



US00D904615S

(12) **United States Design Patent** (10) **Patent No.:** **US D904,615 S**  
**Asfora et al.** (45) **Date of Patent:** **\*\* Dec. 8, 2020**

(54) **BONE SCREW**  
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5,334,205 A 8/1994 Cain  
5,676,545 A 10/1997 Jones  
5,725,581 A 3/1998 Branemark  
5,735,898 A 4/1998 Branemark  
5,743,916 A 4/1998 Greenberg et al.  
D411,009 S 6/1999 Asfora  
6,030,162 A 2/2000 Huebner  
(Continued)

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

FOREIGN PATENT DOCUMENTS

WO 2014026134 A2 2/2014

(21) Appl. No.: **29/624,322**

OTHER PUBLICATIONS

(22) Filed: **Oct. 31, 2017**  
(51) **LOC (12) Cl.** ..... **24-03**  
(52) **U.S. Cl.**  
USPC ..... **D24/155**  
(58) **Field of Classification Search**  
USPC ..... D24/127, 130, 133, 146, 147, 155, 156,  
D24/157, 145; 606/311, 312, 323, 604;  
D8/385, 387, 388, 391, 393, 349, 382  
CPC ..... A61B 17/864; A61B 17/8635; A61B  
17/0401; A61B 17/3472; A61B 2017/564;  
A61B 17/1637; A61B 17/1671; A61B  
17/8875; A61B 17/7037; A61B 17/7032;  
A61B 17/7291; A61B 17/8605; A61B  
17/8685; A61B 17/70; A61B 17/7011;  
A61B 17/7035; A61B 17/7082; A61B  
17/86; A61B 17/861; A61B 17/8625;  
A61B 17/863; A61C 8/0022; A61C  
8/0006; A61C 8/0089  
See application file for complete search history.

An Injectable Cementing Screw for Fixation in Osteoporotic Bone  
<https://musculoskeletalkey.com/an-injectable-cementing-screw-for-fixation-in-osteoporotic-bone/> Aug. 21, 2016 (Year: 2016).\*

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(57) **CLAIM**

The ornamental design of a bone screw, as shown and described.

**DESCRIPTION**

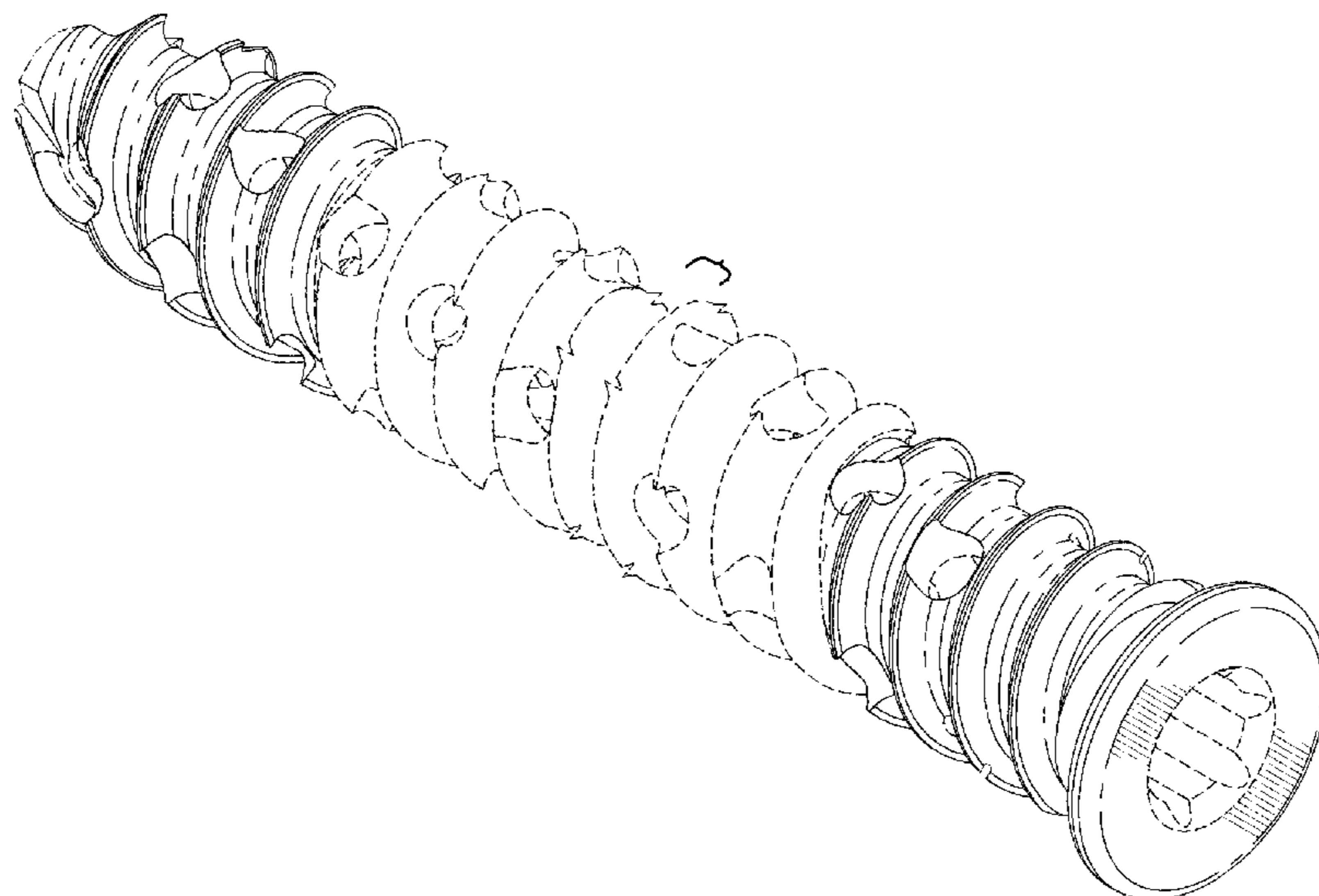
FIG. 1 is a front, top-right perspective-view of an embodiment of a bone screw;  
FIG. 2 is a rear, top-left perspective-view thereof;  
FIG. 3 is a top-side view thereof;  
FIG. 4 is a bottom-side view thereof;  
FIG. 5 is a rear view thereof;  
FIG. 6 is a front view thereof;  
FIG. 7 is a right-side view thereof; and,  
FIG. 8 is a left-side view thereof.  
The broken lines shown in FIGS. 1-8 illustrate portions of the bone screw that form no part of the claimed design. The bone screw is shown with a symbolic break in its length. The appearance of any portion of the article between the break lines forms no part of the claimed design.

