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(19) **United States**(12) **Patent Application Publication****Allen et al.**(10) **Pub. No.: US 2010/0014922 A1**(43) **Pub. Date: Jan. 21, 2010**(54) **VIV AND/OR DRAG REDUCTION DEVICE
INSTALLATION SYSTEMS AND METHODS**(86) PCT No.: **PCT/US07/73057**

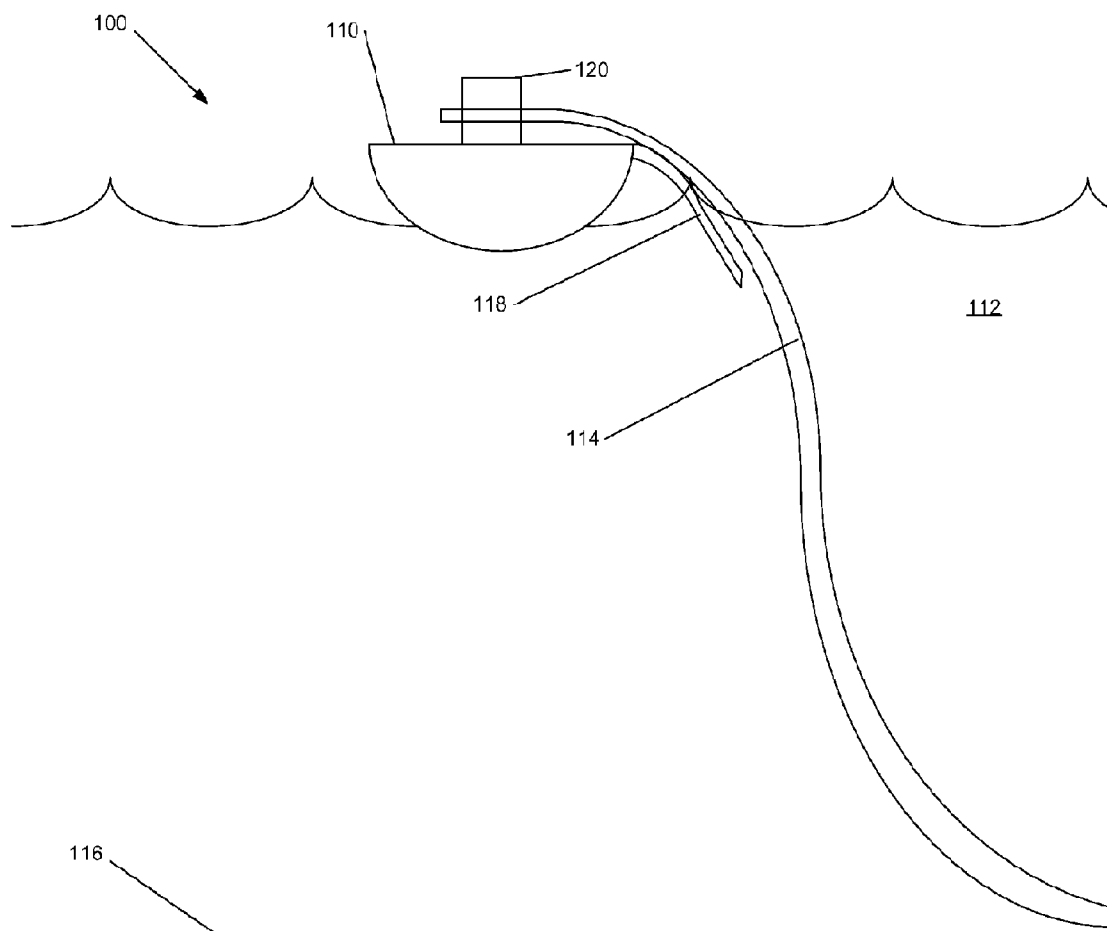
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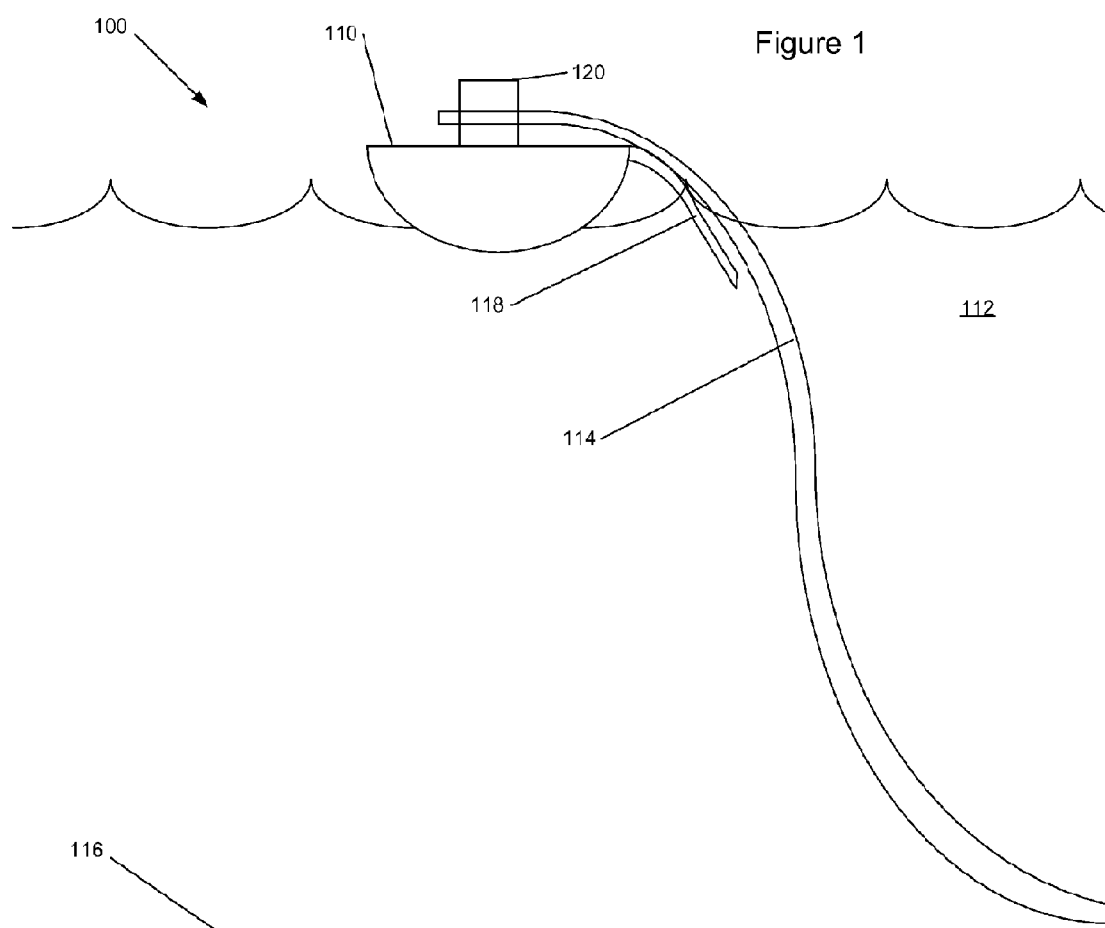
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TX (US)**Related U.S. Application Data**(60) Provisional application No. 60/806,882, filed on Jul.
10, 2006.**Publication Classification**(51) **Int. Cl.****E02D 5/60** (2006.01)(52) **U.S. Cl.** **405/224.2**(57) **ABSTRACT**

