

**IMPROVED STUFFING BOX**

1

2 The present invention relates to improvements to stuffing  
3 boxes for use in the production of oil and gas from  
4 downhole wellbores, and in particular to an improved  
5 stuffing box assembly used in wireline and slickline  
6 systems.

7

8 Stuffing box assemblies are commonly used in wireline and  
9 slickline applications to seal and contain well pressure  
10 around a stationary or moving wireline or slickline. A  
11 typical hydraulic stuffing box assembly is shown in  
12 Figure 1, generally depicted at 10. The assembly  
13 comprises a longitudinal body 11 positioned on and  
14 mounted to a lubricator stack and a sheave and bracket  
15 sub-assembly 12. In use, the wireline is passed over the  
16 sheave wheel 13, and through a series of packings 14  
17 housed in the longitudinal body. The sheave and bracket  
18 sub-assembly 12 is mounted to be rotatable around the

1 longitudinal access of the body to allow effective  
2 guiding of the wireline from a storage drum.

3

4 Beneath the stuffing box 10, the wireline is attached to  
5 a rope socket (not shown) which securely connects the  
6 wireline to a tool being run in the wellbore.

7

8 The stuffing box must allow the running of the wire  
9 through its body whilst sealing the internal pressure of  
10 the wellbore against the ambient pressure. To achieve  
11 this, the packing is sealed against the wireline by means  
12 of a hydraulically operated packing nut 15. In  
13 alternative arrangements, the compressive force is  
14 achieved by a compression nut which is tightened  
15 manually.

16

17 The stuffing box also contains an integral blow-out  
18 plunger which functions to automatically seal the well in  
19 the event of the wireline breaking and being forced out  
20 of the packings.

21

22 There are a number of difficulties with existing stuffing  
23 box apparatus. Many of these arise due to the weight,  
24 size and manoeuvrability of the apparatus.

25

26 A conventional stuffing box has a narrow throughbore in  
27 the housing sufficient for the wireline to pass through.

28 The arrangement is such that the wireline must be run  
29 through the stuffing box prior to its attachment to  
30 wireline pressure control equipment. In practice, the  
31 stuffing box assembly, including the body, the packing  
32 nut, the sheave, and the sheave bracket must all be  
33 removed from the lubricator stack and carried or wheeled

1 to an appropriate location for passing the wireline  
2 through the packing. Passing the wire through the  
3 packing can be a difficult task in itself due to the  
4 tight fit between the packing of the wire, and often the  
5 operator would be required to ream the internal packing  
6 to allow the wire to be received. The rope socket is  
7 then attached, the stuffing box assembly carried back to  
8 the wellhead and the rope socket is fixed to the tool  
9 which is located in the lubricator stack of the wellbore.  
10 The stuffing box is then connected to the structure, for  
11 example by an OTIS® Quick Union connector.

12

13 It is notable that the bore through the stuffing box  
14 itself is not of sufficient diameter to allow a tool  
15 being run in the wellbore to pass through any part of the  
16 stuffing box assembly. It is therefore not possible to  
17 load a tool into the wellbore without removing the entire  
18 stuffing box assembly including the sheave and the sheave  
19 bracket. In addition, should the tool be required to be  
20 stripped from the wellhead, it can only be removed after  
21 the entire stuffing box apparatus is detached.

22

23 The stuffing box assembly needs to be of sufficient  
24 mechanical strength to withstand the forces imparted by  
25 the wellbore pressure, weight of the toolstring and the  
26 compressive forces applied to the packing. This results  
27 in a relatively heavy piece of apparatus of the order of  
28 40 kg to 50 kg. Consequently, removal, attachment,  
29 manipulation and handling of the apparatus is difficult.  
30 This is exacerbated by the particular shape and  
31 rotational mounting of the components of the apparatus.  
32 For example, the rotational mounting of the sheave arm to  
33 the stuffing box can cause problems during handling, due

1 to a tendency for it to move unexpectedly risking  
2 striking an operator in its vicinity.

3

4 Various attempts have been made to reduce the weight of  
5 stuffing box assemblies. These include designs which  
6 minimise the amount of material required, while still  
7 retaining the required structural strength. However,  
8 minimising the weight by reducing the material used  
9 inevitably compromises structural strength to an extent.

10 Other approaches include simplifying the design and  
11 features in the stuffing box, for example by using only  
12 manually compressible systems and omitting hydraulic  
13 arrangements. This inevitably compromises the  
14 functionality of the apparatus.

