



US00D852762S

(12) **United States Design Patent** (10) **Patent No.:** **US D852,762 S**
Krishnan et al. (45) **Date of Patent:** **** Jul. 2, 2019**

(54) **WAFER CARRIER WITH A 14-POCKET CONFIGURATION**

(71) Applicant: **Veeco Instruments Inc.**, Plainview, NY (US)

(72) Inventors: **Sandeep Krishnan**, Jersey City, NJ (US); **Raghu Chikkanayakanahalli Moorkannaiah**, Elizabeth, NJ (US)

(73) Assignee: **Veeco Instruments Inc.**, Plainview, NY (US)

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

(21) Appl. No.: **29/612,468**

(22) Filed: **Aug. 1, 2017**

Related U.S. Application Data

(62) Division of application No. 29/522,212, filed on Mar. 27, 2015, now Pat. No. Des. 793,971.

(51) **LOC (11) Cl.** **13-03**

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

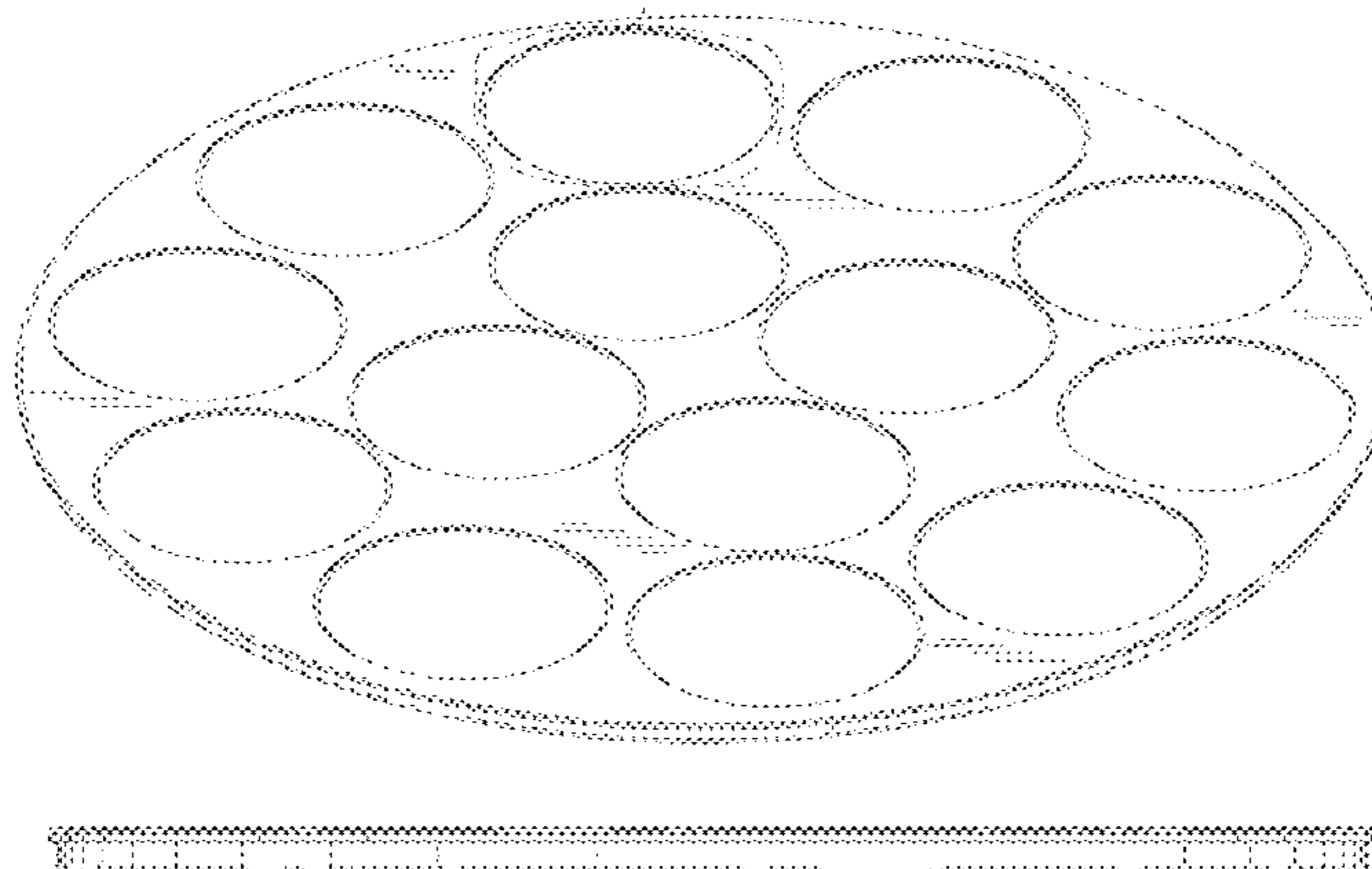
(58) **Field of Classification Search**
USPC D13/182; 118/500, 728, 729; 156/345.53; 279/128; 361/234; 451/287, 288, 289

