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(12) United States Design Patent

Nakagawa et al.

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(54) **ACOUSTIC TRANSDUCER**

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(73) Assignee: **SONY CORPORATION**, Tokyo (JP)

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(30) **Foreign Application Priority Data**

Sep. 18, 2019 (JP) D2019-020893
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(Continued)

(51) **LOC (13) Cl.** **14-01**
(52) **U.S. Cl.**
USPC **D14/217**
(58) **Field of Classification Search**
USPC D14/159, 218, 217, 219, 220, 221, 222, D14/223, 224, 224.1, 225, 227, 228, 229, D14/299, 204, 209, 185
(Continued)

(56) **References Cited**

U.S. PATENT DOCUMENTS

D615,068 S * 5/2010 Yuasa D14/216
D616,423 S * 5/2010 Chen D14/222
(Continued)

FOREIGN PATENT DOCUMENTS

CN 302122602 * 10/2012
JP 60007299 A * 1/1985 ..... H04R 7/20
(Continued)

OTHER PUBLICATIONS

Piezo Discs with Leads, announced Mar. 5, 2018 [online], retrieved Dec. 29, 2021, retrieved from internet, https://www.amazon.com/15Pcs-Trigger-Acoustic-Pickup-Guitar/dp/B07B8RJ8NX.*
(Continued)

Primary Examiner — Messina L Smith
(74) *Attorney, Agent, or Firm* — Michael Best and Friedrich LLP

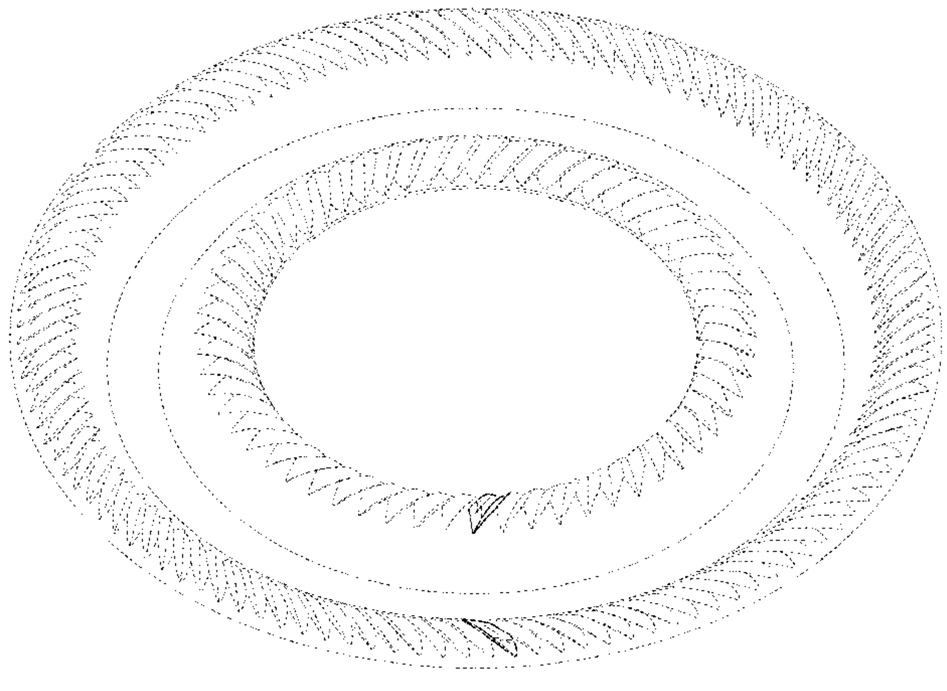
(57) **CLAIM**

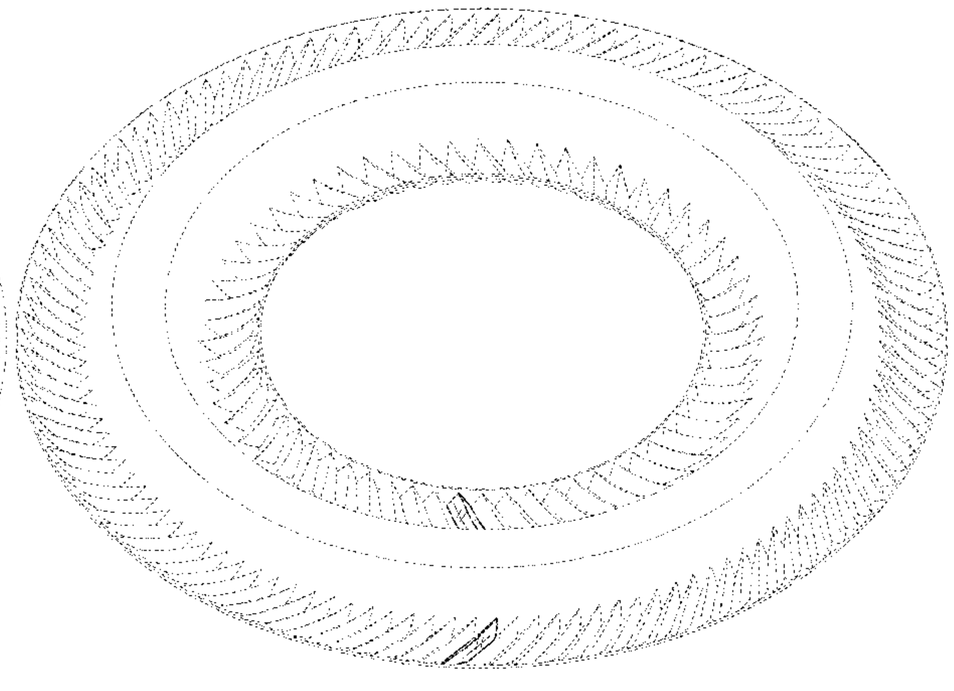
The ornamental design for an acoustic transducer, as shown and described.

DESCRIPTION

FIG. **1** is a front, bottom perspective view of an acoustic transducer showing our new design viewed from the arrow **1** of FIG. **9**;
FIG. **2** is a front, left perspective view thereof viewed from the arrow **2** of FIG. **9**;
FIG. **3** is a front, top perspective view thereof viewed from the arrow **3** of FIG. **9**;
FIG. **4** is a front, right perspective view thereof viewed from the arrow **4** of FIG. **9**;
FIG. **5** is a rear, bottom perspective view thereof viewed from the arrow **5** of FIG. **10**;
FIG. **6** is a rear, left perspective view thereof viewed from the arrow **6** of FIG. **10**;
FIG. **7** is a rear, top perspective view thereof viewed from the arrow **7** of FIG. **10**;
FIG. **8** is a rear, right perspective view thereof viewed from the arrow **8** of FIG. **10**;
FIG. **9** is a front elevational view thereof; and
FIG. **10** is a rear elevational view thereof;
FIG. **11** is a left side elevational view thereof;
FIG. **12** is a right side elevational view thereof; and,
FIG. **13** is a top plan view thereof, a bottom plan view thereof being a mirror image.
The broken lines illustrating portions of the acoustic transducer form no part of the claimed design.

