in a stowed position;

[0019] FIG. 9 is a side perspective view of the lower portion of the stabbing board as shown in FIG. 8; and

[0020] FIG. 10 is another side perspective view of the stabbing board as shown in FIG. 2a.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

[0021] The following description is of a preferred embodiment by way of example only and without limitation to the combination of features necessary for carrying the invention into effect. Reference is to be had to the Figures in which identical reference numbers identify similar components. The drawing figures are not necessarily to scale and certain features are shown in schematic form in the interest of clarity and conciseness.

[0022] FIGS. 1-10 illustrate the configuration of a preferred embodiment of the present invention. In this embodiment, stabbing board 10 is adapted to be removably attached to a rig (not shown) from the inside and for supporting a worker W in stabbing joints of tubular members (also not shown) together during running operations.

[0023] The stabbing board 10 of this embodiment includes generally a frame member 12, rig attachment means 14 to attach or mount the stabbing board to the inside of a rig, a platform 16 to support the worker W, a carriage 22 to slidably mount the platform 16 to the frame member 12, vertical power means 18 for moving the carriage 22 and platform 16 vertically with respect to the frame member 12, a linkage 30 to interconnect the platform 16 with the carriage 22 and to facilitate horizontal movement of the platform 16 relative to the carriage 22 and frame member 12, and horizontal power means 40 for moving the platform 16 horizontally with respect to the frame member 12. Unless otherwise specified, it is preferred that the components of the invention be made of steel or other suitable high-strength materials capable of taking stresses and strains incumbent upon such a stabbing board 10 during its intended use during stabbing operations.

[0024] As is well known and preferred, the drilling rig has a plurality of horizontal girders or braces connecting its legs. Frame member 12 is adapted to be affixed with the rig, along the rig's inside periphery, using one or more of the rig's horizontal girders, in a vertical plane substantially parallel with the tubulars. The frame member 12 includes includes a pair of vertical, substantially parallel channel members 12a, 12b. The channel members 12a, 12b preferably are of a U-shaped channel having channel troughs 12a', 12b' formed within the U-shaped channel members with the channel troughs 12a', 12b' of the channel members 12a, 12b facing inwardly with respect to the frame member 12. Top frame member 12c and bottom frame member 12d separate and maintain the substantially parallel vertical relationship of the channel members 12a, 12b and provide for the upper and lower strength of the frame member 12 of the present invention. A plurality of braces 12e provide further structural support for the frame member 12 and are mounted therewith adjacent the exterior surface of the vertical channel members 12a, 12b and preferably not within the troughs 12a', 12b' of the channel members 12a, 12b. The upper end 12j of the frame member 12 is formed by the top frame member 12c and the adjacent portions of channel members 12a, 12b while the lower end 12k of the frame member 12 is formed by bottom frame member 12d and adjacent channel member 12a, 12b, respectively. It is preferred that the frame member 12 be of a rigid construction, as noted above.

[0025] The stabbing board 10 of the present invention preferably comprises rig attachment means 14 with the frame

member 12 for removably securing the frame member 12 with the inside of a rig. In the preferred embodiment, rig attachment means 14 includes a top support member 24 mounted with the upper end 12j of the frame member 12. The top support member 24 may also be referred to as girder locking assembly and comprises a pair of top supports 24a, each substantially alike and having a suitable hook 24b formed adjacent one end thereof. Preferably, the top support 24a and hook 24b are an integral unit. The top support member 24 is adapted to supportably engage the rig for supporting the frame member 12. The top support member 24 is mounted with the rig in such a fashion that the top support 24a may extend through the rig side with a portion thereof disposed on a girder of the drilling rig. Advantageously, the hook 24b is useful for engaging the girder of rig during installation procedures and to prevent the stabbing board 10 from falling from the rig during such preliminary placement procedures.

[0026] The rig attachment means 14 further comprises bottom locating means designated generally as 34. The bottom locating means 34 comprises at least one arm 34a adapted to be mounted with the lower end 12k of the frame member 12. Multiple arms 34a may be used, if desired. The arms 34a are preferably pivotally mounted to the lower end 12k at a pivot points P. More preferably, arms 34a are slidably mounted, using securable sliding means 34s, with and along the vertical channel members 12a, 12b adjacent the lower end 12k thereof. This preferred arrangement of the bottom locating means 34 results in substantially universal mounting of the arm 34a with the frame member 12 such that the arm 34a may pivot and slide in a vertical plane with respect to the frame member 12.

