

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

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(45) **Date of Patent:** **Mar. 23, 2004**

- (54) **DRILLABLE BRIDGE PLUG**
- (75) Inventors: **Gabriel Slup**, Spring, TX (US);
Douglas J. Lehr, The Woodlands, TX (US)
- (73) Assignee: **BJ Services Company**, Houston, TX (US)
- (*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 37 days.

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(21) Appl. No.: **10/146,491**

(22) Filed: **May 15, 2002**

(65) **Prior Publication Data**

US 2002/0189820 A1 Dec. 19, 2002

Related U.S. Application Data

(63) Continuation-in-part of application No. 09/844,512, filed on Apr. 27, 2001, which is a continuation-in-part of application No. 09/608,052, filed on Jun. 30, 2000.

(51) **Int. Cl.**⁷ **E21B 33/129**

(52) **U.S. Cl.** **166/382; 166/387; 166/123; 166/134; 166/212**

(58) **Field of Search** 166/387, 382, 166/118, 134, 135, 192, 217, 123, 124, 125

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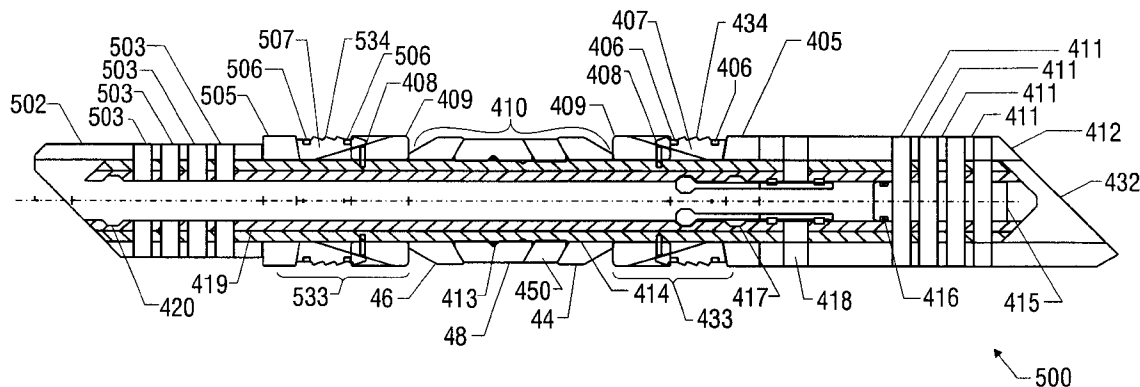
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Primary Examiner—William Neuder

(57) **ABSTRACT**

A method and apparatus for use in a subterranean well is described. The apparatus typically includes a subterranean plug including a mandrel having an outer surface and a non-circular cross-section and a packing element arranged about the mandrel, the packing element having a non-circular inner surface matching the mandrel outer surface such that concentric rotation between the mandrel and the packing element is precluded. The apparatus may include slips having cavities to facilitate quick drill-out of the plug. The apparatus may include a valve for controlling fluid flow through a hollow mandrel. The apparatus may include a composite mandrel having radial vents that establish fluid communication from within to without the mandrel. Also, the apparatus may include a wire line adapter kit for running the apparatus in a well bore.

38 Claims, 9 Drawing Sheets



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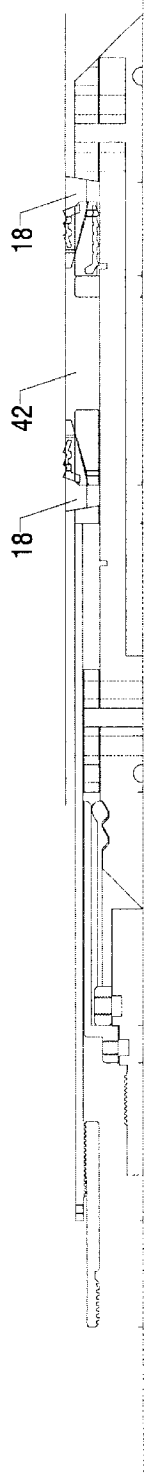


