METHODS AND APPARATUS FOR Disconnecting A Line From A Device disposed within A Pipe or Wellbore

Applicant: Halliburton Energy Services, Inc., Houston, TX (US)

Inventors: Aimee Kathleen Greening, Duncan, OK (US); Steven Ray Lovett, Marlow, OK (US)

Assignee: Halliburton Energy Services, Inc., Houston, TX (US)

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ABSTRACT
A tool is configured to be deployed via a hoist line in the inner diameter of a pipe or a wellbore. The tool includes an end cap including an aperture, a disconnect device including a collet, at least a portion of which collet is received within the aperture, and an actuated member configured to move from a first position to a second position relative to the disconnect device. In the first position, the actuated member engages the collet to lock the disconnect device to the end cap. In the second position, the actuated member disengages the collet to unlock the disconnect device from the end cap.
ACTUATE MEMBER OF PACKER TO MOVE FROM FIRST POSITION TO SECOND POSITION

APPLY FORCE TO HOIST LINE TO DECOUPLE DISCONNECT DEVICE FROM PACKER

FIG. 5
METHODS AND APPARATUS FOR DISCONNECTING A LINE FROM A DEVICE DISPOSED WITHIN A PIPE OR WELLBORE

BACKGROUND

[0001] This disclosure relates generally to offshore pipelines, and more specifically to methods and apparatus for disconnecting hoist lines from devices deployed within submerged pipelines.

[0002] In offshore pipeline installations, as the pipeline is laid on the sea floor the pipeline is subjected to significant forces and moments that can compromise the integrity of the pipeline and, in some cases, cause failures. In the event the submerged pipeline is compromised to the point of failure, water rushes into the inner diameter of the pipeline. Such failures are commonly referred to as wet buckles. Once a wet buckle occurs the flooded pipeline is too heavy to retrieve for repair and re-installation.

[0003] Companies that lay the pipeline keep a fleet of compressor ships on standby while the pipeline is being laid on the sea floor in case of a failure like a wet buckle. The compressor ships are present to pump the water out of the pipeline after the buckled section has been removed and the sections on either side of the buckle have been sealed. After the water has been removed, sections of the damaged pipeline can be retrieved and brought to the surface and the pipeline vessel can continue laying pipe onto the sea floor.

[0004] Pipeline failures like wet buckles are relatively rare. As such, during installation, the fleet of compressor ships hired by the pipeline installation company is generally inactive and serves no function for the installation process unless the rare failure occurs. The cost of the compressor ships and the associated service the ships and crew provide can reach the millions of dollars.

BRIEF DESCRIPTION OF DRAWINGS

[0005] FIG. 1 schematically depicts a submerged pipeline installation system including a number of wet buckle packers.

[0006] FIG. 2 depicts a section view of a wet buckle packer including an example quick-disconnect device according to this disclosure.

[0007] FIG. 3A depicts an example quick-disconnect device locked to a packer device.

[0008] FIG. 3B depicts the example quick-disconnect device of FIG. 3A unlocked from the packer device.

[0009] FIGS. 4A and 4B depict the deflection of collet fingers of an example quick-disconnect device as the device is inserted into or pulled out of an aperture in a packer device.

[0010] FIG. 5 depicts an example method of releasing a hoist line from a tool suspended in the inner diameter of a pipe or a wellbore.

DETAILED DESCRIPTION

[0011] Examples according to this disclosure are directed to methods and apparatus for disconnecting hoist lines from devices deployed within, e.g., a submerged pipeline or a subterranean wellbore. For example, methods and apparatus according to this disclosure can be employed to release a hoist line from an apparatus deployed to seal a submerged pipeline that has a wet buckle. Additionally, methods and apparatus according to this disclosure can be employed to release a hoist line from a tool suspended downhole in a subterranean wellbore.


[0013] Examples according to this disclosure can be employed in conjunction with the use of packer devices that are engaged to seal a submerged pipeline in the event of a wet buckle (e.g., such as the packers described in the foregoing applications). The packer is deployed within the pipeline with a hoist line or cable that runs from a pipelay vessel on the surface of the sea downpipe to the packer. In the event of a wet buckle, the packer device can automatically respond to water invasion into the inner diameter of the pipeline and rapidly deploy a sealing system that will prevent the laid pipeline from being flooded with sea water. Once the packer is actuated, the device may also function to be prevented from moving within the pipeline. As such, at some point in time the hoist line may need to be disconnected from the actuated packer device so that the line can be retrieved back up to the pipelay vessel on the surface.

