

US00D846738S

(12) **United States Design Patent** (10) **Patent No.:** **US D846,738 S**
Kalina, Jr. et al. (45) **Date of Patent:** **** Apr. 23, 2019**

(54) **IMPLANT DELIVERY APPARATUS**
(71) Applicant: **GLAUKOS CORPORATION**, San Clemente, CA (US)
(72) Inventors: **Charles Raymond Kalina, Jr.**, Irvine, CA (US); **James Robert Dennewill, Sr.**, Anaheim, CA (US)
(73) Assignee: **GLAUKOS CORPORATION**, San Clemente, CA (US)

4,800,890 A 1/1989 Cramer
4,846,172 A 7/1989 Berlin
4,846,793 A 7/1989 Leonard et al.
4,867,173 A 9/1989 Leoni
4,870,953 A 10/1989 DonMicheal et al.
4,900,300 A 2/1990 Lee
4,905,667 A 3/1990 Foerster et al.

(Continued)

FOREIGN PATENT DOCUMENTS

AU 200072059 A1 7/2001
AU 2004264913 12/2011

(Continued)

(**) Term: **15 Years**

(21) Appl. No.: **29/623,940**

(22) Filed: **Oct. 27, 2017**

(51) **LOC (11) Cl.** **24-02**

(52) **U.S. Cl.**
USPC **D24/133**

(58) **Field of Classification Search**
USPC D24/133, 140, 146, 150, 155, 157, 113
CPC A61F 2/14
See application file for complete search history.

(56) **References Cited**

U.S. PATENT DOCUMENTS

2,269,963 A 1/1942 Frederick
3,439,675 A 4/1969 Cohen
3,948,271 A 4/1976 Aklyama
3,948,871 A 4/1976 Butterfield et al.
3,976,077 A 8/1976 Kerfoot, Jr.
4,113,088 A 9/1978 Binkhorst
4,299,227 A 11/1981 Lincoff
4,366,582 A 1/1983 Faulkner
4,449,529 A 5/1984 Burns et al.
4,501,274 A 2/1985 Skjaerpe
4,560,383 A 12/1985 Leiske
4,578,058 A 3/1986 Grandon
4,634,418 A 1/1987 Binder
4,642,090 A 2/1987 Ultrata
4,782,819 A 11/1988 Adair
4,800,870 A 1/1989 Reid, Jr.

OTHER PUBLICATIONS

De Juan et al., "Refinements in microinstrumentation for vitreous surgery," Am. J. Ophthalmol. 109:218-20 (1990).

Primary Examiner — Wan Laymon

(74) *Attorney, Agent, or Firm* — Knobbe Martens Olson & Bear LLP

(57) **CLAIM**

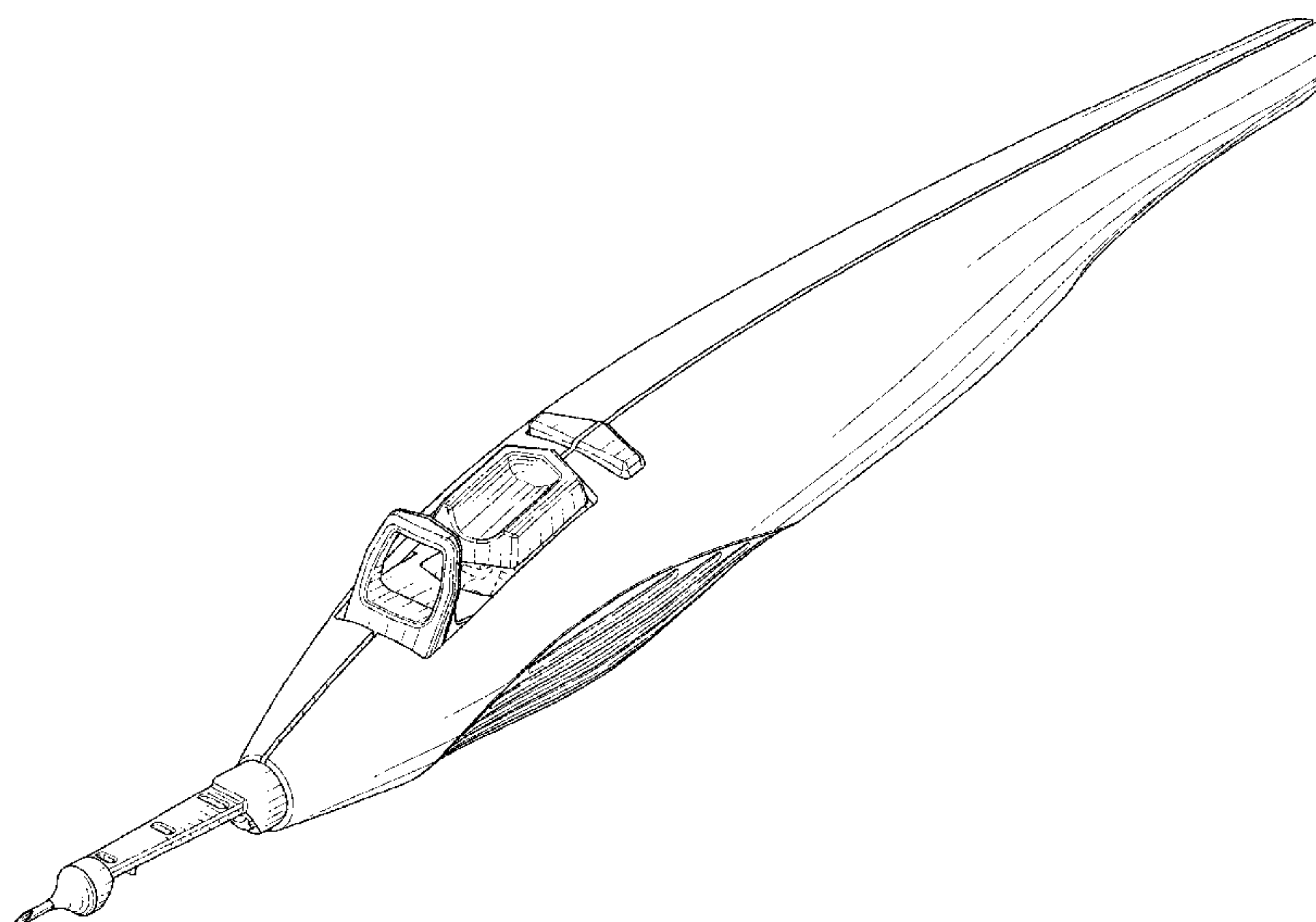
The ornamental design for an implant delivery apparatus, as shown and described.

