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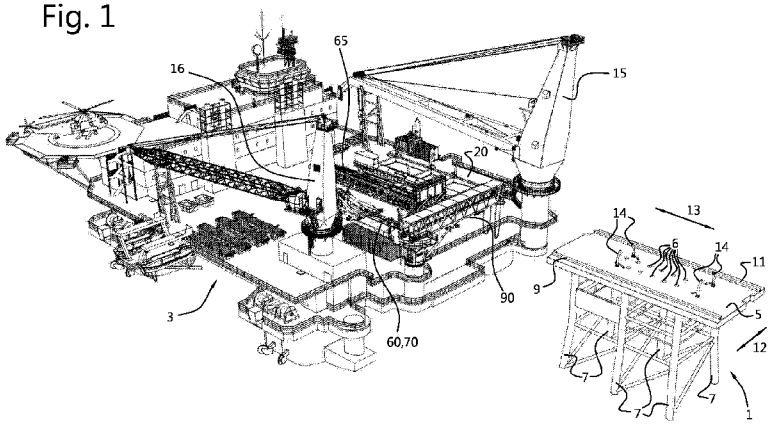
(54) Title: METHOD FOR POSITIONING A DRILLING RIG ONTO AN OFFSHORE PLATFORM

Fig. 1



(57) Abstract: The invention relates to a method for positioning a drilling rig onto an offshore platform provided with a fixed first rig skid beam and a fixed second rig skid beam arranged horizontally and parallel to each other and defining a longitudinal direction, said method being characterized by the following steps: a. positioning a vessel near the offshore platform, said vessel transporting the drilling rig with a skid system comprising a first skid assembly to engage with the first rig skid beam and a second skid assembly to engage with the second rig skid beam, each first and second skid assembly comprising at least two skid shoes to engage with the respective first or second rig skid beam, a gripping unit to grip the respective first or second rig skid beam, and a push-pull device to apply push and pull forces between the gripping unit and one of the at least two skid shoes; b. adjusting a distance between the first and second skid assembly to correspond to a distance between the first and second rig skid beam; and c. positioning the drilling rig onto the offshore platform such that the first and second skid assembly engage with the first and second rig skid beam respectively to support the drilling rig from the first and second rig skid beam and to skid the drilling rig relative to the first and second rig skid beam in the longitudinal direction.

WO 2016/144164 A1

Title: Method for positioning a drilling rig onto an offshore platform

The invention relates to a method for positioning a drilling rig onto an offshore platform.

Fixed offshore platforms have been used extensively in the past to extract oil and natural gas at sea. After one or more wells serviced by the platform are depleted or underperforming, the wells may be plugged and the platform may be abandoned meaning that the facilities to drill wells, to extract and process oil and natural gas or to temporarily store product until it can be brought to shore for refining and marketing have been removed.

Hence, what usually remains at sea is a fixed platform with a first and second rig skid beam arranged parallel to each other. However, after some time has passed, newly developed techniques in for instance drilling and well analysis may provide the capability of extracting more product using the platform.

To service the wells of an underperforming or abandoned platform, a cantilevered drilling rig may be provided over the platform typically using a jack-up type vessel. An advantage of using such a jack-up type vessel with cantilevered drilling rig is that the process becomes more or less independent of the dimensions and type of platform. However, drawbacks of using a jack-up type vessel with cantilevered drilling rig are that the vessel is relatively large and that it takes relatively a lot of time to setup the vessel and cantilevered drilling rig before drilling can commence. This makes the use of a jack-up type vessel not cost effective.

It is therefore an object of the invention to improve the servicing of underperforming or abandoned wells, in particular to make the servicing more time and/or cost effective.

In a first aspect of the invention, this object is achieved by a method for positioning a drilling rig onto an offshore platform provided with a fixed first rig skid beam and a fixed second rig skid beam arranged horizontally and parallel to each other and defining a longitudinal direction, said method being characterized by the following steps:

a. positioning a vessel near the offshore platform, said vessel transporting the drilling rig with a skid system comprising a first skid assembly to engage with the first rig skid beam and a second skid assembly to engage with the second rig skid beam, each first and second skid assembly comprising at least two skid shoes to engage with the respective first or second rig skid beam, a gripping unit to grip the respective first or

second rig skid beam, and a push-pull device to apply push and pull forces between the gripping unit and one of the at least two skid shoes;

b. adjusting a distance between the first and second skid assembly to correspond to a distance between the first and second rig skid beam; and

c. positioning the drilling rig onto the offshore platform such that the first and second skid assembly engage with the first and second rig skid beam respectively to support the drilling rig from the first and second rig skid beam and to skid the drilling rig relative to the first and second rig skid beam in the longitudinal direction.

The invention is based on the insight that equipment can be made much smaller and setting up can be done much faster when a relatively small drilling rig is transferred to the platform. As a result thereof no large cantilevers and supporting structures are required as is currently done in the prior art. Further, the vessel carrying the equipment does not have to be of the jack-up type, but can be a semi-submersible or any other vessel.

However, the inventors also realized that when the equipment is to be used for multiple different platforms, the drilling rig to be transferred to the platform should be able to adjust itself to the specific situation. The inventors realized that the main difference between platforms is that the rig skid beams on the platform may be arranged at different distances, so that the drilling rig should at least be able to adjust itself to the specific distance between the rig skid beams in order to be able to re-use the rig skid beams.

Re-use of the rig skid beams has the advantage that these rig skid beams can be used to support and skid the drilling rig relative to the platform to position the drilling rig above a well and to subsequently move the drilling rig to a another well. This means that no complex adjustments have to be made to the platform itself.

In an embodiment, the at least two skid shoes of the first skid assembly are connected by a separate load transfer beam, and wherein the at least two skid shoes of the second skid assembly are connected by a separate load transfer beam. This has the advantage that the skid shoe without corresponding gripping unit and push-pull device can be dragged along by the other skid shoe without introducing undesired loads.

Alternatively or additionally, all skid shoes may comprise a corresponding gripping unit and push-pull device, so that introduction of undesired loads can be prevented by synchronizing the operation of the different gripping units and push-pull device without the use of a separate load transfer beam.

In an embodiment, positioning the drilling rig onto the offshore platform includes lifting the drilling rig with a crane and lowering the drilling rig onto the offshore platform. The crane may be provided on the vessel transporting the drilling rig, but may also be provided on a separate vessel. In case the platform itself is provided with a crane, this crane may alternatively or additionally be used to position the drilling rig onto the offshore platform.

In an embodiment, the skid shoes and the gripping units of the first and second skid assembly comprise respective jaws to be positioned around a flange of the first or second rig skid beam, wherein preferably the jaws are moveable between a retracted position in which a distance between the jaws is large enough to let the respective flange pass, and an active position in which the jaws are arranged around the respective flange, and wherein positioning the drilling rig onto the offshore platform includes:

c1. moving the jaws to the retracted position;

c2. positioning the drilling rig onto the offshore platform until the skid shoes and the gripping units of the first and second skid assembly engage with the respective first and second rig skid beam; and

c3. moving the jaws to the active position.