[0014] Examples according to this disclosure are directed to a quick-disconnect device that allows a hoist line to be disconnected from a downpipe packer (or other type of) device. The disconnect device is coupled to the hoist line and releasably connected to the packer. Generally speaking, the disconnect device is a cylindrical collet device that is configured to be locked to the packer at least in part based on the movement of an actuated member of the packer. The actuated member locks the disconnect device to the packer when the packer is in an unengaged state and unlocks the disconnect device from the packer when the packer is engaged to seal the inner diameter of the pipeline.

[0015] In one example, a tool is configured to be deployed via a hoist line in the inner diameter of at least one of a pipe or a wellbore. The tool includes an end cap including an aperture, a disconnect device including a collet, at least a portion of which is received within the aperture, and an actuated member configured to move from a first position to a second position relative to the disconnect device. In the first position, the actuated member engages the collet to lock the disconnect device to the end cap. In the second position, the actuated member disengages the collet to unlock the disconnect device from the end cap.

[0016] The following examples of a quick-disconnect device and associated methods are described in the context of a packer device employed to arrest wet buckle or other types of failures in a submerged pipeline. However, examples according to this disclosure can be employed to disconnect other types of devices from hoist lines or cables. For example,
methods and apparatus in accordance with this disclosure could be employed to disconnect a tool from a line, from which the tool is suspended in a subterranean wellbore.  

[0017] FIG. 1 depicts a submerged pipeline installation system 10 in which a packer device including a quick-disconnect device in accordance with this disclosure may be employed. Offshore submerged pipelines can be installed in a number of ways. In general, individual pipes are transported by a cargo ship to a pipelay vessel at the pipeline installation location. The individual pipes are processed and connected to one another on the pipelay vessel and laid onto the sea floor. The pipelay vessel progressively welds individual pipes or welded pipe sections to one another to assemble the pipeline. As the pipeline is assembled the pipelay vessel moves across the surface of the water and the assembled pipeline is pulled off of the ship by the weight of the pipeline. As the pipeline is progressively pulled off of the back of the pipelay vessel it descends to the sea floor.

[0018] Two methods that are employed to install submerged pipelines is the “J” lay and the “S” lay. The moniker of each method represents the shape of the pipeline as it is pulled off of the pipelay vessel onto the sea floor. In an “J” lay, the pipeline is pulled off of the pipelay vessel substantially vertically to near the sea floor, where the pipeline bends to run horizontally along the floor. In an “S” lay, the pipeline is pulled off of the pipelay vessel substantially horizontally, bends vertically down toward the sea floor and then bends back horizontally away from the vessel to run along the sea floor. Although the following examples are described in the context of an “S” lay installation, wet buckle packers in accordance with this disclosure can also be employed in a “J” lay installation system or other pipeline installation methods not covered here.  

[0019] FIG. 1 depicts a submerged pipeline installation system 10 for an “S” lay installation. In FIG. 1, system 10 includes pipelay vessel 12 and pipeline 14. Pipelay vessel 12 includes production factory 16, tensioners 18, crane 20, and stinger 22. As described in more detail below, after individual pipes are transported to and loaded on pipelay vessel 12, the pipes are conveyed into production factory 16. Production factory 16 includes a variety of processing stations for preparing pipes and coupling individual pipes into pipe sections and ultimately assembling pipeline 14.

[0020] Pipelay vessel 12 is shown floating in a body of water 24. Pipelay vessel 12 utilizes crane 20 to perform heavy lifting operations, including loading pipes from a cargo ship onto the vessel. In general, individual pipes on board pipelay vessel 12 are placed on an assembly line within production factory 16 and joints of the pipes are welded into pipeline 14. Pipeline 14 is held in tension between sea floor 26 and pipelay vessel 12 by pipeline tensioners 18 as the pipeline is lowered. As pipelay vessel 12 moves forward by pulling on a mooring system off of the bow, pipeline 14 is lowered from pipelay vessel 12 over stinger 22. Stinger 22 is attached to and extends from the stern of pipelay vessel 12. Stinger 22 provides support for pipeline 14 as it leaves pipelay vessel 12.

