US00D938585S

(12) United States Design Patent

Kalina, Jr. et al.

(10) Patent No.: US D938,585 S
(45) Date of Patent: ** Dec. 14, 2021

(54) **IMPLANT DELIVERY APPARATUS**

(71) Applicant: **GLAUKOS CORPORATION**, San Clemente, CA (US)

(72) Inventors: **Charles Raymond Kalina, Jr.**, Irvine, CA (US); **James Robert Dennewill**, Anaheim, CA (US)

(73) Assignee: **Glaukos Corporation**, San Clemente, CA (US)

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

(21) Appl. No.: **29/757,235**

(22) Filed: **Nov. 4, 2020**

Related U.S. Application Data

(62) Division of application No. 29/682,793, filed on Mar. 7, 2019, now Pat. No. Des. 901,683, which is a division of application No. 29/623,940, filed on Oct. 27, 2017, now Pat. No. Des. 846,738.

(51) **LOC (13) Cl.** **24-03**

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

(58) **Field of Classification Search**
USPC D24/133, 140, 146, 150, 155, 157, 127
CPC .. A61F 9/0017; A61F 9/00781; A61F 9/0008; A61F 9/00709; A61F 9/00736; A61F 2/14
See application file for complete search history.

(56) **References Cited**

U.S. PATENT DOCUMENTS

2,269,963	A	1/1942	Frederick
3,416,530	A	12/1968	Ness
3,439,675	A	4/1969	Cohen
3,948,271	A	4/1976	Akiyama
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

(Continued)

FOREIGN PATENT DOCUMENTS

AU	200072059	12/2000
AU	2004264913	12/2011

(Continued)

OTHER PUBLICATIONS

Bucciarelli, Patrice D., "Working Model is Next Step in Team's Long Journey to Commercial Product", Healthfirst, Business First of Louisville, LOUISVILLE.BIZJOURNALS.COM, Feb. 27, 2004.

(Continued)

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

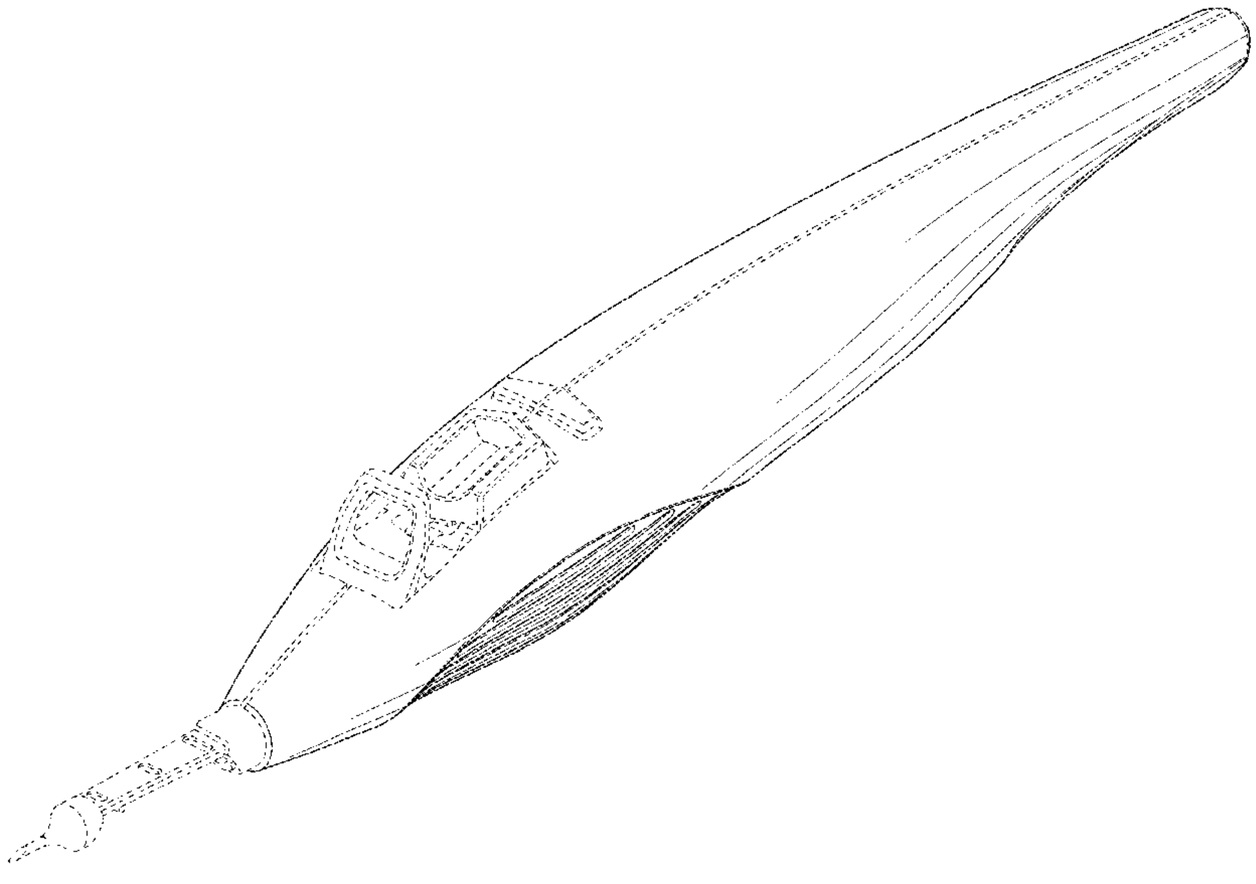
(57) **CLAIM**

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 showing 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.
All features illustrated in broken lines form no part of the claimed design.