This has the advantage that the drilling rig can be lowered without difficulty and no complex sideways motion is required nor complex adjustments or assembly with respect to the first and second skid assembly.

The jaws of the gripping units of the first and second skid assembly are preferably configured to temporarily fix its position relative to a respective flange by clamping the respective flange, so that the corresponding push-pull device can move the drilling rig over the skid beams while the gripping units clamp the respective flanges. It is preferred that the gripping units are able to clamp flanges of different thicknesses, so that the drilling rig can be used in combination with any skid beam having a flange thickness falling in a particular range.

In an embodiment, the drilling rig comprises a third rig skid beam and a fourth rig skid beam arranged horizontally and parallel to each other and defining a transverse direction perpendicular to the longitudinal direction, wherein the skid system comprises a third skid assembly to engage with the third rig skid beam and a fourth skid assembly to engage with the fourth rig skid beam, each third and fourth skid assembly comprising at least two skid shoes to engage with the respective third or fourth rig skid beam, a gripping unit to grip the

respective third or fourth rig skid beam, and a push-pull device to apply push and pull forces between the gripping unit and one of the at least two skid shoes, and wherein the skid shoes of the third and fourth skid assemblies are carried by the skid shoes of the first and second skid assemblies, thereby allowing to skid the drilling rig relative to the platform in the transverse direction.

This has the advantage that the drilling rig can be positioned in the transverse direction as well and can be accurately positioned above any well. In practice, the wells may be arranged in multiple parallel rows and by being able to skid in the transverse direction as well, all rows can be serviced by moving the drilling rig over the offshore platform only.

In an embodiment, the third skid assembly and the fourth skid assembly are used to adjust the distance between the first and second skid assembly.

As with many offshore operations, vessels and platforms may be moveable relative to each other due to wave and wind actions. This makes transferring equipment from one vessel or platform to another vessel or platform always more difficult than on land. Due to the first and second rig skid beam extending parallel to each other in the longitudinal direction, positioning the skid assemblies relative to the first and second rig skid beam in the longitudinal direction is usually not that critical, but positioning the skid assemblies relative to the first and second rig skid beam in the transverse direction may be more difficult. Hence, in an embodiment, guiding elements are provided on the offshore platform prior to positioning the drilling rig onto the offshore platform to guide the positioning of the drilling rig relative to the platform in a horizontal transverse direction perpendicular to the longitudinal direction.

In an embodiment, the drilling rig comprises multiple modules, wherein one of the modules is a support frame for supporting a drilling tower, said support frame comprising a carrier frame and the skid system, and wherein positioning the drilling rig onto the offshore platform starts with the positioning of the support frame on the platform followed by the other modules.

An advantage of using a separate support frame is that it is easier to provide a stable support on the platform first before transferring the more heavy equipment to the platform. A further advantage may be that it is possible to combine the separate support frame with different drilling towers, wherein only the separate support frame needs to be adaptable to the different offshore platforms, instead of all drilling towers being adaptable.

It will be apparent to the skilled person that the use of a separate support frame that is positioned first on the platform can also be combined with the other features described above for the drilling rig as a whole. E.g. the third and fourth rig skid beams are arranged on the carrier frame of the support frame when this feature is applied, and the guiding elements on the platform guide the positioning of the support frame in the transvers direction.

In an embodiment, the drilling tower is formed by multiple modules and the drilling tower is positioned on the carrier frame of the support frame by assembling the multiple modules on the carrier frame.

In an embodiment, the carrier frame of the support frame is provided with guiding elements to guide the positioning of the drilling tower relative to the carrier frame in the horizontal direction perpendicular to the longitudinal direction.

In an embodiment, the guide elements are moveable between an active position in which they are able to guide the drilling rig, carrier frame and/or the drilling tower, whatever is applicable, and an inactive position in which the guiding elements do not interfere with movements of the drilling rig over the platform and operation of the drilling rig.

The first aspect of the invention also relates to a drilling rig to be positioned on an offshore platform with a fixed first rig skid beam and a fixed second rig skid beam arranged horizontally and parallel to each other and defining a longitudinal direction, said drilling rig comprising a skid system to skid the drilling rig relative to the platform in the longitudinal direction with a first skid assembly to engage with the first rig skid beam and a second skid assembly to engage with the second rig skid beam, each first and second skid assembly comprising at least two skid shoes to engage with the respective first or second rig skid beam, a gripping unit to grip the respective first or second rig skid beam, and a push-pull device to apply push and pull forces between the gripping unit and one of the at least two skid shoes, wherein the distance between the first and second skid assembly is adjustable.

In an embodiment, the skid shoes and the gripping units of the first and second skid assembly comprise respective jaws to be positioned around a flange of the first or second rig skid beam, wherein preferably the jaws are moveable between a retracted position in which a distance between the jaws is large enough to let the respective flange pass, and an active position in which the jaws are arranged around the respective flange.

The jaws of the gripping units of the first and second skid assembly are preferably configured to temporarily fix its position relative to a respective flange by clamping the respective flange, so that the corresponding push-pull device can move the drilling rig over the skid beams while the gripping units clamp the respective flanges. It is preferred that the gripping units are able to clamp flanges of different thicknesses, so that the drilling rig can be used in combination with any skid beam having a flange thickness falling in a particular range.

In an embodiment, the drilling rig further comprises a third rig skid beam and a fourth rig skid beam arranged horizontally and parallel to each other and defining a transverse direction substantially perpendicular to the longitudinal direction, wherein the skid system comprises a third skid assembly to engage with the third rig skid beam and a fourth skid assembly to engage with the fourth rig skid beam, each third and fourth skid assembly comprising at least two skid shoes to engage with the respective third or fourth rig skid beam, a gripping unit to grip the respective third or fourth rig skid beam, and a push-pull device to apply push and pull forces between the gripping unit and one of the at least two skid shoes, and wherein the skid shoes of the third and fourth skid assemblies are carried by the skid shoes of the first and second skid assemblies, thereby allowing to skid the drilling rig relative to the platform in the transverse direction.

In an embodiment, the drilling rig comprises a drilling tower and a support frame for the drilling tower, said support frame comprising a carrier frame and the skid system.

According to a second aspect of the invention, there is provided an offshore platform provided with a fixed rig skid beam and a fixed second rig skid beam arranged horizontally and parallel to each other and defining a longitudinal direction, wherein the platform further comprises guiding elements that are pivotable about a pivot axis by an actuator between an active position in which the guiding elements are able to guide a drilling rig or part thereof that is to be positioned on the platform by the first and second rig skid beams in a horizontal transverse direction perpendicular to the longitudinal direction, and an inactive position in which the guiding elements are out of the way to allow movement and operation of the drilling rig.

In an embodiment, the guiding elements are lying parallel to the first and second rig skid beams in the inactive position and preferably do not extend above the first and second rig skid beams in the inactive position.

In an embodiment, the offshore platform is a platform suitable to be used in the invention according to the first aspect.

According to a third aspect of the invention, there is provided an offshore platform with a skiddable structure and a supply vessel near the offshore platform, wherein a telescopic pivotable walkway is provided extending between the supply vessel and the skiddable structure, so that the length and orientation of the walkway is automatically adjusted when the skiddable structure skids over the platform or when the relative position between platform and vessel changes.