15

16 Alternative approaches have considered the use of  
17 composite materials or metals and alloys of titanium and  
18 other high strength, low weight components. Use of such  
19 components has effect on the capital and manufacturing  
20 costs of the apparatus, pushing up costs for the buyer.

21

22 As well as particular disadvantages of the above-  
23 described approaches to reducing weight of the stuffing  
24 box assembly, the overall weight loss is not significant  
25 in terms of its effect on manoeuvrability and handling.  
26 Typically, the above-described techniques might be  
27 expected to reduce the weight of the apparatus by around  
28 10% so that the weight of the apparatus might be of the  
29 order of 35 kg to 45 kg. This does not have a  
30 significant effect on the ability for an operator to lift  
31 and manoeuvre the apparatus.

32

1 In some jurisdictions, health and safety guidelines  
2 require that an operator not be expected to lift weights  
3 greater than 25 kg. Using the above-described  
4 techniques, it is difficult or impossible to produce an  
5 effective stuffing box that meets the health and safety  
6 lifting guidelines.

7  
8 It is one aim of the invention to provide a stuffing box  
9 that obviates, or at least mitigates, some of the  
10 deficiencies and disadvantages of the prior art.

11  
12 It is another aim of the present invention to provide a  
13 stuffing box with improved manoeuvrability and handling.

14  
15 It is a further aim of the invention to provide a  
16 stuffing box that allows the wellbore to be accessed by  
17 removing components of low weight when compared with the  
18 prior art.

19  
20 It is a further aim of the invention to provide a  
21 stuffing box assembly that allows a tool to be loaded  
22 into or removed from a wellhead without removing some  
23 components of the stuffing box assembly from the  
24 wellhead.

25  
26 Further aims and objects of the invention will become  
27 apparent from reading the following description.

28  
29 According to the first aspect of the invention, there is  
30 provided a stuffing box assembly comprising a body  
31 coupled to wireline pressure control equipment and a  
32 packing chamber for providing a compression seal with a

1 wireline, wherein the packing chamber is provided within  
2 a module removable from the body.

3

4 In the context of this description, the wireline pressure  
5 control equipment could, for example, be a lubricator or  
6 a blow out preventer. The wireline pressure control  
7 equipment could be attached at the wellhead, or the  
8 stuffing box assembly could be coupled to the pressure  
9 control equipment on the catwalk prior to attachment to  
10 the wellhead.

11

12 Preferably, the assembly further comprises a support  
13 bracket adapted to support a sheave, the support bracket  
14 being mounted to the body such that the module is  
15 detachable from the body and the support bracket.

16

17 Preferably, the body is provided with a throughbore into  
18 which the module is received.

19

20 Preferably, the throughbore is of sufficient diameter to  
21 allow a tool to be run in the wellbore to be passed  
22 through. More preferably, the throughbore is of  
23 sufficient diameter to allow a 2½ inch (63.5mm) rope  
24 socket and toolstring to be passed through.

25

26 Preferably, the module comprises a packing nut for  
27 providing a compressive force to the packing, and the  
28 support bracket is secured to the body by the packing  
29 nut.

30

31 Optionally, the packing nut is hydraulically operated.

32

1 Preferably, the module comprises means for creating a  
2 fluid bath through which the wireline passes..

3

4 Optionally, the module comprises an upper packing set, a  
5 lower packing set displaced from the upper packing set,  
6 and the fluid bath is located between the upper packing  
7 and the lower packing.

8

9 Preferably, means is provided for injecting a fluid into  
10 the fluid bath. More preferably, the fluid is corrosion  
11 inhibitor or lubricant.

12

13 Optionally, the assembly is provided with guiding means  
14 for guiding a wireline to a throughbore in the packing  
15 chamber.

16

17 Preferably, the guiding means comprises a plurality of  
18 rollers.

19

20 More preferably, the rollers are located on the module.

21

22 According to a second aspect of the invention there is  
23 provided a stuffing box assembly comprising a body  
24 adapted to house a packing chamber for providing a  
25 compression seal with a wireline and a support bracket  
26 for supporting a sheave, wherein the assembly allows a  
27 tool to be loaded into or removed from wireline pressure  
28 control equipment while the assembly is attached to the  
29 wireline pressure control equipment.

30

31 That is, the assembly allows a tool to be loaded into or  
32 removed from a lubricator stack or BOP while the assembly  
33 is attached to the lubricator stack or BOP.

