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54

Workover unit, mobile workover unit provided therewith, and method for providing a workover unit.

57

The present invention relates to a workover unit or hydraulic workover unit, mobile workover unit, and method for providing a workover unit. The workover unit according to the invention comprises:

- a basic structure;
- a BOP-stack provided in the basic structure; and
- a skidding system configured for positioning the basic structure being in an upright working position over a wellhead.

WORKOVER UNIT, MOBILE WORKOVER UNIT PROVIDED THEREWITH, AND
METHOD FOR PROVIDING A WORKOVER UNIT

5 The present invention relates to a workover unit or hydraulic workover unit, optionally comprising a snubbing unit, and that is capable to operate as a service rig that is typically used for downhole operations or proceedings of oil and gas wells, for example.

From practice workover units are known that rely on a crane, more specifically a mobile crane, for lifting and positioning the workover unit over a wellhead. This requires delicate maneuvering. Also, there is a risk of damaging the wellhead during this maneuvering.

10 Also known from practice are so-called (mobile) derrick rigs that are pivoted from a mobile platform, such as a trailer, to an upright position while being positioned directly over a wellhead. This also requires accurate positioning in an often relatively rough terrain. Incidents when performing the lifting and/or pivoting maneuvers may result in damaging the wellhead. This forms an unwanted risk in conventional workover units. Examples of conventional systems are disclosed in WO 2004/005666 A1 and WO 99/27222.

An object of the invention is to obviate or at least reduce the above mentioned problems and to provide a workover unit that can be positioned and/or operated more effectively and/or more efficiently with reduced risks.

This object is achieved with the workover unit according to claim 1.

20 The workover unit according to the present invention is preferably hydraulically operated and is also referred to as a hydraulic workover unit. The workover unit according to the present invention can be operated as a workover rig that enables repair, piping/tubing replacement, or other downhole proceedings of an oil or gas well, for example. Preferably, the workover unit is capable of pulling sufficient weight, dealing with upwards acting forces during live well operating due to a well pressure, and/or withstanding wind gusts, for example.

The workover unit comprises a basic structure that comprises a BOP-stack having a Blow Out Preventer (BOP) and can be applied to well with or without pressure. Preferably, the BOP-stack comprises a swivel for aligning the stack. The basic structure acts as a frame for the overall workover unit. Preferably, the first structure is configured such that one or more further structures can be positioned on top of it. This enables a modular approach and modular assembly of the workover unit according to the present invention. As a further effect this enables optimization of the logistic operation when a workover unit needs to be installed at a well, for example.

30 The workover unit according to the present invention further comprises a skidding system. This skidding system is configured for positioning the basic structure, when brought in an upright working position, over a wellhead.

More specifically, this skidding system enables placing the basic structure of the working unit next to the wellhead in an upright working position. Thereafter, the basic structure is moved in this upright working position with the skidding system and positioned over the wellhead. This enables accurate positioning of the basic structure of the workover unit over the wellhead, thereby
5 also enabling an accurate connection thereto.

In addition, as the skidding system enables placing the basic structure next to the wellhead in an upright position, the risk of damaging the wellhead in case of incidents or accidents when performing maneuvering operations on the basic (or further) structure, such as pivoting and lifting, is significantly reduced. This reduces the overall risks of workover units according to the present
10 invention.

The workover unit according to the present invention with the BOP-stack and skidding system further enables operation of the workover unit as a so-called hydraulic workover unit that can be used in oil and gas wells, geothermal wells, salt solution mining, and gas storage, for example. Also these operations with the workover unit according to the present invention can be
15 performed more safely as compared to conventional units.

In a further preferred embodiment according to the present invention the workover unit further comprises a further structure, with the basic structure comprising an integrated crane configured for lifting the further structure to a working position on top of the basic structure.

Providing a further structure next to the basic structure of the work unit enables a modular
20 configuration of the workover unit. The individual basis and/or further structures can be transported separately having optimal dimensions suitable for efficient and effective transport.

Providing an integrated crane to the basic structure enables lifting a further structure to a working position on top of the basic structure. This prevents the need for providing a separate crane or lifting facility during rig up of the workover unit. Also, this prevents transport of such
25 separate crane or lifting facility to the wellhead location. This is especially advantageous in case the wellhead location is an (impassable) remote location such that the logistic operation can be relatively complex and expensive. Also, some of these locations do not hold sufficient footprint for easy use of a separate crane or lifting facility.

Preferably, the integrated crane comprises a first telescopic element enabling reduction of
30 the transport dimensions. When in use the extended telescopic element enables lifting and positioning of the further structure.

Optionally, the workover unit according to the invention comprises three or more further structures. The crane may also involve additional or alternative pivoting elements to increase its working height when in use and reduce its dimensions in a transport mode. Optionally, the
35 integrated crane according to the invention can also be applied to conventional workover units, optionally without applying the skidding system according to the invention.

Preferably, the crane comprises a further crane element configured for enabling lifting operations when the work unit is in use. Such further crane element preferably comprises a second telescopic crane element that enables pipe handling, for example. This provides the integrated crane of the basic structure with a dual action mode. In a first assembling mode, the crane is used for assembling the workover unit according to the present invention. In a second operational mode, the integrated crane enables further operations when the work unit is in use, such as pipe handling. This enables an effective use of the integrated crane.

In a presently preferred embodiment according to the present invention the crane is connected to the basic structure with a pivoting shaft enabling rotating the crane over a working angle around the pivoting shaft that extends in a substantially horizontal direction in a working position of the work unit with the basic structure being in the upright working position.

Providing a pivoting shaft enables rotating the integrated crane around a substantially horizontal shaft or axis such that the crane can be rotated in a substantially vertical plane. This provides a relatively simple crane configuration that is preferably capable to perform the aforementioned dual mode operation. For example, a further structure that is positioned next to the wellhead with the basic structure being positioned over the wellhead can be lifted after which the crane pivots and next positions the further structure on top of the basic structure. This relates to using the crane in the assembling mode. Similar crane movements can also be used in the operational mode to enable pipe handling, for example.

In a presently preferred embodiment according to the present invention the work unit further comprises a snubbing unit.

The snubbing unit that is preferably provided in or on the basic structure enables (heavy) well intervention, for example on oil and gas wells. The snubbing unit is typically configured for running in and pulling out pipes to and from the well. Furthermore, such snubbing unit enables performing operations with the well still being under pressure. For example, this enables effective pipe replacement and efficient well operation. Preferably, the snubbing unit includes the BOP to improve safety when performing operations with the workover unit, while the well is under pressure. In that case the snubbing unit may enable bringing pipes, tubing and bottom hole assemblies in and out of a well, for example.

In a presently preferred embodiment according to the present invention the workover unit further comprises a pre-tensioning system configured for applying a pre-tension to a wellhead.

Providing a pre-tensioning system enables application of a pre-tension onto a wellhead. This may eliminate the use of so-called guywires and anchoring dead-weights. This reduces the amount of operations that is required when installing a workover unit. Also, as some locations do not hold sufficient footprint for the deploying anchoring dead-weights, these locations can be operated effectively with the workover unit according to the present invention.

Furthermore, by providing a pre-tensioning system the so-called wellhead loading can be substantially eliminated. Also, the use of the pre-tensioning system prevents transport of dead-weights to a remote location thereby rendering the overall logistic operation is simpler.

5 Preferably, the pre-tensioning system comprises one or more hydraulic cylinders to press the BOP towards the wellhead. In this preferred embodiment according to the present invention, the BOP is positioned movable in the basic structure of the workover unit. Such BOP is preferably part of the snubbing unit. This enables an effective operation of the BOP with the pre-tensioning system.

10 The invention further relates to a mobile workover unit, the mobile workover unit comprising:

- a workover unit as described earlier; and
- a trailer, truck or mobile platform comprising a self-propelling device.

The mobile work unit provides the same effects and advantages as described for the workover unit.

15 The mobile platform, including a trailer or truck, comprises a self-propelling device that is configured to pivot the basic structure from the mobile platform to an upright working position next to the wellhead. This self-propelling device may comprise a number of hydraulics cylinders and a hinge or pivoting shaft enabling pivoting the basic structure, for example. Similar maneuvers can be performed with additional further structures.