In an embodiment, the skiddable structure is skiddable in two orthogonal directions over the platform.

In an embodiment, the skiddable structure is a support frame for a drilling tower as described with respect to the first aspect.

In an embodiment, the walkway comprises actuators to position a free end of the walkway on the skiddable structure. Preferably, the free end of the walkway can be temporarily connected to the skiddable structure.

In an embodiment, the walkway is configured to support all cabling and piping between the supply vessel and the offshore platform, which cabling and piping may include power cables, hydraulic power lines, mud lines, mud return lines and/or fire hose water supply.

In an alternative embodiment of the third aspect, the walkway is provided extending between the supply vessel and the offshore platform instead of between the supply vessel and the skiddable structure on the offshore platform.

The supply vessel may be a barge, semi-submersible or floater.

The third aspect may readily be combined with the first and/or second aspect of the invention where applicable.

The invention will now be described in a non-limiting way by reference to the accompanying drawing in which like parts are indicated by like reference symbols and in which:

Fig. 1 depicts schematically a perspective view of an offshore platform and vessel transporting a drilling rig according to an embodiment of the invention;

Fig. 2 depicts a support frame of the drilling rig when positioned on the platform of Fig. 1;

Fig. 3 depicts the support frame of Fig. 2 when being positioned on another platform;

Fig. 4 depicts the support frame of Fig. 2 when fully coupled to the platform of Fig. 1;

Fig. 5 depicts the positioning of a frame of a drilling tower on the support frame of Figs. 2 and 4; and

Fig. 6 depicts a side view of the complete drilling rig of Fig. 1 when positioned on the platform.

Fig. 1 schematically depicts a perspective view of an offshore platform 1 and a vessel 3 transporting a drilling rig according to an embodiment of the invention. The platform 1 may be an underperforming or abandoned offshore platform that is about to be re-used.

The platform 1 comprises a deck 5 supported above water level by multiple interconnected columns 7 fixed to the sea bottom. The platform in this embodiment is therefore a fixed platform, but the invention may also be applied to other platform types.

Provided on the deck 5 are a first rig skid beam 9 and a second rig skid beam 11. The first and second rig skid beam 9, 11 are fixed to the deck 5 and arranged horizontally and parallel to each other. The first and second rig skid beam 9, 11 define a longitudinal direction indicated by arrow 13.

The deck 5 comprises further two rows of openings 6 allowing a drilling rig to drill through, to extract e.g. oil and natural gas through, and/or to perform well intervention or plug and abandonment operations.

Provided on the deck 5 are in this embodiment four guiding elements 14 which, as will be shown later, allow to guide the positioning of the drilling rig in a horizontal transverse direction indicated by arrow 12, which transverse direction is perpendicular to the longitudinal direction 13. In Fig. 1, the guiding elements 14 are shown in an active position in which they can guide the drilling rig. The guiding elements can also be pivoted to an inactive position in which they lie parallel to the deck 5 and therefore do not interfere with movements and operation of the drilling rig.

The vessel 3, here embodied as a semi-submersible, is positioned next to the platform 1. The vessel comprises cranes 15 and 16 to transfer equipment from and to the vessel 3, hence, in this embodiment between the vessel 3 and the platform 1.

The drilling rig to be positioned on the platform is in this embodiment formed by multiple modules, wherein one of the modules is a support frame to be positioned on the platform, and the remaining module or modules form a drilling tower to be positioned on the support frame. This will be explained in more detail below. Preferably, the support frame is a universal support frame that can also be used with other drilling towers, possibly after some minor modifications.

Fig. 2 depicts a support frame 20 with a carrier frame 22 and a skid system. In this embodiment, the skid system comprises a first and second skid assembly for skidding the carrier frame 22 and thus the drilling rig relative to the platform 1 in the longitudinal direction 13, and a third and fourth skid assembly for skidding the carrier frame 22 and thus the drilling rig relative to the platform 1 in the transverse direction 12.

In Fig. 2, the support frame 20 is positioned on the platform 1 by for instance crane 15 of Fig. 1, such that the first skid assembly engages with the first rig skid beam 9 and such that the second skid assembly engages with the second rig skid beam 11.

The first skid assembly can be seen partially in Fig. 2 and comprises a skid shoe 24 engaging with the first rig skid beam 9, a gripping unit 26 for gripping the first rig skid beam 9, and a push-pull device 28 between the gripping unit 26 and the skid shoe 24 to apply push and pull forces between the gripping unit 26 and skid shoe 24. Not shown is that the first skid assembly comprises another skid shoe engaging with the first rig skid beam 9, thereby providing two support locations for the carrier frame 22.

The second skid assembly can also be seen partially in Fig. 2 and comprises a skid shoe 34 engaging with the second rig skid beam 11, a gripping unit 36 for gripping the second rig skid beam 11, and a push-pull device 38 between the gripping unit 36 and the skid shoe 34 to apply push and pull forces between the gripping unit 36 and skid shoe 34. Not shown is that the second skid assembly comprises another skid shoe engaging with the second rig skid beam 11, thereby providing two additional support locations for the carrier frame 22.

Hence, in total four support locations are provided by the first and second skid assembly. However, it will be clear for a skilled person that more support locations may be provided by

increasing the number of skid shoes, which skid shoes may be combined with a respective gripping unit and push-pull device if required or desired.

The third skid assembly can be seen in full in Fig. 2 and comprises a skid shoe 44 engaging with a third rig skid beam 42 on the carrier frame 22 and carried by skid shoe 24 of the first skid assembly, a skid shoe 45 engaging with the third rig skid beam 42 and carried by skid shoe 34 of the second skid assembly, a gripping unit 46 to grip the third rig skid beam 42, and a push-pull device 48 arranged between the gripping unit 46 and skid shoe 44 to apply push and pull forces between the gripping unit 46 and the skid shoe 44.

The fourth skid assembly, which is similar to the third skid assembly, is carried in a similar way by the non-visible skid shoes of the first and second skid assemblies and engages with a fourth rig skid beam 43.

The gripping units 26, 36 and skid shoes 24, 34 of the first and second skid assembly comprise jaws, which can only be seen in Fig. 2 for the gripping units 26 and 36 and are indicated by reference numbers 26a, 26b, 36a, 36b. The skid shoes have a similar construction.

The jaws 26a, 26b, 36a, 36b are moveable between a retracted position, as shown in Fig. 2, in which a distance between the jaws 26a, 26b, 36a, 36b is large enough to let the respective flanges of the first and second rig skid beams 9, 11 pass, and an active position, as shown in Fig. 4, in which the jaws 26a, 26b, 36a, 36b are arranged around the respective flange to couple the support frame 22 to the platform 1. This allows the support frame 20 to be lowered on the first and second rig skid beams 9, 11 while the jaws 26a, 26b, 36a, 36b are in the retracted position after which the jaws 26a, 26b, 36a, 36b can be moved to the active position. An advantage of moveable jaws is that the first and second skid assemblies are able to adjust itself to different widths of the first and second rig skid beams 9, 11.