DESCRIPTION

FIG. 1 is a front, top, and left side perspective view of an implant delivery apparatus of our design; FIG. 2 is a front view thereof; FIG. 3 is a rear view thereof; FIG. 4 is a right side view thereof; FIG. 5 is a left side view thereof; FIG. 6 is a top view thereof; and, FIG. 7 is a bottom view thereof.

The broken lines shown in the figures are included for the purpose of illustrating portions of the implant delivery apparatus and form no part of the claimed design.

1 Claim, 4 Drawing Sheets



(56)

References Cited

U.S. PATENT DOCUMENTS

4,991,602 A	2/1991	Amplatz et al.	6,454,787 B1	9/2002	Maddalo et al.
5,053,040 A	10/1991	Goldsmith, III	6,530,896 B1	3/2003	Elliott
5,053,044 A	10/1991	Mueller et al.	6,544,249 B1	4/2003	Yu et al.
5,095,887 A	3/1992	Leon et al.	6,561,974 B1	5/2003	Grieshaber et al.
5,129,895 A	7/1992	Vassiliadis et al.	6,582,426 B2	6/2003	Moorman et al.
5,169,386 A	12/1992	Becker et al.	6,585,680 B2	7/2003	Bugge
5,180,362 A	1/1993	Worst	6,607,542 B1	8/2003	Wild
5,207,685 A	5/1993	Cinberg et al.	6,613,343 B2	9/2003	Dillingham et al.
5,221,255 A	6/1993	Mahurkar et al.	6,620,154 B1	9/2003	Amirkhanian et al.
5,246,451 A	9/1993	Trescony et al.	6,629,981 B2	10/2003	Bui et al.
5,284,476 A	2/1994	Koch	6,638,239 B1	10/2003	Bergheim et al.
5,290,295 A	3/1994	Querals et al.	6,676,607 B2	1/2004	De Juan, Jr. et al.
5,324,306 A	6/1994	Makower et al.	6,699,272 B2	3/2004	Slepian et al.
5,342,370 A	8/1994	Simon et al.	D490,152 S	5/2004	Myall et al.
5,360,399 A	11/1994	Stegmann	6,763,833 B1	7/2004	Khera et al.
5,415,666 A	5/1995	Gourlay et al.	6,764,439 B2	7/2004	Schaaf et al.
5,445,637 A	8/1995	Bretton	6,767,346 B2	7/2004	Damasco et al.
5,462,558 A	10/1995	Kolesa et al.	6,780,165 B2	8/2004	Kadziauskas et al.
5,472,440 A	12/1995	Beckman	6,827,738 B2	12/2004	Willis et al.
5,486,165 A	1/1996	Stegmann	6,902,577 B2	6/2005	Lipshitz et al.
5,556,400 A	9/1996	Tunis	6,955,656 B2	10/2005	Bergheim et al.
5,558,637 A	9/1996	Allonen et al.	6,966,888 B2	11/2005	Cullen et al.
5,626,588 A	5/1997	Sauer et al.	7,077,821 B2	7/2006	Durgin
5,643,321 A	7/1997	McDevitt	7,077,848 B1	7/2006	de Juan et al.
5,651,782 A	7/1997	Simon et al.	7,090,681 B2	8/2006	Weber et al.
5,651,783 A	7/1997	Reynard	7,135,009 B2	11/2006	Tu et al.
5,653,724 A	8/1997	Imonti	7,135,016 B1	11/2006	Asia et al.
5,669,501 A	9/1997	Hissong et al.	7,163,543 B2	1/2007	Smedley et al.
5,676,679 A	10/1997	Simon et al.	7,186,232 B1	3/2007	Smedley et al.
5,681,323 A	10/1997	Arick	7,217,263 B2	5/2007	Humayun et al.
5,695,479 A	12/1997	Jagpal	7,273,475 B2	9/2007	Tu et al.
5,702,414 A	12/1997	Richter et al.	7,297,130 B2	11/2007	Bergheim et al.
5,702,419 A	12/1997	Berry et al.	7,331,984 B2	2/2008	Tu et al.
5,725,546 A	3/1998	Samson	7,344,528 B1	3/2008	Tu et al.
5,733,256 A	3/1998	Costin	7,431,710 B2	10/2008	Tu et al.
5,741,292 A	4/1998	Mendius	7,468,065 B2 *	12/2008	Weber A61F 9/0017 606/107
5,762,625 A	6/1998	Igaki	7,488,303 B1	2/2009	Haffner et al.
5,792,099 A	8/1998	DeCamp et al.	7,520,876 B2	4/2009	Ressemann et al.
5,807,244 A	9/1998	Barot	D592,746 S *	5/2009	Highley D24/133
5,817,100 A	10/1998	Igaki	7,563,241 B2	7/2009	Tu et al.
5,833,694 A	11/1998	Poncet	D606,190 S *	12/2009	Pruitt D24/113
5,836,939 A	11/1998	Negus et al.	7,713,228 B2	5/2010	Robin
5,846,199 A	12/1998	Hijlkema et al.	7,758,624 B2	7/2010	Dorn et al.
5,865,831 A	2/1999	Cozean et al.	7,771,388 B2	8/2010	Olsen et al.
5,868,697 A	2/1999	Richter et al.	7,857,782 B2	12/2010	Tu et al.
5,891,084 A	4/1999	Lee	7,867,186 B2	1/2011	Haffner et al.
5,893,837 A	4/1999	Eagles et al.	7,867,205 B2	1/2011	Bergheim et al.
5,941,250 A	8/1999	Aramant et al.	7,879,001 B2	2/2011	Haffner et al.
5,984,913 A	11/1999	Kritzinger et al.	7,879,079 B2	2/2011	Tu et al.
6,004,302 A	12/1999	Brierley	7,905,904 B2	3/2011	Stone et al.
6,030,416 A	2/2000	Huo et al.	7,931,660 B2	4/2011	Aranyi et al.
6,036,678 A	3/2000	Giungo	7,945,336 B2	5/2011	Sauter-Starace et al.
6,036,682 A	3/2000	Lange et al.	7,959,632 B2	6/2011	Fugo
6,045,557 A	4/2000	White et al.	7,967,772 B2	6/2011	McKenzie et al.
6,050,999 A	4/2000	Paraschac et al.	8,007,459 B2	8/2011	Haffner et al.
6,071,286 A	6/2000	Mawad	D645,489 S	9/2011	Gille et al.
6,135,977 A	10/2000	Drasler et al.	D645,490 S	9/2011	Gille et al.
6,142,990 A	11/2000	Burk	8,062,244 B2	11/2011	Tu et al.
6,146,387 A	11/2000	Trott et al.	8,075,511 B2	12/2011	Tu et al.
6,187,016 B1	2/2001	Hedges et al.	8,118,768 B2	2/2012	Tu et al.
6,221,078 B1	4/2001	Bylsma	8,142,364 B2	3/2012	Haffner et al.
6,224,570 B1	5/2001	Le et al.	8,197,418 B2	6/2012	Lal et al.
6,254,612 B1	7/2001	Hieshima	8,267,882 B2	9/2012	Euteneuer et al.
6,264,668 B1	7/2001	Prywes	8,273,050 B2	9/2012	Bergheim et al.
6,287,313 B1	9/2001	Sasso	8,333,742 B2	12/2012	Bergheim et al.
6,299,603 B1	10/2001	Hecker et al.	8,337,445 B2	12/2012	Tu et al.
6,342,058 B1	1/2002	Portney	8,506,515 B2	8/2013	Burns et al.
6,355,033 B1	3/2002	Moorman et al.	8,540,659 B2	9/2013	Berlin
6,361,519 B1	3/2002	Knudson et al.	8,579,846 B2	11/2013	Tu et al.
6,375,642 B1	4/2002	Grieshaber et al.	8,617,094 B2	12/2013	Smedley et al.
6,402,734 B1	6/2002	Weiss	8,679,089 B2	3/2014	Berlin
6,405,732 B1	6/2002	Edwards et al.	8,801,648 B2	8/2014	Bergheim et al.
6,428,501 B1	8/2002	Reynard	8,808,219 B2	8/2014	Bergheim et al.
6,428,566 B1	8/2002	Holt	8,814,820 B2	8/2014	Bergheim et al.
6,450,937 B1	9/2002	Mercereau et al.	8,852,137 B2	10/2014	Horvath et al.
			8,852,266 B2	10/2014	Brooks et al.
			8,998,983 B2 *	4/2015	Auld A61F 2/1678 606/107

(56)