**1 Claim, 7 Drawing Sheets**

(56) **References Cited**

U.S. PATENT DOCUMENTS

1,563,574 A 12/1925 Jensen  
2,243,718 A 5/1941 Moreira  
2,943,624 A 7/1960 Alquist  
3,844,318 A 10/1974 Raia et al.  
4,563,178 A 1/1986 Santeramo  
5,061,181 A 10/1991 Niznick



(56)

References Cited

U.S. PATENT DOCUMENTS

6,135,772	A	10/2000	Jones	10,631,905	B2 *	4/2020	Asfora .....	A61B 17/8625
6,149,686	A	11/2000	Kuslich et al.	2001/0004694	A1	6/2001	Carchidi	
6,287,343	B1	9/2001	Kuslich et al.	2002/0087161	A1	7/2002	Randall	
6,391,058	B1	5/2002	Kuslich et al.	2006/0149263	A1	7/2006	Newcomb	
6,517,542	B1	2/2003	Papay et al.	2006/0247642	A1	11/2006	Stone	
6,554,830	B1	4/2003	Chappius	2007/0233123	A1 *	10/2007	Ahmad .....	A61B 17/863 606/307
6,565,572	B2	5/2003	Chappius	2009/0318981	A1	12/2009	Kang	
6,604,945	B1	8/2003	Jones	2010/0211118	A1	8/2010	Christen	
6,755,835	B2	6/2004	Schultheiss et al.	2011/0137352	A1	6/2011	Biedermann et al.	
7,354,442	B2	4/2008	Sasso et al.	2011/0137354	A1	6/2011	Matthis	
D578,218	S	10/2008	Purga	2011/0190830	A1 *	8/2011	Biedermann .....	A61B 17/8685 606/305
D588,699	S	3/2009	Aldecoa	2011/0213426	A1 *	9/2011	Yedlicka .....	A61B 17/8635 606/309
7,527,611	B2	5/2009	Sweeney	2012/0010659	A1	1/2012	Angert	
7,575,572	B2	8/2009	Sweeney	2012/0022603	A1	1/2012	Kirschman	
D601,703	S	10/2009	Kahdemann	2012/0089195	A1	4/2012	Yedlicka et al.	
7,608,062	B2	10/2009	Sweeney	2012/0197311	A1	8/2012	Kirschman	
D603,513	S	11/2009	Emanuelli	2012/0232599	A1	9/2012	Schoenly	
D604,851	S	11/2009	Ishikawa	2013/0065698	A1	3/2013	Biedermann et al.	
D605,291	S	12/2009	Ishikawa	2013/0072986	A1	3/2013	Robinson	
7,717,947	B1	5/2010	Wilberg et al.	2013/0237813	A1	9/2013	Beyar	
D620,117	S	7/2010	Dawson	2013/0245602	A1	9/2013	Sweeney	
8,062,270	B2	11/2011	Sweeney et al.	2014/0012340	A1	1/2014	Beck et al.	
D659,247	S	5/2012	Lussi	2014/0046381	A1 *	2/2014	Asfora .....	A61B 17/1615 606/304
D667,548	S	9/2012	Brannon	2014/0058460	A1	2/2014	Reed	
D668,764	S	10/2012	Lussi	2014/0277188	A1	9/2014	Poulos	
8,303,602	B2	11/2012	Biedermann et al.	2015/0127057	A1 *	5/2015	Ganey .....	A61B 17/7098 606/309
8,382,808	B2	2/2013	Wilberg et al.	2015/0230844	A1	8/2015	Ellis	
8,574,273	B2 *	11/2013	Russell .....	2015/0238203	A1	8/2015	Asfora	