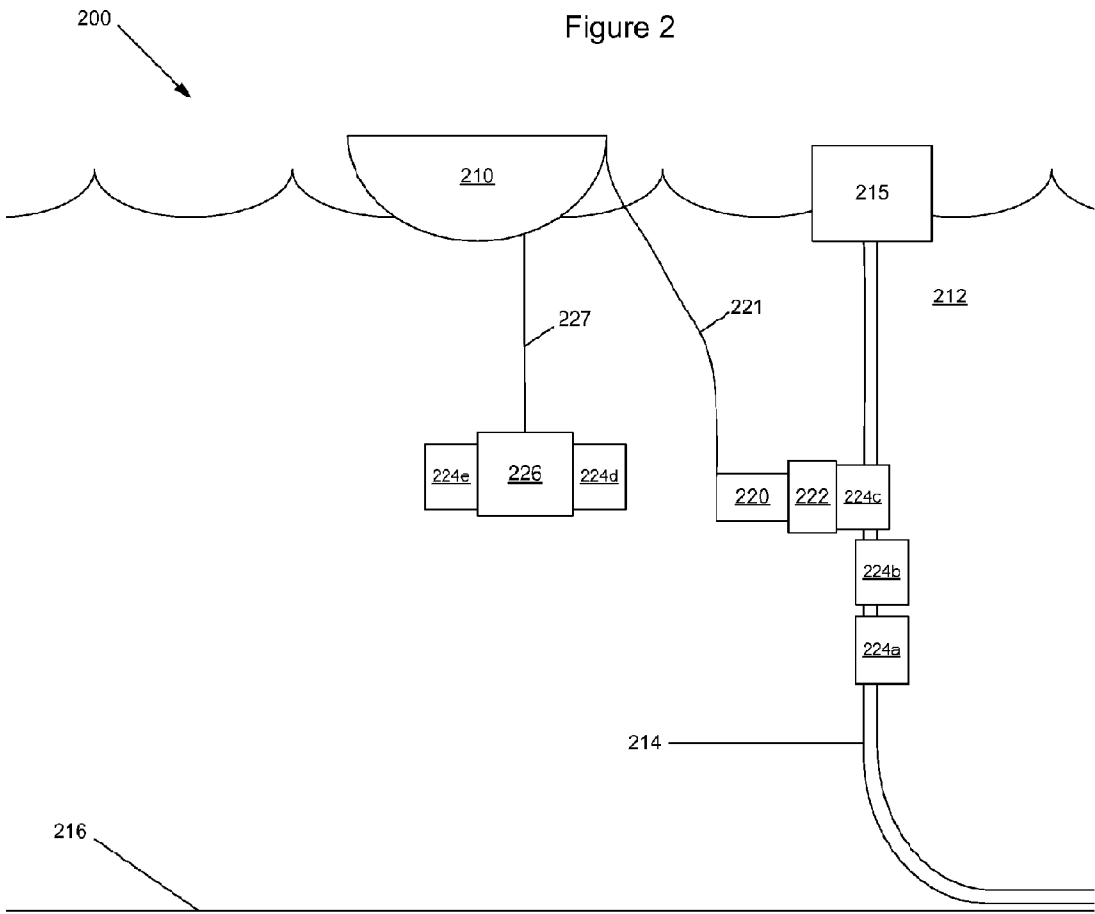
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SHELL OIL COMPANY**P O BOX 2463****HOUSTON, TX 772522463**(21) Appl. No.: **12/307,969**(22) PCT Filed: **Jul. 9, 2007**

There is disclosed a system comprising a structural element;
a transport tool carrying a plurality of VIV and/or drag reduction
devices; and an installation tool adapted to remove a VIV
and/or drag reduction device from the transport tool and to
install the device around the structural element.