20 The invention further also relates to a method for providing a workover unit according to claim 9.

The method provides the same effects and advantaged as mentioned to the workover unit and the mobile workover unit that optionally are provided with a snubbing unit. Specifically, the method has the advantage that the basic structure can be positioned in an upright working position next to the wellhead, where after the basic structure in the upright position can be moved horizontally with the skidding system over the wellhead and be connected thereto. This provides a relatively simple and safe approach to provide a workover unit, while reducing risks associated with maneuvering a component of such workover unit, for example a basic structure thereof.

30 In a preferred embodiment of the present invention the positioning of the workover unit involves placing a basic structure over a wellhead, providing a second structure that is placed next to a wellhead in an upright position, where after the further structure is placed on top of the basic structure using a crane or lifting facility, preferably an integrated crane of the basic structure. This reduces the need for providing a separate crane or lifting facility.

35 In addition, the risks associated with maneuvering the (sub) structures are significantly reduced.

In a presently preferred embodiment according to the present invention the method further comprises the step of connecting the workover unit to a wellhead using a pre-tensioning system such that in use the pre-tensioning system applies a pre-tension onto the wellhead. By applying a pre-tension onto the wellhead so-called wellhead loading can be eliminated and/or reduced.

5 Furthermore, applying a pre-tension enables more stable positioning of the workover unit.

Further advantages, features or details of the invention are elucidated on basis of the preferred embodiments thereof, wherein reference is made to the accompanying drawings, wherein:

- 10 - figure 1 shows a truck for transporting a basic structure of the work unit according to the invention;
- figure 2 shows the truck of figure 1 when pivoting the basic structure to an upright position;
- figures 3 and 4 show the basic structure being moved over the wellhead with a skidding system; and
- 15 - figures 5-7 show maneuvering a further structure relative to the basic structure with an integrated crane;
- figure 8A-B illustrates the pre-tensioning system with the movable BOP; and
- figure 9 shows a further detail of the pre-tensioning system of figure 8.

Mobile workover unit 2 (figure 1) is in the illustrated embodiment transported with truck 4. 20 Trailer 6 carries basic structure 8. Having arrived at the desired location, basic structure 8 of workover unit 2 needs to be maneuvered in an upright position (figure 2). In the illustrated embodiment trailer 6 of truck 4 comprises self-propelling device 10. Self-propelling device 10 comprises hinge 12, first hydraulic cylinder 14 and second hydraulic cylinder 16. Self-propelling device 10 enables pivoting a basic structure 8 comprising an optional snubbing unit 18 and 25 integrated crane 20 from a substantially horizontal transport position into a substantially vertical working position.

A basic structure 8 of workover unit 22 is pivoted from trailer 6 and is positioned next to well 24 and wellhead 26 thereof (figure 3). Wellhead 26 comprises wellhead connector 28 comprising a connecting flange. Basic structure 8 optionally comprises snubbing unit 18.

30 Furthermore, basic structure 8 comprises telescopic crane 20 and is positioned on ground or floor 30. In the illustrated embodiments basic structure 8 further comprises a BOP 32 with aligning swivel that can be integrated with the optional snubbing unit 18. Integrated crane 20 is connected with rotating shaft 34 to basic structure 8. In the upright position of structure 8 rotating shaft 34 extends in a substantially horizontal direction. Crane 20 is connected to shaft 34 with connecting 35 plate 36. Crane 20 comprises two first crane elements or arms 38 that are substantially parallel. In the illustrated embodiment crane 20 further comprises second telescopic elements 40 and third

telescopic elements 42. The two elements or arms of crane 20 are connected with a cross beam carrying hoisting device 44.

Skid 46 (figure 4) enables moving basic structure 8 in a substantial horizontal direction towards wellhead 26. In the illustrated embodiment, after positioning basic structure 8 with skid 46, a further structure 48 can be positioned next to wellhead 26 (figure 5). Crane 20 can be rotated over working angle α to enable lifting further structure 48 with hoist 44 (figure 6). After reaching the desired height with structure 48 crane 20 pivots around shaft 34 to its substantially vertical position and connects further structure 48 to the top of basic structure 8 (figure 7). In the illustrated embodiment on top of basic structure 8 there is provided first platform 50 and on top of further structure 48 there is provided second platform 52. This enables a safe working environment.

Hydraulic pre-tensioning system 54 (figure 8A-B) comprises first hydraulic cylinder 56 and second hydraulic cylinder 58 (figure 9) enabling movement of BOP 32 in basic structure 8 along guiding elements 59. BOP connector 60 is moved towards wellhead connector 28 to connect BOP 32 to wellhead 26. In addition, pre-tensioning system 54 is capable of applying a pre-tension onto wellhead 26.

Assembling a workover unit 22 starts with transporting basic structure 8 and further structure 48 to well 24. After arriving at the desired location basic structure 8 is pivoted from mobile platform, such as trailer 6, with self-propelling device 10 from a substantially horizontal transport position to a substantially vertical working position, such that basic structure 8 is positioned next to wellhead 26. After having put basic structure 8 into an upward position structure 8 is moved with skidding system 46 and positioned over wellhead 26.

Further structure 48 can be placed in a similar way next to well head 26. By providing basic structure 8 with integrated crane 20, further structure 48 can be lifted and positioned on top of basic structure 8. Preferably, integrated crane is capable of performing a pivoting or rotating movement around shaft 34 to change working angle α . In addition, integrated crane 20 can be used to handle pipes when workover unit 22 is in operational use. BOP 32 is connected to wellhead 26 with pre-tensioning system 54 that moves BOP 32 downwards such that BOP connectors 60 engages wellhead connector 28. Pre-tensioning system 54 preferably applies a pre-tension onto wellhead 26 to eliminate guywires, dead-weights, and wellhead loading.

The present invention is by no means limited to the above-described preferred embodiments thereof. The rights sought are defined in the following claims within the scope of which many modifications can be envisaged.

CLAUSES

1. Workover unit, comprising:

- a basic structure;
- 5 - a BOP-stack provided in the basic structure; and
- a skidding system configured for positioning the basic structure being in an upright working position over a wellhead.

2. Workover unit according to clause 1, further comprising a further structure, and wherein
10 the basic structure comprises an integrated crane configured for lifting the further structure to a working position on top of the basic structure.

3. Workover unit according to clause 2, wherein the crane comprises a further crane element
15 configured for enabling lifting operations when the unit is in use.

4. Workover unit according to clause 2 or 3, wherein the crane is connected to the basic
structure with a pivoting shaft enabling rotating the crane over a working angle around the pivoting
shaft that extends in a substantially horizontal direction in a working position of the unit with the
basic structure being in the upright working position.

20

5. Workover unit according to one or more of the foregoing clauses, further comprising a
snubbing unit to enable operations with a well being under pressure.

6. Workover unit according to one or more of the foregoing clauses, further comprising a
25 pre-tensioning system configured for applying a pre-tension onto a wellhead.

7. Workover unit according to clause 5, wherein the pre-tensioning system comprises one or
more cylinders to press a BOP towards a wellhead.

30 8. Mobile workover unit, comprising:

- a workover unit according to one or more of the foregoing clauses; and
- a trailer, a truck or other mobile platform comprising a self-propelling device.

9. Method for providing a workover unit, comprising the steps of:

- providing a workover unit or mobile workover unit according to one or more of the foregoing clauses;
- positioning the unit; and
- 5 - connecting the unit.

10. Method according to clause 9, wherein positioning the unit comprises moving the unit over a skidding system.

10 11. Method according to clause 9 or 10, wherein the method further comprising the steps of:

- placing a basic structure;
- providing a further structure; and
- placing the further structure substantially on top of the basic structure using a lifting element of the basic structure.

15

12. Method according to clause 9, 10 or 11, further comprising the step of connecting the unit to a wellhead using a pre-tensioning system such that in use the pre-tensioning system applies a pre-tension onto the wellhead.