1

2 Preferably, the packing chamber is provided in a module  
3 removably mounted to the body.

4

5 More preferably, the body comprises a throughbore into  
6 which the module is received, and the assembly allows a  
7 tool to be loaded into or removed from wireline pressure  
8 control equipment via the throughbore.

9

10 According to a third aspect of the invention, there is  
11 provided a method of loading a tool into wireline  
12 pressure control equipment, the method comprising the  
13 steps of:

- 14 - Loading the tool into wireline pressure control  
15 equipment via a throughbore provided in a body of a  
16 stuffing box assembly coupled to the wireline  
17 pressure control equipment;
- 18 - Locating a module comprising a packing chamber for  
19 providing a compression seal with a wireline in the  
20 throughbore.

21

22 According to a fourth aspect of the invention there is  
23 provided a method of removing a tool from wireline  
24 pressure control equipment, the method comprising the  
25 steps of:

- 26 - Removing a module comprising a packing chamber for  
27 providing a compression seal with a wireline from a  
28 throughbore provided in a body of a stuffing box  
29 assembly coupled to wireline pressure control  
30 equipment;
- 31 - Removing the tool from the wireline pressure  
32 control equipment via the throughbore.

33

1 According to a fifth aspect of the invention there is  
2 provided a method of configuring a stuffing box apparatus  
3 for a wireline or slickline operation, the method  
4 comprising the steps of:

- 5 - Removing a module comprising a packing chamber from  
6 a stuffing box assembly coupled to wireline  
7 pressure control equipment
- 8 - Passing a wireline through the module and the  
9 packing chamber;
- 10 - Locating the module in the stuffing box assembly  
11 attached to the wireline pressure control  
12 equipment.

13

14 According to a sixth aspect of the invention there is  
15 provided a method of loading a tool into wireline  
16 pressure control equipment, the wireline pressure control  
17 equipment having a stuffing box assembly coupled thereto,  
18 the stuffing box assembly having a body and a module  
19 comprising a packing chamber for providing a compression  
20 seal with a wireline, the method comprising the steps of:

- 21 - Loading the tool into the wireline pressure control  
22 equipment via a throughbore provided in the body of  
23 the stuffing box assembly;
- 24 - Locating the module in the throughbore.

25

26 According to a seventh aspect of the invention there is  
27 provided a method as claimed in Claim 18, the method  
28 comprising the additional steps of:

29

- 30 - Passing a wireline through the module and the  
31 packing chamber;
- 32 - Coupling the wireline to the tool located in the  
33 wireline pressure control equipment.

1

2 According to an eighth aspect of the invention there is  
3 provided a method of removing a tool from wireline  
4 pressure control equipment, the wireline pressure  
5 control equipment having a stuffing box assembly coupled  
6 thereto, and the stuffing box assembly having a body and  
7 a module comprising a packing chamber for providing a  
8 compression seal with a wireline, the method comprising  
9 the steps of:

- 10 - Removing the module from a throughbore provided in  
11 the body of the stuffing box assembly;  
12 - Removing the tool from the wireline pressure control  
13 equipment via the throughbore.

14

15 According to a ninth aspect of the invention there is  
16 provided a method of configuring stuffing box apparatus  
17 for a wireline or slickline operation, the stuffing box  
18 apparatus comprising a stuffing box assembly coupled to  
19 wireline pressure control equipment and a module  
20 comprising a packing chamber, the method comprising the  
21 steps of:

- 22 - Removing the module from the stuffing box assembly;  
23 - Passing a wireline through the module and the  
24 packing chamber;  
25 - Locating the module in the stuffing box assembly.

26

27 There will now be described, by way of example only, an  
28 embodiment of the invention with reference to the  
29 following drawings, of which:

30

31 Figure 1 is a side view of a prior art hydraulic  
32 stuffing box;

33

11.

1       Figure 2 is an exploded side view of a stuffing box  
2       assembly in accordance with an embodiment of the  
3       invention;

4

5       Figure 3A is a perspective view of the sheave and  
6       support frame of the embodiment of Figure 2;

7

8       Figure 3B is a perspective, partially exploded view  
9       of components of the assembly shown in Figure 2;

10

11       Figure 4 is a longitudinal section through the  
12       stuffing box assembly in accordance with an  
13       embodiment of the invention, and;

14

15       Figure 5 is a plan view of the stuffing box assembly  
16       in accordance with an embodiment of the invention.

