



US005865361A

United States Patent [19]
Milliman et al.

[11] **Patent Number:** **5,865,361**
[45] **Date of Patent:** **Feb. 2, 1999**

- [54] **SURGICAL STAPLING APPARATUS**
- [75] Inventors: **Keith L. Milliman**, Bethel; **Frank J. Viola**, Sandy Hook; **Joseph Orban**, Norwalk; **Randolph F. Lehn**, Stratford, all of Conn.
- [73] Assignee: **United States Surgical Corporation**, Norwalk, Conn.
- [21] Appl. No.: **935,980**
- [22] Filed: **Sep. 23, 1997**
- [51] **Int. Cl.⁶** **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

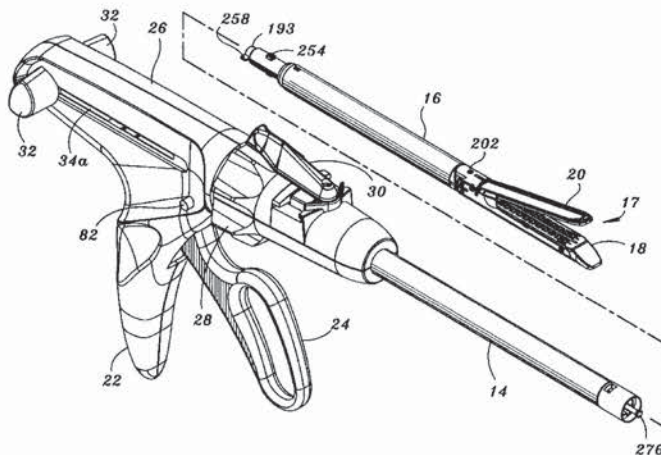
- 0 484 677 5/1992 European Pat. Off. .
- 0 589 306 3/1994 European Pat. Off. .
- 0 591 946 4/1994 European Pat. Off. .
- 0 592 243 4/1994 European Pat. Off. .
- 0 656 188 6/1994 European Pat. Off. .
- 0 621 009 10/1994 European Pat. Off. .
- 2 681 775 10/1991 France .
- 43 00 307 7/1994 Germany .
- 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
5,474,571	12/1995	Lang .	5,582,617	12/1996	Klieman et al. .
5,484,451	1/1996	Akopov et al. .	5,607,095	3/1997	Smith et al. 227/176.1
5,486,185	1/1996	Freitas et al. .	5,615,820	4/1997	Viola 227/176.1
5,487,500	1/1996	Knodel et al. .	5,651,491	7/1997	Heaton et al. 227/175.1

