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(12) **United States Design Patent**
Alfaro et al.

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(54) **CERAMIC BONDING TOOL WITH TEXTURED TIP**

(71) Applicant: **COORSTEK, INC.**, Golden, CO (US)

(72) Inventors: **Cesar Alfaro**, Lewisville, TX (US); **Russell Bell**, Ventura, CA (US); **Anne Cenedella**, Evergreen, CO (US); **Steve Govorchin**, Superior, CO (US); **Mark S. Greenwell**, Ventura, CA (US); **Brian Seegmiller**, Arvada, CO (US); **Matthew Simpson**, Evergreen, CO (US)

(73) Assignee: **CoorsTek, Inc.**, Golden, CO (US)

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

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Related U.S. Application Data

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(51) **LOC (11) Cl.** **15-09**
(52) **U.S. Cl.**
USPC **D15/144**
(58) **Field of Classification Search**
USPC D8/14, 29.1, 29.2, 30; D15/122, 138, D15/144, 144.1, 144.2; 219/121.39, 219/121.46, 121.45, 121.5, 121.51, 75
CPC .. B23K 20/004; B23K 20/005; B23K 20/106; H01L 24/85
See application file for complete search history.

(56) **References Cited**

U.S. PATENT DOCUMENTS

2,721,250	A	10/1955	Franklin
3,101,634	A	8/1963	Cooper
3,289,452	A	12/1966	Hartwig

(Continued)

FOREIGN PATENT DOCUMENTS

JP	S62190343	U	12/1987
JP	S63080845	U	5/1988

(Continued)

OTHER PUBLICATIONS

Decision of Grant dated Jan. 26, 2016 in Japanese Design Application No. 2015-21935 with a listing of references considered.

(Continued)

Primary Examiner — Patricia A Palasik
(74) *Attorney, Agent, or Firm* — Faegre Baker Daniels LLP