17

18       Referring firstly to Figures 2, 3A and 3B, there is shown  
19       a stuffing box assembly, generally depicted at 20,  
20       consisting of a housing 21, a module in the form of  
21       cartridge 23, a sheave assembly 25, and a sheave support  
22       bracket 27. The main body 21 comprises conjoining  
23       annular sections, and the lower section is provided with  
24       a mechanism for mounting to a lubricator stack (not  
25       shown). In this example, the connection is made by an  
26       OTIS® Quick Union joint.

27

28       The housing body 21 comprises a throughbore 22 for  
29       receiving cartridge 23. Cartridge 23 comprises a  
30       throughbore for receiving the wireline, and includes a  
31       main body 35 housing a packing chamber and a  
32       hydraulically operated packing nut 24, the two components  
33       may be retained together by means of cap screws or

1 alternative means. The inner surface of the throughbore  
2 22 is provided with a thread for mating with a counter-  
3 thread provided on the outer surface of the Cartridge.  
4 Cartridge 23 will be described in more detail below.

5  
6 Body 21 comprises an upper section of reduced outer  
7 diameter, upon which is mounted a sheave bracket 27.  
8 The sheave bracket 27 comprises a bore 26 for receiving  
9 the upper section of the body 21 and is rotationally  
10 mounted on the body. The sheave support bracket 27 is  
11 provided with a second bore 28, radially displaced from  
12 the main longitudinal access of the housing 21. This  
13 second bore 28 receives the sheave support frame 30 of  
14 the sheave assembly 25.

15  
16 The sheave support frame 30 retains the sheave wheel 13,  
17 and includes a lower section to be received in the bore  
18 28. In the example shown, the lower section is of  
19 reduced outer diameter compared with the main part of the  
20 support frame, such that a shoulder is formed to abut the  
21 sheave bracket 27. The lower section is provided with a  
22 locating pin 32 protruding radially from the support  
23 frame 30. The locating pin 32 can be depressed to be  
24 flush with the lower section of the support frame 30, but  
25 is biased outwardly to its protruding position by a  
26 spring mechanism.

27  
28 The locating pin 32 functions to be received in one of  
29 the corresponding radial bores 33 provided in the bore  
30 28. In the example shown, three radial bores 33 are  
31 provided at 90° intervals such that the biasing force of  
32 the spring causes the locating pin to engage at one of  
33 three rotational positions of the support frame.

1 Depression of the locating pin allows the support frame  
2 30 to be rotated from an operational position to an  
3 access position. In the operational position (shown in  
4 Figure 5) the sheave wheel 13 is aligned with the sheave  
5 bracket 27 and the edge of the sheave wheel is located  
6 over the longitudinal axis of the housing 21 and the  
7 cartridge 23. In the access position, the sheave wheel  
8 13 is rotated through 90° and is perpendicular to the  
9 sheave bracket 27, such that the area above the housing  
10 21 and the cartridge 23 is clear, allowing access to the  
11 cartridge and wellbore.

12

13 The cartridge 23, most clearly shown in Figures 2 and 4,  
14 comprises a main body 35 defining a packing chamber and a  
15 hydraulic packing nut 24 for tightening the packing  
16 against the wireline. A longitudinal bore is provided in  
17 the cartridge for receiving the wireline. In alternative  
18 embodiments the packing nut may be a manual compression  
19 nut.

20

21 The packing chamber includes a first, upper series of  
22 packings 36, and a second, lower set of packings 37  
23 (which in this example consists of a single packing).  
24 The packings are, in this example, brass annular  
25 components provided with a radial split extending along  
26 the longitudinal length of the packing from the  
27 circumference to the centre, although other packings  
28 could also be used. Between the upper and lower packings  
29 is a blow-out plunger which is designed to seal the well  
30 automatically in the event of the wireline breaking and  
31 being forced out of the packings.

32

1 An injection port 38 is provided to allow the injection  
2 of fluid into a chamber between the upper and lower  
3 packings. The lower packings substantially seal the  
4 chamber, allowing a fluid bath to be created in the lower  
5 portion of the cartridge. Lubricant or corrosion  
6 inhibitor is injected into the chamber to create a bath  
7 through which the wireline passes, soaking or flooding  
8 the wireline. This is particularly advantageous for  
9 wireline systems used in gas wells, which tend to dry the  
10 wireline causing problems when withdrawing the wireline  
11 through the packing.

