US00D877101S

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

(10) **Patent No.: US D877,101 S**
(45) **Date of Patent: ** Mar. 3, 2020**

---

(54) **TARGET PROFILE FOR A PHYSICAL VAPOR DEPOSITION CHAMBER TARGET**

(71) Applicant: **APPLIED MATERIALS, INC.**, Santa Clara, CA (US)

(72) Inventors: **William R. Johanson**, Gilroy, CA (US); **Kirankumar Neelasandra Savandaiah**, Bangalore (IN); **Prashant Prabhakar Prabhu**, Karwar (IN)

(73) Assignee: **APPLIED MATERIALS, INC.**, Santa Clara, CA (US)

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

(21) Appl. No.: **29/639,953**

(22) Filed: **Mar. 9, 2018**

(51) **LOC (12) Cl.** **13-03**

(52) **U.S. Cl.**
USPC **D13/182**

(58) **Field of Classification Search**
USPC D13/182; D15/144.1, 144.2, 199
CPC H01L 21/67742; H01L 21/0226; H01L 21/02263; H01L 21/02266; H01L 21/02269; H01L 21/02271; H01L 2224/75186; H01L 2224/76185; H01L 2224/76186; H01L 2221/68363
See application file for complete search history.

(56) **References Cited**

U.S. PATENT DOCUMENTS

5,320,728 A	6/1994	Tepman	
D351,450 S	10/1994	Maryska	
6,086,725 A	7/2000	Abburi et al.	
6,114,216 A	9/2000	Yieh et al.	
6,390,905 B1 *	5/2002	Korovin	B24B 37/30 451/286
6,659,850 B2	12/2003	Korovin et al.	
D487,254 S	3/2004	Suenaga	
6,815,352 B1	11/2004	Tamura et al.	
D503,729 S	4/2005	Leeuw et al.	
D553,104 S	10/2007	Oohashi et al.	
D557,226 S	12/2007	Uchino	
D559,993 S	1/2008	Nagakubo et al.	

(Continued)

FOREIGN PATENT DOCUMENTS

CN	206573738 U	10/2017
JP	D1420846	8/2011

(Continued)

OTHER PUBLICATIONS

Search Report for Taiwan Design Application No. 106301373 dated Jun. 20, 2017.

(Continued)

Primary Examiner — Elizabeth J Oswecki
(74) *Attorney, Agent, or Firm* — Moser Taboada; Alan Taboada

(57) **CLAIM**

The ornamental design for a target profile for a physical vapor deposition chamber target, as shown and described.

DESCRIPTION

FIG. **1** is a top perspective view of a target profile for a physical vapor deposition chamber target, showing our new design;

FIG. **2** is a bottom perspective view thereof;

FIG. **3** is a top plan view thereof;

FIG. **4** is a bottom plan view thereof;

FIG. **5** is a right side elevation view thereof;