References Cited

U.S. PATENT DOCUMENTS

9,173,775 B2	11/2015	Haffner et al.	2008/0058704 A1	3/2008	Hee et al.
9,220,632 B2	12/2015	Smedley et al.	2008/0082078 A1	4/2008	Berlin
9,301,875 B2	4/2016	Tu et al.	2008/0091224 A1	4/2008	Griffis, III et al.
9,554,940 B2	1/2017	Haffner et al.	2008/0097214 A1	4/2008	Meyers et al.
9,561,131 B2	2/2017	Tu et al.	2008/0097335 A1	4/2008	Trogden et al.
9,572,963 B2	2/2017	Tu et al.	2008/0108933 A1	5/2008	Yu et al.
9,592,151 B2	3/2017	Rangel-Friedman et al.	2008/0109037 A1	5/2008	Steiner et al.
9,597,230 B2	3/2017	Haffner et al.	2008/0114440 A1	5/2008	Hlavka et al.
9,849,027 B2*	12/2017	Highley A61F 9/0017	2008/0125691 A1	5/2008	Yaron et al.
2001/0000527 A1	4/2001	Yaron et al.	2008/0140059 A1	6/2008	Schachar et al.
2001/0025150 A1	9/2001	de Juan et al.	2008/0147083 A1	6/2008	Vold et al.
2002/0052640 A1	5/2002	Bigus et al.	2008/0183289 A1	7/2008	Werblin
2002/0072673 A1	6/2002	Yamamoto et al.	2008/0188860 A1	8/2008	Vold
2002/0111608 A1	8/2002	Baerveldt et al.	2008/0200860 A1	8/2008	Tu et al.
2002/0120284 A1	8/2002	Schachar et al.	2008/0200923 A1	8/2008	Beckman et al.
2002/0120285 A1	8/2002	Schachar et al.	2008/0208176 A1	8/2008	Loh
2002/0133168 A1	9/2002	Smedley et al.	2008/0215062 A1	9/2008	Bowen et al.
2002/0143284 A1	10/2002	Tu et al.	2008/0221501 A1	9/2008	Cote et al.
2002/0165522 A1	11/2002	Holmen	2008/0228127 A1	9/2008	Burns et al.
2002/0177856 A1	11/2002	Richter et al.	2008/0243156 A1	10/2008	John
2003/0014021 A1	1/2003	Holmen	2008/0255545 A1	10/2008	Mansfield et al.
2003/0014092 A1	1/2003	Neuhann	2008/0269730 A1	10/2008	Dotson
2003/0060752 A1	3/2003	Bergheim et al.	2008/0281250 A1	11/2008	Bergsneider et al.
2003/0079329 A1	5/2003	Yaron et al.	2008/0306429 A1	12/2008	Shields et al.
2003/0093084 A1	5/2003	Nissan et al.	2009/0043242 A1	2/2009	Bene et al.
2003/0097117 A1	5/2003	Buono	2009/0043321 A1	2/2009	Conston et al.
2003/0097151 A1	5/2003	Smedley et al.	2009/0043365 A1	2/2009	Friedland et al.
2003/0105456 A1	6/2003	Lin	2009/0112245 A1	4/2009	Haefliger
2003/0109907 A1	6/2003	Shaddock	2009/0124973 A1	5/2009	D'Agostino et al.
2003/0135149 A1	7/2003	Cullen et al.	2009/0132040 A1	5/2009	Frion et al.
2003/0139729 A1	7/2003	Stegmann et al.	2009/0137989 A1	5/2009	Kataoka
2003/0195438 A1	10/2003	Petillo	2009/0182421 A1	7/2009	Silvestrini et al.
2003/0208217 A1	11/2003	Dan	2009/0198213 A1	8/2009	Tanaka
2003/0212383 A1	11/2003	Cote et al.	2009/0204053 A1	8/2009	Nissan et al.
2004/0088048 A1	5/2004	Richter et al.	2009/0227934 A1	9/2009	Eutenever et al.
2004/0098122 A1	5/2004	Lee et al.	2009/0264813 A1	10/2009	Chang
2004/0102729 A1	5/2004	Haffner et al.	2009/0287233 A1	11/2009	Huculak
2004/0147870 A1	7/2004	Burns et al.	2010/0004581 A1	1/2010	Brigatti et al.
2004/0236343 A1	11/2004	Taylor et al.	2010/0010416 A1	1/2010	Juan, Jr. et al.
2004/0243227 A1	12/2004	Starksen et al.	2010/0010452 A1	1/2010	Paques et al.
2004/0249404 A1	12/2004	Haefliger	2010/0057093 A1	3/2010	Ide et al.
2004/0254517 A1	12/2004	Quiroz-Mercado et al.	2010/0076419 A1	3/2010	Chew et al.
2004/0254520 A1	12/2004	Porteous et al.	2010/0087774 A1	4/2010	Haffner et al.
2005/0096639 A1	5/2005	Slatkine et al.	2010/0121248 A1	5/2010	Yu et al.
2005/0125003 A1	6/2005	Pinchuk et al.	2010/0121249 A1	5/2010	Yu et al.
2005/0165385 A1	7/2005	Simon	2010/0121342 A1	5/2010	Schieber et al.
2005/0171562 A1	8/2005	Criscuolo et al.	2010/0137981 A1	6/2010	Silvestrini et al.
2005/0209672 A1	9/2005	George et al.	2010/0152626 A1	6/2010	Schwartz
2005/0240222 A1	10/2005	Shipp	2010/0173866 A1	7/2010	Hee et al.
2005/0267478 A1	12/2005	Corradi et al.	2010/0185138 A1	7/2010	Yaron et al.
2005/0277864 A1	12/2005	Haffner et al.	2010/0185205 A1	7/2010	Novakovic et al.
2006/0032507 A1	2/2006	Tu	2010/0191103 A1	7/2010	Stamper et al.
2006/0106370 A1	5/2006	Baerveldt et al.	2010/0240987 A1	9/2010	Christian et al.
2006/0116626 A1	6/2006	Smedley et al.	2010/0262174 A1	10/2010	Sretavan
2006/0155300 A1	7/2006	Stamper et al.	2010/0274258 A1	10/2010	Silvestrini et al.
2006/0155300 A1	7/2006	Stamper et al.	2010/0280317 A1	11/2010	Silvestrini et al.
2006/0200113 A1	9/2006	Haffner et al.	2011/0009874 A1	1/2011	Wardle et al.
2006/0210605 A1	9/2006	Chang et al.	2011/0009958 A1	1/2011	Wardle et al.
2006/0217741 A1	9/2006	Ghannoum	2011/0022065 A1	1/2011	Shipp
2006/0241580 A1	10/2006	Mittelstein et al.	2011/0028883 A1	2/2011	Juan, Jr. et al.
2007/0021653 A1	1/2007	Hattenbach et al.	2011/0028983 A1	2/2011	Silvestrini et al.
2007/0073275 A1	3/2007	Conston et al.	2011/0046536 A1	2/2011	Stegmann et al.
2007/0078471 A1	4/2007	Schachar et al.	2011/0071524 A1	3/2011	Keller
2007/0118065 A1	5/2007	Pinchuk et al.	2011/0077626 A1	3/2011	Baerveldt et al.
2007/0118066 A1	5/2007	Pinchuk et al.	2011/0082385 A1	4/2011	Diaz et al.
2007/0123812 A1	5/2007	Pinchuk et al.	2011/0092878 A1	4/2011	Tu et al.
2007/0123919 A1	5/2007	Schachar et al.	2011/0092965 A1	4/2011	Slatkine et al.
2007/0149927 A1	6/2007	Itou et al.	2011/0098629 A1	4/2011	Juan, Jr. et al.
2007/0161981 A1	7/2007	Sanders et al.	2011/0098809 A1	4/2011	Wardle et al.
2007/0179471 A1	8/2007	Christian et al.	2011/0105987 A1	5/2011	Bergheim et al.
2007/0191863 A1	8/2007	De Juan et al.	2011/0112546 A1	5/2011	Juan, Jr. et al.
2007/0276315 A1	11/2007	Haffner	2011/0118649 A1	5/2011	Stegmann et al.
2007/0287958 A1	12/2007	McKenzie et al.	2011/0118835 A1	5/2011	Silvestrini et al.
2007/0293873 A1	12/2007	Chang	2011/0144641 A1	6/2011	Dimalanta, Jr. et al.
2008/0033351 A1	2/2008	Trogden et al.	2011/0202049 A1	8/2011	Jia et al.
2008/0051681 A1	2/2008	Schwartz	2011/0224597 A1	9/2011	Stegmann et al.
			2011/0230877 A1	9/2011	Huculak et al.
			2011/0306915 A1	12/2011	De Juan, Jr. et al.
			2011/0319793 A1	12/2011	Hyhynen