CPC . B05B 13/0285; B05B 13/0292; B05B 13/02; B05B 13/0228; C23C 14/50; C23C 14/505; C23C 16/4585; C23C 16/4576; C23C 16/4561; C23C 16/4583; C23C 16/4584; B05C 13/00; H01L 21/6838; H01L 21/68771; H01L 21/68735; H01L 21/67103; H01L 21/67051; H01L 21/6708; H01L 21/68785; H01L 21/6831; H01L 21/6833; H01L 21/67109; B23B 31/28; B23Q 3/154; B23Q 3/1546; G03F 7/70708; B24B 37/30; B24B 37/26; B24B 37/04; B24B 37/32; B24B 57/02; B24B 53/017; B24B 4/061

See application file for complete search history.

		(56) References Cited	
		U.S. PATENT DOCUMENTS	
	1,448,769 A	3/1923	Sanders
	3,409,138 A	11/1968	Robert
	3,461,537 A	8/1969	Lotz
	3,731,435 A	5/1973	Boettcher et al.
	3,783,822 A	1/1974	Wollam
	3,845,738 A *	11/1974	Berkman C23C 16/46 118/725
	4,165,584 A *	8/1979	Scherrer B24B 37/32 257/E21.214
	D265,069 S	6/1982	LeVan
	D280,803 S	10/1985	Peterson
	D296,029 S	5/1988	Knox
	D302,204 S	7/1989	Gatton
	D310,874 S	9/1990	Utley, Jr.
	D325,934 S	5/1992	Ramljak
	5,152,842 A	10/1992	Urata et al.
	5,191,738 A *	3/1993	Nakazato B24B 37/013 451/287
	D344,788 S	3/1994	Castro et al.
	5,422,316 A *	6/1995	Desai B24B 37/013 156/345.14
	D365,541 S	12/1995	Hirsch et al.
	5,573,448 A	11/1996	Nakazima et al.
	5,647,789 A	7/1997	Kitta et al.
	D383,377 S	9/1997	Sellers
	5,674,107 A	10/1997	Graebner et al.
	5,690,742 A	11/1997	Ogata et al.
	D388,123 S	12/1997	Sukumoda et al.
	5,788,560 A	8/1998	Hashimoto et al.
	D398,997 S	9/1998	Taylor
	5,800,622 A	9/1998	Takemi et al.
	5,840,124 A *	11/1998	Gurary C23C 16/4585 118/726
	D410,408 S	6/1999	Green
	6,080,042 A	6/2000	McGregor et al.
	D428,133 S	7/2000	Chen
	6,331,136 B1	12/2001	Bass et al.
	6,454,635 B1 *	9/2002	Zhang B24B 37/28 29/402.08
	D464,420 S	10/2002	Tolar
	D466,597 S	12/2002	Carr et al.
	6,492,625 B1	12/2002	Boguslaysky et al.
	6,500,059 B2 *	12/2002	Chang B24B 37/345 451/289
	6,514,424 B2	2/2003	Wenski et al.
	D475,023 S	5/2003	Maushard et al.
	6,645,049 B2	11/2003	Nguyen
	6,666,948 B2	12/2003	Nguyen

