

According to a third aspect of the invention we provide a method of operating a blow out preventer assembly according to the second aspect of the invention, the blow out preventer assembly being subjected to fluid at a first pressure at a first end of the assembly and to fluid at a second pressure at a second end of the assembly, the method comprising connecting to the conduit provided in the housing to fluid at a third pressure, the third pressure being higher than the first pressure and lower than the second pressure.

This makes use of the fact that experience with annular preventers over the years has shown that lower rates of wear of the elements are experienced with lower well pressures. In this way the wellbore pressure can be staged down to reduce the overall pressure drop across each stripping sleeve. This may further enhance the longevity of the stripping sleeves. Such a system may also allow detection of leakage of any of the elements.

Such a method also allows the staging through of the larger diameter tool-joints as it is well known to those skilled in the art of stripping that leaks are most likely to occur when stripping with a change in diameter of the tubular. Having two stripping sleeves spaced further apart than the total tool-joint length further enhances the pressure retaining properties of the system disclosed.

According to a fourth aspect of the present disclosure, we provide a blowout preventer assembly including: two annular blow out preventers and two stripping sleeves, wherein the two annular blow out preventers are arranged around a common central passage and are longitudinally displaced with respect to one another along the common central passage, and the two stripping sleeves are connected by means of a tubular connector, wherein each of the two annular blow out preventers includes an annular packing unit and an actuator operable to reduce the internal diameter of the annular packing unit. Each stripping sleeve has a tubular elastomeric sleeve which in use is positioned generally centrally of the corresponding annular packing unit so that the corresponding annular packing unit surrounds at least a portion of

- the corresponding elastomeric sleeve, wherein the blowout preventer assembly further includes a lowermost annular blow out preventer, wherein the lowermost annular blow out preventer includes an annular packing unit and an actuator operable to reduce the internal diameter of the annular packing unit;
- 5 and wherein neither stripping sleeve extends into the lowermost blow out preventer, so, when activated the annular packing unit of the lowermost blow out preventer can seal around a drill string without there being an intervening seal.
- 10 According to a fifth aspect of the present disclosure, a method of operating a blowout preventer assembly according to the fourth aspect of the present disclosure is provided. The blow out preventer assembly being subjected to fluid at a first pressure at a first end of the assembly and to fluid at a second pressure at a second end of the assembly, the method comprising connecting
- 15 to the conduit provided in the housing to fluid at a third pressure, the third pressure being higher than the first pressure and lower than the second pressure.

CLAIMS

1. A blowout preventer assembly including:

two annular blow out preventers and two stripping sleeves, wherein the two annular blow out preventers are arranged around a common central passage and are longitudinally displaced with respect to one another along the common central passage, and the two stripping sleeves are connected by means of a tubular connector;

wherein each of the two annular blow out preventers includes:

an annular packing unit, and

an actuator operable to reduce the internal diameter of the annular packing unit;

wherein each stripping sleeve has a tubular elastomeric sleeve which in use is positioned generally centrally of the corresponding annular packing unit so that the corresponding annular packing unit surrounds at least a portion of the corresponding elastomeric sleeve;

wherein the blowout preventer assembly further includes a lowermost annular blow out preventer, wherein the lowermost annular blow out preventer includes an annular packing unit and an actuator operable to reduce the internal diameter of the annular packing unit; and

wherein neither stripping sleeve extends into the lowermost blow out preventer, so, when activated the annular packing unit of the lowermost blow out preventer can seal around a drill string without there being an intervening seal.

2. A blowout preventer assembly according to claim 1 wherein the actuator of at least one of the two annular blow out preventers comprises a piston movable generally parallel to the longitudinal axis of the blow out preventer by the supply of pressurised fluid to the at least one annular blow out preventer.

3. A blowout preventer assembly according to any preceding claim wherein at least one of the stripping sleeves further comprises two annular

support parts, the corresponding elastomeric sleeve being positioned between the two support parts.

4. A blowout preventer assembly according to claim 3 wherein the outer diameter of each of the support parts is greater than the outer diameter of the corresponding elastomeric sleeve.

5. A blowout preventer assembly according to claim 4 wherein at least one of the annular packing units comprises an elastomeric body and at least one generally rigid insert, the insert lying at least partially between the two corresponding annular support parts when the corresponding annular packing unit engages with the corresponding elastomeric sleeve.

6. A blowout preventer assembly according to claim 5 wherein the at least one of the annular packing units comprises first and second generally rigid inserts, the elastomeric body lying between the first and second inserts and the first insert being at a first end of the annular packing unit adjacent to one of the support parts and the second insert being at a second end of the annular packing unit adjacent to the other of the support parts, both inserts lying at least partially between the two corresponding support parts when the packing unit is engaged with the corresponding elastomeric sleeve.

7. A blowout preventer assembly according to any one of claims 3 to 6 wherein the inner diameter each of the support parts is substantially the same as the inner diameter of the corresponding elastomeric sleeve.

8. A blowout preventer assembly according to any one of claims 3 to 7 wherein each support part is provided with a circular ridge which extends into an end of the corresponding elastomeric sleeve.

9. A blowout preventer assembly according to any preceding claim wherein the maximum outer diameter of at least one stripping sleeve is less than the inner diameter of the corresponding annular packing unit when the

corresponding packing unit is not being acted on by the corresponding actuator.

10. A blowout preventer assembly according to any preceding claim wherein at least one stripping sleeve further comprises a polymeric sealing element which is arranged radially inwardly of the corresponding elastomeric sleeve.

11. A blowout preventer assembly according to claim 10 wherein the polymeric sealing element contains a plurality of apertures into which the elastomeric sleeve extends.

12. A blowout preventer assembly according to any preceding claim wherein at least one of the two annular blow out preventers has an outer housing, and the corresponding annular packing unit and the corresponding stripping sleeve are rotationally static relative to the outer housing.

13. A blowout preventer assembly according to claim 12 wherein the outer housing encloses a housing bore that extends from a bottom end of the outer housing to a top end of the outer housing, and wherein the maximum outer diameter of the corresponding stripping sleeve is less than the minimum inner diameter of the housing bore, and is less than the inner diameter of the packing unit when the corresponding packing unit is not being acted on by the corresponding actuator.

14. A blowout preventer assembly according to any preceding claim wherein the packing units and actuators of the annular blow out preventers are contained in a housing which encloses the common central passage, there being a conduit provided in the housing to connect the volume of the common central passage between the two annular blow out preventers with the exterior of the housing.

15. A method of operating a blowout preventer assembly according to any preceding claim, the blow out preventer assembly being subjected to fluid at a first pressure at a first end of the assembly and to fluid at a second pressure at a second end of the assembly, the method comprising connecting to the conduit provided in the housing to fluid at a third pressure, the third pressure being higher than the first pressure and lower than the second pressure.