(56)

References Cited

U.S. PATENT DOCUMENTS

2011/0319806 A1 12/2011 Wardle
 2012/0016286 A1 1/2012 Silvestrini et al.
 2012/0022409 A1 1/2012 Gertner et al.
 2012/0022424 A1 1/2012 Yamamoto et al.
 2012/0022429 A1 1/2012 Silvestrini et al.
 2012/0035524 A1 2/2012 Silvestrini
 2012/0035525 A1 2/2012 Silvestrini
 2012/0065570 A1 3/2012 Yeung et al.
 2012/0071908 A1 3/2012 Sorensen et al.
 2012/0078158 A1 3/2012 Haffner et al.
 2012/0078281 A1 3/2012 Cox et al.
 2012/0123439 A1 5/2012 Romoda et al.
 2012/0123440 A1 5/2012 Horvath et al.
 2012/0165721 A1 6/2012 Grabner et al.
 2012/0165722 A1 6/2012 Horvath et al.
 2012/0165723 A1 6/2012 Horvath et al.
 2012/0197175 A1 8/2012 Horvath et al.
 2012/0203262 A1 8/2012 Connors et al.
 2012/0220917 A1 8/2012 Silvestrini et al.
 2012/0232570 A1 9/2012 Jenson et al.
 2012/0271272 A1 10/2012 Hammack et al.
 2012/0283557 A1 11/2012 Berlin
 2012/0310137 A1 12/2012 Silvestrini
 2012/0323159 A1 12/2012 Wardle et al.
 2013/0006165 A1 1/2013 Eutenener et al.
 2013/0018295 A1 1/2013 Haffner et al.
 2013/0018412 A1 1/2013 Journey et al.
 2013/0079701 A1 3/2013 Schieber et al.
 2013/0079759 A1 3/2013 Dotson et al.
 2013/0110125 A1 5/2013 Silvestrini et al.
 2013/0184631 A1 7/2013 Pinchuk
 2013/0245532 A1 9/2013 Tu et al.
 2013/0253404 A1 9/2013 Tu
 2013/0253405 A1 9/2013 Tu
 2013/0281910 A1 10/2013 Tu et al.
 2013/0289467 A1 10/2013 Haffner et al.
 2014/0052046 A1 2/2014 Peartree et al.
 2014/0081194 A1 3/2014 Burns et al.
 2014/0135916 A1 5/2014 Clauson et al.
 2014/0155803 A1 6/2014 Silvestrini
 2014/0276332 A1 9/2014 Crimaldi et al.
 2015/0065940 A1 3/2015 Rangel-Friedman et al.

2016/0074220 A1* 3/2016 Ianchulev A61F 9/00825
 606/107
 2016/0151204 A1 6/2016 Haffner et al.
 2017/0273829 A1 9/2017 Tu et al.
 2017/0312124 A1 11/2017 Rangel-Friedman et al.