1 Claim, 4 Drawing Sheets



(56) **References Cited**

U.S. PATENT DOCUMENTS

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.
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	DonMichael et al.
4,900,300	A	2/1990	Lee
4,905,667	A	3/1990	Foerster et al.
4,991,602	A	2/1991	Amplatz et al.
5,053,040	A	10/1991	Goldsmith, III
5,053,044	A	10/1991	Mueller et al.
5,095,887	A	3/1992	Leon et al.
5,129,895	A	7/1992	Vassiliadis et al.
5,169,386	A	12/1992	Becker et al.
5,180,362	A	1/1993	Worst
5,207,685	A	5/1993	Cinberg et al.
5,221,255	A	6/1993	Mahurkar et al.
5,246,451	A	9/1993	Trescony et al.
5,284,476	A	2/1994	Koch
5,290,295	A	3/1994	Querals et al.
5,324,306	A	6/1994	Makower et al.
5,342,370	A	8/1994	Simon et al.
5,360,399	A	11/1994	Stegmann
5,415,666	A	5/1995	Gourlay et al.
5,445,637	A	8/1995	Bretton
5,462,558	A	10/1995	Kolesa et al.
5,472,440	A	12/1995	Beckman
5,486,165	A	1/1996	Stegmann
5,556,400	A	9/1996	Tunis
5,558,637	A	9/1996	Allonen et al.
5,626,588	A	5/1997	Sauer et al.
5,643,321	A	7/1997	McDevitt
5,651,782	A	7/1997	Simon et al.
5,651,783	A	7/1997	Reynard
5,653,724	A	8/1997	Imonti
5,669,501	A	9/1997	Hissong et al.
5,676,679	A	10/1997	Simon et al.
5,681,323	A	10/1997	Arick
5,695,479	A	12/1997	Jagpal
5,702,414	A	12/1997	Richter et al.
5,702,419	A	12/1997	Berry et al.
5,725,546	A	3/1998	Samson
5,733,256	A	3/1998	Costin
5,741,292	A	4/1998	Mendius
5,762,625	A	6/1998	Igaki
5,792,099	A	8/1998	DeCamp et al.
5,807,244	A	9/1998	Barot
5,817,100	A	10/1998	Igaki
5,833,694	A	11/1998	Poncet
5,836,939	A	11/1998	Negus et al.
D402,757	S	12/1998	Davis et al.
5,846,199	A	12/1998	Hijlkema et al.
5,865,831	A	2/1999	Cozean et al.
5,868,697	A	2/1999	Ritcher et al.
5,891,084	A	4/1999	Lee
5,893,837	A	4/1999	Eagles et al.
5,927,585	A	7/1999	Moorman et al.
5,941,250	A	8/1999	Aramant et al.
5,984,913	A	11/1999	Kritzinger et al.
6,004,302	A	12/1999	Brierley
6,030,416	A	2/2000	Huo et al.
6,036,678	A	3/2000	Giungo
6,036,682	A	3/2000	Lange et al.
6,045,557	A	4/2000	White et al.
6,050,999	A	4/2000	Paraschac et al.
6,071,286	A	6/2000	Mawad
6,074,395	A	6/2000	Trott et al.
6,135,977	A	10/2000	Drasler et al.
6,142,990	A	11/2000	Burk
6,146,387	A	11/2000	Trott et al.
6,187,016	B1	2/2001	Hedges et al.
6,221,078	B1	4/2001	Bylsma
6,224,570	B1	5/2001	Le et al.
6,254,612	B1	7/2001	Hieshima
6,264,668	B1	7/2001	Prywes
6,287,313	B1	9/2001	Sasso
6,299,603	B1	10/2001	Hecker et al.
6,342,058	B1	1/2002	Portney
6,355,033	B1	3/2002	Moorman et al.
6,361,519	B1	3/2002	Knudson et al.
6,363,938	B2	4/2002	Saadat
6,375,642	B1	4/2002	Grieshaber et al.
6,378,526	B1	4/2002	Bowman et al.
6,402,734	B1	6/2002	Weiss
6,405,732	B1	6/2002	Edwards et al.
6,428,501	B1	8/2002	Reynard
6,428,566	B1	8/2002	Holt
6,450,937	B1	9/2002	Mercereau et al.
6,450,984	B1	9/2002	Lynch et al.
6,454,787	B1	9/2002	Maddalo et al.
6,464,724	B1	10/2002	Lynch et al.
6,524,275	B1	2/2003	Lynch et al.
6,530,896	B1	3/2003	Elliott
6,544,249	B1	4/2003	Yu et al.
6,561,974	B1	5/2003	Grieshaber et al.
6,582,426	B2	6/2003	Moorman et al.
6,585,680	B2	7/2003	Bugge
6,589,203	B1	7/2003	Mitrev
6,607,542	B1	8/2003	Wild
6,613,343	B2	9/2003	Dillingham et al.
6,620,154	B1	9/2003	Amirkhanian et al.
6,626,858	B2	9/2003	Lynch et al.
6,629,981	B2	10/2003	Bui et al.
6,638,239	B1	10/2003	Bergheim et al.
6,666,841	B2	12/2003	Gharib et al.
6,676,607	B2	1/2004	de Juan, Jr et al.
6,699,272	B2	3/2004	Slepian et al.
D490,152	S	5/2004	Myall et al.
6,730,056	B1	5/2004	Ghaem et al.
6,736,791	B1	5/2004	Tu et al.
6,763,833	B1	7/2004	Khera et al.
6,764,439	B2	7/2004	Schaaf et al.
6,767,346	B2	7/2004	Damasco et al.
6,780,164	B2	8/2004	Bergheim et al.
6,780,165	B2	8/2004	Kadziauskas et al.
6,783,544	B2	8/2004	Lynch et al.
6,827,699	B2	12/2004	Lynch et al.
6,827,700	B2	12/2004	Lynch et al.
6,827,738	B2	12/2004	Willis et al.
6,902,577	B2	6/2005	Lipshitz et al.
6,939,298	B2	9/2005	Brown et al.
6,955,656	B2	10/2005	Bergheim et al.
6,966,888	B2	11/2005	Cullen
6,981,958	B1	1/2006	Gharib et al.
7,077,821	B2	7/2006	Durgin
7,077,848	B1	7/2006	de Juan et al.
7,090,681	B2	8/2006	Weber et al.
7,094,225	B2	8/2006	Tu et al.
7,135,009	B2	11/2006	Tu et al.
7,135,016	B1	11/2006	Asia et al.
7,163,543	B2	1/2007	Smedley et al.
7,186,232	B1	3/2007	Smedley et al.
7,192,412	B1	3/2007	Zhou et al.
7,217,263	B2	5/2007	Humayun et al.
7,220,238	B2	5/2007	Lynch et al.
7,273,475	B2	9/2007	Tu et al.
7,297,130	B2	11/2007	Bergheim et al.
7,331,984	B2	2/2008	Tu et al.
7,344,528	B1	3/2008	Tu et al.
7,431,710	B2	10/2008	Tu et al.
7,468,065	B2	12/2008	Weber et al.
7,488,303	B1	2/2009	Haffner et al.
7,520,876	B2	4/2009	Reesemann et al.
D592,746	S	5/2009	Highley et al.
7,563,241	B2	7/2009	Tu et al.
D606,190	S	12/2009	Pruitt et al.
7,678,065	B2	3/2010	Haffner et al.
7,708,711	B2	5/2010	Tu et al.
7,713,228	B2	5/2010	Robin
7,758,624	B2	7/2010	Dorn et al.