12

13 It will be appreciated that the provision of lower  
14 packing to provide a seal for a chamber functioning as a  
15 fluid bath is applicable to other stuffing box  
16 arrangements (such as that of Figure 1), and is not  
17 limited to the embodiment described with reference to  
18 Figures 2 to 5.

19

20 The cartridge 23 is provided with four wireline guide  
21 rollers 39 located on the packing nut 24. A cross-  
22 section through two of the rollers 39 is shown in Figure  
23 4, whereas three of the rollers 39 are visible in Figure  
24 5. The rollers are metal discs pivotally mounted on the  
25 packing nut, and are provided with a circumferential  
26 groove for receiving the wireline and guiding it into the  
27 longitudinal bore in the cartridge 23. One set of  
28 rollers is suitable for a particular range of outer  
29 diameters of wireline, although it may be necessary or  
30 desirable to select rollers with different dimensions for  
31 wireline diameters outside that range.

32

1 The roller arrangement reduces wear on the components of  
2 the stuffing box caused by misalignment of the wireline.  
3 It will be appreciated that the provision of rollers to  
4 guide the wireline into the packing chamber is applicable  
5 to other stuffing box arrangements (such as that of  
6 Figure 1), and is not limited to the embodiment described  
7 with reference to Figures 2 to 5.

8  
9 An example of the manner in which the apparatus can be  
10 used will now be described. The stuffing box assembly 20  
11 will be assembled at the wellhead, typically with the  
12 body 21 coupled to the lubricator stack by an OTIS® Quick  
13 Union joint. The sheave bracket 27 is located on the  
14 upper section of the body 21, and the sheave assembly 25  
15 is located in the bore 28 of the bracket. With the  
16 sheave assembly 25 rotated to the access position, the  
17 cartridge 23 is located in the throughbore 22 in the body  
18 21, and thus extends through the corresponding bore 26 in  
19 the sheave bracket.

20

21 When feeding the wireline through the stuffing box for  
22 attachment of a tool, the cartridge 23 is removed from  
23 the rest of the assembly by unscrewing the cartridge from  
24 the body 21, leaving the body, bracket and sheave  
25 assembly in place at the wellhead. The cartridge 23 is  
26 carried to an appropriate location for feeding the  
27 wireline through the packing. The packing nut 24 is  
28 separated from main body 35 housing the packing chamber,  
29 by unfastening cap screws holding the two components  
30 today. The wireline is fed into and pulled through the  
31 bore provided in the packing nut. Subsequently, the  
32 wireline is fed through the packings in the packing  
33 chamber before the cartridge is reassembled by fastening

1 the main body and the packing nut together by means of  
2 cap screws. A rope socket is attached to the wireline  
3 beneath the cartridge. The cartridge 23, with wireline  
4 attached, is carried back to the wellhead, and the  
5 wireline is fed around the sheave wheel by removal and  
6 attachment of the retaining member 41 that forms part of  
7 the sheave support frame 30. The rope socket is attached  
8 to the tool to be run in the wellbore, which is loaded  
9 into the lubricator stack through the bore in the body 21  
10 of the stuffing box assembly. Subsequently, the  
11 cartridge 23 is located in the bore 22 of the body 21,  
12 and the hydraulic packing nut is used to tighten the  
13 packing against the wireline. The sheave assembly 25 is  
14 then rotated to its operating position.

15  
16 In order to access and remove a tool from the wellhead it  
17 is only necessary to remove the cartridge 23 from the  
18 remainder of the assembly. This is done by rotating the  
19 sheave assembly to its access position and removing the  
20 cartridge 23. The throughbore 22 in the body 21 is large  
21 enough to allow the tool to be removed from the wellhead  
22 via the throughbore, and significantly while the stuffing  
23 box assembly is in place at the wellhead.

24  
25 Significant advantages are apparent from the above  
26 description of use. Significantly, the provision of a  
27 module in the form of a removable cartridge containing  
28 the packing chamber significantly increases the ease of  
29 use of the apparatus. Removal of the cartridge 23  
30 provides a bore 22 in the support assembly of inner  
31 diameter large enough to allow a tool to be loaded into  
32 or removed from the relevant wireline pressure control  
33 equipment without removing the entire stuffing box

1 assembly. This significantly increases the ease of use  
2 of the apparatus when attaching a tool to be run or  
3 stripping a tool from the wellbore.