FOREIGN PATENT DOCUMENTS

CA 2244646 A1 2/1999
 CA 2643357 11/1999
 CH 92111244 7/1993
 EM 000071071-0001 12/2003
 EM 000071071-0002 12/2003
 EM 000071071-0003 12/2003
 EM 000097431-0001 12/2005
 EM 000097431-0002 12/2005
 EM 000097431-0003 12/2005
 EP 0436232 A1 7/1991
 EP 0858788 A1 8/1998
 EP 2088976 8/2009
 EP 2260803 A2 12/2010
 EP 2351589 8/2011
 EP 2982354 A1 2/2016
 EP 2985012 A1 2/2016
 JP 4031836 B2 1/2008
 JP 2012-198134 9/2012
 JP 2013-208434 10/2013
 JP 2014-193366 10/2014
 JP 2014-240022 12/2014
 RU 2143250 12/1999
 WO 92/08406 5/1992
 WO 98/23237 A1 6/1998
 WO 98/37831 9/1998
 WO 99/26567 A1 6/1999
 WO 01/68016 A2 9/2001
 WO 01/85065 11/2001
 WO 02/074052 A2 9/2002
 WO 03/041622 5/2003
 WO 03/045290 A1 6/2003
 WO 2005/107845 11/2005
 WO 08/061043 A2 5/2008
 WO 11/020633 A1 2/2011
 WO 13/148275 10/2013
 WO 14/151070 9/2014