1 Claim, 11 Drawing Sheets





(30) **Foreign Application Priority Data**

Sep. 18, 2019 (JP) D2019-020895
Sep. 18, 2019 (JP) D2019-020896
Sep. 18, 2019 (JP) D2019-020897

(58) **Field of Classification Search**
CPC . H04R 1/00; H04R 1/02; H04R 1/323; H04R 1/326; H04R 1/403; H04R 1/406; H04R 1/222; H04R 1/023; H04R 7/00; H04R 7/20; H04R 27/00; H04R 2201/00; H04R 2400/00; H04R 17/02; H04R 29/004; H04R 29/005; H04R 19/00; H04R 2420/07; H04R 2410/00
See application file for complete search history.

(56) **References Cited**

U.S. PATENT DOCUMENTS

D619,565	S *	7/2010	Chen	D14/222
D626,945	S *	11/2010	Chen	D14/222
8,270,648	B2 *	9/2012	Murozaki	H04R 1/1091 381/328
D689,470	S *	9/2013	Chen	D14/222
D729,858	S	5/2015	Imai et al.	
D730,326	S *	5/2015	Huang	D14/222
9,253,576	B2 *	2/2016	Tripp	H04R 7/16
D826,906	S *	8/2018	Lasnier de Lavalette	D14/224
D865,719	S *	11/2019	Tanabe	D14/221
D875,084	S *	2/2020	Lopez Castillo	D14/221
D881,846	S *	4/2020	Chen	D14/222
D913,262	S *	3/2021	Allen	D14/204
D916,053	S *	4/2021	Risbo	H04R 1/00 D14/221
11,051,102	B2 *	6/2021	Fuller	H04R 7/20
D951,224	S *	5/2022	Siu	D14/204
2004/0007420	A1 *	1/2004	Takahashi	H04R 7/20 181/171
2006/0162993	A1 *	7/2006	Honda	H04R 7/20 181/172
2010/0236861	A1 *	9/2010	Her	H04R 7/14 181/164
2011/0228949	A1 *	9/2011	Haba	H04R 7/16 381/86
2012/0039491	A1 *	2/2012	Katz	H04R 9/066 381/120
2014/0054104	A1 *	2/2014	He	H04R 7/125 181/167
2015/0075900	A1 *	3/2015	Yuen	G10K 13/00 181/168
2016/0330549	A1 *	11/2016	Yuen	H04R 9/025
2017/0013365	A1 *	1/2017	Huang	H04R 9/06
2019/0289401	A1 *	9/2019	Fujitani	H04R 31/003
2019/0335276	A1 *	10/2019	Xie	H04R 31/003
2019/0373370	A1 *	12/2019	Yang	H04R 9/06
2019/0373372	A1 *	12/2019	Yang	H04R 7/20
2019/0379979	A1 *	12/2019	Wang	H04R 31/003
2020/0112794	A1 *	4/2020	Fujitani	H04R 9/025
2020/0322731	A1 *	10/2020	Chen	H04R 7/06
2022/0210542	A1 *	6/2022	Zhou	H04R 1/24

FOREIGN PATENT DOCUMENTS

JP	09224297	A *	8/1997	
JP	2004364334	A *	12/2004	
JP	2005204215	A *	7/2005	
JP	2005303775	A *	10/2005	
JP	2017112505	A *	6/2017	H04R 7/127
JP	2018042043	A *	3/2018	
JP	2020036306	A *	3/2020	
KR	300324739.0000	*	5/2003	

OTHER PUBLICATIONS

Brown plastic ridged disk, announced Nov. 2021 [online], retrieved Dec. 29, 2021, retrieved from internet, https://www.reddit.com/r/whatisthisthing/comments/qve5aa/brown_plastic_ridged_disk_found_at_the_bottom_of/.*

In-ear Earphones, announced Aug. 12, 2019 [online], retrieved Dec. 29, 2021, retrieved from internet, https://www.gearbest.com/earphones/pp_009557780788.html.*

Titanium Speaker Diaphragm, announced © 1998-2021 [online], retrieved Dec. 29, 2021, retrieved from internet, https://cnesound.en.made-in-china.com/product/GCgJqQDSOuVp/China-High-Quality-44-4mm-Titanium-Speaker-Diaphragm.html.*

Apple wants to use graphene membranes to enhance next-gen iPhone speakers or microphones, announced May 6, 2017 [online], retrieved Dec. 29, 2021, retrieved from internet, https://www.graphene-info.com/apple-wants-use-graphene-membranes-enhance-next-gen-iphone-speakers-or-microphones.*

