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(71) Applicant: **Vetco Gray Inc.**
Houston, TX 77041 (US)

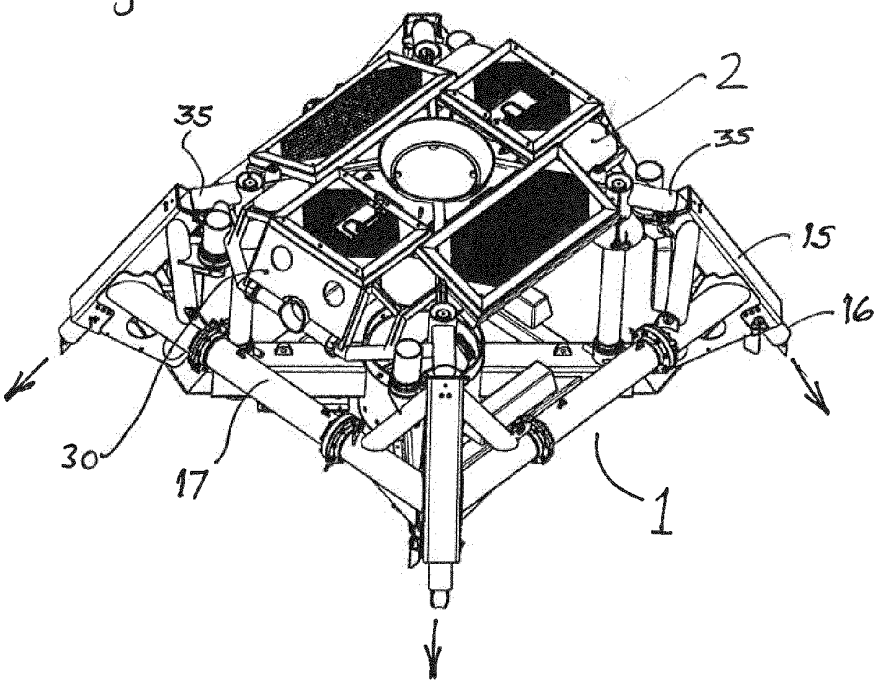
(72) Inventor: **Ude, Nnamdi Cyril**
Aberdeen AB23 8GD (GB)

(74) Representative: **Emerson, Peter James et al**
Page Hargrave
Whitefriars
Lewins Mead
Bristol BS1 2NT (GB)

(54) **Subsea wellhead protection structure, canopy and installation**

(57) A subsea wellhead protection structure (WPS) comprises a base frame (1) and a removable canopy (2), the base frame providing a protected space for a subsea wellhead when in use, the canopy being adapted to engage the base frame and provide cover over the protected space. The base frame and canopy incorporate a plurality of locking means each comprising a locking pin (19) and corresponding locking sleeve (21), which are adapted to engage and disengage under opposite loading, requiring a lower load for a locking sleeve (21) to lock onto a locking pin (19) than to disengage therefrom. The WPS may additionally incorporate leg housings (15) for telescopic legs (16) with a mechanical release mechanism (41, 42a, 42b, 43) actuated by the weight of the canopy to allow the telescopic legs (16) to extend under their own weight. The canopy (2) may incorporate a door latching mechanism (31) comprising a handle bar with two differently sized and weighted arms (31b, 31c), and handle (31a) and a first latching element (31d) adapted to engage a corresponding second latching element (37) on the canopy frame.

Fig.11



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Description

Field of the Invention

[0001] This invention relates to a subsea wellhead protection structure ("WPS") including a canopy adapted to be locked and unlocked from above a subsea wellhead.

Background to the Invention

[0002] In order to protect subsea wellheads from potential snagging and damage, for example, from trawlers pulling nets or boats dragging anchors, it is common practice to install a defensive WPS frame around the subsea wellhead and to place a canopy over the wellhead itself. The WPS canopy needs to be able to resist accidental detachment, but must allow for access for servicing of the wellhead Christmas tree fittings and must be removable for workover purposes. Typically, heretofore, a WPS canopy requires divers or a remotely operated vehicle ("ROV") for installation and removal.

Summary of the Invention

[0003] The present invention is directed at providing improvements to WPS canopy design, which avoid the requirement for diver or ROV intervention during installation. The improvements may comprise one or more of the following features, including: a biased mechanical locking system to allow automatic locking of the canopy in position or installation, and unlocking under a predetermined over-pull; a facility for automatically deploying overtrawlable legs from the WPS on installation of the canopy; a single point locking/unlocking and lift mechanism for operating service access doors in the canopy.

[0004] In a first aspect, the invention provides a subsea WPS comprising a base frame and a removable canopy, the base frame defines a protected space for a subsea wellhead when in use, the canopy being adapted to engage the base frame and to provide cover over the protected space, and the base frame and canopy are provided with a plurality of locking means comprising respectively, corresponding locking pins and locking sleeves which are adapted to engage and disengage under opposite loading, and to require a lower load to lock the canopy onto the base frame than to disengage therefrom. Typically, at least two sets of locking means are used to lock the canopy to the base frame across the protected space. Providing locking means adapted to have differential loading levels for engagement and disengagement facilitates the ease of installation of the canopy and the design of the canopy to meet desired performance standards against accidental detachment of the canopy in circumstances such as overtrawling. The locking pins may be provided on the base frame, with the corresponding locking sleeves being located on the canopy, or vice-versa. Alternatively, the base frame may have one or more locking pins and one or more locking sleeves with the canopy having one or more corresponding locking sleeves and corresponding locking pins. Such a mixed arrangement may be used, for example, to ensure the canopy can only be locked to the base frame in a specific orientation.

[0005] Conveniently, the locking pins have first and second differential taper sections to engage the corresponding locking sleeves, the first taper section tapers in towards the tip of the locking pin and the second taper section tapers in towards the base of the pin. The first taper section is at first taper angle and the second taper section is at a second taper angle relative to the plane normal to the pin axis. The first taper angle is higher than the second taper angle. The locking sleeves are provided with engagement means to engage the taper sections of the locking pins. Having the respective taper sections effectively reversed (the first tapering in towards the tip and the second tapering in towards the base of the pin, and with differential taper angles, means that desired differential loading levels for engagement and disengagement can be achieved by appropriately selecting the respective taper angles.

[0006] Further, the engagement means conveniently comprise one or more spring-loaded latching-dogs, which are forced against the taper sections of the locking pins in use. The spring-loading of these dogs may be provided by a C-spring, which can be conveniently positioned around part of the circumference of the locking sleeve and adapted to spring-load one, two or more dogs against an inserted locking pin in use.

[0007] For a typical subsea WPS, the first taper angle may be in the range from 60° to 80° for a steel on steel pin and sleeve locking system and the second taper angle may be in the range from 24° to 30° to require a suitably high loading for disengaging the canopy from the base frame. Preferably, the first taper angle is approximately 75° and the second taper angle is approximately 25°.

[0008] In a second aspect, the present invention further provides a WPS base frame which incorporates at least one leg housing for a telescopic leg having a mechanical release mechanism which is actuated by the weight of the canopy being transmitted onto the mechanism, thereby to allow the telescopic leg to extend under its own weight. Telescopic legs are useful on a WPS as they can automatically adapt to differences in levels of the seabed around the WPS when installed.

[0009] Providing an automated mechanism to deploy supporting legs on a WPS has the significant advantage of avoiding the need for diver or ROV intervention to release the telescopic legs. Conveniently, the release mechanism may comprise a retaining pin which holds the telescopic leg in the housing, the retaining pin being connected to a lever crank, which is actuated to disengage the retaining pin when the weight of the canopy is transmitted onto the lever crank. Typically, the weight of the canopy can be transmitted though a landing arm provided on the canopy and positioned to engage a leg housing and the respective release mechanism.