[0021] In practice, a cargo ship transports pipe sections (sometimes referred to as stands) to pipelay vessel 12. Crane 20 moves pipe sections from the cargo ship to pipelay vessel 12 onto cradles that form a conveyor system for moving pipe into production factory 16. Within production factory 16, a number of different operations are carried out to prepare and join pipe sections. For example, the pipe ends are beveled (and bevels are deburred). The pipe ends are preheated within production factory 16 and moved through a number of welding stations to join different sections with weld beads applied both to the outer and inner diameters of the sections at the joints. In some cases, a final welding station within production factory 16 applies a welded cap to the joints of pipe sections.

[0022] The joints of the welded pipe sections can also be tested within production factory 16. For example, the welded joints can pass through ultrasonic testing stations that apply water to the joints as the medium to transmit the ultrasonic signals. The ultrasonic signals can be processed by a computing system and graphically displayed for inspection by an operator.

[0023] After testing, the joints of the welded pipe sections can be grit blasted and a field joint coating can be applied. In some installation systems, each individual pipe is subjected to this process as it is welded to pipeline 14. In other cases, multiple pipes, e.g., two pipes in a double stand facility, are first welded together and then welded to the pipeline in the firing line onboard pipelay vessel 12. At any rate, the assembled pipeline 14 is ultimately conveyed through tensioners 18 and over stinger 22 to be dropped off of the stern of pipelay vessel 12 to sea floor 26.

[0024] As pipeline 14 is laid on sea floor 26, suspended pipe span 28 forms a shallow “S” shape between sea floor 26 and pipelay vessel 12. The “S” shape of suspended pipe 28 is sometimes referred to as the S-curve. Second curve 30 or the tail of the S-curve just before suspended pipe span 28 meets sea floor 26 is sometimes referred as the “sag bend.” The S-curve of pipeline 14 is controlled by stinger 22 and pipeline tensioners 18. Increases in the curvature of pipeline 14 cause increases in the bending moment on the pipeline, and, as a result, higher stresses. High stresses on pipeline 14 and, in particular, on suspended pipe span 28 can result in buckling of the pipeline 14. For example, a loss of tension in pipeline 14 during the pipe lay will normally cause pipeline 14 to buckle at a point along the suspended pipe span 28. A buckle in pipeline 14 is called a wet buckle if pipeline 14 has cracked or becomes damaged in a manner such that water is allowed to enter the inner diameter of the pipeline. The influx of water into the pipeline 14 greatly increases the weight of suspended pipe span 28 such that the pipe can become over stressed at a location along suspended pipe span 28, generally near stinger 22. In such circumstances, flooded pipeline 14 can break and drop from pipelay vessel 12 to sea floor 26. Regardless of whether pipeline 14 breaks in the event of a wet buckle, the increased weight can prevent recovery of and repair to pipeline 14 before the water is pumped out of the pipe inner diameter.

[0025] In FIG. 1, installation system 10 includes two wet buckle packers 32 and 34 deployed within pipeline 14. Packer 32 is deployed along suspended pipe span 28, while packer 34 is deployed downpipe where pipeline 14 meets sea floor 26. Wet buckle packers 32 and 34 are deployed within pipeline 14 with a hoist line or cable (not shown). In cases where multiple wet buckle packers are deployed in series, a hoist line may be coupled between the packers. In the example of FIG. 1, a hoist line may be coupled to a hoist on pipelay vessel 12 to packer 32 and another line can be coupled between packers 32 and 34.

[0026] Wet buckle packers 32 and 34 are configured to automatically respond to water invasion into the inner diameter of pipeline 14 and rapidly deploy a sealing system that will prevent the laid pipeline from being flooded with sea
water. For example, wet buckle packers 32 and 34 seal the inner diameter of pipeline 14 to prevent or significantly inhibit water from flooding the submerged pipeline. Additionally, wet buckle packers 32 and 34 deploy a braking mechanism to prevent or inhibit the packers from moving within pipeline 14 as a result of the pressures introduced by the sea water entering the pipe from the wet buckle.

Either one or both of the wet buckle packers 32 and 34 may include a quick-disconnect device in accordance with this disclosure. The disconnect device can be connected to one or both ends of each of packers 32 and 34. The disconnect device is configured to allow packers 32 and 34 to be disconnected from the hoist lines by which they are deployed within pipeline 14 in the event the packers are actuated to engage and seal the pipeline.