The first, second, third and fourth skid assemblies operate in a known manner to the skilled person, meaning that the gripping unit is able to grip a rig skid beam, after which operation of the push-pull device will move the corresponding skid shoe and therefore the entire structure supported by it. Gripping can be done using friction, but also, as is known in the art, using pin-hole configurations when the first and second rig skid beams are provided with holes along their length.

Positioning in the transverse direction needs to be done accurately in order to prevent damage to the skid shoes, gripping units and/or first and second rig skid beams. However, accurate positioning may be challenging due to wave actions and weather conditions when the support frame is lifted by a crane.

Positioning is therefore carried out using the guiding elements 14. The guiding elements 14 are pivotable about respective pivot axes 14a between the inactive position substantially parallel to the deck 5 and the active position as shown in Fig. 2 using an actuator 14b, in this case a hydraulic cylinder.

During lowering of the support frame 20, the guiding elements 14 engage with longitudinal beams 23 of the carrier frame 22 thereby fixing the position of the carrier frame 22 in the transverse direction. Subsequent lowering then ensures that the skid shoes and gripping units of the first and second skid assembly properly engage with the first and second rig skid beams respectively.

Fig. 3 depicts the support frame 20 of Fig. 2 on a different offshore platform 1' comprising a deck 5' supported by columns 7'. The deck 5' comprises a fixed first rig skid beam 9' and a fixed second rig skid beam 11' arranged horizontally and parallel to each other and defining a longitudinal direction 13'.

The main difference between the platform 1 of Figs. 1 and 2, and the platform 1' of Fig. 3 is that a distance between the first and second rig skid beams of the platform 1' of Fig. 3 is smaller than a distance between the first and second rig skid beams of the platform 1 of Figs. 1 and 2. However, the advantage of using a drilling rig according to the invention is that the first and second skid assembly are adjustable in a horizontal transverse direction perpendicular to the longitudinal direction.

In the embodiment of Figs. 2 and 3, the third and fourth skid assembly can advantageously be used to adjust the distance between the first and second skid assembly by moving the skid shoes 44, 45 and gripping units 46 of the third and fourth skid assembly relative to the third and fourth skid beams 42, 43 on the carrier frame 22 of the support frame 20. This allows to use the same drilling rig for different platforms.

The step of adjusting the distance between the first and second skid assembly may be carried out on the vessel 3, where for instance the support frame for this purpose is

supported from the deck by e.g. four supports, such that the skid assemblies can freely move without interfering with the deck or other equipment.

Fig. 4 depicts a similar situation as Fig. 2, with the difference that the jaws e.g. 26a, 26b, of the first skid assembly and the jaws, e.g. 36a, 36b, of the second skid assembly have moved to the active position to couple with the first and second rig skid beams 9, 11 respectively.

Once the support frame is coupled to the platform, the support frame can be loaded. Besides loading the support frame with a drilling tower, loading may also be in the form of providing a telescopic pivotable walkway 90 between the vessel 3 and the support frame 20 as skiddable structure as is shown in Fig. 5. Personnel is than able to walk from and to the platform while the length and angular orientation of the walkway is automatically adjusted during skidding of the support frame over the platform. The walkway 90 may comprise actuators to move a free end of the walkway to the support frame on the platform. The walkway may also be used prior to positioning the support frame to allow personnel on the platform to install the guiding elements 14 on the platform.

Figs. 2-4 also show that the carrier frame 22 is provided with guiding elements 50 that are similar to guiding elements 14. Guiding elements 50 are provided on the carrier frame 22 to guide the positioning of a drilling tower on the carrier frame in the transverse direction by engaging with the drilling tower.

As mentioned before, the drilling tower may comprise multiple modules which in this embodiment are assembled on the carrier frame positioned on the platform. Fig. 5 depicts a base structure 60 with pipe loader 70 after being positioned on the carrier frame 22 of the support frame 20. The base structure may have been lifted of the vessel by crane 15 and subsequently be lowered on the support frame 20.

After positioning the base structure 60, the guiding elements 50 may be moved out of the way by pivoting them to an inactive position parallel to the carrier frame 22 as shown in Fig. 5. Pivoting the guiding elements 50 may be done in the same way as the guiding elements 14 using an actuator 50b to pivot the guiding elements 50 about a pivot axis 50a.

Subsequently, other modules, such as a drilling rig mast 65 may be provided to the platform, e.g. by crane 15 to assemble the drilling tower. To aid the assembly, the pipe loader 70 transferred to the platform with the base structure may be provided with alignment elements

80, 81 which fix the position of the drilling mast in one or more directions allowing easy assembly. The alignment elements may be removable, so that during operation the alignment elements do not interfere with the operations.

Fig. 6 depicts a fully assembled drilling rig positioned on the platform in side view with removed alignment elements 80, 81. In this figure it can also be seen that skid shoe 34 of the second skid assembly and skid shoe 35 also part of the second skid assembly are connected by a separate load transfer beam 85, so that skid shoe 35 can be dragged along with the skid shoe 34.

It will be apparent for the skilled person that the first, second and third aspect of the invention can readily be combined where appropriate as is shown with respect to the accompanying drawings.

Although not shown, components required to drive and power the skid system, e.g. the gripping units and push-pull devices, are preferably provided on the support frame. These components may comprise hydraulic motors, valves, control electronics etc. However, one or more of these components may also be provided on the drilling tower or on the vessel transporting the drilling rig, where dedicated cabling and tubing provides the necessary power and resources.

CLAIMS

1. A method for positioning a drilling rig onto an offshore platform provided with a fixed first rig skid beam and a fixed second rig skid beam arranged horizontally and parallel to each other and defining a longitudinal direction, said method being characterized by the following steps:
   a. positioning a vessel near the offshore platform, said vessel transporting the drilling rig with a skid system comprising a first skid assembly to engage with the first rig skid beam and a second skid assembly to engage with the second rig skid beam, each first and second skid assembly comprising at least two skid shoes to engage with the respective first or second rig skid beam, a gripping unit to grip the respective first or second rig skid beam, and a push-pull device to apply push and pull forces between the gripping unit and one of the at least two skid shoes;
   b. adjusting a distance between the first and second skid assembly to correspond to a distance between the first and second rig skid beam; and
   c. positioning the drilling rig onto the offshore platform such that the first and second skid assembly engage with the first and second rig skid beam respectively to support the drilling rig from the first and second rig skid beam and to skid the drilling rig relative to the first and second rig skid beam in the longitudinal direction.
2. A method according to claim 1, wherein the at least two skid shoes of the first skid assembly are connected by a separate load transfer beam, and wherein the at least two skid shoes of the second skid assembly are connected by a separate load transfer beam.
3. A method according to claim 1, wherein positioning the drilling rig onto the offshore platform involves lifting the drilling rig with a crane and lowering the drilling rig onto the offshore platform.
4. A method according to claim 1, wherein the skid shoes and the gripping units of the first and second skid assembly comprise respective jaws to be positioned around a flange of the first or second rig skid beam, wherein preferably the jaws are moveable between a retracted position in which a distance between the jaws is large enough to let the respective flange pass, and an active position in which the jaws are arranged around the respective flange, and wherein positioning the drilling rig onto the offshore platform includes:
   c1. moving the jaws to the retracted position;

c2. positioning the drilling rig onto the offshore platform until the skid shoes and the gripping units of the first and second skid assembly engage with the respective first and second rig skid beam;

c3. moving the jaws to the active position.

