CLAIMS

1. A tensioner for maintaining a tensile force in a riser extending from a subsea wellhead assembly to a deck of a floating platform, the tensioner comprising:

a hydro-pneumatic assembly having a first section configured to be secured to the deck and a second section secured to a support frame located above the deck, the support frame having an upper opening with a central axis through which the riser is adapted to extend;

a pivot joint adapted to be coupled to the riser and coupled to the support frame at the upper opening so that the riser is retained axially static with respect to the support frame and is pivotable with respect to the support frame;

at least one guide rod radially spaced from and parallel to the axis;

a guide assembly having at least two guide elements, the guide elements being axially spaced from each other so that when the deck and the support frame move axially relative to each other, the guide assembly restricts relative pivotal rotational movement between the deck and the support frame; and wherein

the first section of the hydro-pneumatic assembly extends downward from the deck and has a lower end that defines a lower opening through which the axis passes, the lower opening having a greater cross-sectional area than the upper opening to enable pivotal movement of the riser relative to the support frame.

2. The tensioner of claim 1, wherein the deck has an intermediate opening through which the axis passes, the intermediate opening being below the upper opening and above the lower opening, the intermediate opening having a greater cross-sectional area than the upper opening.

3. The tensioner of claim 1, wherein the guide rod is mounted to and moves axially with the support frame relative to the deck.

4. The tensioner of claim 3, wherein the guide rod extends downward from the support frame, and both of the guide elements are mounted to and axially fixed with the deck.

5. The tensioner of claim 1, wherein:

the guide assembly further comprises a guide element support mounted to and extending downward from a lower side of the deck, the guide elements being mounted to the guide element support: and wherein

the guide rod is mounted to the support frame for axial movement in unison relative to the deck, the guide rod extending downward from the support frame through the deck and both of the guide elements.

6. The tensioner of claim 1, wherein the guide assembly further comprises:

a guide element support mounted to the support frame for axil movement in unison relative to the deck, both of the guide elements being mounted to the guide element support; and wherein

the guide rod is mounted to and axially fixed with the deck and extends upward from the deck through both of the guide elements.

7. The tensioner of claim 1, further comprising:

a guide element support mounted to and extending upward from the deck above the support frame; wherein

an upper one of the guide elements is mounted to and axially fixed with the guide element support above the support frame;

a lower one of the guide elements is mounted to and fixed with the deck;

the guide rod is mounted to and axially movable with the support frame relative to the deck, the guide rod extending downward from the guide frame through the lower one of the guide elements, and

the second section of the hydro-pneumatic assembly extends upward from the deck through the upper one of the guide elements.

8. The tensioner of claim 1, wherein the guide assembly further comprises:

a tubular guide element support mounted to and extending downward from the deck;

both of the elements are mounted within the guide element support below the deck; and wherein

the guide rod is mounted to the support frame for axial movement in unison with the support frame relative to the deck, the guide rod extending downward from the support frame

through the guide element support and both of the guide elements.

9. The tensioner of claim 1, wherein the guide assembly further comprises:

a tubular guide element support mounted to the support frame for axial movement in unison relative to the deck, both the guide elements being mounted within the guide element support, with one of the guide elements above the support frame and the other below the support frame; and wherein

the guide rod is mounted to and axially fixed with the deck and extends upward from the deck through the guide element support and both of the guide elements.

10. The tensioner of claim 1, wherein the second section of the hydro-pneumatic assembly extends through one of the guide elements and is axially movable relative to said one of the guide elements.

11. A tensioner for maintaining a tensile force in a riser extending from a subsea wellhead assembly to a deck of a floating platform, the tensioner comprising:

a support frame with a central axis spaced axially away from, and configured to be generally parallel to the deck;

a hydro-pneumatic assembly having a first section configured to be secured to the deck and a second section secured to the support frame, the hydro-pneumatic assembly urging the support frame away from the deck;

a pivot joint adapted to be coupled to the riser and coupled to the support frame so that the riser is retained axially static with respect to the support frame and is pivotable with respect to the support frame;

a guide rod mounted to and axially movable with the support frame, the guide rod extending downward from the support frame through the deck, the guide rod being parallel to and radially spaced from the axis;

at least two guide elements axially fixed with deck, the guide elements being axially spaced from each other; and

the guide rod extending through at least one of the guide elements.

12. The tensioner of claim 11, wherein both of the guide elements are mounted below the deck; and the guide rod extends through both of the guide elements.

13. The tensioner of claim 11, further comprising:

a tubular guide element support axially fixed with and extending downward from the deck; wherein

both of the guide elements are mounted within the guide element support below the deck; and

the guide rod extends through the guide element support and both of the guide elements.

14. The tensioner of claim 11, wherein:

a lower one of the guide elements is mounted below the deck;

an upper one of the guide elements is mounted above the deck and above the support frame;

the guide rod extends through the lower one of the guide elements; and

the second section of the hydro-pneumatic assembly extends through the upper one of the guide elements.

15. A tensioner for maintaining a tensile force in a riser extending from a subsea wellhead assembly to a deck of a floating platform, the tensioner comprising:

a support frame with a central axis spaced axially away from, and configured to be generally parallel to and above the deck;

a hydro-pneumatic assembly having a first section configured to be secured to the deck and a second section secured to the support frame, the hydro-pneumatic assembly urging the support frame away from the deck;

a pivot joint adapted to be coupled to the riser and coupled to the support frame so that the riser is retained axially static with respect to the support frame and is pivotable with respect to the support frame;

a guide rod mounted to and axially fixed with the deck, the guide rod extending upward from the deck through the support frame, the guide rod being parallel to and radialy spaced from the axis;

an upper guide element axially fixed with and located above the support frame ;

a lower guide element axially fixed with and located below the support frame; and wherein

the guide rod extends through and is axially movable relative to both of the guide elements.