			A61B 17/8605 606/304	2015/0272646	A1	10/2015	Russell	
8,764,797	B2	7/2014	Dreyfuss et al.	2015/0313658	A1 *	11/2015	Kolb .....	A61B 17/8625 606/309
8,808,337	B2	8/2014	Sweeney et al.	2015/0320469	A1	11/2015	Biedermann	
8,870,836	B2	10/2014	Sweeney	2016/0000489	A1	1/2016	Kaloostian	
8,945,193	B2	2/2015	Kirschman	2016/0008044	A1	1/2016	Sweeney	
8,956,369	B2	2/2015	Millett et al.	2016/0038205	A1 *	2/2016	Smith .....	A61B 17/1655 606/304
8,992,587	B2	3/2015	Kirschman	2016/0120583	A1	5/2016	Bales	
9,055,986	B1	6/2015	Whipple	2016/0143671	A1	5/2016	Jiminez	
9,131,970	B2	9/2015	Kang	2016/0143679	A1	5/2016	Asfora	
9,173,692	B1	11/2015	Kaloostian	2016/0143742	A1	5/2016	Asfora	
9,198,702	B2	12/2015	Biederman et al.	2016/0151100	A1	6/2016	Biedermann et al.	
D748,263	S	1/2016	Ishiwata	2016/0157908	A1 *	6/2016	Cawley .....	A61B 17/7032 606/301
9,265,540	B2	2/2016	Kirschman	2016/0220291	A1	8/2016	Russell et al.	
9,271,742	B2	3/2016	Asfora	2016/0310188	A1	10/2016	Marino et al.	
9,271,743	B2	3/2016	Asfora	2017/0095349	A1 *	4/2017	Asfora .....	A61F 2/4455
9,295,488	B2	3/2016	Asfora	2018/0014867	A1 *	1/2018	Mazel .....	A61B 17/864
9,326,779	B2	5/2016	Dorawa et al.	2018/0235596	A1 *	8/2018	Housman .....	A61B 17/0401
9,326,801	B2	5/2016	Poulos	2018/0263617	A1 *	9/2018	Feezor .....	A61B 17/0401
9,333,018	B2	5/2016	Russell et al.	2018/0360915	A1 *	12/2018	Hart .....	A61F 2/0811
9,445,852	B2	9/2016	Sweeney	2019/0105131	A1 *	4/2019	Barton .....	A61C 8/0022
9,526,548	B2	12/2016	Asfora	2019/0125408	A1 *	5/2019	Asfora .....	A61B 17/8625
9,566,100	B2	2/2017	Asfora	2019/0328426	A1 *	10/2019	Cormier .....	A61B 17/8635
D783,821	S *	4/2017	Folsom .....	2019/0343562	A1 *	11/2019	Lintula .....	A61F 2/42
			D24/155	2019/0343565	A1 *	11/2019	Tempco .....	B33Y 80/00
9,616,205	B2	4/2017	Nebosky et al.	2019/0350683	A1 *	11/2019	Kenealy .....	A61C 8/0048
9,642,656	B2	5/2017	Kotuljac et al.					
D812,751	S *	3/2018	Richter .....					
			D24/146					
10,179,014	B1 *	1/2019	Menmuir .....					
			A61B 17/864					
D847,994	S *	5/2019	Asfora .....					
			D24/155					
D857,897	S *	8/2019	Loftus .....					
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D857,898	S *	8/2019	Loftus .....					
			D24/155					
D868,967	S *	12/2019	Sauer .....					
			D24/145					

