



US00D937982S

(12) **United States Design Patent** (10) **Patent No.:** **US D937,982 S**
Boyd et al. (45) **Date of Patent:** **** Dec. 7, 2021**

(54) **APPARATUS FOR A PLUNGER SYSTEM**

(74) *Attorney, Agent, or Firm* — Jason P. Mueller;
FisherBroyles, LLP

(71) Applicant: **FlowCo Production Solutions, LLC**,
Fort Worth, TX (US)

(72) Inventors: **Garrett S. Boyd**, Godley, TX (US);
Mitchell A. Boyd, Haslet, TX (US)

(57) **CLAIM**

(73) Assignee: **FLOWCO PRODUCTION SOLUTIONS, LLC**, Fort Worth, TX (US)

The ornamental design for an apparatus for a plunger system, as shown and described.

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

(21) Appl. No.: **29/692,914**

DESCRIPTION

(22) Filed: **May 29, 2019**

(51) **LOC (13) Cl.** **23-01**

(52) **U.S. Cl.**
USPC **D23/249**

(58) **Field of Classification Search**
USPC D23/233
CPC E21B 43/121; E21B 33/068; E21B 43/123;
E21B 43/12

See application file for complete search history.

FIG. 1 is a top perspective view of an apparatus for a plunger system showing our new design;
FIG. 2 is a side view thereof;
FIG. 3 is a second side view thereof, taken at a 90-degree rotation from the view shown in FIG. 2;
FIG. 4 is a top view thereof;
FIG. 5 is a bottom view thereof;
FIG. 6 is a front view thereof;
FIG. 7 is a back view thereof, and featuring a dotted line shown for reference with respect to FIG. 8;
FIG. 8 is an internal view thereof, taken along the dotted line as shown in FIG. 7;
FIG. 9 is a top perspective view of an exploded view of an apparatus for a plunger system;
FIG. 10 is a side view thereof;
FIG. 11 is a second side view thereof, taken at a 90-degree rotation from the view shown in FIG. 10;
FIG. 12 is a top view thereof;
FIG. 13 is a bottom view thereof;
FIG. 14 is a front view thereof;
FIG. 15 is a back view thereof, and featuring a dotted line shown for reference with respect to FIG. 16; and,
FIG. 16 is an internal view thereof, taken along the dotted line as shown in FIG. 15.
The dotted lines shown in FIGS. 7 and 15 are shown for purposes of illustration, and do not constitute part of the claimed design.

(56) **References Cited**

U.S. PATENT DOCUMENTS

1,415,788 A 5/1922 Burlin
1,509,386 A 11/1924 Wilson
1,910,616 A 5/1933 Leahy

(Continued)

FOREIGN PATENT DOCUMENTS

CA 2428618 A1 11/2004
CA 2635993 A1 12/2009

(Continued)

