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

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(52) **U.S. Cl.**

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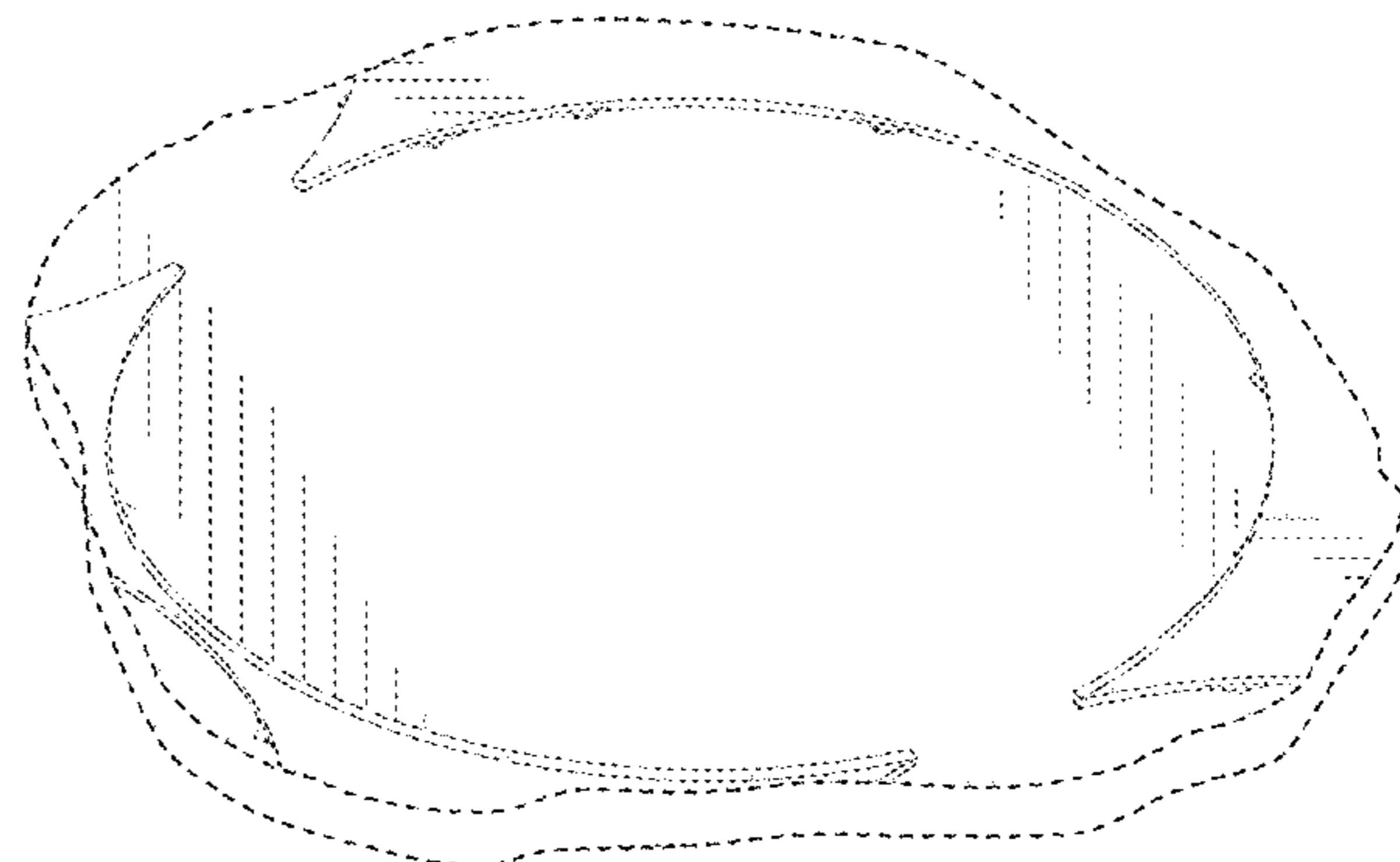
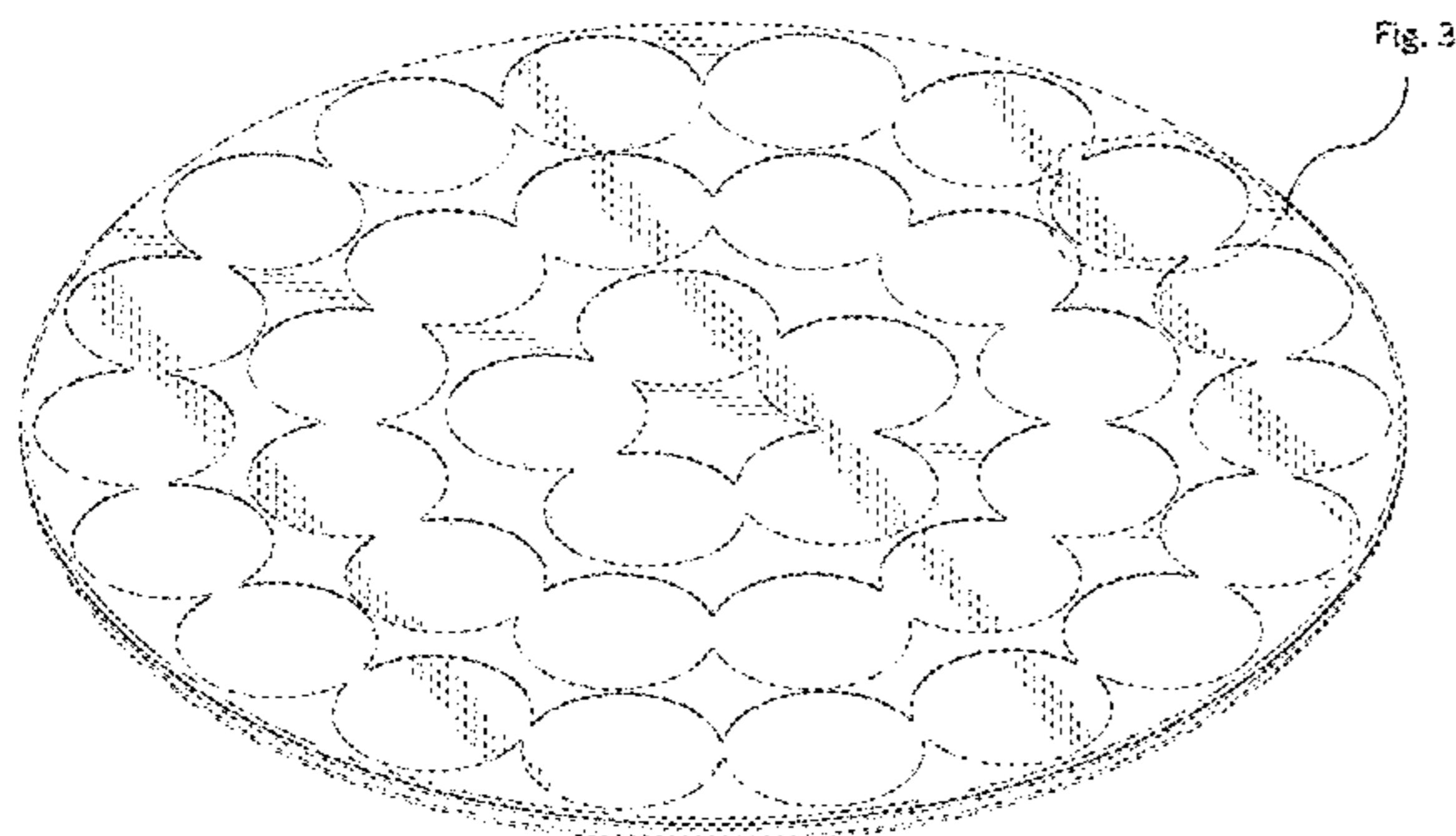
See application file for complete search history.

