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(54) **SURGICAL STAPLING INSTRUMENT
HAVING A SPENT CARTRIDGE LOCKOUT**

(75) Inventors: **Frederick E. Shelton, IV**, Hillsboro, OH (US); **Michael Earl Setser**, Burlington, KY (US); **William Bruce Weisenburgh, II**, Maineville, OH (US)

(73) Assignee: **Ethicon Endo-Surgery, Inc.**, Cincinnati, OH (US)

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A61B 17/068 (2006.01)

(52) **U.S. Cl.** **227/175.2**; 227/19; 227/176.1; 227/180.1

(58) **Field of Classification Search** 227/175.1, 227/175.2, 178.1, 182.1, 19, 180.1, 176.1
See application file for complete search history.

(56) **References Cited**

U.S. PATENT DOCUMENTS

4,892,244 A	1/1990	Fox et al.	
5,031,814 A	7/1991	Tompkins et al.	
5,040,715 A *	8/1991	Green et al.	227/176.1
5,071,052 A	12/1991	Rodak et al.	
5,137,198 A	8/1992	Nobis et al.	
5,307,976 A *	5/1994	Olson et al.	227/175.3
5,332,142 A *	7/1994	Robinson et al.	227/175.2
5,397,046 A	3/1995	Savage et al.	
5,413,267 A	5/1995	Solyntjes et al.	
5,413,268 A	5/1995	Green et al.	

5,415,334 A *	5/1995	Williamson et al.	227/178.1
5,445,304 A	8/1995	Plyley et al.	
5,465,895 A *	11/1995	Knodel et al.	227/176.1
5,484,095 A	1/1996	Green et al.	
5,487,500 A *	1/1996	Knodel et al.	227/181.1
5,535,937 A	7/1996	Boiarski et al.	
5,562,239 A *	10/1996	Boiarski et al.	227/175.2
5,562,241 A *	10/1996	Knodel et al.	227/175.1
5,584,425 A	12/1996	Savage et al.	
5,605,272 A *	2/1997	Witt et al.	227/175.2
5,680,983 A	10/1997	Plyley et al.	
5,709,334 A	1/1998	Sorrentino et al.	
5,718,359 A	2/1998	Palmer et al.	
5,735,445 A	4/1998	Vidal et al.	
5,779,131 A *	7/1998	Knodel et al.	227/176.1
5,820,009 A *	10/1998	Melling et al.	227/176.1
5,826,776 A *	10/1998	Schulze et al.	227/176.1

(Continued)

FOREIGN PATENT DOCUMENTS

WO WO 03/030743 4/2003

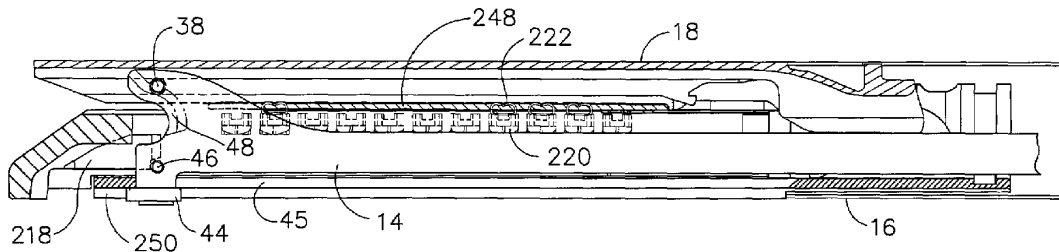
Primary Examiner—Scott A. Smith

(74) *Attorney, Agent, or Firm*—Dean Garner

(57) **ABSTRACT**

A surgical instrument for laparoscopic and endoscopic clinical procedures simultaneously severs and staples tissue clamped in an end effector comprising an elongate channel, which holds a staple cartridge, and a pivotally attached anvil. An E-beam firing bar engages the channel and selectively engages the anvil during distal firing movements, wherein the tissue is severed and stapled driven upward from the staple cartridge to form against the anvil. In particular, a wedge integral to the staple cartridge is driven distally by a middle pin of the firing bar to effect stapling. A lockout mechanism of the staple cartridge responds to the presence of the wedge sled in its unfired position to allow the firing bar to fire. Otherwise, the lockout mechanism prevents firing when the staple cartridge is spent.