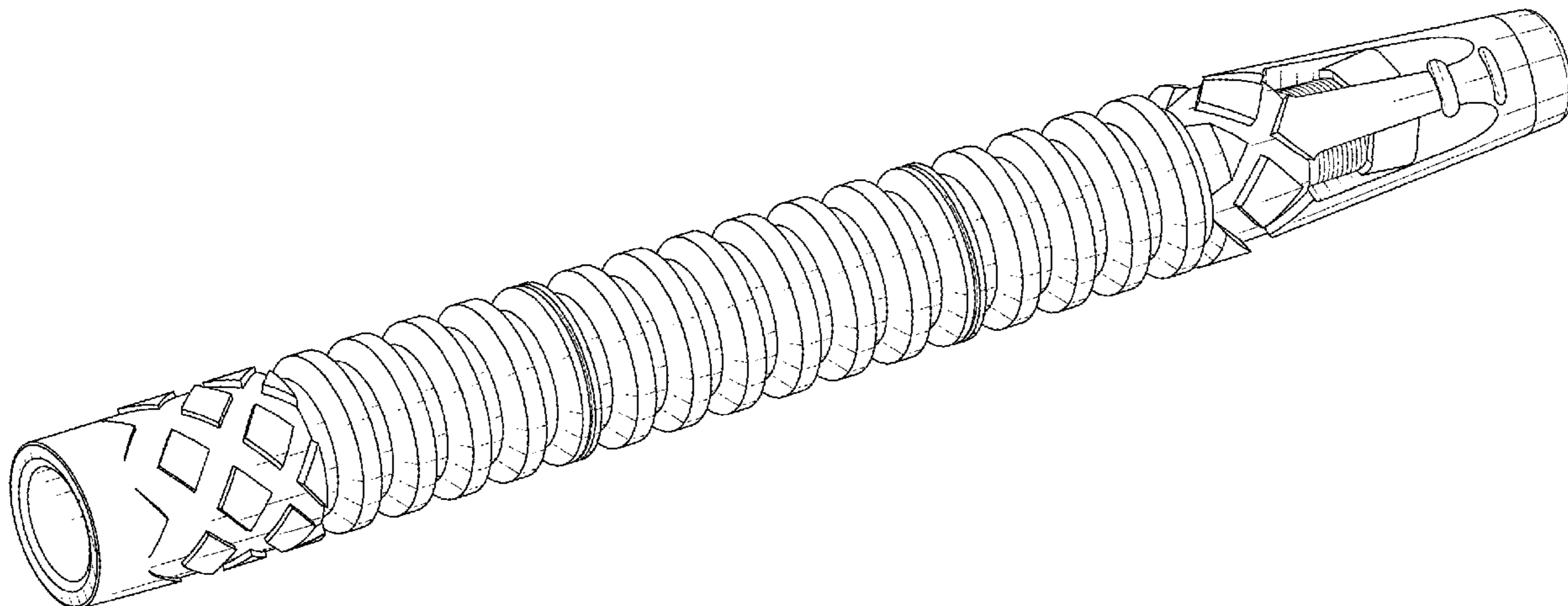
OTHER PUBLICATIONS

Bal-Seal, Bal Springtm Canted Coil Springs for Mechanical Applications, product website, 3 pages, www.balseal.com/mechanical.

(Continued)

Primary Examiner — Gino Colan

1 Claim, 10 Drawing Sheets



(56)

References Cited

U.S. PATENT DOCUMENTS

1,932,992 A	10/1933	Sherman et al.	7,314,080 B2	1/2008	Giacomino
2,018,204 A	10/1935	Seth et al.	7,322,417 B2	1/2008	Rytlewski et al.
2,175,770 A	10/1939	Dodson	7,328,748 B2	2/2008	Giacomino
2,215,751 A	9/1940	Coleman	7,383,878 B1	6/2008	Victor
2,301,319 A	11/1942	Peters	7,438,125 B2	10/2008	Victor
2,312,476 A	3/1943	Penick et al.	7,475,731 B2	1/2009	Victor
2,437,429 A	3/1948	Hossfeld	7,513,301 B2	4/2009	Victor
2,509,922 A	5/1950	Hall	7,523,783 B2	4/2009	Victor
2,642,002 A	6/1953	Knox et al.	7,819,189 B1	10/2010	Cosby
2,661,024 A	12/1953	Knox	7,954,545 B2	6/2011	Hearn et al.
2,676,547 A	4/1954	Knox	8,181,706 B2	5/2012	Tanton
2,714,855 A	8/1955	Brown	8,286,700 B1	10/2012	Franchini
2,762,310 A	9/1956	Eklund	8,347,955 B1	1/2013	Sewell et al.
2,785,757 A	3/1957	Middleton	8,448,710 B1	5/2013	Stephens
2,878,754 A	3/1959	McMurry	8,464,798 B2	6/2013	Nadkrynechny
2,956,797 A	10/1960	Polhemus	8,627,892 B2	1/2014	Nadkrynechny
2,962,978 A	12/1960	Paul	8,757,267 B2	6/2014	Mitchell et al.
2,970,547 A	2/1961	McMurry	8,863,837 B2	10/2014	Bender et al.
3,020,852 A	2/1962	Roach et al.	8,893,777 B1	11/2014	Garrett
3,055,306 A	9/1962	Tausch	9,068,443 B2	6/2015	Jefferies et al.
3,090,315 A	5/1963	Milton	9,677,389 B2	6/2017	Boyd et al.
3,127,197 A	3/1964	Kretzschmar	9,683,430 B1	6/2017	Kuykendall
3,146,725 A	9/1964	Harris	9,689,242 B2	6/2017	Kuykendall et al.
3,171,487 A	3/1965	Ault	9,790,772 B2	10/2017	Jefferies et al.
3,181,470 A	5/1965	Clingman	9,915,133 B2 *	3/2018	Mitchell et al.
3,304,874 A	2/1967	Ray	9,957,784 B1 *	5/2018	Mitchell et al.
3,395,759 A	8/1968	Talley, Jr.	9,957,785 B2 *	5/2018	Mitchell et al.
3,412,798 A	11/1968	Gregston	10,018,015 B2	7/2018	Purkis et al.
3,508,428 A	4/1970	Matson	10,161,230 B2	12/2018	Roycroft et al.
3,806,106 A	4/1974	Hamel et al.	10,221,849 B2	3/2019	Roycroft et al.
3,861,471 A	1/1975	Douglas	10,273,789 B2	4/2019	Boyd et al.
3,944,641 A	3/1976	Lemelson	10,550,674 B2	2/2020	Boyd et al.
4,018,248 A	4/1977	Carr	10,669,824 B2 *	6/2020	Mitchell et al. E21B 43/12
4,030,858 A	6/1977	Coles, Jr.	10,767,679 B2	9/2020	Balsells
4,211,279 A	7/1980	Isaacks	2002/0005284 A1	1/2002	Allen
4,239,458 A	12/1980	Yeatts	2003/0155129 A1	8/2003	Gray et al.
4,440,229 A	4/1984	Burch	2003/0198513 A1	10/2003	Wang