(56) **References Cited**

U.S. PATENT DOCUMENTS

1,448,769 A * 3/1923 Sanders E04D 13/0409
210/164
3,409,138 A * 11/1968 Lawrence E04D 13/0409
210/238
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 et al.
4,165,584 A 8/1979 Scherrer
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. D13/102
D325,934 S 5/1992 Ramljak
5,152,842 A 10/1992 Urata et al.
5,191,738 A 3/1993 Nakazato et al.
D344,788 S 3/1994 Castro et al.
5,422,316 A 6/1995 Desai et al.
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 et al.
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 et al.
D464,420 S 10/2002 Tolar
D466,597 S 12/2002 Carr
6,492,625 B1 * 12/2002 Boguslavskiy C23C 16/46
118/725
6,500,059 B2 12/2002 Chang et al.
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
D485,613 S 1/2004 Xiao et al.
D486,906 S 2/2004 Xiao et al.
6,709,981 B2 3/2004 Grabbe et al.
6,710,611 B2 3/2004 Saulnier et al.
D490,183 S 5/2004 Benensohn
D490,511 S 5/2004 Campbell
6,733,367 B1 5/2004 Nguyen
D491,098 S 6/2004 Buzzelli
D493,246 S 7/2004 Benensohn
D502,990 S 3/2005 Morris, III
D504,666 S 5/2005 Cockburn
D510,988 S 10/2005 Blateri
D511,827 S 11/2005 Wilson, Jr.
D512,500 S 12/2005 Wilson, Jr.
D512,501 S 12/2005 Wilson, Jr.