11 Claims, 21 Drawing Sheets



U.S. PATENT DOCUMENTS						
5,871,135	A *	2/1999	Williamson, IV et al.	227/178.1	6,109,500 A 8/2000	Alli et al.
5,918,791	A	7/1999	Sorrentino et al.		6,202,914 B1 *	3/2001 Geiste et al.
6,010,054	A *	1/2000	Johnson et al.	227/176.1	6,669,073 B2 *	12/2003 Milliman et al.
6,032,849	A	3/2000	Mastri et al.		6,786,382 B1 *	9/2004 Hoffman
6,079,606	A *	6/2000	Milliman et al.	227/175.2	6,805,273 B2 *	10/2004 Bilotti et al.
					2001/0029384 A1	10/2001 Nicholas et al.
						* cited by examiner

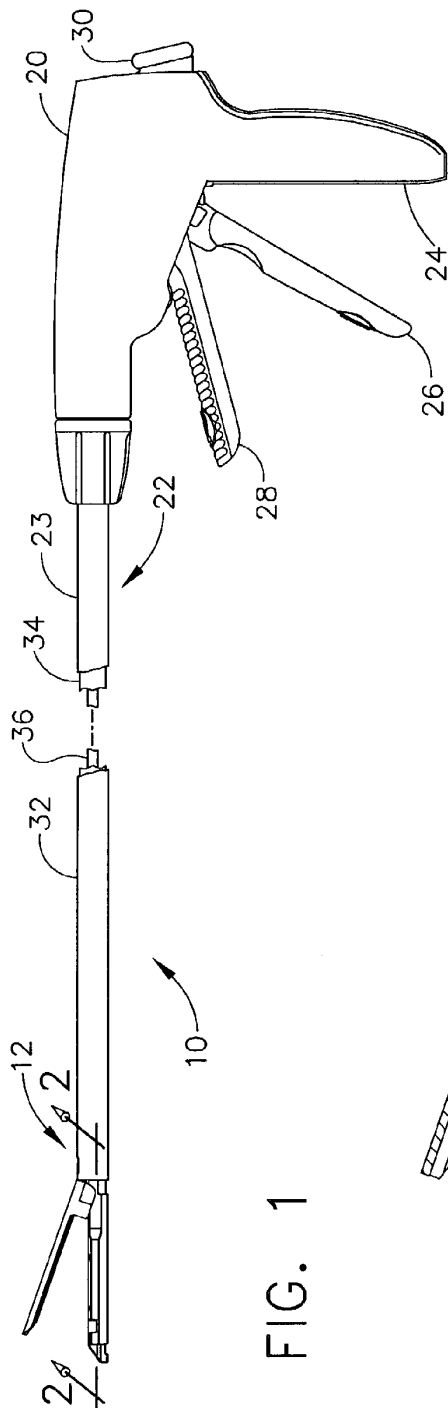


FIG. 1

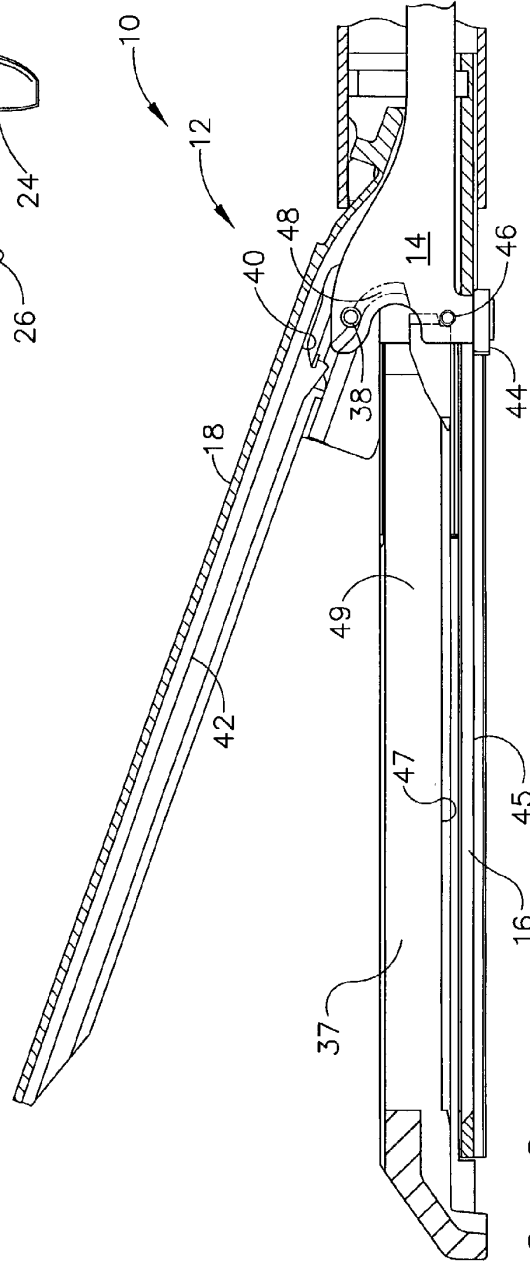


FIG. 2

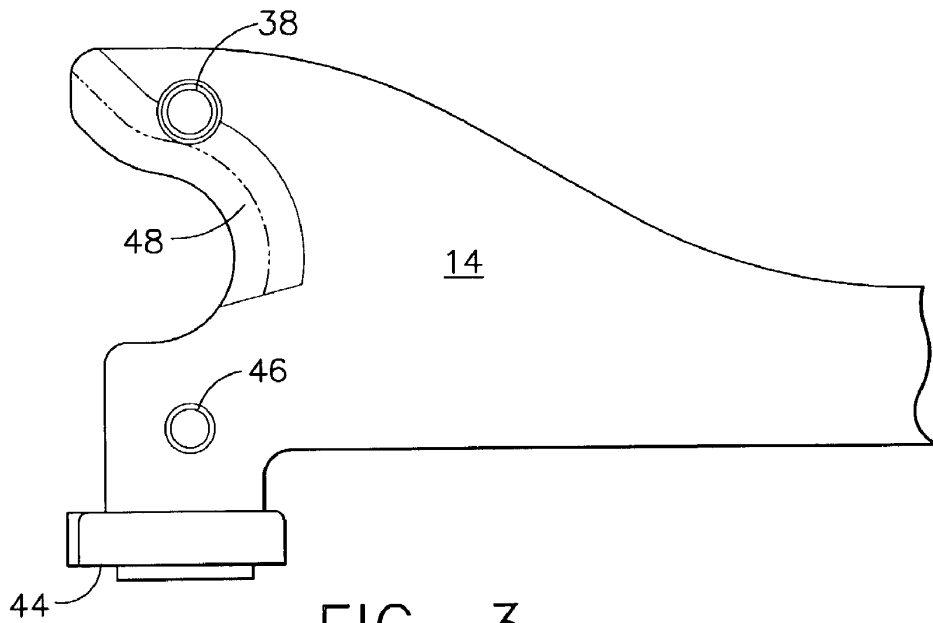


FIG. 3

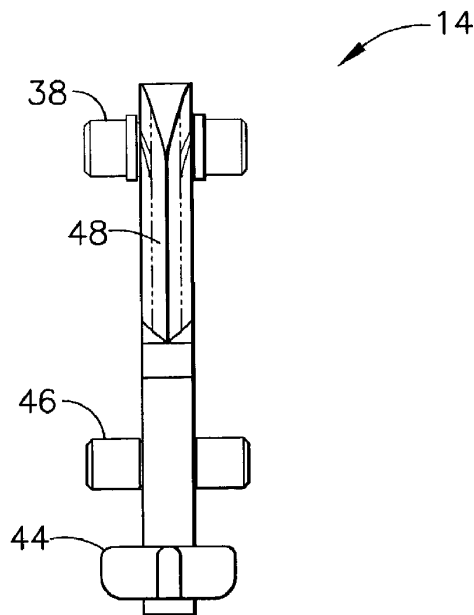


FIG. 4

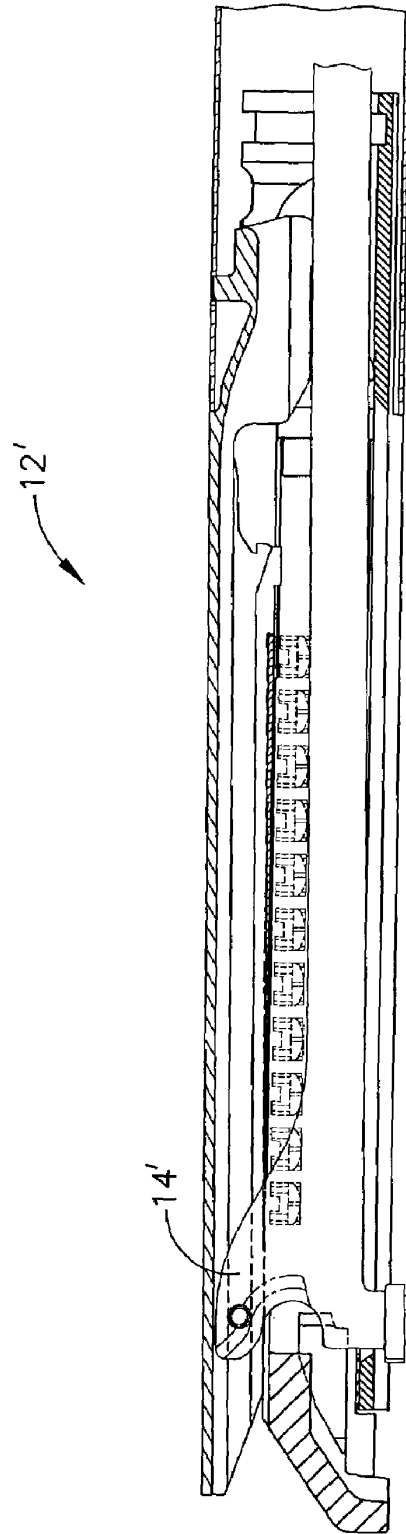


FIG. 5

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