5. A method according to claim 1, wherein the drilling rig comprises a third rig skid beam and a fourth rig skid beam arranged horizontally and parallel to each other and defining a transverse direction perpendicular to the longitudinal direction, wherein the skid system comprises a third skid assembly to engage with the third rig skid beam and a fourth skid assembly to engage with the fourth rig skid beam, each third and fourth skid assembly comprising at least two skid shoes to engage with the respective third or fourth rig skid beam, a gripping unit to grip the respective third or fourth rig skid beam, and a push-pull device to apply push and pull forces between the gripping unit and one of the at least two skid shoes, and wherein the skid shoes of the third and fourth skid assemblies are carried by the skid shoes of the first and second skid assemblies, thereby allowing to skid the drilling rig relative to the platform in the transverse direction.

6. A method according to claim 5, wherein the third skid assembly and the fourth skid assembly are used to adjust the distance between the first and second skid assembly.

7. A method according to claim 1, wherein prior to positioning the drilling rig onto the offshore platform, guiding elements are provided on the offshore platform to guide the positioning of the drilling rig relative to the platform in a horizontal transverse direction perpendicular to the longitudinal direction.

8. A method according to claim 1, wherein the drilling rig comprises multiple modules, wherein one of the modules is a support frame for supporting a drilling tower, said support frame comprising a carrier frame and the skid system, and wherein positioning the drilling rig onto the offshore platform starts with the positioning of the support frame on the platform followed by the other modules.

9. A method according to claim 8, wherein the drilling tower is formed by multiple modules and the drilling tower is positioned on the carrier frame of the support frame by assembling the multiple modules on the carrier frame.

10. A method according to claim 8, wherein the carrier frame of the support frame is provided with guiding elements to guide the positioning of the drilling tower relative to the carrier frame in the horizontal direction perpendicular to the longitudinal direction.

11. A method according to claim 7 and/or 10, wherein the guide elements are moveable between an active position in which they are able to guide the drilling rig, carrier

frame and/or the drilling tower, whatever is applicable, and an inactive position in which the guiding elements do not interfere with movements of the drilling rig over the platform and operation of the drilling rig.

12. A drilling rig to be positioned on an offshore platform with a fixed first rig skid beam and a fixed second rig skid beam arranged horizontally and parallel to each other and defining a longitudinal direction, said drilling rig comprising a skid system to skid the drilling rig relative to the platform in the longitudinal direction with a first skid assembly to engage with the first rig skid beam and a second skid assembly to engage with the second rig skid beam, each first and second skid assembly comprising at least two skid shoes to engage with the respective first or second rig skid beam, a gripping unit to grip the respective first or second rig skid beam, and a push-pull device to apply push and pull forces between the gripping unit and one of the at least two skid shoes, wherein the distance between the first and second skid assembly is adjustable.

13. A drilling rig according to claim 12, wherein the skid shoes and the gripping units of the first and second skid assembly comprise respective jaws to be positioned around a flange of the first or second rig skid beam, wherein preferably the jaws are moveable between a retracted position in which a distance between the jaws is large enough to let the respective flange pass, and an active position in which the jaws are arranged around the respective flange.

14. A drilling rig according to claim 12, further comprising a third rig skid beam and a fourth rig skid beam arranged horizontally and parallel to each other and defining a transverse direction perpendicular to the longitudinal direction, wherein the skid system comprises a third skid assembly to engage with the third rig skid beam and a fourth skid assembly to engage with the fourth rig skid beam, each third and fourth skid assembly comprising at least two skid shoes to engage with the respective third or fourth rig skid beam, a gripping unit to grip the respective third or fourth rig skid beam, and a push-pull device to apply push and pull forces between the gripping unit and one of the at least two skid shoes, and wherein the skid shoes of the third and fourth skid assemblies are carried by the skid shoes of the first and second skid assemblies, thereby allowing to skid the drilling rig relative to the platform in the transverse direction.

15. A drilling rig according to claim 12, wherein the drilling rig comprises a drilling tower and a support frame for the drilling tower, said support frame comprising a carrier frame and the skid system.