CONCLUSIES

1. Workover eenheid (2,22), omvattende:
 - een basis structuur (8);
 - 5 - een BOP-stack (32) voorzien in de basis structuur; en
 - een skidding systeem (46) geconfigureerd voor het in een in hoofdzaak horizontale richting over een bron (24) positioneren van de basis structuur die is gebracht in een opgerichte werkpositie naast de bron.
- 10 2. Workover eenheid volgens conclusie 1, verder omvattende een verdere structuur, en waarin de basis structuur een geïntegreerde kraan (20) omvat geconfigureerd voor het heffen van de verdere structuur naar een werkpositie bovenop de basis structuur.
- 15 3. Workover eenheid volgens conclusie 2, waarin de kraan een verder kraanelement omvat geconfigureerd voor het mogelijk maken van hefoperaties wanneer de eenheid in gebruik is.
- 20 4. Workover eenheid volgens conclusie 2 of 3, waarin de kraan is verbonden met de basis structuur via een rotatie-as (34) die een rotatie van de kraan mogelijk maakt over een werkhoeck rond de rotatie-as die zich in een in hoofdzaak horizontale richting uitstrekt in een werkpositie van de eenheid wanneer de basis structuur in de opgerichte werkpositie is.
- 25 5. Workover eenheid volgens één of meer van de voorgaande conclusies, verder omvattende een snubbing systeem (18) voor het mogelijk maken operaties uit te voeren bij een bron onder druk.
- 30 6. Workover eenheid volgens één of meer van de voorgaande conclusies, verder omvattende een voorspan systeem (54) geconfigureerd voor het aanbrengen van een voorspanning op de bron.
- 35 7. Workover eenheid volgens conclusie 6, waarin het voorspan systeem één of meer cilinders omvat voor het drukken van een BOP naar de bron.
8. Mobiele workover eenheid (2), omvattende:
 - een workover eenheid volgens één of meer van de voorgaande conclusies; en
 - een trailer, truck, of ander mobiel platform omvattende een zelf oprichtende inrichting.

9. Werkwijze voor het voorzien van een workover eenheid (2,22), omfattende de stappen:

- het voorzien van een workover eenheid of mobiel workover eenheid volgens één of meer van de voorgaande conclusies;
- het positioneren van de basis structuur (8) van de eenheid in een opwaarts gerichte werkpositie naast de bron; en
- het vervolgens in hoofdzaak in horizontale richting met het skidding systeem (46) verplaatsen van de basis structuur en het verbinden van de eenheid.

10. Werkwijze volgens conclusie 9, waarin het positioneren van de eenheid het bewegen van de eenheid over een skidding systeem omvat.

11. Werkwijze volgens conclusie 9 of 10, waarin het positioneren van de eenheid omfattende de stappen:

- het plaatsen van een basis structuur;
- het voorzien van een verdere structuur; en
- het plaatsen van de verdere structuur in hoofdzaak bovenop de basis structuur gebruikmakend van een hefelement van de basis structuur.

12. Werkwijze volgens conclusie 9, 10 of 11, verder omfattende de stap van het verbinden van de eenheid met een bron gebruik makend van een voorspan systeem zodanig dat in gebruik het voorspan systeem een voorspanning uitoefent op de bron.

