US0D1036656S

(12) United States Design Patent

Davidson et al.

(10) Patent No.: US D1,036,656 S
(45) Date of Patent: ** Jul. 23, 2024

(54) **APPLICATOR**

(71) Applicant: **Verrica Pharmaceuticals Inc.**, West Chester, PA (US)

(72) Inventors: **Matthew Gene Davidson**, Venice, CA (US); **Jayson Michael Rieger**, Charlottesville, VA (US); **Eugene Scavola**, Charlottesville, VA (US); **Paul Daly**, Plymouth, NH (US)

(73) Assignee: **Verrica Pharmaceuticals Inc.**, West Chester, PA (US)

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

(21) Appl. No.: **29/750,763**

(22) Filed: **Sep. 16, 2020**

Related U.S. Application Data

(62) Division of application No. 29/607,744, filed on Jun. 15, 2017, now Pat. No. Des. 900,312.

(51) **LOC (14) Cl.** **24-02**

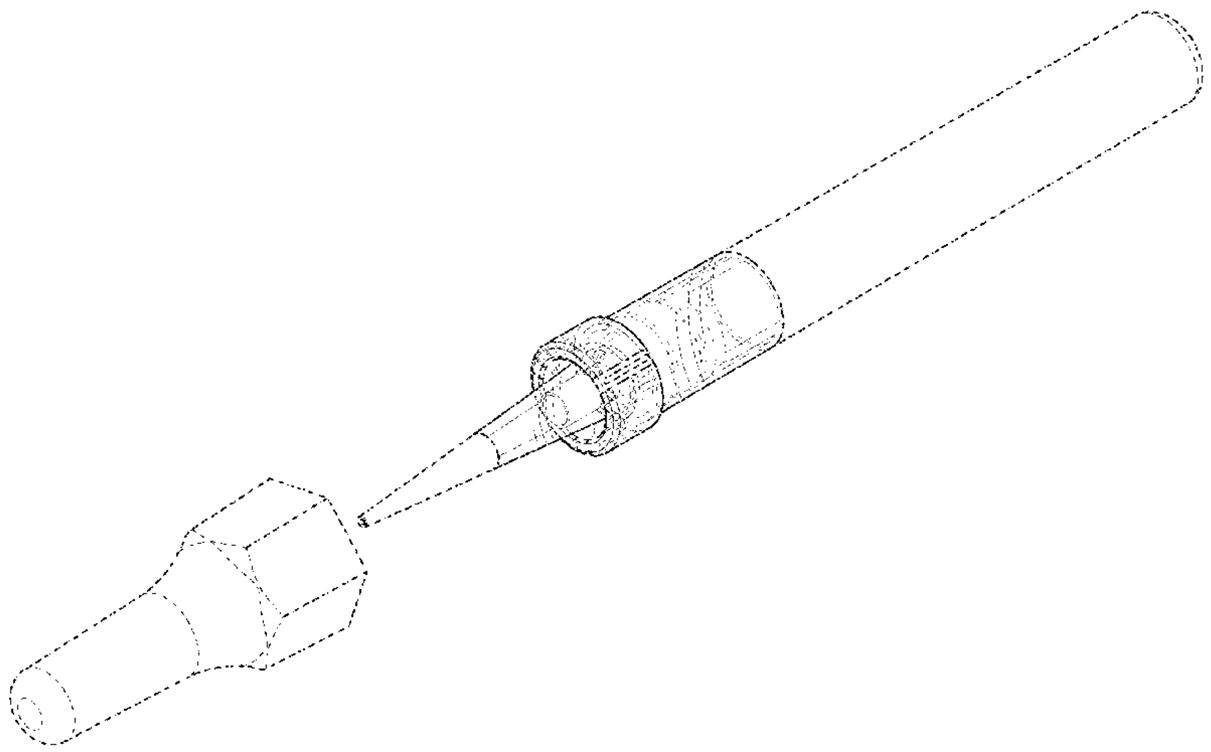
(52) **U.S. Cl.**
USPC **D24/119**

(58) **Field of Classification Search**
USPC D24/108, 112, 113, 114, 115, 127–131, D24/133, 186, 216, 224, 111, 119, 137, D24/138, 141, 147, 177, 214, 222; D9/418, 434, 435, 447, 448, 449, 452, D9/453, 454, 724; D28/7; D23/233–250, D23/207, 209, 365
CPC A61M 25/00; A61M 39/00; A61M 27/00; A61M 25/0043; A61M 25/0067; A61M 25/0097; A61F 2/958; B01D 35/143; B01D 2201/304; B01D 27/10; B01D 27/106; A61K 31/12; A61K 31/365; A61K 36/29; A61K 31/7048; A61K 31/60
See application file for complete search history.

(56) **References Cited**

U.S. PATENT DOCUMENTS

1,744,893	A		1/1930	Hein
3,393,962	A		7/1968	Maurice
3,981,924	A		9/1976	Hall