* cited by examiner

FIG.1

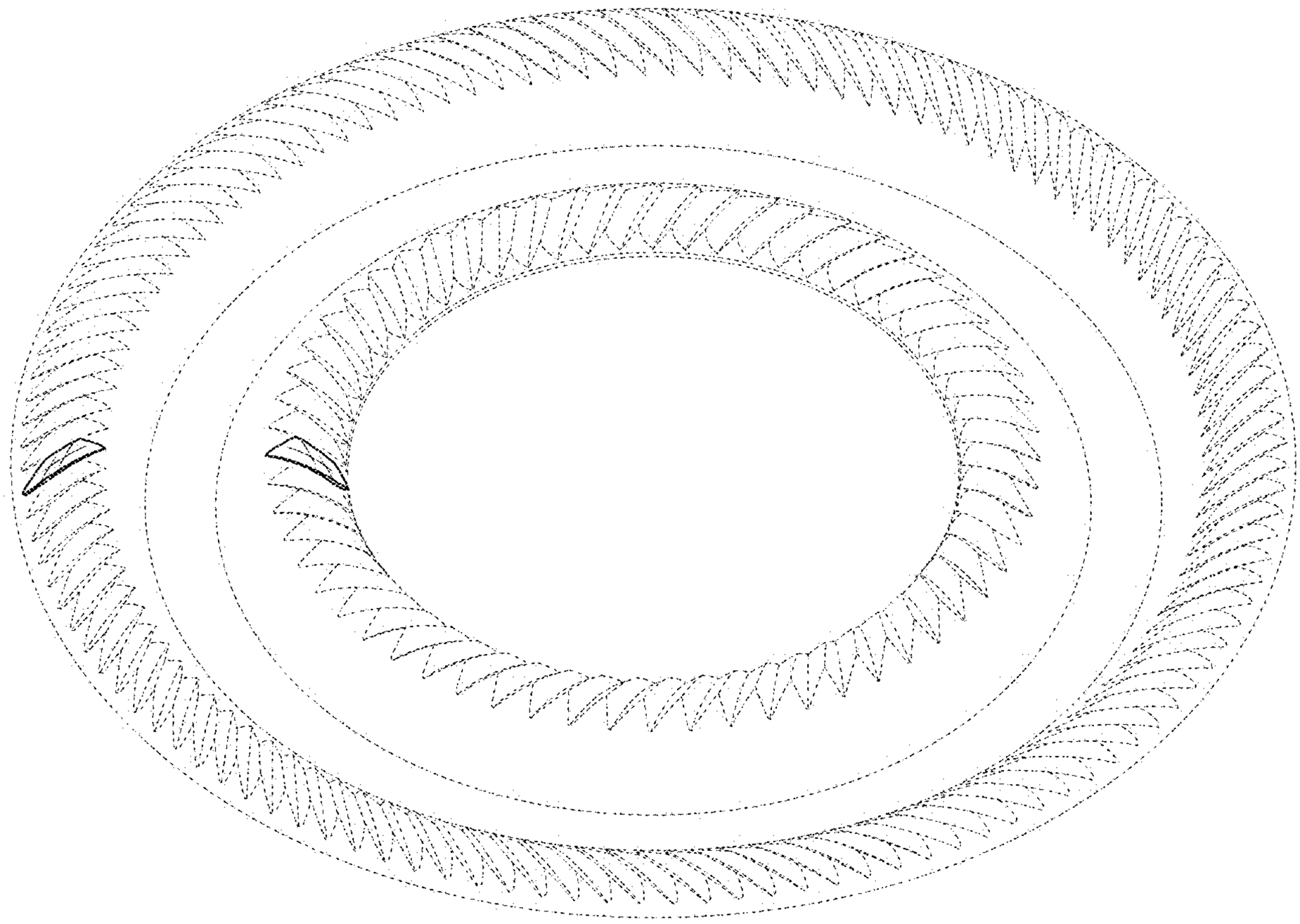


FIG.2

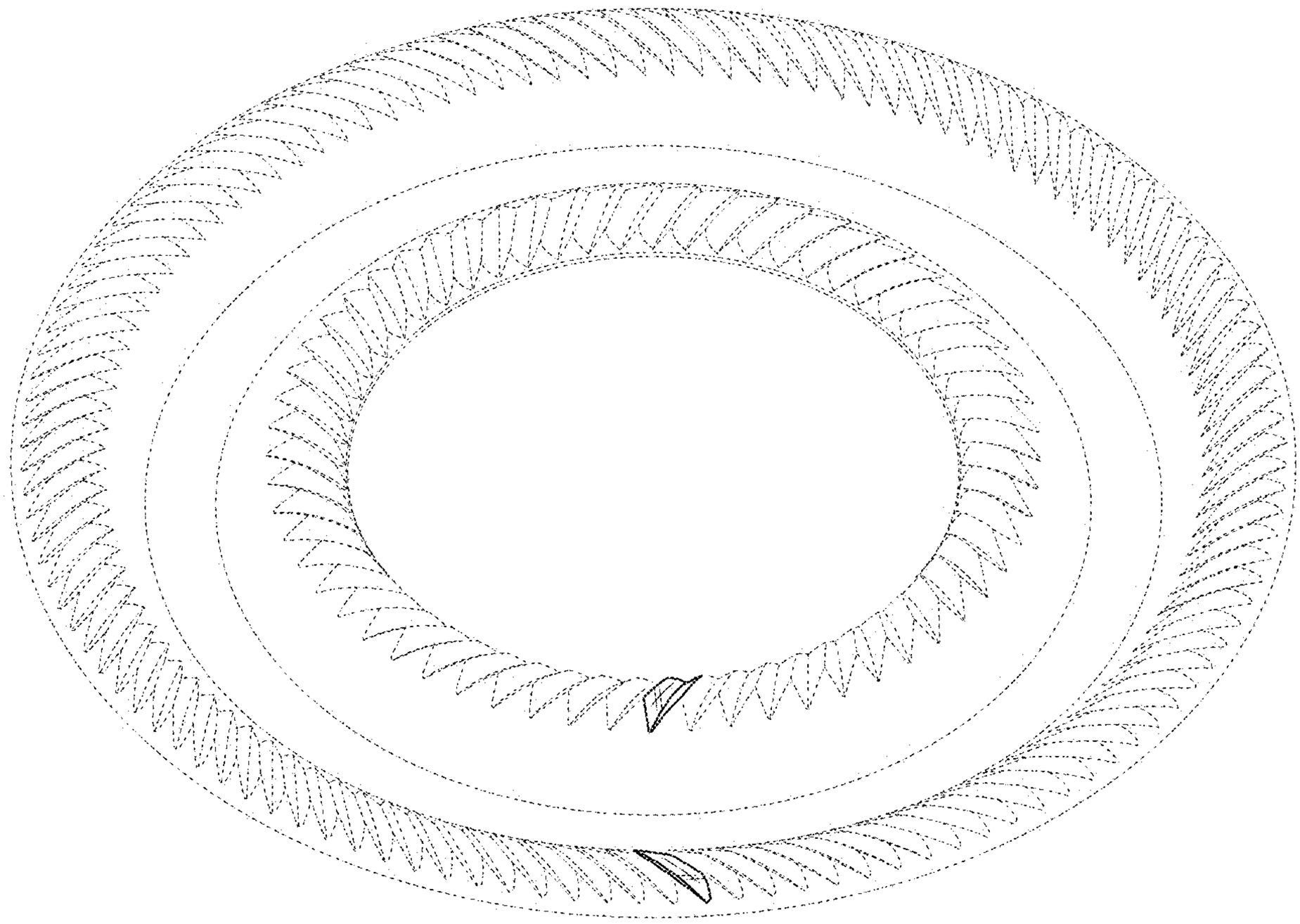