[0010] In a further aspect, the invention provides a door latching mechanism for an access door hinged to a WPS canopy frame along one edge of the door. The door latching mechanism comprises a handle bar with two arms, the bar being hinged at the junction of the two arms, about a hinge point on the edge of the door opposite the hinged edge, the first arm being longer and heavier than the second arm, a handle is attached to the end of the first arm away from the hinge point, and a first latching element is provided at the end of the second arm, the first latching element being adapted to engage a corresponding second latching element provided on the canopy frame.

[0011] Providing a door latching mechanism with a handle bar with differential arm lengths and weights has an advantage that the mechanism is thereby biased into the locked position and is resistant to accidental release. Conversely, when intentionally operated via the handle the leverage provided by the longer arm makes it relatively easier and quicker for a diver to release the door latching mechanism when required.

[0012] Conveniently, the first latching element may comprise a locking bar extending perpendicular to the axis of the handle bar and the second latching element is a corresponding slot in the canopy frame, adapted to receive the locking bar. Alternatively, the first latching element may comprise a hook and the second latching element a corresponding eye on the canopy frame to receive the hook. Other suitable adaptations will be apparent to those skilled in the art.

Brief Description of the Drawings

[0013]

Fig. 1 is a perspective view of a WPS base frame adapted according to the invention;

Fig. 2 is a plan view of the same WPS base frame;

Fig. 3 is a side elevational view of a WPS canopy according to the invention;

Fig. 4 is a corresponding side elevational view (partially in section) of the WPS base frame;

Fig. 5 is a partial cross-sectional view of a locking sleeve on the canopy engaging with a guide post on the WPS base frame;

Fig. 6 is a partial horizontal cross-sectional view illustrating the locking mechanism;

Fig. 7 is a perspective view of a WPS canopy according to the invention;

Fig. 8 is a plan view of the WPS canopy of Fig. 7;

Fig. 9 is a partial cutaway view of one corner of the WPS base frame of Fig. 1;

Fig. 10 is a cross-sectional view of the leg housing along D-D of Fig. 2;

Fig. 11 is a perspective view of the WPS canopy landed on the corresponding WPS base frame;

Fig. 12 is a plan view of the assembly of Fig. 11;

Fig. 13 is a side elevational view (partially in section) of the same assembly;

Fig. 14 is a side elevational view (partially in section) of the WPS canopy, showing one of the access doors in open position, with a small plan view of the door latching mechanism in Fig. 14a; and

Fig. 15 is a perspective view of the WPS canopy, with one of the access doors likewise shown in open position.

Detailed Description of the Invention

[0014] Figure 1 shows a perspective view of a WPS base frame 1 adapted according to the invention.

[0015] Figure 2 is a plan view of the same base frame 1. The frame comprises a cylindrical, central support element 11 with a flared skirt 12. This central support element is located around the subsea wellhead (not shown) at seafloor level. Four arms 13 extend radially from the central support 11, each arm being set at right angles with respect to each adjacent arm. The arms 13 are each connected to a corner frame 14, each comprising a leg housing 15 for an extensible telescopic leg 16. The corner frames 14 are designed to be set at an adjustable radial distance from the central support element 11 and are each provided with an inner arm 13a which can be slid in or out of the arms 13 to the desired extent, and fixed during construction of the base frame 1, so that the overall width of the base frame can thereby be adapted to accommodate wellhead Christmas tree structures. The four corner frames 14 are then connected by bumper bars 17 of appropriate length for the desired overall frame size.

[0016] As shown, the base frame includes four guide posts 18, one extending vertically upwards from each of the arms 13. Each corner frame 14 has an upwardly tapering locking pin 19, with a biased profile (see Figure 5), which is adapted to engage a corresponding locking sleeve 21 on the WPS canopy 2 of Figure 3.

[0017] Figure 3 shows a side elevational view of a WPS canopy 2 according to the invention, aligned in conjunction with a corresponding side elevational view in Figure 4 of the base frame 1, with a partial sectional view along V-V from Figure 2. In deployment, the canopy 2 is conveniently lowered on to the WPS base frame using a conventional, positive-locking J-tool as a running tool for this purpose. In operation, the locking sleeves 21 engage the locking pins 19. As shown in partial cross-section in Figures 5 and 6, the biased (or differential) taper profile of the top of each locking pin 19, means that there is a substantial difference between the load required to lock on each locking pin and that required to unlock, or disengage, from each locking pin.

[0018] The locking sleeve 21 incorporates latching-dogs 22, which are biased against the locking pin 19 by C-spring 23 and held in place by latch-dog screws 24. Override screws 25 are provided at either end of the C-spring 23. These screws 25 provide means for manually releasing the locking sleeve 21 from the locking pin 19 if necessary. An eye bolt 26 is shown on the top of the

guide post 19. This may be used for assembly onto the base frame 1. On engagement of the locking sleeve 21, the detaching-dogs 22 follow the steeper taper 19a until they latch over the circumferential rib 20, where the guide post 19 is of maximum diameter. Theoretically, for a 75° taper angle 19a relative to the plane normal to the pin axis (as illustrated), the calculated load required to overcome the friction arising from the C-spring 23 forcing the latching-dogs 22 against a guide post, is about 0.6 tonnes for the illustrated design. As the total weight of the canopy 2 is around 3.5 tonnes, this would allow the canopy to provide sufficient locking load under its own weight to achieve locking on the four locking pins 19 shown. Conversely, the lower reverse taper 19b means that a considerably greater force is required to disengage the locking sleeve by forcing the latching-dogs 22 back over the rib 20. For a 25° reverse taper angle 19b relative to the plane normal to the pin axis, a calculated force of approximately 5 tonnes would be required to disengage from each locking pin 19. This would mean an overpull of up to 20 tonnes would be needed to disengage the canopy, which exceeds the specified minimum specific fishing net snag load capacity of 10 tonnes.

[0019] Figure 7 shows a WPS canopy 2 according to the invention in perspective view and Figure 8 shows the same canopy in plan view. The canopy 2 comprises a tubular framework supporting a central annulus 36, upwardly flared for running tool access. A central cover plate 40 is located within the annulus 36 and, as shown, has four equally spaced apertures on the rim where a J-tool can be latched to deploy the canopy 2. Protective rectangular panels 33 are provided on opposite sites of the annulus 36 and two access doors 30 are mounted opposite each other and between the panels 33. The access doors 30 are hinged about end frame members 32 to open outwardly away from the annulus 36. Each door has a single door latch mechanism 31 for unlocking and lifting the door open.

[0020] Guide pods 34 are disposed towards each corner of the canopy 2. These pods have flared conical lower openings, which receive the tops of the guide posts 18. When the canopy 2 is installed on the base frame 1, the pods 34 engage the tops of the guide posts 18 and ensure that the canopy is correctly located as it is lowered onto the base. The locking sleeves 21 operate to latch the canopy 2 onto the base frame 1 (as previously described), but do not have to transfer the entire weight of the canopy onto the locking pins 19.

[0021] Extending outwards from each support pod 34 towards the corners of the canopy 2 are landing arms 35, which are configured to engage the upper ends of each respective leg housing 15. The weight of the canopy 2 is borne by the leg housings 15 supporting each landing arm 35. When each landing arm 35 engages the respective leg housing 15 it activates a leg release mechanism to allow the telescopic legs 16 to be automatically deployed under their own weight. The WPS base frame 1 has four telescopic legs 16, one at each corner, which are designed to extend and to dig into the seabed to stabilise the WPS and provide deflection, and resistance to damage, and to prevent dislodging of the WPS in the event of overtrawling by a fishing net.

[0022] The provision of an automated release mechanism for deployment of the legs has the advantage of avoiding any need for diver or ROV intervention on installation.