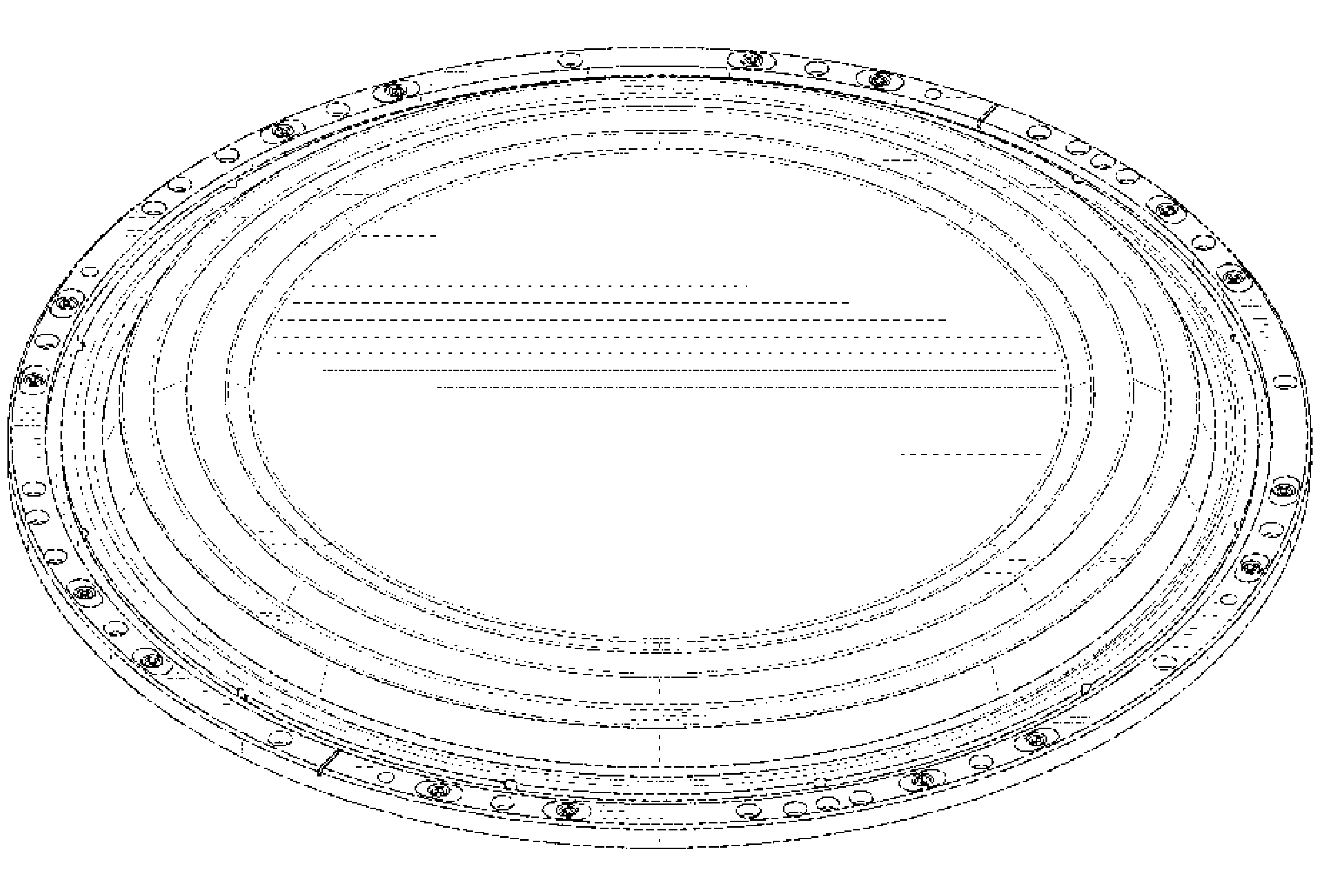
FIG. **6** is a left side elevation view thereof;