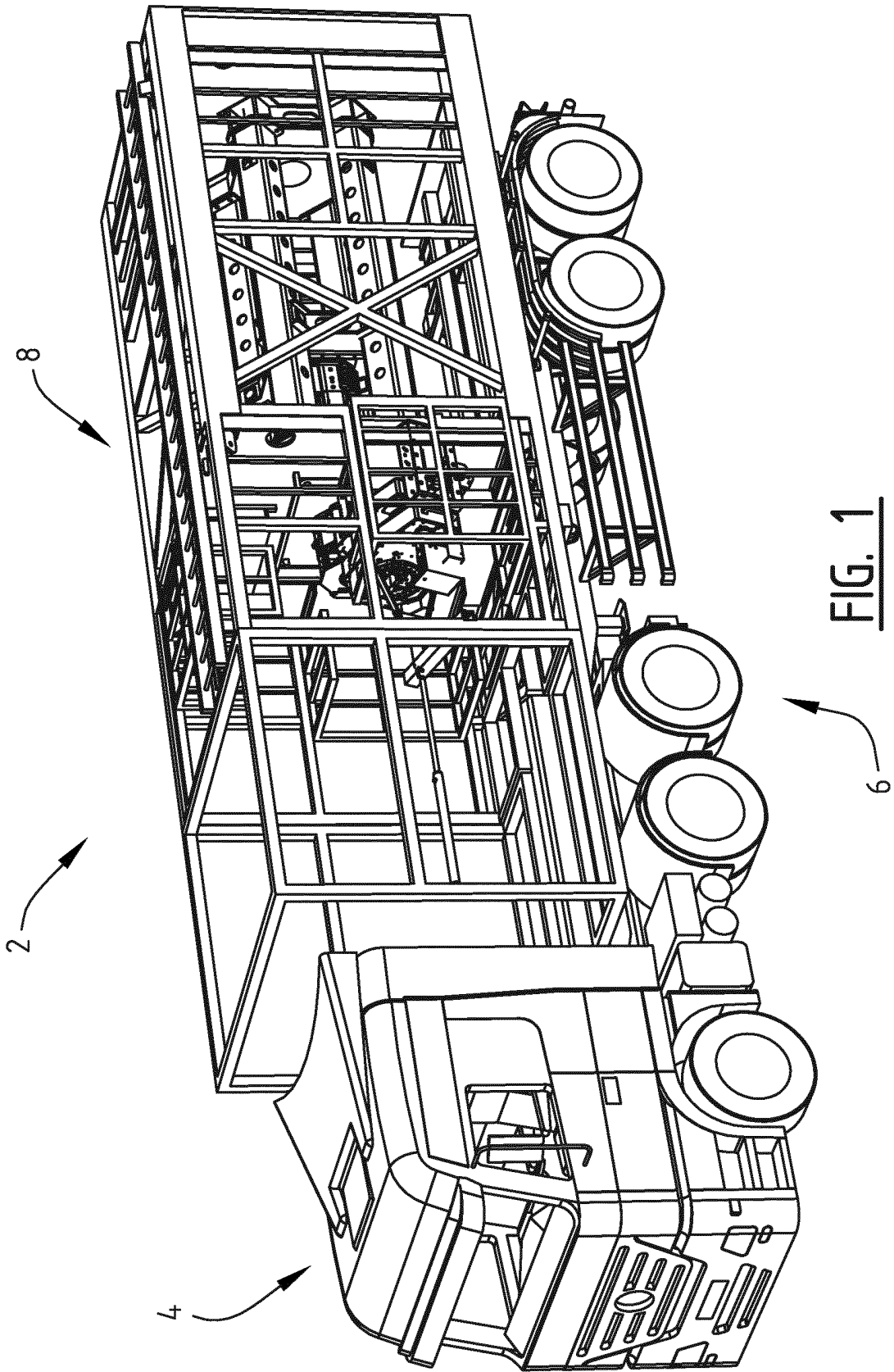


FIG. 1

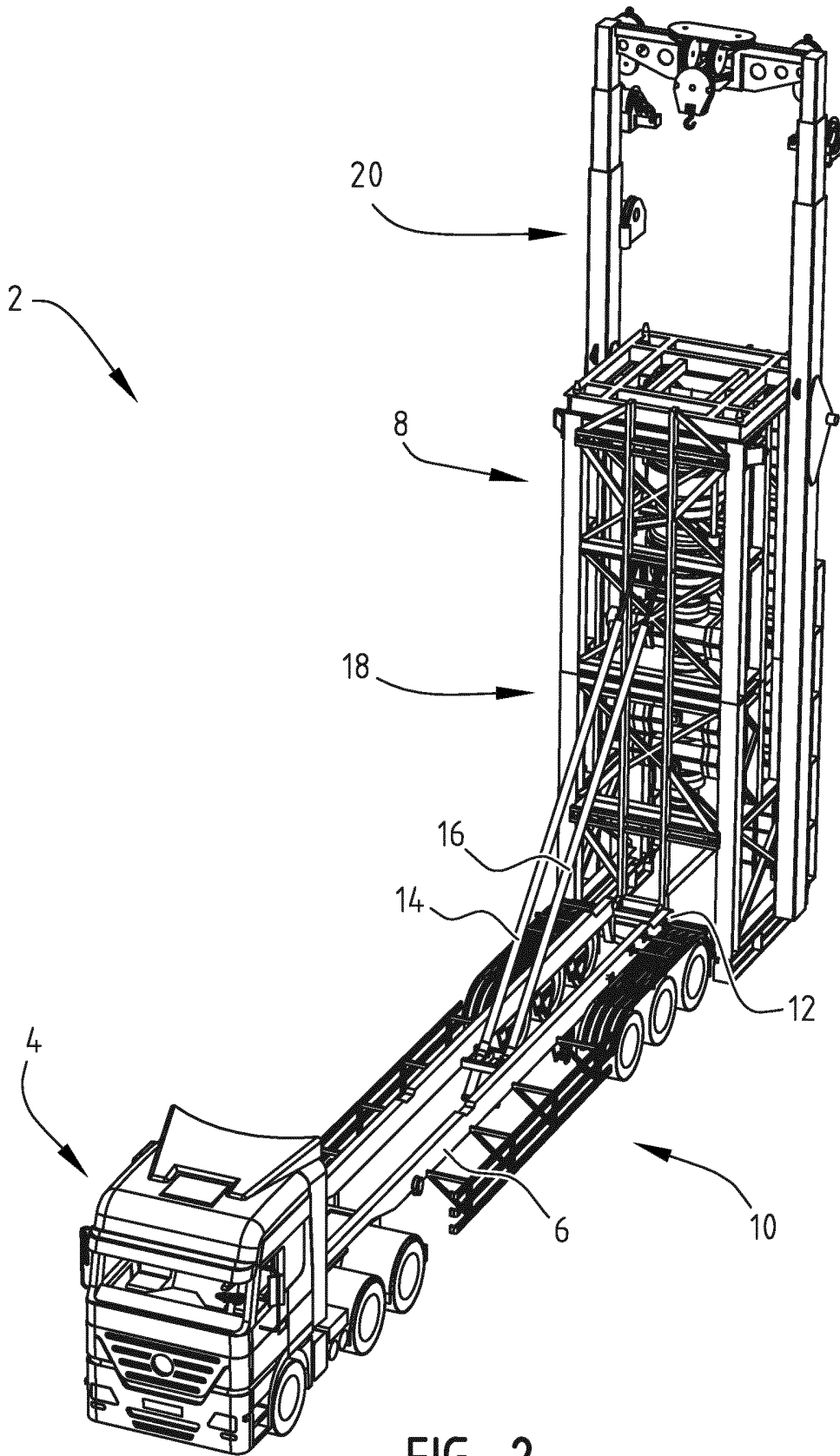


FIG. 2