[0023] Figures 9, 10 and 11 illustrate the release mechanism and how it operates. Figure 9 is a cutaway view of one corner of the WPS base frame 1. Figure 10 is a sectional view along D-D of Figure 2. Figure 11 is a perspective view showing canopy 2 when landed on the WPS base frame 1. As shown in Figures 9 and 10, the upper end of the leg housing 15 is open and the telescopic legs 16 are initially held inside the housing by a retaining pin 41, which is fitted through one side of the housing and, which is engaged by a lever crank 42, hinged at point 43 at the upper end of the housing. The lever crank 42 has an actuating arm 42a extending into the upper open end of the leg housing 15. This actuating arm 42a is forced down when the corresponding landing arm 35 on the canopy engages the upper end of the leg housing (see Figure 11). This forces the release arm 42b outwards, pulling the retaining pin away and thereby releasing the telescopic legs 16 to deploy themselves under their own weight.

[0024] Figure 12 provides a plan view of the canopy 2 in position on the WPS base frame 1 (with the telescopic legs shown unextended) and Figure 13 is a side elevational view with a partial sectional view along X-X of Figure 12.

[0025] Figure 14 is a side-elevational view, in partial section, and Figure 15 is a perspective view, of the WPS canopy 2 showing one access door 30 hinged into an open position. The access door 30 is hinged about a cross-member 32 of the canopy frame. As shown in side view, the door is shaped like a bent arm. The weight of the door thereby exerts a moment about the hinge, which acts to hold the door closed when it is in the closed position and conversely to hold the door open when it is in the open position. The door latching mechanism 31 is shown in side view in partial section in the main Figure 14 and in partial plan view in Figure 14a. The door latch mechanism 31 comprises a handle 31a (which may be operated by a diver or ROV), attached to one end of a handle bar 31b, 31c, which is hinged to one edge of the door at point 31e. The handle bar is biased, with one longer and heavier arm 31b attached to the handle 31a and one shorter arm 31c on the opposite side of the hinge point 31e. A short locking bar 31d is fixed to the end of the short arm 31c and set perpendicular to the length of the handle bar. This locking bar 31d engages a latching slot 37 (see Figure 15) in the canopy frame to hold the door locked when in the closed position. The upper panel 39 of the door frame has a cutaway portion to allow access to the handle. A cover 38 on the underside of the door frame protects the door latch mechanism on that

side. As shown, the door panel (and other panels on the canopy) can be made of lightweight GRP (glass reinforced plastic) to reduce the overall canopy weight.

[0026] When the door is closed, the differential weights of the handle bar arms 31b, 31c will act to hold the door latched closed. If pressure is applied to the underside of the door frame (e.g. in the splash zone when the canopy is being deployed) the locking bar will also be held in the latched position, ensuring the door can only be released when the handle 31a is raised in normal operation.

[0027] The aspects of the invention have been particularly described with reference to the substantially square design of WPS base shown in the figures. However, it will be apparent to those skilled in the art that there is no limitation to use of the various aspects of the invention in relation to such square bases. A base frame may be circular in place, for example, or of an alternative geometric shape such as a triangle, rectangle or hexagon. The locking pins may all be provided on the corresponding locking sleeves on the base frame and the canopy as shown in the Figures, or vice versa; or alternatively the base frame may have a combination of one or more locking pins and one or more locking sleeves and the canopy have corresponding locking sleeves and locking pins. Such a configuration may be used to ensure that the canopy and the base frame can only be connected in one orientation (e.g. not be rotatable through 180° as with the designs illustrated in the figures). So long as at least two locking pins (and corresponding locking sleeves) are deployed on opposite sides of the wellhead across the frame and canopy, then the automatic canopy locking mechanism of the invention can be conveniently employed.

[0028] Further, supporting legs capable of being automatically deployed in the manner of the present invention can be positioned at any desired point around the base frame if the canopy is provided with corresponding landing arms to operate the release mechanisms for the legs when the canopy is landed on the base frame.

[0029] Further also, use of the canopy door latch mechanism herein is not limited to the particular canopy door design illustrated in the figures.

Claims

1. A subsea wellhead protection structure (WPS) comprising a base frame (1) and a removable canopy (2), the base frame defining a protected space for a subsea wellhead when in use, the canopy being adapted to engage the base frame and to provide cover over the protected space, wherein the base frame and the canopy incorporate a plurality of locking means, each locking means comprising a locking pin (19) and a corresponding locking sleeve (21), the locking pins (19) and locking sleeves (21) being adapted to engage and disengage under opposite loading, and to require a lower load for a locking sleeve (21) to lock on to a locking pin (19) than to disengage therefrom.

2. A WPS according to claim 1, in which the locking pins (19) have first (19a) and second (19b) differential taper sections to engage corresponding locking sleeves (21), the first taper section (19a) tapering in towards the tip of the locking pin at a first taper angle relative to the plane normal to the pin axis and the second taper section (19b) tapering in towards the base of the locking pin at a second taper angle, lower than the said first taper angle, relative to the plane normal to the pin axis, and the locking sleeves (21) include engagement means (22) to engage the taper sections (19a, 19b) of the locking pins (19).

3. A WPS according to claim 2, in which the engagement means comprise one or more spring-loaded latching-dogs (22) in a locking sleeve (21).

4. A WPS according to claim 3, in which the latching-dogs (22) are sprung-loaded by a C-spring (23), which acts to force the latching-dogs against the locking pin taper sections in use.

5. A WPS according to claim 2, 3 or 4, in which the first taper angle is in the range from 60° to 80°, and the second taper angle is in the range from 24° to 30°.

6. A WPS according to claim 5, in which the first taper angle is approximately 75° and the second taper angle is approximately 25°.

7. A WPS according to any preceding claim, in which the base frame (1) incorporates at least one leg housing (15) for a telescopic leg (16) provided with a mechanical release mechanism (41, 42a, 42b, 43) adapted to be actuated by the weight of canopy on the mechanism, to allow the telescopic leg (16) to extend under its own weight.

8. A WPS according to claim 7, in which the mechanical release mechanism comprises a retaining pin (41) to hold the telescopic leg (16) in the leg housing (15), the retaining pin (41) being connected to a lever crank (42), which is actuated to disengage the retaining pin when the weight of the canopy is transmitted on to the lever crank.

9. A WPS according to claim 8, in which the canopy (2) is provided with a landing arm (35) to engage each leg housing (15) and the mechanical release mechanism in each leg housing (15) is actuated by the weight transmitted by each respective landing arm (35).

10. A canopy (2) for a WPS according to any preceding claim, the canopy incorporating an access door

hinged to the canopy frame along one edge of the door and with a door latching mechanism (31) to engage the canopy frame when the door is closed and to disengage therefrom when the door is opened, the door latching mechanism comprising a handle bar having two arms (31b, 31c) hinged at the junction of the two arms about a point (31e) on the edge of the door opposite the hinged edge, the first arm (31b) being longer and heavier than the second arm (31c), a handle (31a) attached to the end of the first arm away from the hinge point (31e) and a first latching element (31d) provided at the end of the second arm (31c), the first latching element (31d) being adapted to engage a corresponding second latching element (37) on the canopy frame.

11. A canopy according to claim 10, in which the first latching element is a locking bar (31d) and the second latching element is a corresponding slot (37) in the canopy frame, adapted to receive the locking bar (31d).