Fig. 2 depicts wet buckle packer 100 including example disconnect device 102 in accordance with this disclosure. Packer 100 also includes head cap 104, spindle 106, mandrel 108, brake 110, seal plate 112, expansion boot 114, base cap 116, and packer shaft 118. Head cap 104 and base cap 116 define opposite ends of packer 100. Spindle 106 includes shaft 120 and pressure plate 122. Spindle 106, mandrel 108, seal plate 112, and base cap 116 are all coupled to packer shaft 118. Disconnect device 102 is connected to head cap 104.

Pressure plate 122 of spindle 106 is configured to be actuated by fluid pressure generated within a submerged pipeline in the event of a wet buckle or other failure of the pipeline. Actuation of pressure plate 122 causes spindle 106 to move axially toward base cap 116 from a first position to a second position. Spindle 106 is depicted in the first position in Fig. 2. When in the second position, spindle 106 causes expansion boot 114 to compress axially between seal plate 112 and base cap 116, which causes expansion boot 114 to expand radially into engagement with an inner surface of the pipeline. Additionally, spindle 106 causes brake 110 to be engaged to prevent or inhibit packer 100 from moving within the pipeline. Additional details regarding the structure and function of packer 100 are described in U.S. application Ser. No. ______ (Atty. Docket No. 1880,519US1), filed Jul. 2013 and entitled “METHODS AND APPARATUS FOR ARRESTING FAILURES IN SUBMERGED PIPELINES,” the entire contents of which are incorporated herein by reference.

As noted, disconnect device 102 is connected to head cap 104. In Fig. 2, packer 100 is in an unengaged state in which packer 100 is not actuated to seal the inner diameter of a pipeline. In the unengaged state of packer 100, disconnect device 102 is locked to head cap 104. As will be described in more detail below, disconnect device 102 includes a cylindrical collet that is configured to be locked to head cap 104 of packer 100 at least in part based on the movement of an actuated member of packer 100. Generally speaking, the actuated member locks disconnect device 102 to packer 100 when packer 100 is in an unengaged state and unlocks disconnect device 102 from packer 100 when packer 100 is actuated. Another way of describing this function is that the actuated member is configured to move between first and second positions corresponding to the member not being actuated and being actuated, respectively. In the first position, the actuated member functions to lock disconnect device 102 to packer 100. In the second position, disconnect device 102 is releasable from packer 100 and thus the hoist line can be decoupled from packer 100 via disconnect device 102 simply by pulling the line up from the surface. The actuated member of packer 100 that functions to lock and unlock disconnect device 102 from head cap 104 is spindle 106.

Fig. 3A and 3B depict detail section views of example disconnect device 102 coupled to end cap 124 of an example packer. Fig. 3 presents a simplified representation of the packer structure not pertinent to the structure or operation of the disconnect devices, and thus the configuration of end cap 124 to which disconnect device 102 is connected differs slightly from head cap 104 of packer 100 as depicted in Fig. 2. However, the connection and function of disconnect device 102 with respect to the example of Figs. 3A and 3B is substantially similar to the connection and function of disconnect device 102 with respect to the example of packer 100 of Fig. 2.

Referring to Figs. 3A and 3B, disconnect device 102 includes cylindrical cap 126 defining one end of device 102. Ring-eye swivel 128 (or another hoist line fitting) is connected to cap 126 and is configured to be connected to the hoist line from which the packer is suspended within the pipeline, and is configured to allow the packer to rotate within the pipeline without coating the hoist line. Disconnect device 102 also includes shoulder 130 protruding radially outward from a portion of cap 126. Collet 132 extends axially from shoulder 130 away from cap 126.

As illustrated in Figs. 3A and 3B, collet 132 of disconnect device 102 is configured to be inserted into hole 134 in end cap 124. Shoulder 130 provides a hard stop to limit how far disconnect device 102 can be inserted through hole 134 in end cap 124.

Collet 132 includes a plurality of collet fingers 136. Each collet finger 136 includes axially extending portion 138 and tip portion 140 extending radially outward. Fingers 136 are flexible such that they can be deflected to cause tip portions 140 to move radially inward and outward to change the effective outer diameter of collet 132.

To insert disconnect device 102 into hole 134 in end cap 124 initially, collet fingers 136 can be deflected radially inward such that tip portions 140 can be inserted through hole 134 in end cap 124. When collet 132 is pushed through hole 134 in end cap 124 to the point that tip portions 140 pass all the way through hole 134, collet fingers 134 are configured to automatically deflect outward such that axially extending portions 138 abut the inner surface of hole 134 in end cap 124 and tip portions 140 extend radially outwardly beyond the periphery of hole 134. In one example, collet fingers 134 are biased into a relatively radially expanded state in which axially extending portions 138 fit into hole 134 and tip portions 140 extend radially beyond the periphery of hole 134.

