



US008012153B2

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

(10) **Patent No.:** **US 8,012,153 B2**
(45) **Date of Patent:** **Sep. 6, 2011**

(54) **ROTARY ELECTROSURGICAL APPARATUS
AND METHODS THEREOF**

(75) Inventors: **Jean Woloszko**, Mountain View, CA
(US); **Robert H. Dahla**, Sunnyvale, CA
(US)

(73) Assignee: **ArthroCare Corporation**, Austin, TX
(US)

(*) Notice: Subject to any disclaimer, the term of this
patent is extended or adjusted under 35
U.S.C. 154(b) by 1050 days.

(21) Appl. No.: **10/565,116**

(22) PCT Filed: **Jul. 16, 2004**

(86) PCT No.: **PCT/US2004/022803**

§ 371 (c)(1),

(2), (4) Date: **Jan. 17, 2006**

(87) PCT Pub. No.: **WO2005/009213**

PCT Pub. Date: **Feb. 3, 2005**

(65) **Prior Publication Data**

US 2006/0178670 A1 Aug. 10, 2006

Related U.S. Application Data

(60) Provisional application No. 60/488,134, filed on Jul.
16, 2003.

(51) **Int. Cl.**
A61B 18/14 (2006.01)

(52) **U.S. Cl.** 606/48; 606/50

(58) **Field of Classification Search** 606/32-50
See application file for complete search history.

(56) **References Cited**

U.S. PATENT DOCUMENTS

2,050,904 A 4/1936 Trice 219/31
2,056,377 A 10/1939 Wappler 125/303

2,275,167 A 3/1942 Bierman 606/50
3,633,425 A 1/1972 Sanford 73/356
3,699,967 A 10/1972 Anderson 606/37
3,707,149 A 12/1972 Hao et al. 128/303.14
3,812,858 A 5/1974 Oringer 604/22
3,815,604 A 6/1974 O'Malley et al. 128/305
3,828,780 A 8/1974 Morrison, Jr. 128/275
3,901,242 A 8/1975 Storz 128/303
3,920,021 A 11/1975 Hildebrandt 128/303

(Continued)

FOREIGN PATENT DOCUMENTS

DE 2521719 11/1976

(Continued)

OTHER PUBLICATIONS

Buchelt, et al. "Excimer Laser Ablation of Fibrocartilage: An in Vitro
and in Vivo Study", Lasers in Surgery and Medicine, vol. 11, pp.
271-279, 1991.

(Continued)

Primary Examiner — Michael Peffley

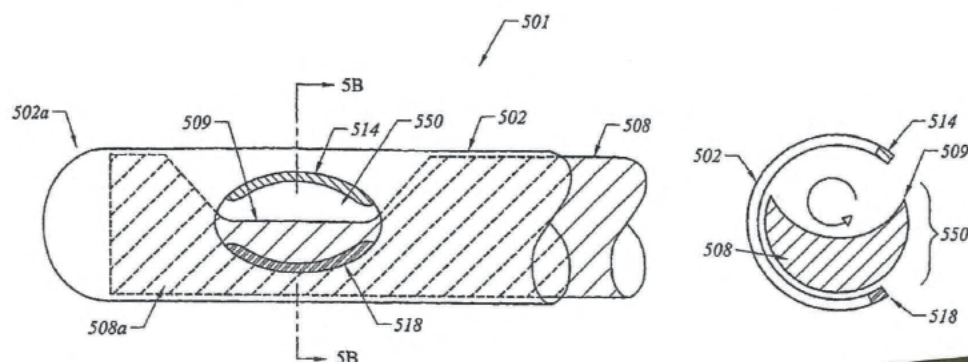
Assistant Examiner — Ronald Hupeczy, Jr.

(74) *Attorney, Agent, or Firm* — Matthew Scheele; Brian
Szymczak

(57) **ABSTRACT**

Electrosurgical systems, apparatus, and methods for the controlled removal and treatment of a target tissue. An instrument of the invention includes a rotating member housed longitudinally within a shaft, a tissue removal port disposed at the shaft distal end portion, and an active electrode disposed at the instrument distal end. The active electrode is adapted to electrosurgically remove at least a portion of the target tissue as the rotating member rotates within the shaft. According to alternative embodiments, the active electrode may be disposed on the rotating member or on the shaft.

37 Claims, 11 Drawing Sheets



CX-1092.1

Serendia, LLC
Exhibit 2028
EndyMed v. Serendia
IPR2024-00842
Ex. 2028-001

US 8,012,153 B2

Page 2

U.S. PATENT DOCUMENTS

3,939,839 A	2/1976	Curtiss	128/303	5,037,421 A	8/1991	Boutacoff et al.	606/15
3,945,375 A *	3/1976	Banko	600/104	5,047,026 A	9/1991	Rydell	606/48
3,964,487 A	6/1976	Judson	606/39	5,047,027 A	9/1991	Rydell	606/48
3,970,088 A	7/1976	Morrison	128/303	5,057,105 A	10/1991	Malone et al.	606/28
4,033,351 A	7/1977	Hetzel	606/48	5,057,106 A	10/1991	Kasevich et al.	606/33
4,040,426 A	8/1977	Morrison, Jr.	128/303	5,057,743 A	10/1991	Krasko et al.	313/639
4,043,342 A	8/1977	Morrison, Jr.	128/303	5,061,266 A	10/1991	Hakky	606/15
4,074,718 A	2/1978	Morrison, Jr.	128/303	5,078,717 A	1/1992	Parins et al.	606/48
4,092,986 A	6/1978	Schneiderman	128/303	5,080,660 A	1/1992	Buelna	606/45
4,116,198 A	9/1978	Roos	128/303	5,083,565 A	1/1992	Parins	600/374
4,181,131 A	1/1980	Ogiu	128/303	5,084,044 A	1/1992	Quint	606/27
4,184,492 A	1/1980	Meinke et al.	128/303	5,085,659 A	2/1992	Rydell	606/47
4,202,337 A	5/1980	Hren et al.	128/303	5,088,997 A	2/1992	Delahuerga et al.	606/42
4,203,444 A *	5/1980	Bonnell et al.	604/22	5,092,339 A	3/1992	Geddes et al.	606/505
4,228,800 A	10/1980	Degler, Jr. et al.	128/303	5,093,877 A	3/1992	Aita et al.	385/34
4,232,676 A	11/1980	Herczog	128/303	5,098,431 A	3/1992	Rydell	606/48
4,240,441 A	12/1980	Khalil	600/505	5,099,840 A	3/1992	Goble et al.	128/422
4,248,231 A	2/1981	Herczog et al.	128/303	5,102,410 A	4/1992	Dressel	606/15
4,269,174 A	5/1981	Adair	128/842	5,103,804 A	4/1992	Abele et al.	600/116
4,274,414 A	6/1981	Johnson et al.	606/170	5,108,391 A	4/1992	Flachenecker et al.	606/38
4,326,529 A	4/1982	Doss et al.	128/303	RE33,925 E	5/1992	Bales et al.	606/48
4,381,007 A	4/1983	Doss	128/303	5,112,330 A	5/1992	Nishigaki et al.	606/46
4,411,266 A	10/1983	Cosman	606/49	5,122,138 A	6/1992	Manwaring	606/46
4,418,692 A	12/1983	Guay	606/42	5,125,928 A	6/1992	Parins et al.	606/48
4,429,694 A	2/1984	McGreevy	128/303.14	5,137,530 A	8/1992	Sand	606/5
4,474,179 A	10/1984	Koch	606/40	5,147,354 A	9/1992	Boutacoff et al.	606/15
4,476,862 A	10/1984	Pao	128/303	5,151,098 A	9/1992	Loertscher	606/16
4,483,338 A	11/1984	Bloom et al.	606/50	5,156,151 A	10/1992	Imran	600/375
4,532,924 A	8/1985	Auth et al.	128/303	5,167,659 A	12/1992	Ohtomo et al.	606/40
4,548,207 A	10/1985	Reimels	128/303	5,171,311 A	12/1992	Rydell et al.	606/48
4,567,890 A	2/1986	Ohta et al.	128/303	5,176,528 A	1/1993	Fry et al.	439/181
4,572,206 A	2/1986	Geddes et al.	600/505	5,178,620 A	1/1993	Eggers et al.	606/41
4,580,557 A	4/1986	Hertzmann	606/12	5,183,338 A	2/1993	Wickersheim et al.	374/131
4,582,057 A	4/1986	Auth et al.	606/31	5,190,517 A	3/1993	Zieve et al.	604/22
4,587,975 A	5/1986	Salo et al.	600/506	5,191,883 A	3/1993	Lennox et al.	607/102
4,590,934 A	5/1986	Malis et al.	128/303	5,192,280 A	3/1993	Parins	606/48
4,593,691 A	6/1986	Lindstrom et al.	128/303	5,195,959 A	3/1993	Smith	604/34
4,641,649 A	2/1987	Walinsky et al.	606/33	5,197,466 A	3/1993	Marchosky et al.	128/399
4,658,817 A	4/1987	Hardy	606/14	5,197,963 A	3/1993	Parins	606/46
4,660,571 A	4/1987	Hess et al.	128/784	5,207,675 A	5/1993	Canady	606/40
4,674,499 A	6/1987	Pao	128/303	5,217,455 A	6/1993	Tan	606/9
4,682,596 A	7/1987	Bales et al.	128/303	5,217,457 A	6/1993	Delahuerga et al.	606/42
4,706,667 A	11/1987	Roos	128/303	5,217,459 A	6/1993	Kamerling	606/48
4,709,698 A	12/1987	Johnston et al.	606/41	5,230,334 A	7/1993	Klopotek	601/3
4,727,874 A	3/1988	Bowers et al.	128/303	5,234,428 A	8/1993	Kaufman	606/45
4,736,743 A	4/1988	Daikuzono	128/303.1	5,246,438 A	9/1993	Langberg	606/33
4,737,678 A	4/1988	Hasegawa	313/36	5,249,585 A	10/1993	Turner et al.	607/99
4,762,128 A	8/1988	Rosenbluth	128/343	5,255,980 A	10/1993	Thomas et al.	374/161
4,765,331 A	8/1988	Petruzzi et al.	128/303	5,261,410 A	11/1993	Alfano et al.	600/475
4,785,806 A	11/1988	Deckelbaum	128/303.1	5,267,994 A	12/1993	Gentelia et al.	606/15
4,785,823 A	11/1988	Eggers et al.	128/692	5,267,997 A	12/1993	Farin et al.	606/38
4,805,616 A	2/1989	Pao	128/303	5,269,794 A *	12/1993	Rexroth	606/180
4,813,429 A	3/1989	Eshel et al.	128/736	5,273,524 A	12/1993	Fox et al.	604/21
4,815,462 A	3/1989	Clark	606/170	5,277,201 A	1/1994	Stern	607/98
4,823,791 A	4/1989	D'Amelio et al.	123/303	5,277,696 A	1/1994	Hagen	606/49
4,827,911 A	5/1989	Broadwin et al.	604/22	5,279,299 A	1/1994	Imran	600/393
4,832,048 A	5/1989	Cohen	128/786	5,281,216 A	1/1994	Klicek	606/42
4,860,752 A	8/1989	Turner	607/102	5,281,218 A	1/1994	Imran	606/41
4,903,696 A	2/1990	Stasz et al.	606/37	5,282,797 A	2/1994	Chess	606/9
4,907,589 A	3/1990	Cosman	606/34	5,282,799 A	2/1994	Rydell	606/48
4,920,978 A	5/1990	Colvin	128/784	5,290,273 A	3/1994	Tan	606/9
4,931,047 A	6/1990	Broadwin et al.	604/22	5,290,282 A	3/1994	Casscells	606/29
4,936,281 A	6/1990	Stasz	128/660	5,293,868 A	3/1994	Nardella	600/373
4,936,301 A	6/1990	Rexroth et al.	606/45	5,300,069 A	4/1994	Hunsberger et al.	606/37
4,940,064 A	7/1990	Desai	607/122	5,300,099 A	4/1994	Rudie	607/101
4,943,290 A	7/1990	Rexroth et al.	606/45	5,301,687 A	4/1994	Wong et al.	607/116
4,955,377 A	9/1990	Lennox et al.	607/105	5,304,169 A	4/1994	Sand	606/5
4,966,597 A	10/1990	Cosman	606/50	5,304,170 A	4/1994	Green	606/9
4,967,765 A	11/1990	Turner et al.	128/785	5,306,238 A	4/1994	Fleenor	606/42
4,968,314 A	11/1990	Michaels	606/7	5,312,395 A	5/1994	Tan et al.	606/9
4,976,709 A	12/1990	Sand	606/5	5,312,400 A	5/1994	Bales et al.	606/41
4,976,711 A	12/1990	Parins et al.	606/48	5,314,406 A	5/1994	Arias et al.	604/21
4,979,948 A	12/1990	Geddes et al.	606/33	5,318,563 A	6/1994	Malis et al.	606/38
4,998,933 A	3/1991	Eggers et al.	606/41	5,322,507 A	6/1994	Costello et al.	128/4
5,007,437 A	4/1991	Sterzer	428/786	5,324,254 A	6/1994	Phillips	604/21
5,007,908 A	4/1991	Rydell	606/47	5,330,470 A	7/1994	Hagen	606/42
5,009,656 A	4/1991	Reimels	606/48	5,330,518 A	7/1994	Neilson et al.	607/101
5,035,696 A	7/1991	Rydell	606/47	5,334,140 A	8/1994	Phillips	604/35
				5,334,183 A	8/1994	Wuchinich	606/46