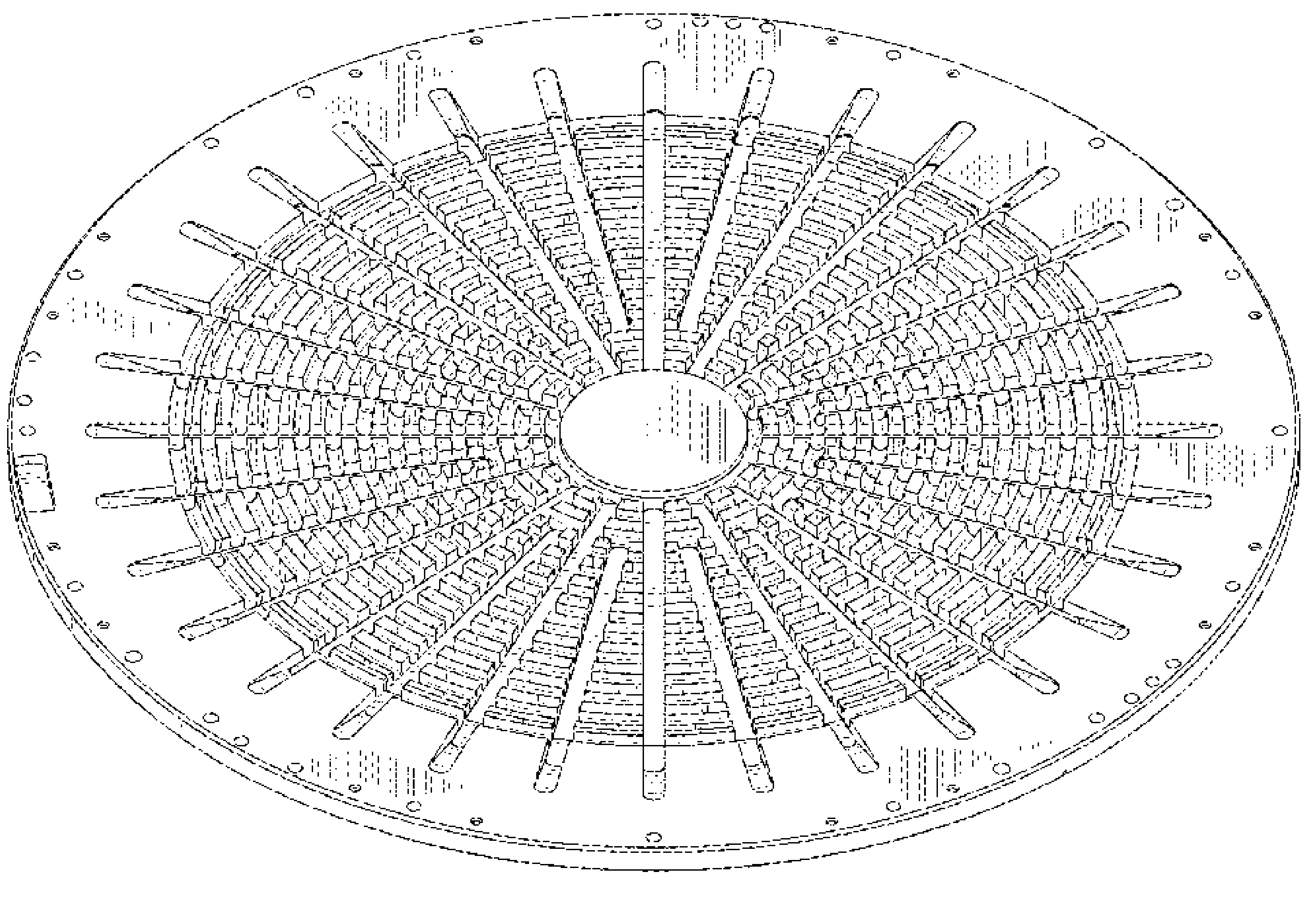
FIG. **7** is a front elevation view thereof;

FIG. **8** is a back elevation view thereof; and,

FIG. **9** is an enlarged cross sectional view taken along line **9-9** in FIG. **4**.

1 Claim, 7 Drawing Sheets





(56) **References Cited**

U.S. PATENT DOCUMENTS

D559,994	S	1/2008	Nagakubo et al.	
7,402,098	B2 *	7/2008	Severson	B24B 37/30 451/288
D600,660	S	9/2009	Sato	
D614,593	S	4/2010	Lee et al.	
D616,390	S	5/2010	Sato	
D633,452	S	3/2011	Namiki et al.	
D649,126	S	11/2011	Takahashi	
D669,509	S	10/2012	Krink et al.	
D683,806	S	6/2013	Dueck	
D687,790	S	8/2013	Krishnan et al.	
D687,791	S	8/2013	Krishnan et al.	
D691,974	S	10/2013	Osada	
D716,742	S	11/2014	Jang et al.	
D724,553	S	3/2015	Choi et al.	
D732,094	S	6/2015	Jussel et al.	
D741,823	S	10/2015	Tateno et al.	
D750,728	S	3/2016	Kremer	
D767,234	S	9/2016	Kirkland et al.	
D769,200	S	10/2016	Fukushima et al.	
D770,992	S	11/2016	Tauchi et al.	
D790,041	S	6/2017	Jang et al.	
D793,572	S	8/2017	Kozuka et al.	
D795,208	S	8/2017	Sasaki et al.	
D796,458	S	9/2017	Jang et al.	
D797,067	S	9/2017	Zhang et al.	
D797,691	S	9/2017	Joubert et al.	
D798,248	S	9/2017	Hanson et al.	
D801,942	S	11/2017	Riker et al.	
D808,349	S	1/2018	Fukushima et al.	
D810,705	S	2/2018	Krishnan et al.	
D813,181	S	3/2018	Okajima et al.	
D825,504	S *	8/2018	Zhang	D13/182
D825,505	S *	8/2018	Hanson	D13/182
D830,435	S	10/2018	Wakisaka et al.	
D830,981	S	10/2018	Jeong et al.	
D836,572	S *	12/2018	Riker	D13/182
D837,755	S *	1/2019	Riker	D13/182
D839,224	S	1/2019	Yamaki et al.	
2004/0149567	A1	8/2004	Kosyachkov	
2005/0152089	A1	7/2005	Matsuda et al.	
2005/0193952	A1	9/2005	Goodman et al.	
2007/0076345	A1 *	4/2007	Bang	H01L 21/67259 361/234
2008/0308416	A1	12/2008	Allen et al.	
2009/0260982	A1	10/2009	Riker et al.	
2010/0096261	A1	4/2010	Hoffman et al.	
2010/0108500	A1	5/2010	Hawrylchak et al.	
2010/0170786	A1	7/2010	Wang et al.	
2012/0033340	A1	2/2012	Roy et al.	
2013/0316628	A1	11/2013	Jang et al.	
2014/0261180	A1	9/2014	Yoshidome et al.	
2015/0170888	A1	6/2015	Riker et al.	
2016/0002776	A1	1/2016	Nal et al.	
2016/0002788	A1	1/2016	Nal et al.	
2016/0035547	A1	2/2016	Johanson et al.	