The radially inward and outward deflection of collet fingers 136 is depicted schematically in more detail in Figs. 4A and 4B. In Fig. 4A, disconnect device 102 is in the process of being inserted into hole 134 of end cap 124 and collet finger 136 is deflected radially inward with tip portion 140 sliding against the inner surface of hole 134. In Fig. 4B, disconnect device 102 is inserted all the way into hole 134 and collet finger 136 is deflected back radially outward such that axially extending portion 138 abuts the inner surface of hole 134 and tip portion 140 extends axially beyond the periphery of hole 134.

As illustrated in Figs. 4A and 4B, tip portion 140 includes ramp 142. Ramp 142 provides an angled surface extending from axially extending portion 138 into tip portion 140. The angled surface of ramp 142 allows disconnect
device 102 is connected. For example, axial movement of spindle 144 from the first position to the second position may function to cause a sealing element and/or a braking mechanism of the packer to engage the inner surface of a floating pipeline to seal and to arrest movement of the packer within the pipeline. In such cases, there is a risk that as spindle 144 moves axially to engage the packer, shaft 146 may move out of collet 132 before the packer is completely engaged within the pipeline. In the event disconnect device 102 was unlocked prior to the packer becoming fully engaged, ring-eye swivel 128 and disconnect device 102 could be pulled out of the packer and the packer could slide through the pipeline without being fully engaged.

[0043] To address the risk of automatically unlocking disconnect device 102 and releasing the packer before the device is fully engaged within a pipeline, different portions of spindle 144 can be configured as separate components, which can be separately actuated. For example, shaft 146, which extends axially from the intermediate collet 124 (up in the views of FIGS. 3A and 3B), can be configured as a separate component that is decoupled from pressure plate 148 and the shaft extending from pressure plate 148 away from end cap 124 (down in the views of FIGS. 3A and 3B). Pressure plate 148 and the shaft extending from pressure plate 148 away from end cap 124 can define a spindle or piston structure that is configured to be actuated by fluid pressure (or by a actuating device like a solenoid or another type of actuator) to cause the packer to become engaged. Shaft 146, in this example, is actuated separately from movement of pressure plate 148. In this manner, axial movement of shaft 146 to lock and unlock disconnect device 102 from the packer can be functionally decoupled from the actuation of the packer into engagement with a pipeline.

[0044] Although it is not strictly necessary for the function of disconnect device 102, the example wet-buckle packer of FIGS. 3A and 3B also includes coiled spring 152. Coiled spring 152 is configured to bias spindle 144 into the second position shown in FIGS. 3A and 3B, respectively. For example, spring 152 can be compressed between spindle 144 and end cap 124 when the packer is in the unengaged state illustrated in FIG. 3A. Spindle 144 may be held in position against the force of spring 152 by pins (not shown) received in holes 154 in end cap 124 and engaging a slot in spindle 144. The pins can be configured such that the force of water invading the pipeline shears the pins and releases spindle 144. The force generated by spring 152 can push against spindle 144 to augment the force of the water pushing spindle 144. Additionally, once engaged as illustrated in FIG. 3B, the axially expanded spring 152 can function resist the packer from becoming unengaged and thus lock or partially lock the device within the pipeline.

[0045] A variety of materials can be used to fabricate disconnect device 102 including, e.g., metals, plastics, elastomers, and composites. For example, disconnect device 102 can be fabricated from a variety of different types of steel including properties that could configure collet fingers 136 to be flexible and biased appropriately to be inserted into hole 132 and lock to end cap 124. Flexible plastics could also be employed to fabricate disconnect device 102. Disconnect device 102 can be fabricated using a variety of techniques including, e.g., machining, injection molding, and casting.

[0046] FIG. 5 is a flowchart depicting an example method of releasing a hoist line from a tool suspended in the inner diameter of a pipe or a wellbore. The method includes actu-
ating a component of the tool to move from a first position to a second position relative to a disconnect device coupled to the tool and to the hoist line (200) and applying a force to the hoist line to decouple the disconnect device from the tool (202). In the first position, the actuated component functions to lock the disconnect device to the tool. In the second position, the actuated component functions to unlock the disconnect device from the tool. After the disconnect device has been decoupled from the tool, the hoist line and disconnect device can be retrieved through the inner diameter of the pipe or wellbore.