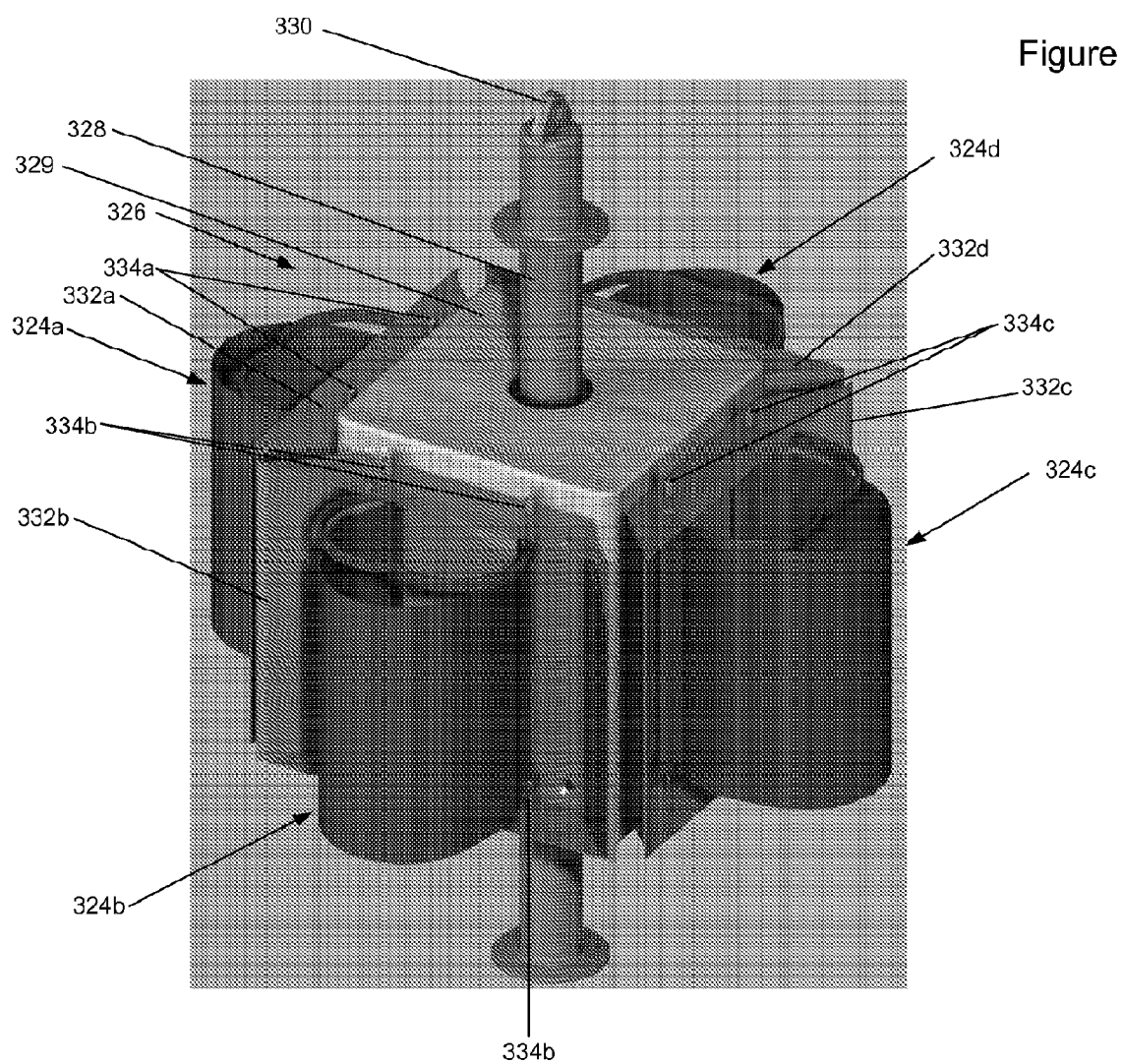


Figure 4

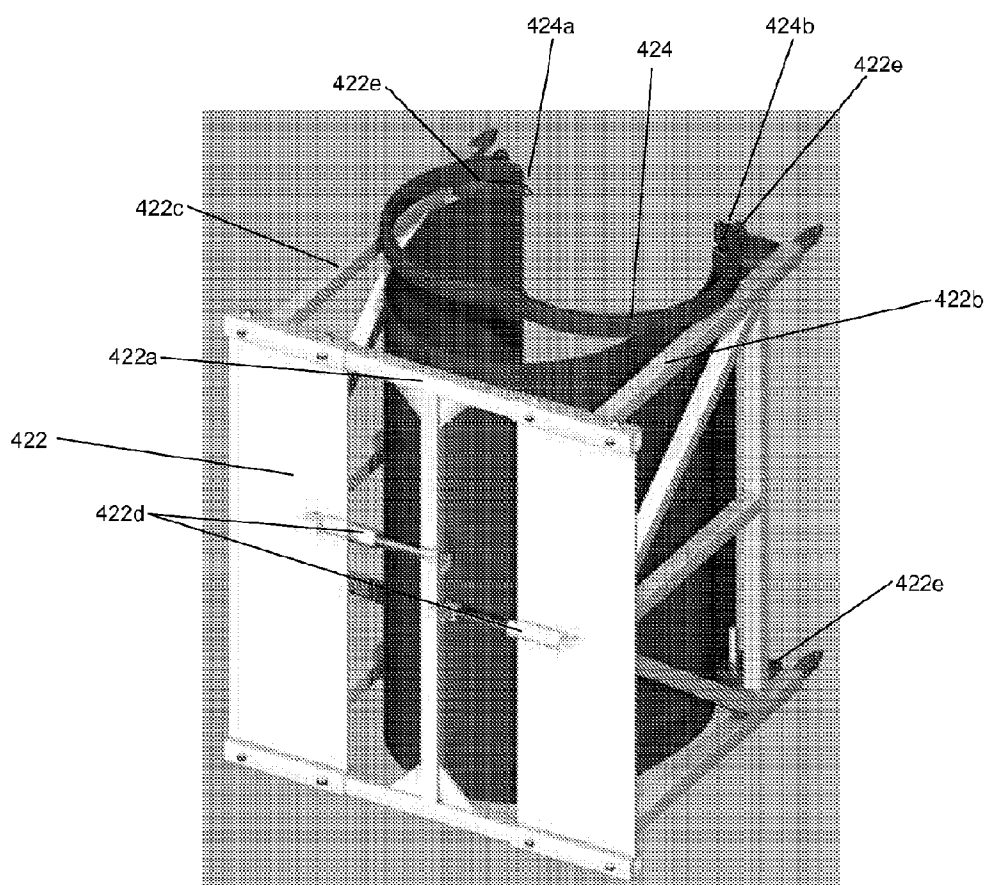


Figure 4

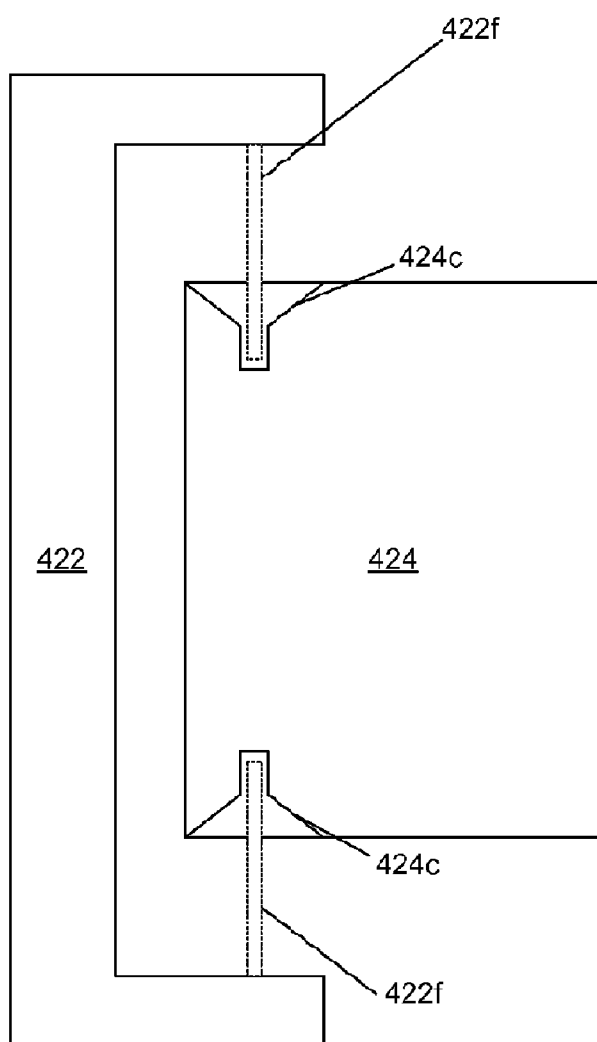
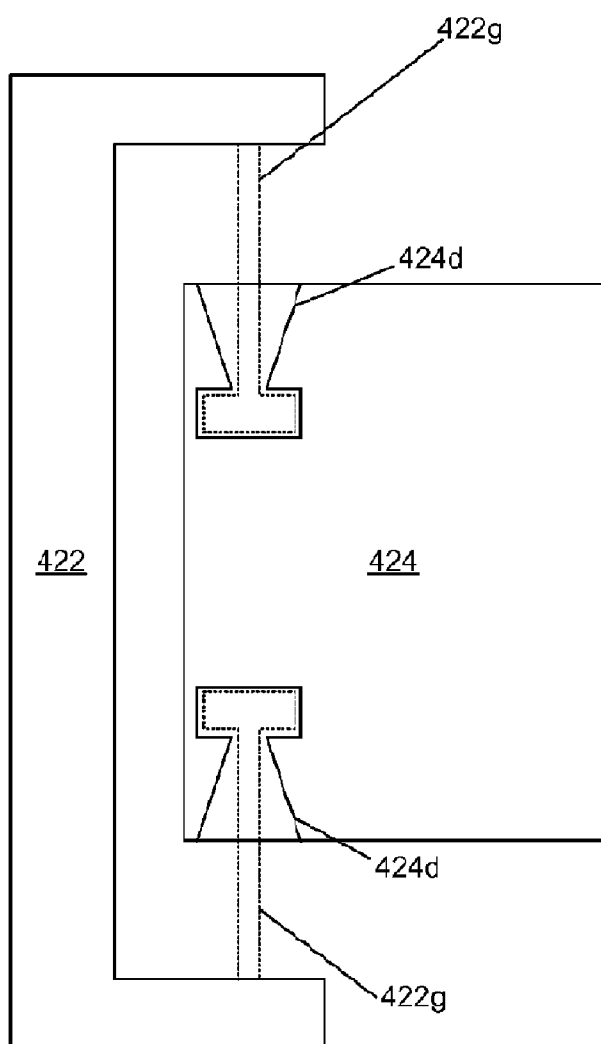
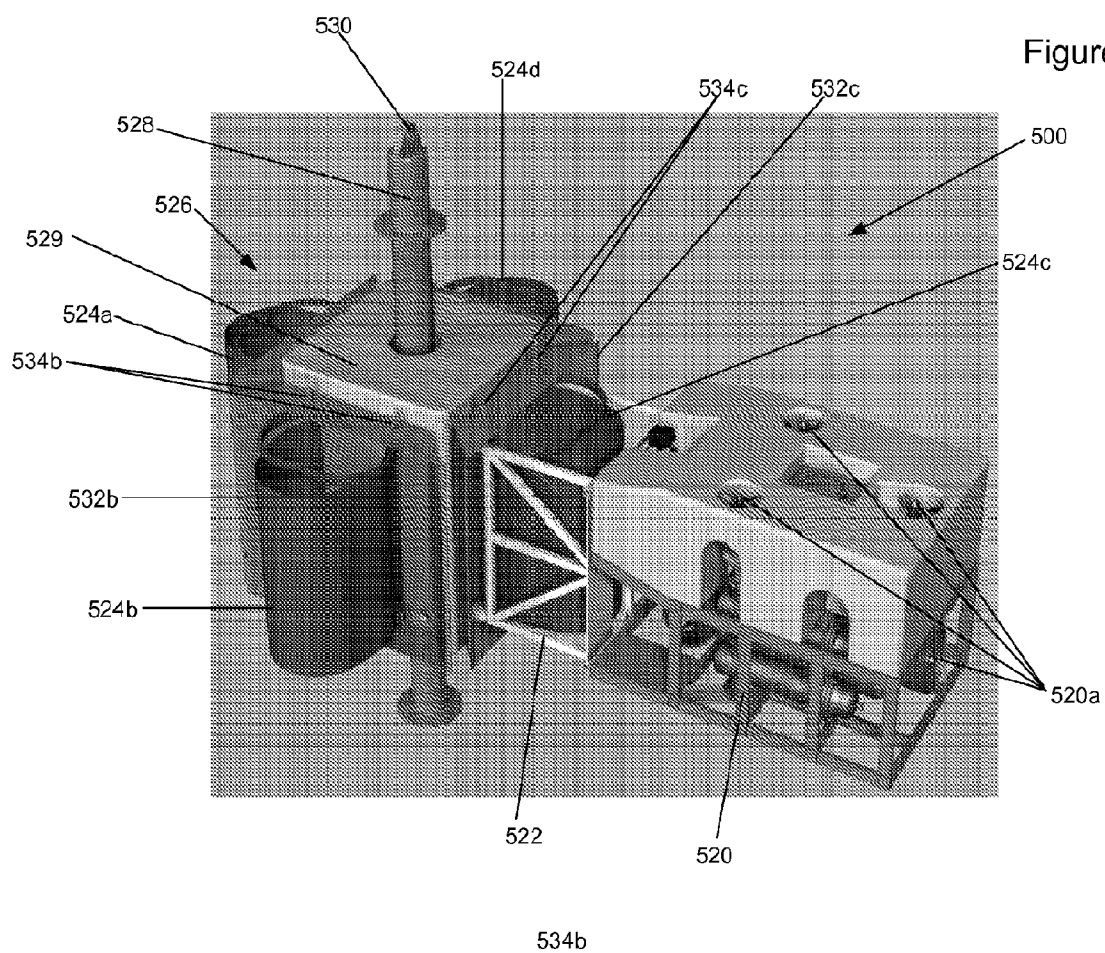
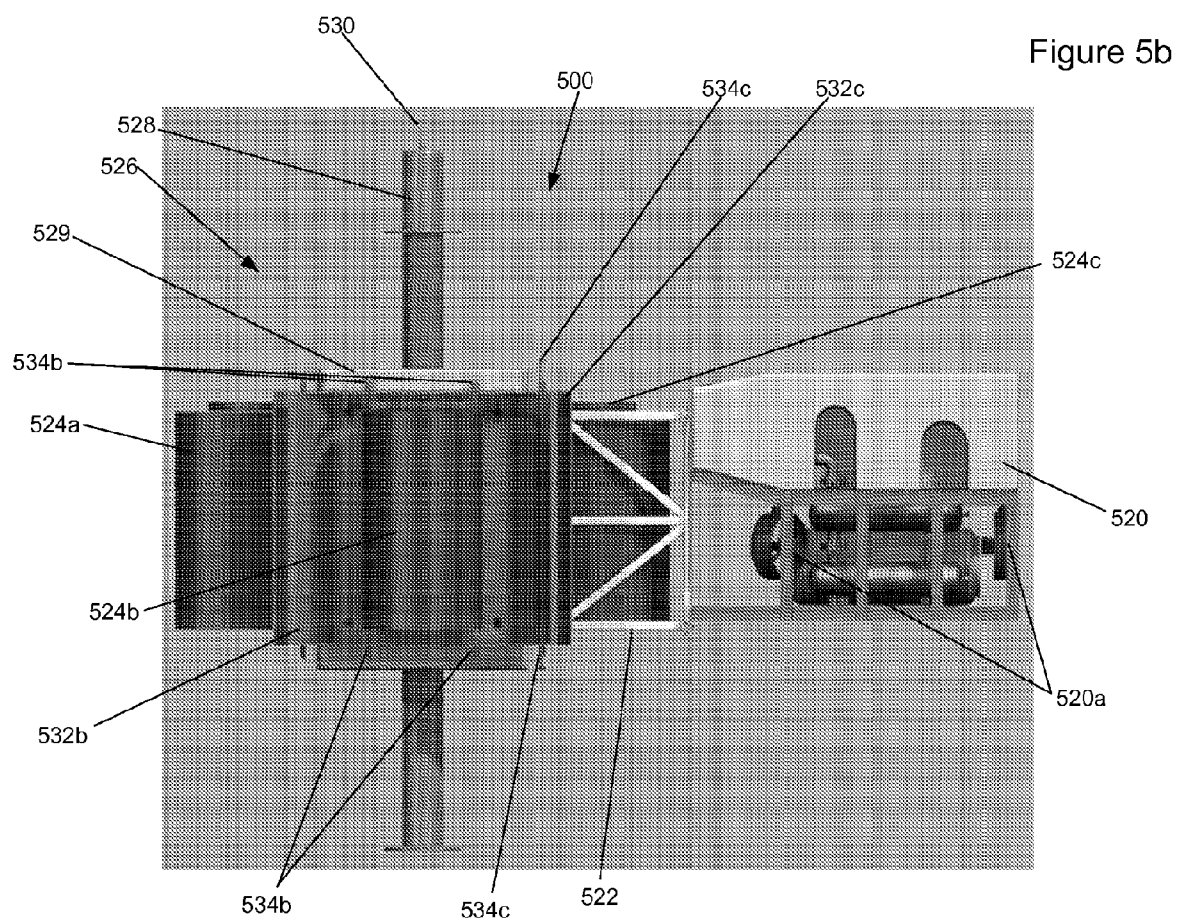


Figure 4c







VIV AND/OR DRAG REDUCTION DEVICE INSTALLATION SYSTEMS AND METHODS

FIELD OF INVENTION

[0001] The present disclosure relates to VIV and/or drag reduction device installation systems and methods. In particular to installation systems and methods for use underwater.