Fig. 1

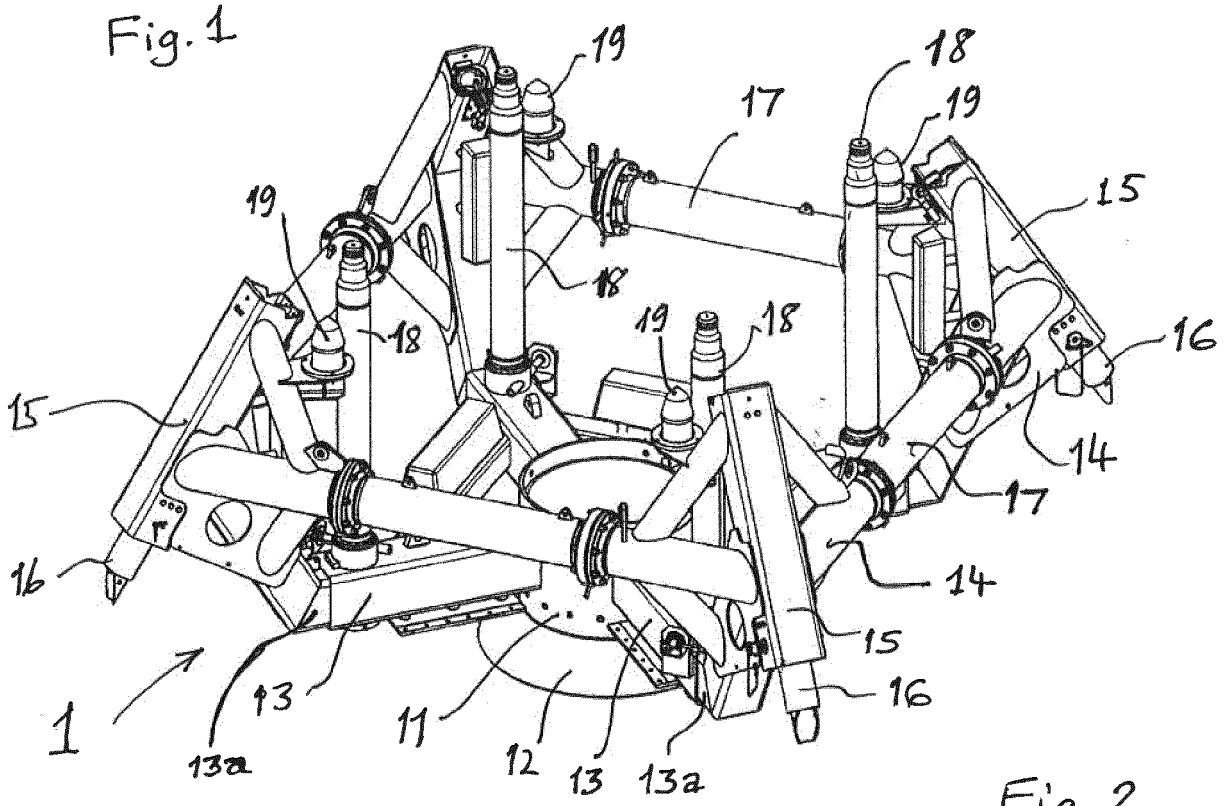
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Fig. 2

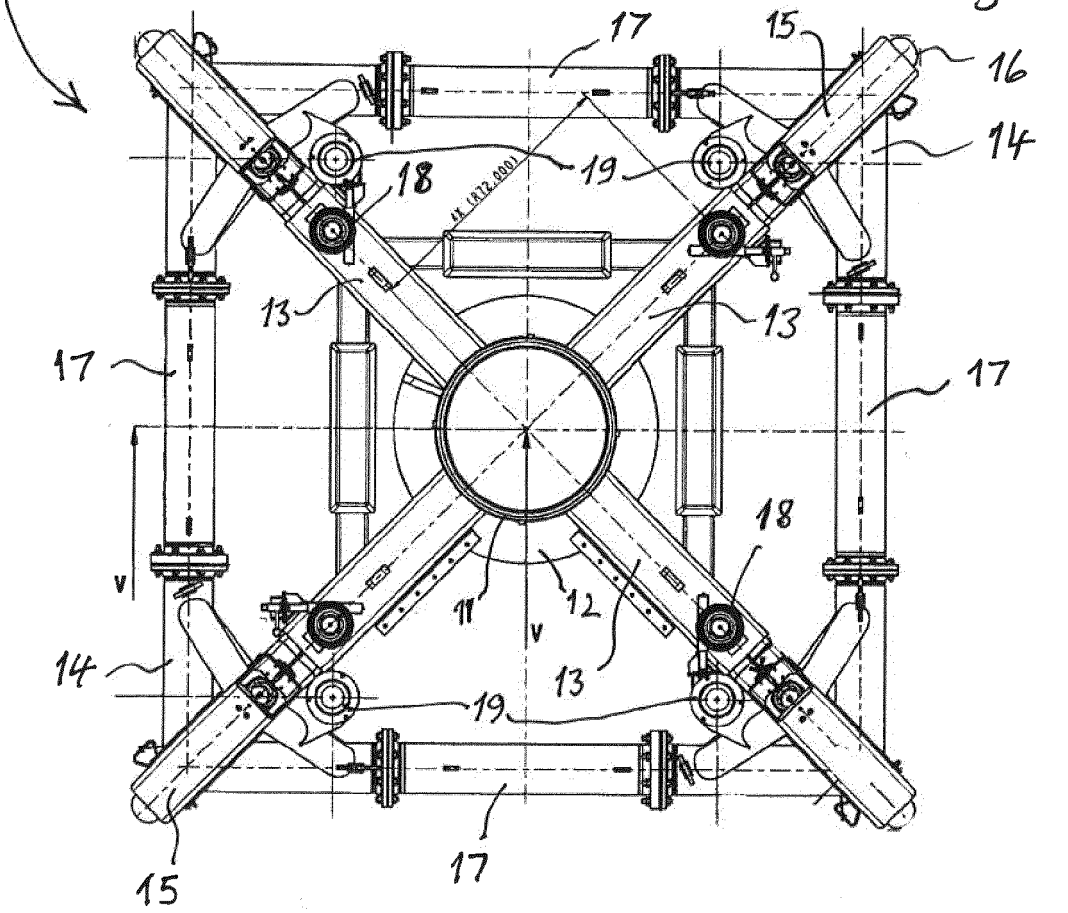
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Fig. 3

