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**United States Patent** [19]  
**Milliman et al.**

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- [54] **SURGICAL STAPLING APPARATUS**
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- [21] Appl. No.: **935,980**
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- [51] Int. Cl.<sup>6</sup> ..... **A61B 17/068**
- [52] U.S. Cl. .... **227/176.1; 227/19; 227/178.1**
- [58] Field of Search ..... **227/19, 175.1, 227/176.1, 175.3, 178.1, 179.1**

5,141,144	8/1992	Foslien et al. .
5,152,279	10/1992	Wilk .
5,209,747	5/1993	Knoepfler .
5,275,608	1/1994	Forman et al. .
5,282,826	2/1994	Quadri .
5,307,976	5/1994	Olson et al. .
5,312,023	5/1994	Gren et al. .
5,318,221	6/1994	Green et al. .
5,326,013	7/1994	Green et al. .
5,330,302	7/1994	Hassler et al. .
5,332,142	7/1994	Robinson et al. .
5,350,391	9/1994	Iacovelli .
5,354,311	10/1994	Kambin et al. .
5,374,277	12/1994	Hassler .
5,376,095	12/1994	Ortiz .
5,383,888	1/1995	Zvenyatsky et al. .
5,397,046	3/1995	Savage et al. .
5,415,334	5/1995	Williamson, IV et al. .
5,415,335	5/1995	Knodel, Jr. .
5,433,721	7/1995	Hooven et al. .
5,465,895	11/1995	Knodel et al. .
5,467,911	11/1995	Tsuruta et al. .
5,474,566	12/1995	Alesi et al. .

[56] **References Cited**

**U.S. PATENT DOCUMENTS**

Re. 34,519	1/1994	Fox et al. .
3,079,606	3/1963	Bobrov et al. .
3,490,675	1/1970	Green et al. .
4,244,372	1/1981	Kapitanov et al. .
4,429,695	2/1984	Green .
4,520,817	6/1985	Green .
4,589,413	5/1986	Malyshev et al. .
4,605,001	8/1986	Rothfuss et al. .
4,608,981	9/1986	Rothfuss et al. .
4,610,383	9/1986	Rothfuss et al. .
4,633,861	1/1987	Chow et al. .
4,633,874	1/1987	Chow et al. .
4,672,964	6/1987	Dee et al. .
4,763,669	8/1988	Jaeger .
4,863,088	9/1989	Redmond et al. .
4,880,015	11/1989	Nierman .
4,892,244	1/1990	Fox et al. .
4,978,049	12/1990	Green .
4,991,764	2/1991	Mericle .
5,040,715	8/1991	Green et al. .
5,065,929	11/1991	Schulze et al. .
5,074,454	12/1991	Peters .
5,083,695	1/1992	Foslien et al. .
5,111,987	5/1992	Moeinzadeh et al. .
5,129,570	7/1992	Schulze et al. .

(List continued on next page.)

**FOREIGN PATENT DOCUMENTS**

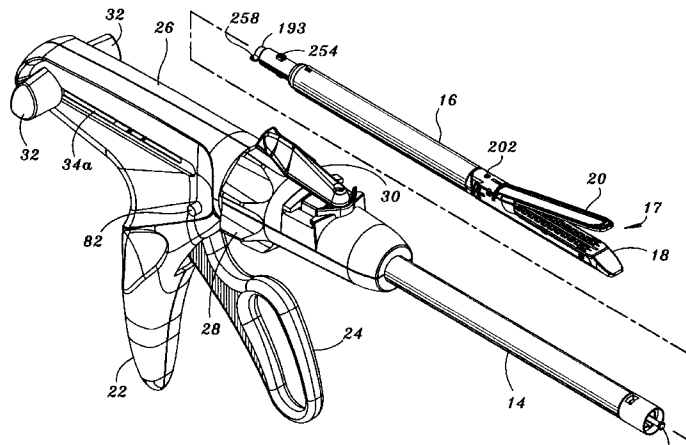
0 484 677	5/1992	European Pat. Off. .
0 589 306	3/1994	European Pat. Off. .
0 591 946	4/1994	European Pat. Off. .
0 592 243	4/1994	European Pat. Off. .
0 656 188	6/1994	European Pat. Off. .
0 621 009	10/1994	European Pat. Off. .
2 681 775	10/1991	France .
43 00 307	7/1994	Germany .
980703	12/1982	Russian Federation .
990220	1/1983	Russian Federation .