BACKGROUND

[0002] Structural elements can be installed at sea from a floating vessel using a J-lay configuration where the structural element is held vertically on the vessel and dropped vertically into the water and then when it reaches the bottom of the body of water, it lays horizontal, or alternatively structural elements can be installed in a S-lay configuration where the structural element is held horizontally on the vessel, drops to vertical through the body of water, and then rests on the bottom of the body of water in a horizontal configuration. Other configurations for installing a structural element from a vessel in a body of water are also known.

[0003] Referring now to FIG. 1, system 100 for installing structural element 114 on bottom 116 of body of water 112 is illustrated. System 100 includes vessel 110 with tensioner 120 and stinger 118. Tensioner 120 holds structural element 114 in a horizontal configuration as it enters water, and then structural element 114 rolls down stinger 118, then drops to a vertical configuration, and then back to a horizontal configuration as it lays on bottom 116. Tensioner 120 and vessel 110 have a sufficient capacity to support structural element 114 as it is being installed.

[0004] Currents in body of water 112 may cause vortexes to shed from the sides of structural element 114. When these types of structural elements, such as a cylinder, experience a current in a flowing fluid environment, it is possible for the structural element to experience vortex-induced vibrations (VIV). These vibrations may be caused by oscillating dynamic forces on the surface which can cause substantial vibrations of the structural element, especially if the forcing frequency is at or near a structural natural frequency.

[0005] There are generally two kinds of current-induced stresses in flowing fluid environments. The first kind of stress is caused by vortex-induced alternating forces that vibrate the structural element ("vortex-induced vibrations") in a direction perpendicular to the direction of the current. When fluid flows past the structural element, vortices may be alternately shed from each side of the structural element. This produces a fluctuating force on the structural element transverse to the current. If the frequency of this harmonic load is near the resonant frequency of the structural element, large vibrations transverse to the current can occur. These vibrations can, depending on the stiffness and the strength of the structural element and any welds, lead to unacceptably short fatigue lives. In fact, stresses caused by high current conditions in marine environments have been known to cause structural elements such as risers to break apart and fall to the ocean floor.

[0006] The second type of stress is caused by drag forces which push the structural element in the direction of the current due to the structural element's resistance to fluid flow. The drag forces may be amplified by vortex induced vibrations of the structural element. For instance, a riser pipe that is vibrating due to vortex shedding will disrupt the flow of

water around it more than a stationary riser. This may result in more energy transfer from the current to the riser, and hence more drag.

[0007] Some devices used to reduce vibrations caused by vortex shedding from sub-sea structural elements operate by modifying the boundary layer of the flow around the structural element to prevent the correlation of vortex shedding along the length of the structural element. Examples of such devices include sleeve-like devices such as helical strake elements, shrouds, fairings and substantially cylindrical sleeves. Currently available strake elements and fairings cover part or all the circumference of a cylindrical element or may be clamshell shaped to be installed about the circumference.

[0008] Some VIV and/or drag reduction devices can be installed on risers and similar structural elements before those structural elements may be deployed underwater. Deploying structural elements may damage the VIV and/or drag reduction devices by the installation, for example by the stinger or rollers during an S-lay installation. Alternatively, VIV and/or drag reduction devices can be installed on structural elements after those structural elements have been deployed underwater.

[0009] When installing a structural element in an S-lay configuration, the structural element may travel over a stinger and encounter one or more rollers on the stinger. A pre-installed VIV and/or drag reduction devices may be damaged if it passes over the stinger.

[0010] In addition, holding onto a structural element with a tensioner may damage VIV and/or drag reduction devices. One alternative is to install the devices on the structural element after it passes over the rollers and the stinger.

[0011] In addition, VIV and/or drag reduction devices may have a useful life less than the life of the structural element to which they have been applied. In such a case, it may be desirable to have a retrofit installation of VIV and/or drag reduction devices to a structural element.

[0012] Retrofit installation of VIV and/or drag reduction devices normally involves bringing the devices and any tools necessary to install the devices to the desired depth and location. Currently, the number of devices that can be transported to the desired depth and location is limited, and may lead to increased costs and installation time to transport additional devices to the desired depth and location. In addition, in many configurations currently in use, the tools necessary to install the devices are frequently brought to the surface to reload the tools with devices.

[0013] U.S. Pat. No. 6,695,539 discloses apparatus and methods for remotely installing vortex-induced vibration (VIV) reduction and drag reduction devices on elongated structures in flowing fluid environments. The apparatus is a tool for transporting and installing the devices. The devices installed can include clamshell-shaped strakes, shrouds, fairings, sleeves and flotation modules, installed by a clamshell-shaped tool. U.S. Pat. No. 6,695,539 is herein incorporated by reference in its entirety.

[0014] There is a need in the art for an improved apparatus and method for installing VIV and/or drag reduction devices. There is another need in the art of apparatus for and new and improved methods of installing VIV and/or drag reduction devices in a flowing fluid environment. There is another need in the art of apparatus for and new and improved methods of installing VIV and/or drag reduction devices with fewer trips required to the surface for additional devices. There is another

need in the art of apparatus for and new and improved methods of installing VIV and/or drag reduction devices which does not require retrieving the tooling to the surface to reload the tooling with additional devices.

[0015] These and other needs of the present disclosure will become apparent to those of skill in the art upon review of this specification, including its drawings and claims.

SUMMARY OF THE INVENTION

[0016] One aspect of the invention provides a system comprising a structural element; a transport tool carrying a plurality of VIV and/or drag reduction devices; and an installation tool adapted to remove a VIV and/or drag reduction device from the transport tool and to install the device around the structural element.

[0017] Another aspect of the invention provides a method comprising moving a transport tool carrying a plurality of VIV and/or drag reduction devices near to the structural element; moving an installation tool near to the transport tool; removing one or more VIV and/or drag reduction devices from the transport tool to the installation tool; and installing the one or more VIV and/or drag reduction devices around the structural element with the installation tool.

[0018] Advantages of the invention include one or more of the following:

[0019] an improved apparatus and method for installing VIV and/or drag reduction devices;

[0020] an apparatus for and new and improved methods of installing VIV and/or drag reduction devices in a flowing fluid environment;

[0021] an apparatus for and new and improved methods of installing VIV and/or drag reduction devices with fewer trips required to the surface for additional devices; and

[0022] an apparatus for and new and improved methods of installing VIV and/or drag reduction devices which does not require retrieving the tooling to the surface to reload the tooling with additional devices.

BRIEF DESCRIPTION OF THE DRAWINGS

[0023] FIG. 1 illustrates a system for installing a structural element in a body of water in an S-lay configuration.

