

ADVANCED BLOW-OUT PREVENTER

REFERENCES TO CO-PENDING APPLICATIONS

[0001] This application claims the benefit of priority to U.S. Provisional Patent Application No. 61/717,459 to Bryce Levett, Gerard Ludtka, and Mariana Dionisio filed on October 23, 2012 and entitled "Advanced Blow-Out Preventer," which is incorporated by reference in its entirety.

STATEMENT OF GOVERNMENT SUPPORT

[0002] This invention was made with Government support under Work for Others Agreement No. NFE-12-04104 awarded by the United States Department of Energy. The Government has certain rights in this invention.

BRIEF SUMMARY

[0003] ~~The~~Embodiments of the present invention ~~is directed to provide~~ a system and method for controlling wells and stopping blowouts once they have begun. ~~One form~~An aspect of the invention ~~is provides~~ an arrester section that includes a first arrester that extends downwardly towards a wellhead, a second arrester that extends downwardly towards the wellhead and is positioned above and in-line with the first arrester; and a motor connected to the first arrester, the motor configured to open the first arrester when energized. ~~The~~Embodiments of the invention may further include an attachment point below the first arrester that is configured to be attached to a wellhead, shear section, existing BOP, or other common connector. The first arrester section may include blades configured to act together to close around a tubular member. The blades may be solid or include vents. For vented blades, at least some of the vents may be connected by veins.

[0004] ~~Another form aspect~~ of the invention ~~is provides~~ an advanced BOP that includes an arrester section; a shear section; and a gripping section; wherein the gripping section ~~is positioned~~is positioned closest to a well head, followed by the shear section, and then the arrester section. The arrester section may include a first arrester extending downwardly towards the wellhead. The first arrester may comprise a number of arrester blades shaped to close around a tubular member. ~~In another aspect~~embodiments of the invention at least one of the arrester blades is vented. Further, all or some of the vented blades include veins connected to a fluid source. The fluid source in one configuration is

configured to hold coagulant, dispersant, or other material that might beneficially be supplied to vents. The arrester section of the advanced BOP may further include a second arrester positioned in line with said first arrester. The second arrester may include a number of vented arrester blades. It is also understood that the vents of the first arrester section define a first vented area; the vents of the second arrester section define a second vented area wherein the first vented area may be larger than the second vented area. The gripping section of the advanced BOP may include a pipe gripping cone extending upwardly from the wellhead. The advanced BOP may include a seal section positioned above the shear section that is designed to seal the well bore once tubular members extending into the well have been sheared. The advanced BOP may also include a retention section that is able to grip and suspend tubular members once they have been sheared.

[0005] Another ~~form aspect~~ of the invention ~~is provides~~ an advanced BOP with an arrester section that includes at least one downwardly extending arrester ring; a shear section positioned below said arrester section; and a gripping section positioned below the shear section, wherein the arrester section, shear section, and gripping section define a passage through the BOP large enough to receive a tubular member. The shear section may include inductive shearing blades. The advanced BOP may further include a sealing ring positioned between said arrester section and said shear section. The arrester ring may be configured with overlapping blades that can be actuated to constrict inwardly to reduce the passage through the BOP. The arrester section of the advanced BOP may also include a second arrester ring positioned above said first arrester ring.

[0006] The foregoing has outlined rather broadly the features and technical advantages of the present invention in order that the detailed description of the invention that follows may be better understood. Additional features and advantages of the invention will be described hereinafter which form the subject of the claims of the invention. It should be appreciated by those skilled in the art that the conception and specific embodiment disclosed may be readily utilized as a basis for modifying or designing other structures for carrying out the same purposes of the present invention. It should also be realized by those skilled in the art that such equivalent constructions do not depart from the spirit and scope of the invention as set forth in the appended claims. The novel features which are believed to be characteristic of the invention, both as to its organization and method of operation, together with further objects and