[0047] In one example, the foregoing method is employed using disconnect device 102 described above with reference to the examples of FIGS. 2, 3A, and 3B. For example, the actuated component can be spindle 106 of packer 100 or spindle 144 of the example of FIGS. 3A and 3B. As the spindle is actuated to cause the packer to engage and seal a submerged pipeline, the shaft of the spindle also unlocks disconnect device 102 from the end of the packer to which device 102 is connected. At this point, the hoist machine on the pipelay vessel can be operated to apply a force to the hoist line connected to the ring-eye swivel connected to disconnect device 102. The force applied by the hoist line functions to cause ramps 142 of tip portions 140 of collet fingers 136 to engage the edge of hole 134, which, in turn, causes collet fingers 136 to deflect radially inward to allow disconnect device 102 to be pulled out of hole 134.

[0048] As noted above, in some examples, different portions of spindle 144 can be configured as separate components, which can be separately actuated. In such a case, shaft 146 can be configured as a separate component that is decoupled from pressure plate 148 and the shaft extending from pressure plate 148 away from cap 124 (down in the views of FIGS. 3A and 3B). Shaft 146 can be actuated to lock and unlock disconnect device 102 separately from movement of pressure plate 148.

[0049] In one example, fluid pressure causes pressure plate 148 and the shaft extending from pressure plate 148 away from cap 124 by to move axially to cause the packer to become engaged. Movement of pressure plate 148 can be detected with a motion or other appropriate sensor included in the packer. The same or another sensor included could also be employed to detect when pressure plate 148 has moved enough to cause the packer to become fully engaged. In the event the packer does not become fully engaged within the pipeline, shaft 146 may not be actuated to unlock disconnect device 102. In the event that the packer is detected as fully engaged, a signal can be sent via a supply line connected to or via control electronics included in the packer to an actuation device that is configured to actuate shaft 146 to move axially out of collet 132 to allow disconnect device 102 to be disconnected from the packer.

[0050] Various examples have been described. These and other examples are within the scope of the following claims.

I claim:

1. A tool configured to be deployed via a hoist line in the inner diameter of a pipe or a wellbore, the tool comprising:
   - an end cap comprising an aperture;
   - a disconnect device comprising a collet, at least a portion of which collet is received within the aperture; and
   - an actuated member configured to move from a first position to a second position relative to the disconnect device, wherein, in the first position, the actuated member engages the collet to lock the disconnect device to the end cap, and wherein, in the second position, the actuated member disengages the collet to unlock the disconnect device from the end cap.

2. The tool of claim 1, wherein:
   - the actuated member comprises a shaft;
   - the collet is radially flexible to allow the collet to deflect radially inward as the collet pass through the aperture; and
   - in the first position, the shaft is received within the collet and is sized to substantially prevent the collet from deflecting radially inward; and
   - in the second position, the shaft is moved out of the collet.

3. The tool of claim 2, wherein:
   - the collet comprises a plurality of collet fingers, each of which collet fingers comprises an axially extending portion and a tip portion extending radially outward, in the first position, the shaft maintains the tip portions as extending radially outward beyond the aperture to lock the disconnect device to the end cap.

4. The tool of claim 3, wherein each of the tip portions comprises an angled surface arranged to engage an edge of the aperture adjacent the respective tip portion.

5. The tool of claim 4, wherein, in the second position, the shaft is moved out of the collet to unlock the disconnect device from the end cap by allowing an applied axial force to cause the angled surfaces of the tip portions to engage the edge of the aperture to cause the respective collet fingers to deflect radially inward to allow the tip portions to pass through the aperture.

6. The tool of claim 1, wherein, in the second position, the actuated member triggers at least one function of the tool.

7. The tool of claim 1, wherein the tool comprises a wet buckle packer and the at least one function comprises causing a seal member of the packer to engage the inner surface of a submerged pipeline to substantially seal at least a portion of the pipeline from water invasion.

8. The tool of claim 1, wherein the disconnect device comprises:
   - a cylindrical cap defining one end of the disconnect device to which a hoist line fitting is configured to be attached for coupling the hoist line to the tool; and
   - a shoulder protruding radially outward from a portion of the cap,
   - wherein the collet extends axially from the shoulder away from the cap.