FIG. 4



US D852,762 S

D485,613 S	1/2004	Xiao et al.	D697,581 S	1/2014	Sawchuk et al.
D486,906 S	2/2004	Xiao et al.	D698,434 S	1/2014	Wolff
6,709,981 B2	3/2004	Grabbe et al.	D699,199 S	2/2014	Kuwabara et al.
6,710,611 B2	3/2004	Saulnier et al.	D699,201 S	2/2014	Petsch
D490,183 S	5/2004	Benensohn et al.	D699,691 S	2/2014	Yang et al.
D490,511 S	5/2004	Campbell	D700,987 S	3/2014	Nepple et al.
6,733,367 B1	5/2004	Nguyen	D701,939 S	4/2014	Sawchuk et al.
D491,098 S	6/2004	Buzzelli	D702,356 S	4/2014	Vosch et al.
D493,246 S	7/2004	Benensohn	D702,357 S	4/2014	Vosch et al.
D502,990 S	3/2005	Morris, III	D703,162 S	4/2014	Tamaso
D504,666 S	5/2005	Cockburn	D704,155 S *	5/2014	Chang D13/182
D510,988 S	10/2005	Blateri	D708,346 S	7/2014	Harder
D511,827 S	11/2005	Wilson, Jr.	D708,728 S	7/2014	Yoo et al.
D512,500 S	12/2005	Wilson, Jr.	8,795,480 B2	8/2014	Mayer et al.
D512,501 S	12/2005	Wilson, Jr.	D713,492 S	9/2014	Sawchuk et al.
6,988,942 B2	1/2006	Chen et al.	D714,488 S	9/2014	Chen et al.
D517,073 S	3/2006	McDonald et al.	D716,742 S *	11/2014	Jang D13/182
7,008,308 B2 *	3/2006	Bjelopavlic B24B 37/28 451/269	D717,086 S	11/2014	Pendleton
D523,825 S	6/2006	Egawa	D720,309 S	12/2014	Kaneko et al.
D544,452 S	6/2007	Nakamura et al.	D720,313 S	12/2014	Flynn et al.
7,235,139 B2 *	6/2007	Boguslavskiy C23C 16/4585 118/500	D721,417 S	1/2015	Sawchuk et al.
D552,565 S *	10/2007	Nakamura D13/182	D722,150 S	2/2015	Heine
D554,452 S	11/2007	Ammann	D723,077 S	2/2015	Sakata
D566,880 S	4/2008	Silver	D724,553 S *	3/2015	Choi D13/182
D570,075 S	5/2008	Wood et al.	9,000,605 B2	4/2015	Glass
D571,436 S	6/2008	Genord et al.	9,039,238 B2	5/2015	Kim
D577,159 S	9/2008	Hasapoglou	D731,409 S	6/2015	Erlich et al.
D591,695 S	5/2009	Oh et al.	D732,647 S	6/2015	McPhilliamy et al.
D597,639 S	8/2009	Chen et al.	9,068,264 B2	6/2015	Yang et al.
D606,952 S	12/2009	Lee et al.	D736,941 S	8/2015	Nicholson et al.
D609,655 S	2/2010	Sugimoto	D746,437 S	12/2015	Blomberg et al.
D610,290 S	2/2010	Yoshinobu et al.	D747,454 S	1/2016	Stewart et al.
D611,042 S	3/2010	Ferrari et al.	D748,429 S	2/2016	Lv
D614,593 S	4/2010	Lee et al.	D748,593 S	2/2016	Dempster et al.
D618,328 S	6/2010	Chan	D751,380 S	3/2016	Torrison et al.
D621,804 S	8/2010	Sip et al.	D751,381 S	3/2016	Torrison et al.
D624,692 S	9/2010	Mackin et al.	D751,382 S	3/2016	Torrison et al.
D629,547 S	12/2010	Salm	D751,383 S	3/2016	Torrison et al.
D633,452 S *	3/2011	Namiki D13/182	D751,384 S	3/2016	Torrison et al.
8,021,487 B2	9/2011	Boguslajsky	D751,773 S	3/2016	Gailen
8,022,372 B2	9/2011	Lee	D751,999 S	3/2016	Sharma et al.
D648,289 S	11/2011	Mayer et al.	D752,199 S	3/2016	Berkman et al.
D649,126 S	11/2011	Takahashi	D752,202 S	3/2016	Berkman et al.
8,177,993 B2	5/2012	Seah et al.	D752,728 S	3/2016	McPhilliamy et al.
8,182,315 B2	5/2012	Nguyen	9,273,413 B2	3/2016	Krishnan
D664,285 S	7/2012	Toft	D753,269 S	4/2016	Yamagishi et al.
D664,708 S	7/2012	Toft	D754,785 S	4/2016	Gibson et al.
8,216,379 B2	7/2012	Ishikawa et al.	D756,907 S	5/2016	Secard
D668,211 S	10/2012	Feng et al.	9,328,908 B2	5/2016	Clifford et al.
D668,577 S	10/2012	Musk	D758,905 S	6/2016	Evans
D672,915 S	12/2012	Toft	D760,180 S	6/2016	Dempster et al.
D673,113 S	12/2012	Fowler	D760,883 S	7/2016	Mann
D674,759 S	1/2013	Chang et al.	D761,746 S	7/2016	Toyoshima
D674,961 S	1/2013	Baran et al.	9,388,493 B2	7/2016	Chang et al.
D675,171 S	1/2013	Tanaka	D762,506 S	8/2016	Windstrup et al.
D677,422 S	3/2013	Lin et al.	D764,957 S	8/2016	Bhattacharya
D678,294 S	3/2013	Weaver, II et al.	D765,608 S	9/2016	Park et al.
D679,446 S	4/2013	Harrington, Jr.	D766,850 S	9/2016	Morisaki et al.
8,414,361 B2	4/2013	Nguyen et al.	D768,538 S	10/2016	Chen et al.
D681,867 S	5/2013	Wegger et al.	D769,432 S	10/2016	Dingle
D682,028 S	5/2013	Preisler	D771,622 S	11/2016	Akana et al.
D686,175 S	7/2013	Gurary et al.	D771,785 S	11/2016	Huang
D686,354 S	7/2013	Feigenbaum	D772,334 S	11/2016	Nishi et al.
D686,582 S	7/2013	Krishnan et al.	D772,735 S	11/2016	Mansueto et al.
D686,713 S	7/2013	Kimpara	9,490,157 B2	11/2016	Goela et al.
D687,788 S	8/2013	Chen et al.	9,500,341 B2	11/2016	Jungwirth
D687,790 S	8/2013	Krishnan et al.	D774,128 S	12/2016	Young et al.
D687,791 S	8/2013	Krishnan et al.	D774,934 S	12/2016	Akana et al.
8,535,445 B2	9/2013	Volf et al.	D778,247 S	2/2017	Gurary et al.
D690,671 S	10/2013	Gurary et al.	D778,416 S	2/2017	Bu et al.
D690,840 S	10/2013	Feigenbaum	D778,422 S	2/2017	Gajewski
D690,841 S	10/2013	Feigenbaum	D778,423 S	2/2017	Buzanowski et al.
8,562,746 B2	10/2013	Gurary	D778,651 S	2/2017	Jackson
D693,782 S	11/2013	Mori et al.	D778,850 S	2/2017	Matsumoto
D695,241 S	12/2013	Gurary et al.	D779,052 S	2/2017	Gajewski
D695,242 S	12/2013	Gurary et al.	D779,093 S	2/2017	Gajewski
D697,038 S	1/2014	Matsumoto et al.	D780,763 S	3/2017	Beals
			D780,821 S	3/2017	Koenig, II
			D780,980 S	3/2017	Starck

