



(12) **United States Patent**  
**Rutledge et al.**

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(54) **SUCKER ROD APPARATUS AND METHOD**

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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 0 days.

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**Related U.S. Application Data**

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(51) **Int. Cl.**  
**E21B 17/04** (2006.01)  
**E21B 43/12** (2006.01)  
**E21B 17/10** (2006.01)

(52) **U.S. Cl.**  
CPC ..... **E21B 17/04** (2013.01); **Y10T 403/7064** (2015.01); **E21B 43/127** (2013.01); **E21B 17/1071** (2013.01)

(58) **Field of Classification Search**  
None  
See application file for complete search history.

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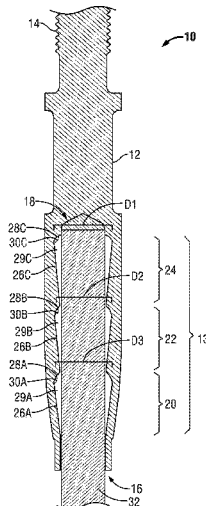
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*Primary Examiner* — Giovanna C Wright

(57) **ABSTRACT**

Sucker rods include end fittings having an outer wedge portion proximate to an open end, an inner wedge portion proximate to a closed end, and an intermediate wedge portion between the outer and inner wedges. Each wedge includes a leading edge, a trailing edge, and an angle between the leading and trailing edges. The triangular configuration, length of the leading edge, the length of the trailing edge, and size of the angle in each wedge portion cause distribution of force, such that compressive forces distributed to the rod proximate the closed end exceed compressive forces distributed to the rod proximate the open end.