4,148,874	A		4/1979	Smith
4,157,967	A		6/1979	Meyst et al.
4,299,006	A		11/1981	Cruz
4,413,154	A		11/1983	Dessau
5,445,462	A		8/1995	Johnson et al.
5,464,855	A		11/1995	Capiris et al.
5,590,780	A		1/1997	O'Meara
5,702,694	A		12/1997	Chamness
6,066,124	A		5/2000	Caillouette
D436,661	S		1/2001	Berry
6,379,342	B1		4/2002	Levinson
6,547,467	B2		4/2003	Quintero
6,673,031	B2		1/2004	Mark
6,811,342	B2		11/2004	Pauchet
8,518,076	B2		8/2013	Stenton
8,871,801	B2		10/2014	Levitt
D771,250	S		11/2016	Zhang et al.
D772,407	S		11/2016	Zhang et al.
9,480,691	B1		11/2016	Roth
D801,830	S		11/2017	Zhang et al.
10,195,635	B2		2/2019	Sporrer
D868,160	S		11/2019	Lam
10,745,413	B2		8/2020	Davidson et al.
D900,312	S	*	10/2020	Davidson D24/119
11,052,064	B2		7/2021	Davidson
D933,494	S	*	10/2021	Tempfli D9/724
11,147,790	B2		10/2021	Welgus et al.
11,168,091	B2		11/2021	Davidson et al.
D938,587	S	*	12/2021	Fujii D24/138
D947,027	S	*	3/2022	Marik D9/449
11,279,165	B2	*	3/2022	Skinner B43K 1/01
D957,625	S	*	7/2022	Reynolds D24/114
D969,312	S	*	11/2022	Daniel A61M 5/3243 D24/128
11,559,294	B2	*	1/2023	Pollack A61F 9/00727
2003/0068331	A1		4/2003	Battaglia et al.
2004/0152766	A1		8/2004	Au-Yeung et al.
2004/0254561	A1		12/2004	Stenton
2005/0019418	A1		1/2005	Crutchfield et al.
2005/0111900	A1		5/2005	Fazzolari et al.
2005/0169696	A1		8/2005	Albisetti
2006/0110415	A1		5/2006	Gupta
2006/0116649	A1		6/2006	Hagele
2006/0180613	A1		8/2006	Manesis
2007/0000566	A1		1/2007	Gueret
2007/0111954	A1		5/2007	Crutchfield et al.