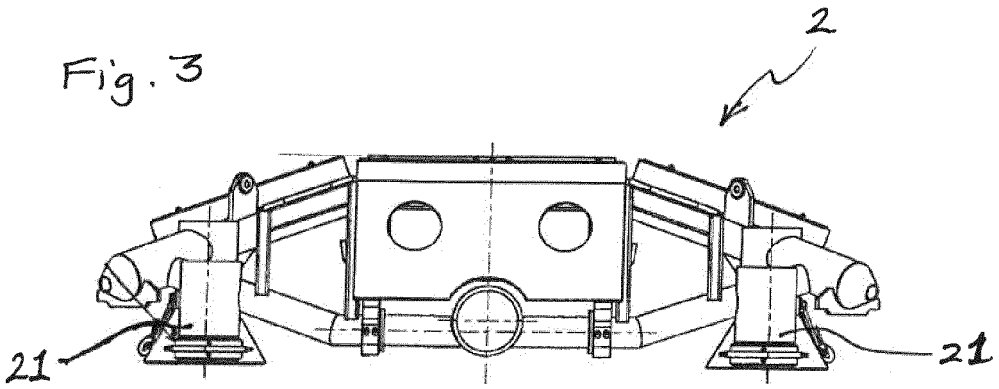

Fig. 4

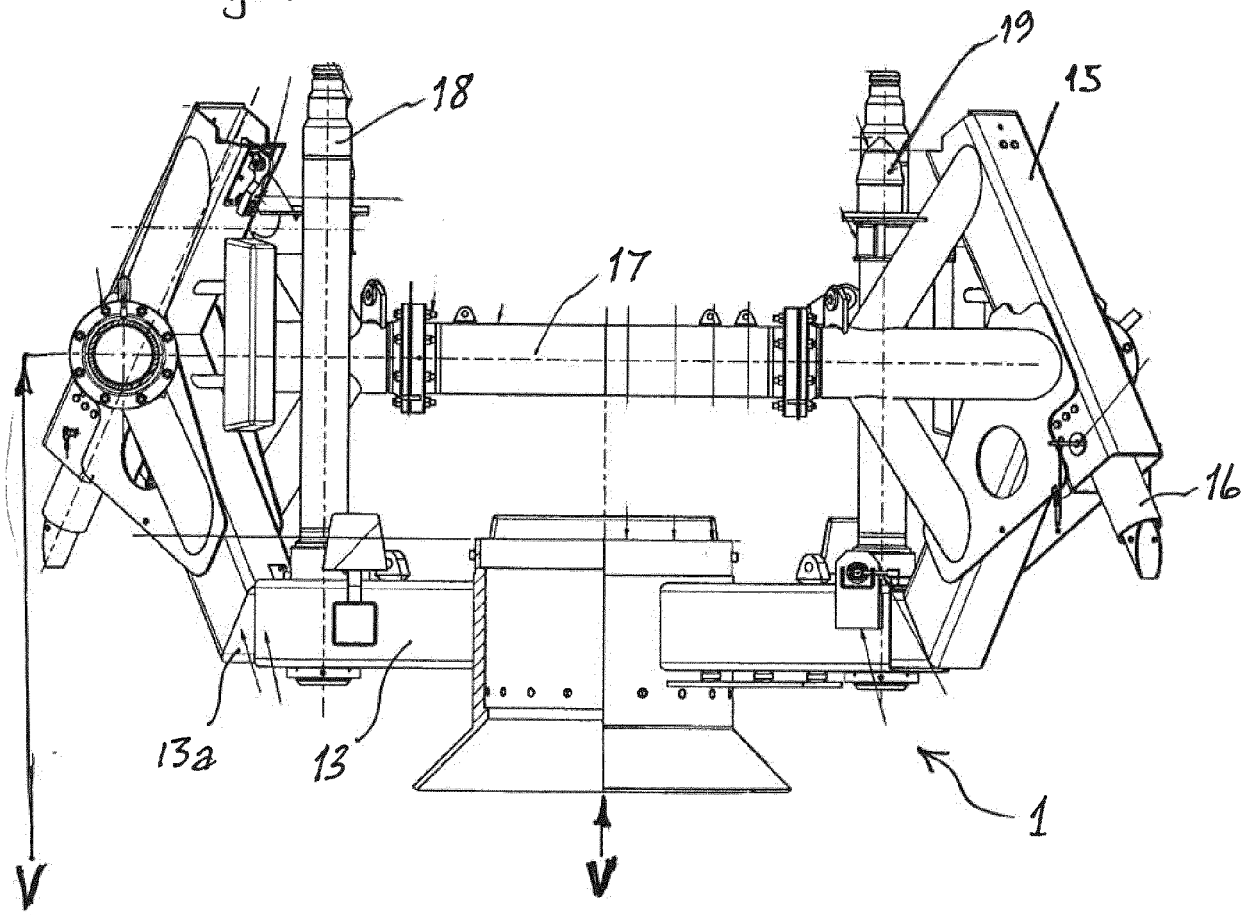

Fig. 5

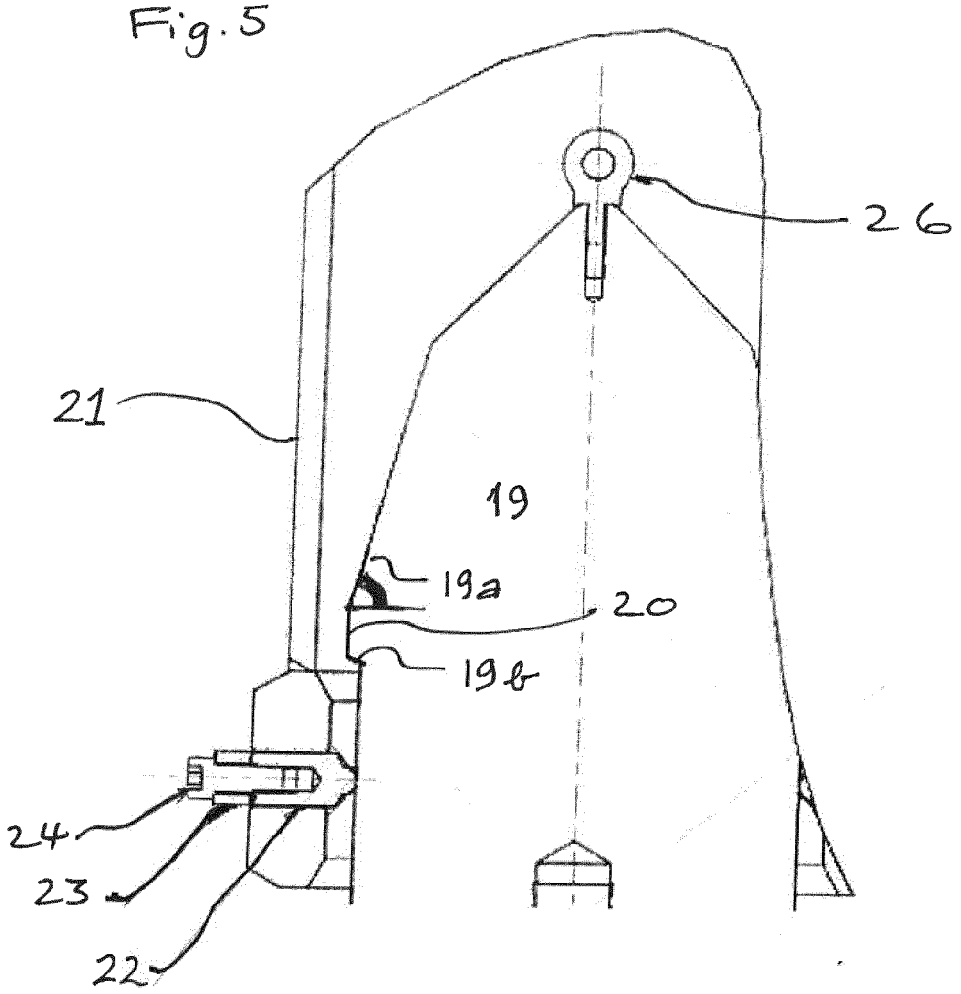

Fig. 6

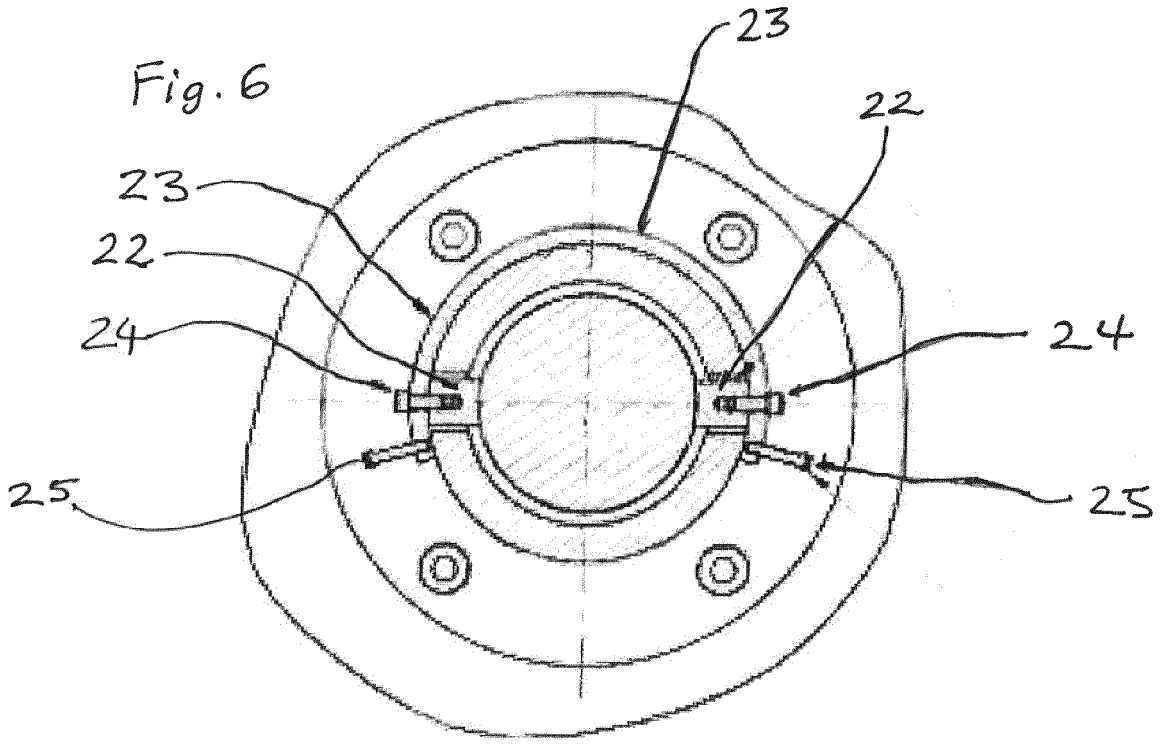

Fig. 7