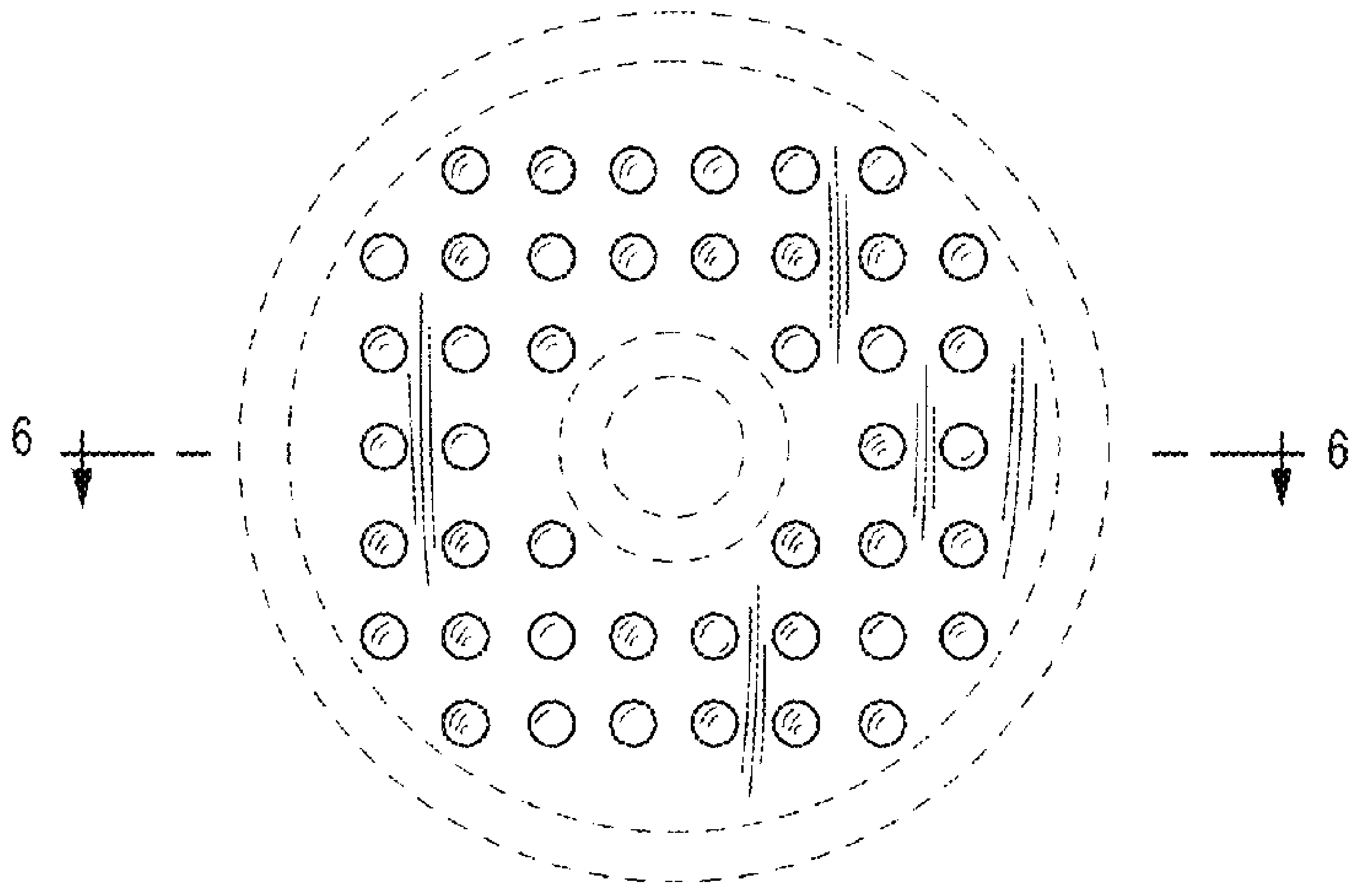
(57) **CLAIM**

The ornamental design for a ceramic bonding tool with textured tip, as shown and described.

DESCRIPTION

FIG. **1** depicts a perspective view of a ceramic bonding tool with textured tip.
FIG. **2** depicts a side elevation view of the ceramic bonding tool with textured tip of FIG. **1**.
FIG. **3** depicts a top plan view of the ceramic bonding tool with textured tip of FIG. **1**.
FIG. **4** depicts a bottom plan view of the ceramic bonding tool with textured tip of FIG. **1**.
FIG. **5** depicts a detailed bottom plan view of the ceramic bonding tool with textured tip shown in FIG. **4**; and,
FIG. **6** depicts a detailed side cross-section view of the ceramic bonding tool with textured tip, the cross-section taken along cross-section indicator line **6**-**6** of FIG. **5**.
The broken lines in the drawings illustrate environmental structure on the article and form no part of the claimed design.