US 8,012,153 B2

Page 3

5,334,193 A	8/1994	Nardella	606/41	5,662,680 A	9/1997	Desai	606/210
5,335,668 A	8/1994	Nardella	600/547	5,676,693 A	10/1997	LaFontaine et al.	607/116
5,336,217 A	8/1994	Buys et al.	606/9	5,681,282 A	10/1997	Eggers et al.	604/114
5,336,220 A	8/1994	Ryan et al.	604/22	5,681,308 A	10/1997	Edwards et al.	606/41
5,336,443 A	8/1994	Odashima	252/511	5,683,366 A	11/1997	Eggers et al.	604/114
5,342,357 A	8/1994	Nardella	606/40	5,688,267 A	11/1997	Panescu et al.	606/41
5,348,554 A	9/1994	Imran et al.	606/41	5,697,281 A	12/1997	Eggers et al.	604/114
5,364,395 A	11/1994	West, Jr.	606/46	5,697,536 A	12/1997	Eggers et al.	604/114
5,366,443 A	11/1994	Eggers et al.	252/511	5,697,882 A	12/1997	Eggers et al.	604/114
5,370,642 A	12/1994	Keller	606/9	5,697,909 A	12/1997	Eggers et al.	604/114
5,370,644 A	12/1994	Langberg	606/33	5,700,262 A	12/1997	Acosta et al.	606/48
5,370,675 A	12/1994	Edwards et al.	607/101	5,713,896 A	2/1998	Nardella	606/50
5,374,261 A	12/1994	Yoon	604/385.01	5,715,817 A	2/1998	Steven-Wright et al.	600/373
5,374,265 A	12/1994	Sand	606/5	5,722,975 A	3/1998	Edwards et al.	606/41
5,375,588 A	12/1994	Yoon	128/4	5,725,524 A	3/1998	Mulier et al.	606/41
5,380,277 A	1/1995	Phillips	604/33	5,743,870 A	4/1998	Edwards	604/22
5,380,316 A	1/1995	Aita	606/7	5,743,903 A	4/1998	Stern et al.	606/31
5,383,876 A	1/1995	Nardella	606/49	5,746,746 A	5/1998	Garito et al.	606/41
5,383,917 A	1/1995	Desai et al.	607/702	5,749,869 A	5/1998	Lindenmeier et al.	606/34
5,389,096 A	2/1995	Aita	606/15	5,755,753 A	5/1998	Knowlton	607/98
5,395,312 A	3/1995	Desai	604/22	5,766,153 A	6/1998	Eggers et al.	604/114
5,395,363 A	3/1995	Billings et al.	606/41	5,769,843 A	6/1998	Abela et al.	606/10
5,400,267 A	3/1995	Denen et al.	702/59	5,769,847 A	6/1998	Panescu et al.	606/42
5,401,272 A	3/1995	Perkins	606/15	5,782,795 A *	7/1998	Bays	604/22
5,403,311 A	4/1995	Abele et al.	606/49	5,785,705 A	7/1998	Baker	606/32
5,405,376 A	4/1995	Mulier et al.	607/127	5,786,578 A	7/1998	Christy et al.	219/720
5,417,687 A	5/1995	Nardella et al.	606/32	5,800,429 A	9/1998	Edwards	606/41
5,419,767 A	5/1995	Eggers et al.	604/114	5,800,431 A	9/1998	Brown	606/42
5,423,803 A	6/1995	Tankovich	606/9	5,807,384 A	9/1998	Mueller	606/7
5,423,810 A	6/1995	Goble et al.	606/40	5,807,395 A	9/1998	Mulier et al.	606/41
5,423,844 A *	6/1995	Miller	606/171	5,810,764 A	9/1998	Eggers et al.	604/23
5,423,882 A	6/1995	Jackman et al.	607/122	5,810,802 A	9/1998	Panescu et al.	606/31
5,431,649 A	7/1995	Mulier et al.	606/41	5,810,809 A	9/1998	Rydell	606/49
5,433,708 A	7/1995	Nichols et al.	604/113	5,836,875 A	11/1998	Webster, Jr.	600/374
5,436,566 A	7/1995	Thompson et al.	324/713	5,843,019 A	12/1998	Eggers et al.	604/22
5,437,662 A	8/1995	Nardella	606/40	5,843,078 A	12/1998	Sharkey	606/41
5,437,664 A	8/1995	Cohen et al.	606/42	5,843,106 A	12/1998	Heisler	606/167
5,438,302 A	8/1995	Goble	331/167	5,855,277 A	1/1999	Apps et al.	606/35
5,441,499 A	8/1995	Fritzsche	606/45	5,860,951 A	1/1999	Eggers	604/510
5,445,634 A	8/1995	Keller	606/9	5,860,974 A	1/1999	Abele	606/41
5,451,224 A	9/1995	Goble et al.	606/48	5,860,975 A	1/1999	Goble et al.	606/45
5,454,809 A	10/1995	Janssen	606/41	5,871,469 A	2/1999	Eggers et al.	604/114
5,458,596 A	10/1995	Lax et al.	606/31	5,871,524 A	2/1999	Knowlton	607/101
5,458,597 A	10/1995	Edwards et al.	606/41	5,873,855 A	2/1999	Eggers et al.	604/114
5,462,545 A	10/1995	Wang et al.	606/41	5,873,877 A	2/1999	McGaffigan	606/41
5,472,443 A	12/1995	Cordis et al.	606/48	5,876,398 A	3/1999	Mulier et al.	606/41
5,484,435 A	1/1996	Fleenor et al.	606/46	5,885,277 A	3/1999	Korth	606/35
5,487,385 A	1/1996	Avitall	600/374	5,888,198 A	3/1999	Eggers et al.	604/114
5,490,850 A	2/1996	Ellman et al.	606/45	5,891,095 A	4/1999	Eggers et al.	604/114
5,496,312 A	3/1996	Klicek	606/34	5,891,134 A	4/1999	Goble et al.	606/27
5,496,314 A	3/1996	Eggers	606/41	5,893,848 A	4/1999	Negus et al.	606/41
5,496,317 A	3/1996	Goble et al.	606/48	5,895,386 A	4/1999	Odell et al.	606/50
5,505,730 A	4/1996	Edwards et al.	606/41	5,897,553 A	4/1999	Mulier	606/41
5,514,130 A	5/1996	Baker	606/41	5,902,272 A	5/1999	Eggers et al.	604/114
5,520,685 A	5/1996	Wojciechowicz	606/49	5,904,681 A *	5/1999	West, Jr.	606/41
5,536,267 A	7/1996	Edwards et al.	606/41	5,906,613 A	5/1999	Mulier et al.	606/41
5,542,915 A	8/1996	Edwards et al.	604/22	5,919,219 A	7/1999	Knowlton	607/102
5,542,928 A	8/1996	Evans et al.	604/113	5,941,876 A	8/1999	Nardella et al.	606/45
5,545,161 A	8/1996	Imran	606/41	5,944,715 A	8/1999	Goble et al.	606/41
5,554,152 A	9/1996	Aita	606/7	5,954,716 A	9/1999	Sharkey et al.	606/32
5,556,397 A	9/1996	Long et al.	606/48	5,964,754 A	10/1999	Osypka	606/37
5,562,703 A	10/1996	Desai	606/210	5,964,786 A	10/1999	Ochs et al.	607/5
5,567,890 A	10/1996	Lindberg et al.	75/243	5,976,127 A	11/1999	Lax	606/32
5,569,242 A	10/1996	Lax et al.	606/42	5,980,516 A	11/1999	Mulier et al.	606/41
5,571,100 A	11/1996	Goble et al.	606/41	5,980,545 A	11/1999	Pacala et al.	606/170
5,579,764 A	12/1996	Goldreyer	600/374	5,984,919 A	11/1999	Hilal et al.	606/45
5,584,872 A	12/1996	LaFontaine et al.	607/117	6,004,319 A	12/1999	Goble et al.	606/48
5,599,350 A	2/1997	Schulze et al.	606/51	6,007,533 A *	12/1999	Casscells et al.	606/45
5,607,421 A	3/1997	Jeevanandam et al.	606/15	6,013,076 A	1/2000	Goble et al.	606/41
5,609,151 A	3/1997	Mulier et al.	128/642	6,015,406 A	1/2000	Goble et al.	606/41
5,609,573 A	3/1997	Sandock	604/22	6,016,809 A	1/2000	Mulier et al.	128/898
5,618,293 A	4/1997	Sample et al.	606/170	6,024,733 A	2/2000	Eggers et al.	604/500
5,626,576 A	5/1997	Janssen	606/41	6,027,501 A	2/2000	Goble et al.	606/41
5,633,578 A	5/1997	Eggers et al.	323/301	6,030,383 A	2/2000	Benderrev	606/45
5,643,255 A	7/1997	Organ	606/41	6,032,673 A *	3/2000	Savage et al.	128/898
5,647,869 A	7/1997	Goble et al.	606/37	6,032,674 A	3/2000	Eggers et al.	606/41
5,658,278 A	8/1997	Imran et al.	606/41	6,036,681 A	3/2000	Hooven	604/506
5,660,567 A	8/1997	Nierlich et al.	439/620.21	6,039,734 A	3/2000	Goble et al.	606/41
5,660,836 A	8/1997	Knowlton	607/101	6,045,532 A	4/2000	Eggers et al.	604/114