FIG.3

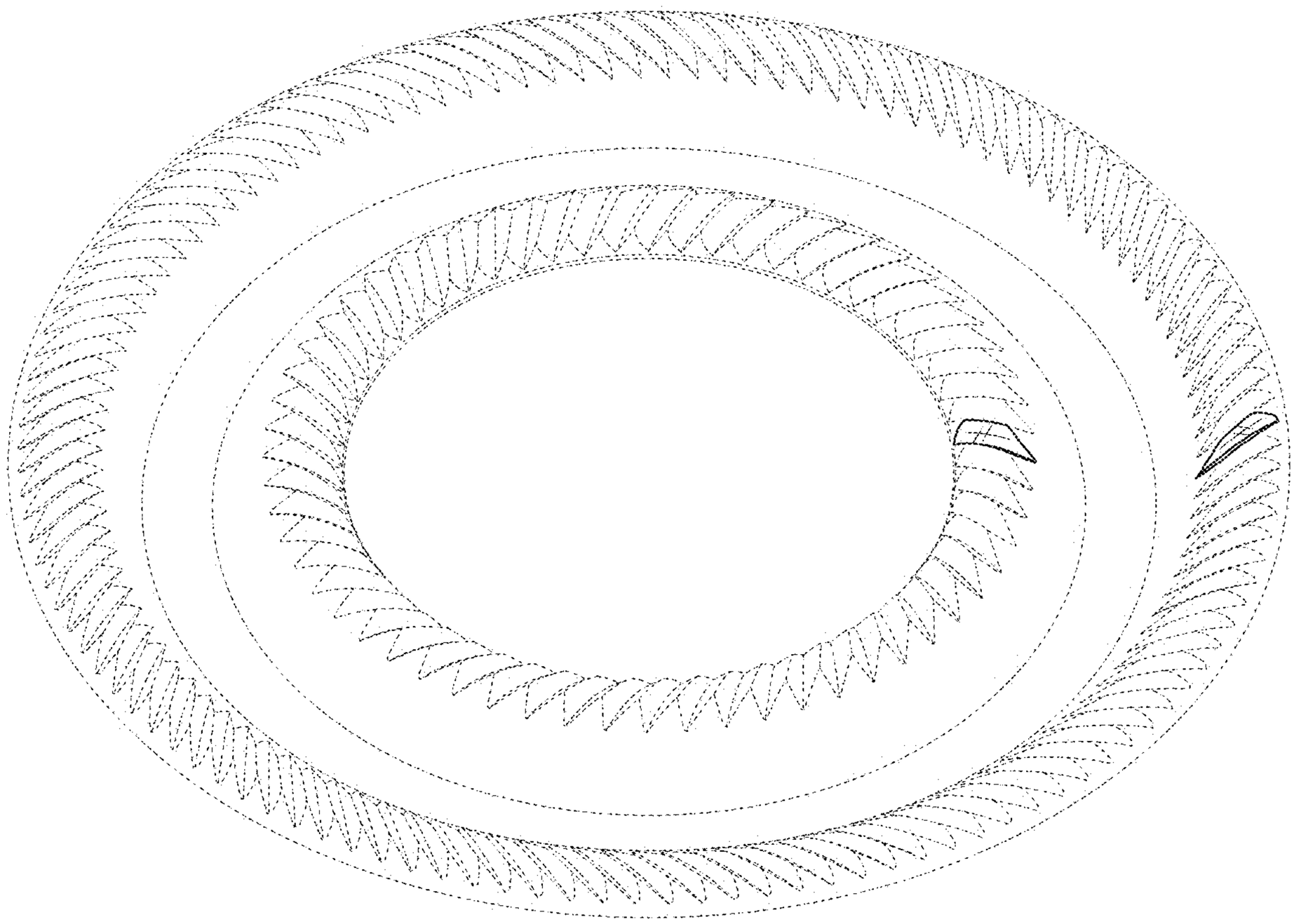


FIG.4

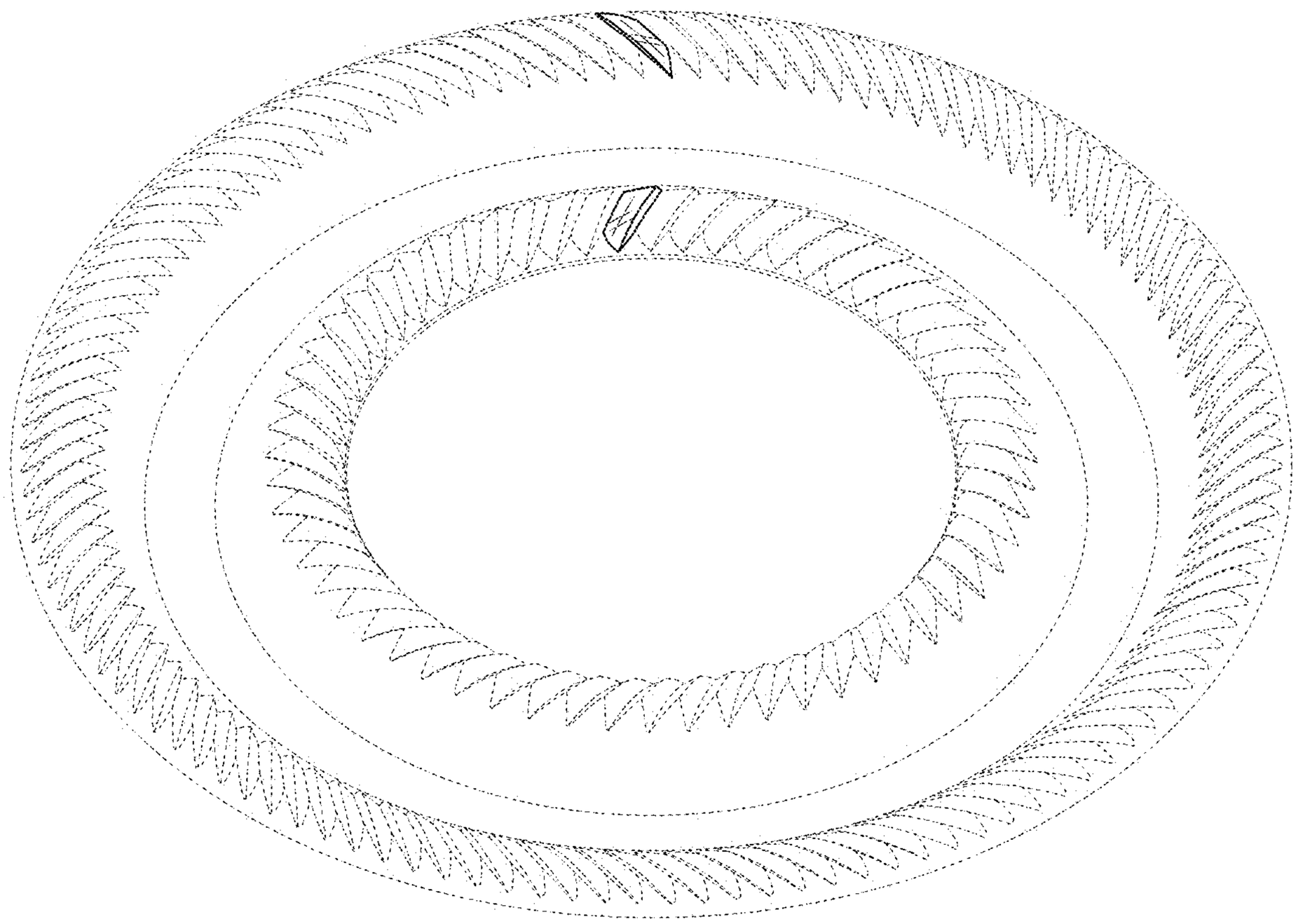