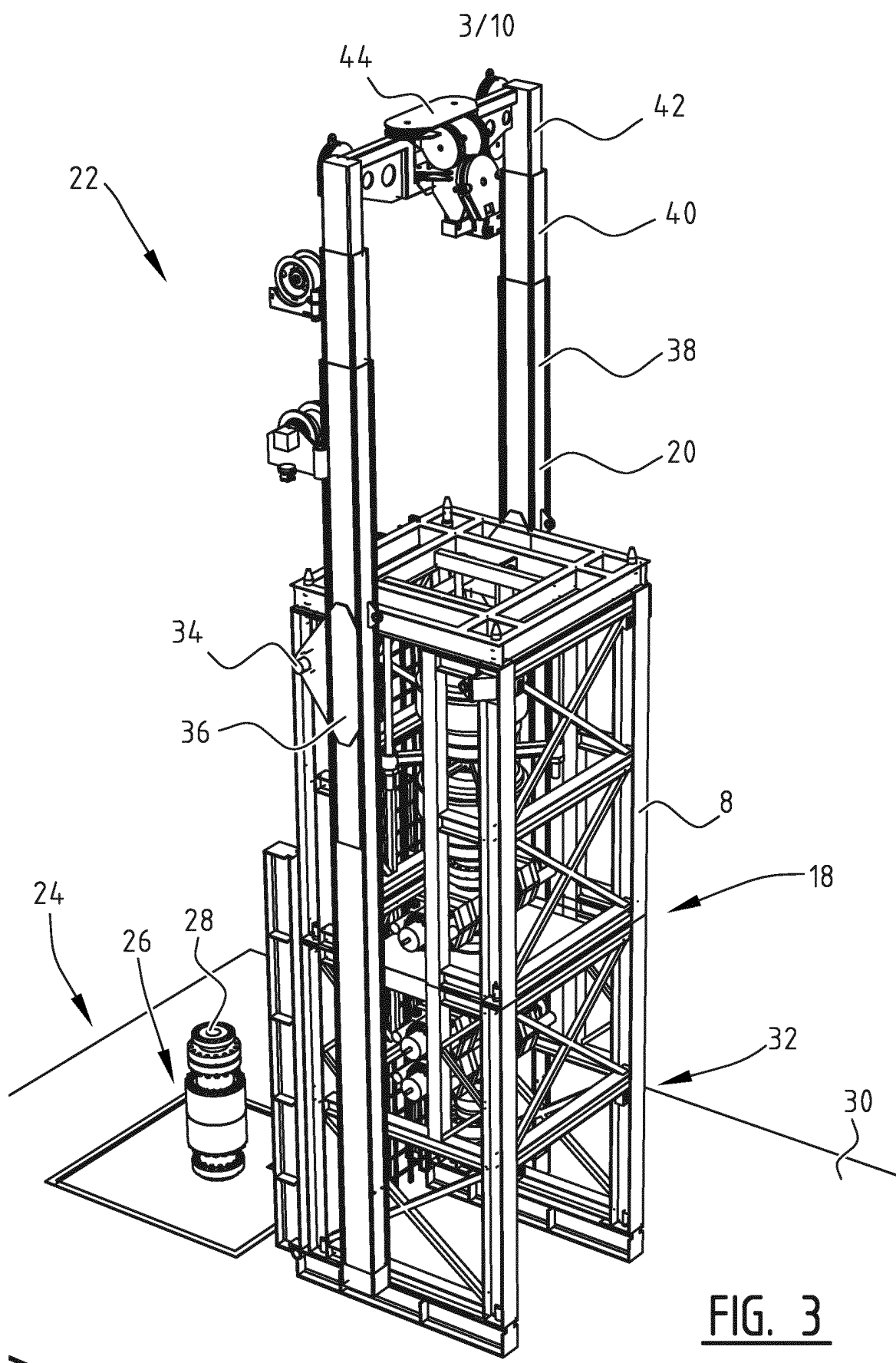


FIG. 3

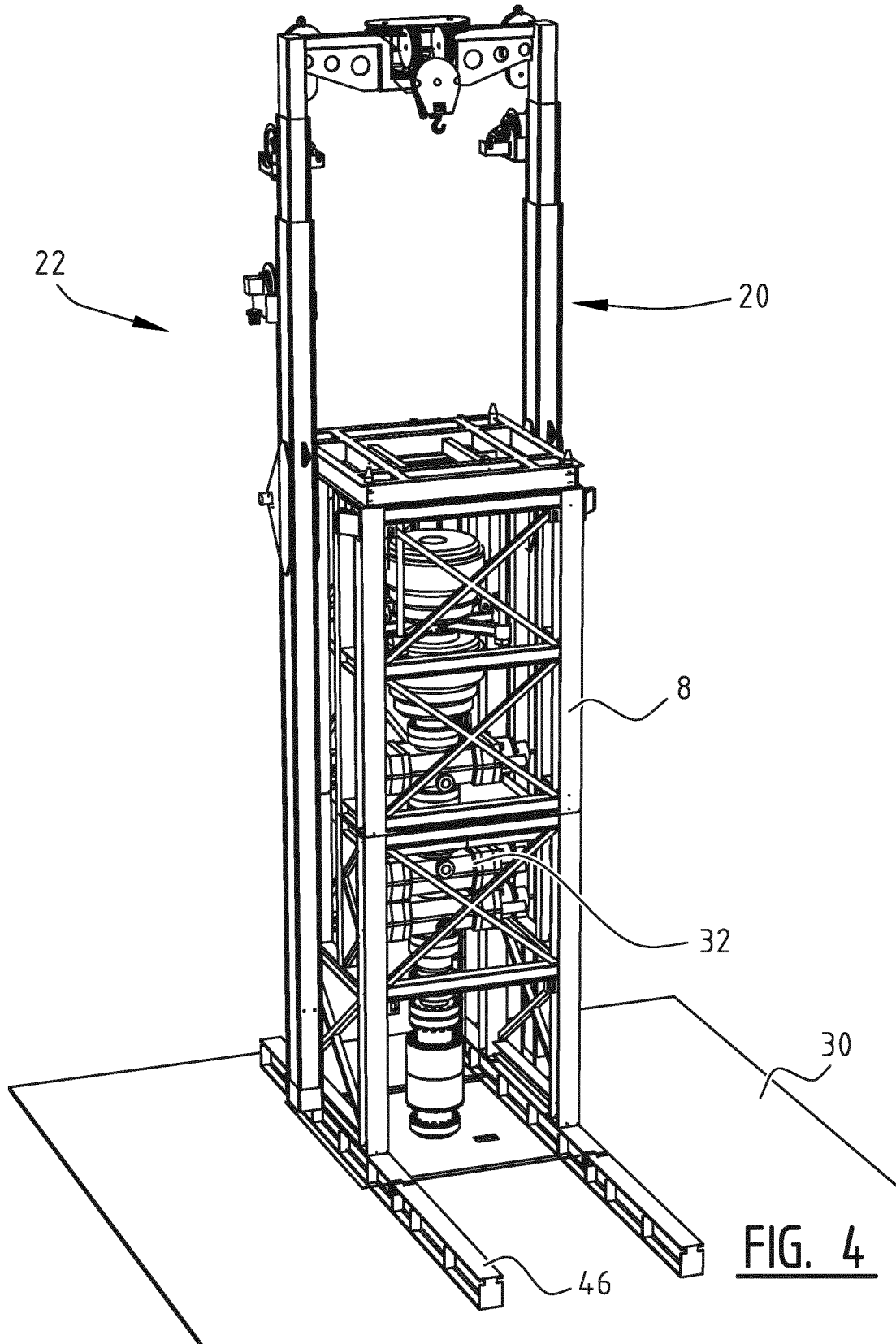
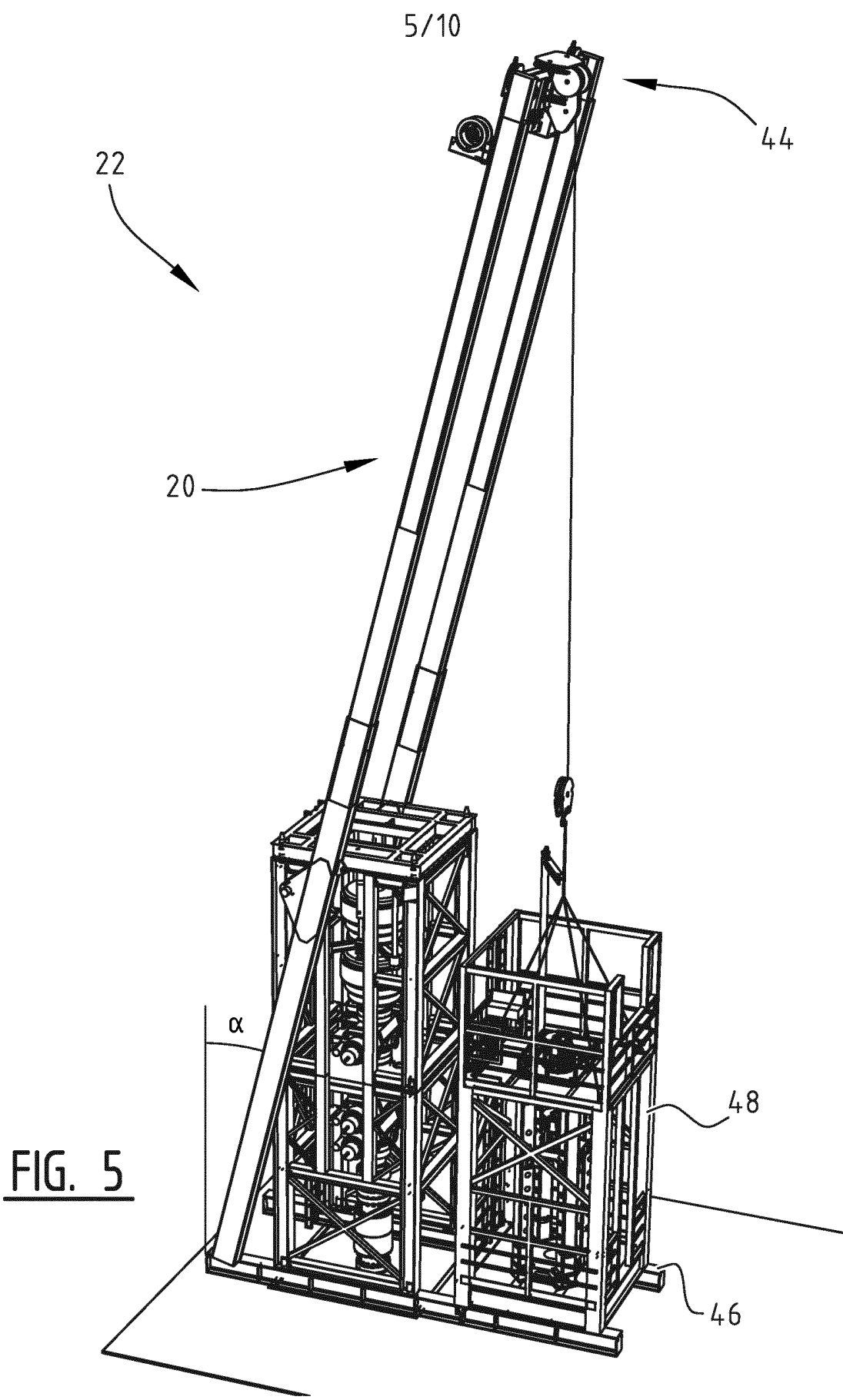