FIG. 6

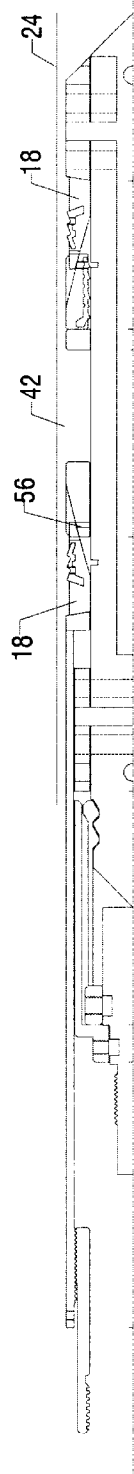


FIG. 5

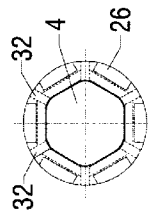


FIG. 2

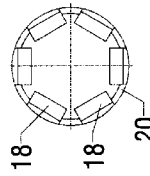


FIG. 3

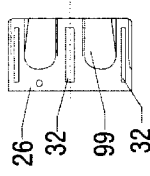


FIG. 4

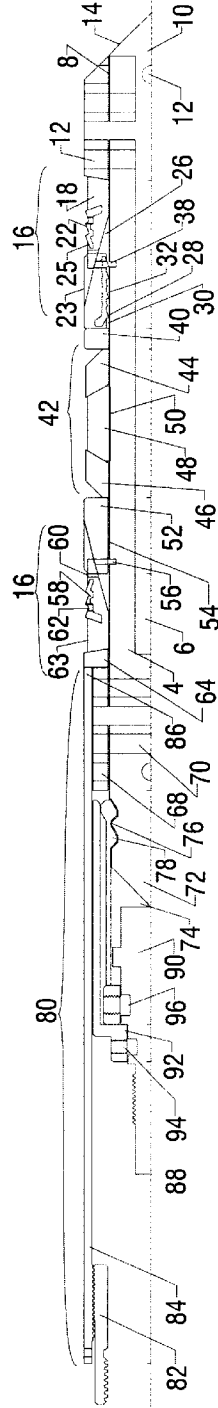


FIG. 1

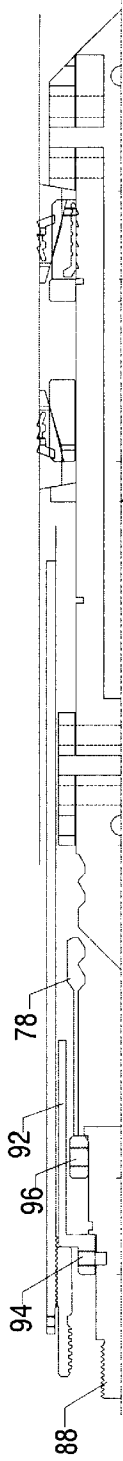


FIG. 10

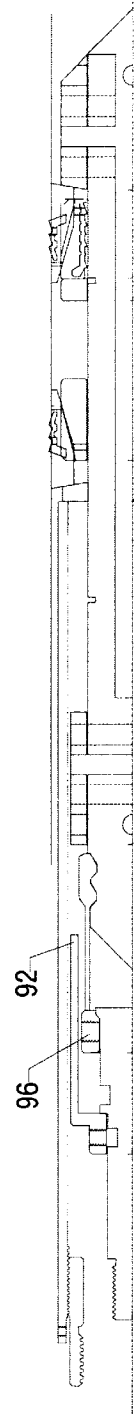


