



US006645227B2

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

(10) **Patent No.:** **US 6,645,227 B2**
(45) **Date of Patent:** **Nov. 11, 2003**

- (54) **SUTURE ANCHOR** 5,549,630 A 8/1996 Bonutti
- 5,554,171 A 9/1996 Gattorna et al.
- (75) **Inventors:** **T. Wade Fallin**, Hyde Park, UT (US);
Daniel E. Gerbec, Logan, UT (US);
Gordon Baker, Nibley, UT (US) 5,584,862 A 12/1996 Bonutti
- 5,626,612 A 5/1997 Bartlett
- 5,683,418 A 11/1997 Luscombe et al.
- 5,718,717 A 2/1998 Bonutti
- (73) **Assignee:** **Stryker Endoscopy**, San Jose, CA (US) 5,733,306 A 3/1998 Bonutti
- 5,782,862 A 7/1998 Bonutti
- (*) **Notice:** Subject to any disclaimer, the term of this
patent is extended or adjusted under 35
U.S.C. 154(b) by 0 days. 5,782,863 A 7/1998 Bartlett
- 5,845,645 A 12/1998 Bonutti
- 5,871,503 A 2/1999 Bartlett
- 5,879,372 A 3/1999 Bartlett
- 5,885,294 A * 3/1999 Pedlick et al. 606/80
- 5,897,574 A 4/1999 Bonutti
- (21) **Appl. No.:** **09/990,033** 5,941,900 A 8/1999 Bonutti
- 5,948,002 A 9/1999 Bonutti
- (22) **Filed:** **Nov. 21, 2001** 5,961,538 A 10/1999 Pedlick et al.
- 5,980,558 A * 11/1999 Wiley 606/232
- (65) **Prior Publication Data** 5,980,559 A 11/1999 Bonutti
- 6,033,430 A 3/2000 Bonutti
- US 2003/0097150 A1 May 22, 2003 6,077,292 A 6/2000 Bonutti
- (51) **Int. Cl.⁷** **A61B 17/04** 6,146,407 A 11/2000 Krebs
- (52) **U.S. Cl.** **606/232; 606/72** 6,146,408 A 11/2000 Bartlett
- (58) **Field of Search** 604/177, 192;
606/72, 74, 232, 104, 73; 411/2-4, 340 6,165,203 A 12/2000 Krebs
- 6,270,518 B1 8/2001 Pedlick et al.

(56) **References Cited**

U.S. PATENT DOCUMENTS

- 3,716,058 A 2/1973 Tanner
- 4,669,473 A 6/1987 Richards et al.
- 4,741,330 A 5/1988 Hayhurst
- 4,898,156 A 2/1990 Gattorna et al.
- 4,899,743 A 2/1990 Nicholson et al.
- 4,946,468 A 8/1990 Li
- 5,002,550 A 3/1991 Li
- 5,041,129 A 8/1991 Hayhurst et al.
- 5,046,513 A 9/1991 Gattorna et al.
- 5,192,303 A 3/1993 Gattorna et al.
- 5,203,787 A 4/1993 Noblitt et al.
- 5,207,679 A 5/1993 Li
- 5,358,511 A 10/1994 Gattorna et al.
- 5,403,348 A 4/1995 Bonutti
- 5,464,425 A 11/1995 Skiba
- 5,527,343 A 6/1996 Bonutti
- 5,540,718 A 7/1996 Bartlett

* cited by examiner

Primary Examiner—Julian W. Woo

(74) *Attorney, Agent, or Firm*—Workman Nydegger

(57) **ABSTRACT**

A suture anchor includes a placement portion frangably connected to an attachment portion. The attachment portion includes an outwardly projecting barb. During insertion of the suture anchor within a bore hole formed on a bone, the barb scores at least a portion of the bone bounding the bore hole. Once the suture anchor is disposed within the bore hole, a withdrawal force is applied to the suture anchor such that the attachment portion thereof rotates within the bore hole and disconnects from the placement portion. In an alternative embodiment, the suture anchor can be formed without the outwardly projecting barb.

49 Claims, 29 Drawing Sheets