1 Claim, 3 Drawing Sheets



(56) References Cited

U.S. PATENT DOCUMENTS

D213,782	S	4/1969	Knowlcs	
3,453,142	A	7/1969	Dorschu et al.	
3,585,352	A	6/1971	Zvanut	
3,690,538	A	9/1972	Gaiser et al.	
3,698,646	A	10/1972	Conabee et al.	
4,030,657	A	6/1977	Scheffer	
D255,318	S	6/1980	Bakkeren	
4,343,983	A	8/1982	Schneider et al.	
D269,521	S	6/1983	Braun	
4,405,074	A	9/1983	Levintov et al.	
4,411,411	A	10/1983	Barthelmess	
4,415,115	A	11/1983	James	
D271,741	S	12/1983	Riccio	
4,600,138	A	7/1986	Hill	
D297,704	S	9/1988	Bulow	
D305,720	S	1/1990	Leech et al.	
5,217,154	A	6/1993	Elwood et al.	
5,248,076	A	9/1993	Eisele et al.	
5,445,306	A	8/1995	Huddleston	
5,485,949	A	1/1996	Tomura et al.	
5,683,603	A	11/1997	Fortune	
5,816,472	A	10/1998	Linn	
5,954,260	A	9/1999	Orcutt	
6,041,995	A	3/2000	Takahashi et al.	
6,068,174	A	5/2000	Ball et al.	
D431,434	S	10/2000	Yoshimura	
6,158,647	A	12/2000	Chapman et al.	
D444,175	S	6/2001	Omura	
6,247,631	B1	6/2001	Kawakatsu et al.	
6,260,753	B1	7/2001	Renard et al.	
6,352,197	B1	3/2002	Mutaguchi	
6,457,627	B1	10/2002	Komiyama	
6,511,389	B2	1/2003	Ogg	
6,564,989	B2	5/2003	Arakawa	
6,646,228	B2	11/2003	Axinte et al.	
6,715,658	B2	4/2004	Perlberg et al.	
6,729,527	B2	5/2004	Sonnenreich et al.	
6,910,612	B2	6/2005	Perlberg et al.	
D517,384	S	3/2006	Ishii et al.	
7,051,915	B2	5/2006	Mutaguchi	
7,216,794	B2	5/2007	Lange et al.	
7,247,588	B2	7/2007	Kwon et al.	
7,249,702	B2	7/2007	Mironescu et al.	
D549,255	S	8/2007	Axinte et al.	
7,261,230	B2	8/2007	Harun et al.	
7,320,425	B2	1/2008	Eder et al.	
7,407,080	B2	8/2008	Lee et al.	
7,500,590	B2	3/2009	Mironescu et al.	
D598,721	S	8/2009	Meza	
7,918,378	B1	4/2011	Pham	
8,056,794	B2	11/2011	Avraham et al.	
D667,857	S	9/2012	Hidaka	
8,292,160	B2	10/2012	Maruya et al.	
D697,956	S	1/2014	Davis et al.	
D720,785	S	1/2015	Sato	
D735,787	S	8/2015	Hassan et al.	
D741,127	S	10/2015	Hasenmayer	
D744,560	S	12/2015	Hassan	
D753,739	S	4/2016	Bell	
9,337,166	B2	5/2016	Hagiwara et al.	
9,455,544	B2	9/2016	Gillotti	
D797,171	S	9/2017	Alfaro et al.	
D797,172	S	9/2017	Alfaro et al.	
D797,826	S	9/2017	Alfaro et al.	
2002/0096551	A1*	7/2002	Reiber	B23K 20/004 228/4.5
2004/0109980	A1	6/2004	Chen et al.	
2006/0273140	A1	12/2006	Ghosh	
2012/0045614	A1	2/2012	Chang et al.	
2013/0341874	A1	12/2013	Aykanat et al.	

FOREIGN PATENT DOCUMENTS

JP	H11354569	A	12/1999
JP	200487822	A	3/2004
JP	2009147103	A	7/2009
JP	2009283814	A	12/2009
JP	200368784	A	3/2013
JP	2013135008	A	7/2013
JP	201482450	A	5/2014
JP	2014222729	A	11/2014
TW	201412448	A	4/2014
TW	201429600	A	8/2014
TW	201429601	A	8/2014

OTHER PUBLICATIONS

Decision to Grant date Apr. 19, 2016 issued in Japanese Patent Application No. 2015-016867.

Decision to Grant date Apr. 19, 2016 issued in Japanese Patent Application No. 2015-016912.

Decision to Grant date Apr. 19, 2016 issued in Japanese Patent Application No. 2015-017097.

Decision to Grant dated Apr. 19, 2016 issued in Japanese Patent Application No. 2016-008039.

Decision to Grant dated Aug. 23, 2016 issued in Japanese Patent Application No. 2016-008037.

Decision to Grant dated Aug. 23, 2016 issued in Japanese Patent Application No. 2016-008038.

Gaiser Precision Bonding Tools "Capillary Wire Bonding," pp. 5-27, located at http://www.coorstek.com/markets/semiconductors_equipment/bonding-tools/capillaries.php, catalog published 2006.

Gaiser Precision Bonding Tools, "Fine-Pitch Process Requirements", pp. 41-59, located at http://www.coorstek.com/markets/semiconductors_equipment/bonding-tools/capillaries.php, catalog published 2006.

Gaiser Precision Bonding Tools, "Thermosonic Capillaries," pp. 28-40, located at http://www.coorstek.com/markets/semiconductors_equipment!bondingtools/cappillaries.php, catalog published 2006.

Gaiser Tool Company "Single Point T.A.B.", p. 109, catalog vol. 11, published 2000.

Information regarding Related Patents and Patent Applications, see the section entitled "Related Patents and Patent Applications" of the accompanying Information Disclosure Statement Transmittal letter.