\* cited by examiner

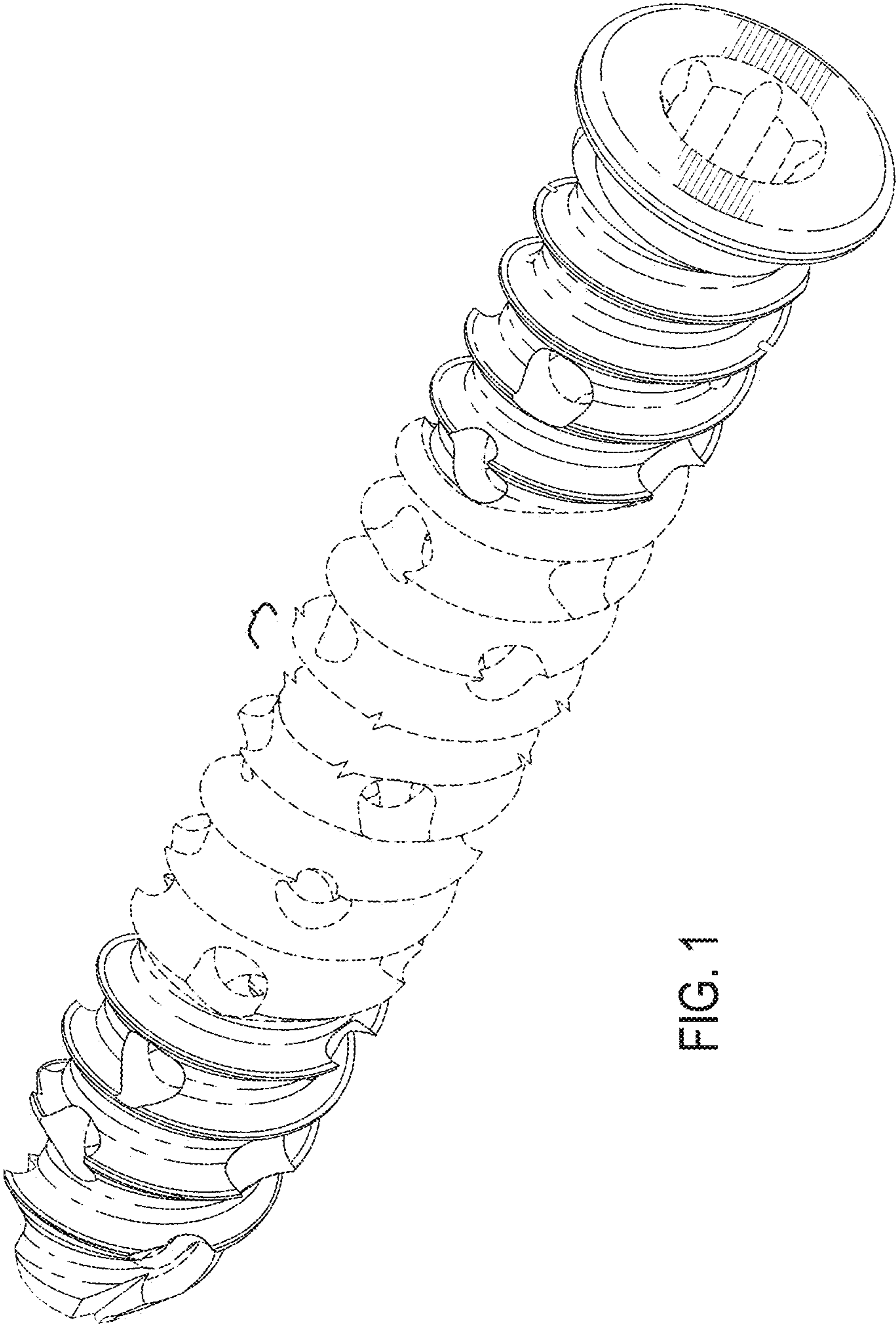


FIG. 1