US 8,012,153 B2

Page 4

6,047,700 A	4/2000	Eggers et al.	128/898	6,379,350 B1	4/2002	Sharkey et al.	606/41
6,053,172 A	4/2000	Hovda et al.	128/898	6,379,351 B1	4/2002	Thapliyal et al.	606/41
6,056,746 A	5/2000	Goble et al.	606/48	6,391,025 B1	5/2002	Weinstein et al.	606/41
6,063,079 A	5/2000	Hovda et al.	606/41	6,391,028 B1	5/2002	Fanton et al.	606/45
6,063,081 A	5/2000	Mulier et al.	606/45	6,398,781 B1	6/2002	Goble et al.	606/41
6,066,134 A	5/2000	Eggers et al.	606/32	6,409,722 B1	6/2002	Hoeey et al.	606/34
6,068,628 A	5/2000	Fanton et al.	606/41	6,409,724 B1	6/2002	Penny et al.	606/41
6,074,386 A	6/2000	Goble et al.	606/34	6,416,507 B1	7/2002	Eggers et al.	606/32
6,086,583 A	7/2000	Ouchi	606/41	6,416,508 B1	7/2002	Eggers et al.	606/32
6,090,106 A	7/2000	Goble et al.	606/41	6,416,509 B1	7/2002	Goble et al.	606/37
6,091,995 A	7/2000	Ingle et al.	607/138	6,428,539 B1	8/2002	Baxter et al.	606/49
6,093,186 A	7/2000	Goble	606/34	6,432,103 B1	8/2002	Ellsberry et al.	606/41
6,096,037 A	8/2000	Mulier et al.	606/49	6,432,105 B1	8/2002	Ellman et al.	606/48
6,102,046 A	8/2000	Weinstein et al.	128/898	6,440,129 B1	8/2002	Simpson	606/42
6,105,581 A	8/2000	Eggers et al.	128/898	6,468,274 B1	10/2002	Alleyne et al.	606/32
6,109,268 A	8/2000	Thapliyal et al.	128/898	6,468,275 B1	10/2002	Wampler et al.	606/48
6,110,169 A	8/2000	Mueller et al.	606/48	6,482,201 B1	11/2002	Olsen et al.	606/41
6,117,109 A	9/2000	Eggers et al.	604/114	6,482,202 B1	11/2002	Goble et al.	606/41
6,126,682 A	10/2000	Sharkey et al.	607/96	6,491,690 B1	12/2002	Goble et al.	606/41
6,142,992 A	11/2000	Cheng et al.	606/34	6,510,854 B2	1/2003	Goble	128/898
6,149,620 A	11/2000	Baker et al.	604/22	6,514,250 B1	2/2003	Jahns et al.	606/41
6,152,923 A	11/2000	Ryan	606/51	6,517,498 B1	2/2003	Burbank et al.	600/564
6,156,031 A	12/2000	Aita et al.	606/33	6,517,535 B2	2/2003	Edwards	606/41
6,159,194 A	12/2000	Eggers et al.	604/500	6,530,922 B2	3/2003	Cosman	606/34
6,159,208 A	12/2000	Hovda et al.	606/41	6,540,741 B1	4/2003	Underwood et al.	606/32
6,162,217 A	12/2000	Kannenberg et al.	606/34	6,557,559 B1	5/2003	Eggers et al.	128/898
6,168,593 B1	1/2001	Sharkey et al.	606/34	6,558,382 B2	5/2003	Jahns et al.	606/41
6,174,309 B1	1/2001	Wrublewski et al.	606/45	6,575,968 B1	6/2003	Eggers et al.	606/41
6,179,824 B1	1/2001	Eggers et al.	604/500	6,575,969 B1	6/2003	Rittman, III et al.	606/41
6,179,836 B1	1/2001	Eggers et al.	606/45	6,578,579 B2	6/2003	Burnside	128/897
6,183,469 B1	2/2001	Thapliyal et al.	606/41	6,582,423 B1	6/2003	Thapliyal et al.	606/32
6,190,381 B1	2/2001	Olsen et al.	606/32	6,589,237 B2	7/2003	Woloszko et al.	606/41
6,193,715 B1	2/2001	Wrublewski et al.	606/45	6,595,990 B1	7/2003	Weinstein et al.	606/41
6,197,021 B1	3/2001	Panescu et al.	606/31	6,597,950 B2	7/2003	Linder et al.	607/8
6,203,542 B1	3/2001	Ellsberry et al.	606/41	6,602,248 B1	8/2003	Sharps et al.	606/32
6,210,402 B1	4/2001	Olsen et al.	606/32	6,620,156 B1	9/2003	Garito et al.	606/50
6,210,405 B1	4/2001	Goble et al.	606/41	6,632,193 B1	10/2003	Davison et al.	604/22
6,214,001 B1	4/2001	Casscells et al.	606/41	6,632,220 B1	10/2003	Eggers et al.	606/41
6,217,575 B1	4/2001	DeVore et al.	606/41	6,632,230 B2	10/2003	Barry	606/159
6,224,592 B1	5/2001	Eggers et al.	606/32	6,663,628 B2 *	12/2003	Peters	606/45
6,228,078 B1	5/2001	Eggers	606/32	6,699,206 B2	3/2004	Burbank et al.	606/567
6,228,081 B1	5/2001	Goble	606/34	6,702,810 B2	3/2004	McClurken et al.	606/34
6,234,178 B1	5/2001	Goble et al.	606/32	6,746,447 B2	6/2004	Davison et al.	606/41
6,235,020 B1	5/2001	Cheng et al.	606/34	6,749,604 B1	6/2004	Eggers et al.	606/41
6,237,604 B1	5/2001	Burnside et al.	128/897	6,749,608 B2	6/2004	Garito et al.	606/45
6,238,391 B1	5/2001	Olsen et al.	606/41	6,763,836 B2	7/2004	Tasto et al.	128/898
6,238,393 B1	5/2001	Mulier et al.	607/127	6,770,071 B2	8/2004	Woloszko et al.	606/41
6,254,600 B1	7/2001	Willink et al.	606/41	6,780,178 B2	8/2004	Palanker et al.	600/41
6,261,286 B1	7/2001	Goble et al.	606/34	6,780,180 B1	8/2004	Goble et al.	606/41
6,261,311 B1	7/2001	Sharkey et al.	607/96	6,802,842 B2	10/2004	Ellman et al.	606/45
6,264,650 B1	7/2001	Hovda	606/32	6,805,130 B2	10/2004	Tasto et al.	606/32
6,264,652 B1	7/2001	Eggers et al.	606/41	6,827,725 B2	12/2004	Batchelor et al.	606/170
6,267,757 B1	7/2001	Aita et al.	606/33	6,832,996 B2	12/2004	Woloszko et al.	606/41
6,270,460 B1	8/2001	McCartan et al.	600/459	6,837,887 B2	1/2005	Woloszko et al.	606/41
6,277,112 B1	8/2001	Underwood et al.	606/32	6,837,888 B2	1/2005	Ciarrocca et al.	606/41
6,280,441 B1	8/2001	Ryan	606/45	6,855,143 B2	2/2005	Davison et al.	606/41
6,283,961 B1	9/2001	Underwood et al.	604/41	6,866,671 B2	3/2005	Tierney et al.	606/130
6,293,942 B1	9/2001	Goble et al.	606/38	6,878,149 B2	4/2005	Gatto	606/46
6,296,636 B1	10/2001	Cheng et al.	606/32	6,890,307 B2	5/2005	Kokate et al.	600/549
6,296,638 B1	10/2001	Davison et al.	606/41	6,892,086 B2	5/2005	Russell	600/372
6,302,903 B1	10/2001	Mulier et al.	607/105	6,896,674 B1	5/2005	Woloszko et al.	606/41
6,306,134 B1	10/2001	Goble et al.	606/42	6,904,303 B2	6/2005	Phan et al.	600/374
6,308,089 B1	10/2001	von der Rur et al.	600/338	6,920,883 B2	7/2005	Bessette et al.	128/898
6,309,387 B1	10/2001	Eggers et al.	606/41	6,929,640 B1	8/2005	Underwood et al.	606/32
6,312,408 B1	11/2001	Eggers et al.	604/114	6,949,096 B2	9/2005	Davison et al.	606/41
6,312,429 B1	11/2001	Burbank et al.	606/47	6,960,204 B2	11/2005	Eggers et al.	606/32
6,315,774 B1	11/2001	Daniel et al.	606/15	6,974,453 B2	12/2005	Woloszko et al.	606/41
6,322,494 B1	11/2001	Bullivant et al.	600/104	6,979,332 B2 *	12/2005	Adams	606/45
6,322,549 B1	11/2001	Eggers et al.	604/500	6,979,601 B2	12/2005	Marr et al.	438/132
6,325,799 B1	12/2001	Goble	606/41	6,984,231 B2	1/2006	Goble et al.	606/37
6,327,505 B1	12/2001	Medhkour et al.	607/99	6,986,700 B2	1/2006	Agarwal	451/6
6,328,736 B1	12/2001	Mulier et al.	606/45	6,991,631 B2	1/2006	Woloszko et al.	606/41
6,336,926 B1	1/2002	Goble	606/34	7,004,941 B2	2/2006	Tvinnereim et al.	606/41
6,346,107 B1	2/2002	Cucin	606/49	7,041,102 B2	5/2006	Truckai et al.	606/51
6,355,006 B1	3/2002	Ryaby et al.	601/2	7,070,596 B1	7/2006	Woloszko et al.	606/41
6,355,032 B1	3/2002	Hovda et al.	606/32	7,090,672 B2	8/2006	Underwood et al.	606/41
6,358,248 B1	3/2002	Mulier et al.	606/41	7,094,215 B2	8/2006	Davison et al.	604/22
6,363,937 B1	4/2002	Hovda et al.	128/898	7,104,986 B2	9/2006	Hovda et al.	606/32
6,364,877 B1	4/2002	Goble et al.	606/34	7,131,969 B1	11/2006	Hovda et al.	606/45