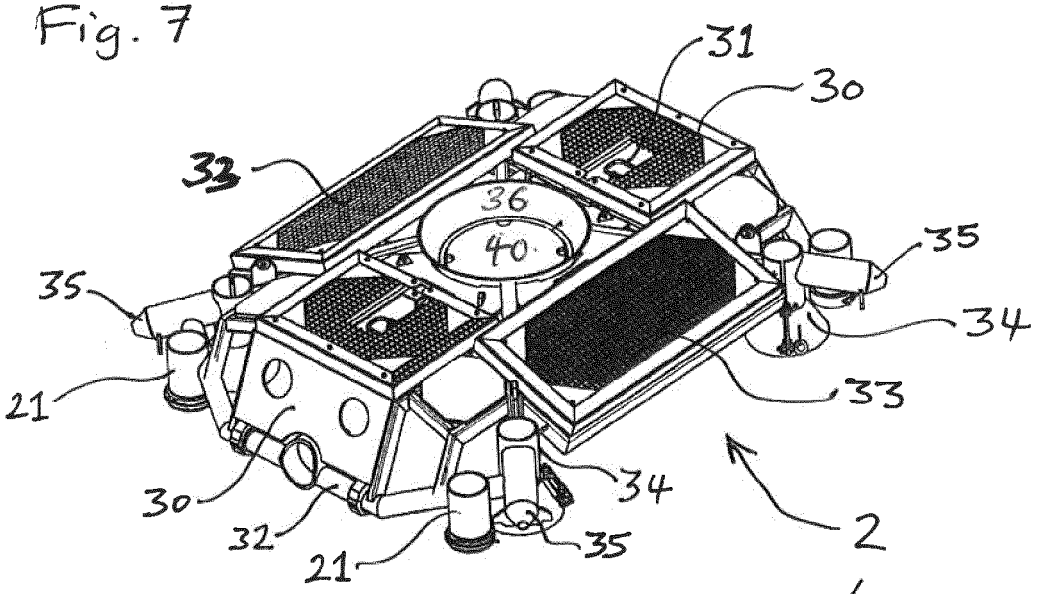
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Fig. 8

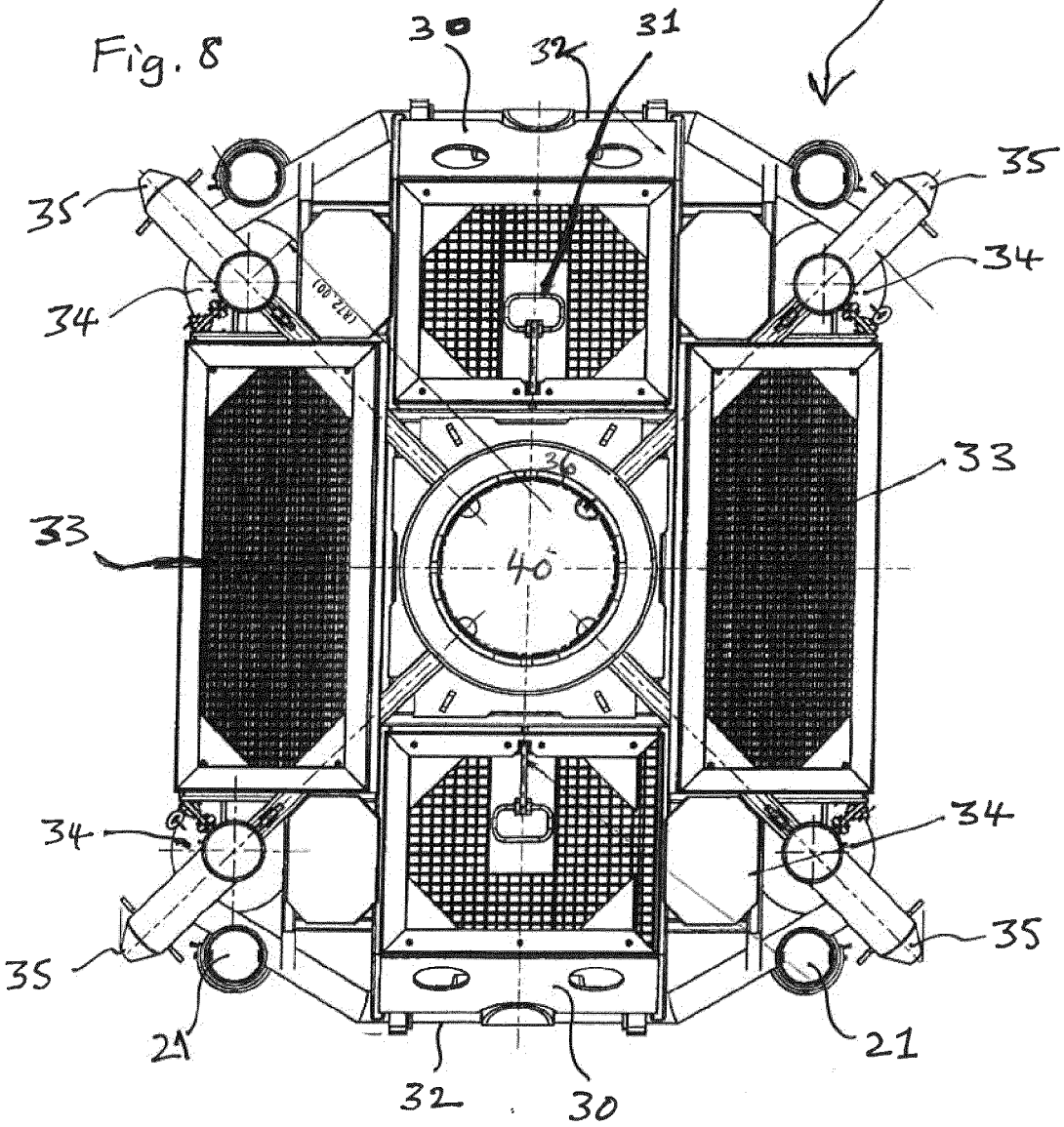
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Fig. 9