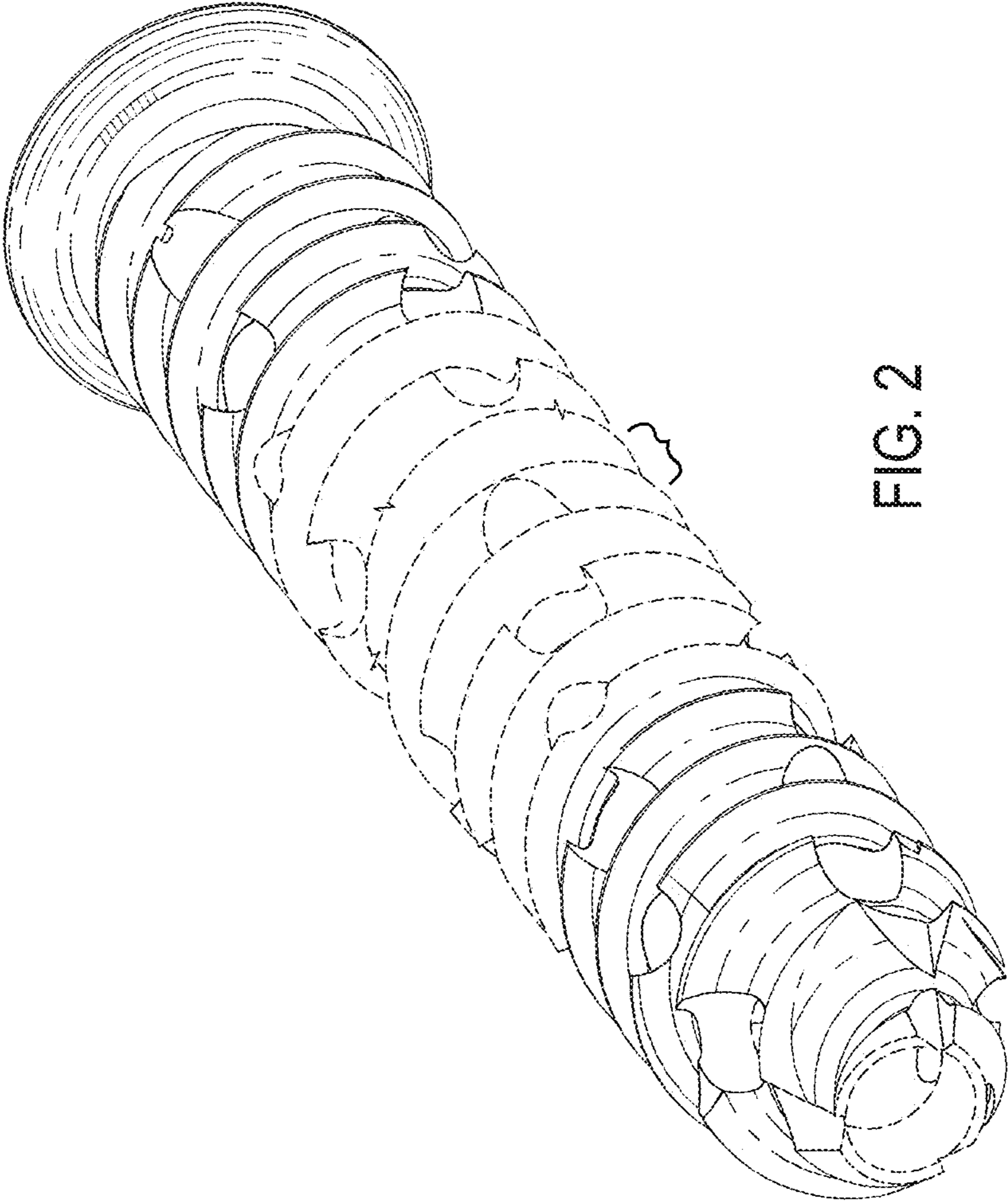


FIG. 2

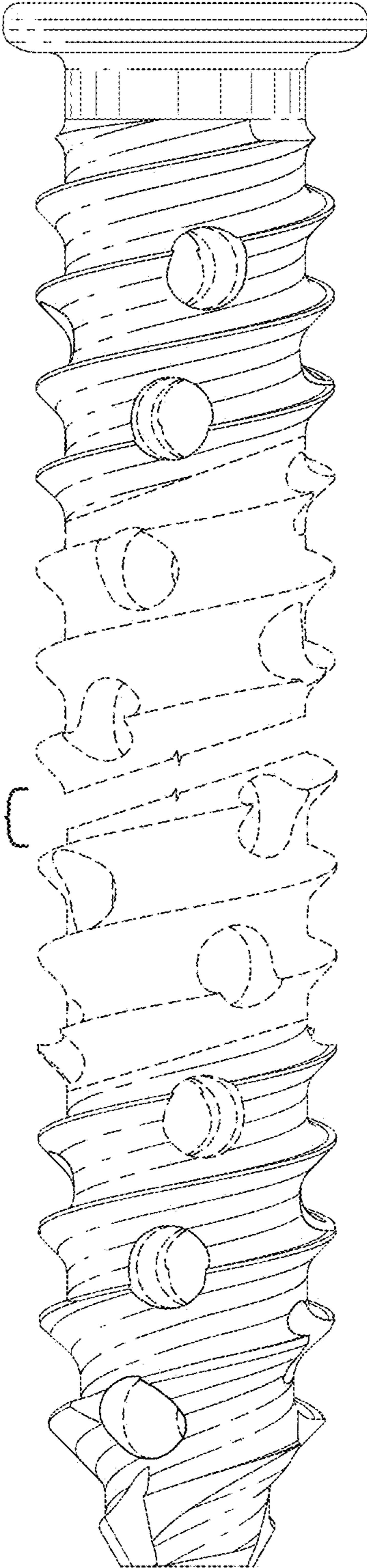


FIG. 3