D781,165	S	3/2017	Rouillac	KR	3006565590000	8/2012
D784,429	S	4/2017	Kim	KR	3006565600000	8/2012
9,633,822	B2	4/2017	Tanaka	KR	3006565580001	12/2012
D785,575	S	5/2017	Mori	KR	3006565590001	12/2012
D785,678	S	5/2017	Aoki	KR	3006565600001	12/2012
D793,971	S	8/2017	Krishnan et al.	KR	3006909570001	9/2013
D793,972	S	8/2017	Krishnan et al.	KR	3007655720000	10/2014
D806,046	S *	12/2017	Gurary	TW	M420823	1/2012
2002/0027762	A1	3/2002	Yamaguchi	WO	WO 7900510	8/1979
2002/0106826	A1	8/2002	Boguslasky	WO	WO 2013/133204	9/2013
2002/0185068	A1	12/2002	Gurary et al.			
2003/0029570	A1	2/2003	Kawamura et al.			
2003/0036341	A1	2/2003	Myoung et al.			
2003/0057089	A1	3/2003	Nguyen			
2004/0124413	A1	7/2004	Arai et al.			
2004/0259332	A1	12/2004	Fukuoka et al.			
2005/0286058	A1	12/2005	Belousov			
2006/0186096	A1	8/2006	Schramm			
2007/0269684	A1	11/2007	Machida et al.			
2007/0281592	A1	12/2007	Benner			
2008/0102199	A1	5/2008	Gurary			
2008/0170396	A1	7/2008	Yuan et al.			
2009/0017190	A1	1/2009	Sferlazzo			
2009/0155028	A1	6/2009	Boguslasky et al.			
2009/0194026	A1	8/2009	Burrows et al.			
2009/0224175	A1	9/2009	Lee et al.			
2009/0247057	A1	10/2009	Kobayashi et al.			
2010/0162951	A1	7/2010	Pinotti			
2010/0162957	A1	7/2010	Boyd et al.			
2010/0190418	A1	7/2010	Yasuoka et al.			
2011/0114022	A1	5/2011	Boguslasky			
2011/0120376	A1	5/2011	Yang et al.			
2011/0159786	A1	6/2011	Joseph			
2011/0265723	A1	11/2011	Chiang			
2011/0265724	A1	11/2011	Chiang			
2011/0303154	A1	12/2011	Kim et al.			
2012/0027936	A1	2/2012	Gurary			
2012/0037927	A1	2/2012	Lai			
2012/0040097	A1	2/2012	Volf			
2012/0156374	A1	6/2012	Gurary et al.			
2012/0171377	A1	7/2012	Volf et al.			
2012/0240859	A1	9/2012	Chen et al.			
2012/0272892	A1	11/2012	Paranjpe et al.			
2012/0307233	A1	12/2012	Boguslasky et al.			
2013/0009179	A1	1/2013	Bhat et al.			
2013/0043493	A1	2/2013	Wang et al.			
2013/0252404	A1	9/2013	Krishnan et al.			
2013/0276704	A1	10/2013	Krishnan et al.			
2014/0190405	A1	7/2014	Chang et al.			
2014/0261187	A1	9/2014	Krishnan et al.			
2014/0261698	A1	9/2014	Krishnan et al.			
2014/0326186	A1	11/2014	Paranjpe et al.			
2014/0360430	A1	12/2014	Armour et al.			
2015/0188009	A1	4/2015	Hsieh et al.			
2015/0184839	A1	7/2015	Amat Girbau et al.			
2015/0187620	A1	7/2015	Gurary et al.			
2015/0330601	A1	11/2015	Jungwirth			
2016/0123541	A1	5/2016	Quilici et al.			
2016/0169503	A1	6/2016	Chen et al.			
2016/0204044	A1	7/2016	Gurary et al.			
2016/0341400	A1	11/2016	Lee et al.			
2016/0370019	A1	12/2016	Myerholtz, Jr. et al.			
2016/0372321	A1	12/2016	Krishnan et al.			
2017/0063249	A1	3/2017	Seo et al.			
2017/0076972	A1	3/2017	Krishnan et al.			
2017/0101047	A1	4/2017	Dellock et al.			
2017/0121847	A1	5/2017	Armour et al.			
2017/0122506	A1	5/2017	Collins			
2017/0130909	A1	5/2017	Yeon et al.			
2017/0139108	A1	5/2017	Boomgaarden et al.			