4,502,843 A	3/1985	Martin	2004/0017049 A1	1/2004	Fink
4,531,891 A	7/1985	Coles, III	2004/0066039 A1	4/2004	Muhammad et al.
4,571,162 A	2/1986	Knox	2004/0070128 A1	4/2004	Balsells
4,629,004 A	12/1986	Griffin	2004/0129428 A1	7/2004	Kelley
4,782,896 A	11/1988	Witten	2005/0056416 A1	3/2005	Gray et al.
4,896,720 A	1/1990	DeRouen	2005/0241819 A1	11/2005	Victor
4,932,471 A	6/1990	Tucker et al.	2006/0024928 A1	2/2006	Seebauer et al.
4,951,752 A	8/1990	Coleman	2006/0054329 A1	3/2006	Chisholm
4,995,459 A	2/1991	Mabry	2006/0113072 A1	6/2006	Lee
5,218,763 A	6/1993	Marker et al.	2006/0124292 A1	6/2006	Victor
5,253,713 A	10/1993	Gregg et al.	2006/0124294 A1	6/2006	Victor
5,280,890 A	1/1994	Wydra	2006/0185853 A1	8/2006	Bender
5,417,291 A	5/1995	Leising	2006/0207796 A1	9/2006	Stewart
5,427,504 A	6/1995	Dinning et al.	2006/0214019 A1	9/2006	Ollendick
5,868,384 A	2/1999	Anderson	2006/0249284 A1	11/2006	Victor
6,045,335 A	4/2000	Dinning	2007/0110541 A1	5/2007	Rawlins et al.
6,148,923 A	11/2000	Casey	2007/0124919 A1	6/2007	Probst
6,176,309 B1	1/2001	Bender	2007/0151738 A1	7/2007	Giacomino
6,200,103 B1	3/2001	Bender	2007/0158061 A1	7/2007	Casey
6,209,637 B1	4/2001	Wells	2008/0029271 A1	2/2008	Bolding et al.
6,234,770 B1	5/2001	Ridley et al.	2008/0029721 A1	2/2008	Miyahara
6,467,541 B1	10/2002	Wells	2009/0229835 A1	9/2009	Filippov
6,478,087 B2	11/2002	Allen	2009/0308691 A1	12/2009	Commins et al.
6,554,580 B1	4/2003	Mayfield et al.	2010/0038071 A1	2/2010	Scott et al.
6,637,510 B2	10/2003	Lee	2011/0253382 A1	10/2011	Nadkrynechny
6,644,399 B2	11/2003	Abbott et al.	2011/0259438 A1	10/2011	Osborne
6,669,449 B2	12/2003	Giacomino	2012/0036913 A1	2/2012	Johnson
6,725,916 B2	4/2004	Gray et al.	2012/0204977 A1	8/2012	Lembcke
6,745,839 B1	6/2004	Simpson	2012/0304577 A1	12/2012	Reid et al.
6,755,628 B1	6/2004	Howell	2012/0305236 A1	12/2012	Gouthaman
6,808,019 B1	10/2004	Mabry	2012/0318524 A1	12/2012	Lea, Jr.
6,846,509 B2	1/2005	Chen et al.	2013/0020091 A1	1/2013	Maerz
6,848,509 B2	2/2005	Myerley	2013/0133876 A1	5/2013	Naedler et al.
6,907,926 B2	6/2005	Bosley	2014/0090830 A1	4/2014	Maerz et al.
7,040,401 B1	5/2006	McCannon	2014/0116714 A1	5/2014	Jefferies et al.
7,055,812 B2	6/2006	Balsells	2014/0131107 A1	5/2014	Southard
7,121,335 B2	10/2006	Townsend	2014/0131932 A1	5/2014	Balsells et al.
7,290,602 B2	11/2007	Victor	2014/0230940 A1	8/2014	Patton
			2015/0027713 A1	1/2015	Penisson
			2015/0136389 A1	5/2015	Bergman
			2015/0167428 A1	6/2015	Hofman et al.
			2015/0316115 A1	11/2015	Carter