US D806,046 S

6,988,942 B2	1/2006	Chen et al.		8,795,480 B2	8/2014	Mayer et al.	
D517,073 S	3/2006	McDonald et al.		D713,492 S	9/2014	Sawchuk et al.	
7,008,308 B2	3/2006	Bjelopavlic et al.		D714,488 S	9/2014	Chen et al.	
D523,825 S	6/2006	Egawa		D716,742 S	11/2014	Jang et al.	
D544,452 S	6/2007	Nakamura et al.		D717,086 S	11/2014	Pendleton	
7,235,139 B2	6/2007	Boguslavskiy et al.		D720,309 S	12/2014	Kaneko et al.	
D552,565 S	10/2007	Nakamura et al.		D720,313 S	12/2014	Flynn et al.	
D554,452 S	11/2007	Ammann		D721,417 S	1/2015	Sawchuk et al.	
D556,880 S	12/2007	Choi et al.		D722,150 S	2/2015	Heine	
D570,075 S	5/2008	Wood et al.		D723,077 S	2/2015	Sakata	
D571,436 S	6/2008	Genord et al.		D724,553 S	3/2015	Choi et al.	
D577,159 S	9/2008	Hasapoglou		9,000,605 B2	4/2015	Glass	
D591,695 S	5/2009	Oh et al.		9,039,238 B2 *	5/2015	Kim	F21K 9/00
D597,639 S	8/2009	Chen Lee					362/218
D606,952 S	12/2009	Lee et al.		D731,409 S *	6/2015	Erlich	D13/102
D609,655 S	2/2010	Sugimoto		D732,647 S	6/2015	McPhilliamy et al.	
D610,290 S	2/2010	Yoshinobu et al.		9,068,264 B2	6/2015	Yang et al.	
D611,042 S	3/2010	Ferrari et al.		D736,941 S	8/2015	Nicholson et al.	
D614,593 S	4/2010	Lee et al.		D746,437 S	12/2015	Blomberg et al.	
D618,328 S	6/2010	Chan		D747,454 S	1/2016	Stewart et al.	
D621,804 S	8/2010	Sip et al.		D748,593 S	2/2016	Dempster et al.	
D624,692 S	9/2010	Mackin et al.		D751,380 S	3/2016	Torrison et al.	
D629,547 S	12/2010	Salm		D751,381 S	3/2016	Torrison et al.	
D633,452 S	3/2011	Namiki et al.		D751,382 S	3/2016	Torrison et al.	
8,021,487 B2 *	9/2011	Boguslavskiy	C23C 16/4581	D751,383 S	3/2016	Torrison et al.	
			118/728	D751,384 S	3/2016	Torrison et al.	
8,022,372 B2 *	9/2011	Lee	G01N 21/645	D751,773 S	3/2016	Gailen	
			250/458.1	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.	
8,117,993 B2	2/2012	Farmer et al.		D752,728 S	3/2016	McPhilliamy et al.	
8,182,315 B2	5/2012	Nguyen		9,273,413 B2 *	3/2016	Krishnan	C30B 25/12
D664,285 S *	7/2012	Toft	F21V 21/30	D753,269 S	4/2016	Yamagishi et al.	
			D26/118	D754,785 S	4/2016	Gibson et al.	
D664,708 S	7/2012	Toft		D756,907 S	5/2016	Secard	
8,216,379 B2	7/2012	Ishikawa et al.		9,328,908 B2	5/2016	Clifford et al.	
D668,211 S	10/2012	Feng et al.		D758,905 S	6/2016	Evans	
D668,577 S	10/2012	Musk		D760,180 S *	6/2016	Dempster	D13/182
D672,915 S	12/2012	Toft		D760,883 S	7/2016	Mann	
D673,113 S	12/2012	Fowler		D761,746 S	7/2016	Toyoshima	
D674,759 S	1/2013	Chang et al.		9,388,493 B2 *	7/2016	Chang	C23C 16/4407
D674,961 S	1/2013	Baran et al.		D762,506 S	8/2016	Windstrup et al.	
D675,171 S	1/2013	Tanaka		D764,957 S	8/2016	Bhattacharya	
D677,422 S	3/2013	Lin et al.		D765,608 S	9/2016	Park et al.	
D678,294 S	3/2013	Weaver, II et al.		D766,850 S *	9/2016	Morisaki	D13/182
D679,446 S	4/2013	Harrington, Jr.		D768,538 S	10/2016	Chen et al.	
8,414,361 B2	4/2013	Nguyen et al.		D769,432 S *	10/2016	Dingle	D23/359
D681,867 S	5/2013	Wegger et al.		D771,622 S	11/2016	Akana et al.	
D682,028 S	5/2013	Preisler		D771,785 S *	11/2016	Huang	D23/366
D686,175 S	7/2013	Gurary et al.		D772,334 S	11/2016	Nishi et al.	
D686,354 S	7/2013	Feigenbaum		D772,735 S	11/2016	Mansueto et al.	
D686,582 S	7/2013	Krishnan et al.		9,490,157 B2	11/2016	Goela et al.	
D686,713 S	7/2013	Kimpara		9,500,341 B2	11/2016	Jungwirth	
D687,788 S	8/2013	Chen et al.		D774,128 S	12/2016	Young et al.	
D687,790 S	8/2013	Krishnan et al.		D774,934 S	12/2016	Akana et al.	
D687,791 S	8/2013	Krishnan et al.		D778,247 S *	2/2017	Gurary	H01L 21/68721
8,535,445 B2	9/2013	Volf et al.					D13/182
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	C23C 16/4584	D778,651 S	2/2017	Jackson	
			118/715	D778,850 S *	2/2017	Matsumoto	D13/182
D693,782 S	11/2013	Mori et al.		D779,052 S *	2/2017	Gajewski	D23/411
D695,241 S	12/2013	Gurary et al.		D779,093 S *	2/2017	Gajewski	D23/411
D695,242 S	12/2013	Gurary et al.		D780,763 S *	3/2017	Beals	D14/436
D697,038 S	1/2014	Matsumoto et al.		D780,821 S *	3/2017	Koenig, II	D16/136
D697,581 S	1/2014	Sawchuk et al.		D780,980 S *	3/2017	Starck	D26/89
D698,434 S	1/2014	Wolff		D781,165 S *	3/2017	Rouillac	D10/91
D699,199 S	2/2014	Kuwabara et al.		D784,429 S *	4/2017	Kim	D15/89
D699,201 S	2/2014	Petsch		9,633,822 B2 *	4/2017	Tanaka	H01J 37/3244
D699,691 S	2/2014	Yang et al.		D785,575 S *	5/2017	Mori	D13/182
D700,987 S	3/2014	Nepple et al.		D785,678 S *	5/2017	Aoki	D15/5
D701,939 S	4/2014	Sawchuk et al.		2002/0027762 A1	3/2002	Yamaguchi	
D702,356 S	4/2014	Vosch et al.		2002/0106826 A1 *	8/2002	Boguslavskiy	C23C 16/4584
D702,357 S	4/2014	Vosch et al.					438/44
D703,162 S	4/2014	Tamaso		2002/0185068 A1 *	12/2002	Gurary	C23C 16/4401
D704,155 S	5/2014	Chang et al.					118/722
D708,346 S	7/2014	Harder		2003/0029570 A1	2/2003	Kawamura et al.	
D708,728 S	7/2014	Yoo et al.		2003/0036341 A1	2/2003	Myoung et al.	