2007/0187437	A1	8/2007	Lord
2007/0233020	A1	10/2007	Hearne
2007/0233021	A1	10/2007	Poisson et al.
2007/0275045	A1	11/2007	Evans et al.
2008/0146674	A1	6/2008	Rosenberg et al.
2008/0195040	A1	8/2008	Clark et al.
2009/0311028	A1	12/2009	Odermatt et al.
2011/0208136	A1	8/2011	Sollingen et al.
2011/0212033	A1	9/2011	Tamarkin et al.
2012/0016320	A1	1/2012	Lin
2012/0148520	A1	6/2012	Strobel et al.
2012/0190658	A1	7/2012	Studin
2012/0312709	A1	12/2012	Kaufman
2013/0004230	A1	1/2013	Kirk et al.
2013/0197075	A1	8/2013	Levitt
2014/0275248	A1	9/2014	Johnson
2015/0118164	A1	4/2015	Tamarkin et al.
2015/0328259	A1	11/2015	Shanler et al.
2016/0193177	A1	7/2016	Davidson
2017/0305925	A1	10/2017	Piotrowski et al.
2019/0002474	A1	1/2019	Davidson et al.
2019/0031674	A1	1/2019	Davidson et al.
2020/0155498	A1	5/2020	Welgus et al.
2020/0270269	A1	8/2020	Davidson et al.
2021/0138214	A1	5/2021	Davidson et al.
2021/0386703	A1	12/2021	Davidson
2021/0401793	A1	12/2021	Welgus et al.

FOREIGN PATENT DOCUMENTS

CH	204207	A	4/1939
CN	1571795	A	1/2005
CN	101012230	A	8/2007
CN	101108853	A	1/2008
CN	101108854	A	1/2008
CN	101161654	A	4/2008
CN	101798309	A	8/2010
CN	102146086	A	8/2011
CN	102268006	A	12/2011
CN	102336765	A	2/2012
CN	102526146	A	7/2012
CN	202730045	A	2/2013
CN	202920809	U	5/2013
CN	103923095	A	7/2014
CN	204817029	U	12/2015
CN	105636637	A	6/2016
CN	106674248	A	5/2017
DE	20016131	U1	11/2000
EP	0841059	A1	5/1998
GB	587994	A	5/1947
JP	S51-141863	A	12/1976
JP	05-058914		3/1993
JP	H05-255367	A	10/1993
JP	10-114626	A	5/1998
JP	11-319064		11/1999
JP	11-335303		12/1999
JP	2004-059446	A	2/2004
JP	2005-187330	A	7/2005
JP	2007-269693	A	10/2007
JP	2008-505960	A	2/2008
JP	2010-516410	A	5/2010
JP	2010-235471	A	10/2010
JP	47-39621	B2	8/2011
JP	2013-507367	A	3/2013
JP	2016-528015	A	9/2016
JP	2017-513907	A	6/2017
KR	10-2005-0032154	A	4/2005
KR	10-2016-0045086	A	4/2016
KR	10-2017-0029413	A	3/2017
WO	WO 2008/092068	A2	7/2008
WO	WO 2010/002476	A1	1/2010
WO	2012/131238	A1	10/2012
WO	WO 2013/189841	A1	12/2013
WO	2015/027111	A1	2/2015
WO	WO 2016/006693	A1	1/2016
WO	2016/100732	A2	6/2016
WO	WO 2016/118633	A1	7/2016
WO	2018/226894	A1	12/2018

OTHER PUBLICATIONS

Extended European Search Report, mailed Mar. 10, 2017, in connection with EP 14837297.2.

International Search Report and Written Opinion, mailed Nov. 20, 2014, in connection with PCT/US2014/052184.

Extended European Search Report, mailed Oct. 26, 2018, in connection with EP 15871116.8.

Supplementary European Search Report, mailed Aug. 8, 2018, in connection with EP 16740681.8.

Extended European Search Report, mailed Dec. 4, 2018, in connection with EP 16740681.8.

Invitation to Pay Additional Fees, mailed Aug. 27, 2018, in connection with PCT/US2018/O3653.

International Search Report and Written Opinion, mailed Oct. 22, 2018, in connection with PCT/US2018/036353.

Invitation to Pay Additional Fees, mailed Sep. 20, 2018, in connection with PCT/US2018/037808.

International Search Report and Written Opinion, mailed Nov. 13, 2018, in connection with PCT/US2018/037808.

International Preliminary Report on Patentability mailed Dec. 26, 2019 in connection with International Application No. PCT/US2018/037808.

Invitation to Pay Additional Fees, mailed Dec. 10, 2018, in connection with PCT/US2018/054373.