(56) **References Cited**

U.S. PATENT DOCUMENTS

7,771,388	B2	8/2010	Olsen et al.	
7,850,637	B2	12/2010	Lynch et al.	
7,857,782	B2	12/2010	Tu et al.	
7,867,186	B2	1/2011	Haffner et al.	
7,867,205	B2	1/2011	Bergheim et al.	
7,879,001	B2	2/2011	Haffner et al.	
7,879,079	B2	2/2011	Tu et al.	
7,905,904	B2	3/2011	Stone et al.	
7,931,660	B2	4/2011	Aranyi et al.	
7,945,336	B2	5/2011	Sauter/Starace et al.	
7,951,155	B2	5/2011	Smedley et al.	
7,959,632	B2	6/2011	Fugo	
7,967,772	B2	6/2011	McKenzie et al.	
8,007,459	B2	8/2011	Haffner et al.	
D645,489	S	9/2011	Gille et al.	
D645,490	S	9/2011	Gille et al.	
8,062,244	B2	11/2011	Tu et al.	
8,070,290	B2	12/2011	Gille et al.	
8,075,511	B2	12/2011	Tu et al.	
8,118,768	B2	2/2012	Tu et al.	
8,142,364	B2	3/2012	Haffner et al.	
8,152,752	B2	4/2012	Lynch et al.	
8,197,418	B2	6/2012	Lal et al.	
8,267,882	B2	9/2012	Euteneuer et al.	
8,273,050	B2	9/2012	Bergheim et al.	
8,333,742	B2	12/2012	Bergheim et al.	
8,337,445	B2	12/2012	Tu et al.	
8,348,877	B2	1/2013	Tu et al.	
8,388,568	B2	3/2013	Lynch et al.	
8,506,515	B2	8/2013	Burns et al.	
8,540,659	B2	9/2013	Berlin	
8,579,846	B2	11/2013	Tu et al.	
8,617,094	B2	12/2013	Smedley et al.	
8,679,089	B2	3/2014	Berlin	
8,771,217	B2	7/2014	Lynch et al.	
8,801,648	B2	8/2014	Bergheim et al.	
8,801,649	B2	8/2014	De Juan, Jr. et al.	
8,808,219	B2	8/2014	Bergheim et al.	
8,814,820	B2	8/2014	Bergheim et al.	
8,852,137	B2	10/2014	Horvath et al.	
8,852,266	B2	10/2014	Brooks et al.	
8,882,781	B2	11/2014	Smedley et al.	
8,998,983	B2	4/2015	Auld	
9,066,782	B2	6/2015	Tu et al.	
9,155,654	B2	10/2015	Tu et al.	
9,155,656	B2	10/2015	Schaller et al.	
9,173,775	B2 *	11/2015	Haffner	A61F 2/14
9,220,632	B2	12/2015	Smedley et al.	
9,301,875	B2	4/2016	Tu et al.	
9,492,320	B2	11/2016	Lynch et al.	
9,554,940	B2 *	1/2017	Haffner	A61F 2/14
9,561,131	B2	2/2017	Tu et al.	
9,572,963	B2	2/2017	Tu et al.	
9,592,151	B2 *	3/2017	Rangel-Friedman	A61F 9/00781
9,597,230	B2	3/2017	Haffner et al.	
9,603,738	B2	3/2017	Haffner et al.	
9,636,255	B2	5/2017	Haffner et al.	
9,668,915	B2	6/2017	Haffner et al.	
9,693,899	B2 *	7/2017	Wardle	A61F 9/0017
9,730,638	B2	8/2017	Haffner et al.	
9,789,001	B2	10/2017	Tu et al.	
9,827,143	B2	11/2017	Lynch et al.	
9,849,027	B2 *	12/2017	Highley	A61F 9/0017
9,962,290	B2	5/2018	Burns et al.	
9,987,472	B2	6/2018	Tu et al.	
9,993,368	B2	6/2018	Bergheim et al.	
D833,008	S	11/2018	Kalina, Jr. et al.	
10,188,551	B2	1/2019	Rangel-Friedman et al.	
10,206,813	B2	2/2019	Haffner et al.	
D846,738	S	4/2019	Kalina, Jr. et al.	
10,245,178	B1	4/2019	Heitzmann et al.	
10,271,989	B2	4/2019	Haffner et al.	
10,285,853	B2	5/2019	Rangel-Friedman et al.	
10,285,856	B2	5/2019	Tu et al.	
10,406,029	B2	9/2019	Tu et al.	
10,485,701	B2	11/2019	Haffner et al.	
10,485,702	B2	11/2019	Bergheim et al.	
10,492,950	B2	12/2019	Lynch et al.	