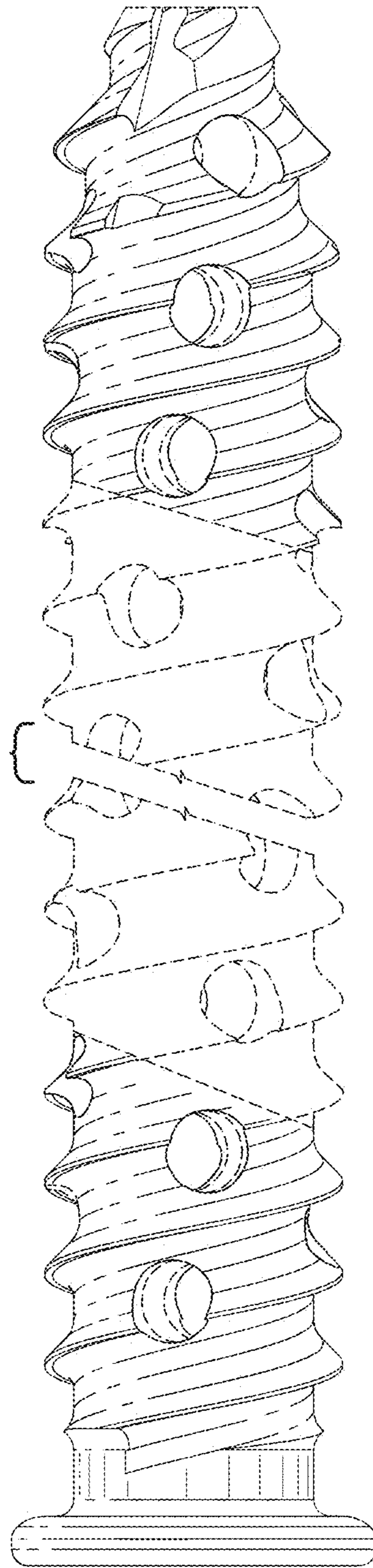


FIG. 4

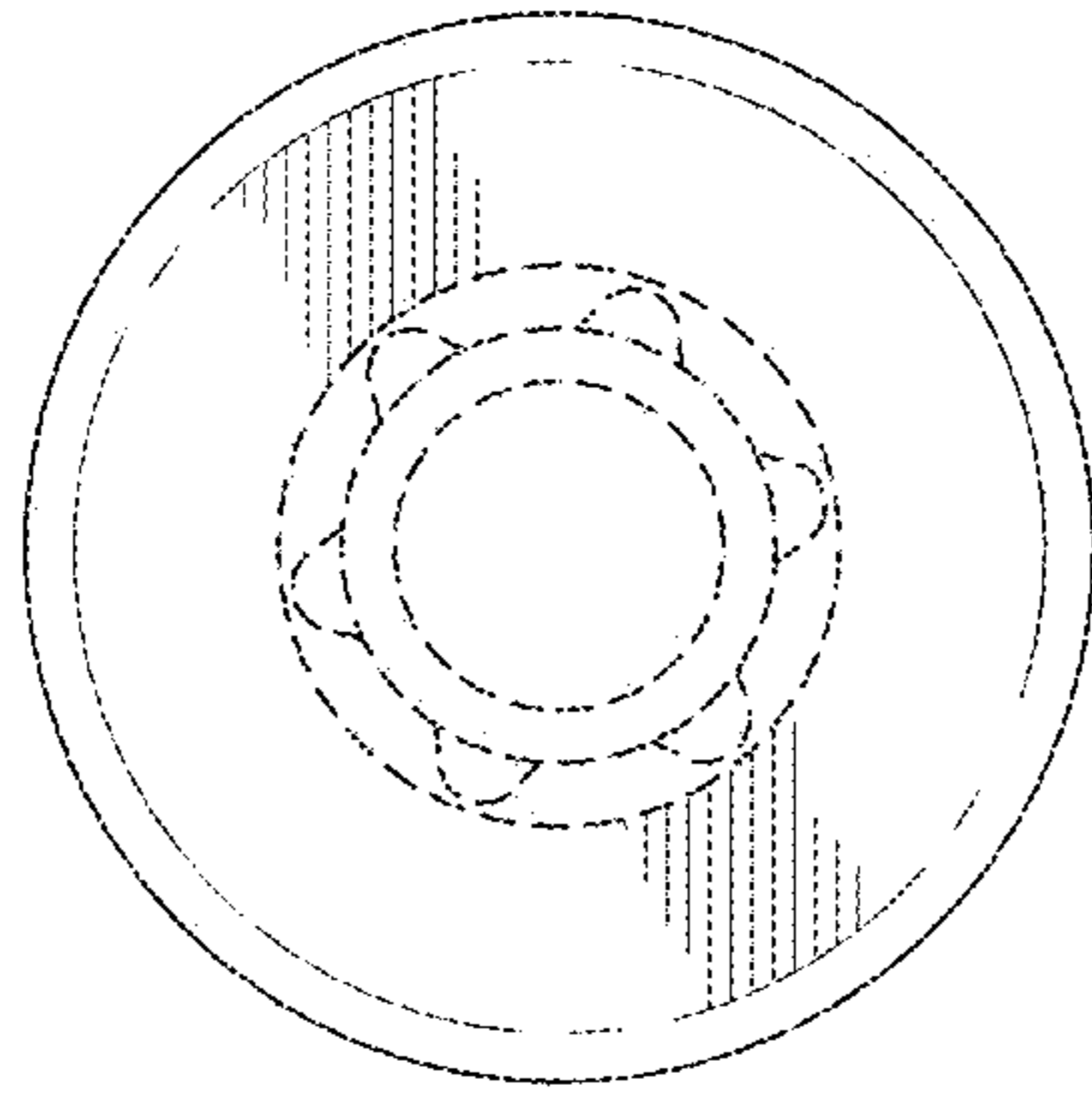