(56)

References Cited

EP 2085572 A2 8/2009
GB 1458906 A 12/1976

U.S. PATENT DOCUMENTS

2016/0010436 A1 1/2016 Boyd
2016/0061012 A1 3/2016 Zimmerman, Jr.
2016/0061239 A1 3/2016 Heaphy et al.
2016/0108710 A1 4/2016 Hightower et al.
2016/0238002 A1 8/2016 Williams et al.
2016/0245417 A1 8/2016 Boyd et al.
2017/0058651 A1 3/2017 Damiano et al.
2017/0107802 A1 4/2017 Kuykendall et al.
2017/0107803 A1 4/2017 Cedillo et al.
2017/0122084 A1 5/2017 Brewer et al.
2017/0268318 A1 9/2017 Roycroft et al.
2017/0362917 A1 12/2017 Esslemont et al.
2018/0355695 A1 12/2018 Holland
2019/0203570 A1 7/2019 Boyd et al.
2020/0088303 A1* 3/2020 Mitchell et al. F16K 1/00

FOREIGN PATENT DOCUMENTS

CA 2763511 A1 1/2011
CA 2791489 A1 12/2012

OTHER PUBLICATIONS

Lufkin, Plunger lift; Bumper Springs website, 2 pages, © 2013 Lufkin Industries, LLC www.lufkin.com.
Weatherford, Plunger Lift Systems brochure, 4 pages; © 2005 Weatherford www.weatherford.com.
HPAlloys Website printout or Monel K500 (2004).
Lufkin, Lufkin Well Manager Controller For Rod Lift Systems; website, <https://www.bhge.com/upstream/production-optimization/artificial-lift/artificial-lift-power-controls-and-automation>.
Smalley Steel Ring Company; Constant Section Rings (Snap Rings); product brochure (website); 3 pages www.smalley.com/reating/rings/constant-section-rings.