International Search Report and Written Opinion, mailed Apr. 3, 2019 in connection with PCT/US2018/054373.

International Preliminary Report on Patentability mailed Apr. 16, 2020, in connection with International Application No. PCT/US2018/054373.

[No Author Listed] CAS RN 27607-77-8. Entered STN: Nov. 16, 1984. 28 pages.

[No Author Listed] CAS RN 76262-87-8. Entered STN: Nov. 16, 1984. 19 pages.

[No Author Listed] CAS RN 89672-77-5. Entered STN: Nov. 16, 1984. 29 pages.

Aitken et al., Fragmentation patterns in the gas-phase pyrolysis of some bi- and tri-cyclic sulfolanes related to the 8-thiabicyclo[4.3.0]non-3-ene 8,8-dioxide ring system . J Chem Soc. Perkin Transactions 1. 1994;16:2301-2308.

Anderson et al., Practical Process Research and Development. 1st Edition. Academic Press. Mar. 20, 2000. 81-111.

Augé et al., Catalysis by Lithium Cation: Lithium Trifluoromethanesulfonate as a Substitute for Lithium Perchlorate in Cycloadditions. Synlett 2000;6:877-9.

Bouacha et al., A theoretical study of the mechanism, stereoselectivity and Lewis acid catalyst on the Diels-Alder cycloaddition between furan and activated alkenes. Tetrahedron Letters. 2013;54:4030-4033.

Braddock et al., Stereochemistry of the Catalysed Diels-Alder Reaction between Cyclopentadiene and Dimethyl Monothionofumarate; Soft versus Hard Lewis Acids. J. Chem. Soc. Chem. Commun. Jan. 1, 1993;16:1244-6. doi: https://doi.org/10.1039/C39930001244.

Brion et al., On the lewis acid catalyzed diels-alder reaction of furan. regio- and stereospecific synthesis of substituted cyclohexenols and cyclohexadienols. Tetrahedron Letters. 1982;23(50):5299-302. https://doi.org/10.1016/S0040-4039(00)85823-2.

Hollis et al., Homogeneous catalysis. Titanium complex [Ti(Cp)2(CF3SO3)2] and zirconium complex [Zr(Cp)2(CF3SO3)2THF], efficient catalysts for the Diels-Alder reaction. Organometallics. Aug. 1, 1992;11(8):2745-8. https://doi.org/10.1021/om00044a004.

Hollis et al., Homogenous Catalysis: Transition Metal Based Lewis Acid Catalysts. Tetrahedron. 1993;49(25):5415-30. doi: https://doi.org/10.1016/S0040-4020(01)87259-8.

Houk et al., On Lewis Acid catalysis of diels-alder reactions. J Am Chem Soc. Jun. 13, 1973;95(12):4094-4096.

Huang, Catalysts for Hetero Diels-Alder Reaction of Imines. Chinese Journal of Organic Chemistry. Oct. 2003;23(10):1064-75.