**69 Claims, 13 Drawing Sheets**



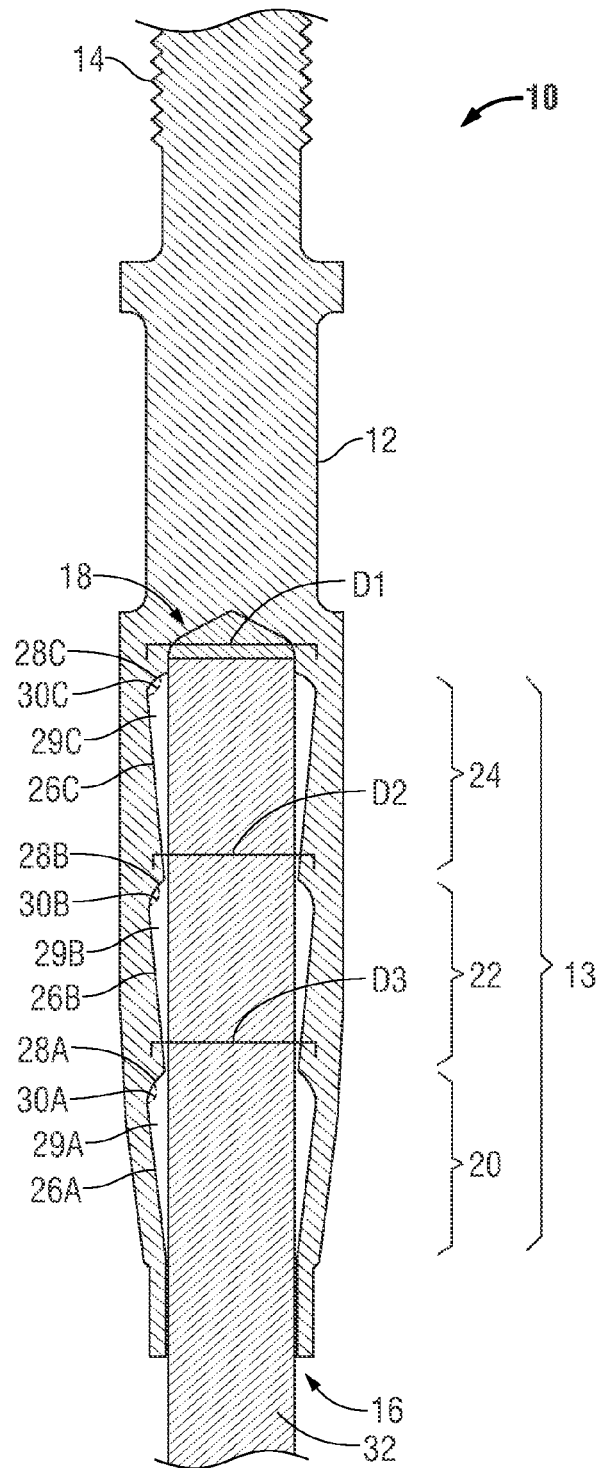


Figure 1

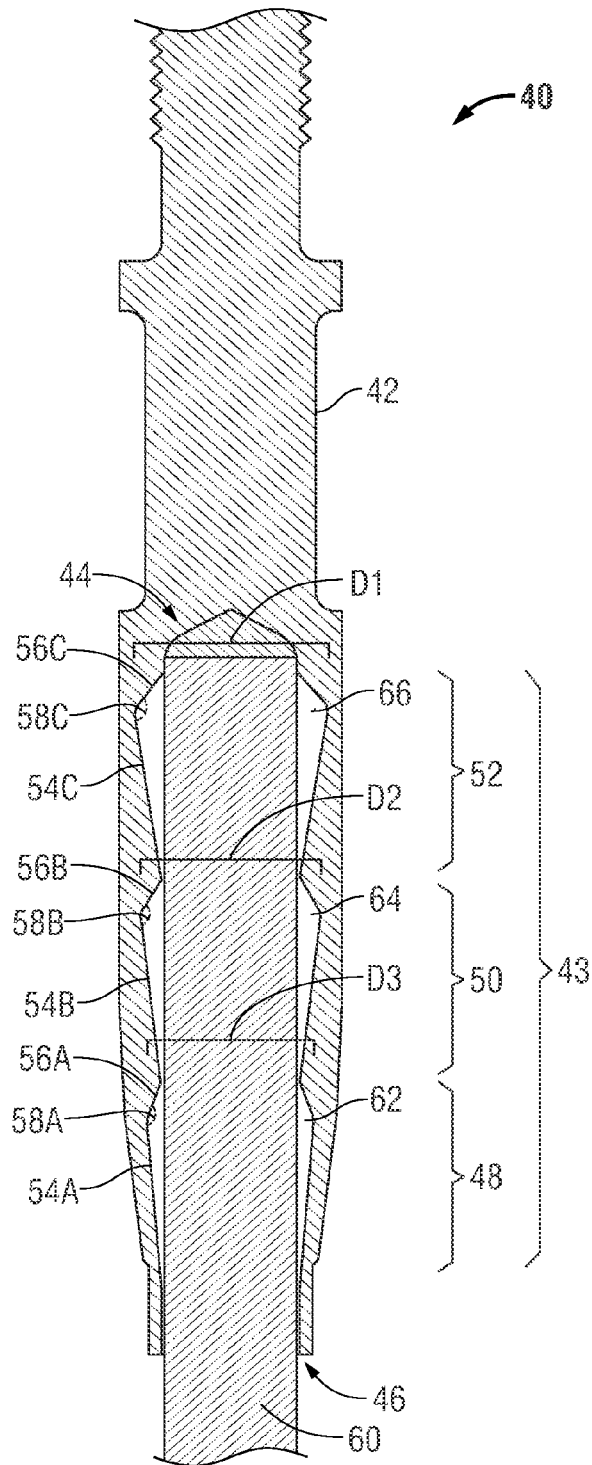


Figure 2