FIG. 9

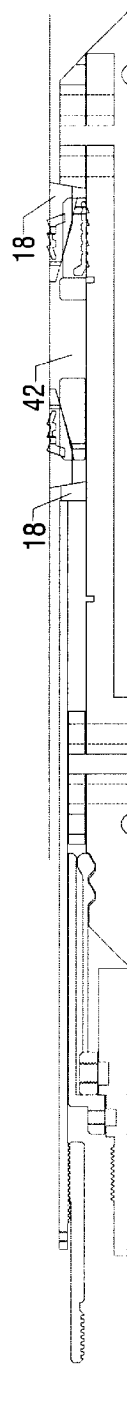


FIG. 8



FIG. 7

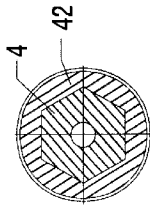


FIG. 13A

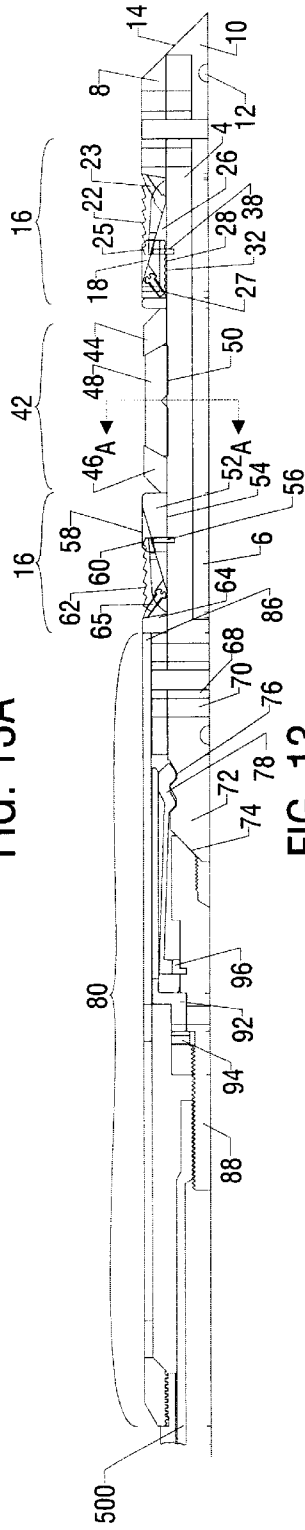


FIG. 13

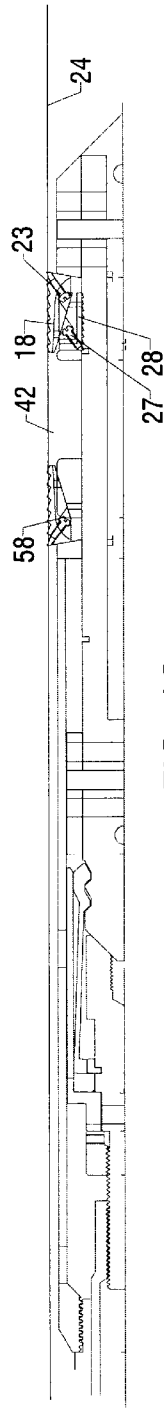


FIG. 12

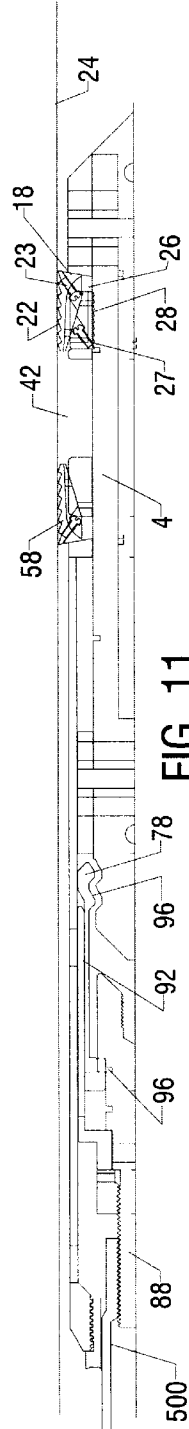


FIG. 11

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