4  
5 The only component that needs to be removed from the  
6 stuffing box assembly provided at the relevant wireline  
7 pressure control equipment is the cartridge. It is  
8 apparent that the cartridge 23 is of significantly  
9 reduced weight when compared with the stuffing box  
10 assembly of the prior art. A typical weight of a prior  
11 art stuffing box assembly, all of which would have to be  
12 detached from the relevant wireline pressure control  
13 equipment in order to access a tool is 40kg to 50kg. In  
14 contrast, the cartridge is of a weight less than 25kg,  
15 which is the maximum lifting weight allowed by health and  
16 safety guidelines in some jurisdictions. By way of  
17 example, the cartridge can be of weight less than 15kg.  
18 The dimensions and shape of the cartridge are also  
19 suitable for being carried by an operator from the  
20 wellhead to an area at which the wireline is to be fed  
21 through the packing.

22  
23 The embodiment of the invention provides other  
24 advantages. The provision of a removable module avoids  
25 the need for weight saving on other parts of the  
26 apparatus, and therefore reduces the loss of  
27 functionality and/or mechanical strength that occurs with  
28 the omission of features in some prior art stuffing box  
29 assemblies.

30  
31 In particular, the removable module allows a larger  
32 internal packing chamber for accommodating the packings.

1 This allows larger packing elements to be used when  
2 compared with prior art systems.

3

4 Larger packing elements have greater flexibility and  
5 resilience, and allowing the wireline to be fed through  
6 the packing more easily. In addition, the larger packing  
7 elements provide superior distribution of heat due to the  
8 frictional forces created by moving wireline.

9 Furthermore, the use of larger packing allows a larger  
10 outer diameter wireline to be used.

11

12 In order to accommodate larger packing in the prior art  
13 systems, a larger internal bore would need to be  
14 provided. This has implications for the packing chamber  
15 housing, which must be scaled up appropriately to have  
16 sufficient mechanical strength. This drives up the  
17 weight of the assembly, which inevitably has implications  
18 for easy of handling and lifting of the stuffing box  
19 assembly. With the present invention, only the weight of  
20 the cartridge is increased, which is in any case  
21 significantly lower than the overall weight of the prior  
22 art systems. With the present invention, it is therefore  
23 possible to provide a larger internal bore allowing the  
24 use of larger packing elements.

25

26 A further advantage of the present invention is that it  
27 allows auxiliary wireline from a secondary drum at the  
28 winch to be used effectively as a back up to the wireline  
29 in use. The auxiliary wireline is fed through an  
30 auxiliary cartridge located at or near the winch. The  
31 auxiliary cartridge is "standing by" and ready to use,  
32 with the wireline already having been fed through the  
33 packing chamber in the cartridge and a rope socket

1 attached. Should the wireline being used break, it is  
2 possible to remove the cartridge presently in use from  
3 the stuffing box assembly and locate a second cartridge,  
4 with the wireline already attached. This significantly  
5 reduces the time required for making the system  
6 operational compared with the traditional time, by  
7 avoiding the need to feed a second wireline through a  
8 standard stuffing box assembly.

9

10 The described embodiment comprises a body 21 attached to  
11 a lubricator stack. It should be noted that the body 21  
12 of the stuffing box assembly could be coupled to other  
13 relevant wireline pressure control equipment, such as  
14 directly onto a blow out preventer. In an alternative  
15 embodiment, the body 21 comprising the throughbore 22 is  
16 integral with relevant wireline pressure control  
17 equipment. For example, the body 21 could be integral  
18 with the upper section of wireline lubricator.

19

20 The foregoing description relates primarily to wireline  
21 systems, although it will be appreciated that the system  
22 is applicable to slickline systems. In addition, the  
23 stuffing box could be adapted to seal around other  
24 workstrings and tubulars, for example coiled tubing.

25

26 Additional advantages are provided by the fluid bath  
27 arrangement and the wireline guide rollers, which it will  
28 be appreciated could be used in other stuffing box  
29 systems.