[0024] FIG. 2 illustrates a system for a retrofit installation of VIV and/or drag reduction devices to an existing element.

[0025] FIG. 3 illustrates a transport tool to transport and store VIV and/or drag reduction devices.

[0026] FIGS. 4a-4c illustrate an installation tool to install VIV and/or drag reduction devices.

[0027] FIGS. 5a and 5b illustrate an installation tool retrieving a VIV and/or drag reduction device from a transport tool.

DETAILED DESCRIPTION OF THE INVENTION

[0028] Referring now to FIG. 2, in one embodiment of the invention, system 200 is illustrated. System 200 includes vessel 210 in body of water 212, installing VIV and/or drag reduction devices 224a-224e, for example strakes or fairings, on structural element 214. As shown, structural element 214 may be a riser, tendon, connector, tubular, umbilical, or other structural or fluid transportation member, and may be connected to surface structure 215. Remotely operated vehicle (ROV) 220 is connected by umbilical 221 to vessel 210. ROV 220 is also connected to installation tool 222, to install VIV and/or drag reduction device 224c on structural element 214.

Transport tool 226 is connected by line 227 to vessel 210. In some embodiments, line 227 may be an umbilical, a rope, a cable, a wire, or others as are known in the art. Transport tool is used to transport VIV and/or drag reduction devices 224d and 224e from vessel 210 to near desired location of structural element 214.

[0029] In some embodiments, multiple transport tools 226 may be used so that there is always a supply of VIV and/or drag reduction devices 224a-224e available for installation tool 222 to install VIV and/or drag reduction device 224c on structural element 214. In some embodiments, transport tool 226 may be able to transport and/store from about 2 to about 10 VIV and/or drag reduction devices 224a-224e. In some embodiments, from about 2 to about 6 transport tools 226 may be connected to each other to transport and/store from about 4 to about 60 VIV and/or drag reduction devices 224a-224e per trip from vessel 210 to the desired location of structural element 214. In some embodiments, one line may be used to transport one or more transport tools 226. In some embodiments, multiple lines may each be used to transport one or more transport tools 226.

[0030] Structural element 214 has outside diameter D. In some embodiments of the invention, outside diameter D may be from about 2 to 60 cm. In some embodiments of the invention, VIV and/or drag reduction devices 224a-224e may be made of a polymer, such as a thermoplastic polymer or a thermosetting polymer, for example polypropylene, polyethylene, other polyolefins, or co-polymers of olefins. In some embodiments of the invention, VIV and/or drag reduction devices 224a-224e may be made of a composite, such as fiberglass or carbon fiber composite. In some embodiments of the invention, VIV and/or drag reduction devices 224a-224e may be made of a metal, such as steel or aluminum. In some embodiments of the invention, VIV and/or drag reduction devices 224a-224e may be attached to a collar, pipe, shell, or other support apparatus. The support apparatus and VIV and/or drag reduction devices 224a-224e may then be installed about structural element 214.

[0031] Referring now to FIG. 3, in some embodiments of the invention, transport tool 326 is illustrated. Transport tool 326 includes handle 328, with connector 330 at one end. Core 329 surrounds handle 328. Holders 332a, 332b, 332c, and 332d are attached on each side of core 329. Holder 332a is connected to fairing 324a with fasteners 334a. Holder 332b is connected to fairing 324b with fasteners 334b. Holder 332c is connected to fairing 324c with fasteners 334c. Holder 332d is connected to fairing 324d with fasteners 334d.

[0032] Referring now to FIG. 4a, in some embodiments of the invention, installation tool 422 is illustrated. Installation tool 422 includes frame 422a, with arm 422b and arm 422c. Arms 422b and 422c move medially and distally relative to frame 422a by actuators 422d, for example pistons or a rack and pinion. Installation tool 422 is attached to fairing 424 by fasteners 422e. Fairing halves can be connected by mating male connector 424a with female connector 424b.

[0033] Referring now to FIG. 4b, in some embodiments of the invention, installation tool 422 is illustrated. Fairing 424 has conical openings 424c. Fairing 424 can be attached to installation tool 422 by extending pins 422f into conical openings 424c. Fairing 424 can be released from installation tool 422 by retrieving pins 422f from conical openings 424c.

[0034] Referring now to FIG. 4c, in some embodiments of the invention, installation tool 422 is illustrated. Fairing 424 has under-reamed conical openings 424d. Fairing 424 can be

attached to installation tool **422** by extending pins **422g** and extending under-reamed portions into under-reamed conical openings **424d**. Fairing **424** can be released from installation tool **422** by retrieving under-reamed portions and pins **422g** from under-reamed conical openings **424d**.

[0035] In some embodiments, fairing **424** has male appurtenances which installation tool can engage with female receptacles. The female receptacles may be adapted to selectively engage and release the male appurtenances on fairing **424**.

[0036] Referring now to FIGS. **5a** and **5b**, in some embodiments of the invention, VIV and/or drag reduction device installation system **500** is illustrated. System **500** includes remotely operated vehicle **520**, with various thrusters **520a** adapted to move ROV **520** in desired directions. System **500** includes installation tool **522** attached to ROV **520**, which is removing fairing **524c** from transport tool **526** by disengaging fasteners **534c**. System **500** also includes transport tool **526**. Transport tool **526** includes handle **528**, with connector **530** at one end. Core **529** surrounds handle **528**. Holders **532a**, **532b**, **532c**, and **532d** are attached on each side of core **529**. Holder **532a** is connected to fairing **524a** with fasteners. Holder **532b** is connected to fairing **524b** with fasteners **534b**. Holder **532c** is connected to fairing **524c** with fasteners **534c**. Holder **532d** is connected to fairing **524d**.

[0037] In some embodiments of the invention, VIV and/or drag reduction devices may be mounted around a structural element according to the method disclosed in U.S. Pat. No. 6,695,539, which is herein incorporated by reference in its entirety.

[0038] In some embodiments of the invention, VIV and/or drag reduction devices may be installed about a structural element according to the method disclosed in U.S. Pat. No. 6,561,734, which is herein incorporated by reference in its entirety.

[0039] In some embodiments of the invention, VIV and/or drag reduction devices may be installed about a structural element according to the method disclosed in United States Patent Application Publication No. 2003/0213113, which is herein incorporated by reference in its entirety.

[0040] In some embodiments of the invention, the outside diameter of a structural element to which VIV and/or drag reduction devices can be attached may be from about 10 to about 50 cm. In some embodiments of the invention, the height of VIV and/or drag reduction devices may be from about 5% to about 50% of the structural element's outside diameter. In some embodiments of the invention, the height of VIV and/or drag reduction devices may be from about 5 to about 50 cm, measured from the outside surface of the structural element to the outside surface of the VIV and/or drag reduction device.

[0041] In some embodiments of the invention, the structural element may be cylindrical, or have an elliptical, oval, or polygonal cross-section, for example a square, pentagon, hexagon, or octagon.

[0042] In some embodiments, portions of structural element **214** may be lowered onto bottom **216** of water **212**. In some embodiments, water **212** has a depth of at least about 1000 meters, at least about 2000 meters, at least about 3000 meters, or at least about 4000 meters. In some embodiments, water **212** has a depth up to about 10,000 meters.