10,499,809	B2	12/2019	Kalina, Jr. et al.	
10,517,759	B2	12/2019	Grimaldi et al.	
10,568,762	B2	2/2020	Lynch et al.	
D886,997	S	6/2020	Kalina, Jr. et al.	
10,674,906	B2	6/2020	Kalina, Jr. et al.	
10,780,218	B2 *	9/2020	Novakovic	A61F 9/0008
10,813,789	B2	10/2020	Haffner et al.	
D901,683	S	11/2020	Kalina, Jr. et al.	
10,828,195	B2	11/2020	Burns et al.	
10,828,473	B2	11/2020	Haffner et al.	
10,959,941	B2	3/2021	Haffner	
11,019,996	B2	6/2021	Kalina, Jr. et al.	
11,019,997	B2	6/2021	Kalina, Jr. et al.	
2001/0000527	A1	4/2001	Yaron et al.	
2001/0025150	A1	9/2001	de Juan et al.	
2002/0052640	A1	5/2002	Bigus et al.	
2002/0072673	A1	6/2002	Yamamoto et al.	
2002/0111608	A1	8/2002	Baerveldt et al.	
2002/0120284	A1	8/2002	Schachar et al.	
2002/0120285	A1	8/2002	Schachar et al.	
2002/0133168	A1	9/2002	Smedley et al.	
2002/0143284	A1	10/2002	Tu et al.	
2002/0165522	A1	11/2002	Holmen	
2002/0177856	A1	11/2002	Richter et al.	
2003/0014021	A1	1/2003	Holmen	
2003/0014092	A1	1/2003	Neuhann	
2003/0055372	A1	3/2003	Lynch et al.	
2003/0060752	A1	3/2003	Bergheim et al.	
2003/0079329	A1	5/2003	Yaron et al.	
2003/0093084	A1 *	5/2003	Nissan	A61F 9/00781 606/108
2003/0097117	A1	5/2003	Buono	
2003/0097151	A1	5/2003	Smedley et al.	
2003/0105456	A1	6/2003	Lin	
2003/0109907	A1	6/2003	Shadduck	
2003/0135149	A1	7/2003	Cullen et al.	
2003/0139729	A1	7/2003	Stegmann et al.	
2003/0181848	A1	9/2003	Bergheim et al.	
2003/0187384	A1	10/2003	Bergheim et al.	
2003/0195438	A1	10/2003	Petillo	
2003/0208217	A1	11/2003	Dan	
2003/0212383	A1	11/2003	Cote et al.	
2003/0229303	A1	12/2003	Haffner et al.	
2003/0236484	A1	12/2003	Lynch et al.	
2004/0024345	A1	2/2004	Gharib et al.	
2004/0088048	A1	5/2004	Richter et al.	
2004/0098122	A1	5/2004	Lee et al.	
2004/0102729	A1	5/2004	Haffner et al.	
2004/0111050	A1	6/2004	Smedley et al.	
2004/0147870	A1	7/2004	Burns et al.	
2004/0154946	A1	8/2004	Solovay et al.	
2004/0210185	A1	10/2004	Tu et al.	
2004/0216749	A1	11/2004	Tu	
2004/0236343	A1	11/2004	Taylor et al.	
2004/0243227	A1	12/2004	Starksen et al.	
2004/0249404	A1	12/2004	Haefliger	
2004/0254517	A1	12/2004	Quiroz/Mercado et al.	
2004/0254519	A1	12/2004	Tu et al.	
2004/0254520	A1	12/2004	Porteous et al.	
2004/0260228	A1	12/2004	Lynch et al.	
2005/0049578	A1	3/2005	Tu et al.	
2005/0096639	A1	5/2005	Slatkine et al.	
2005/0125003	A1	6/2005	Pinchuk et al.	
2005/0165385	A1	7/2005	Simon	
2005/0171562	A1	8/2005	Criscuolo et al.	
2005/0209549	A1	9/2005	Bergheim et al.	
2005/0209672	A1	9/2005	George et al.	
2005/0240222	A1	10/2005	Shipp	
2005/0250788	A1	11/2005	Tu et al.	
2005/0267478	A1	12/2005	Corradi et al.	
2005/0277864	A1	12/2005	Haffner et al.	
2005/0288619	A1	12/2005	Gharib et al.	
2006/0032507	A1	2/2006	Tu	
2006/0074375	A1	4/2006	Bergheim et al.	
2006/0084907	A1	4/2006	Bergheim et al.	