FIG.5

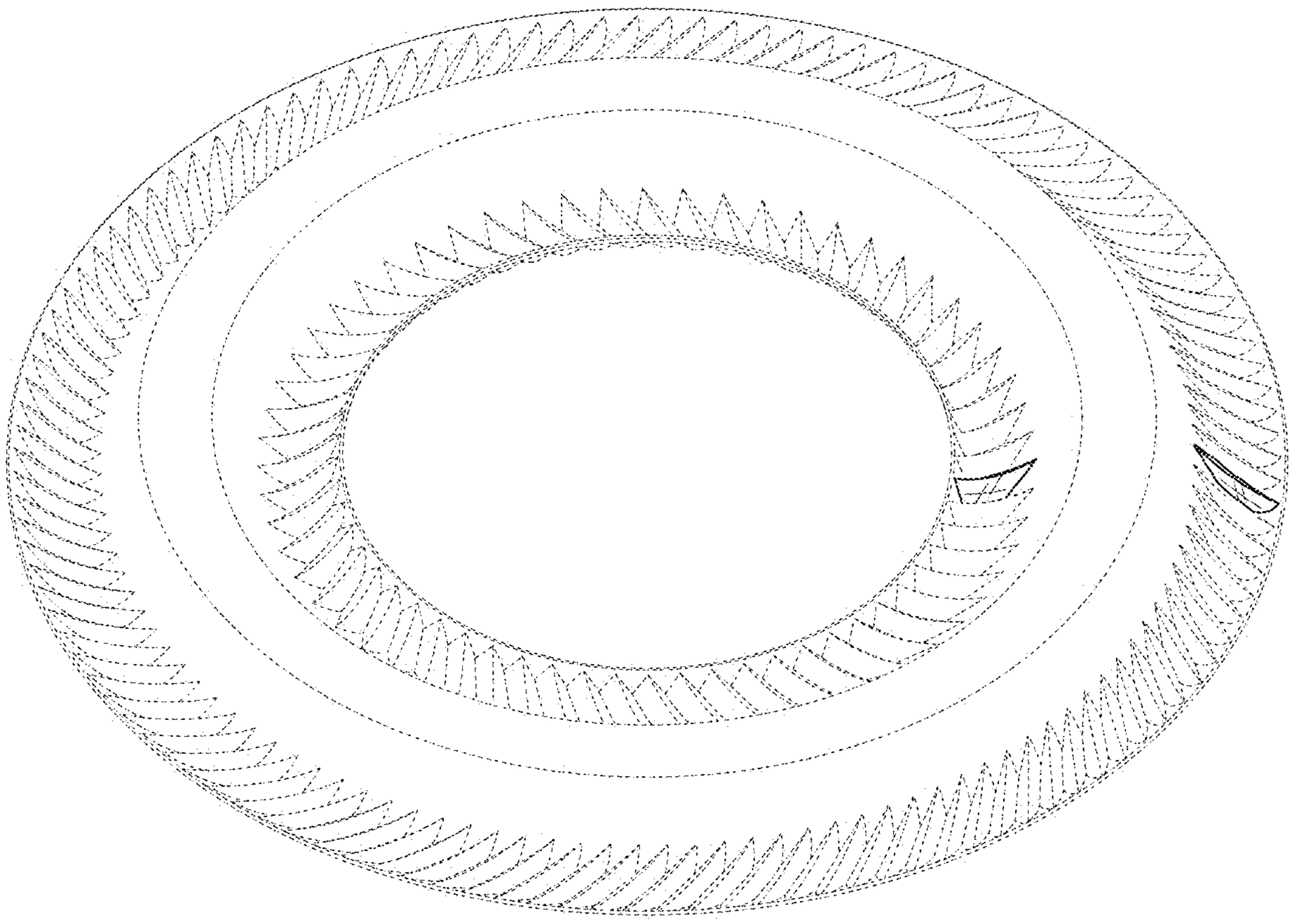


FIG.6

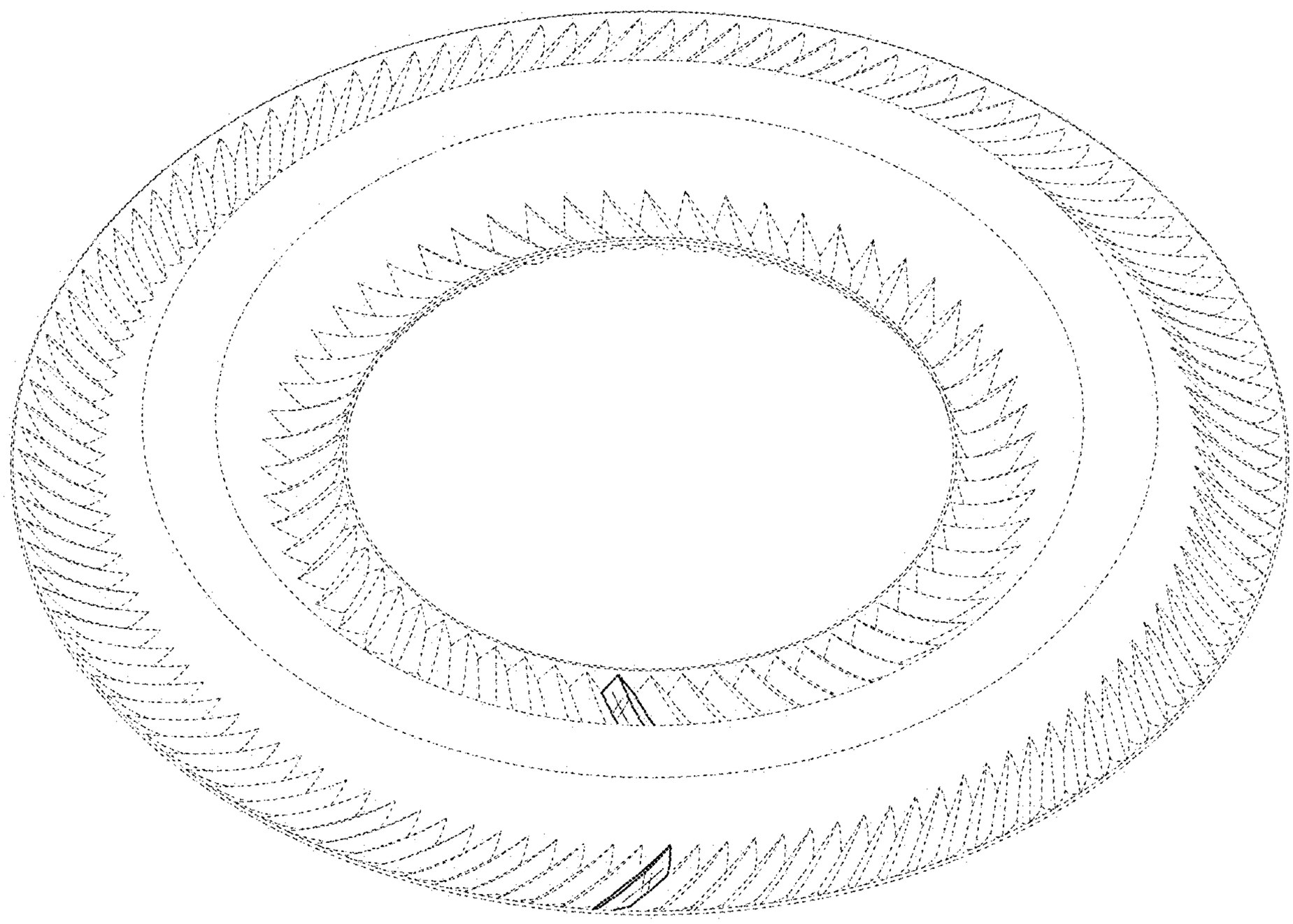