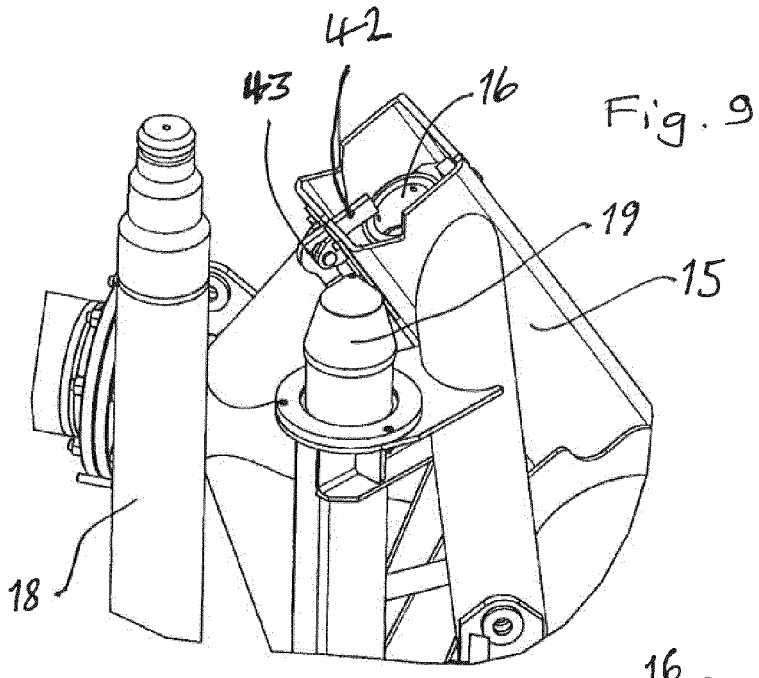


Fig. 10

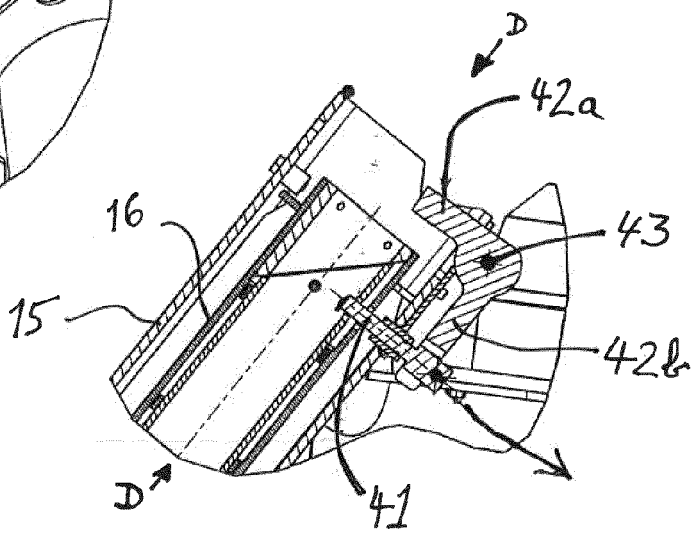


Fig. 11

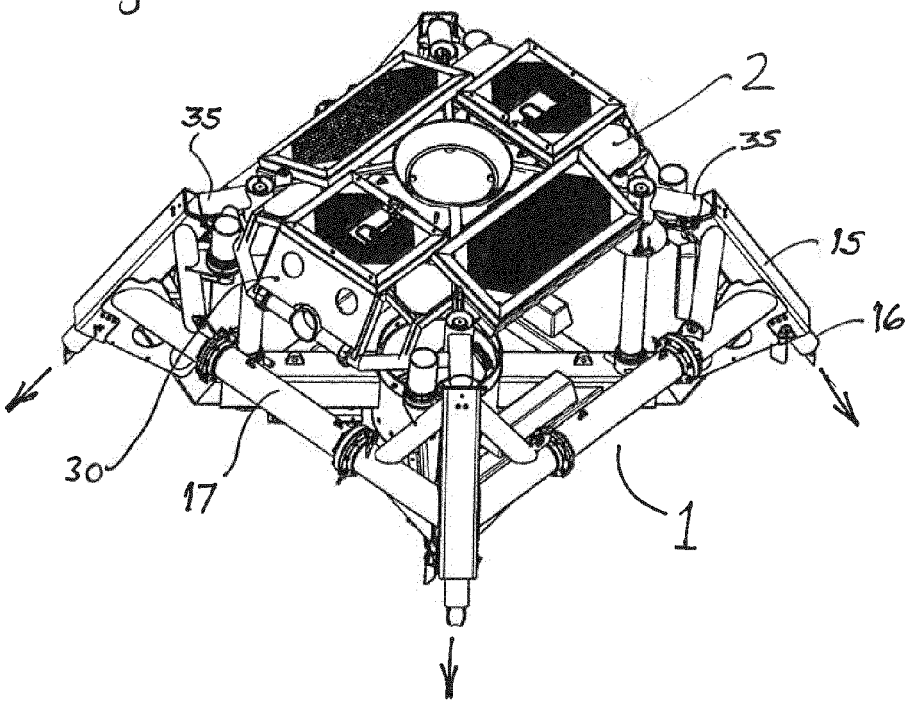


Fig. 12

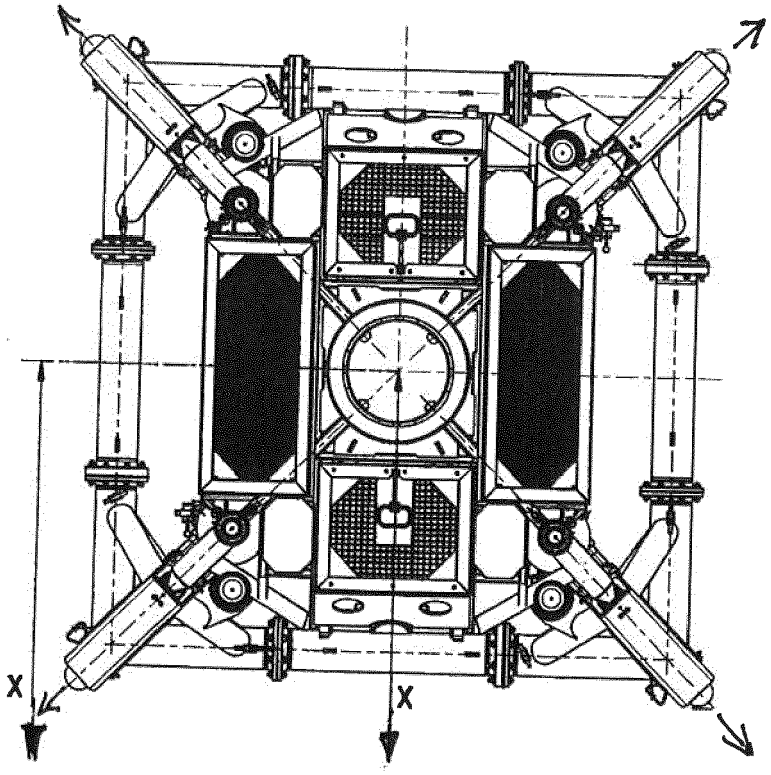
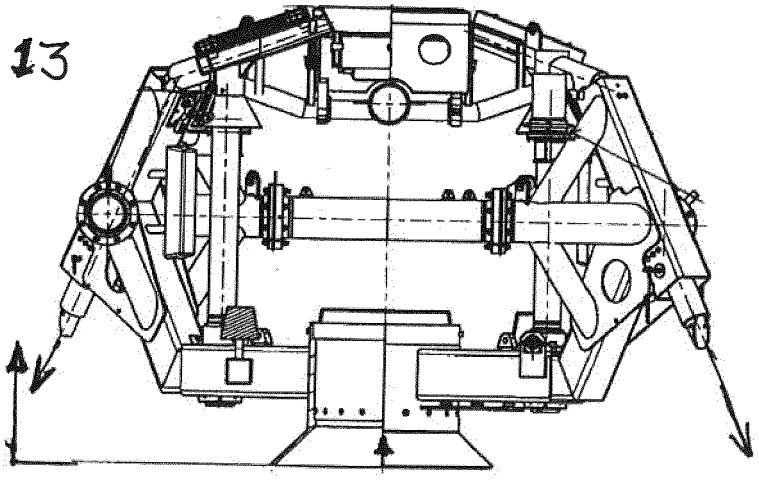