Hubbard et al., Lewis Acid Catalyzed Diels?Alder Reactions of Highly Hindered Dienophiles. J. Org. Chem. 1998;63(12):4143-4146.
Hunt et al., Why do catalytic quantities of lewis acid generally yield more product than 1.1 equiv in the intramolecular diels-adler reaction with a furan diene? Competitive complexation NMR studies provide an answer. J Am Chem Soc. 1995;117:1049-1056.
Kharitonov et al., Synthetic transformations of higher terpenoids: VIII. [4+2]-Cycloaddition reactions of lambertianic acid. Russian J Organic Chem. 2003;39(1):57-74.
Lange et al., Synthesis of 4-carboxy-2-thiabicyclo [3.2.0] Heptan-6-ones via 3-carboxy-2,3-dihydrothiophenes: potential ?-lactamase inhibitors. Tetrahedron Lett. 1985;26(15):1791-1794.
Pagni et al., A chemical, spectroscopic, and theoretical assessment of the lewis acidity of LiClO4 in Diethyl Ether. J. Org Chem. 1993;58:3130-3133.
Prabhakar Reddy et al., Synthesis, cytotoxic activity and structure-activity relationships of hedychenone analogues. Bioorg Med Chem Lett. Apr. 15, 2010;20(8):2525-8. doi: 10.1016/j.bmcl.2010.02.101. Epub Mar. 3, 2010.
Song et al., Ionic liquids as powerful media in scandium triflate catalysed Diels-Alder reactions: significant rate acceleration, selectivity improvement and easy recycling of catalyst. Chem Commun. 2001;12:1122-3.
Sperry et al., Studies on the Diels-Alder reaction of annulated furans: application to the synthesis of substituted phenanthrenes. Tetrahedron Letters. Apr. 18, 2005;46(16):2789-93. Doi: 10.1016/j.tetlet.2005.02.148.
Tseng et al., Synthesis and Evaluation of Cantharidinimides on Human Cancer Cells. J Exp Clin Med. Oct. 2012;4(5):280-283.
U.S. Appl. No. 14/913,335, filed Feb. 19, 2016, Davidson.
U.S. Appl. No. 15/535,860, filed Jun. 14, 2017, Davidson et al.
U.S. Appl. No. 16/995,606, filed Aug. 17, 2020, Davidson et al.
U.S. Appl. No. 15/544,669, filed Jul. 19, 2017, Davidson et al.
U.S. Appl. No. 16/619,675, filed Dec. 5, 2019, Welgus et al.
U.S. Appl. No. 16/621,854, filed Dec. 12, 2019, Davidson et al.
U.S. Appl. No. 16/753,660, filed Apr. 3, 2020, Davidson et al.
U.S. Appl. No. 29/607,744, filed Jun. 15, 2017, Davidson et al.
[No Author Listed] Journal of Organic Chemistry Author Guidelines. Last updated May 5, 2022. 3 pages.
Chen et al., Precautions with gentian violet: skin marking made sterile, effective, and economical. Am J Infect Control. Apr. 2009;37(3):244-6. doi: 10.1016/j.ajic.2008.06.005. Epub Oct. 14, 2008.
Chung et al., Sequential Nitromethane Conjugate Addition/Elimination—PD-Catalyzed Allylation of beta-Trifloxy Acrylates. Application to Carbapenem Synthesis. Org Lett. 1999;1(11):1783-1785.
Earle et al., Diels-Alder reactions in ionic liqu1449—. A safe recyclable alternative to lithium perchlorate-diethyl ether mixtures. Green Chem. Feb. 1999; 1:23-25. doi: 10.1039/A808052F.
Gaul, Part I. Diels-Alder reactions performed in highly polar media. Part II. Reactions of allenylstannanes with in situ generated immonium ions. Dissertation. Indiana University, Bloomington Indiana, 1990. 152 pages.
Harreus et al., 2-Pyrrolidone. Ullmann's Encyclopedia of Industrial Chemistry. 2000. doi: doi: 10.1002/14356007.a22_457.pub2.
Pulce et al., Denatonium Benzoate. Human Toxicol. Jan. 1996;1-12. Accessed 2022 Sep. 12 from <https://www.sciencedirect.com/topics/medicine-and-dentistry/denatonium-benzoate>.
Rossy et al., Aromatization of Dihyrothiophenes. Thiophenesaccharin: A Sweet Surprise. J Org Chem. 1980;45:617-620.
White et al., Quinoline Analogues of Ortho-Quinodimethane. Tetrahedron Lett. 1995;36(33):5983-5986.
EP 14837297.2, Date of Mailing Mar. 10, 2017, *Extended European Search Report.
PCT/US2014/052184, Date of Mailing Nov. 20, 2014, *International Search Report and Written Opinion.
EP 15871116.8, Date of Mailing Oct. 26, 2018, *Extended European Search Report.
PCT/US2015/066487, Date of Mailing Jul. 14, 2016, *International Search Report and Written Opinion.
PCT/US2015/066487, Date of Mailing Jun. 29, 2017, *International Preliminary Report on Patentability.
EP 16740681.8, Date of Mailing Aug. 8, 2018, *Supplementary European Search Report.
EP 16740681.8, Date of Mailing Dec. 4, 2018, *Extended European Search Report.
PCT/US2016/014139, Date of Mailing Jul. 1, 2016, *International Search Report and Written Opinion.
PCT/US2016/014139, Date of Mailing Aug. 3, 2017, *International Preliminary Report on Patentability.
PCT/US2018/036353, Date of Mailing Aug. 27, 2018, *Invitation to Pay Additional Fees.
PCT/US2018/036353, Date of Mailing Oct. 22, 2018, *International Search Report and Written Opinion.
PCT/US2018/037808, Date of Mailing Sep. 20, 2018, *Invitation to Pay Additional Fees.
PCT/US2018/037808, Date of Mailing Nov. 13, 2018, *International Search Report and Written Opinion.
PCT/US2018/037808, Date of Mailing Dec. 26, 2019, *International Preliminary Report on Patentability.
PCT/US2018/054373, Date of Mailing Dec. 10, 2018, *Invitation to Pay Additional Fees.
PCT/US2018/054373, Date of Mailing Apr. 3, 2019, *International Search Report and Written Opinion.
PCT/US2018/054373, Date of Mailing Apr. 16, 2020, *International Preliminary Report on Patentability.