2003/0057089	A1	3/2003	Nguyen et al.	
2004/0124413	A1	7/2004	Arai et al.	
2004/0259332	A1	12/2004	Fukuoka et al.	
2005/0286058	A1*	12/2005	Belousov	G01B 11/24 356/612
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	H01L 21/68764 427/240
2008/0170396	A1	7/2008	Yuan et al.	
2009/0017190	A1*	1/2009	Sferlazzo	C23C 16/45589 427/10
2009/0155028	A1	6/2009	Boguslavskiy 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	Boguslavskiy ...	C23C 16/45508 118/724
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	C23C 16/4407 427/255.5
2012/0037927	A1	2/2012	Lai	
2012/0040097	A1*	2/2012	Volf	C23C 16/4586 427/255.5
2012/0156374	A1	6/2012	Gurary et al.	
2012/0171377	A1*	7/2012	Volf	H01L 21/68771 427/255.28
2012/0240859	A1	9/2012	Chen et al.	
2012/0272892	A1*	11/2012	Paranjpe	C30B 25/10 117/86
2012/0307233	A1*	12/2012	Boguslavskiy ...	H01L 21/67109 356/43
2013/0009179	A1	1/2013	Bhat et al.	
2013/0043493	A1	2/2013	Wang et al.	
2013/0252404	A1*	9/2013	Krishnan	H01L 21/6719 438/478
2013/0276704	A1*	10/2013	Krishnan	C23C 16/4584 118/725
2014/0190405	A1	7/2014	Chang et al.	
2014/0261187	A1*	9/2014	Krishnan	C23C 16/4584 118/730
2014/0261698	A1	9/2014	Krishnan et al.	
2014/0326186	A1	11/2014	Paranjpe et al.	
2014/0360430	A1*	12/2014	Armour	C23C 16/4586 118/725
2015/0184839	A1*	7/2015	Amat Girbau	A61G 13/108 362/147
2015/0187620	A1*	7/2015	Gurary	C23C 16/4584 118/728
2015/0188009	A1	7/2015	Chih et al.	
2015/0330601	A1	11/2015	Jungwirth	
2016/0123541	A1*	5/2016	Quilici	F21K 9/233 315/210
2016/0169503	A1*	6/2016	Chen	F21K 9/20 416/5
2016/0204044	A1*	7/2016	Gurary	C23C 16/45521 438/5
2016/0341400	A1*	11/2016	Lee	F21V 29/67
2016/0370019	A1*	12/2016	Myerholtz, Jr.	F24F 1/04
2016/0372321	A1*	12/2016	Krishnan	H01L 21/67103
2017/0063249	A1*	3/2017	Seo	F04D 19/002
2017/0076972	A1*	3/2017	Krishnan	H01L 21/68785
2017/0101047	A1*	4/2017	Dellock	B60Q 1/2619
2017/0121847	A1*	5/2017	Armour	C30B 25/12
2017/0122506	A1*	5/2017	Collins	F21L 4/027
2017/0130909	A1*	5/2017	Yeon	F21K 9/50
2017/0139108	A1*	5/2017	Boomgaarden	G02B 6/0041