(56) **References Cited**

U.S. PATENT DOCUMENTS

2006/0106370 A1 5/2006 Baerveldt et al.
2006/0116626 A1 6/2006 Smedley et al.
2006/0155300 A1 7/2006 Stamper et al.
2006/0173397 A1 8/2006 Tu et al.
2006/0195055 A1 8/2006 Bergheim et al.
2006/0195056 A1 8/2006 Bergheim et al.
2006/0200113 A1 9/2006 Haffner et al.
2006/0210605 A1 9/2006 Chang et al.
2006/0217741 A1 9/2006 Ghannoum
2006/0241580 A1 10/2006 Mittelstein et al.
2006/0241749 A1 10/2006 Tu et al.
2007/0021653 A1 1/2007 Hattenbach et al.
2007/0073275 A1 3/2007 Conston et al.
2007/0078471 A1 4/2007 Schachar et al.
2007/0088432 A1 4/2007 Solovay et al.
2007/0118065 A1 5/2007 Pinchuk et al.
2007/0118066 A1 5/2007 Pinchuk et al.
2007/0123812 A1 5/2007 Pinchuk et al.
2007/0123919 A1 5/2007 Schachar et al.
2007/0149927 A1 6/2007 Itou et al.
2007/0161981 A1 7/2007 Sanders et al.
2007/0179471 A1 8/2007 Christian et al.
2007/0191863 A1 8/2007 De Juan et al.
2007/0276315 A1 11/2007 Haffner
2007/0282244 A1 12/2007 Tu et al.
2007/0282245 A1 12/2007 Tu et al.
2007/0287958 A1 12/2007 McKenzie et al.
2007/0293807 A1 12/2007 Lynch et al.
2007/0293873 A1 12/2007 Chang
2008/0027304 A1 1/2008 Pardo et al.
2008/0033351 A1 2/2008 Trogden et al.
2008/0045878 A1 2/2008 Bergheim et al.
2008/0051681 A1 2/2008 Schwartz
2008/0058704 A1 3/2008 Hee et al.
2008/0082078 A1 4/2008 Berlin
2008/0091224 A1 4/2008 Griffis III et al.
2008/0097214 A1 4/2008 Meyers et al.
2008/0097335 A1 4/2008 Trogden et al.
2008/0108933 A1 5/2008 Yu et al.
2008/0109037 A1 5/2008 Steiner et al.
2008/0114440 A1 5/2008 Hlavka et al.
2008/0125691 A1 5/2008 Yaron et al.
2008/0140059 A1 6/2008 Schachar et al.
2008/0147083 A1 6/2008 Vold et al.
2008/0183289 A1 7/2008 Werblin
2008/0188860 A1 8/2008 Vold
2008/0200860 A1 8/2008 Tu et al.
2008/0200923 A1 8/2008 Beckman et al.
2008/0208176 A1 8/2008 Loh
2008/0215062 A1 9/2008 Bowen et al.
2008/0221501 A1 9/2008 Cote et al.
2008/0228127 A1 9/2008 Burns et al.
2008/0243156 A1 10/2008 John
2008/0255545 A1 10/2008 Mansfield et al.
2008/0269730 A1 10/2008 Dotson
2008/0281250 A1 11/2008 Bergsneider et al.
2008/0306429 A1 12/2008 Shields et al.
2009/0043242 A1 2/2009 Bene et al.
2009/0043321 A1 2/2009 Conston et al.
2009/0043365 A1 2/2009 Friedland et al.
2009/0076436 A2 3/2009 Gharib et al.
2009/0112245 A1 4/2009 Haefliger
2009/0124973 A1 5/2009 D'Agostino et al.
2009/0132040 A1 5/2009 Frion et al.
2009/0137989 A1 5/2009 Kataoka
2009/0138081 A1 5/2009 Bergheim et al.
2009/0182421 A1 7/2009 Silvestrini et al.
2009/0198213 A1 8/2009 Tanaka
2009/0204053 A1 8/2009 Nissan et al.
2009/0227933 A1 9/2009 Karageozian
2009/0227934 A1 9/2009 Eutenever et al.
2009/0264813 A1 10/2009 Chang
2009/0287233 A1 11/2009 Huculak
2010/0004581 A1 1/2010 Brigatti et al.
2010/0010416 A1 1/2010 Juan, Jr. et al.
2010/0010452 A1 1/2010 Paques et al.
2010/0030150 A1 2/2010 Paques et al.
2010/0056979 A1 3/2010 Smedley et al.
2010/0057093 A1 3/2010 Ide et al.
2010/0076419 A1 3/2010 Chew et al.
2010/0121248 A1 5/2010 Yu et al.
2010/0121249 A1 5/2010 Yu et al.
2010/0121342 A1 5/2010 Schieber et al.
2010/0137981 A1 6/2010 Silvestrini et al.
2010/0152626 A1 6/2010 Schwartz
2010/0158980 A1 6/2010 Kopczynski et al.
2010/0173866 A1 7/2010 Hee et al.
2010/0185138 A1 7/2010 Yaron et al.
2010/0185205 A1 7/2010 Novakovic et al.
2010/0191103 A1 7/2010 Stamper et al.
2010/0225061 A1 9/2010 Bath
2010/0240987 A1 9/2010 Christian et al.
2010/0255061 A1 10/2010 de Juan, Jr et al.
2010/0262174 A1 10/2010 Sretavan
2010/0274258 A1 10/2010 Silvestrini et al.
2010/0278898 A1 11/2010 Hughes et al.
2010/0280317 A1 11/2010 Silvestrini et al.
2011/0009874 A1 1/2011 Wardle et al.
2011/0009958 A1 1/2011 Wardle et al.
2011/0022065 A1 1/2011 Shipp
2011/0028883 A1 2/2011 Juan, Jr. et al.
2011/0028983 A1 2/2011 Silvestrini et al.
2011/0046536 A1 2/2011 Stegmann et al.
2011/0071524 A1 3/2011 Keller
2011/0077626 A1 3/2011 Baerveldt et al.
2011/0082385 A1 4/2011 Diaz et al.
2011/0092965 A1 4/2011 Slatkine et al.
2011/0098629 A1 4/2011 Juan, Jr. et al.
2011/0098809 A1 4/2011 Wardle et al.
2011/0112546 A1 5/2011 Juan, Jr. et al.
2011/0118649 A1 5/2011 Stegmann et al.
2011/0118835 A1 5/2011 Silvestrini et al.
2011/0144641 A1 6/2011 Dimalanta, Jr
2011/0202049 A1 8/2011 Jia et al.
2011/0224597 A1 9/2011 Stegmann et al.
2011/0230877 A1 9/2011 Huculak et al.
2011/0257658 A1 10/2011 Chen et al.
2011/0306915 A1 12/2011 De Juan, Jr et al.
2011/0319793 A1 12/2011 Hyhynen
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.
2012/0078362 A1 3/2012 Haffner 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.
2012/0165933 A1 6/2012 Haffner 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.
2012/0238994 A1 9/2012 Nazzaro et al.
2012/0257167 A1 10/2012 Gille et al.
2012/0259195 A1 10/2012 Haffner 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.
2013/0018296 A1 1/2013 Bergheim 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.