* cited by examiner

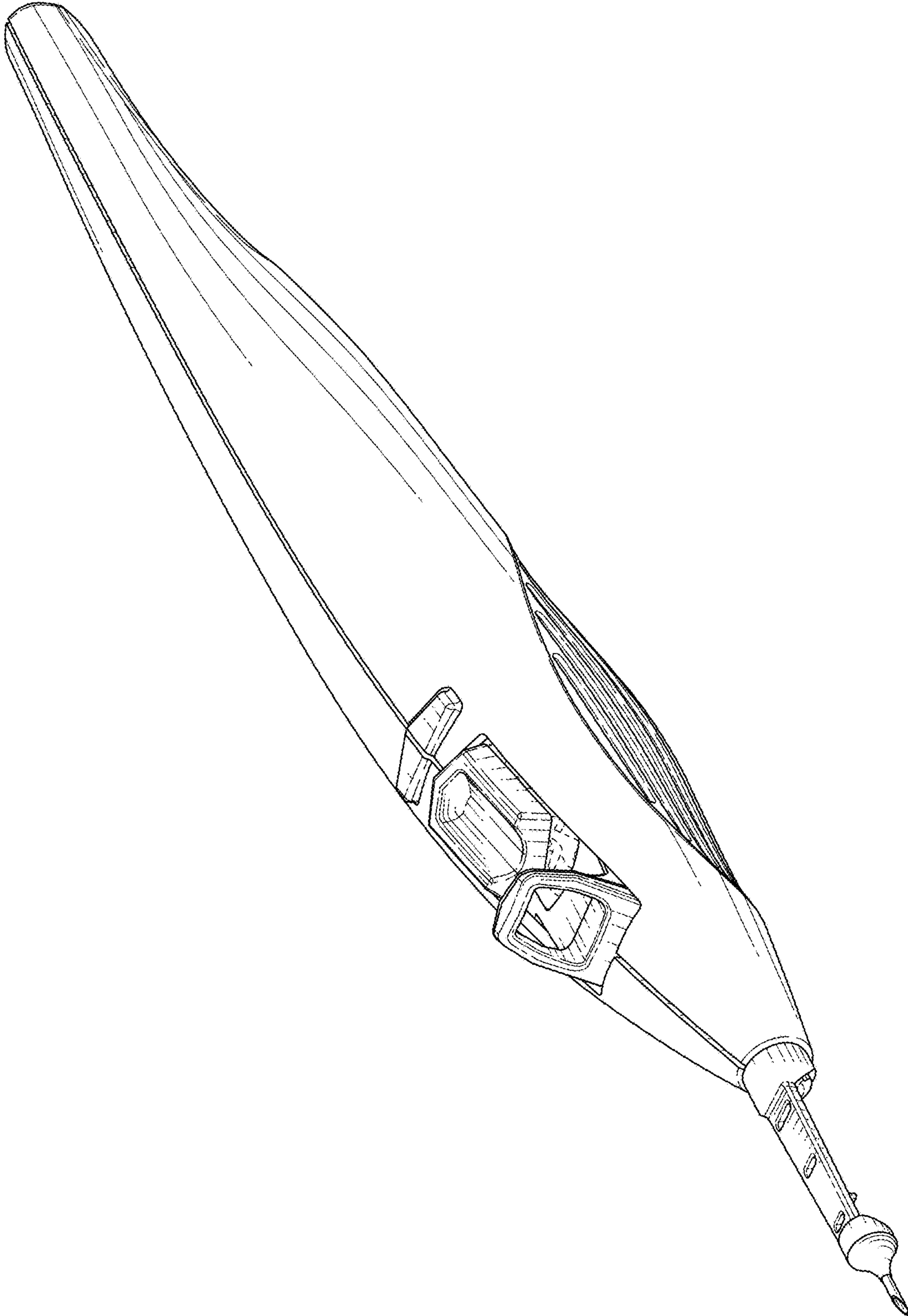


FIG. 1

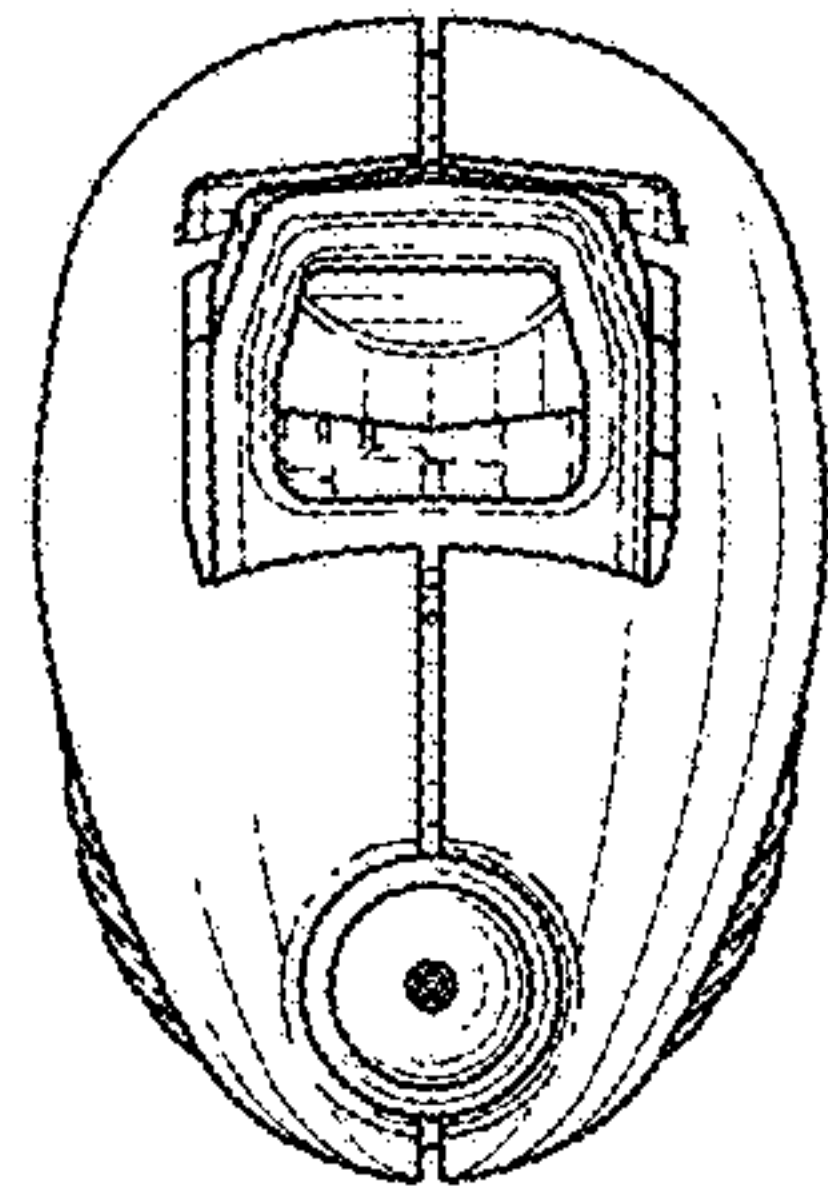


FIG. 2

