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Galle et al.

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(54) **APPARATUS, SYSTEM, AND METHOD OF MANUFACTURING A COMPOSITE TUBULAR USING A STIFFENED MANDREL**

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(52) **U.S. Cl.** **264/281**; 425/383; 425/402; 425/403; 156/172; 156/446; 156/457

(58) **Field of Classification Search** 425/383, 425/402, 403; 264/281; 156/172, 446, 457, 156/173, 175, 156

See application file for complete search history.

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(57) **ABSTRACT**

A stiffened mandrel used in the manufacture of a composite tubular. The mandrel is placed on a filament winding machine and is comprised of an outer and inner shell. A pressure source is connected to the mandrel to exert a tensile force on the outer shell to stiffen the mandrel and thereby prevent sagging and bending of the mandrel. The stiffened mandrel allows for the manufacture of a composite tubular without undesirable flexing, wrinkling, or contamination of the uncured composite.

17 Claims, 3 Drawing Sheets