(56) **References Cited**

U.S. PATENT DOCUMENTS

2013/0085507	A1	4/2013	Nagasaka	
2013/0090534	A1	4/2013	Burns 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	
2013/0253528	A1*	9/2013	Haffner	A61F 9/0017 606/107
2013/0281910	A1	10/2013	Tu	
2013/0289467	A1	10/2013	Haffner et al.	
2013/0310930	A1	11/2013	Tu 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	
2014/0207137	A1	7/2014	Keller	
2014/0276901	A1	9/2014	Auld	
2015/0038893	A1*	2/2015	Haffner	A61F 9/0017 604/8
2015/0223981	A1	8/2015	Smedley et al.	
2015/0342875	A1	12/2015	Haffner	
2016/0354309	A1	12/2016	Heitzmann et al.	
2017/0135857	A1	5/2017	Haffner et al.	
2018/0021170	A1	1/2018	Haffner et al.	
2018/0028361	A1	2/2018	Haffner et al.	
2018/0085065	A1	3/2018	Haffner et al.	
2018/0161205	A1	6/2018	Tu et al.	
2018/0177633	A1	6/2018	Haffner et al.	
2018/0280194	A1	10/2018	Heitzmann et al.	
2018/0303665	A1	10/2018	Heitzmann et al.	
2018/0333296	A1	11/2018	Heitzmann et al.	
2019/0000673	A1	1/2019	Fjield et al.	
2019/0021991	A9	1/2019	Heitzmann et al.	
2019/0053704	A1	2/2019	Burns et al.	
2019/0083307	A1	3/2019	Burns et al.	
2019/0091012	A1	3/2019	Kalina, Jr.	
2019/0104936	A1	4/2019	Gunn et al.	
2019/0105077	A1*	4/2019	Kalina, Jr.	A61F 9/0017
2019/0125581	A1	5/2019	Heitzmann et al.	
2019/0224046	A1	7/2019	Heitzmann et al.	
2019/0314199	A1	10/2019	Haffner et al.	
2019/0321220	A1	10/2019	Rangel-Friedman et al.	
2019/0321225	A1	10/2019	Smedley et al.	
2019/0321226	A1*	10/2019	Haffner	A61F 2/14
2020/0155349	A1	5/2020	Haffner et al.	
2020/0179171	A1	6/2020	Grimaldi et al.	
2020/0367745	A1	11/2020	Kalina, Jr. et al.	
2021/0015662	A1	1/2021	Haffner et al.	
2021/0137737	A1	5/2021	Burns et al.	
2021/0154449	A1	5/2021	Haffner et al.	