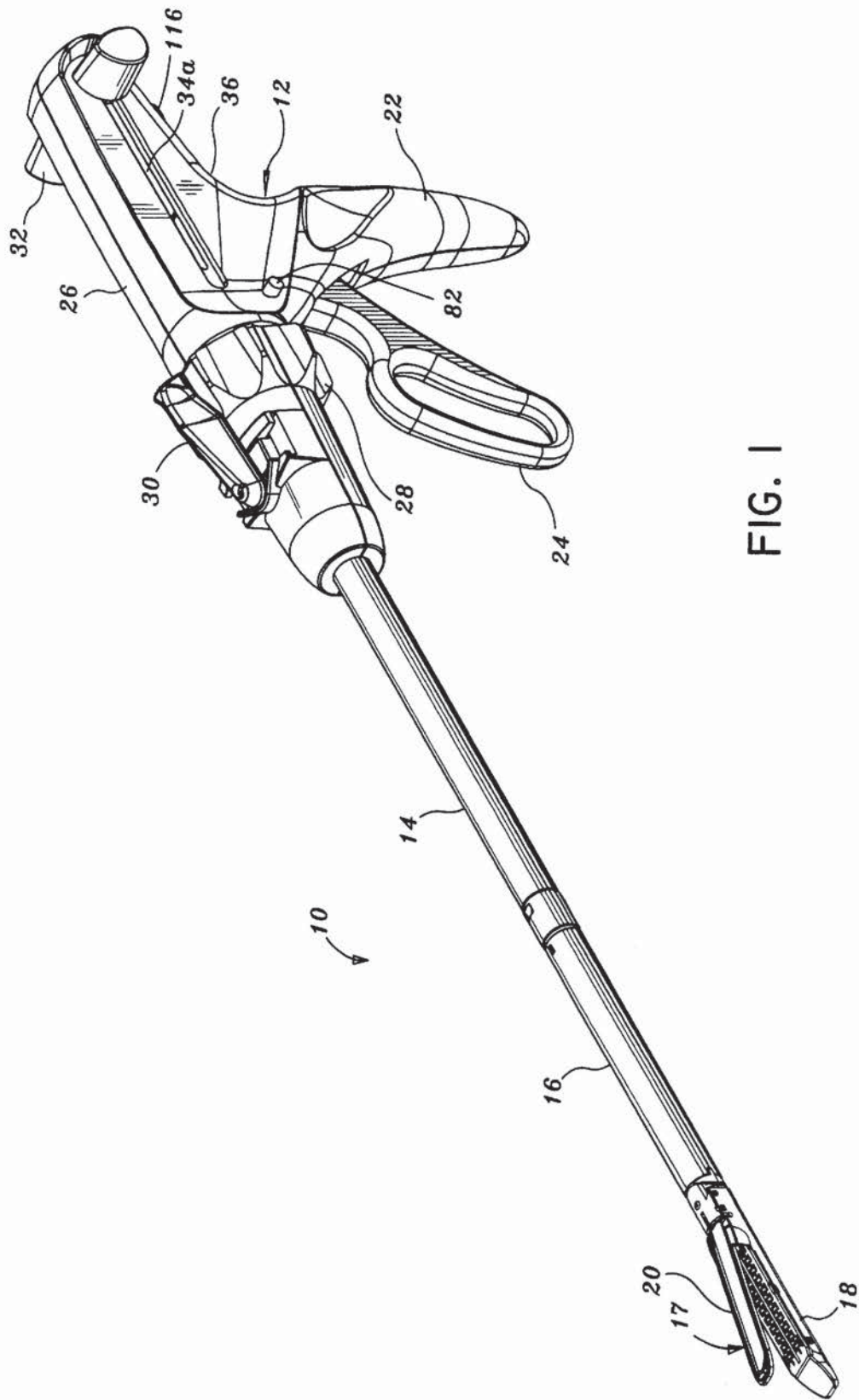


FIG. 1

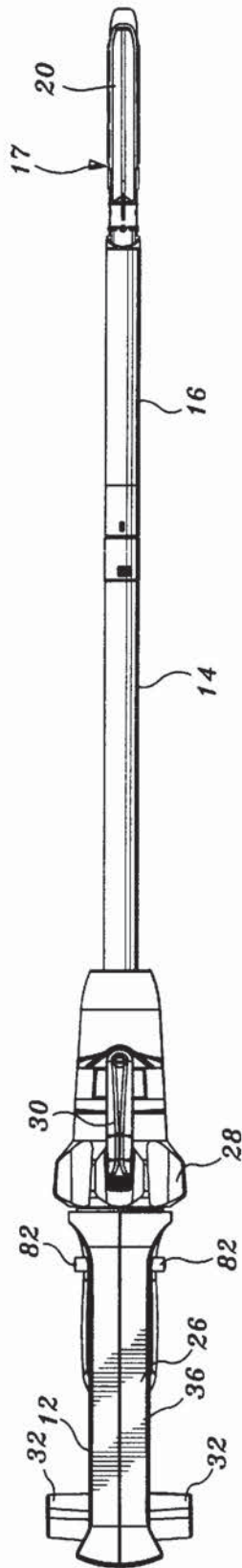


FIG. 2

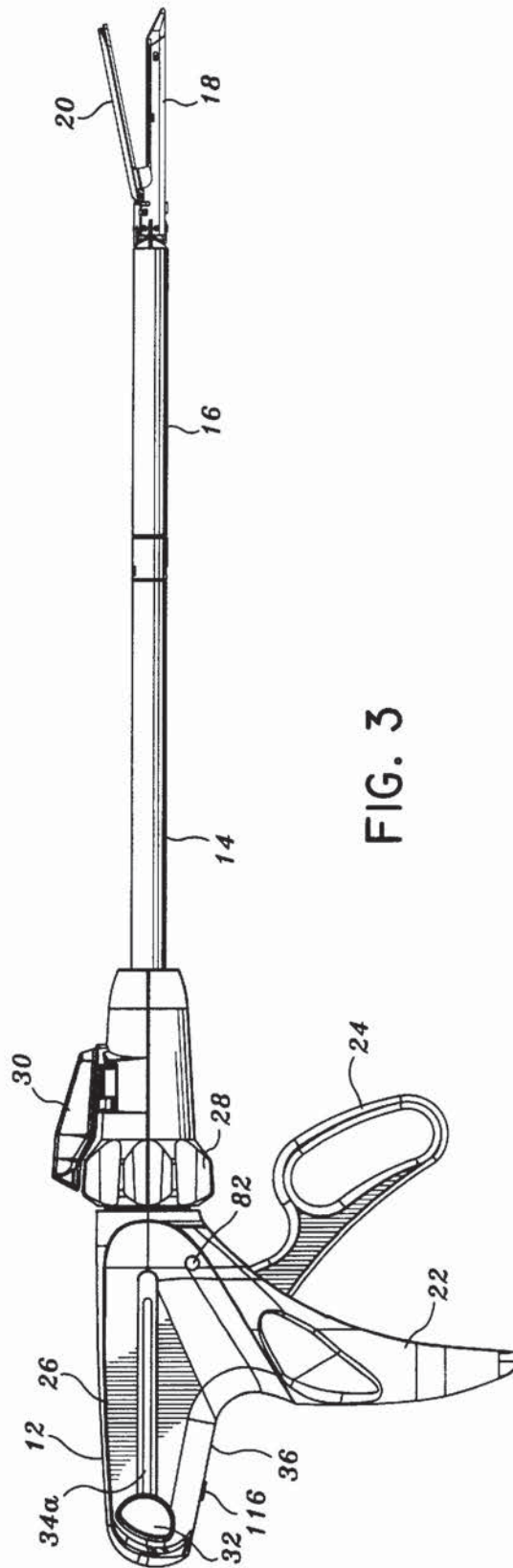


FIG. 3

Explore Litigation Insights

Docket Alarm provides insights to develop a more informed litigation strategy and the peace of mind of knowing you're on top of things.

Real-Time Litigation Alerts



Keep your litigation team up-to-date with **real-time alerts** and advanced team management tools built for the enterprise, all while greatly reducing PACER spend.

Our comprehensive service means we can handle Federal, State, and Administrative courts across the country.

Advanced Docket Research



With over 230 million records, Docket Alarm's cloud-native docket research platform finds what other services can't. Coverage includes Federal, State, plus PTAB, TTAB, ITC and NLRB decisions, all in one place.

Identify arguments that have been successful in the past with full text, pinpoint searching. Link to case law cited within any court document via Fastcase.

Analytics At Your Fingertips



Learn what happened the last time a particular judge, opposing counsel or company faced cases similar to yours.

Advanced out-of-the-box PTAB and TTAB analytics are always at your fingertips.

API

Docket Alarm offers a powerful API (application programming interface) to developers that want to integrate case filings into their apps.

LAW FIRMS

Build custom dashboards for your attorneys and clients with live data direct from the court.

Automate many repetitive legal tasks like conflict checks, document management, and marketing.

FINANCIAL INSTITUTIONS

Litigation and bankruptcy checks for companies and debtors.

E-DISCOVERY AND LEGAL VENDORS

Sync your system to PACER to automate legal marketing.