FIG. 4



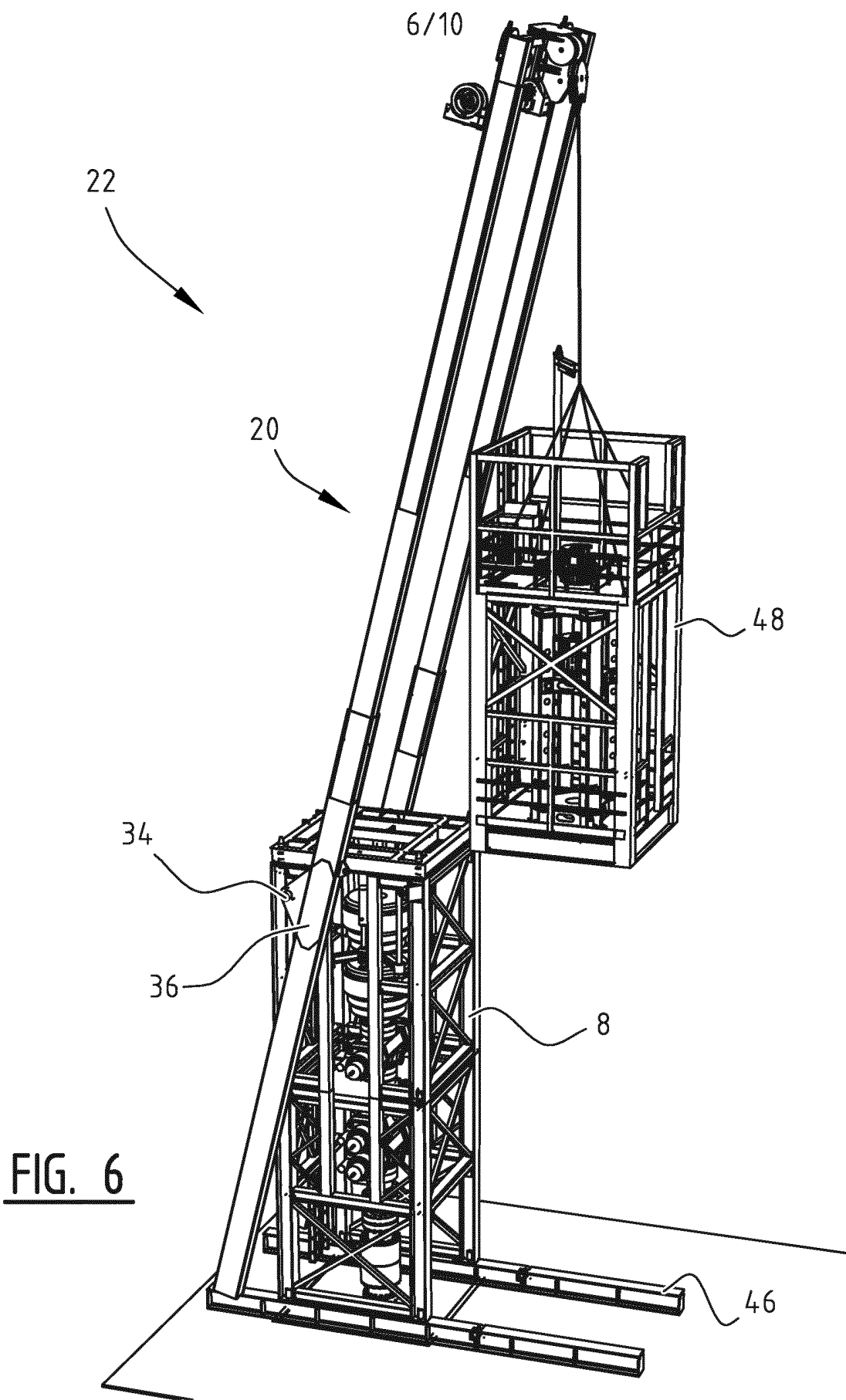


FIG. 6

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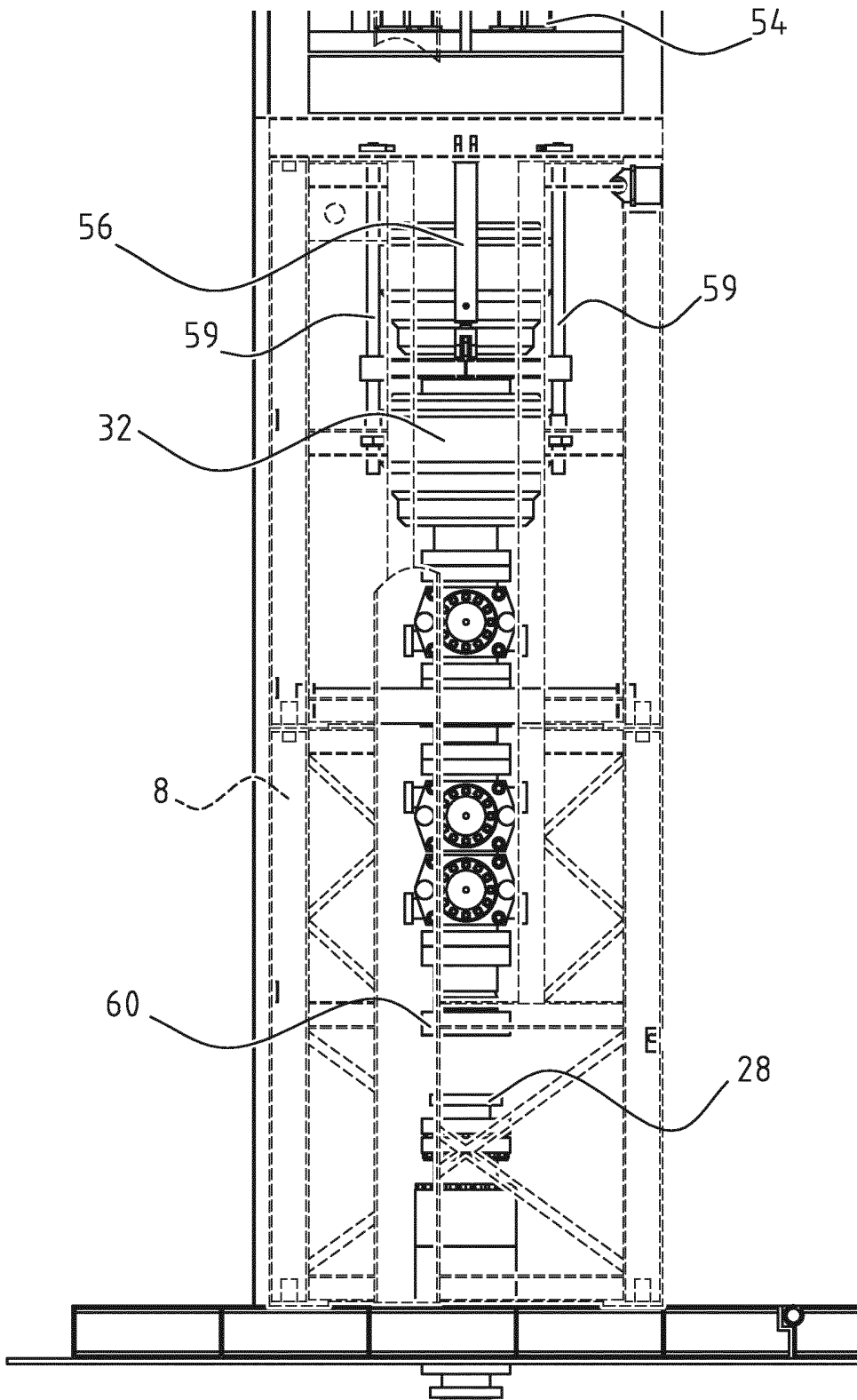


FIG. 8A

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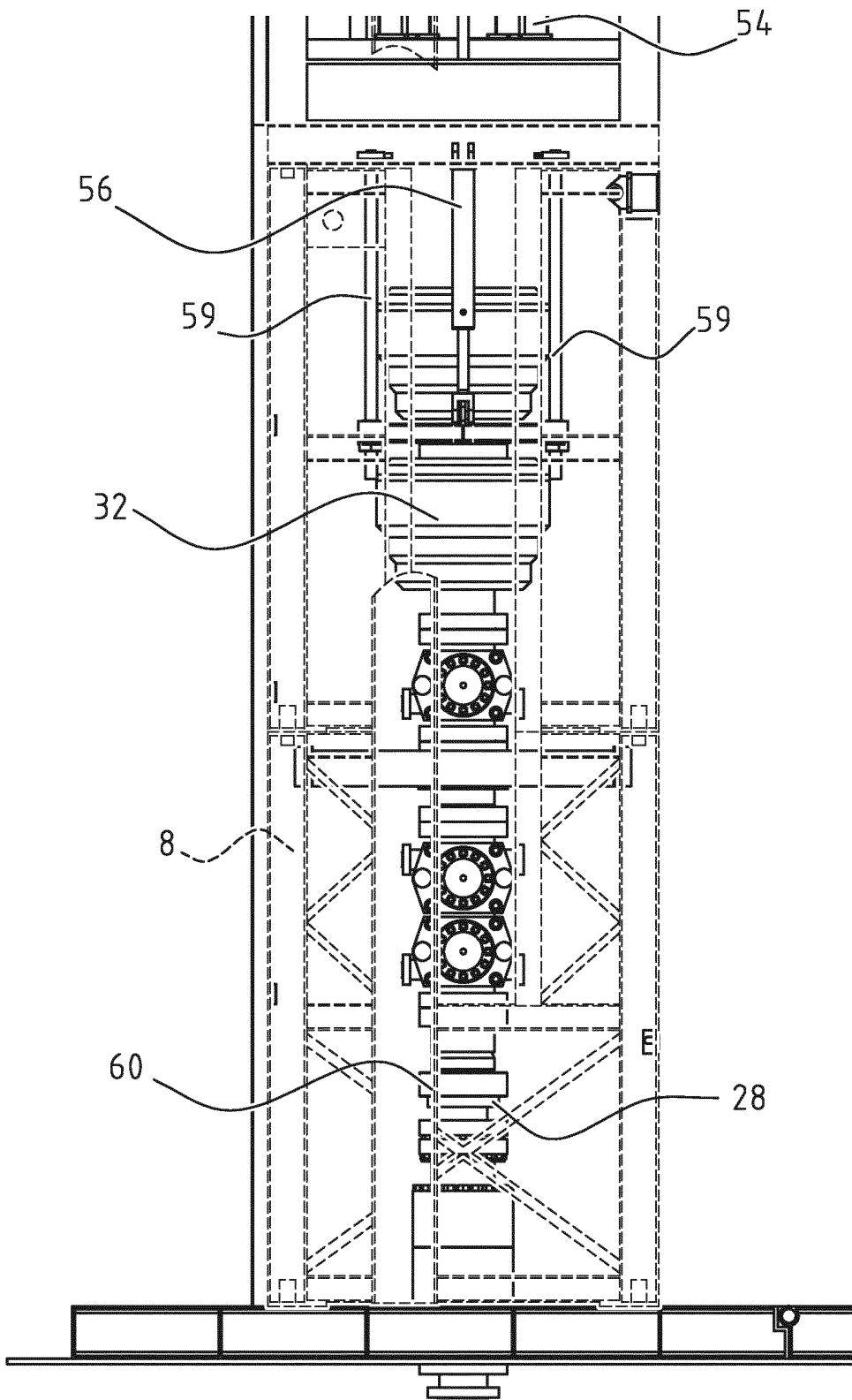