FOREIGN PATENT DOCUMENTS

CN	201942749	U	8/2011
CN	203007414	U	6/2013
DE	102014100024	A1	7/2015
DE	102014114947	A1	11/2015
JP	2009088088	A	4/2009
KR	3006565580000		8/2012
KR	3006565590000		8/2012
KR	3006565600000		8/2012
KR	3006565580001		12/2012
KR	3006565590001		12/2012
KR	3006565600001		12/2012
KR	3006909570001		9/2013
KR	3007655720000		10/2014
TW	M420823	U	1/2012
WO	WO7900510	A1	8/1979
WO	WO2013133204	A1	9/2013

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-ganded-manufacturing-into-reality.html>>.*
 Large-area wafers, 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.
 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. 29/524,104, filed Apr. 16, 2015, Inventors Gurary et al.
 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. 29/522,212, filed Mar. 27, 2015, Inventors Gurary et al.
 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 minor finish, image post date Jan. 28, 2014, site visited Feb. 14, 2017 (online) <<https://web.archive.org/web/20140108222104/http://en.wikipedia.org/wiki/Silicon>>.
 Ex parte Quayle Office Action, for U.S. Appl. No. 29/522,214, dated Feb. 21, 2017, 18 pages.

* cited by examiner

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(57) CLAIM

We claim the ornamental design for a wafer carrier with a multi-pocket configuration, as shown and described.

DESCRIPTION

FIG. 1 is a perspective view of embodiment 1 of the wafer carrier with a multi-pocket configuration according to the new design.

FIG. 2 is a top plan view of the wafer carrier with a multi-pocket configuration shown in FIG. 1.

FIG. 3 is a detail view of a portion of the wafer carrier with a multi-pocket configuration shown in FIG. 1 detailing an enlarged portion corresponding to the area indicated in FIG. 1 that includes a single pocket and surrounding region in a perspective view.

FIG. 4 is a right side view of a wafer carrier with a multi-pocket configuration according to the new design shown in FIGS. 1-3, with the left side, front, and rear views being the same as the right side view.

FIG. 5 is a bottom plan view of a wafer carrier with a multi-pocket configuration according to the new design shown in FIGS. 1-4.

FIG. 6 is a perspective view of a wafer carrier with a multi-pocket configuration according to a second embodiment of the new design.

FIG. 7 is a right side view of a wafer carrier with a multi-pocket configuration according to the new design shown in FIGS. 6-8, with the left side, front, and rear views being the same as the right side view; and,

FIG. 8 is a bottom plan view of a wafer carrier with a multi-pocket configuration according to the new design shown in FIGS. 6-8.

The broken lines, where present, in all views illustrate portions of the wafer carrier with a multi-pocket configuration that represent environment of the claimed design and form no part of the claimed design. The dash-dot lines of FIG. 1 define the area corresponding to the enlarged portion shown in FIG. 3 and form no part of the claimed design. The dash-dot and broken lines in FIG. 3 represent the edge of the enlarged portion of the design and form no part of the claimed design.