FIG.7

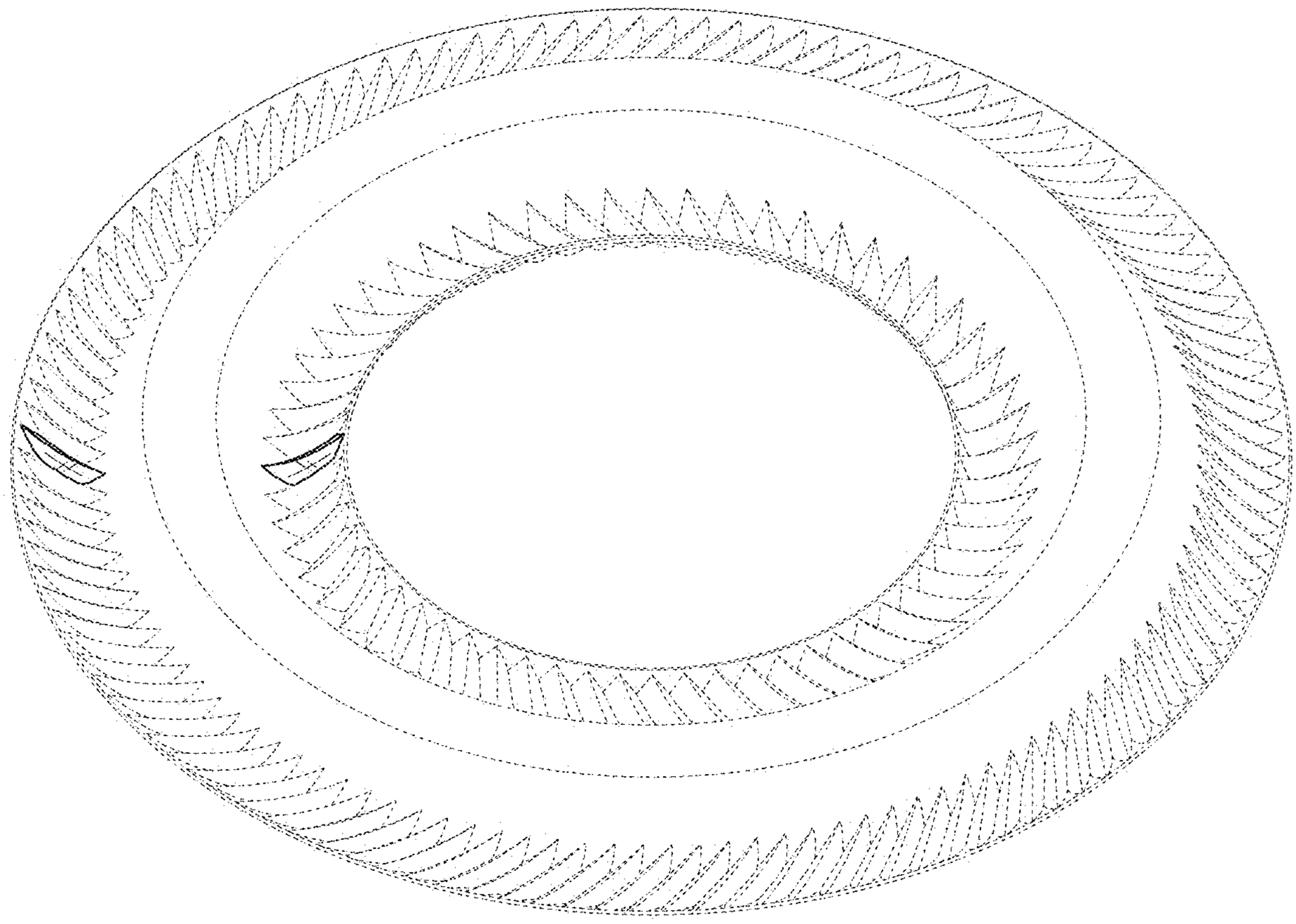


FIG.8

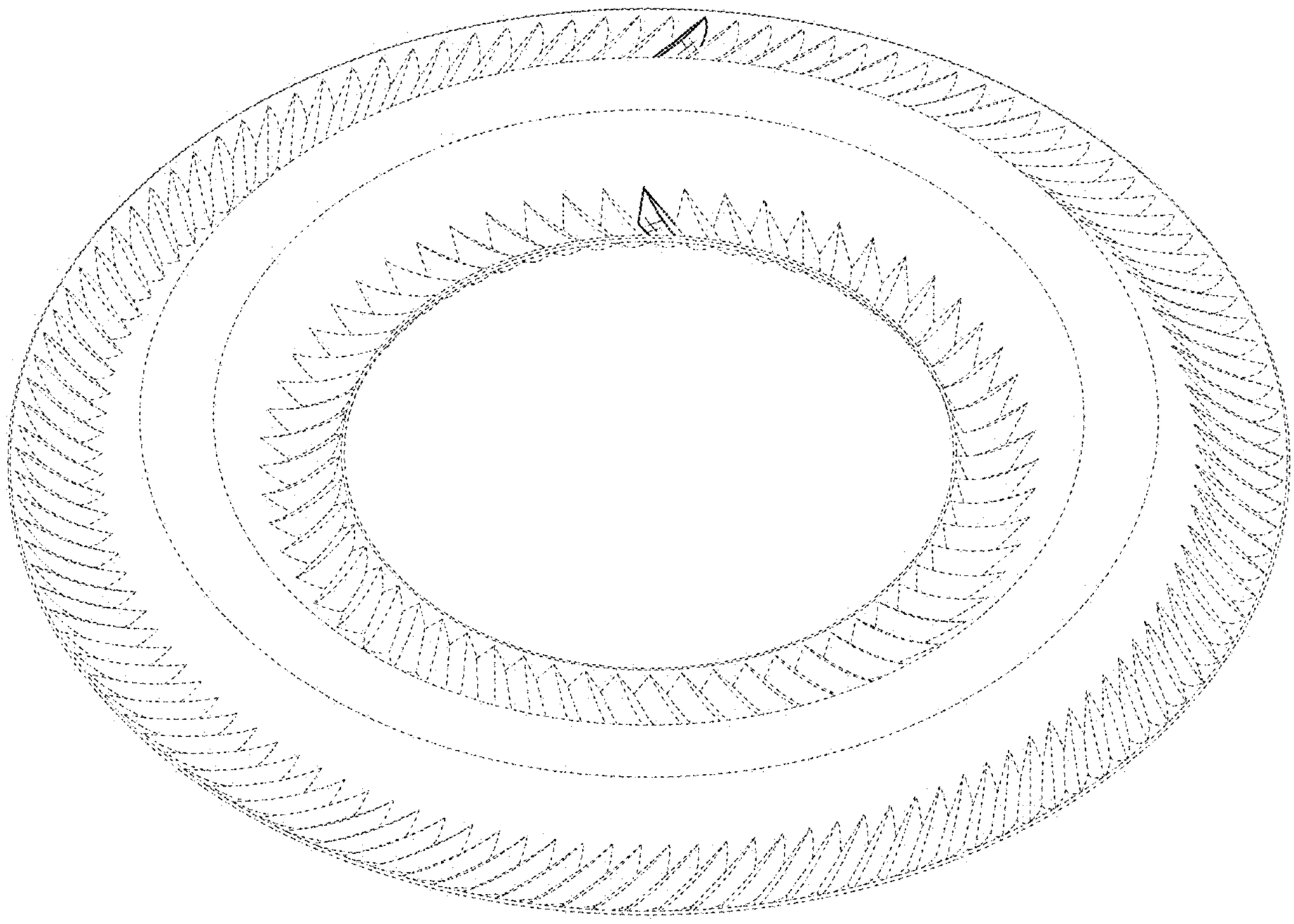