* cited by examiner

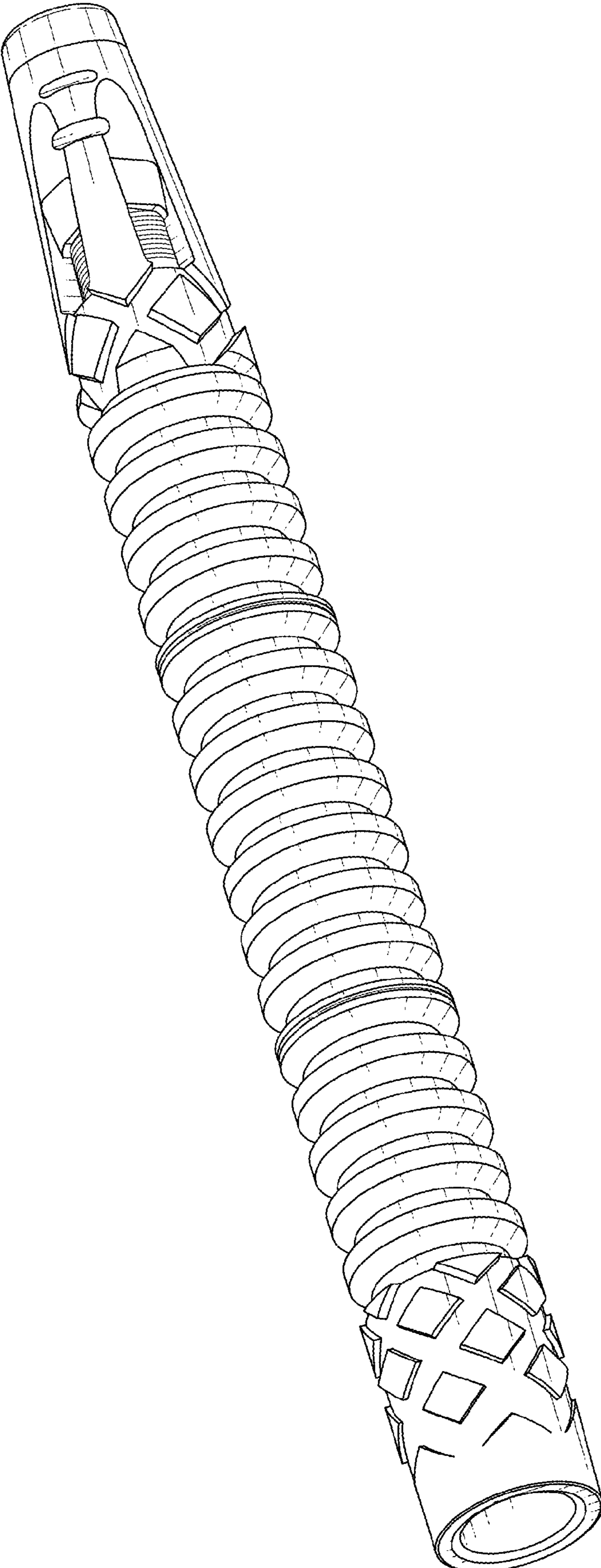


FIG. 1

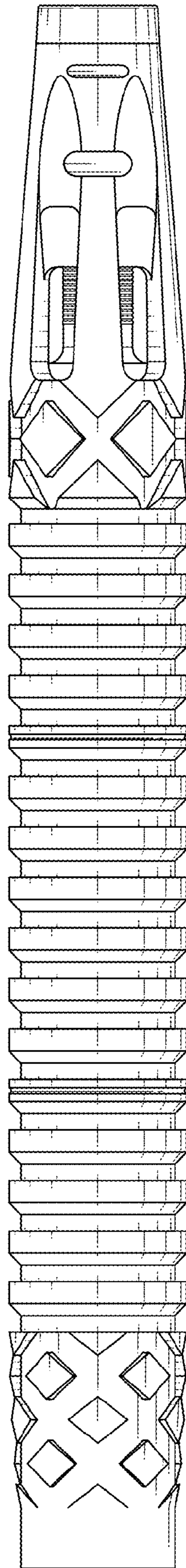


FIG. 2

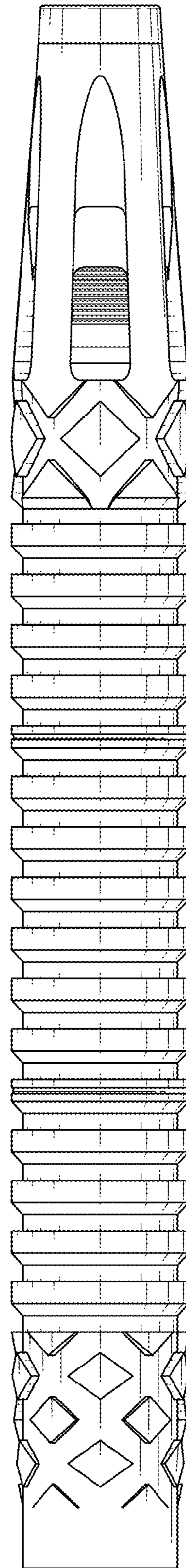


FIG. 3

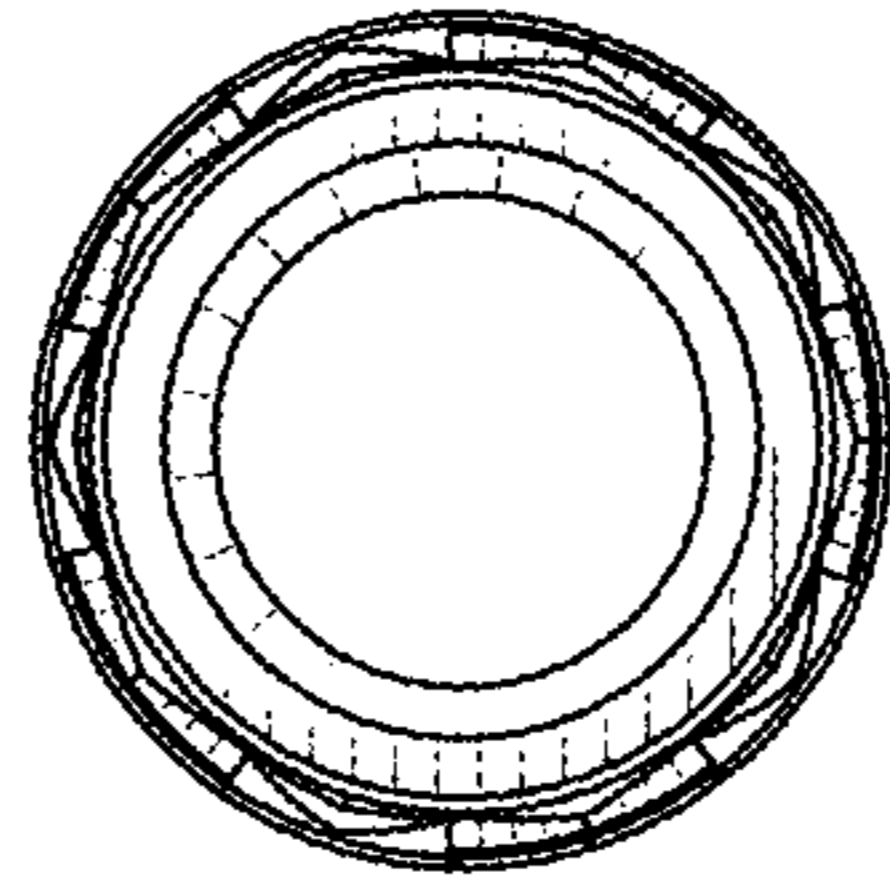