9. A disconnect device for releasing a hoist line from a tool deployed in the inner diameter of a pipe or a wellbore, disconnect device comprising:
   - a cylindrical cap defining one end of disconnect device to which a hoist line fitting is configured to be attached for coupling the hoist line to the tool;
   - a shoulder protruding radially outward from a portion of the cap; and
   - a collet extending axially from the shoulder away from the cap, wherein an actuated member of the tool is configured to move from a first position to a second position relative to the disconnect device, wherein, in the first position, the actuated member is configured to engage the collet to lock the disconnect device to the tool, and wherein, in the second position, the actuated member disengages the collet to unlock the disconnect device from the tool.
10. The disconnect device of claim 9, wherein:
the actuated member comprises a shaft;
the collet is radially flexible to allow the collet to deflect
radially inward as the collet pass through an aperture in
the tool;
in the first position, the shaft is received within the collet
and is sized to substantially prevent the collet from
deflecting radially inward; and
in the second position, the shaft is moved out of the collet.
11. The disconnect device of claim 10, wherein:
the collet comprises a plurality of collet fingers, each of
which collet fingers comprises an axially extending por-
tion and a tip portion extending radially outward,
in the first position, the shaft maintains the tip portions as
extending radially outward beyond the aperture to lock
the disconnect device to the tool.
12. The disconnect device of claim 11, wherein each of the
tip portions comprises an angled surface configured to engage
an edge of the aperture to which the respective tip portion is
configured to be disposed adjacent.
13. The disconnect device of claim 12, wherein, in the
second position, the shaft is moved out of the collet to unlock
the disconnect device from the tool by allowing an applied
axial force to cause the angled surfaces of the tip portions to
engage the edge of the aperture to cause the respective collet
fingers to deflect radially inward to allow the tip portions to
pass through the aperture.
14. A packer apparatus configured to be arranged within
and arrest a failure of a submerged pipeline, the packer appa-
ratus comprising:
a first end and a second end opposite the first end;
an actuated member configured to move from a first posi-
tion to a second position; and
a disconnect device comprising a collet, at least a portion of
which collet is received within an aperture in one of the
first or second end,
wherein, in the first position, the actuated member engages
the collet to lock the disconnect device to the packer, and
wherein, in the second position, the actuated member
causes a seal member to engage an inner surface of the
pipeline to substantially seal a portion of the pipeline
from ingress of water and the actuated member disen-
gages the collet to unlock the disconnect device from the
packer.
15. The packer of claim 14, wherein:
the actuated member comprises a shaft;
the collet is radially flexible to allow the collet to deflect
radially inward as the collet pass through the aperture;
in the first position, the shaft is received within the collet
and is sized to substantially prevent the collet from
deflecting radially inward; and
in the second position, the shaft is moved out of the collet.
16. The packer of claim 15, wherein:
the collet comprises a plurality of collet fingers, each of
which collet fingers comprises an axially extending por-
tion and a tip portion extending radially outward,
in the first position, the shaft maintains the tip portions as
extending radially outward beyond the aperture to lock
the disconnect device to the packer.
17. The packer of claim 16, wherein each of the tip portions
comprises an angled surface arranged to engage an edge of
the aperture adjacent the respective tip portion.
18. The packer of claim 17, wherein, in the second position,
the shaft is moved out of the collet to unlock the disconnect
device from the packer by allowing an applied axial force to
cause the angled surfaces of the tip portions to engage
the edge of the aperture to cause the respective collet fingers
to deflect radially inward to allow the tip portions to
pass through the aperture.
19. The packer of claim 14, wherein the disconnect device
comprises:
a cylindrical cap defining one end of the disconnect device
to which a hoist line fitting is configured to be attached
for coupling the hoist line to the packer; and
a shoulder protruding radially outward from a portion of
the cap,
wherein the collet extends axially from the shoulder away
from the cap.
20. A method of releasing a hoist line from a tool sus-
pended in the inner diameter of a pipe or a wellbore, wherein
the method comprises:
actuating a component of the tool to move from a first
position to a second position relative to a disconnect
device, wherein the disconnect device is coupled to the
tool and to the hoist line, and wherein, in the second
position, the actuated component unlocks the disconnect
device from the tool;
applying a force to the hoist line to decouple the disconnect
device from the tool.
21. The method of claim 20, further comprising retrieving
the hoist line and disconnect device through the inner dia-
meter of the pipe or wellbore.

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