FOREIGN PATENT DOCUMENTS

CA	2244646	2/1999
CA	2643357	11/1999
CH	92111244	7/1993
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	7/1991
EP	0858788	8/1998
EP	2088976	8/2009
EP	2260803	12/2010
EP	2351589	8/2011
EP	2982354	2/2016
EP	2985012	2/2016
JP	2005-533619	11/2005
JP	4031836	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	WO 1992/08406	5/1992
WO	WO 1998/23237	6/1998
WO	WO 1998/37831	9/1998
WO	WO 1999/26567	6/1999
WO	WO 2001/68016	9/2001
WO	WO 2001/085065	11/2001
WO	WO 2002/074052	9/2002
WO	WO 2003/041622	5/2003
WO	WO 2003/045290	6/2003
WO	WO 2005/107845	11/2005
WO	WO 2008/061043	5/2008
WO	WO 2011/020633	2/2011
WO	WO 2013/148275	10/2013
WO	WO 2014/151070	9/2014

OTHER PUBLICATIONS

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

Jordan et al., "A Novel Approach to Suprachoroidal Drainage for the Surgical Treatment of Intractable Glaucoma", J Glaucoma, vol. 15, No. 3, Jun. 2006, pp. 200-205.

* cited by examiner

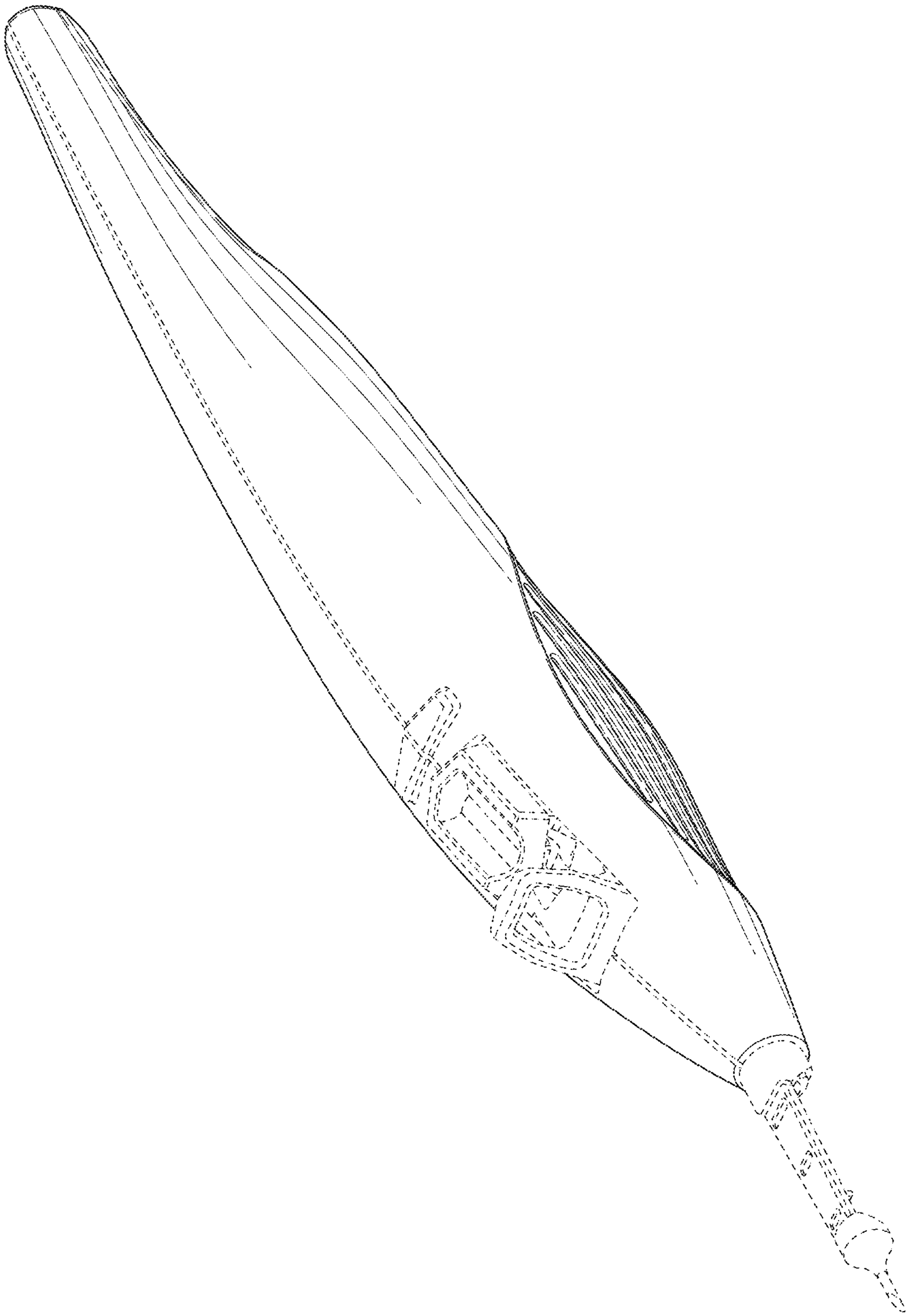


FIG. 1

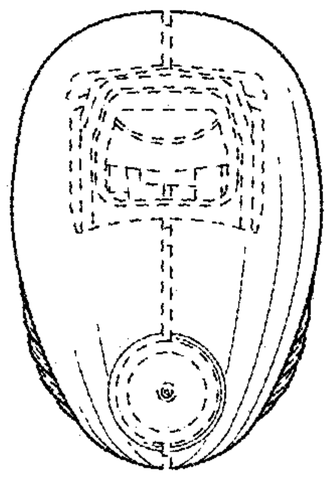


FIG. 2

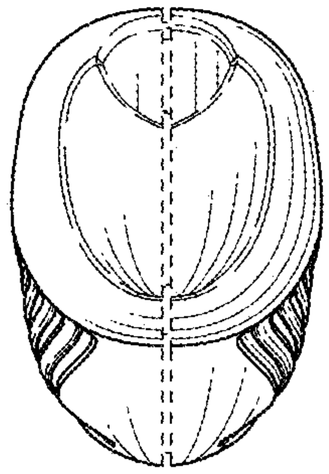


FIG. 3

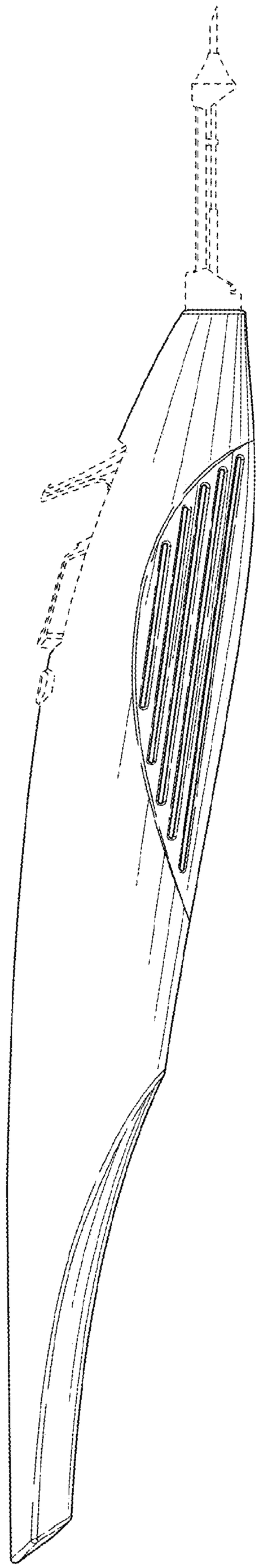


FIG. 4

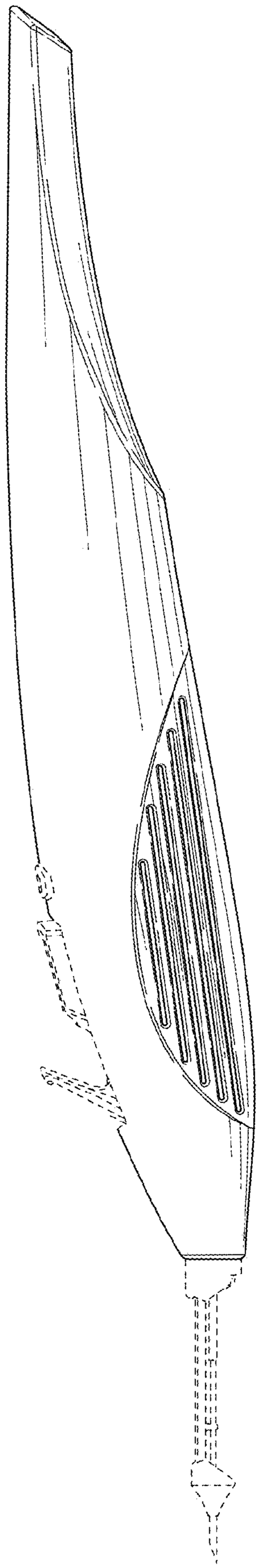


FIG. 5

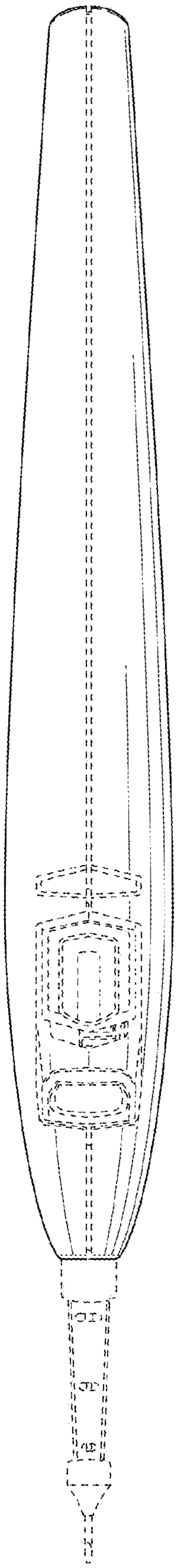


FIG. 6

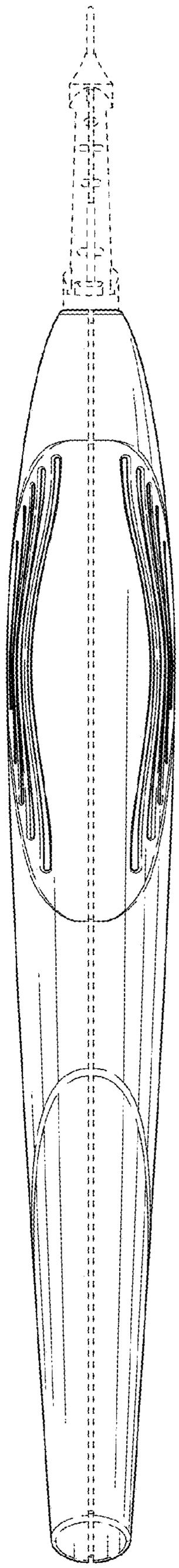


FIG. 7