[0027] The bottom locating means 34 further includes a sleeve 34c slidably mounted with arm 34a and movable along the length thereof as desired. The sleeve 34c has projecting plate 34e depending therefrom. Appropriate securing means 34d which may include an screwable tee handle or the like threaded through a treadable opening within the sleeve 34c. As such, the bottom locating means 34 is for locating the lower end 12k of the frame member 12 an appropriate distance from the rig to insure a substantially vertical disposition of the frame member 12 within the rig. The arm 34a extends from the frame member 12 through the rig side of the drilling rig for engaging a girder thereof. More particularly, the sleeve 34c is positioned with the arm 34a such that the sleeve's plate 34e engages the girder of the rig and the securing means 34d secures the sleeve and consequently arm 34a to the drilling rig upon being suitably disposed against the girder, for ease in quick mounting.

[0028] In an alternate embodiment (not shown), the stabbing board 10 is permanently attached to the rig, such as by welding or bolting the frame member 12 directly to the rig.

[0029] The stabbing board 10 of the present invention further comprises platform 16 for supporting the worker W during running operations. The platform 16 comprises a floor 16f affixed to a rear platform support 16r. Rear platform support 16r comprises a pair of vertical, substantially parallel platform channel members 16a, 16b mounted therewith and extending substantially upwardly from the floor 16f. Top and bottom support members 16t, 16bt separate and maintain the substantially parallel vertical relationship of the platform channel members 16a, 16b and provide for the upper and lower strength of the rear platform support 16r. The platform channel members 16a, 16b preferably are of a U-shaped channel having channel troughs 16a', 16b' formed within the

U-shaped channel members with the platform channel troughs **16a'**, **16b'** of the platform channel members **16a**, **16b** facing inwardly with respect to the rear platform support **16r**. **[0030]** Preferably, the platform **16** further comprises a safety barrier assembly **17** to form the perimeter of a working cage for the worker **W** utilizing the stabbing board **10** of the present invention. The safety barrier assembly **17** has appropriate braces such as vertical posts **17a**, **17b** and safety chain **17c** for providing a suitable barrier to safely keep worker **W** on the stabbing board **10** during running operations. More preferably, the platform floor **16f** further comprises a wire screen or metal grate (not shown) to prevent inadvertent slipping of the worker when standing on the floor **16f**. It is preferred that the rear platform support **16r** is sized such that it is of substantially the same width as the vertical channel members **12a**, **12b** of the frame member **12**.

[0031] Even more preferably, the platform floor **16f** is pivotally connected to the rear platform support **16r**, using a securable pivot means **50**, to enable the platform to be folded up in a substantially vertical position, substantially parallel to the rear platform support **16r**, when the platform **16** is not in use and requires to be stowed (see FIGS. 8 and 9).

[0032] The stabbing board **10** of the present invention further comprises carriage **22** for supporting the platform **16** and capable of vertical movement **V** along the frame member **12**. Carriage **22** comprises a pair of vertical, substantially parallel carriage channel members **22a**, **22b**. Top and bottom support members **22t**, **22bt** separate and maintain the substantially parallel vertical relationship of the carriage channel members **22a**, **22b** and provide for the upper and lower strength of the carriage **22**. The carriage channel members **22a**, **22b** preferably are of a U-shaped channel having carriage channel troughs **22a'**, **22b'** formed within the U-shaped channel members with the carriage channel troughs **22a'**, **22b'** of the carriage channel members **22a**, **22b** facing inwardly with respect to the carriage **22**.

[0033] Carriage **22** is slidably mounted to the frame member **12** for vertical movement **V** along said frame member **12**. Preferably, carriage **22** is disposed within the channel troughs **12a'**, **12b'** formed within vertical channel members **12a**, **12b** of the frame member **12**. More preferably, a plurality of carriage rollers **22r** are provided to facilitate said slidable vertical movement **V** of the carriage **22** within the channel troughs **12a'**, **12b'**.

[0034] The stabbing board **10** of the present invention further comprises vertical power means **18** to provide motive force for moving the carriage **22** vertically with respect to the frame member **12**. Preferably, vertical power means **18** is a leadscrew-based power means, further comprising a leadscrew **18l** (threads not shown) mounted within the frame member **12** in a vertical plane substantially parallel with the frame member, a motor **18m** to drive the leadscrew and a nut **18n** mounted on the carriage **22** to receive and treadably mate with the leadscrew **18l** (leadscrew **18l** otherwise passing through carriage through appropriate sized openings, including openings in top and bottom support members **22t**, **22bt**) and to translate the torque of the leadscrew **18l** into linear vertical motive force on the carriage **22**. More preferably, the threads of the leadscrew **18l** and nut **18n** have an Acme profile. Even more preferably the motor **18m** is an air motor or may alternatively be an electric, hydraulic or any other suitable type of motor. The carriage **22** (and the platform **16** mounted thereto) is movable vertically along the frame member **12** upon actuation of the vertical power means **18**.