Office Action dated Oct. 6, 2015, issued in Japanese Design Application No. 2015-9731.

Search Report dated May 13, 2016 issued in Taiwan Application No. 104305492.

Search Report issued in Taiwan Design Patent Application No. 105302375, dated Jul. 12, 2016.

Search Report issued in Taiwan Design Patent Application No. 105302376, dated Jul. 12, 2016.

Search Report issued in Taiwan Design Patent Application No. 105302377, dated Jul. 12, 2016.

Search Report dated Dec. 7, 2015 in Taiwanese Design Patent Application No. 104302295 (English translation provided.

Search Report dated Mar. 15, 2016 in Taiwanese Design Patent Application No. 104304080 (English Translation).

Search Report dated Mar. 15, 2016 in Taiwanese Design Patent Application No. 104304081 (English Translation).

Search Report dated Mar. 15, 2016 in Taiwanese Design Patent Application No. 104304143 (English Translation).

Design U.S. Appl. No. 29/516,523, filed Feb. 3, 2015, entitled Ceramic Bonding Tool with Textured Tip.

* cited by examiner

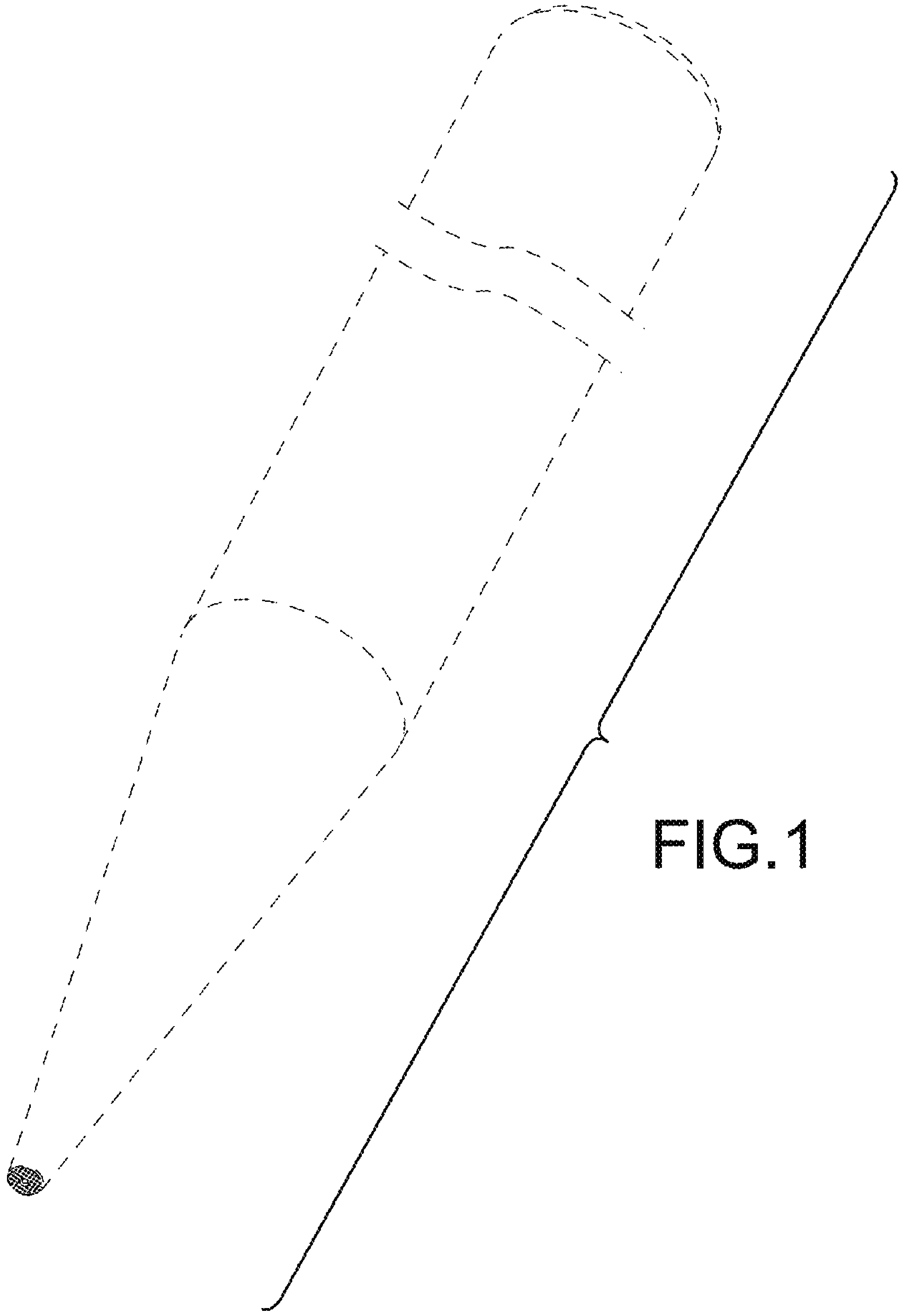