FIG. 8B

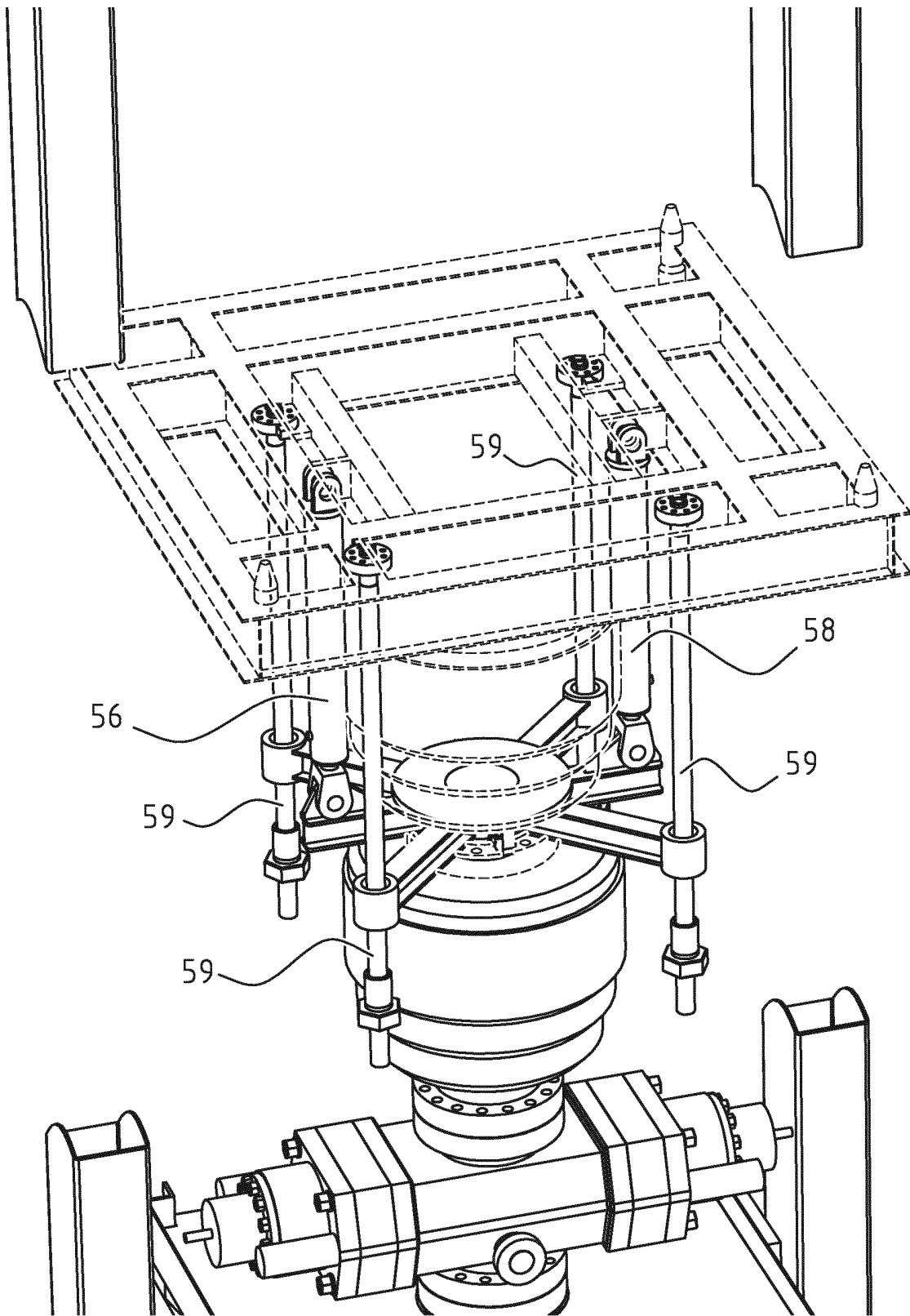


FIG. 9

ABSTRACT

The present invention relates to a workover unit or hydraulic workover unit, mobile workover unit, and method for providing a workover unit. The workover unit according to the

5 invention comprises:

- a basic structure;
- a BOP-stack provided in the basic structure; and
- a skidding system configured for positioning the basic structure being in an upright working position over a wellhead.

SAMENWERKINGSVERDRAG (PCT)

RAPPORT BETREFFENDE NIEUWHEIDSONDERZOEK VAN INTERNATIONAAL TYPE

IDENTIFICATIE VAN DE NATIONALE AANVRAGE	KENMERK VAN DE AANVRAGER OF VAN DE GEMACHTIGDE
	2L/2RR84/mvd-1
Nederlands aanvraag nr.	Indieningsdatum
2014867	27-05-2015
	Ingeleverde voorrangsdatum
Aanvrager (Naam)	
Well Gear Group B.V.	
Datum van het verzoek voor een onderzoek van internationaal type	Door de instantie voor Internationaal Onderzoek aan het verzoek voor een onderzoek van internationaal type toegekend nr.
15-08-2015	SN64695
I. CLASSIFICATIE VAN HET ONDERWERP (bij toepassing van verschillende classificaties, alle classificatiesymbolen opgeven)	
Volgens de internationale classificatie (IPC)	
E21B33/068;E21B15/00	
II. ONDERZOCHETE GEBIEDEN VAN DE TECHNIEK	
Onderzochte minimumdocumentatie	
Classificatiesysteem	Classificatiesymbolen
IPC	E21B
Onderzochte andere documentatie dan de minimum documentatie, voor zover dergelijke documenten in de onderzochte gebieden zijn opgenomen:	
III.	GEEN ONDERZOEK MOGELIJK VOOR BEPAALDE CONCLUSIES (opmerkingen op aanvullingsblad)
IV.	GEBREK AAN EENHEID VAN UITVINDING (opmerkingen op aanvullingsblad)

**ONDERZOEKSRAPPORT BETREFFENDE HET
RESULTAAT VAN HET ONDERZOEK NAAR DE STAND
VAN DE TECHNIEK VAN HET INTERNATIONALE TYPE**

Nummer van het verzoek om een onderzoek naar
de stand van de techniek

NL 2014867

A. CLASSIFICATIE VAN HET ONDERWERP

INV. E21833/068 E21B15/00
ADD.

Volgens de Internationale Classificatie van octrooien (IPC) of zowel volgens de nationale classificatie als volgens de IPC.

B. ONDERZOCHE GEBIEDEN VAN DE TECHNIEK

Onderzochte minimum documentatie (klassificatie gevolgd door classificatiesymbool)

E21B

Onderzochte andere documentatie dan de minimum documentatie, voor dergelijke documenten, voor zover dergelijke documenten in de onderzochte gebieden zijn opgenomen

Tijdens het onderzoek geraadpleegde elektronische gegevensbestanden (naam van de gegevensbestanden en, waar uitvoerbaar, gebruikte trefwoorden)

EPO-Internal, WPI Data

C. VAN BELANGS GEACHTE DOCUMENTEN

Categorie *	Gesceerde documenten, eventueel met aanduiding van opmerking van belang zijnde passages	Van belang voor conclusie nr.
X	WO 2004/005666 A1 (SCHLUMBERGER CA LTD [CA]; SCHLUMBERGER SERVICES PETROL [FR]; SCHLUMBER) 15 januari 2004 (2004-01-15)	1-5,8-11
Y	* alinea [0049]; figuur 20 * * het gehele document * * alinea [0015]; figuur 7 * -----	7
X	WO 99/27222 A1 (MERCUR SUBSEA PRODUCTS AS [NO]; MOEKSVOLD HARALD [NO]) 3 juni 1999 (1999-06-03) * het gehele document * * offshore *	1-6,8-12
Y	US 4 119 297 A (GUNTHER ALBERT W) 10 oktober 1978 (1978-10-10) * kolom 5, regels 57-64; conclusie 1; figuur 1 * * het gehele document * -----	7
	- / - -	

Verder documenten worden vermeld in het vervolg van vak C.