[0035] Advantageously, the leadscrew-based power means is self-locking (i.e. when stopped, a linear force on the nut **18n** will not apply a torque to the leadscrew **18l**). More advantageously, the vertical power means **18** is therefore capable of holding vertical loads (such as the carriage **22**, platform **16** and any worker **W** positioned thereon) when the motor **18m** is turned off, thereby providing significant safety advantages over a winch and cable based power means such as that disclosed in U.S. Pat. No. 4,326,602 to Bryant.

[0036] The stabbing board **10** of the present invention further comprises a linkage **30** to interconnect the platform **16** with the carriage **22** and to facilitate horizontal movement **H** of the platform **16** relative to the carriage **22** and the frame member **12**. Preferably, the linkage **30** is a scissors linkage **30s** capable of moving in the horizontal plane only and comprising laterally off-set, side-by-side scissor linkages, each scissor linkage having one or more sets of lever arms. In this embodiment, scissors linkage **30s** comprises two pairs of lever arms **31**, **31'** and **32**, **32'** each mounted scissor fashion, i.e. a pair of level arms pivoting about a pin **30p** in their median part, respectively pivoting with the side edges of the platform **16** and carriage **22**.

[0037] One of the free ends **31a**, **32a** of each of arms **31**, **32** is pivotally mounted about a fixed pin **31p**, **32p** secured to the carriage **22**, each to their respective carriage channel members **22a**, **22b**. The other free ends **31b**, **32b**, of each of the pairs of arms **31**, **32**, each pivot about a roller or slider **31r**, **32r** slidably mounted within their respective platform channel troughs **16a'**, **16b'** of the platform channel members **16a**, **16b** (see FIG. 3). The other free ends **31b**, **32b** are thereby confined to move in a rectilinear manner, that is, with straight line motion, relative to the platform channel members **16a**, **16b** with which they are associated. Preferably, a pivoting cross-member **33** separates and maintains the substantially parallel relationship of free ends **31b**, **32b** and provide for additional strength of the linkage **30**.

[0038] One of the free ends **31'a**, **32'a** of each of arms **31'**, **32'** is pivotally mounted about a fixed pin **31'p**, **32'p** secured to the platform **16**, each to their respective platform channel members **16a**, **16b**. The other free ends **31'b**, **32'b**, of each of the pairs of arms **31'**, **32'**, each pivot about a roller or slider **31's**, **32's** slidably mounted within their respective carriage channel troughs **22a'**, **22b'** of the carriage channel members **22a**, **22b** (see FIG. 4). The other free ends **31'b**, **32'b** are thereby confined to move in a rectilinear manner, that is, with straight line motion, relative to the carriage channel members **22a**, **22b** with which they are associated. Preferably, a cross-member **34** separates and maintains the substantially parallel relationship of free ends **31'b**, **32'b** and provide for additional strength of the linkage **30**.

[0039] The stabbing board **10** of the present invention further comprises horizontal power means **40** to provide motive force for actuating the linkage **30** between an extended state (see FIG. 2a) and a collapsed state (see FIG. 2b) and, hence, move the platform **16** horizontally with respect to the frame member **12** and, consequently, towards or away from the well center and any tubular members that may be present there.

[0040] Horizontal power means **40** may be a hydraulic ram-based means of conventional design. Preferably, however, horizontal power means **40** is a leadscrew-based power means, further comprising a leadscrew **40l** (threads not shown) mounted within the rear platform support **16r** in a vertical plane substantially parallel with platform channel members **16a**, **16b**, a motor **40m** to drive the leadscrew and a

nut **40n** mounted on the rear platform support **16r** to receive and treadably mate with the leadscrew **40l** and to translate the torque of the leadscrew **40l** into actuating force on the linkage **30** to move it between an extended state and a collapsed state. More preferably, the nut **40n** integral with the pivoting cross-member **33** and allows leadscrew **40l** to pass therethrough. Advantageously, pivoting cross-member **33** pivots as scissors linkage actuates about free ends **31b**, **32b**, thereby allowing leadscrew **40l** to remain substantially parallel with platform channel members **16a**, **16b** while also still maintaining the substantially parallel relationship of free ends **31b**, **32b**. Even more preferably, the threads of the leadscrew **40l** and nut **40n** have an Acme profile. Yet even more preferably the motor **40m** is an air motor or may alternatively be an electric, hydraulic or any other suitable type of motor.