FIG. 4

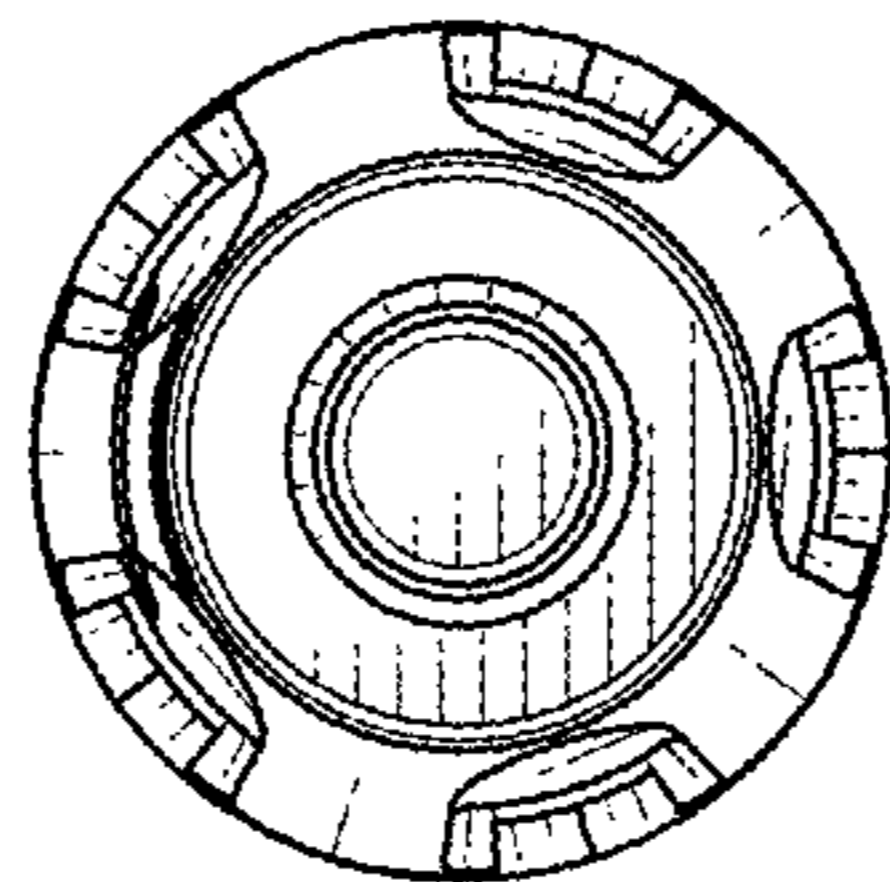


FIG. 5

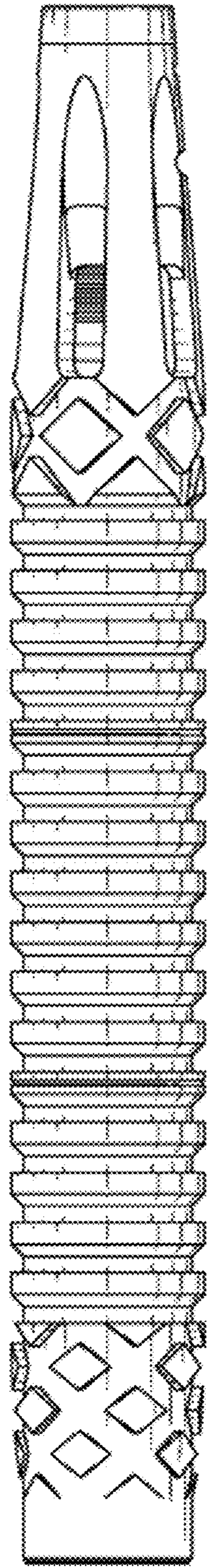


FIG. 6

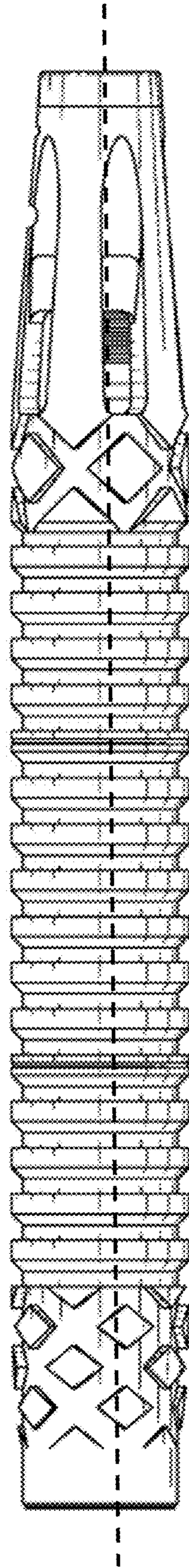


FIG. 7

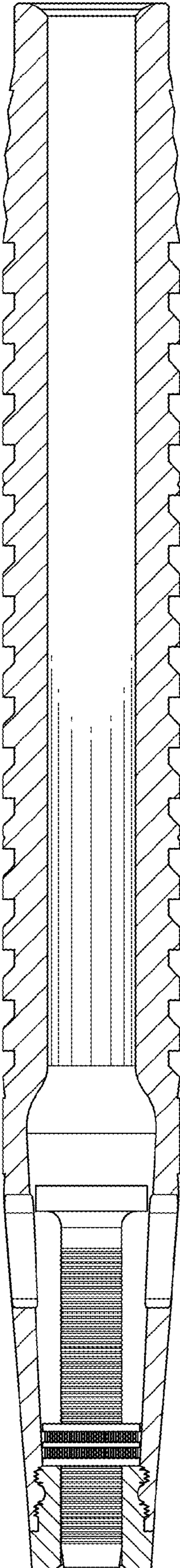