* cited by examiner

Primary Examiner — Lilyana Bekic
Assistant Examiner — Holly M Rodriguez
(74) *Attorney, Agent, or Firm* — Wolf, Greenfield & Sacks, P.C.

(57) **CLAIM**

The ornamental design for an applicator, as shown and described.

DESCRIPTION

FIG. **1** is a perspective view of an applicator;
FIG. **2** is a right side view thereof, the left side view being a mirror image to the right side view;
FIG. **3** is a top view thereof; and,
FIG. **4** is a bottom view thereof.
The surface shading shown in FIGS. **1-2** indicates that the claimed applicator is transparent. Material, texture, color, surface finish and surface ornamentation form no part of the claimed design.
The dot-dash-dot lines represent the bounds of the claimed design that form no part of the claimed design. The remaining broken lines illustrate portions of the applicator that form no part of the claimed design.

1 Claim, 3 Drawing Sheets

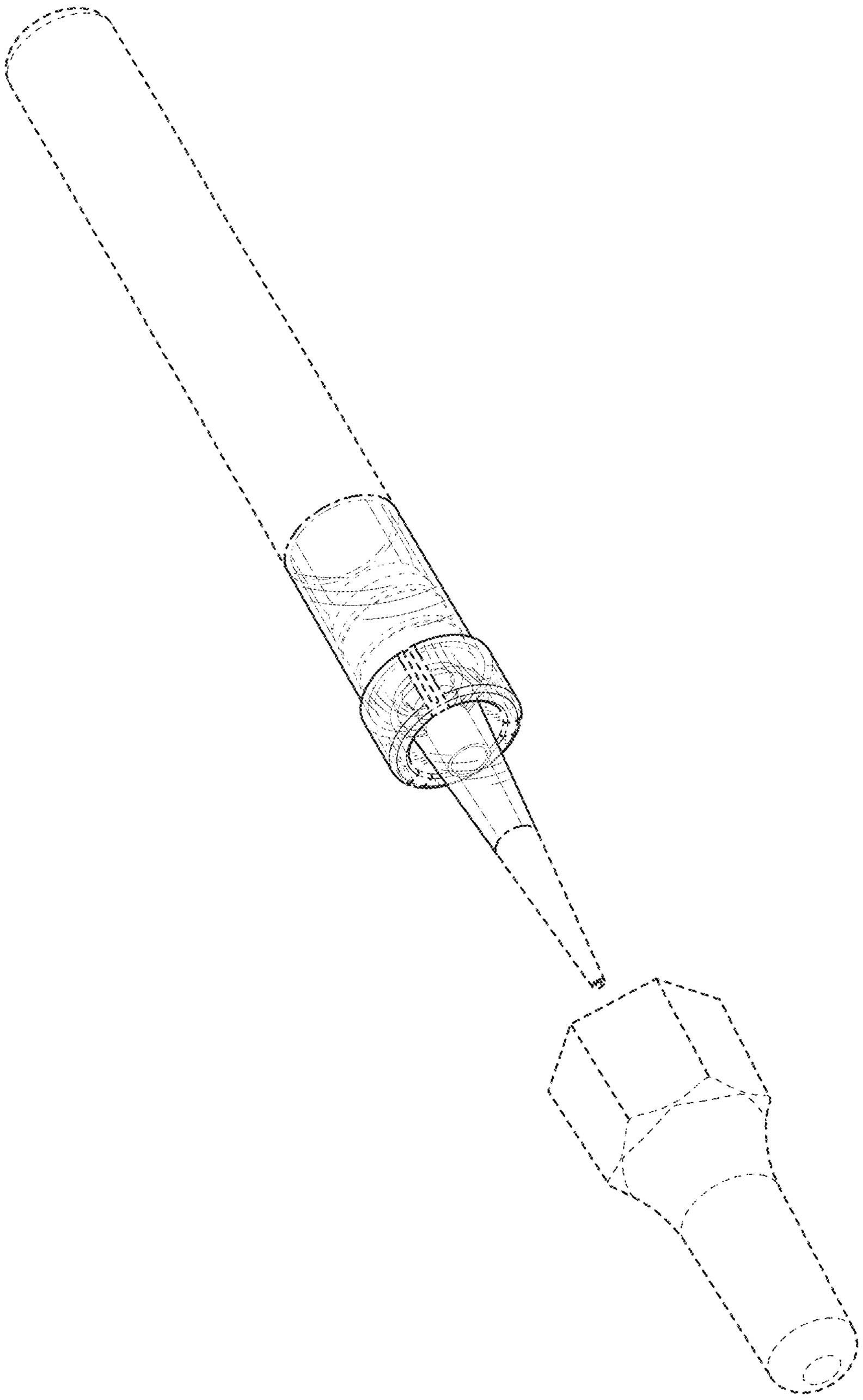


FIG. 1

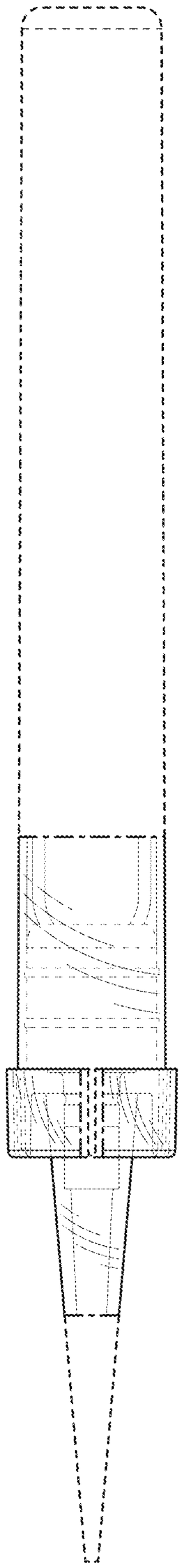


FIG. 2

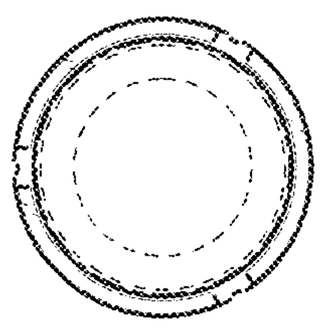


FIG. 4

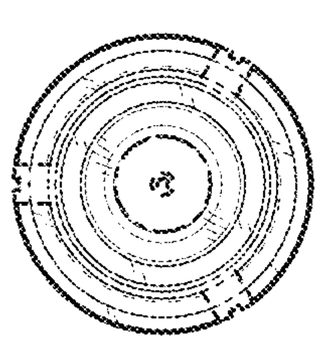


FIG. 3