[0041] During running operations the worker **W** preferably stands on the floor **16f** of the platform **16** for stabbing the appropriate tubular members during such running operations. Should it be necessary that the platform **16** be raised or lowered, the worker merely actuates the vertical power means **18**. In the preferred embodiment, the worker **W** actuates motor **18m** to turn in the appropriate direction, resulting in either upward or downward vertical movement of the carriage **22**, and hence the platform **16**, along the frame member **12** as may be required. Should it be necessary that the platform **16** be moved towards or away from the tubular members, the worker **W** merely actuates the horizontal power means **40**. In the preferred embodiment, the worker **W** actuates motor **40m** to turn in the appropriate direction, resulting in actuating the linkage **30** between an extended state and a collapsed state and, hence, move the platform **16** horizontally with respect to the frame member **12** as may be required.

[0042] As will be appreciated, the stabbing board **10** of the present invention enables a worker **W** to efficiently and safely accomplish the stabbing of joints of tubular members during running operations. Advantageously, by having separate vertical and horizontal power means **18**, **40**, and by having a scissors linkage **30s** which operates in the horizontal plane only, the stabbing board **10** can efficiently move the worker **W** closer to, or farther away from, the tubular members during stabbing operations.

[0043] More advantageously, a worker **W** supported by the stabbing board can easily and quickly actuate the horizontal power means only, so as to swiftly move the platform **16** away from the pipe or tubulars when the worker **W** appears to be at risk of being hit or injured by the moving blocks, tubulars or other equipment within the center of derrick or rig. Such movement along the horizontal plane only is preferably, as compared to say the telescoping, luffing or slewing of a boom (where there is both horizontal and vertical movement), in situations of imminent danger when a worker quickly needs to be moved away from the central axis of the derrick and to a position of safety adjacent the derrick's inside periphery. Thus, the present invention comprehends a stabbing board **10** that is a new and useful concept not heretofore known.

[0044] Those of ordinary skill in the art will appreciate that various modifications to the invention as described herein will be possible without falling outside the scope of the invention.

The embodiments of the invention in which an exclusive property or privilege is being claimed are defined as follows:

1. A stabbing board for a rig and for supporting a worker while stabbing joints of tubular members together during running operations, comprising:

a frame member;
rig attachment means to removably attach the frame member to the rig;
a platform to support the worker;
a carriage;
vertical power means for moving the carriage vertically with respect to the frame member;
a linkage to connect the platform to the carriage and to facilitate horizontal movement of the platform relative to the carriage and the frame member; and
horizontal power means for moving the platform horizontally with respect to the frame member.

2. The stabbing board of claim 1 wherein the linkage is a scissors linkage.

3. The stabbing board of claim 1 wherein the horizontal power means provides motive force for actuating the linkage between an extended state and a collapsed state.

4. The stabbing board of claim 1 wherein the vertical power means comprises:

a leadscrew mounted within the frame member in a vertical plane substantially parallel with said frame member;
a motor to drive the leadscrew; and
a nut mounted on the carriage to receive the leadscrew.

5. The stabbing board of claim 2 wherein the vertical power means comprises:

a leadscrew mounted within the frame member in a vertical plane substantially parallel with said frame member;
a motor to drive the leadscrew; and
a nut mounted on the carriage to receive the leadscrew.

6. A stabbing board for a rig and for supporting a worker while stabbing joints of tubular members together during running operations, comprising:

a frame member;
a platform to support the worker;
a carriage;
vertical power means for moving the carriage vertically with respect to the frame member;
a linkage to connect the platform to the carriage and to facilitate horizontal movement of the platform relative to the carriage and the frame member; and
horizontal power means for moving the platform horizontally with respect to the frame member.

7. The stabbing board of claim 6 wherein the linkage is a scissors linkage.

8. The stabbing board of claim 6 wherein the horizontal power means provides motive force for actuating the linkage between an extended state and a collapsed state.

9. The stabbing board of claim 6 wherein the vertical power means comprises:

a leadscrew mounted within the frame member in a vertical plane substantially parallel with said frame member;
a motor to drive the leadscrew; and
a nut mounted on the carriage to receive the leadscrew.

10. The stabbing board of claim 7 wherein the vertical power means comprises:

a leadscrew mounted within the frame member in a vertical plane substantially parallel with said frame member;
a motor to drive the leadscrew; and
a nut mounted on the carriage to receive the leadscrew.