7,150,747 B1 *	12/2006	McDonald et al.	606/45	2008/0234673 A1	9/2008	Marion et al.	606/45
7,169,143 B2	1/2007	Eggers et al.	606/32	2008/0300590 A1	12/2008	Horne et al.	606/35
7,179,255 B2	2/2007	Letfice et al.	606/32	2009/0069807 A1	3/2009	Eggers et al.	606/48
7,184,811 B2	2/2007	Phan et al.	600/374	2010/0042095 A1	2/2010	Bigley et al.	606/41
7,186,234 B2	3/2007	Dahla et al.	604/22	2010/0152724 A1	6/2010	Marion et al.	606/41
7,192,428 B2	3/2007	Eggers et al.	606/41	2010/0204690 A1	8/2010	Bigley et al.	606/41
7,201,750 B1	4/2007	Eggers et al.	606/41				
7,217,268 B2	5/2007	Eggers et al.	606/32				
7,241,293 B2	7/2007	Davison	600/410				
7,261,712 B2	8/2007	Burbank et al.	606/49				
7,270,658 B2	9/2007	Woloszko et al.	606/32				
7,270,659 B2	9/2007	Hovda et al.	606/32				
7,270,661 B2	9/2007	Dahla et al.	606/41				
7,276,063 B2	10/2007	Davison et al.	606/45				
7,278,994 B2	10/2007	Goble	606/41				
7,297,143 B2	11/2007	Woloszko et al.	606/41				
7,297,145 B2	11/2007	Ormsby et al.	606/41				
7,318,823 B2	1/2008	Sharps et al.	606/32				
7,331,956 B2	2/2008	Hovda et al.	606/32				
RE40,156 E	3/2008	Sharps et al.	606/32				
7,357,798 B2	4/2008	Sharps et al.	606/32				
7,387,625 B2	6/2008	Hovda et al.	606/32				
7,419,488 B2	9/2008	Ciarrocca et al.	606/41				
7,429,260 B2	9/2008	Underwood et al.	606/32				
7,429,262 B2	9/2008	Woloszko et al.	606/46				
7,435,247 B2	10/2008	Woloszko et al.	604/45				
7,488,295 B2	2/2009	Burbank et al.	606/167				
7,819,863 B2	10/2010	Eggers et al.	606/32				
2001/0025177 A1 *	9/2001	Woloszko et al.	606/41				
2002/0029036 A1	3/2002	Goble et al.	606/38				
2002/0038122 A1 *	3/2002	Peters	606/45				
2002/0049438 A1	4/2002	Sharkey et al.	606/41				
2002/0072739 A1	6/2002	Lee et al.	606/47				
2003/0013986 A1	1/2003	Saadat	600/549				
2003/0028189 A1	2/2003	Woloszko et al.	604/45				
2003/0088245 A1	5/2003	Woloszko et al.	606/41				
2003/0130655 A1	7/2003	Woloszko et al.	606/45				
2003/0158545 A1	8/2003	Hovda et al.	606/32				
2003/0163126 A1 *	8/2003	West, Jr.	606/41				
2003/0171743 A1	9/2003	Tasto et al.	606/32				
2003/0208194 A1	11/2003	Hovda et al.	606/41				
2003/0208196 A1	11/2003	Stone	606/41				
2003/0209958 A1	11/2003	Hwang et al.	606/41				
2003/0212396 A1	11/2003	Eggers et al.	606/41				
2003/0216725 A1	11/2003	Woloszko et al.	606/41				
2003/0216732 A1	11/2003	Truckai et al.	606/49				
2004/0049180 A1	3/2004	Sharps et al.	606/32				
2004/0116922 A1	6/2004	Hovda et al.	606/41				
2004/0127893 A1	7/2004	Hovda	606/41				
2004/0230190 A1	11/2004	Dahla et al.	604/41				
2005/0004634 A1	1/2005	Ricart et al.	606/41				
2005/0010205 A1	1/2005	Hovda et al.	606/32				
2005/0033278 A1	2/2005	McClurken et al.	606/34				
2005/0119650 A1	6/2005	Sanders et al.	424/426				
2005/0131402 A1	6/2005	Ciarrocca et al.	600/450				
2005/0187543 A1	8/2005	Underwood et al.	606/41				
2005/0234439 A1	10/2005	Underwood	606/32				
2005/0251134 A1	11/2005	Woloszko et al.	606/32				
2005/0261754 A1	11/2005	Woloszko	606/32				
2005/0288665 A1	12/2005	Woloszko	606/41				
2006/0036237 A1	2/2006	Davison et al.	606/41				
2006/0095031 A1	5/2006	Ormsby	606/34				
2006/0178670 A1	8/2006	Woloszko et al.	606/48				
2006/0189971 A1	8/2006	Tasto et al.	606/32				
2006/0253117 A1	11/2006	Hovda et al.	128/898				
2006/0259025 A1	11/2006	Dahla	607/108				
2007/0010808 A1	1/2007	Dahla	606/41				
2007/0106288 A1	5/2007	Woloszko et al.	606/41				
2007/0112348 A1	5/2007	Eggers et al.	606/41				
2007/0129715 A1	6/2007	Eggers et al.	606/32				
2007/0149966 A1	6/2007	Dahla et al.	606/41				
2007/0161981 A1	7/2007	Sanders et al.	606/41				
2007/0179497 A1	8/2007	Eggers et al.	606/41				
2007/0208334 A1	9/2007	Woloszko et al.	606/41				
2007/0208335 A1	9/2007	Woloszko et al.	606/41				
2007/0213700 A1	9/2007	Davison et al.	606/32				
2007/0282323 A1	12/2007	Woloszko et al.	606/41				
2008/0021447 A1	1/2008	Davison et al.	606/41				
2008/0167646 A1	7/2008	Godara et al.	606/41				
				DE	3930451 A1	3/1991	
				DE	4425015	1/1996	
				DE	296 09 350	8/1996	
				DE	195 37 084	4/1997	
				DE	296 19 029	4/1997	
				DE	102009057921 A1	6/2010	
				EP	0 502 268	9/1992	
				EP	0 515 867	12/1992	
				EP	543123	5/1993	
				EP	0 597 463	5/1994	
				EP	774926	3/1995	
				EP	0 650 701	5/1995	
				EP	0703461 A2	3/1996	
				EP	0740926 A2	11/1996	
				EP	0 754 437	1/1997	
				EP	923907	6/1999	
				EP	0 694 290	11/2000	
				EP	1149564	10/2001	
				FR	2313949	1/1977	
				GB	2037167	7/1980	
				GB	2 308 979	7/1997	
				GB	2 308 980	7/1997	
				GB	2 308 981	7/1997	
				GB	2 327 350	1/1999	
				GB	2 327 351	1/1999	
				GB	2 327 352	1/1999	
				GB	2331247	5/1999	
				GB	2379878	3/2003	
				GB	2408936	6/2005	
				JP	57-57802	4/1982	
				JP	57-117843	7/1982	
				JP	57-183850	11/1982	
				JP	63-40099	8/1988	
				JP	9-501328	2/1997	
				WO	90/03152	4/1990	
				WO	90/07303	7/1990	
				WO	91/13650	9/1991	
				WO	92/21278	12/1992	
				WO	93/13816	7/1993	
				WO	93/20747	10/1993	
				WO	94/03134	2/1994	
				WO	94/04220	3/1994	
				WO	94/08654	4/1994	
				WO	94/10924	5/1994	
				WO	94/14383	7/1994	
				WO	94/26228	11/1994	
				WO	95/05780	3/1995	
				WO	95/05781	3/1995	
				WO	95/05867	3/1995	
				WO	95/10326	4/1995	
				WO	95/30373	11/1995	
				WO	95/34259	12/1995	
				WO	96/00042	1/1996	
				WO	96/07360	3/1996	
				WO	96/34568	11/1996	
				WO	96/35469	11/1996	
				WO	96/39914	12/1996	
				WO	96/39962	12/1996	
				WO	96/39964	12/1996	
				WO	96/39965	12/1996	
				WO	96/39967	12/1996	
				WO	97/00646	1/1997	
				WO	97/00647	1/1997	
				WO	97/15238	5/1997	
				WO	97/18765	5/1997	
				WO	97/18768	5/1997	
				WO	97/24073	7/1997	
				WO	97/24074	7/1997	
				WO	97/24992	7/1997	
				WO	97/24993	7/1997	
				WO	97/24994	7/1997	

FOREIGN PATENT DOCUMENTS

WO	97/25101	7/1997
WO	97/32551	9/1997
WO	97/33523	9/1997
WO	97/34540	9/1997
WO	97/41786	11/1997
WO	97/44071	11/1997
WO	97/48345	12/1997
WO	97/48346	12/1997
WO	98/07468	2/1998
WO	98/14131	4/1998
WO	98/17185	4/1998
WO	98/17186	4/1998
WO	98/27877	7/1998
WO	98/27879	7/1998
WO	98/27880	7/1998
WO	98/30144	7/1998
WO	98/34550	8/1998
WO	98/34558	8/1998
WO	98/38925	9/1998
WO	98/39038	9/1998
WO	99/00060	1/1999
WO	99/20185	4/1999
WO	99/20213	4/1999
WO	99/42037	8/1999
WO	99/44506	9/1999
WO	99/51155	10/1999
WO	99/51158	10/1999
WO	00/00098	1/2000
WO	00/09053	2/2000
WO	01/26570	4/2001
WO	01/87154	5/2001
WO	01/95819	12/2001
WO	02/36028	5/2002
WO	02/07857	10/2002
WO	02/10255	12/2002
WO	03/024305	3/2003
WO	03/024339	3/2003
WO	03/092477	11/2003
WO	2004/071278	8/2004
WO	2005/125287	12/2005
WO	2007/006000	1/2007
WO	2007/056729	5/2007

OTHER PUBLICATIONS

Costello et al., "Nd: YAG Laser Ablation of the Prostate as a Treatment for Benign Prostatic Hypertrophy", *Lasers in Surgery and Medicine*, vol. 12, pp. 121-124, 1992.

Rand et al., "Effect of Electrocautery on Fresh Human Articular Cartilage", *J. Arthro. Surg.*, vol. 1, pp. 242-246, 1985.

O'Neill et al., "Percutaneous Plasma Dissection Stimulates Repair in Injured Porcine Intervertebral Discs", Dept. of Orthopaedic Surgery, Dept. of Radiology University of California at San Francisco, CA, 3 pgs.

PCT International Search Report for PCT/US99/14685, 1 pg, Mailed Oct. 21, 1999.

PCT Notification of International Preliminary Examination Report for PCT/US99/14685, 4 pgs, Mailed Feb. 20, 2001.

PCT International Search Report for PCT/US98/22323, 1 pg, Mailed Mar. 3, 1999.

PCT Notification of International Preliminary Examination Report for PCT/US98/22323, 5 pgs, Mailed Nov. 28, 2000.

European Search Report for EP 98953859, 2 pgs, Jul. 2, 2001.

Supplementary European Search Report for EP 98953859, 3 pgs, Oct. 18, 2001.

PCT International Search Report for PCT/US99/18289, 1 pg, Mailed Dec. 7, 1999.

PCT Notification of International Preliminary Examination Report for PCT/US99/18289, 4 pgs, Mailed Jul. 7, 2000.

European Search Report for EP 99945039.8, 3 pgs, Oct. 1, 2001.

PCT International Search Report for PCT/US02/19261, 1 pg, Mailed Sep. 18, 2002.

PCT International Preliminary Examination Report for PCT/US02/19261, 3 pgs, Mar. 25, 2003.

PCT International Search Report for PCT/US02/29476, 1 pg, Mailed May 24, 2004.

PCT International Search Report for PCT/US03/13686, 1 pg, Mailed Nov. 25, 2003.

PCT International Search Report for PCT/US04/03614, 1 pg, Mailed Sep. 14, 2004.

PCT Written Opinion of the International Searching Authority for PCT/US04/03614, 4 pgs, Mailed Sep. 14, 2004.

EP Communication, European Examination Report for EP 98953859.0, 3 pgs, Jun. 14, 2004.

EP Communication, European Examination Report for EP 99945039.8, 5 pgs, May 10, 2004.

PCT Notification of International Search Report and Written Opinion for PCT/US06/26321, 8 pgs, Mailed Apr. 25, 2007.

PCT Notification of the International Search Report and Written Opinion for PCT/US06/60618, 7 pgs, Mailed Oct. 5, 2007.

Barry et al., "The Effect of Radiofrequency-generated Thermal Energy on the Mechanical and Histologic Characteristics of the Arterial Wall in Vivo: Implications of Radiofrequency Angioplasty" *American Heart Journal* vol. 117, pp. 332-341, 1982.

Codman & Shurtleff, Inc. "The Malis Bipolar Coagulating and Bipolar Cutting System CMC-II" brochure, early, 2 pgs, 1991.

Codman & Shurtleff, Inc. "The Malis Bipolar Electrosurgical System CMC-III Instruction Manual", 15 pgs, Jul. 1991.

Cook et al., "Therapeutic Medical Devices: Application and Design", Prentice Hall, Inc., 3 pgs, 1982.