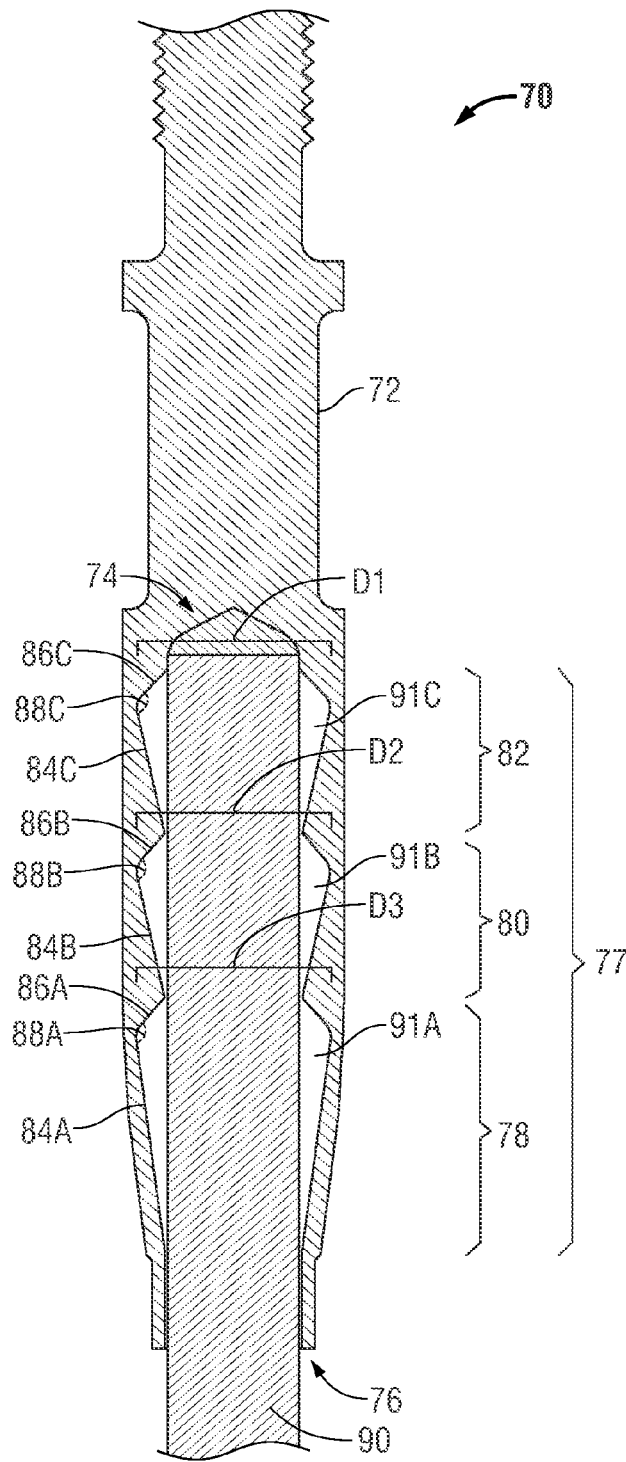


Figure 3

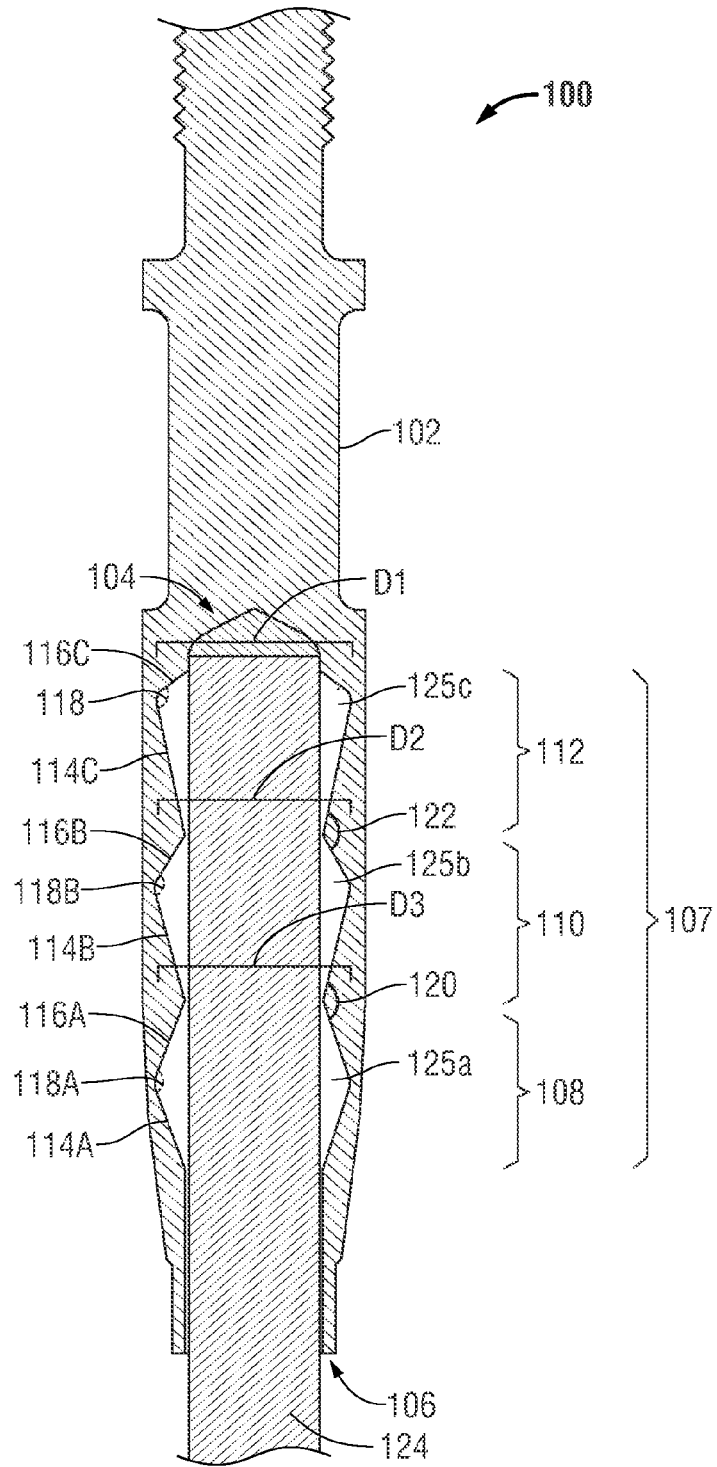


Figure 4

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