OTHER PUBLICATIONS

AIX G5 HT, image post date Jan. 31, 2011, site visited Apr. 30, 2016, (online), <<http://www.compoundsemiconductor.net/article/87562-turning-6-inch-gan-led-manufacturing-into-reality.html>>.
 Rotary-Planetary-Tilting and Rotary-Tilting Stages, image post date Nov. 7, 2014, site visited Feb. 14, 2017, (online), <<http://web.archive.org/web/20141107184242/http://www.tedpella.com/cressington.html/Cressington-Rotary-Tilting-Stages.htm>>.
 Silicon wafer with mirror finish, image post date Jan. 28, 2014, site visited Feb. 14, 2017, (online), <<http://web.archive.org/web/20140108222104/http://en.wikipedia.org/wiki/Silicon>>.
 Large-area wafer, image post date Oct. 3, 2013, site visited May 27, 2017, (online), <<http://iopscience.iop.org/article/10.1088/0034-4885/76/10/106501>>.
 Examiner's Notice, for Japanese Patent Application No. 2015-021231, dated Jan. 22, 2016, 1 page.
 Office Action, for Korean Design Application No. 30-2015-49043, dated Mar. 4, 2016, 2 pages.
 Notification to Make Rectification, for Chinese Utility Model Application No. 201520873877.1, dated Dec. 31, 2015, 2 pages.
 Notice of Rejection, for Japanese Design Application No. 2015-21232, dated Jun. 24, 2016, 2 pages.
 Office Action, for Korean Design Application No. 30-2015-49042, dated Mar. 4, 2016, 2 pages.
 Office Action, for Taiwan Utility Model Patent Application No. 105208619, dated Aug. 18, 2016, 2 pages.
 Office Action, for Taiwan Utility Model Patent Application No. 105208621, dated Aug. 18, 2016, 2 pages.
 Application and File History for Design U.S. Appl. No. 29/522,214, filed Mar. 27, 2015, Inventors Krishnan et al.
 Application and File History for Design U.S. Appl. No. 29/522,212, filed Mar. 27, 2015, Inventors Gurary et al.
 Application and File History for Design U.S. Appl. No. 29/524,104, filed Apr. 16, 2015, Inventors Gurary et al.
 Application and File History for Design U.S. Appl. No. 29/587,929, filed Dec. 6, 2016, Inventors Gurary et al.
 Application and File History for Design U.S. Appl. No. 29/628,062, filed Dec. 1, 2017, Inventors Gurary et al.

