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(54) **COMPOSITE ENHANCED METALLIC DRILLING RISER SYSTEM**

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(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 385 days.

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(57) **ABSTRACT**

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An offshore composite enhanced metallic drilling riser is equipped to enable preloading of the composite shell and the metallic riser. A riser has steel end connectors and a continuous metallic inner liner, encased in a composite shell. A segmented hyperboloid shaped profile is located near each of the end fittings for preloading of the composite and the metallic riser. In one version, both halves of the hyperboloid shape are capable of axial movement by adjusting jack bolts connected to one of the hyperboloid halves. One of the halves is limited in axial movement while the other half moves axially away from the restricted half, the movement simultaneously generates the composite pre-load and the metallic riser pre-load. The other version uses fluid pressure between mating faces of the segments to push them apart.

(65) **Prior Publication Data**

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(52) **U.S. Cl.** **166/367; 405/195.1**

(58) **Field of Classification Search** **166/367; 405/195.1**

See application file for complete search history.

20 Claims, 4 Drawing Sheets