30

31 Various modifications and embodiments could be made  
32 within the scope of the invention herein intended.

CLAIMS

1. A stuffing box assembly comprising a body coupled to wireline pressure control equipment and a packing chamber for providing a compression seal with a wireline, wherein the packing chamber is provided within a module removable from the body.
2. A stuffing box assembly as claimed in Claim 1, further comprising a support bracket adapted to support a sheave, the support bracket being mounted to the body such that the module is detachable from the body and the support bracket.
3. A stuffing box assembly as claimed in Claim 1 or Claim 2 wherein the body is provided with a throughbore into which the module is received.
4. A stuffing box assembly as claimed in Claim 3, wherein the throughbore is of sufficient diameter to allow a tool to be run in the wellbore to be passed through.
5. A stuffing box assembly as claimed in Claim 3 or Claim 4 wherein the throughbore is of sufficient diameter to allow a 2½ inch (63.5mm) rope socket and toolstring to be passed through.
6. A stuffing box assembly as claimed in any of Claims 2 to 5, wherein the module comprises a packing nut for providing a compressive force to the packing, and the support bracket is secured to the body by the packing nut.

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7. A stuffing box assembly as claimed in Claim 6,  
wherein the packing nut is hydraulically operated.

8. A stuffing box assembly as claimed in any preceding  
Claim, wherein the module comprises means for  
creating a fluid bath through which the wireline  
passes.

9. A stuffing box assembly as claimed in Claim 8,  
wherein the module comprises an upper packing set  
and a lower packing set displaced from the upper  
packing set, and the fluid bath is located between  
the upper packing and the lower packing.

10. A stuffing box assembly as claimed in Claim 8 or  
Claim 9, wherein means is provided for injecting a  
fluid into the fluid bath.

11. A stuffing box assembly as claimed in any of Claims  
8 to 10, wherein the fluid is corrosion inhibitor or  
lubricant.

12. A stuffing box assembly as claimed in any preceding  
Claim, wherein the assembly is provided with guiding  
means for guiding a wireline to a throughbore in the  
packing chamber.

13. A stuffing box assembly as claimed in Claim 12,  
wherein the guiding means comprises a plurality of  
rollers.

1 14. A stuffing box assembly as claimed in Claim 13,  
2 wherein the rollers are located on the module.

3  
4 15. A stuffing box assembly comprising a body adapted to  
5 house a packing chamber for providing a compression  
6 seal with a wireline and a support bracket for  
7 supporting a sheave, wherein the assembly allows a  
8 tool to be loaded into or removed from wireline  
9 pressure control equipment while the assembly is  
10 attached to the wireline pressure control equipment.

11  
12 16. A stuffing box assembly as claimed in Claim 15,  
13 wherein the packing chamber is provided in a module  
14 removably mounted to the body.

15  
16 17. A stuffing box assembly as claimed in Claim 16,  
17 wherein the body comprises a throughbore into which  
18 the module is received, and the assembly allows a  
19 tool to be loaded into or removed from wireline  
20 pressure control equipment via the throughbore.

21  
22 18. A method of loading a tool into wireline pressure  
23 control equipment, the wireline pressure control  
24 equipment having a stuffing box assembly coupled  
25 thereto, the stuffing box assembly having a body and  
26 a module comprising a packing chamber for providing  
27 a compression seal with a wireline, the method  
28 comprising the steps of:

29 - Loading the tool into the wireline pressure control  
30 equipment via a throughbore provided in the body of  
31 the stuffing box assembly;

32 - Locating the module in the throughbore.

33

1 19. A method as claimed in Claim 18, the method  
2 comprising the additional steps of:

- 3
- 4 - Passing a wireline through the module and the
  - 5 packing chamber;
  - 6 - coupling the wireline to the tool located in the
  - 7 wireline pressure control equipment.
- 8

9 20. A method of removing a tool from wireline pressure  
10 control equipment, the wireline pressure control  
11 equipment having a stuffing box assembly coupled  
12 thereto, and the stuffing box assembly having a body  
13 and a module comprising a packing chamber for  
14 providing a compression seal with a wireline, the  
15 method comprising the steps of:

- 16 - Removing the module from a throughbore provided in
  - 17 the body of the stuffing box assembly;
  - 18 - Removing the tool from the wireline pressure control
  - 19 equipment via the throughbore.
- 20

21 21. A method of configuring stuffing box apparatus for a  
22 wireline or slickline operation, the stuffing box  
23 apparatus comprising a stuffing box assembly coupled  
24 to wireline pressure control equipment and a module  
25 comprising a packing chamber, the method comprising  
26 the steps of:

- 27 - Removing the module from the stuffing box assembly;
  - 28 - Passing a wireline through the module and the
  - 29 packing chamber;
  - 30 - Locating the module in the stuffing box assembly.
- 31
- 32