Dennis et al., "Evolution of Electrofulguration in Control of Bleeding of Experimental Gastric Ulcers," *Digestive Diseases and Sciences*, vol. 24, No. 11, 845-848, Nov. 1979.

Dobbie, A.K., "The Electrical Aspects of Surgical Diathermy, Bio Medical Engineering" *Bio-Medical Engineering* vol. 4, pp. 206-216, May 1969.

Elsasser, V.E. et al., "An Instrument for Transurethral Resection without Leakage of Current" *Acta Medico Technica* vol. 24, No. 4, pp. 129-134, 1976.

Geddes, "Medical Device Accidents: With Illustrative Cases" CRC Press, 3 pgs, 1998.

Honig, W., "The Mechanism of Cutting in Electrosurgery" *IEEE* pp. 58-65, 1975.

Kramolowsky et al., "The Urological App of Electrosurgery" *J. of Urology* vol. 146, pp. 669-674, 1991.

Kramolowsky et al., "Use of 5F Bipolar Electrosurgical Probe in Endoscopic Urological Procedures" *J. of Urology* vol. 143, pp. 275-277, 1990.

Lee, B et al., "Thermal Compression and Molding of Artherosclerotic Vascular Tissue with Use" *JACC* vol. 13(5), pp. 1167-1171, 1989.

Letter from Department of Health to Jerry Malis dated Jan. 24, 1991, 3 pgs.

Letter from Department of Health to Jerry Malis dated Jul. 25, 1985, 1 pg.

Letter from Jerry Malis to FDA dated Jul. 25, 1985, 2 pgs.

Lu, et al., "Electrical Thermal Angioplasty: Catheter Design Features, in Vitro Tissue Ablation Studies and in Vitro Experimental Findings," *Am J. Cardiol* vol. 60, pp. 1117-1122, Nov. 1, 1987.

Malis, L., "Electrosurgery, Technical Note," *J. Neurosurg.*, vol. 85, pp. 970-975, Nov. 1996.

Malis, L., "Excerpted from a seminar by Leonard I. Malis, M.D. at the 1995 American Association of Neurological Surgeons Meeting," 1pg, 1995.

Malis, L., "Instrumentation for Microvascular Neurosurgery" *Cerebrovascular Surgery*, vol. 1, pp. 245-260, 1985.

Malis, L., "New Trends in Microsurgery and Applied Technology," *Advanced Technology in Neurosurgery*, pp. 1-16, 1988.

Malis, L., "The Value of Irrigation During Bipolar Coagulation" See ARTC 21602, 1 pg, Apr. 9, 1993.

Nardella, P.C., *SPIE* 1068: pp. 42-49, Radio Frequency Energy and Impedance Feedback, 1989.

O'Malley, Schaum's Outline of Theory and Problems of Basic Circuit Analysis, McGraw-Hill, 2nd Ed., pp. 3-5, 1992.

Olsen MD, Bipolar Laparoscopic Cholecystectomy Lecture (marked confidential), 12 pgs, Oct. 7, 1991.

Pearce, John A., "Electrosurgery", pp. 17, 69-75, 87, John Wiley & Sons, New York, 1986.

Pearce, John A., "Electrosurgery", Handbook of Biomedical Engineering, chapter 3, Academic Press Inc., N.Y., pp. 98-113, 1988.

- Piercey et al., "Electrosurgical Treatment of Experimental Bleeding Canine Gastric Ulcers" *Gastroenterology* vol. 74(3), pp. 527-534, 1978.
- Protell et al., "Computer-Assisted Electrocoagulation: Bipolar v. Monopolar in the Treatment of Experimental Canine Gastric Ulcer Bleeding," *Gastroenterology* vol. 80, No. 3, pp. 451-455, 1981.
- Ramsey et al., "A Comparison of Bipolar and Monopolar Diathermy Probes in Experimental Animals," *Urological Research* vol. 13, pp. 99-102, 1985.
- Selikowitz et al., "Electric Current and Voltage Recordings on the Myocardium During Electrosurgical Procedures in Canines," *Surgery, Gynecology & Obstetrics*, vol. 164, pp. 219-224, Mar. 1987.
- Shuman, "Bipolar Versus Monopolar Electrosurgery: Clinical Applications," *Dentistry Today*, vol. 20, No. 12, 7 pgs, Dec. 2001.
- Slager et al., "Spark Erosion of Arteriosclerotic Plaques" *Z. Kardiol.* 76:Suppl. 6, pp. 67-71, 1987.
- Slager et al., "Vaporization of Atherosclerotic Plaques by Spark Erosion" *JACC* 5(6): pp. 1382-1386, Jun. 1985.
- Stoffels, E. et al., "Investigation on the Interaction Plasma-Bone Tissue", E-MRS Spring Meeting, 1 pg, Jun. 18-21, 2002.
- Stoffels, E. et al., "Biomedical Applications of Plasmas", Tutorial presented prior to the 55th Gaseous Electronics Conference in Minneapolis, MN, 41 pgs, Oct. 14, 2002.
- Stoffels, E. et al., "Plasma Interactions with Living Cells", Eindhoven University of Technology, 1 pg, 2002.
- Stoffels, E. et al., "Superficial Treatment of Mammalian Cells using Plasma Needle", *J. Phys. D: Appl. Phys.* 26, pp. 2908-2913, Nov. 19, 2003.
- Stoffels, E. et al., "Plasma Needle", Eindhoven University of Technology, 1 pg, Nov. 28, 2003.
- Stoffels, E. et al., "Plasma Physicists Move into Medicine", Physicsweb, 1 pg, Nov. 2003.
- Stoffels, E. et al., "Plasma Treated Tissue Engineered Skin to Study Skin Damage", Biomechanics and Tissue Engineering, Materials Technology, 1 pg, 2003.
- Stoffels, E. et al., "Plasma Treatment of Dental Cavities: A Feasibility Study", *IEEE Transaction on Plasma Science*, vol. 32, No. 4, pp. 1540-1542, Aug. 2004.
- Stoffels, E. et al., "The Effects of UV Irradiation and Gas Plasma Treatment on Living Mammalian Cells and Bacteria: A Comparative Approach", *IEEE Transaction on Plasma Science*, vol. 32, No. 4, pp. 1544-1550, Aug. 2004.
- Stoffels, E. et al., "Electrical and Optical Characterization of the Plasma Needle", *New Journal of Physics* 6, pp. 1-14, Oct. 28, 2004.
- Stoffels, E. et al., "Where Plasma Meets Plasma", Eindhoven University of Technology, 23 pgs, 2004.
- Stoffels, E. et al., "Gas Plasma effects on Living Cells", *Physica Scripta*, T107, pp. 79-82, 2004.
- Stoffels, E. et al., "Plasma Treatment of Mammalian Vascular Cells: A Quantitative Description", *IEEE Transaction on Plasma Science*, vol. 33, No. 2, pp. 771-775, Apr. 2005.
- Stoffels, E. et al., "Deactivation of *Escherichia coli* by the Plasma Needle", *J. Phys. D: Appl. Phys.* 38, pp. 1716-1721, May 20, 2005.
- Stoffels, E. et al., "Development of a Gas Plasma Catheter for Gas Plasma Surgery", XXVIII ICPIG, Eindhoven University of Technology, pp. 18-22, Jul. 2005.
- Stoffels, E. et al., "Development of a Smart Positioning Sensor for the Plasma Needle", *Plasma Sources Sci. Technol.* 15, pp. 582-589, Jun. 27, 2006.
- Stoffels, E. et al., "Killing of *S. Mutans* Bacteria Using a Plasma Needle at Atmospheric Pressure", *IEEE Transaction on Plasma Science*, vol. 34, No. 4, pp. 1317-1324, Aug. 2006.
- Stoffels, E. et al., "Plasma-Needle Treatment of Substrates with Respect to Wettability and Growth of *Escherichia coli* and *Streptococcus Mutans*", *IEEE Transaction on Plasma Science*, vol. 34, No. 4, pp. 1325-1330, Aug. 2006.
- Stoffels, E. et al., "Reattachment and Apoptosis after Plasma-Needle Treatment of Cultured Cells", *IEEE Transaction on Plasma Science*, vol. 34, No. 4, pp. 1331-1336, Aug. 2006.
- Stoffels, E. et al., "UV Excimer Lamp Irradiation of Fibroblasts: The Influence on Antioxidant Homostasis", *IEEE Transaction on Plasma Science*, vol. 34, No. 4, pp. 1359-1364, Aug. 2006.
- Stoffels, E. et al., "Plasma Needle for in Vivo Medical Treatment: Recent Developments and Perspectives", *Plasma Sources Sci. Technol.* 15, pp. S169-S180, Oct. 6, 2006.
- Swain, C.P., et al., "Which Electrode, A Comparison of four endoscopic methods of electrocoagulation in experimental bleeding ulcers" *Gut* vol. 25, pp. 1424-1431, 1987.
- Tucker, R. et al., "A Comparison of Urologic Application of Bipolar Versus Monopolar Five French Electrosurgical Probes" *J. of Urology* vol. 141, pp. 662-665, 1989.
- Tucker, R. et al., "In vivo effect of 5 French Bipolar and Monopolar Electrosurgical Probes on the Porcine Bladder" *Urological Research* vol. 18, pp. 291-294, 1990.
- Tucker, R. et al., "Demodulated Low Frequency Currents from Electrosurgical Procedures," *Surgery, Gynecology and Obstetrics*, 159:39-43, 1984.
- Tucker, R. et al., Abstract P14-11, p. 248, "A Bipolar Electrosurgical Turp Loop", Nov. 1989.
- Valley Forge Scientific Corp., "Summary of Safety and Effective Information from 510K", 2pgs, 1991.
- Valley Forge's New Products, Clinica, 475, 5, Nov. 6, 1991.
- Valleylab SSE2L Instruction Manual, 11 pgs, Jan. 6, 1983.
- Valleylab, Inc., "Valleylab Part No. 945 100 102 A" Surgistat Service Manual, pp. 1-46, Jul. 1988.
- Wattiez, Arnaud et al., "Electrosurgery in Operative Endoscopy," *Electrosurgical Effects*, Blackwell Science, pp. 85-93, 1995.
- Wyeth, "Electrosurgical Unit" pp. 1181-1202, 2000.
- UK Search Report for GB0805061.9 1 pg, Jul. 15, 2008.
- BiLAP IFU 910033-002 Rev A for BiLAP Model 3527, L-Hook; BiLAP Model 3525, J-Hook; BiLAP Model 3529, High Angle, 2 pgs, Nov. 30, 1993.
- BiLAP IFU 910026-001 Rev A for BiLAP Model 3525, J-Hook, 4 pgs, May 20, 1991.
- BiLAP Generator Settings, Jun. 1991.
- Tucker et al., "The interaction between electrosurgical generators, endoscopic electrodes, and tissue," *Gastrointestinal Endoscopy*, vol. 38, No. 2, pp. 118-122, 1992.
- Buchelt, et al., "Excimer Laser Ablation of Fibrocartilage: An in Vitro and in Vivo Study", *Lasers in Surgery and Medicine*, vol. 11, pp. 271-279, 1991.
- Costello et al., "Nd: YAG Laser Ablation of the Prostate as a Treatment for Benign Prostatic Hypertrophy", *Lasers in Surgery and Medicine*, vol. 12, pp. 121-124, 1992.
- Hardy et al., "Regional Myocardial Blood Flow and Cardiac mechanics in dog Hearts with CO₂ laser-induced Intramyocardial Revascularization", *Basic Research in cardiology* 85:179-196, 1990.
- Mirhoseini et al., "New Concepts in Revascularization of the Myocardium", *Ann Thorac Surg* 45:415-420, 1988.
- Mirhoseini et al., "Revascularization of the heart by Laser", *J. of Microsurgery* 2:253-260, 1981.
- Mirhoseini et al., "Transmyocardial Laser Revascularization: A Review", *J. of Clinical Laser medicine & Surgery* 11 (1) :15-19, 1993.
- Mirhoseini et al., "Transventricular Revascularization by Laser", *Lasers in Surgery and Medicine* 2:187-198, 1982.
- Rand et al., "Effect of Electrocautery on Fresh Human Articular Cartilage", *J. Arthro. Surg.*, vol. 1, pp. 242-246, 1985.
- Walter et al., "Treatment of Acute Myocardial Infarction by Transmural Blood Supply from the Ventricular Cavity", *Erop. Surgery Res.* 3:130-138, 1971.
- Whittaker et al., "Transmural Channels Can Protect Ischemic Tissue", *Circulation* 93(1):143-152, Jan. 1, 1996.
- EP Search Report for EP01124768 2 pgs, Nov. 30, 2001.
- EP Search Report for EP01935650 10 pgs, Mailed Jul. 26, 2006.
- EP Search Report for EP01935650 8 pgs, Mailed May 3, 2005.
- EP Search Report for EP02768969 3 pgs, Mailed Feb. 12, 2007.
- EP Search Report for EP03762238 3 pgs, Mailed Jun. 2, 2006.
- EP Search Report for EP94916716 2 pgs, Oct. 29, 1996.
- EP Search Report for EP96941386 2 pgs, Nov. 27, 1998.
- EP Search Report for EP98952032 2 pgs, Nov. 24, 2000.
- PCT International Search Report for PCT/US00/07718 1 pg, Mailed Sep. 5, 2000.
- PCT International Search Report for PCT/US01/16006 1pg, Mailed Aug. 14, 2001.