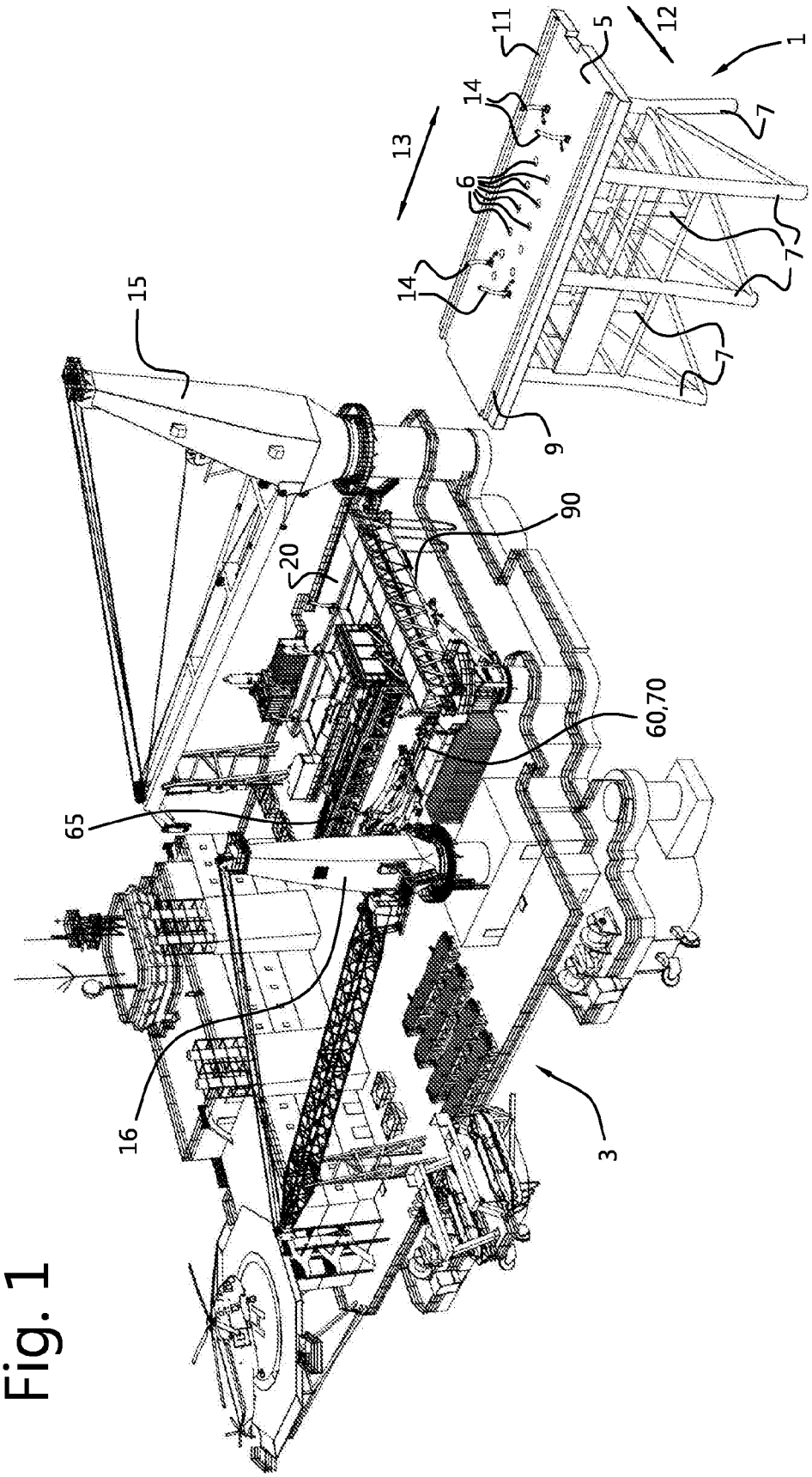


Fig. 1

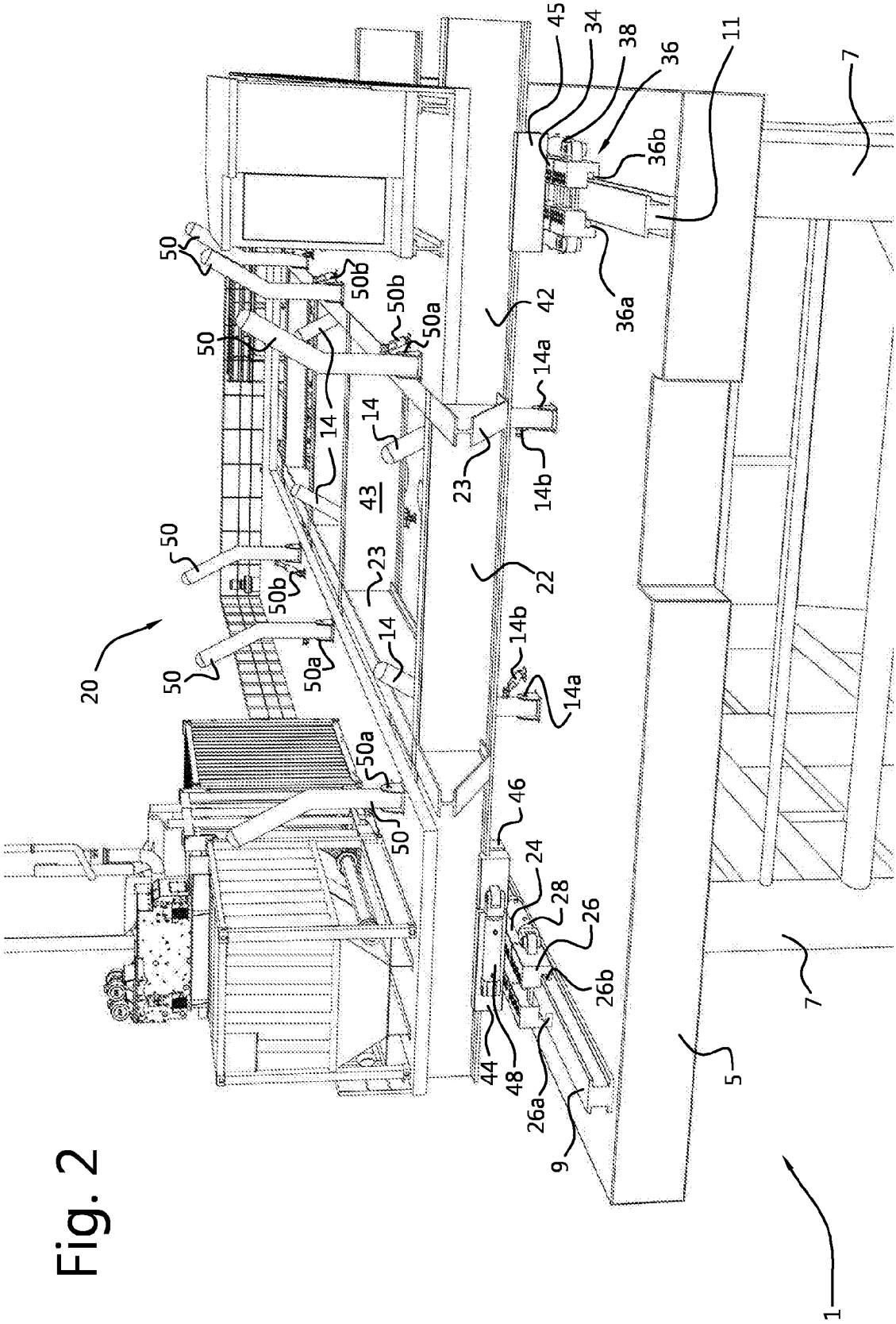

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Fig. 2

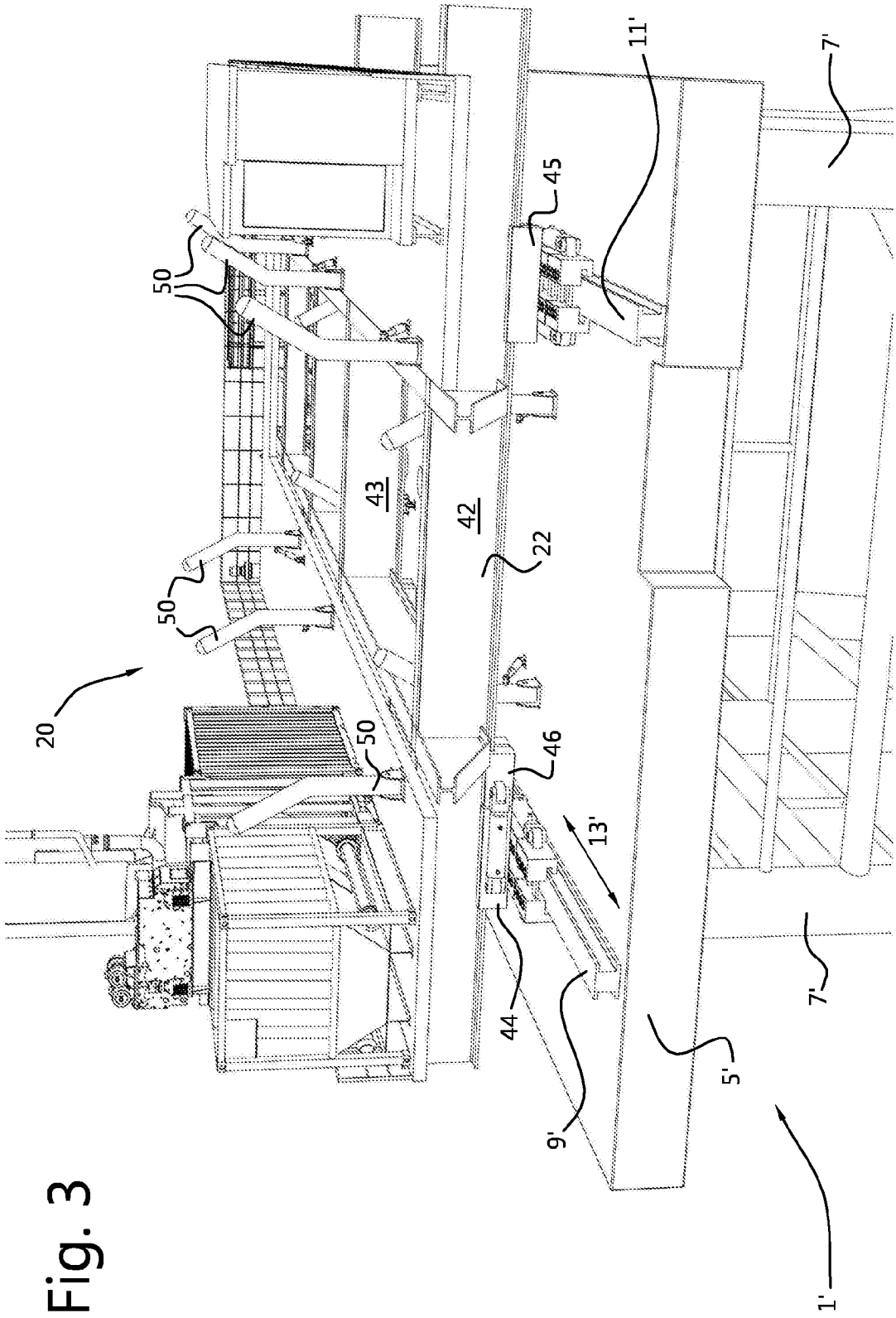


Fig. 3

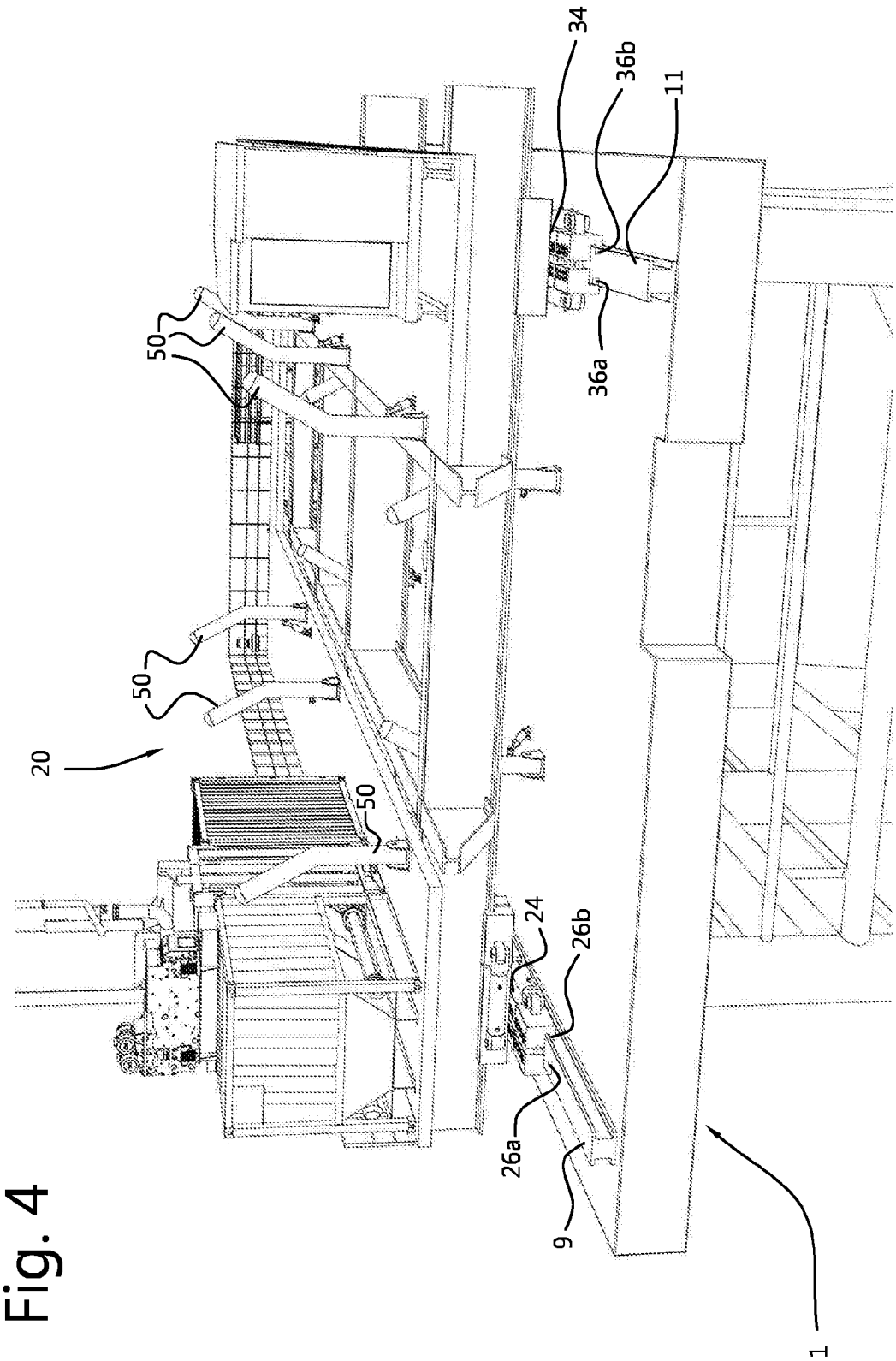


Fig. 4

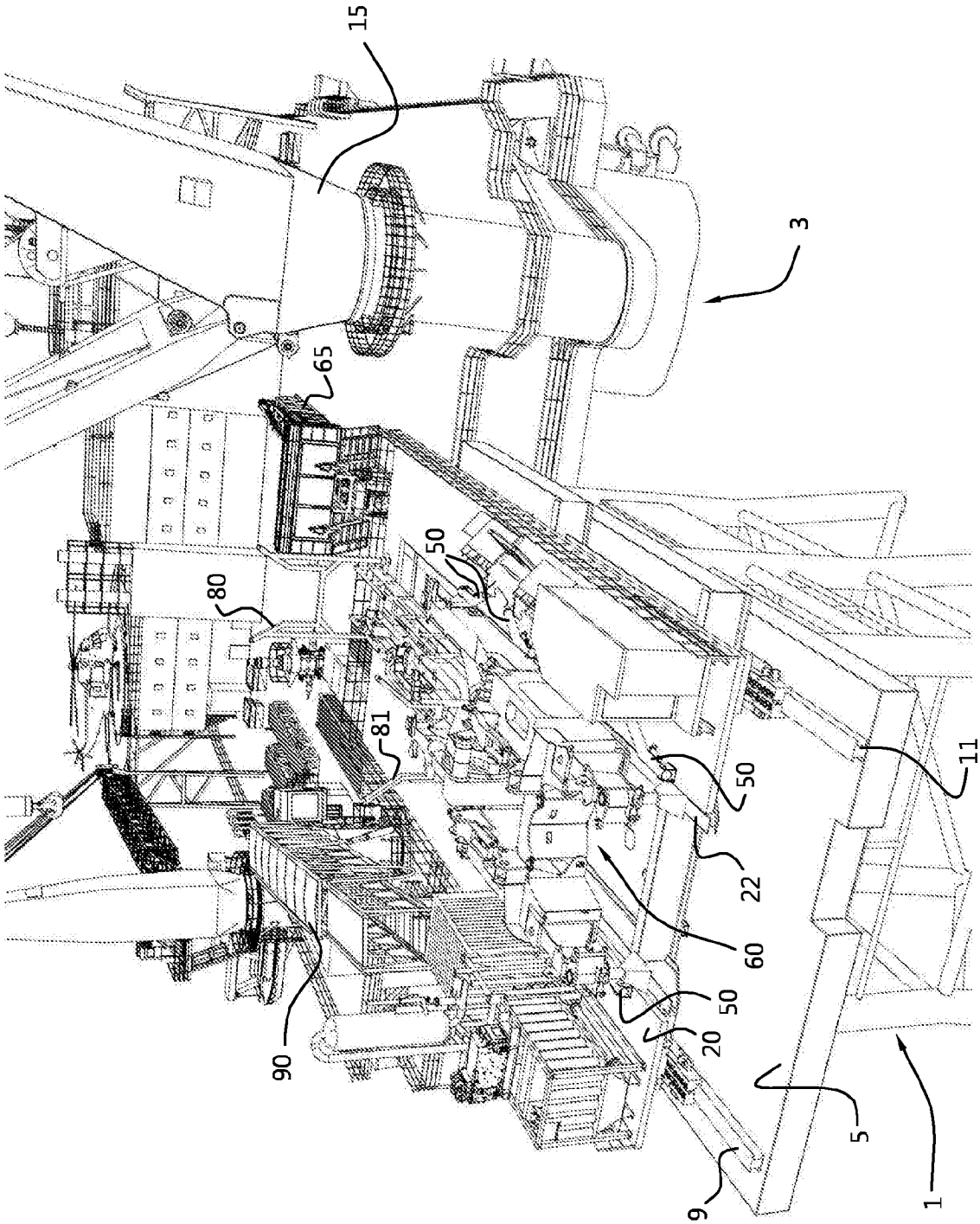
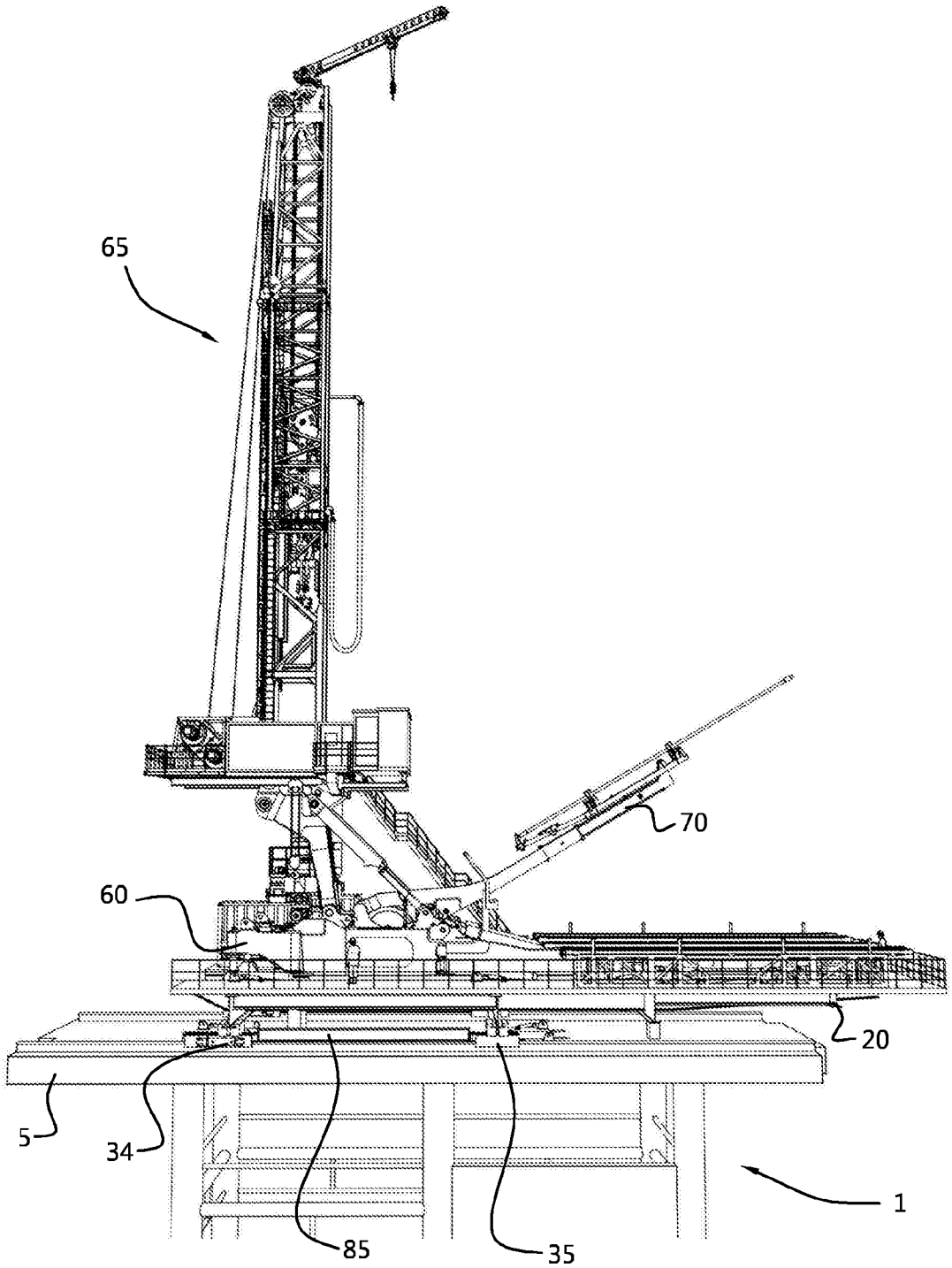


Fig. 5

Fig. 6



INTERNATIONAL SEARCH REPORT

International application No
PCT/NL2016/050152

A. CLASSIFICATION OF SUBJECT MATTER
INV. E21B15/00 E21B15/02 E02B17/02
ADD.

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
E21B B63B E02B

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)
EPO-Internal, WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
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X	US 4 938 628 A (INGLE JAMES E [US]) 3 July 1990 (1990-07-03) column 2, line 50 - column 9, line 37; figures	1-6, 12-14
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A	NL 1 006 889 C2 (MARINE STRUCTURE CONSUL [MS]) 2 March 1999 (1999-03-02) page 5, line 21 - page 8, line 28; figures	1,12

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[X] Further documents are listed in the continuation of Box C.

[X] See patent family annex.

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"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
11 July 2016	19/07/2016

Name and mailing address of the ISA/	Authorized officer
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1

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INTERNATIONAL SEARCH REPORT

International application No
PCT/NL2016/050152

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

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