FIG. 6

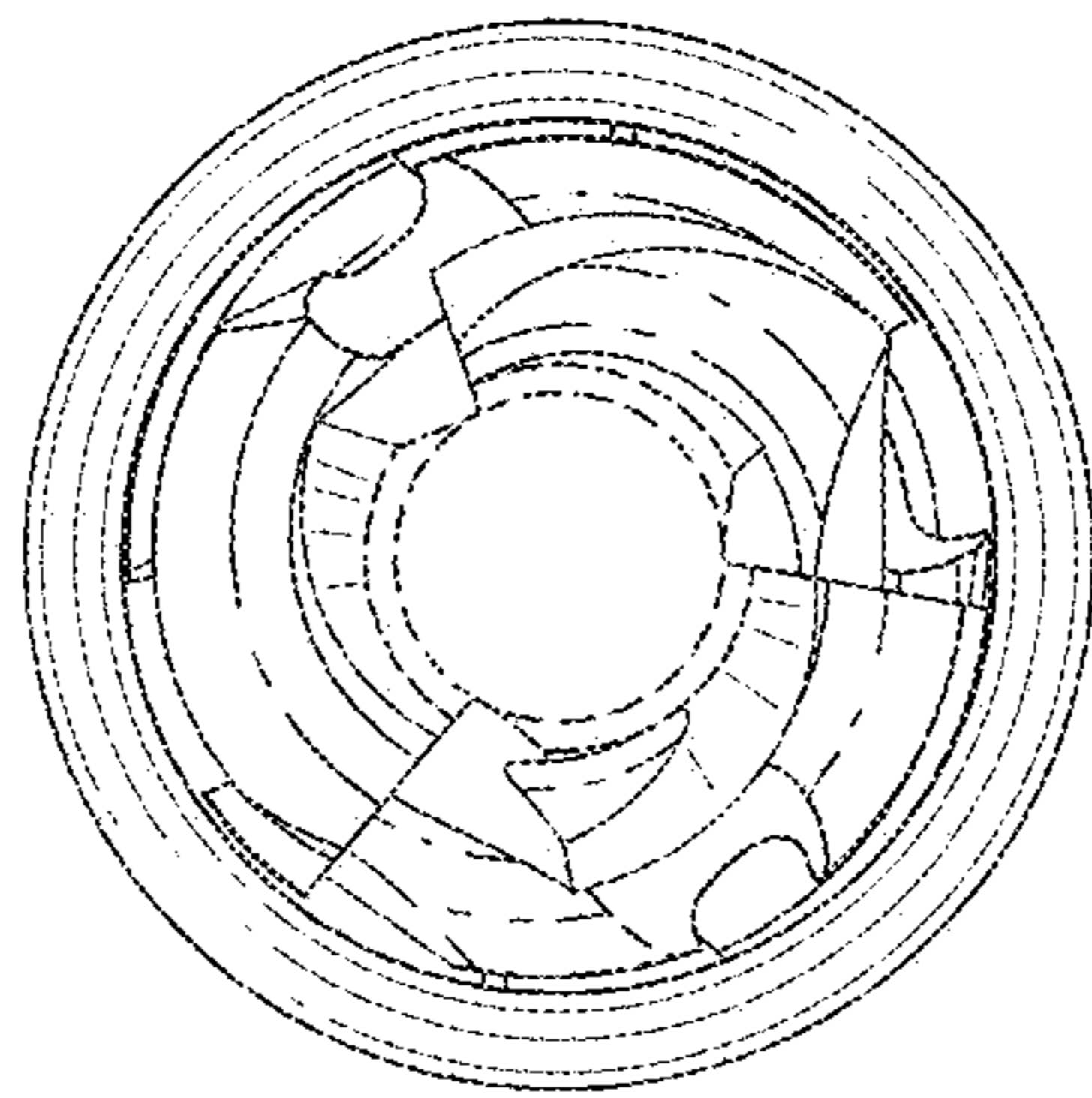


FIG. 5