FIG.9

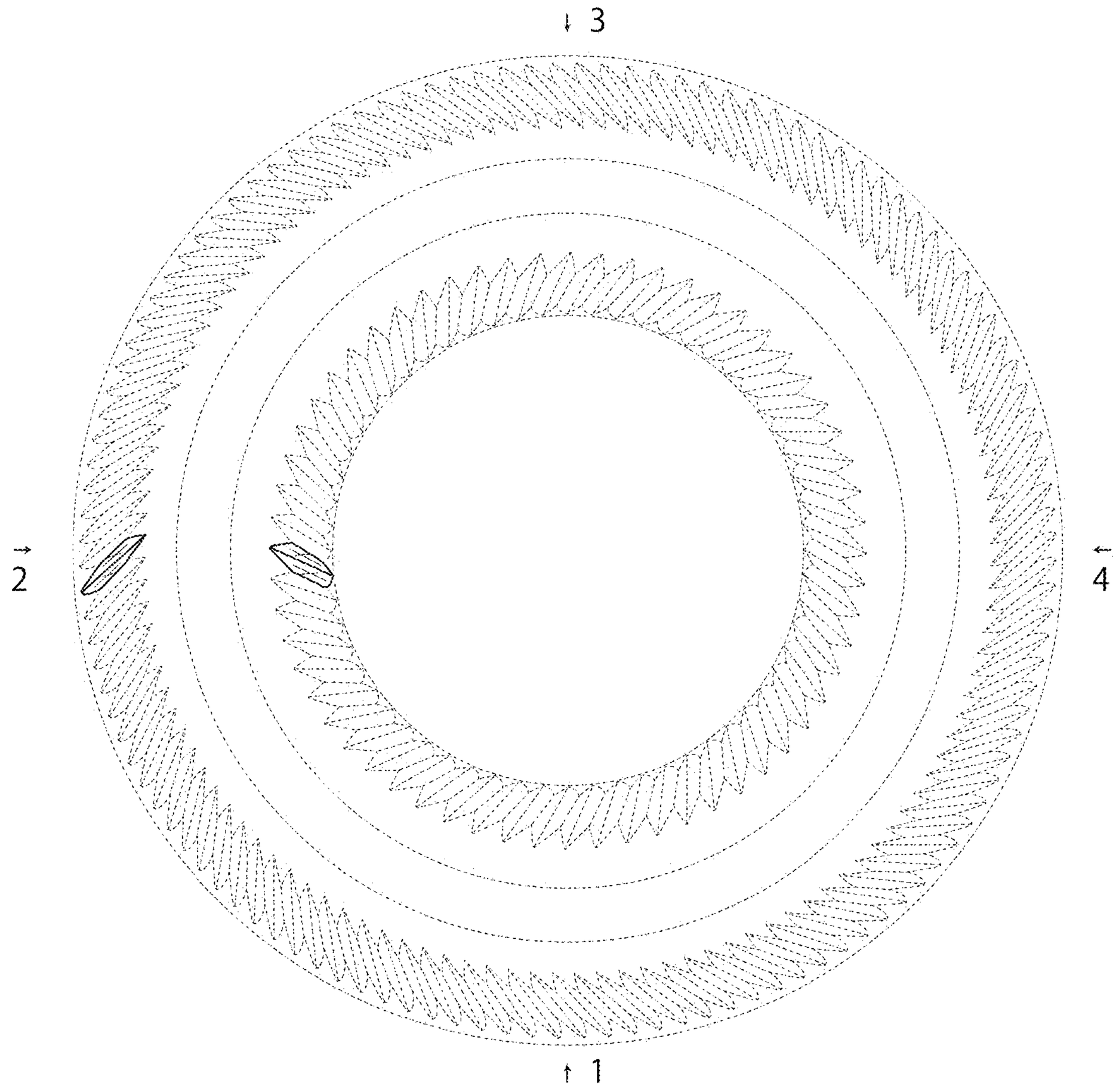


FIG.10

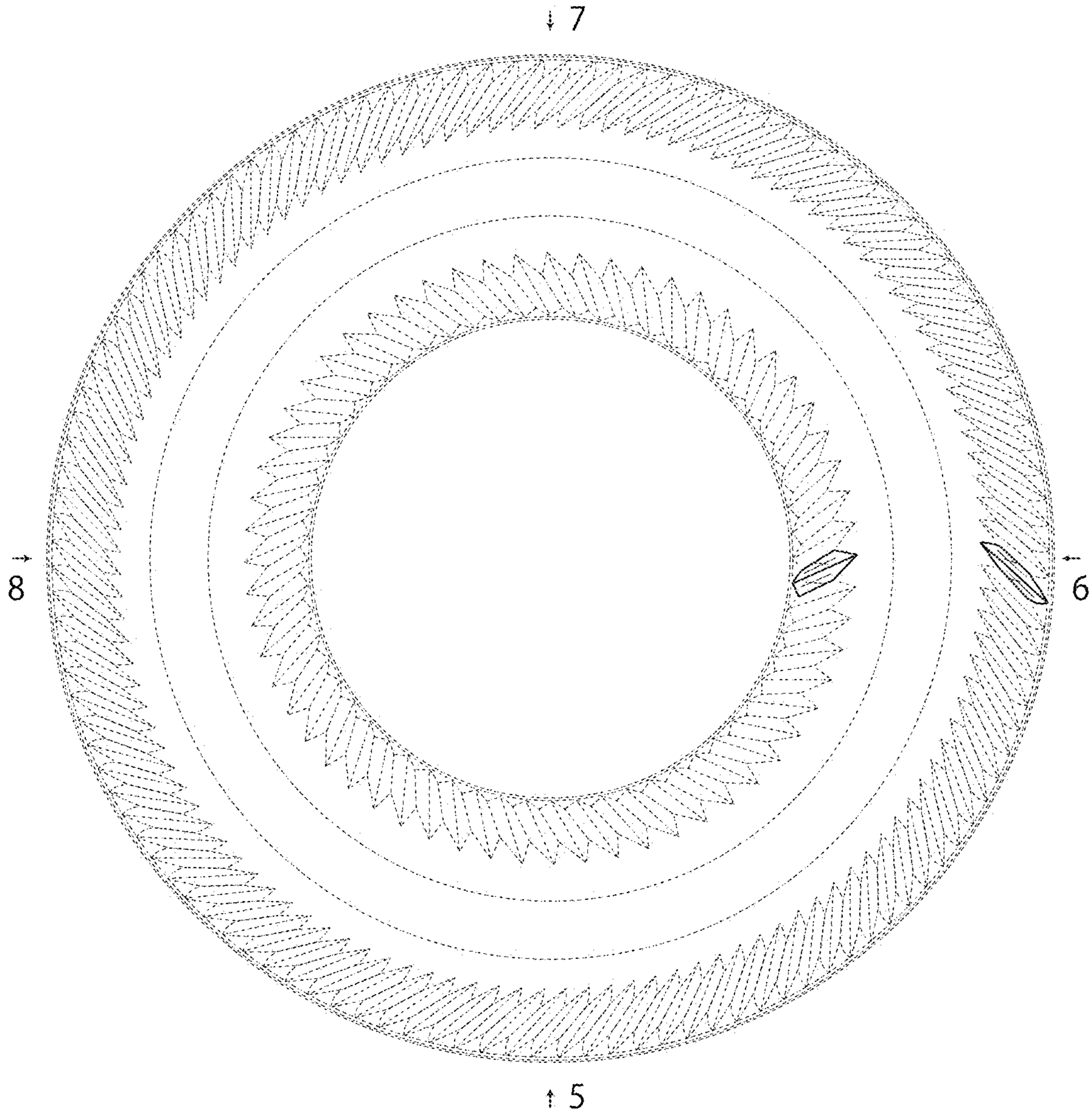