FIG.1

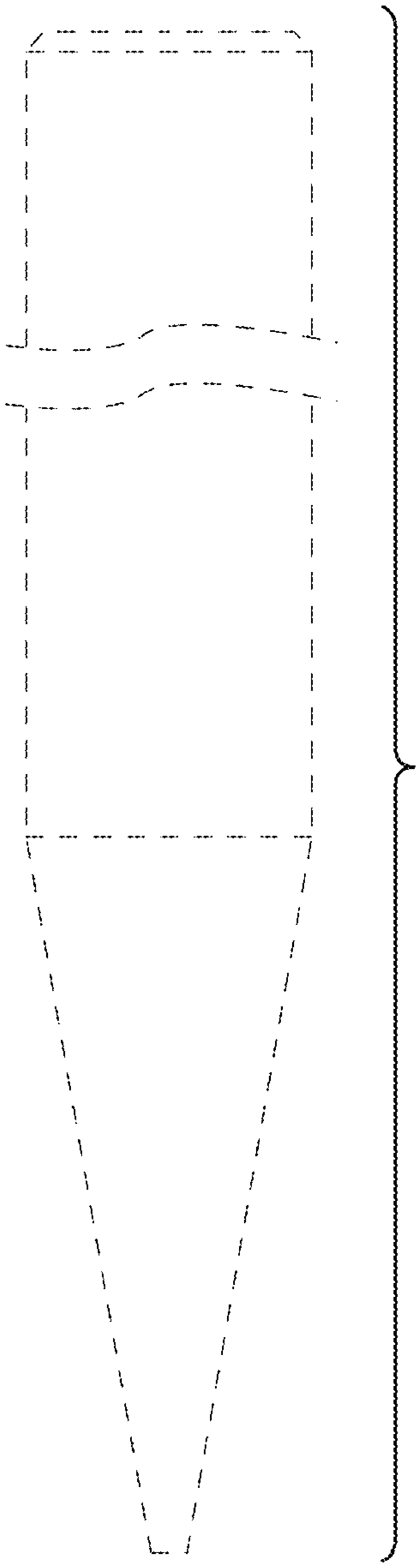


FIG.2

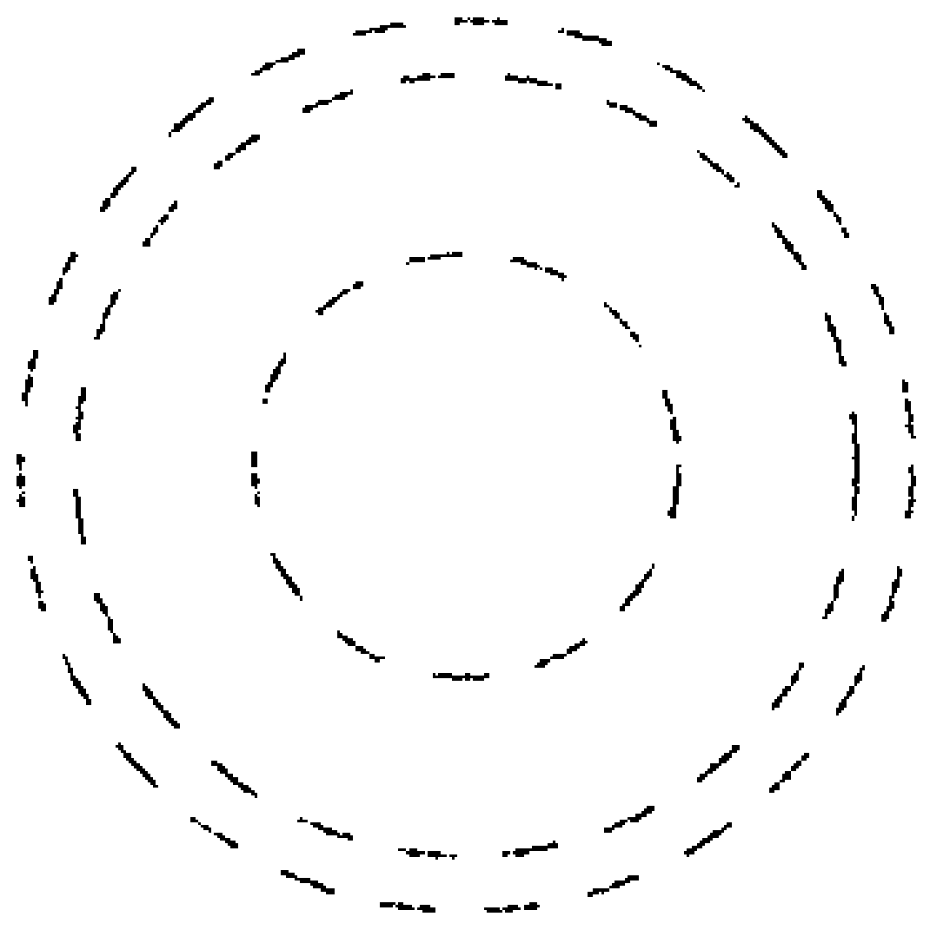


FIG.3

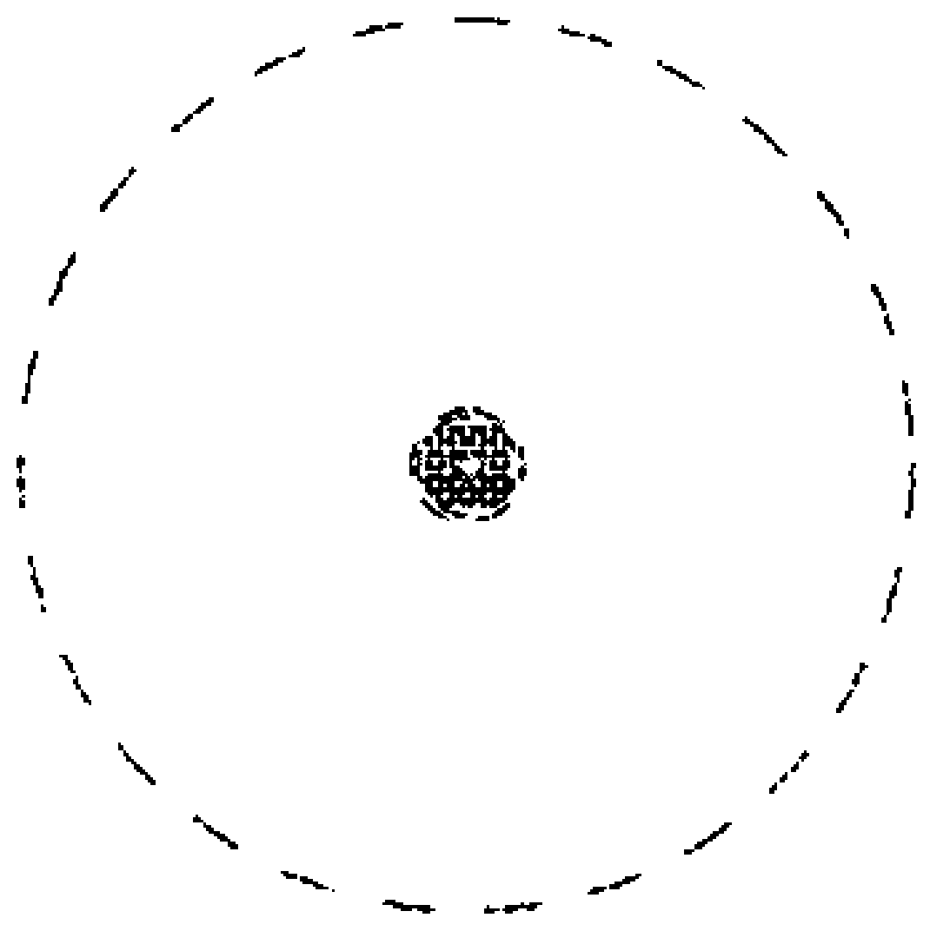


FIG.4

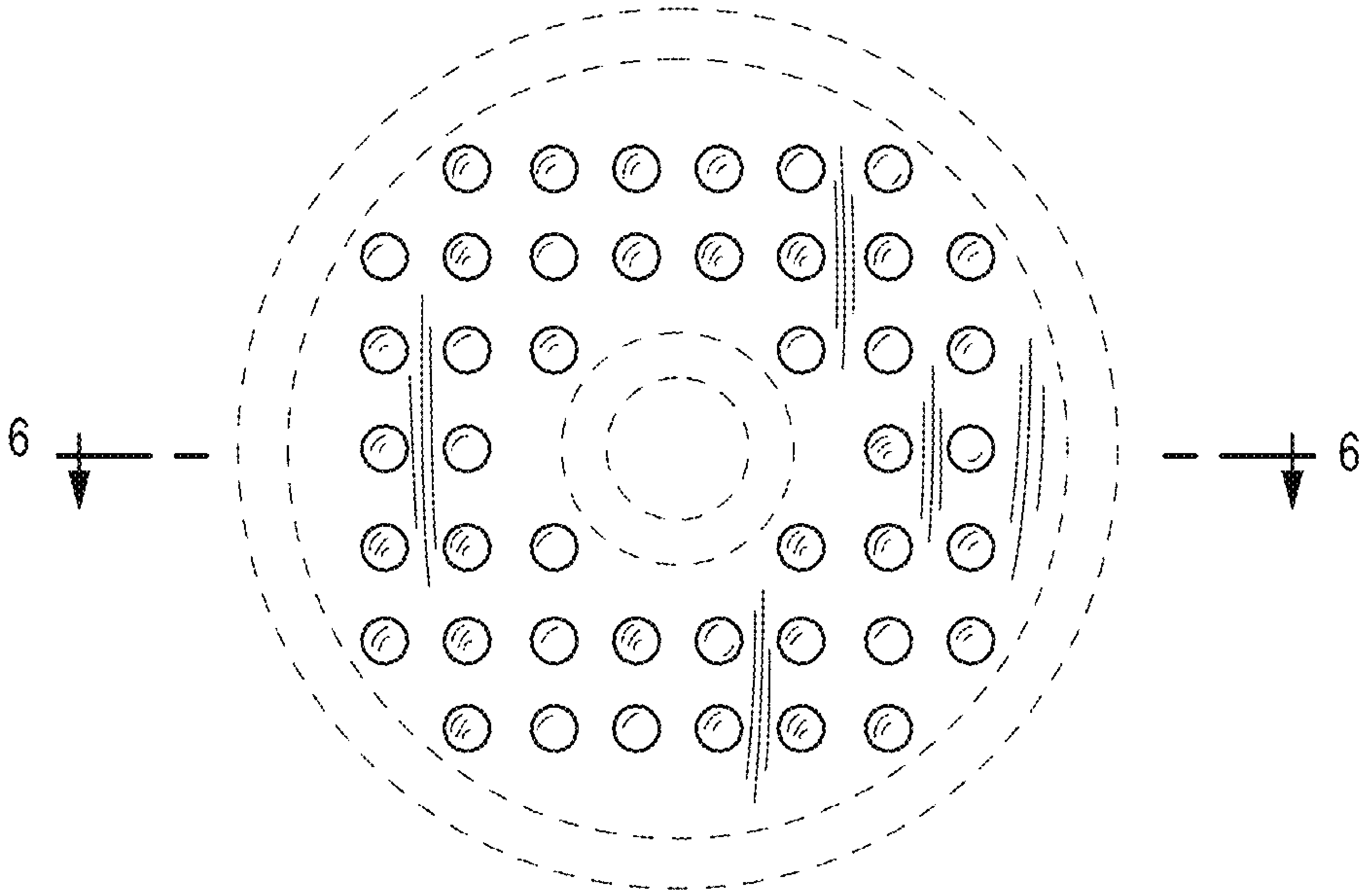


FIG.5

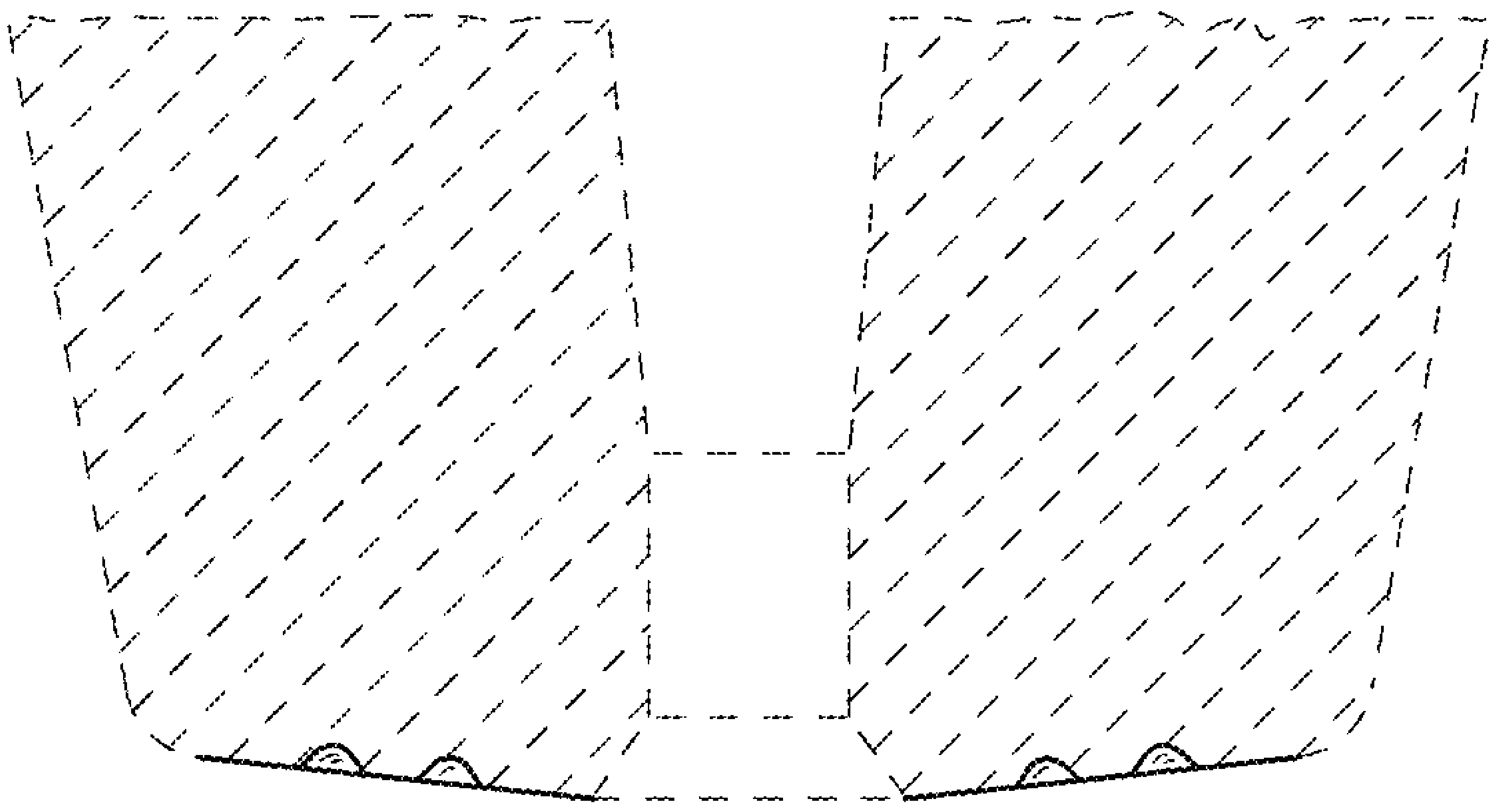


FIG.6