FIG. 8

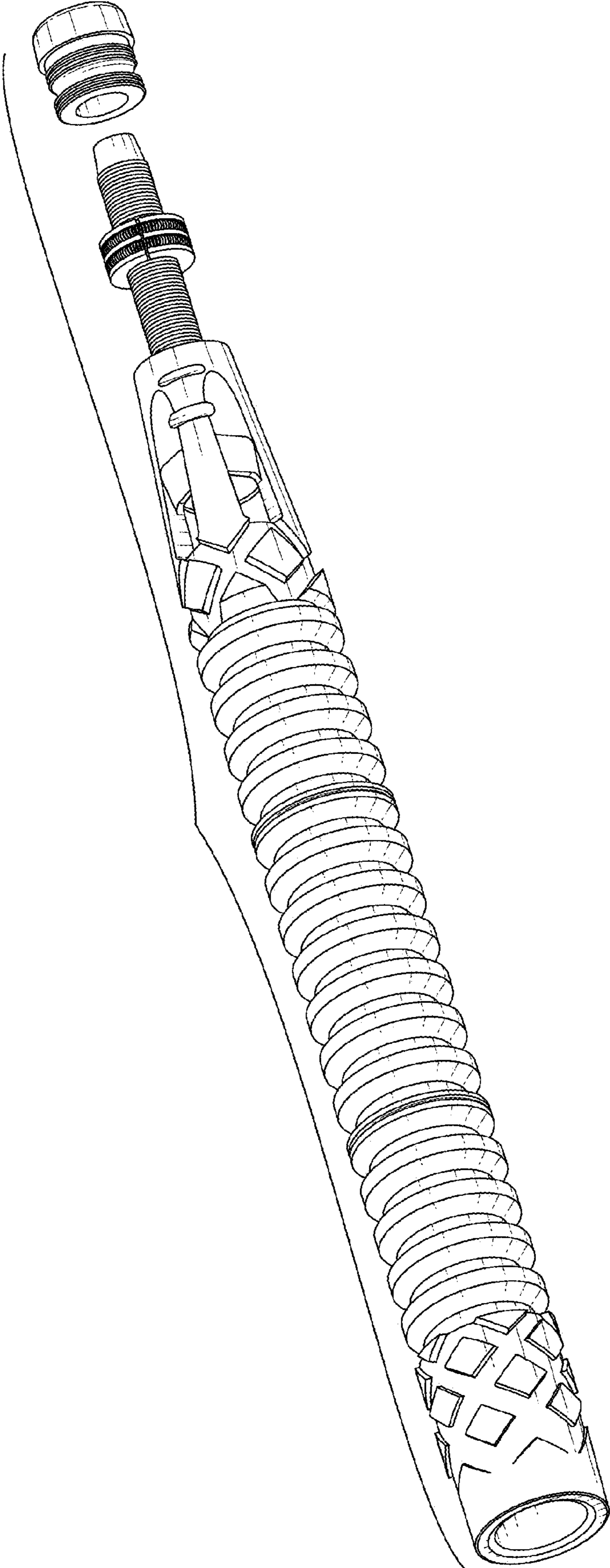


FIG. 9

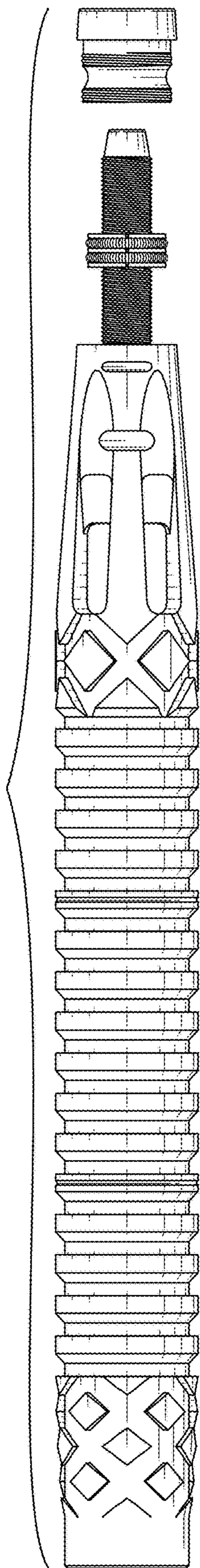


FIG. 10

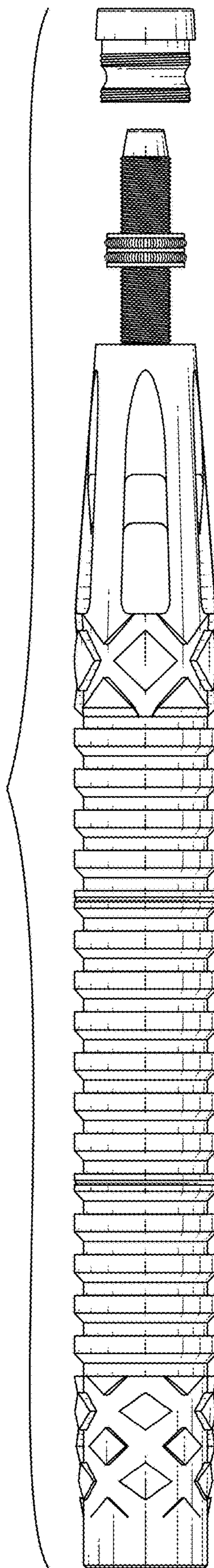


FIG. 11

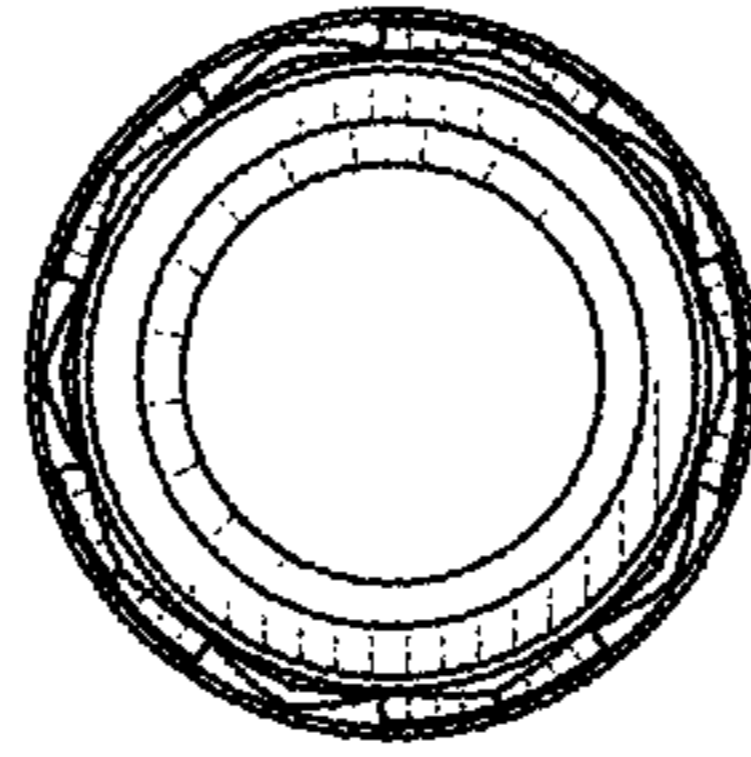