Leden van dezelfde octroofamilie zijn vermeld in een bijlage

*** Speciale categorieën van aangehaalde documenten**

"A" niet tot de categorie X of Y behorende literatuur die de stand van de techniek beschrijft

"D" in de octrooiaanvraag vermeld

"E" eerdere ontwerp(ausvinding), gepubliceerd op of na de indieningsdatum, waarin dezelfde uitvinding wordt beschreven

"L" om andere redenen vermeldde literatuur

"O" met schriftelijke stand van de techniek

"P" tussen de voortgangdatum en de indieningsdatum gepubliceerde literatuur

"T" na de indieningsdatum of de voortgangdatum gepubliceerde literatuur die niet bezwaarlijk is voor de octrooiaanvraag, maar wordt vermeld ter verheldering van de theorie of het principe dat ten grondslag ligt aan de uitvinding

"X" de conclusie wordt als niet nieuw of niet inventief beschouwd ten opzichte van deze literatuur

"Y" de conclusie wordt als niet inventief beschouwd ten opzichte van de combinatie van deze literatuur met andere gesceerde literatuur van dezelfde categorie, waarbij de combinatie voor de vakman voor de hand liggend wordt geacht

"Z" lid van dezelfde octroofamilie of overeenkomstige octrooipublicatie

Datum waarop het onderzoek naar de stand van de techniek van internationaal type werd voltooid

1 februari 2016

Verzenddatum van het rapport van het onderzoek naar de stand van de techniek van internationaal type

Naam en adres van de instantie

European Patent Office, P.B. 2818 Patentlaan 2
NL - 2280 HV Rijswijk
Tel. (+31-70) 340-2040
Fax: (+31-70) 340-3218

De bevoegde ambtenaar

van Berlo, André

1

**ONDERZOEKSRAPPORT BETREFFENDE HET
 RESULTAAT VAN HET ONDERZOEK NAAR DE STAND
 VAN DE TECHNIEK VAN HET INTERNATIONALE TYPE**

Nummer van het verzoek om een onderzoek naar
 de stand van de techniek

NL 2014867

C (Verzoek) VAN BELANG GEACHTE DOCUMENTEN

Categorie *	Geacheerde documenten, eventueel met aanduiding van specifiek van belang zijnde passages	Van belang voor conclusie nr.
A	US 2010/193179 A1 (TUCKEN BRIAN [CA]) 5 augustus 2010 (2010-08-05) * alinea [0023]; figuren 8-11 * * het gehele document * -----	7
A	WO 99/67502 A1 (VIBRATION TECHNOLOGY LLC [US]; BERNAT HENRY A [US]) 29 december 1999 (1999-12-29) * figuren 3,4 * * het gehele document * -----	7
A	US 2007/193749 A1 (FOLK STEVE [CA]) 23 augustus 2007 (2007-08-23) * alinea [0084]; figuren 18,19,29 * * het gehele document * -----	7

**ONDERZOEKSRAPPORT BETREFFENDE HET
RESULTAAT VAN HET ONDERZOEK NAAR DE STAND
VAN DE TECHNIEK VAN HET INTERNATIONALE TYPE**

informatie over leden van dezelfde octrooifamilie

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In het rapport genoemd octrooigezinslid	Datum van publicatie	Overeenkomstige geschrift(en)	Datum van publicatie
WO 2004005666	A1	15-01-2004	AT 347020 T 15-12-2006
			AU 2003238029 A1 23-01-2004
			BR 0311917 A 29-03-2005
			CA 2491920 A1 15-01-2004
			DE 60310079 T2 05-07-2007
			DK 1520082 T3 26-03-2007
			EP 1520082 A1 06-04-2005
			NO 328193 B1 04-01-2010
			US 2003221822 A1 04-12-2003
			WO 2004005666 A1 15-01-2004

WO 9927222	A1	03-06-1999	GEEN
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US 4119297	A	10-10-1978	GEEN
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US 2010193179	A1	05-08-2010	CA 2652068 A1 30-07-2010
			US 2010193179 A1 05-08-2010
			US 2014174718 A1 26-06-2014
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WO 9967502	A1	29-12-1999	AT 311521 T 15-12-2005
			AU 4698699 A 10-01-2000
			CA 2335910 A1 29-12-1999
			DE 69928666 D1 05-01-2006
			EP 1090206 A1 11-04-2001
			NO 20006562 A 20-02-2001
			US 6412560 B1 02-07-2002
			WO 9967502 A1 29-12-1999
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US 2007193749	A1	23-08-2007	GEEN
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WRITTEN OPINION

File No. SN64695	Filing date (day/month/year) 27.05.2015	Priority date (day/month/year)	Application No. NL2014867
International Patent Classification (IPC) INV. E21B33/068 E21B15/00			
Applicant Well Gear Group B.V.			

This opinion contains indications relating to the following items:

- Box No. I Basis of the opinion
- Box No. II Priority
- Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- Box No. IV Lack of unity of invention
- Box No. V Reasoned statement with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- Box No. VI Certain documents cited
- Box No. VII Certain defects in the application
- Box No. VIII Certain observations on the application

	Examiner van Berlo, André
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WRITTEN OPINION

Box No. I Basis of this opinion

1. This opinion has been established on the basis of the latest set of claims filed before the start of the search.
2. With regard to any **nucleotide and/or amino acid sequence** disclosed in the application and necessary to the claimed invention, this opinion has been established on the basis of:
 - a. type of material:
 - a sequence listing
 - table(s) related to the sequence listing
 - b. format of material:
 - on paper
 - in electronic form
 - c. time of filing/furnishing:
 - contained in the application as filed.
 - filed together with the application in electronic form.
 - furnished subsequently for the purposes of search.
3. In addition, in the case that more than one version or copy of a sequence listing and/or table relating thereto has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that in the application as filed or does not go beyond the application as filed, as appropriate, were furnished.
4. Additional comments:

Box No. V Reasoned statement with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty	Yes: Claims	7
	No: Claims	1-6, 8-12
Inventive step	Yes: Claims	
	No: Claims	1-12
Industrial applicability	Yes: Claims	1-12
	No: Claims	

2. Citations and explanations

see separate sheet

Re Item V

Reasoned statement with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

Reference is made to the following documents:

- D1 WO 2004/005666 A1 (SCHLUMBERGER CA LTD [CA]; SCHLUMBERGER SERVICES PETROL [FR]; SCHLUMBER) 15 januari 2004 (2004-01-15)
- D2 WO 99/27222 A1 (MERCUR SUBSEA PRODUCTS AS [NO]; MOEKSVOLD HARALD [NO]) 3 juni 1999 (1999-06-03)
- D3 US 4 119 297 A (GUNTHER ALBERT W) 10 oktober 1978 (1978-10-10)
- D4 US 2010/193179 A1 (TUCKEN BRIAN [CA]) 5 augustus 2010 (2010-08-05)
- D5 WO 99/67502 A1 (VIBRATION TECHNOLOGY LLC [US]; BERNAT HENRY A [US]) 29 december 1999 (1999-12-29)
- D6 US 2007/193749 A1 (FOLK STEVE [CA]) 23 augustus 2007 (2007-08-23)

1.1 The present application does not meet the criteria of patentability, because the subject-matter of claim 1 is not new.

1.2 The document D1 discloses (references applying to this document):

Workover eenheid, omvattende:

- een basis structuur (52);
- een BOP-stack (18) voorzien in de basis structuur; en
- een skidding systeem (10) geconfigureerd voor het positioneren van de basis structuur die is gebracht in een opgerichte werkpositie over een bron (see fig 20).

2. The same reasoning applies, mutatis mutandis, to the subject-matter of the corresponding independent claim 9, which therefore is also considered not new.

3.1 Dependent claims 2-8 and 10-12 do not contain any features which, in combination with the features of any claim to which they refer, meet the requirements of novelty and/or inventive step, see the documents D1-D6.

3.2 With regards to the subject-matter of claim 7, the document D3 is cited as YY-document in the search report, because it specifically mentions the pre-tensioning. It is however noted that also the further cited documents D4-D6 show hydraulic snubbing systems, with which can be pushed towards the BOP. These documents also make the subject-matter of claim 7 non-inventive.

4. The following remarks are made furthermore:

- No documents, such as D1-D4, reflecting the prior art are identified in the description.
- The independent claims are not in the two-part form in accordance with, with those features known in combination from the prior art being placed in the preamble and with only the remaining features, which form the contribution over said prior art, being included in the characterising part.
- The features of the claims are not provided with reference signs placed in parentheses.