- PCT International Search Report for PCT/US02/31640 1 pg, Mailed May 23, 2003.
- PCT International Search Report for PCT/US03/04689 1 pg, Mailed Sep. 26, 2003.
- PCT International Search Report for PCT/US03/12790 1pg, Mailed Aug. 12, 2003.
- PCT International Search Report for PCT/US03/20574 1 pg, Mailed May 25, 2005.
- PCT International Search Report for PCT/US04/22803 1 pg, Mailed Apr. 29, 2005.
- PCT International Search Report for PCT/US05/07038 1 pg, Mailed Sep. 2, 2005.
- PCT International Search Report for PCT/US94/05168, 1 pg, Mailed Oct. 18, 1994.
- PCT International Search Report for PCT/US98/20768 1pg, Mailed Jan. 20, 1999.
- PCT International Search Report for PCT/US98/22327 1 pg, Mailed Feb. 9, 1999.
- PCT IPER for PCT/US01/16006 3pgs, Apr. 16, 2002.
- PCT IPER for PCT/US98/22327 4pgs, Aug. 27, 2000.
- PCT Written Opinion for PCT/US04/22803 3pgs, Mailed Apr. 29, 2005.
- PCT Written Opinion for PCT/US05/07038 3pgs, Mailed Sep. 2, 2005.
- Barry et al., "The Effect of Radiofrequency-generated Thermal Energy on the Mechanical and Histologic Characteristics of the Arterial Wall in Vivo: Implications of Radiofrequency Angioplasty" *American Heart Journal* vol. 117, pp. 332-341, 1982.
- Codman & Shurtleff, Inc. "The Malis Bipolar Coagulating and Bipolar Cutting System CMC-II" brochure, early, 2 pgs, 1991.
- Codman & Shurtleff, Inc. "The Malis Bipolar Electrosurgical System CMC-III Instruction Manual", 15 pgs, Jul. 1991.
- Cook et al., "Therapeutic Medical Devices: Application and Design", Prentice Hall, Inc., 3pgs, 1982.
- Dennis et al. "Evolution of Electrofulguration in Control of Bleeding of Experimental Gastric Ulcers," *Digestive Diseases and Sciences*, vol. 24, No. 11, 845-848, Nov. 1979.
- Dobbie et al., "The Electrical Aspects of Surgical Diathermy, Bio Medical Engineering" *Bio-Medical Engineering* vol. 4, pp. 206-216, May 1969.
- Elsasser, V.E. et al., "An Instrument for Transurethral Resection without Leakage of Current" *Acta Medico Technica* vol. 24, No. 4, pp. 129-134, 1976.
- Geddes, "Medical Device Accidents: With Illustrative Cases" CRC Press, 3 pgs, 1998.
- Honig, W., "The Mechanism of Cutting in Electrosurgery" *IEEE* pp. 58-65, 1975.
- Kramolowsky et al. "The Urological App of Electorsurgery" *J. of Urology* vol. 146, pp. 669-674, 1991.
- Kramolowsky et al. "Use of 5F Bipolar Electrosurgical Probe in Endoscopic Urological Procedures" *J. of Urology* vol. 143, pp. 275-277, 1990.
- Lee, B et al. "Thermal Compression and Molding of Artherosclerotic Vascular Tissue with Use" *JACC* vol. 13(5), pp. 1167-1171, 1989.
- Letter from Department of Health to Jerry Malis dated Jan. 24, 1991, 3 pgs.
- Letter from Department of Health to Jerry Malis dated Jul. 25, 1985, 1 pg.
- Letter from Jerry Malis to FDA dated Jul. 25, 1985, 2 pgs.
- Lu, et al., "Electrical Thermal Angioplasty: Catheter Design Features, in Vitro Tissue Ablation Studies and in Vitro Experimental Findings," *Am J. Cardiol* vol. 60, pp. 1117-1122, Nov. 1, 1987.
- Malis, L., "Electrosurgery, Technical Note," *J. Neurosurg.*, vol. 85, pp. 970-975, Nov. 1996.
- Malis, L., "Excerpted from a seminar by Leonard I. Malis, M.D. at the 1995 American Association of Neurological Surgeons Meeting," 1pg, 1995.
- Malis, L., "Instrumentation for Microvascular Neurosurgery" *Cerebrovascular Surgery*, vol. 1, pp. 245-260, 1985.
- Malis, L., "New Trends in Microsurgery and Applied Technology," *Advanced Technology in Neurosurgery*, pp. 1-16, 1988.
- Malis, L., "The Value of Irrigation During Bipolar Coagulation" See ARTC 21602, 1 pg, Apr. 9, 1993.
- Nardella, P.C., *SPIE* 1068: pp. 42-49, Radio Frequency Energy and Impedance Feedback, 1989.
- O'Malley, Schaum's Outline of Theory and Problems of Basic Circuit Analysis, McGraw-Hill, 2nd Ed., pp. 3-5, 1992.
- Olsen MD, Bipolar Laparoscopic Cholecystectomy Lecture (marked confidential), 12 pgs, Oct. 7, 1991.
- Pearce, John A. "Electrosurgery", pp. 17, 69-75, 87, John Wiley & Sons, New York, 1986.
- Pearce, John A., "Electrosurgery", Handbook of Biomedical Engineering, chapter 3, Academic Press Inc., N.Y., pp. 98-113, 1988.
- Piercey et al., "Electrosurgical Treatment of Experimental Bleeding Canine Gastric Ulcers" *Gastroenterology* vol. 74(3), pp. 527-534, 1978.
- Proffell et al., "Computer-Assisted Electrocoagulation: Bipolar v. Monopolar in the Treatment of Experimental Canine Gastric Ulcer Bleeding," *Gastroenterology* vol. 80, No. 3, pp. 451-455, 1981.
- Ramsey et al., "A Comparison of Bipolar and Monopolar Diathermy Probes in Experimental Animals", *Urological Research* vol. 13, pp. 99-102, 1985.
- Selikowitz et al., "Electric Current and Voltage Recordings on the Myocardium During Electrosurgical Procedures in Canines," *Surgery, Gynecology & Obstetrics*, vol. 164, pp. 219-224, Mar. 1987.
- Shuman, "Bipolar Versus Monopolar Electrosurgery: Clinical Applications," *Dentistry Today*, vol. 20, No. 12, 7 pgs, Dec. 2001.
- Slager et al. "Spark Erosion of Arteriosclerotic Plaques" *Z. Kardiol.* 76:Suppl. 6, pp. 67-71, 1987.
- Slager et al. "Vaporization of Atherosclerotic Plaques by Spark Erosion" *JACC* 5(6): pp. 1382-1386, Jun. 1985.
- Stoffels, E. et al., "Investigation on the Interaction Plasma-Bone Tissue", E-MRS Spring Meeting, 1 pg, Jun. 18-21, 2002.
- Stoffels, E. et al., "Biomedical Applications of Plasmas", Tutorial presented prior to the 55th Gaseous Electronics Conference in Minneapolis, MN, 41 pgs, Oct. 14, 2002.
- Stoffels, E. et al., "Plasma Interactions with Living Cells", Eindhoven University of Technology, 1 pg, 2002.
- Stoffels, E. et al., "Superficial Treatment of Mammalian Cells using Plasma Needle", *J. Phys. D: Appl. Phys.* 26, pp. 2908-2913, Nov. 19, 2003.
- Stoffels, E. et al., "Plasma Needle", Eindhoven University of Technology, 1 pg, Nov. 28, 2003.
- Stoffels, E. et al., "Plasma Physicists Move into Medicine", Physicsweb, 1 pg, Nov. 2003.
- Stoffels, E. et al., "Plasma Treated Tissue Engineered Skin to Study Skin Damage", Biomechanics and Tissue Engineering, Materials Technology, 1 pg, 2003.
- Stoffels, E. et al., "Plasma Treatment of Dental Cavities: A Feasibility Study", *IEEE Transaction on Plasma Science*, vol. 32, No. 4, pp. 1540-1542, Aug. 2004.
- Stoffels, E. et al., "The Effects of UV Irradiation and Gas Plasma Treatment on Living Mammalian Cells and Bacteria: A Comparative Approach", *IEEE Transaction on Plasma Science*, vol. 32, No. 4, pp. 1544-1550, Aug. 2004.
- Stoffels, E. et al., "Electrical and Optical Characterization of the Plasma Needle", *New Journal of Physics* 6, pp. 1-14, Oct. 28, 2004.
- Stoffels, E. et al., "Where Plasma Meets Plasma", Eindhoven University of Technology, 23 pgs, 2004.
- Stoffels, E. et al., "Gas Plasma effects on Living Cells", *Physica Scripta*, T107, pp. 79-82, 2004.
- Stoffels, E. et al., "Plasma Treatment of Mammalian Vascular Cells: A Quantitative Description", *IEEE Transaction on Plasma Science*, vol. 33, No. 2, pp. 771-775, Apr. 2005.
- Stoffels, E. et al., "Deactivation of *Escherichia coli* by the Plasma Needle", *J. Phys. D: Appl. Phys.* 38, pp. 1716-1721, May 20, 2005.
- Stoffels, E. et al., "Development of a Gas Plasma Catheter for Gas Plasma Surgery", XXVIIth ICPIG, Endoven University of Technology, pp. 18-22, Jul. 2005.
- Stoffels, E. et al., "Development of a Smart Positioning Sensor for the Plasma Needle", *Plasma Sources Sci. Technol.* 15, pp. 582-589, Jun. 27, 2006.
- Stoffels, E. et al., Killing of S. Mutans Bacteria Using a Plasma Needle at Atmospheric Pressure, *IEEE Transaction on Plasma Science*, vol. 34, No. 4, pp. 1317-1324, Aug. 2006.