FIG. 12

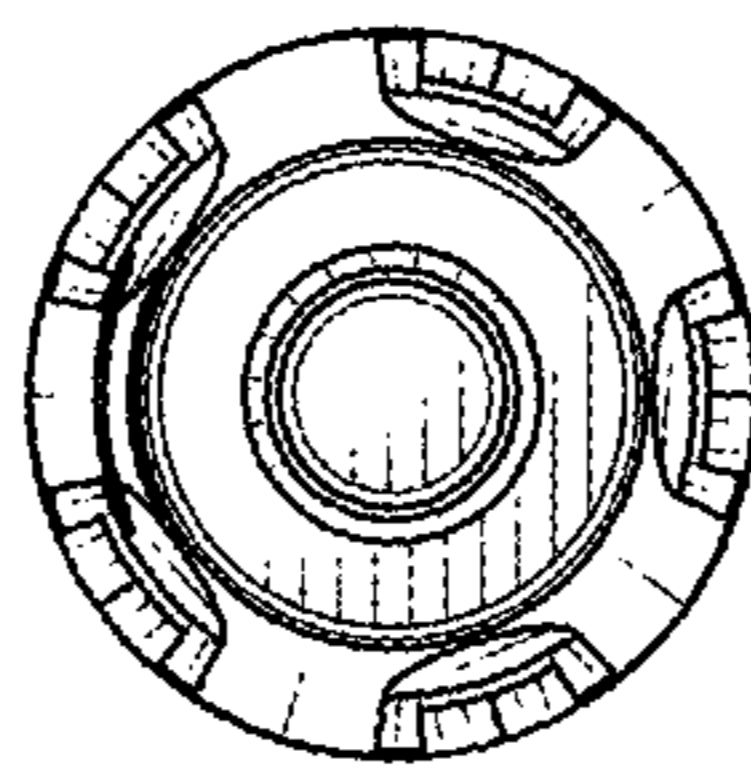


FIG. 13

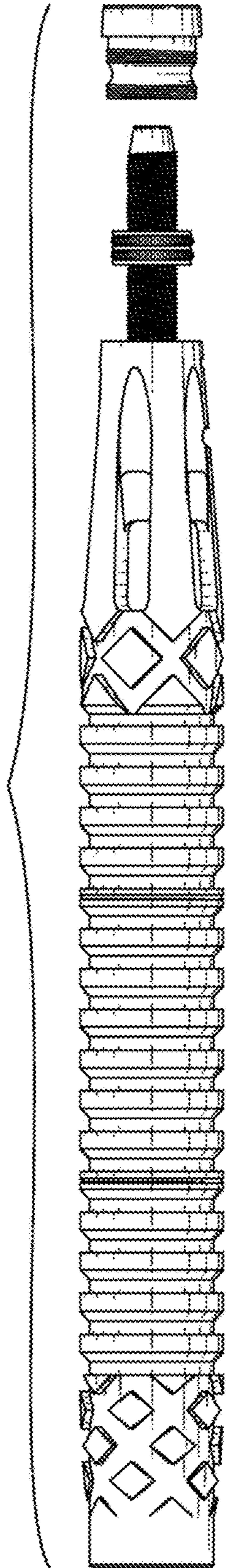


FIG. 14

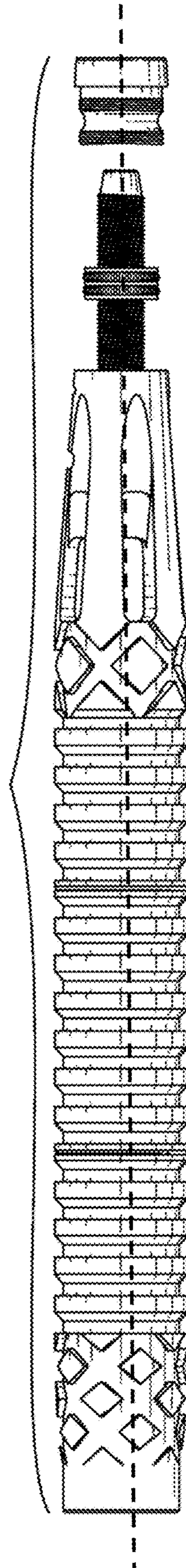


FIG. 15

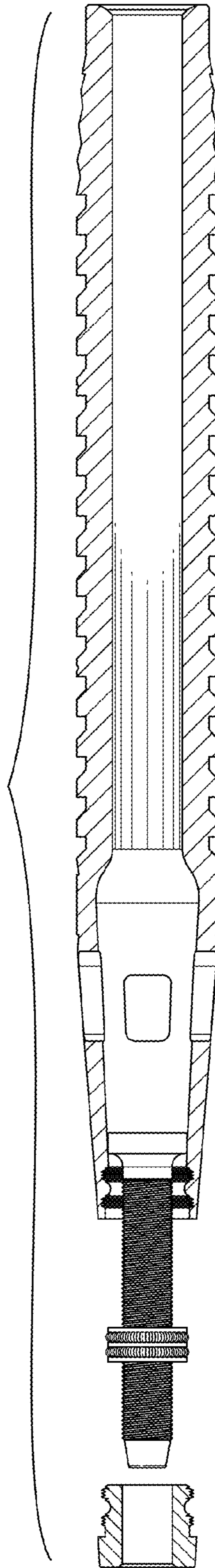


FIG. 16