*Primary Examiner*—Scott A. Smith

[57] **ABSTRACT**

A surgical stapling device particularly suited for endoscopic procedures is described. The device can be used with both articulating and non-articulating disposable loading units and has a sensing mechanism for sensing the type of disposable loading unit secured to the device.

**4 Claims, 39 Drawing Sheets**



U.S. PATENT DOCUMENTS						
			5,507,426	4/1996	Young et al. .	
			5,535,937	7/1996	Boiarski et al. ....	227/19
			5,582,617	12/1996	Klieman et al. .	
5,474,571	12/1995	Lang .	5,607,095	3/1997	Smith et al. ....	227/176.1
5,484,451	1/1996	Akopov et al. .	5,615,820	4/1997	Viola .....	227/176.1
5,486,185	1/1996	Freitas et al. .	5,651,491	7/1997	Heaton et al. ....	227/175.1
5,487,500	1/1996	Knodel et al. .				

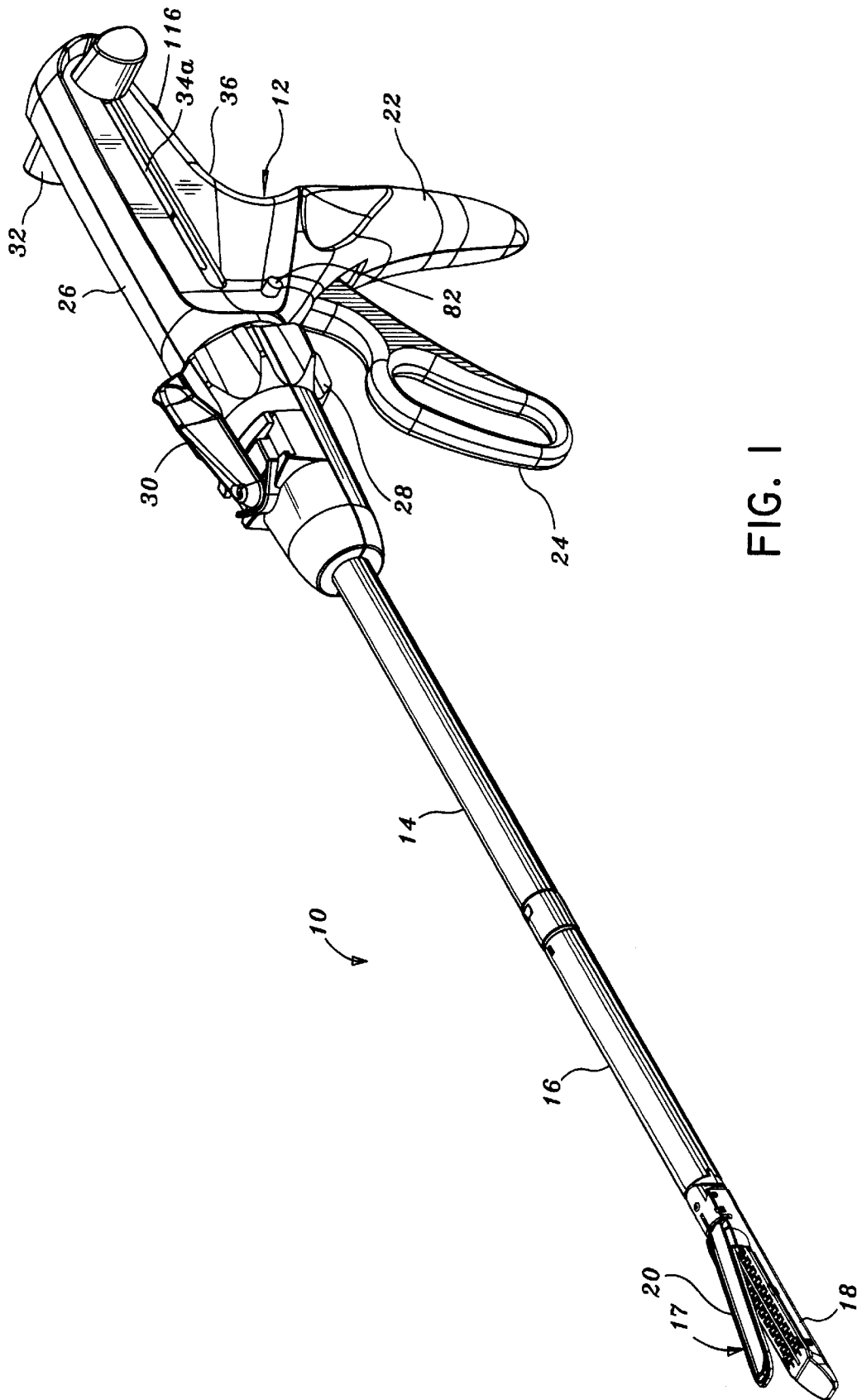


FIG. 1

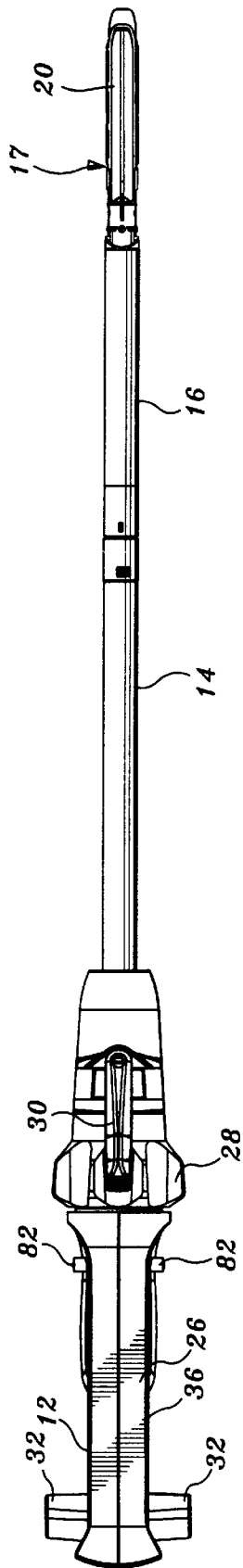


FIG. 2

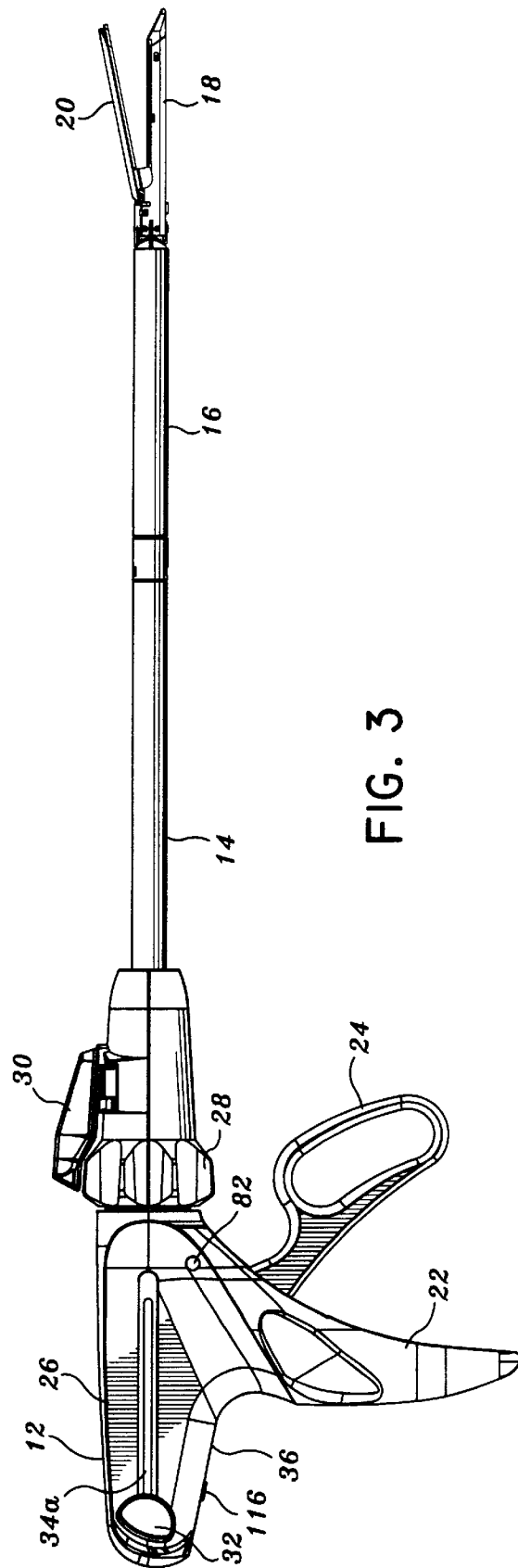


FIG. 3

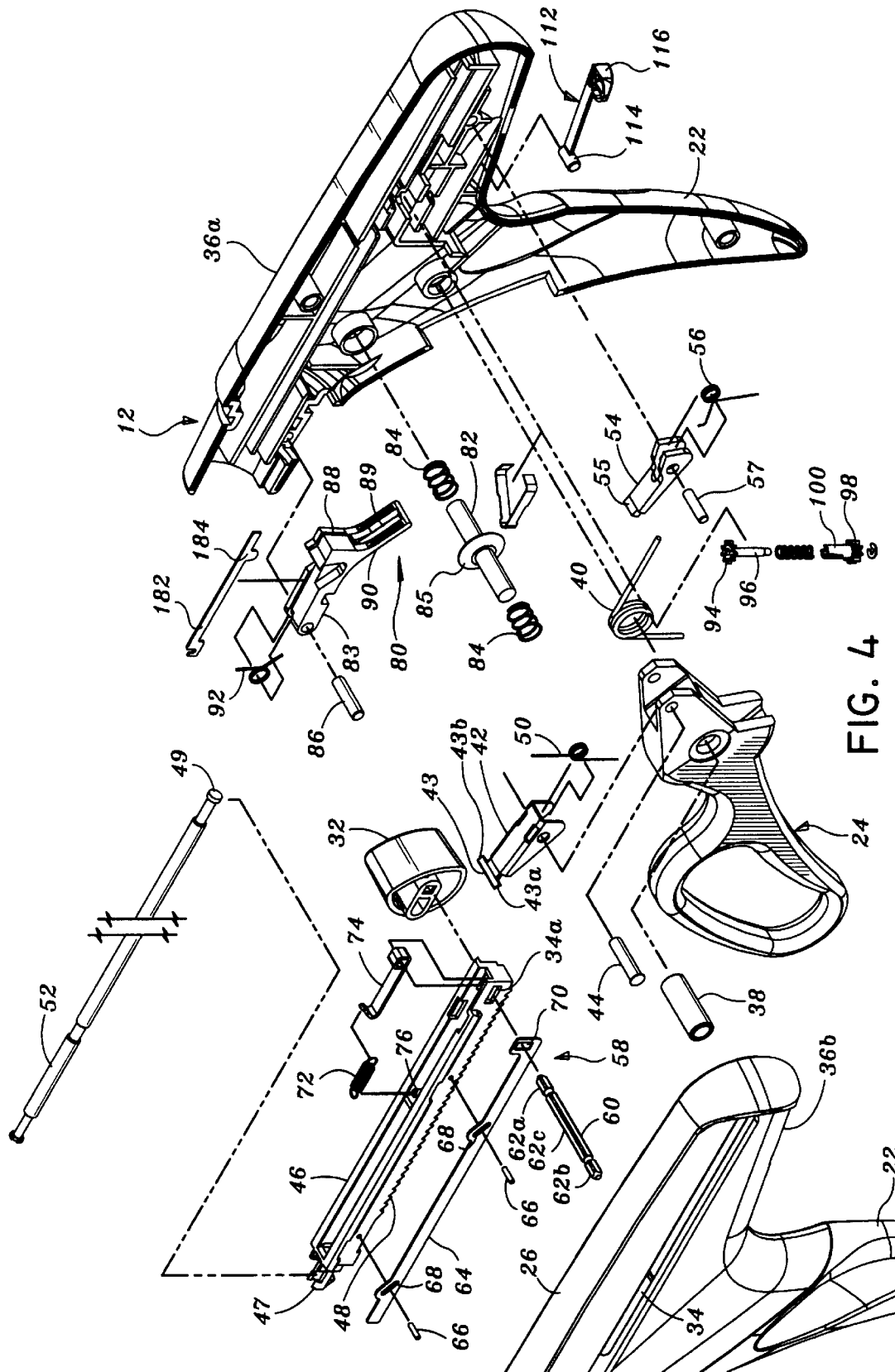


FIG. 4

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