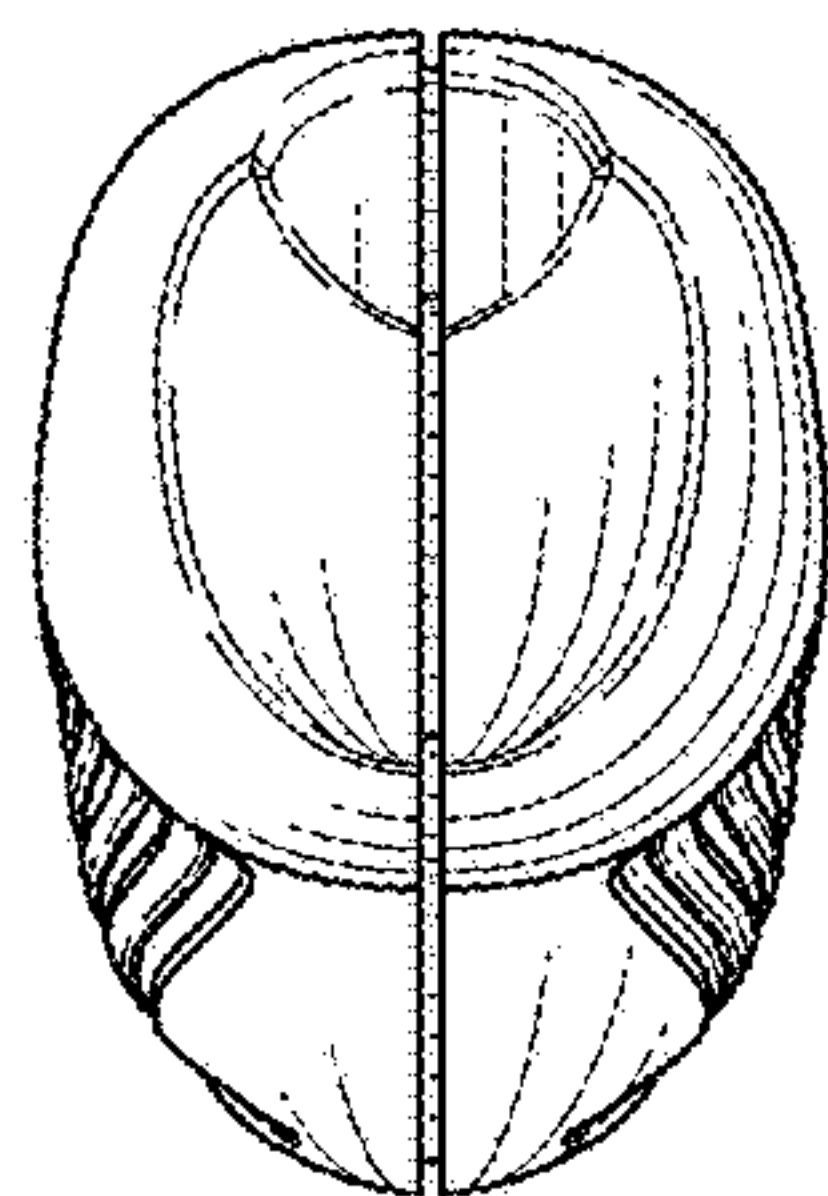


FIG. 3

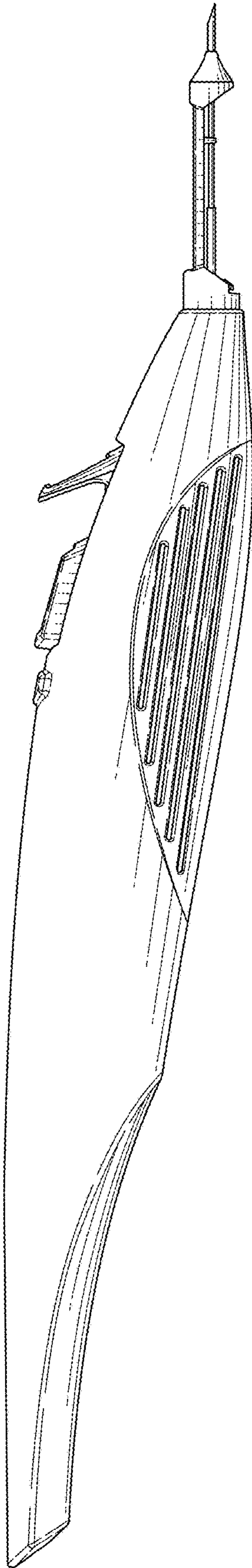


FIG. 4

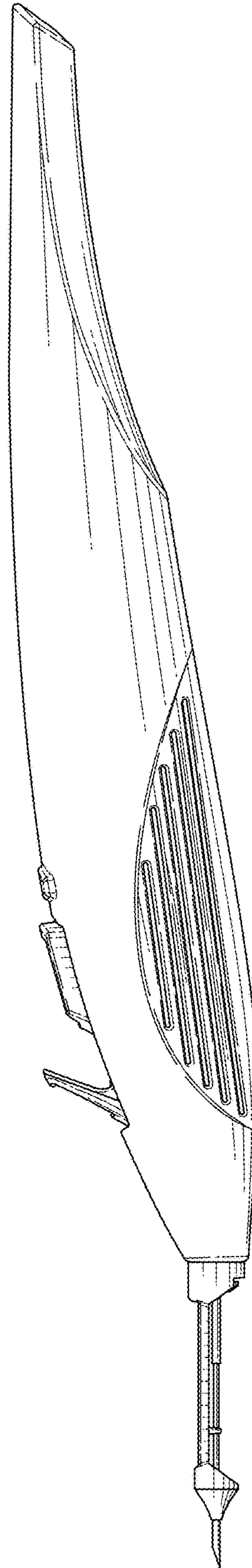