Fig. 13



SECTION X-X

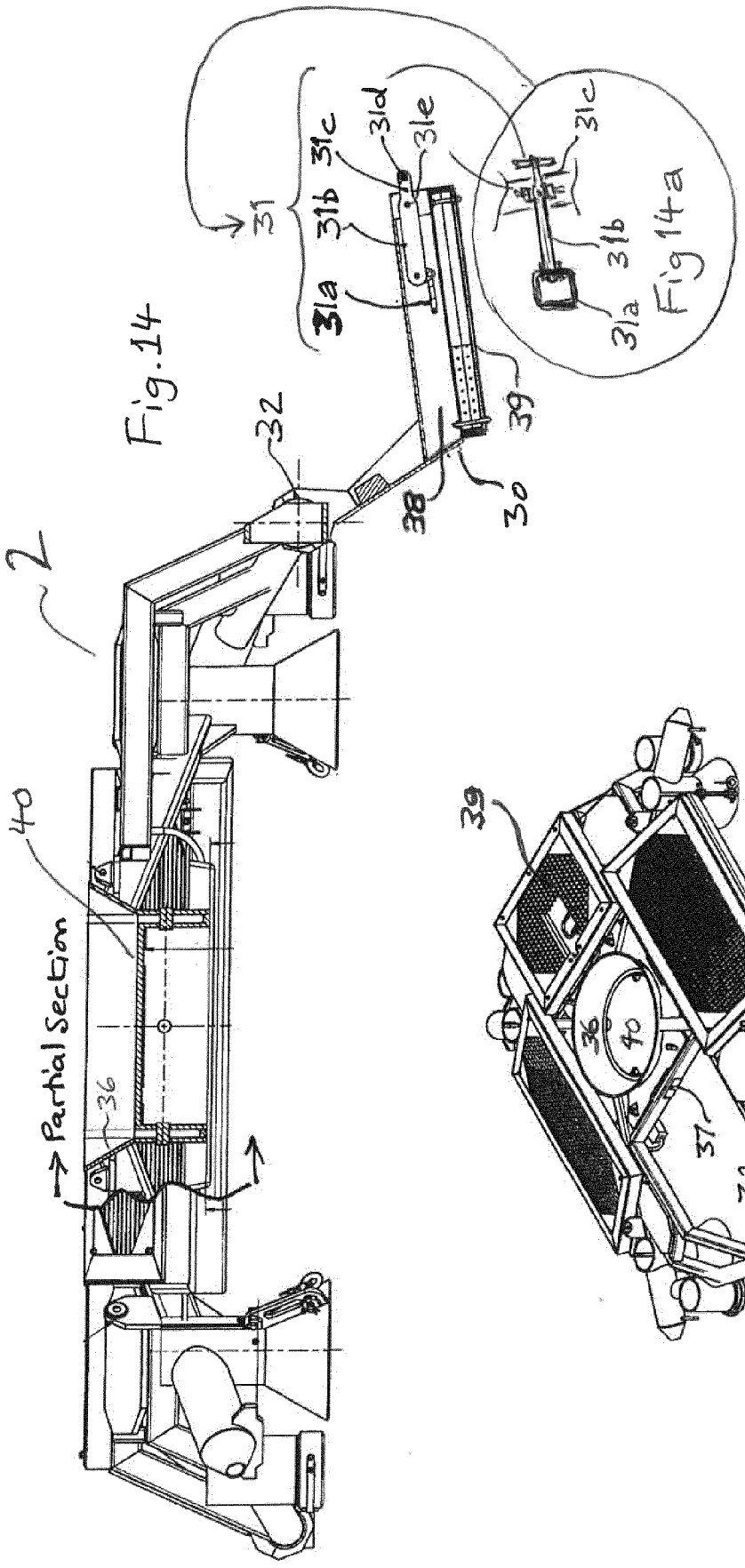


Fig. 14

Fig. 14a

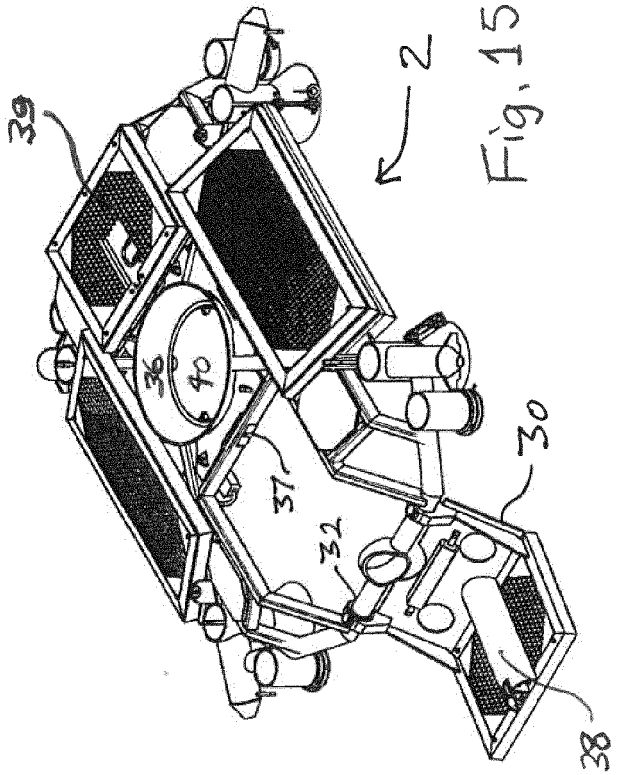


Fig. 15

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EUROPEAN SEARCH REPORT

Application Number
EP 12 15 5550

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	WO 98/04805 A1 (MCDERMOTT SA J RAY [US]; WALKER DAVID JOHN [GB]) 5 February 1998 (1998-02-05) * page 4, line 29 - page 5, line 13; figures 1-4 * * page 5, line 30 - page 6, line 14 * * page 7, line 33 - page 8, line 4 * * page 8, line 24 - page 10, line 3 * * page 10, line 13 - line 15 *	1-8	INV. E21B33/037
A	WO 01/63088 A1 (ABB OFFSHORE SYSTEMS AB [NO]; QVAM HELGE ANDREAS [NO]; AUGILERA PATRIC) 30 August 2001 (2001-08-30) * page 6, line 31 - page 7, line 4 *	1-9	
X	US 2005/186033 A1 (ELLINGSEN KJELL E [NO] ELLINGSEN KJELL EINAR [NO]) 25 August 2005 (2005-08-25) * page 3, column 1, line 10 - line 23; figure 3 *	10,11	
A	WO 02/075103 A1 (ABB OFFSHORE SYSTEMS AS [NO]; HUSEBY GEIR [NO]; WEUM HAAKON [NO]) 26 September 2002 (2002-09-26) * page 1, line 7 - page 4, line 22; figures 3,10,-18 *	10,11	TECHNICAL FIELDS SEARCHED (IPC) E21B

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
The Hague	20 July 2012	Dantinne, Patrick

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
Y : particularly relevant if combined with another document of the same category
A : technological background
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P : intermediate document

T : theory or principle underlying the invention
E : earlier patent document, but published on, or after the filing date
D : document cited in the application
L : document cited for other reasons

& : member of the same patent family, corresponding document

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CLAIMS INCURRING FEES

The present European patent application comprised at the time of filing claims for which payment was due.

☐ Only part of the claims have been paid within the prescribed time limit. The present European search report has been drawn up for those claims for which no payment was due and for those claims for which claims fees have been paid, namely claim(s):

☐ No claims fees have been paid within the prescribed time limit. The present European search report has been drawn up for those claims for which no payment was due.

LACK OF UNITY OF INVENTION

The Search Division considers that the present European patent application does not comply with the requirements of unity of invention and relates to several inventions or groups of inventions, namely:

see sheet B

☐ All further search fees have been paid within the fixed time limit. The present European search report has been drawn up for all claims.

☒ As all searchable claims could be searched without effort justifying an additional fee, the Search Division did not invite payment of any additional fee.

☐ Only part of the further search fees have been paid within the fixed time limit. The present European search report has been drawn up for those parts of the European patent application which relate to the inventions in respect of which search fees have been paid, namely claims:

☐ None of the further search fees have been paid within the fixed time limit. The present European search report has been drawn up for those parts of the European patent application which relate to the invention first mentioned in the claims, namely claims:

☐ The present supplementary European search report has been drawn up for those parts of the European patent application which relate to the invention first mentioned in the claims (Rule 164 (1) EPC).

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LACK OF UNITY OF INVENTION
SHEET B

Application Number
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The Search Division considers that the present European patent application does not comply with the requirements of unity of invention and relates to several inventions or groups of inventions, namely:

1. claims: 1-9

A subsea wellhead protection structure comprising a base frame and a removable canopy.

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2. claims: 10, 11

A canopy comprising an hinged access door and a door latching mechanism

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ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO. EP 12 15 5550

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on
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20-07-2012

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