1 Claim, 8 Drawing Sheets

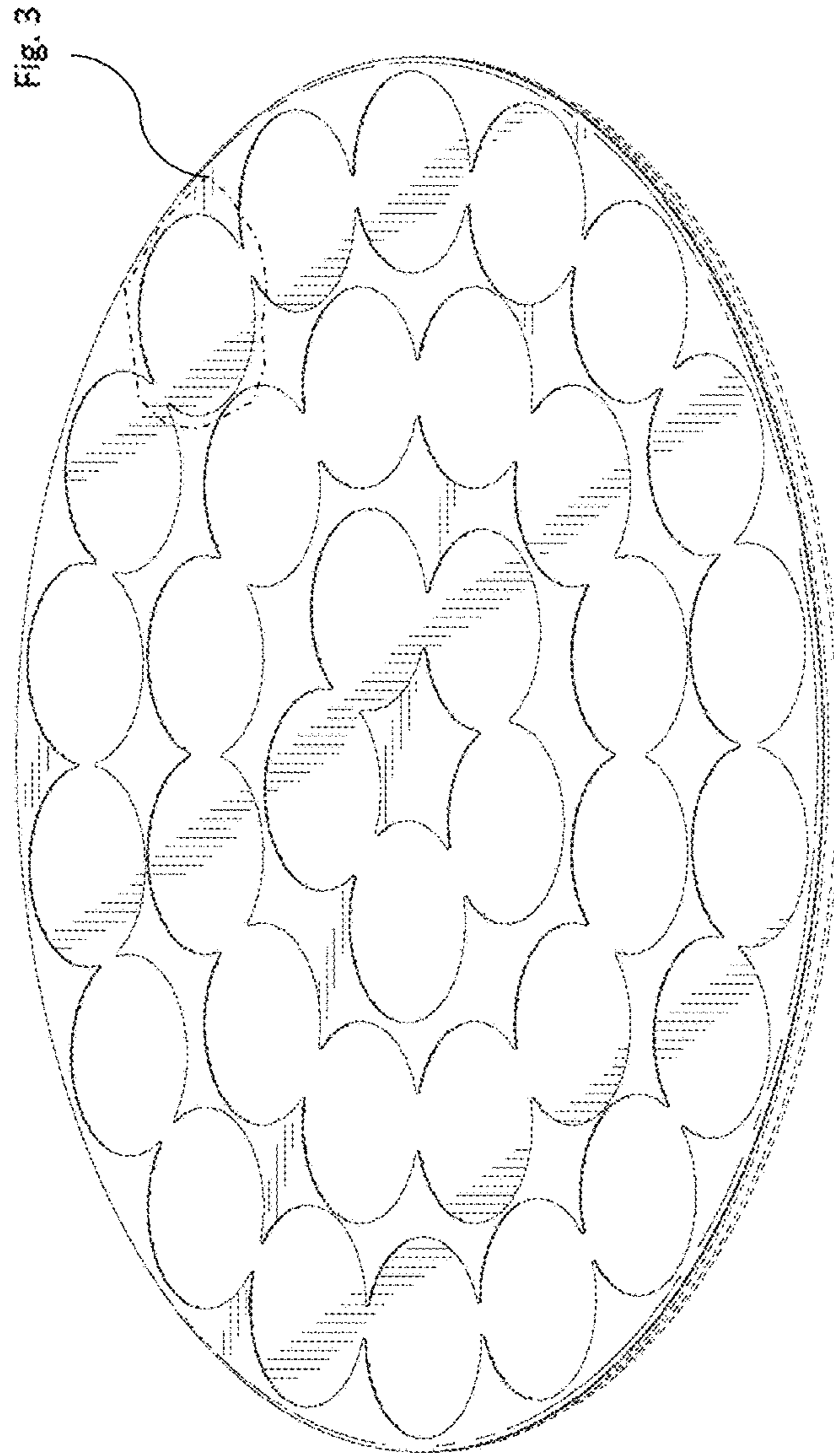