- Stoffels, E. et al., "Plasma-Needle Treatment of Substrates with Respect to Wettability and Growth of *Escherichia coli* and *Streptococcus Mutans*", IEEE Transaction on Plasma Science, vol. 34, No. 4, pp. 1325-1330, Aug. 2006.
- Stoffels, E. et al., "Reattachment and Apoptosis after Plasma-Needle Treatment of Cultured Cells", IEEE Transaction on Plasma Science, vol. 34, No. 4, pp. 1331-1336, Aug. 2006.
- Stoffels, E. et al., "UV Excimer Lamp Irradiation of Fibroblasts: The Influence on Antioxidant Homostasis", IEEE Transaction on Plasma Science, vol. 34, No. 4, pp. 1359-1364, Aug. 2006.
- Stoffels, E. et al., "Plasma Needle for in Vivo Medical Treatment: Recent Developments and Perspectives", Plasma Sources Sci. Technol. 15, pp. S169-S180, Oct. 6, 2006.
- Swain, C.P., et al., "Which Electrode, A Comparison of four endoscopic methods of electrocoagulation in experimental bleeding ulcers" *Gut* vol. 25, pp. 1424-1431, 1987.
- Tucker, R. et al. "A Comparison of Urologic Application of Bipolar Versus Monopolar Five French Electrosurgical Probes" *J. of Urology* vol. 141, pp. 662-665, 1989.
- Tucker, R. et al. "In vivo effect of 5 French Bipolar and Monopolar Electrosurgical Probes on the Porcine Bladder" *Urological Research* vol. 18, pp. 291-294, 1990.
- Tucker, R. et al., "Demodulated Low Frequency Currents from Electrosurgical Procedures," *Surgery, Gynecology and Obstetrics*, 159:39-43, 1984.
- Tucker, R. et al., Abstract P14-11, p. 248, "A Bipolar Electrosurgical Turp Loop", Nov. 1989.
- Valley Forge Scientific Corp., "Summary of Safety and Effective Information from 510K", 2pgs, 1991.
- Valley Forge's New Products, Clinica, 475, 5, Nov. 6, 1991.
- Valleylab SSE2L Instruction Manual, 11 pgs, Jan. 6, 1983.
- Valleylab, Inc. "Valleylab Part No. 945 100 102 A" Surgistat Service Manual, pp. 1-46, Jul. 1988.
- Wattiez, Arnaud et al., "Electrosurgery in Operative Endoscopy," Electrosurgical Effects, Blackwell Science, pp. 85-93, 1995.
- Wyeth, "Electrosurgical Unit" pp. 1181-1202, 2000.
- EP Search Report for EP 03736488 3 pgs, Mailed Jun. 25, 2009.
- PCT International Search Report for PCT/US96/18505, 3 pgs, Mailed Jan. 17, 1997.
- PCT Notif of the Int'l Search Report and Written Opinion for PCT/US09/67001 6 pgs, Mailed Jan. 29, 2010.
- UK Search Report for GB0921635.9 3pgs, Apr. 12, 2010.
- EP Search Report for EP 07118068 3pgs, Mailed Dec. 27, 2010.
- EP Search Report for EP 04778347 4pgs, Feb. 22, 2011.