* cited by examiner

Primary Examiner — Elizabeth J Oswecki
 (74) Attorney, Agent, or Firm — Patterson Thuente Pedersen, P.A.

(57) CLAIM

The ornamental design for a wafer carrier with a 14-pocket configuration, as shown and described.

DESCRIPTION

FIG. 1 is a perspective view of a wafer carrier with a 14-pocket configuration showing our new design;
 FIG. 2 is a right side elevation view thereof, the left side elevation view, front elevation view, and rear elevation view being identical;
 FIG. 3 is a bottom plan view thereof; and,

FOREIGN PATENT DOCUMENTS

CN	203007414	6/2003
CN	201942749	8/2011
DE	102014100024	7/2015
DE	102010114947	11/2015
JP	2009088088 A	4/2009
KR	3006565580000	8/2012

FIG. 4 is an enlarged portion view taken from encircled portion labeled, "FIG. 4." in FIG. 1.

In each of the figures, portions or features shown in even broken lines form no part of the claimed design. The dashed-dot lines depict the boundary of the enlarged portion view of FIG. 4 and form no part of the claimed design.

1 Claim, 4 Drawing Sheets

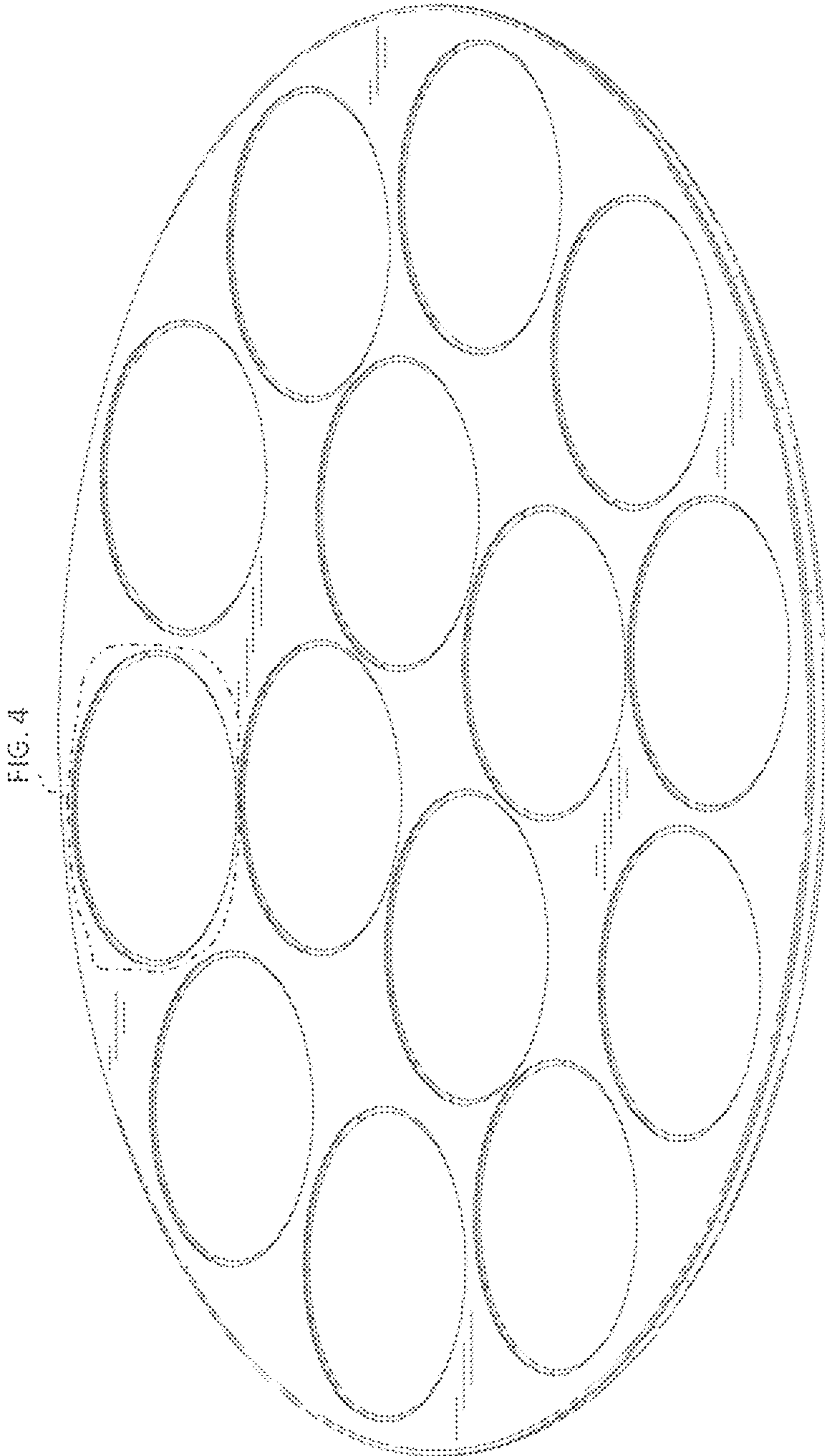


FIG. 4

FIG. 1

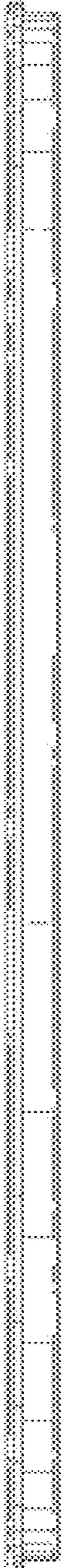


FIG. 2

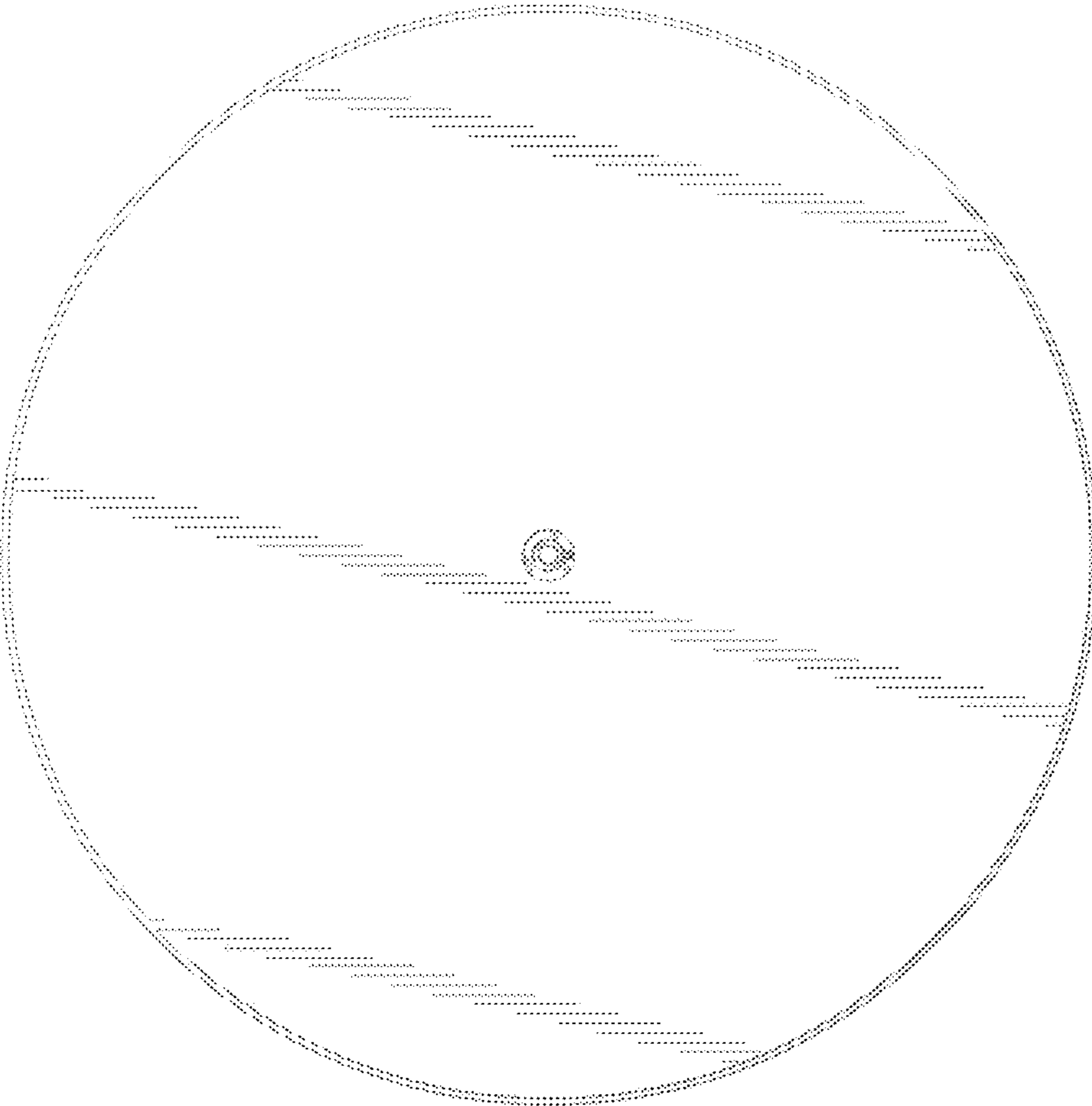


FIG. 3

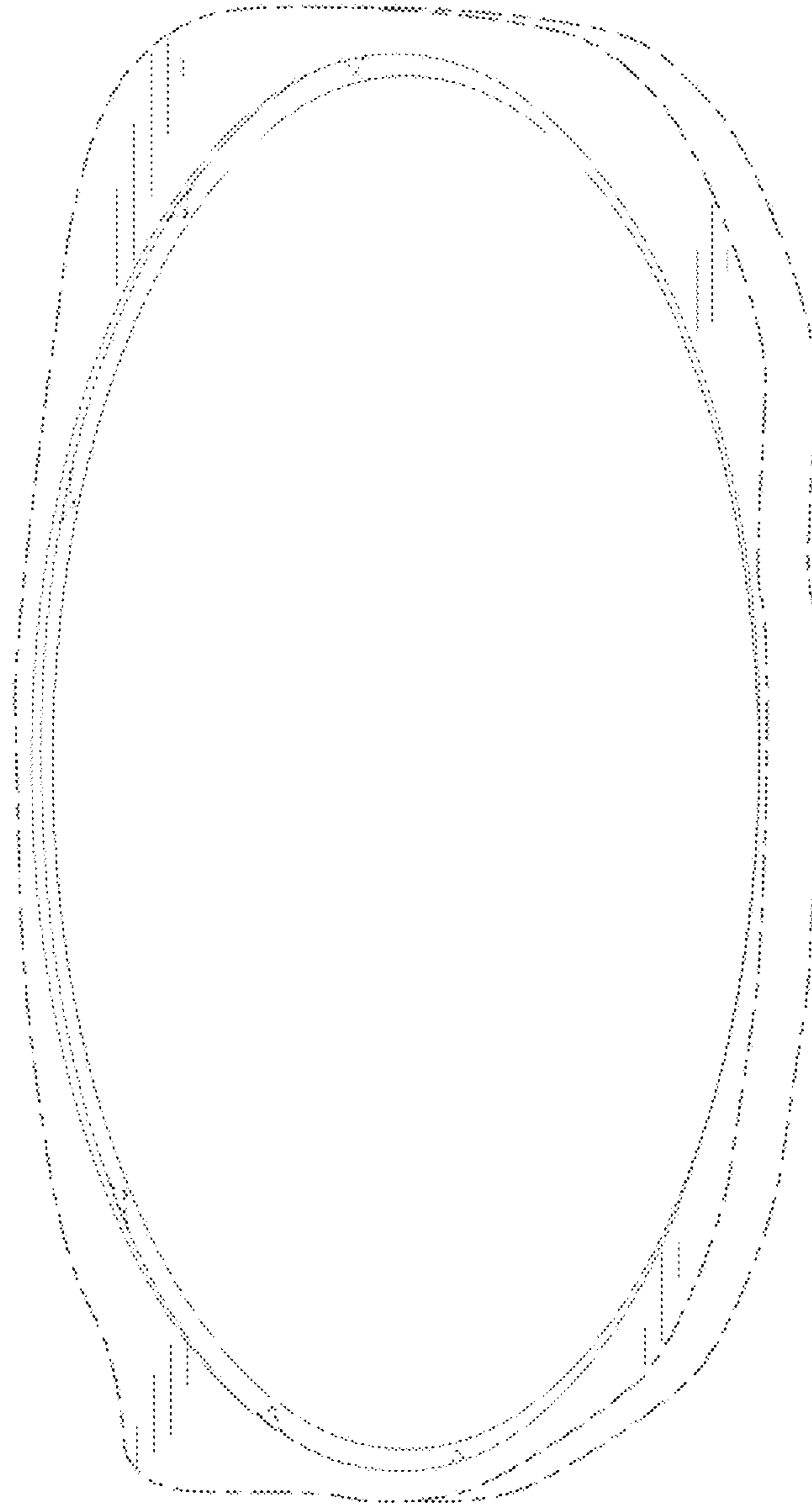


FIG. 4