FOREIGN PATENT DOCUMENTS

JP	D1421157	8/2011
JP	D1422692	9/2014
TW	223429	5/1994
TW	223430	5/1994
TW	D146490	4/2012

OTHER PUBLICATIONS

Search Report for Taiwan Design Application No. 107305358 dated Feb. 21, 2019.

Search Report for Taiwan Design Application No. 1077303086 dated Jul. 6, 2018.

Sputtering Targets, posted at Angstrom Sciences, posting date May 5, 2016. Site visited Apr. 1, 2019. URL: <https://web.archive.org/web/20160505015447/https://www.angstromsciences.com/sputtering-targets> (Year: 2016).

Sputtering Targets for LSis, posted at JX Nippon Mining & Metals, posting date Mar. 22, 2016. Site visited Apr. 1, 2019. URL: <https://web .archive .org/web/20 160322055046/http :1/www.nmm.jx-group.co.jp/english/products/04_supa/target_adv.html> (Year: 2016).

* cited by examiner

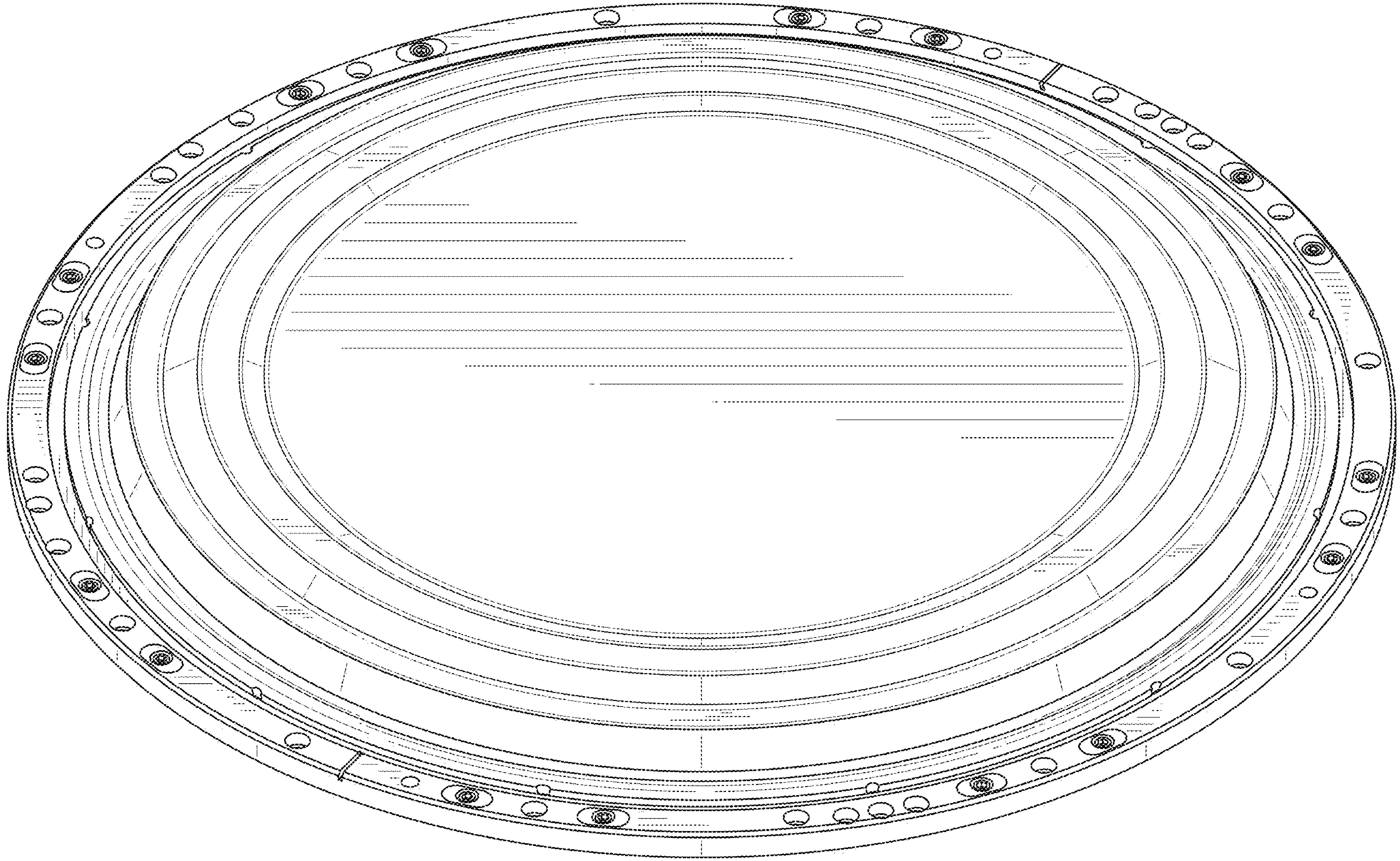


FIG. 1

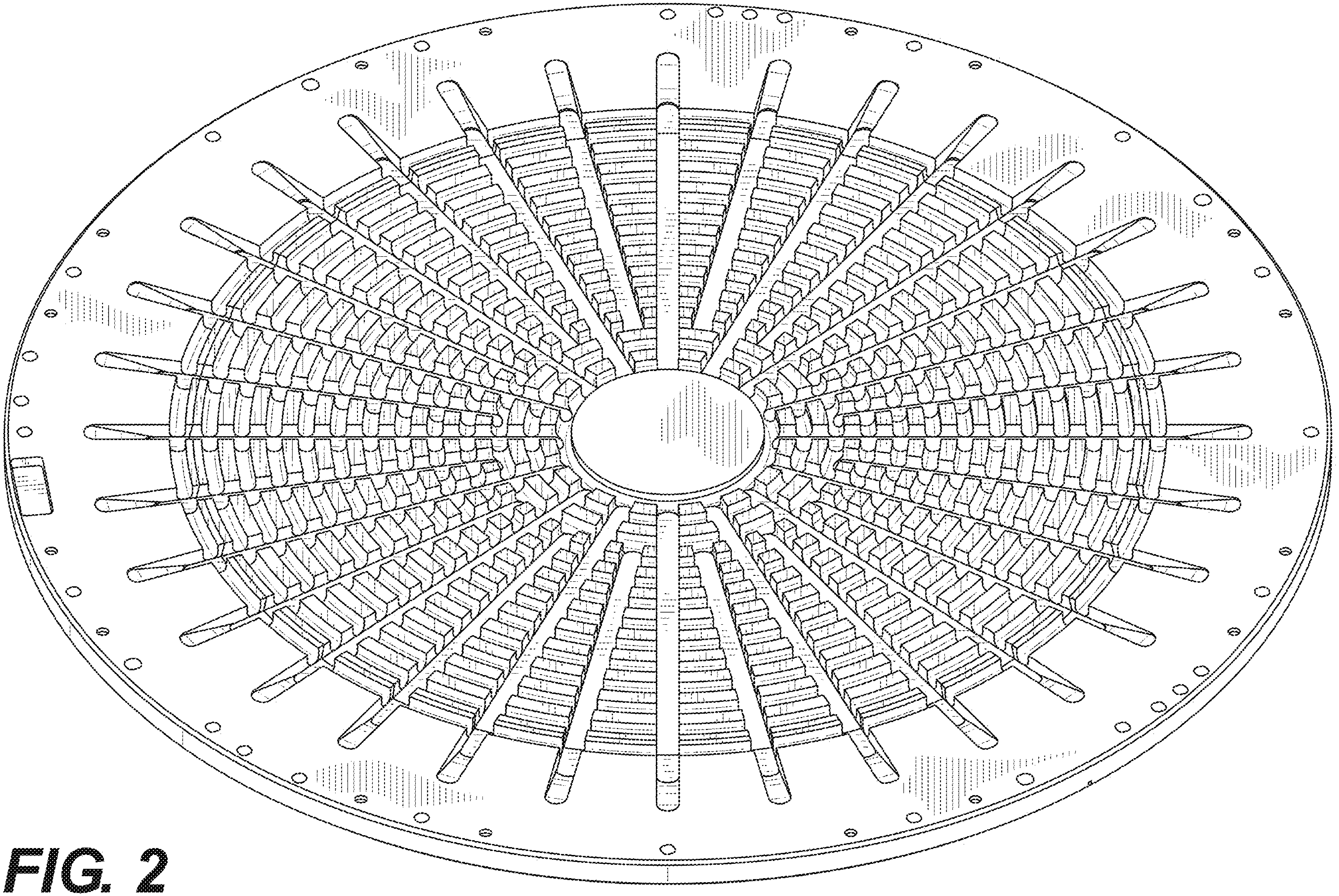


FIG. 2

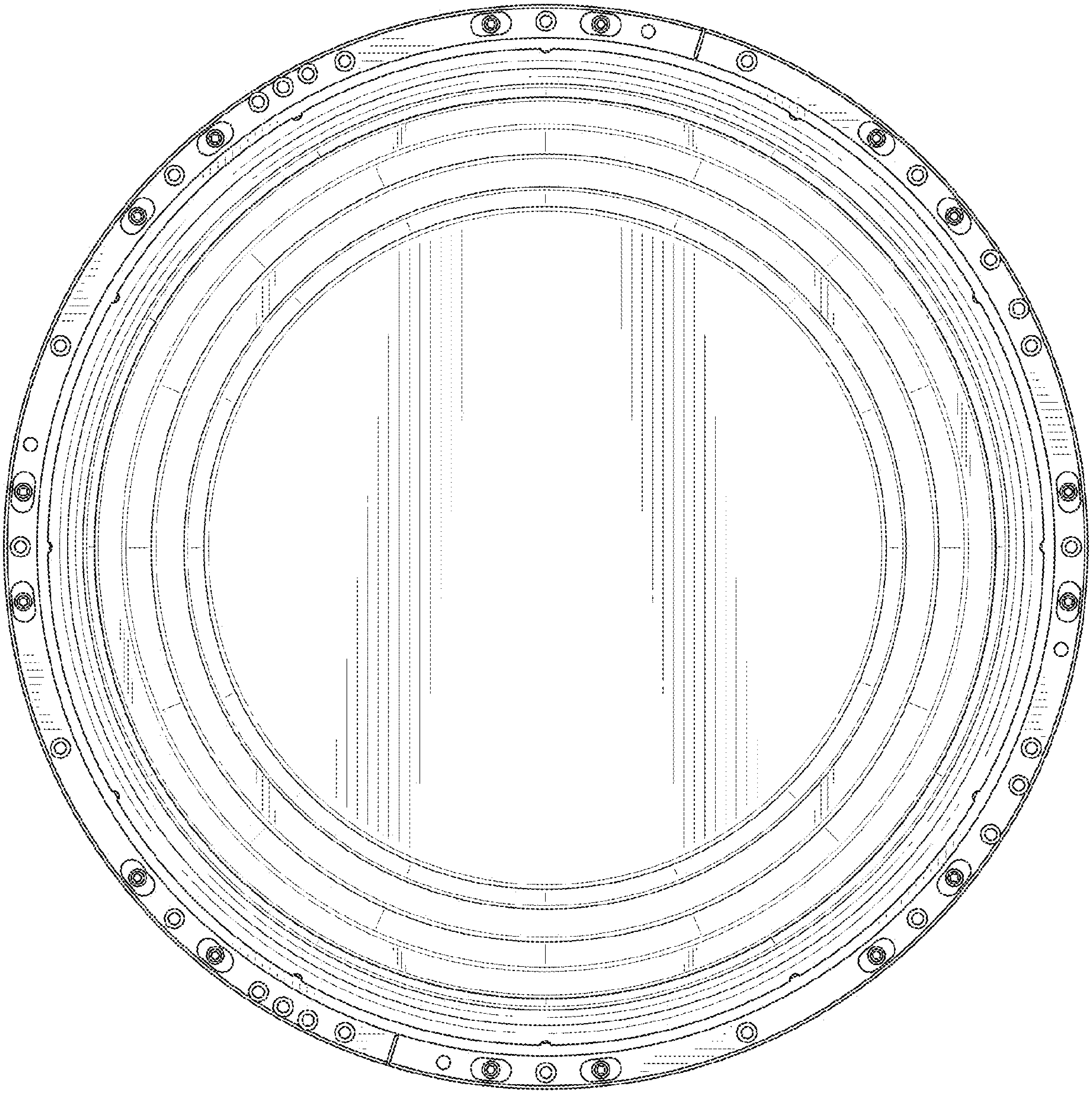


FIG. 3

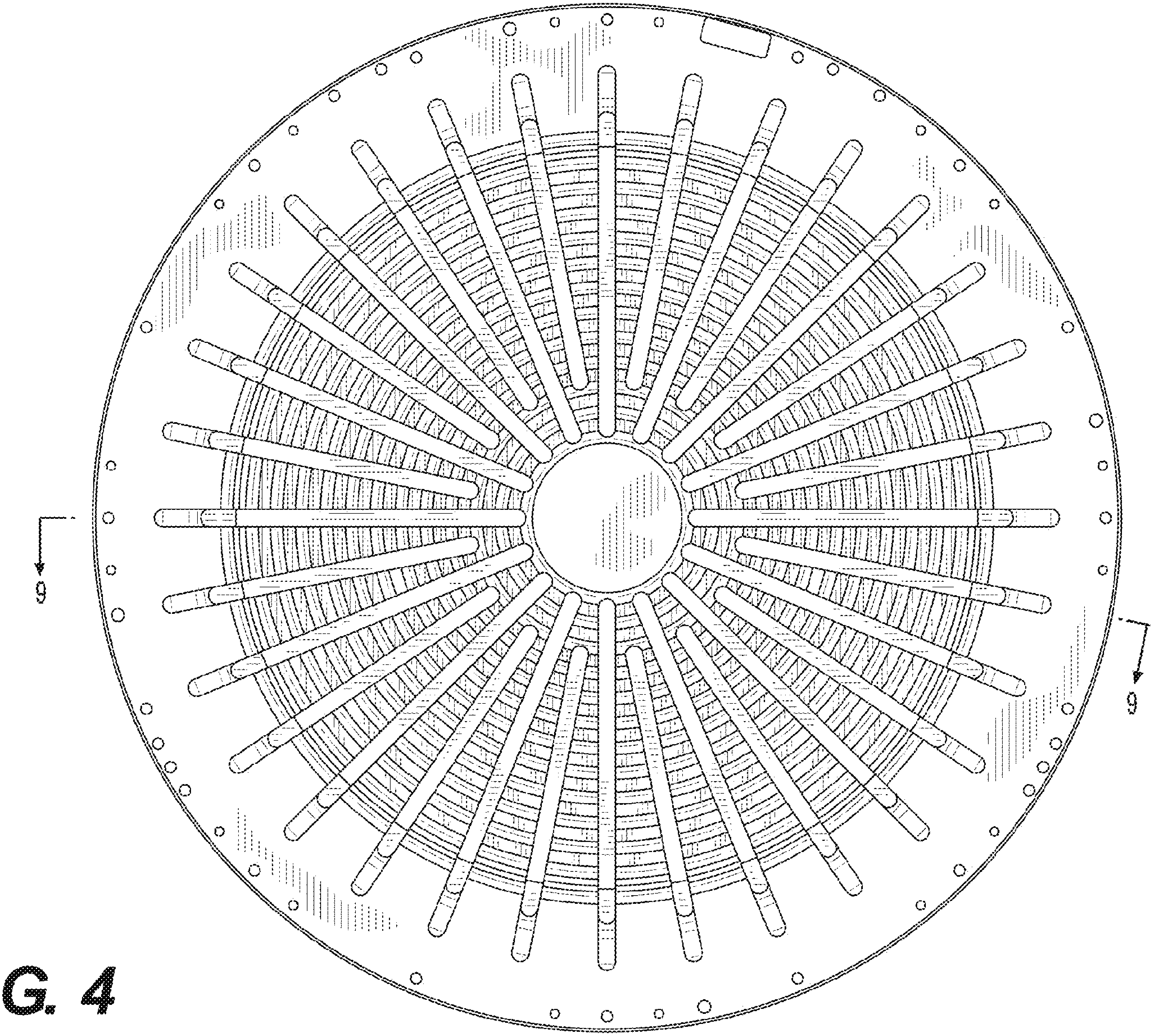


FIG. 4