FIG. 5

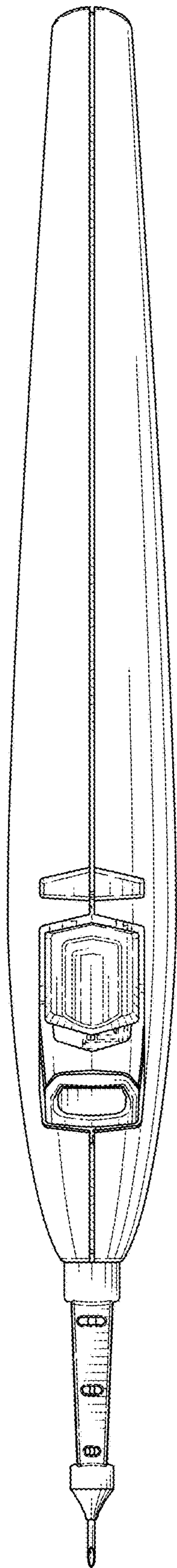


FIG. 6

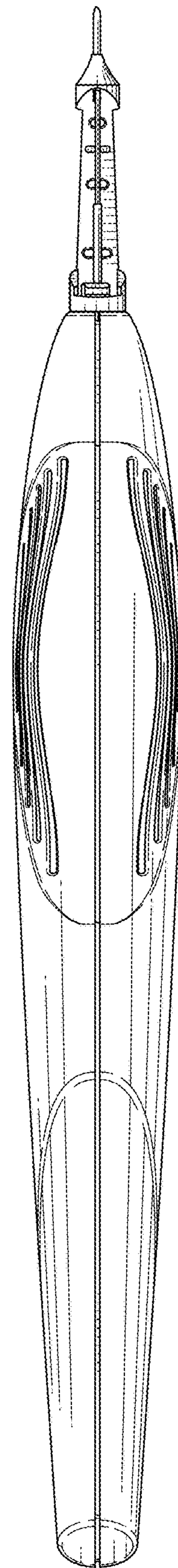


FIG. 7