[0043] In some embodiments of the invention, structural element **214** may be a pipeline, a crude oil flowline, a mooring line, a riser, a tubular, or any other structural element installed in a body of water. In some embodiments, structural element **214** may have a diameter from about 0.1 to about 5 meters, and a length from about 10 to about 200 kilometers (km). In

some embodiments, structural element **214** may have a length to diameter ratio from about 100 to about 100,000. In some embodiments, structural element **214** may be composed from about 50 to about 30,000 tubular sections, each with a diameter from about 10 cm to about 60 cm and a length from about 5 m to about 50 m, and a wall thickness from about 0.5 cm to about 5 cm.

[0044] In some embodiments, there is provided two (2) separate tool packages, a transport tool to carry VIV suppression devices subsea and an installation tool to attach the VIV suppression device to the tubular.

[0045] In some embodiments, VIV suppression devices may be attached to the transport tool on the surface by hand. The transport may then be launched from the offshore subsea intervention vessel or platform and lowered to a depth where the VIV suppression devices are to be installed. The transport tool is configured so that the ROV, with the installation tool attached can locate it and 'dock' the installation tool with the transport tool. The ROV operator then functions the installation tool's VIV suppression device acquisition feature and a VIV suppression device is transferred from the transport tool to the installation tool.

[0046] In some embodiments, the installation tool may be a frame that is built to fit a range of VIV suppression devices and be attached to an ROV. The installation tool may have hydraulic cylinders or rotary actuators that are aligned perpendicular to and attached to the VIV suppression devices. The installation tool utilizes the perpendicular hydraulic cylinders or rotary actuators to close and latch the VIV suppression devices around the subsea tubular. The VIV suppression device is then released from the installation tool and the ROV returns to the transport tool to acquire another VIV suppression device. The transport tool is recovered to the surface when empty and re-loaded. This cycle is repeated until all of the retrofit VIV installation devices are attached to the tubular where it is required.

[0047] In some embodiments, the installation tool and/or the transport tool may be made of any one of numerous materials, including, but not limited to thermoplastics, fiberglass, and metals. The VIV suppression devices to be installed with this tool and method may be of any vortex interrupting design.

[0048] In some embodiments, the methods and installation tooling may also be used to install load-bearing collars associated with VIV suppression devices.

[0049] In some embodiments, the installation tool may have a self-opening feature. In some embodiments, the installation tool may have hydraulic powered, mechanical assemblies to facilitate opening. In some embodiments, the installation tool may have a rack and gear system to keep the two arms aligned and prevent binding. In some embodiments, the installation tool may have hydraulic powered mechanical assemblies, to facilitate acquiring/releasing the VIV suppression device or load bearing collars associated with VIV suppression devices. These assemblies may be at any location on the installation tool. In some embodiments, the installation tool may have hydraulic powered mechanical assemblies to lock on and release the installation tool from the transport tool. In some embodiments, the installation tool may be equipped with a vacuum device that would allow it to transport fairings from the transport tool to the riser. In some embodiments, the installation tool may have one or more ROV compatible docking receptacles and may be docked by a ROV remotely.

[0050] In some embodiments, the VIV suppression devices may be fitted to the transport tool manually. In some embodiments, the transport tool may have hydraulic or mechanical

devices to secure the installation tooling while in motion. In some embodiments, the transport tool mechanical devices may be operated manually or by the ROV. In some embodiments, the transport tool may be equipped with manually operated spring clips to secure the suppression devices to the transport tool. In some embodiments, the transport tool may contain any number of suppression devices, and multiple transport tools may be chained or linked together to deliver more suppression devices in a given trip. In some embodiments, a central transport tool, not containing any suppression but containing hardware for mating additional transport tools, may be used so that transport tools containing suppression can be attached to the central transport tool. For example, if the transport tools are rectangular, the central transport tool could have up to four transport tools attached to it (one on each side) and each of those outer transport tools could have suppression on three sides for a total of 12 suppression devices delivered per trip. This may be preferred to chaining transport tools together to ease installation.

[0051] In some embodiments, the installation tool allows the opening and closing of the tool's arms to move in a horizontal plane, rather than a clam shell fashion, which allows the tool to be easily adapted to different size tubulars and/or suppression devices. The only portion of the transport tool, that needs to be modified for each size riser, is the bumper portion of the tool and the stops. With a clam shell design new arms need to be fabricated for each size tubular. The use of the stab points on the transport tool will stabilize the ROV vertical and horizontal motion during the transfer of the fairing from the transport to the tool package.

[0052] In some embodiments, the amount of time needed to transport suppression from the surface to a sub sea location may be reduced. The use of the transport unit will allow more suppression to be transported to the job location per trip. This allows the ROV to use the tooling to retrieve suppression out of the transport rather than disconnecting from the tooling and sending the tooling back to the surface to be reloaded. This installation method and associated tooling will allow retrofitting VIV suppression devices at a much faster rate than can be achieved with current methods and tools at a greatly reduced cost.

Illustrative Embodiments

[0053] In one embodiment, there is disclosed a system comprising a structural element; a transport tool carrying a plurality of VIV and/or drag reduction devices; and an installation tool adapted to remove a VIV and/or drag reduction device from the transport tool and to install the device around the structural element. In some embodiments, the structural element is selected from the group consisting of a shell, a collar, an oil flowline, a pipeline, a drilling riser, a production riser, a steel tubular, import and export risers, subsea pipelines, tendons for tension leg platforms, legs for traditional fixed and for compliant platforms, space-frame members for platforms, cables, umbilicals, mooring elements for deepwater platforms, hull structures for tension leg platforms and for spar type structures, and column structures for tension leg platforms, and for spar type structures, and truss members for spar type structures and fixed structures. In some embodiments, the VIV and/or drag reduction devices are selected from strakes and fairings. In some embodiments, the transport tool is carrying from 2 to 10 VIV and/or drag reduction devices. In some embodiments, the system also includes from 2 to 6 transport tools, each carrying a plurality of VIV and/or drag reduction devices, wherein the installation tool is adapted to remove a VIV and/or drag reduction device from each of the transport tools. In some embodiments, at least 2 of

the transport tools are connected to each other. In some embodiments, the system also includes a remotely operated vehicle (ROV), the ROV connected to the installation tool, and adapted to move and activate the installation tool. In some embodiments, the system also includes a vessel, the installation tool connected to the vessel by a first umbilical, and the transport tool connected to the vessel by a second umbilical. In some embodiments, the system also includes a second transport tool connected to the vessel by a third umbilical. In some embodiments, the transport tool comprises one or more transport tools connected to the vessel by a second umbilical, wherein the one or more transport tools are adapted to transport from 4 to 60 VIV and/or drag reduction devices from the vessel to the installation tool for each trip of the one or more transport tools from the vessel to the installation tool. In some embodiments, the structural element is located in a body of water, the system further comprising a surface structure located at a surface of the body of water.