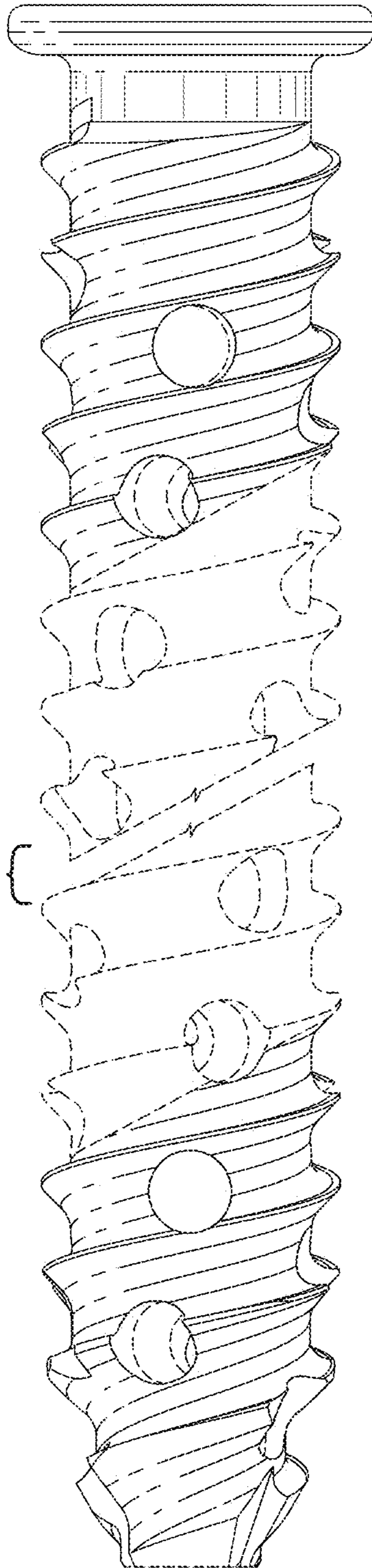


FIG. 7



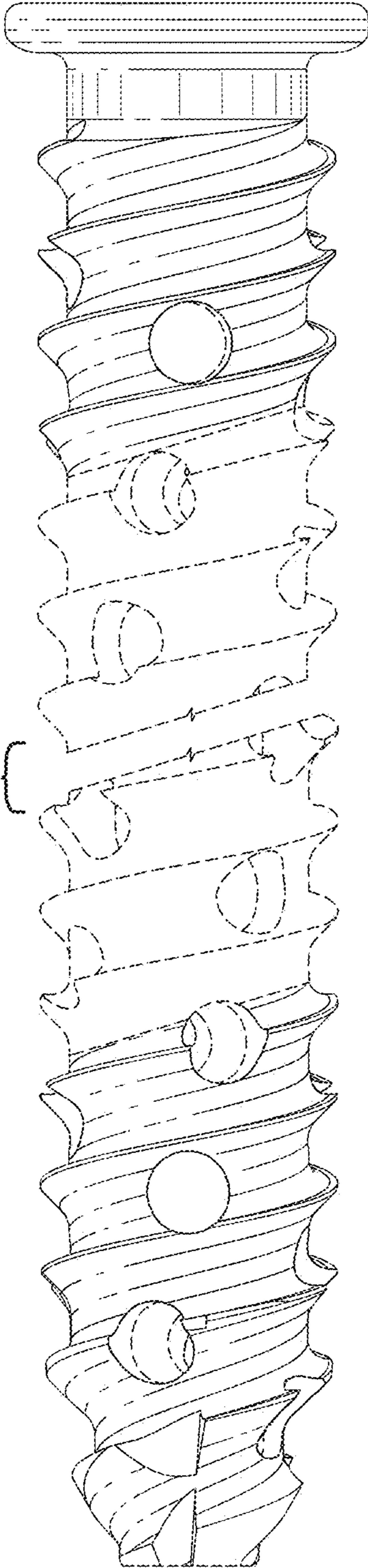


FIG. 8