FIG.11

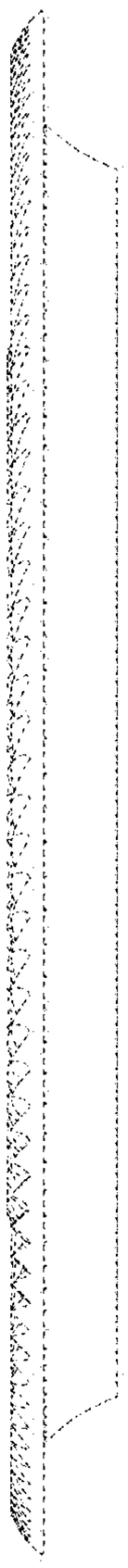


FIG.12

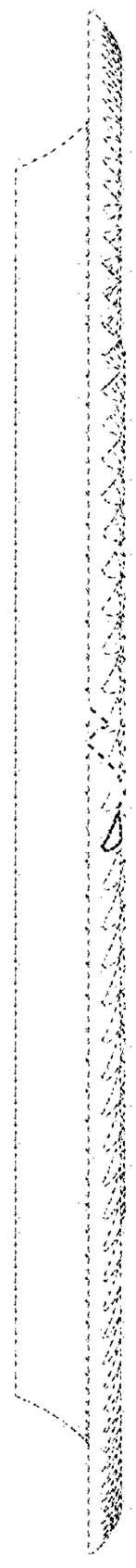


FIG.13