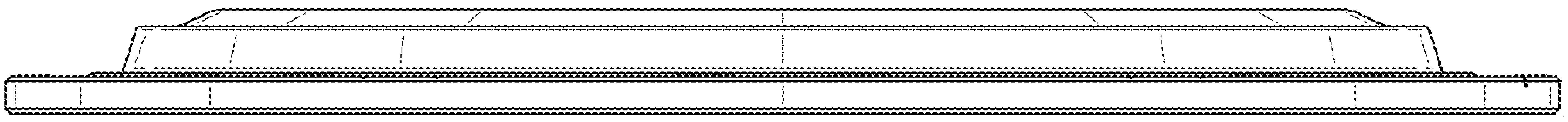


FIG. 5

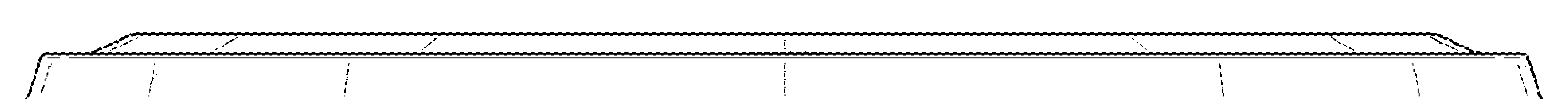


FIG. 6

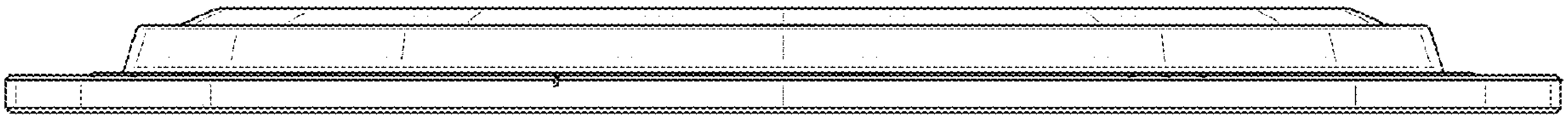


FIG. 7

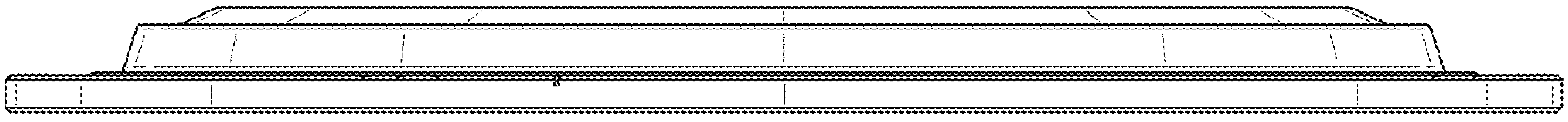


FIG. 8

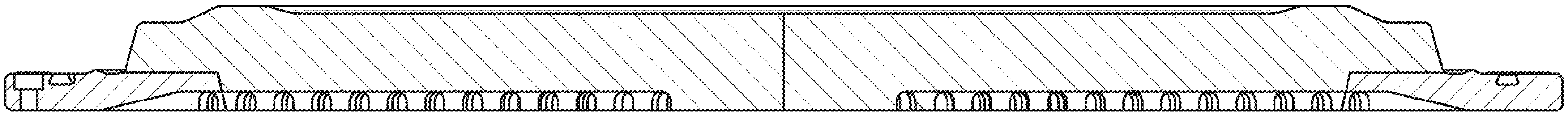


FIG. 9