* cited by examiner

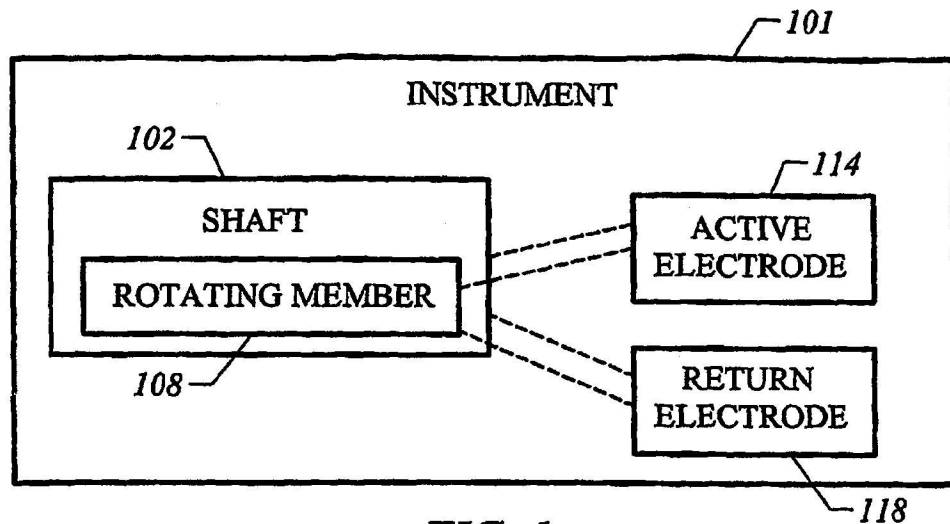


FIG. 1

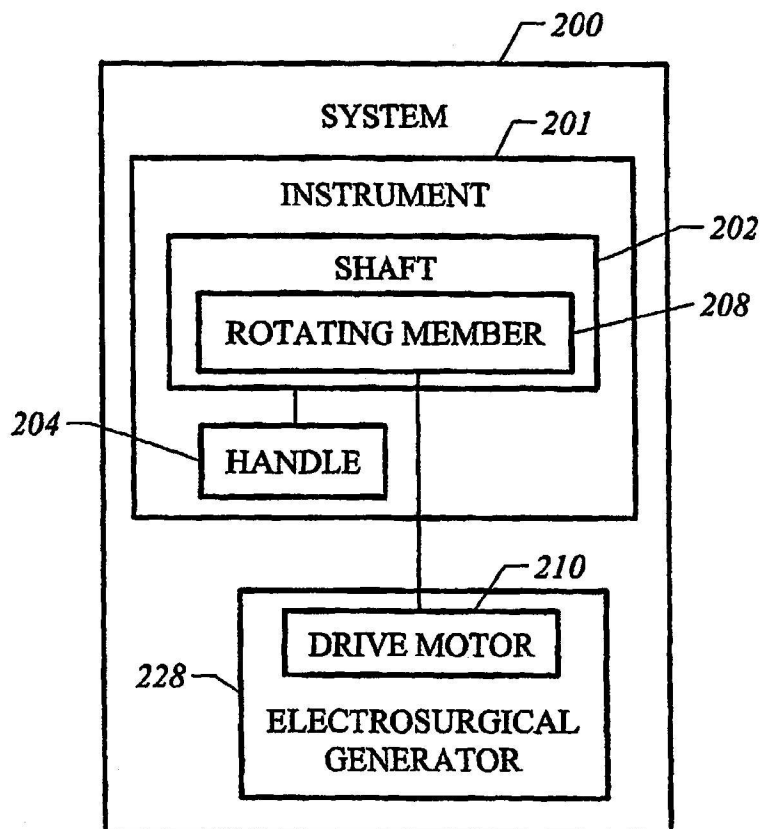


FIG. 2

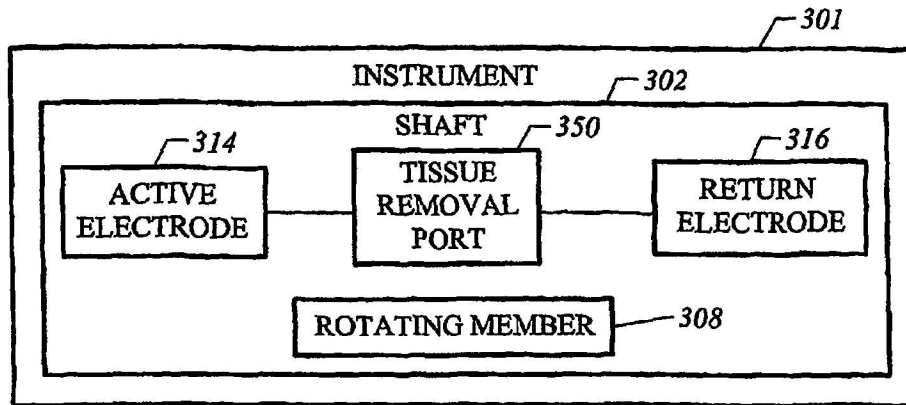


FIG. 3A

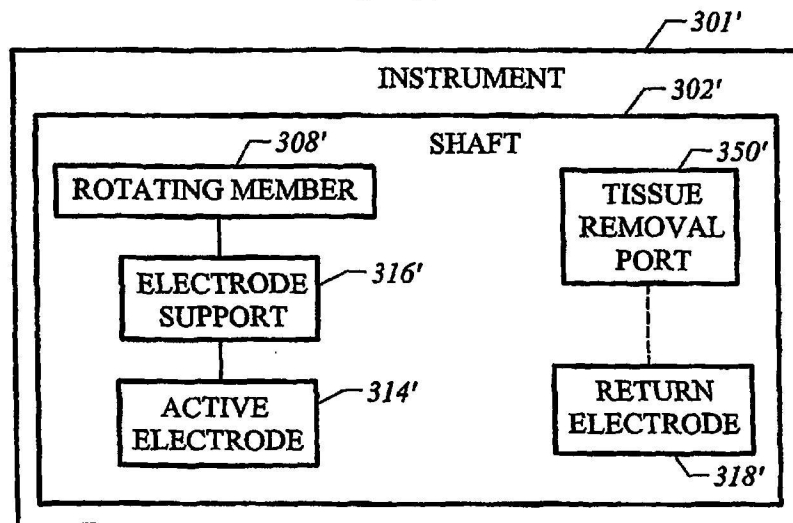


FIG. 3B

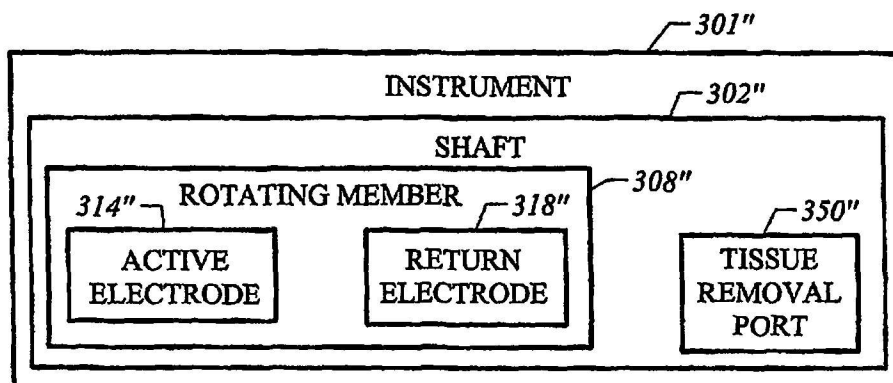


FIG. 3C

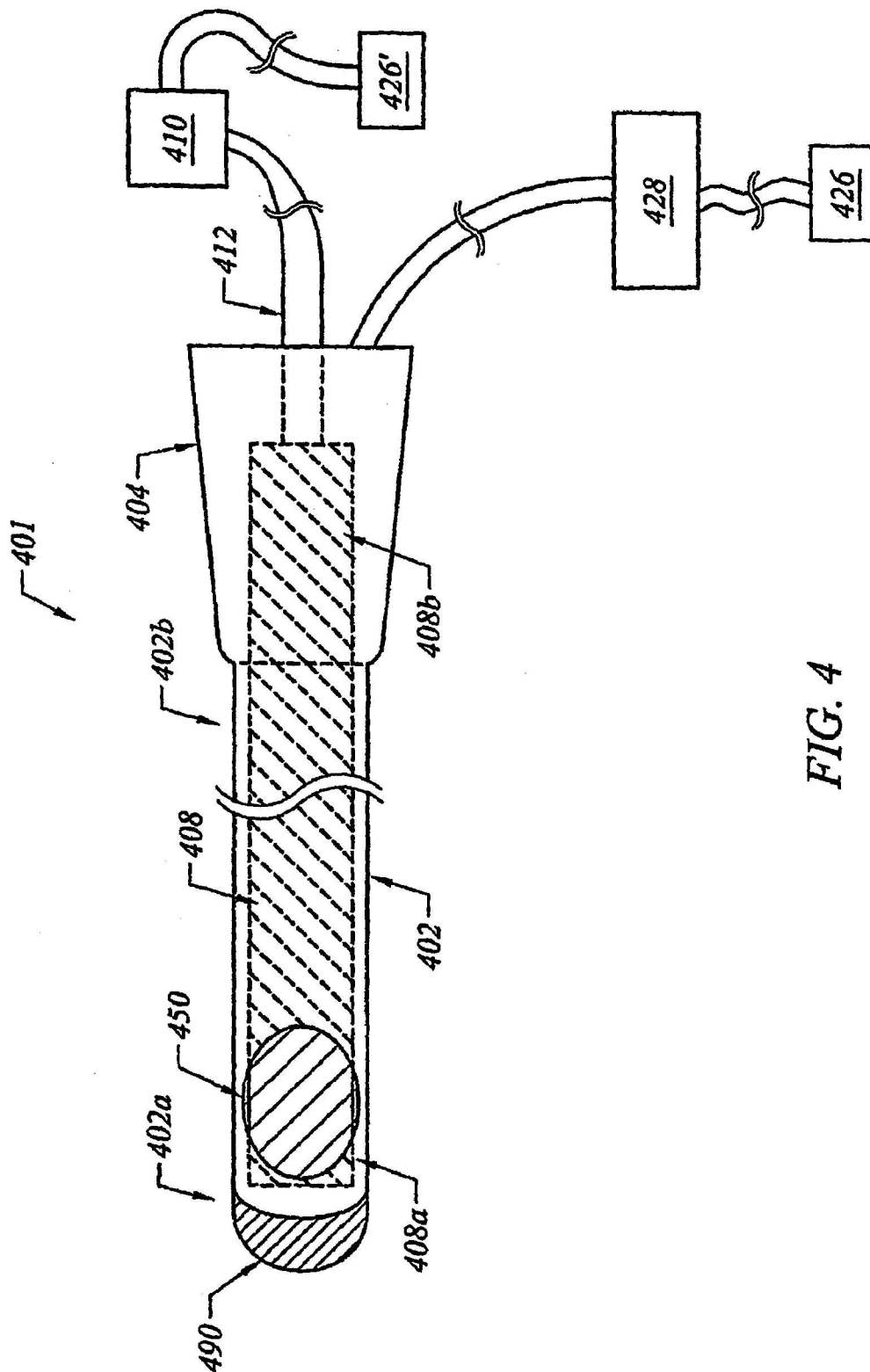


FIG. 4

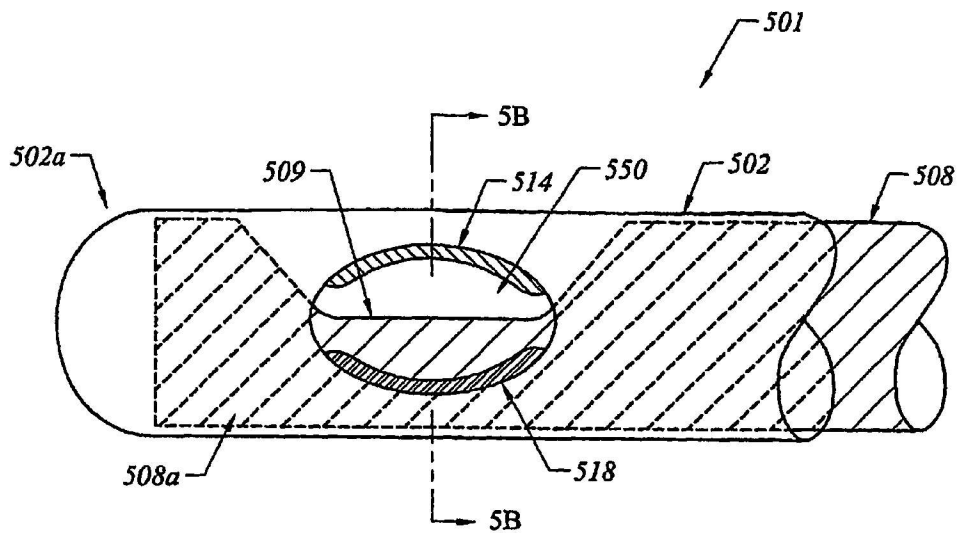


FIG. 5A

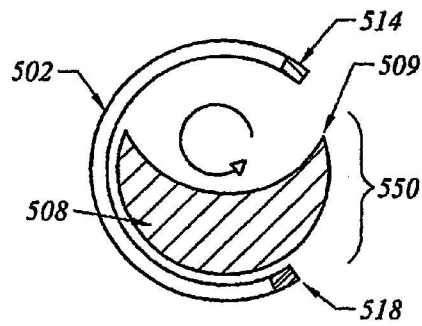


FIG. 5B

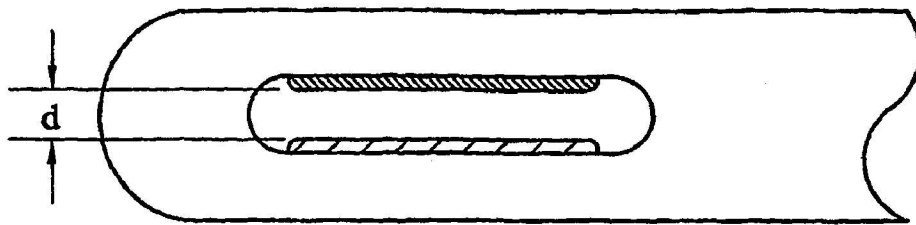


FIG. 5C

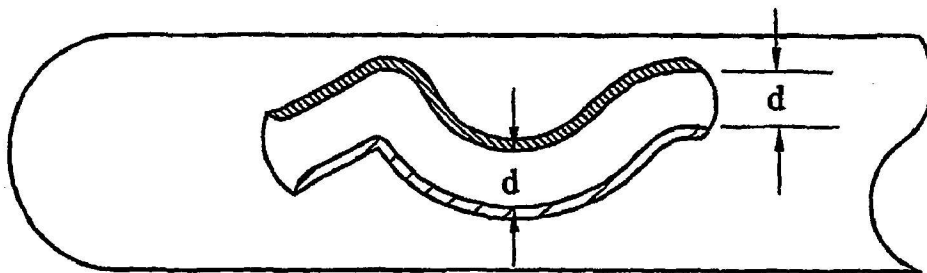


FIG. 5D

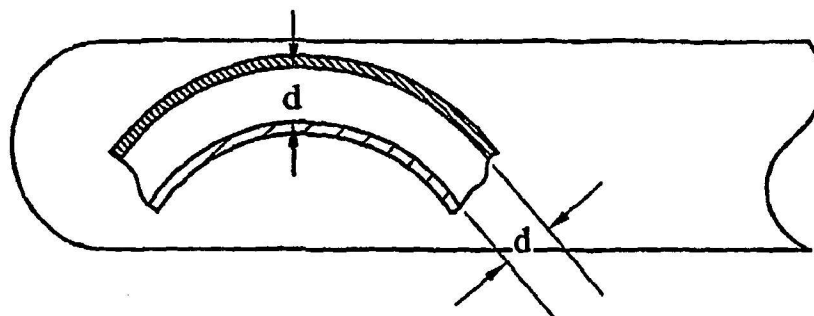


FIG. 5E

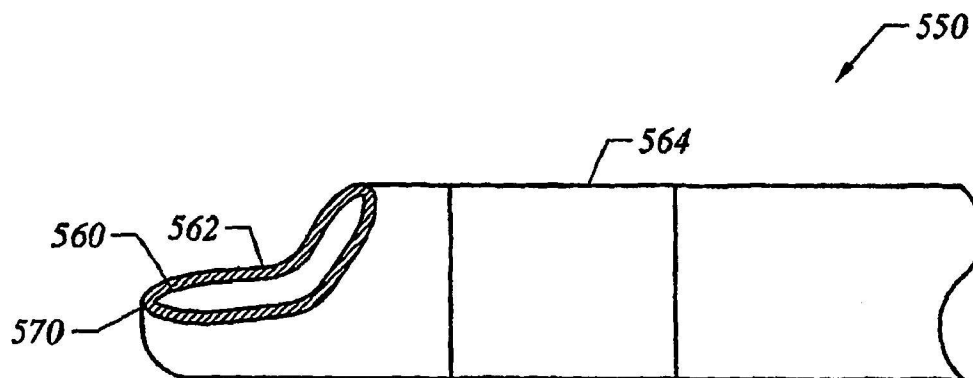


FIG. 5F

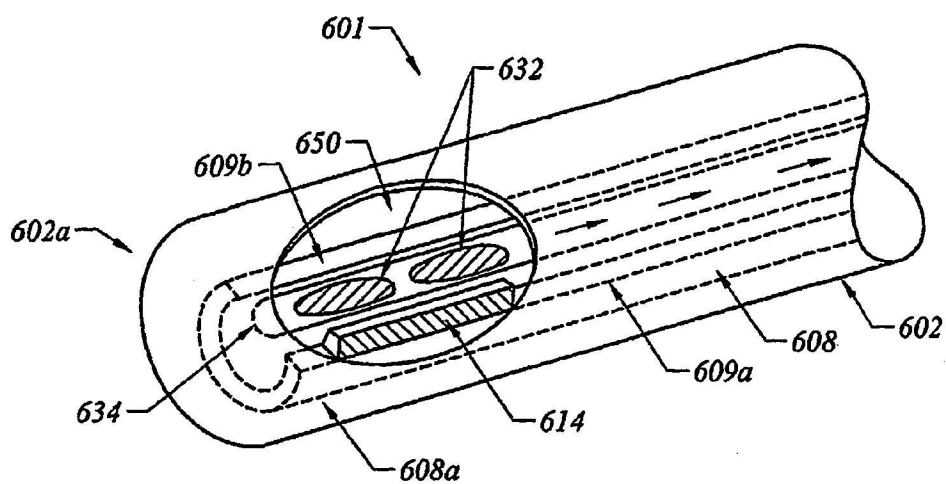


FIG. 6A

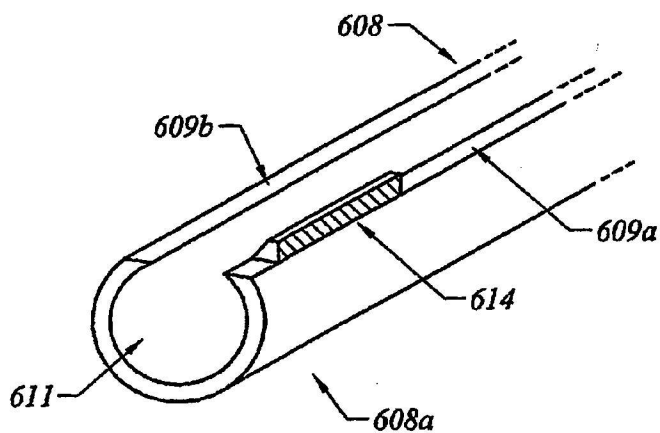


FIG. 6B