[0054] In one embodiment, there is disclosed a method comprising moving a transport tool carrying a plurality of VIV and/or drag reduction devices near to the structural element; moving an installation tool near to the transport tool; removing one or more VIV and/or drag reduction devices from the transport tool to the installation tool; and installing the one or more VIV and/or drag reduction devices around the structural element with the installation tool. In some embodiments, the structural element is selected from the group consisting of a shell, a collar, an oil flowline, a pipeline, a drilling riser, a production riser, a steel tubular, import and export risers, subsea pipelines, tendons for tension leg platforms, legs for traditional fixed and for compliant platforms, space-frame members for platforms, cables, umbilicals, mooring elements for deepwater platforms, hull structures for tension leg platforms and for spar type structures, and column structures for tension leg platforms and for spar type structures. In some embodiments, the VIV and/or drag reduction devices are selected from strakes and fairings. In some embodiments, the transport tool is carrying from 2 to 10 VIV and/or drag reduction devices. In some embodiments, the method also includes moving from 2 to 6 transport tools near to the structural element, each of the transport tools carrying a plurality of VIV and/or drag reduction devices. In some embodiments, the method also includes connecting at least 2 transport tools to each other, then moving the transport tools near to the structural element. In some embodiments, the method also includes connecting the installation tool to a remotely operated vehicle (ROV), the ROV adapted to move and activate the installation tool. In some embodiments, the method also includes connecting the installation tool to a vessel by a first umbilical, and connecting the transport tool to the vessel by a second umbilical. In some embodiments, the method also includes connecting a second transport tool to the vessel by a third umbilical, and moving the second transport tool near to the structural element. In some embodiments, the transport tool comprises one or more transport tools, the one or more transport tools carrying from 4 to 60 VIV and/or drag reduction devices. In some embodiments, the transport tool comprises one or more transport tools, the one or more transport tools carrying from 4 to 60 VIV and/or drag reduction devices, further comprising lowering the one or more transport tools from a vessel with one or more umbilicals, installing the VIV and/or drag reduction devices around the structural element with the installation tool, and retrieving the one or more transport tools to the vessel with the one or more umbilicals. In some embodiments, the method also includes reloading the one or more transport tools at the vessel after they have been retrieved. In some embodiments, the method

also includes lowering the reloaded one or more transport tools from the vessel with the one or more umbilicals.

[0055] Those of skill in the art will appreciate that many modifications and variations are possible in terms of the disclosed embodiments, configurations, materials and methods without departing from their spirit and scope. Accordingly, the scope of the claims appended hereafter and their functional equivalents should not be limited by particular embodiments described and illustrated herein, as these are merely exemplary in nature.

1. A system comprising:

a structural element;

a transport tool carrying a plurality of VIV and/or drag reduction devices; and

an installation tool adapted to remove a VIV and/or drag reduction device from the transport tool and to install the device around the structural element.

2. The system of claim 1, wherein the structural element is selected from the group consisting of a shell, a collar, an oil flowline, a pipeline, a drilling riser, a production riser, a steel tubular, import and export risers, subsea pipelines, tendons for tension leg platforms, legs for traditional fixed and for compliant platforms, space-frame members for platforms, cables, umbilicals, mooring elements for deepwater platforms, hull structures for tension leg platforms and for spar type structures, and column structures for tension leg platforms and for spar type structures.

3. The system of claim 1, wherein the VIV and/or drag reduction devices are selected from strakes and fairings.

4. The system of claim 1, wherein the transport tool is carrying from 2 to 10 VIV and/or drag reduction devices.

5. The system of claim 1, further comprising from 2 to 6 transport tools, each carrying a plurality of VIV and/or drag reduction devices, wherein the installation tool is adapted to remove a VIV and/or drag reduction device from each of the transport tools.

6. The system of claim 5, wherein at least 2 of the transport tools are connected to each other.

7. The system of claim 1, further comprising a remotely operated vehicle (ROV), the ROV connected to the installation tool, and adapted to move and activate the installation tool.

8. The system of claim 1, further comprising a vessel, the installation tool connected to the vessel by a first umbilical, and the transport tool connected to the vessel by a line.

9. The system of claim 8, further comprising a second transport tool connected to the vessel by a second line.

10. The system of claim 8, wherein the transport tool comprises one or more transport tools connected to the vessel by a line, wherein the one or more transport tools are adapted to transport from 4 to 60 VIV and/or drag reduction devices from the vessel to the installation tool for each trip of the one or more transport tools from the vessel to the installation tool.

11. The system of claim 1, wherein the structural element is located in a body of water, the system further comprising a surface structure located at a surface of the body of water.

12. The system of claim 1, further comprising one or more additional installation tools adapted to remove a VIV and/or drag reduction device from the transport tool and to install the device around the structural element.

13. The system of claim 12, further comprising one remotely operated vehicle for each of the installation tools, wherein one remotely operated vehicle is connected to each of the installation tools, and adapted to move and activate the installation tool.

14. A method of installing one or more VIV and/or drag reduction devices around a structural element comprising:

moving a transport tool carrying a plurality of VIV and/or drag reduction devices near to the structural element;

moving an installation tool near to the transport tool;

removing one or more VIV and/or drag reduction devices from the transport tool to the installation tool; and

installing the one or more VIV and/or drag reduction devices around the structural element with the installation tool.

15. The method of claim 14, wherein the structural element is selected from the group consisting of a shell, a collar, an oil flowline, a pipeline, a drilling riser, a production riser, a steel tubular, import and export risers, subsea pipelines, tendons for tension leg platforms, legs for traditional fixed and for compliant platforms, space-frame members for platforms, cables, umbilicals, mooring elements for deepwater platforms, hull structures for tension leg platforms and for spar type structures, and column structures for tension leg platforms and for spar type structures.

16. The method of claim 14, wherein the VIV and/or drag reduction devices are selected from strakes and fairings.

17. The method of claim 14, wherein the transport tool is carrying from 2 to 10 VIV and/or drag reduction devices.

18. The method of claim 14, further comprising moving from 2 to 6 transport tools near to the structural element, each of the transport tools carrying a plurality of VIV and/or drag reduction devices.

19. The method of claim 14, further comprising connecting at least 2 transport tools to each other, then moving the transport tools near to the structural element.

20. The method of claim 14, further comprising connecting the installation tool to a remotely operated vehicle (ROV), the ROV adapted to move and activate the installation tool.

21. The method of claim 14, further comprising connecting the installation tool to a vessel by a first umbilical, and connecting the transport tool to the vessel by a second umbilical.

22. The method of claim 21, further comprising connecting a second transport tool to the vessel by a third umbilical, and moving the second transport tool near to the structural element.

23. The method of claim 14, wherein the transport tool comprises one or more transport tools, the one or more transport tools carrying from 4 to 60 VIV and/or drag reduction devices.

24. The method of claim 14, wherein the transport tool comprises one or more transport tools, the one or more transport tools carrying from 4 to 60 VIV and/or drag reduction devices, further comprising lowering the one or more transport tools from a vessel with one or more umbilicals,

installing the VIV and/or drag reduction devices around the structural element with the installation tool, and retrieving the one or more transport tools to the vessel with the one or more umbilicals.

25. The method of claim 24, further comprising reloading the one or more transport tools at the vessel after they have been retrieved.

26. The method of claim 25, further comprising lowering the reloaded one or more transport tools from the vessel with the one or more umbilicals.