Fig. 1

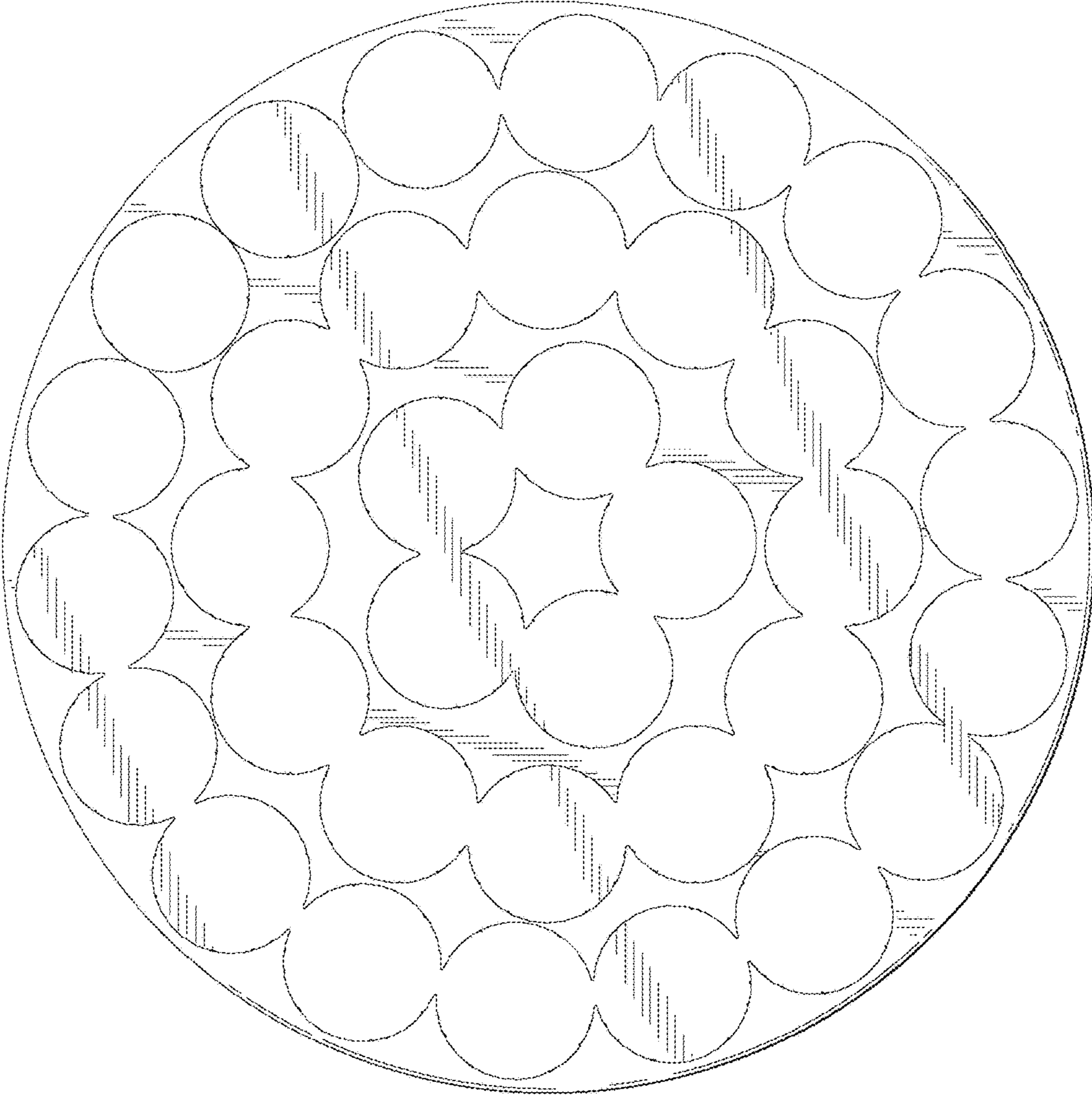


Fig. 2

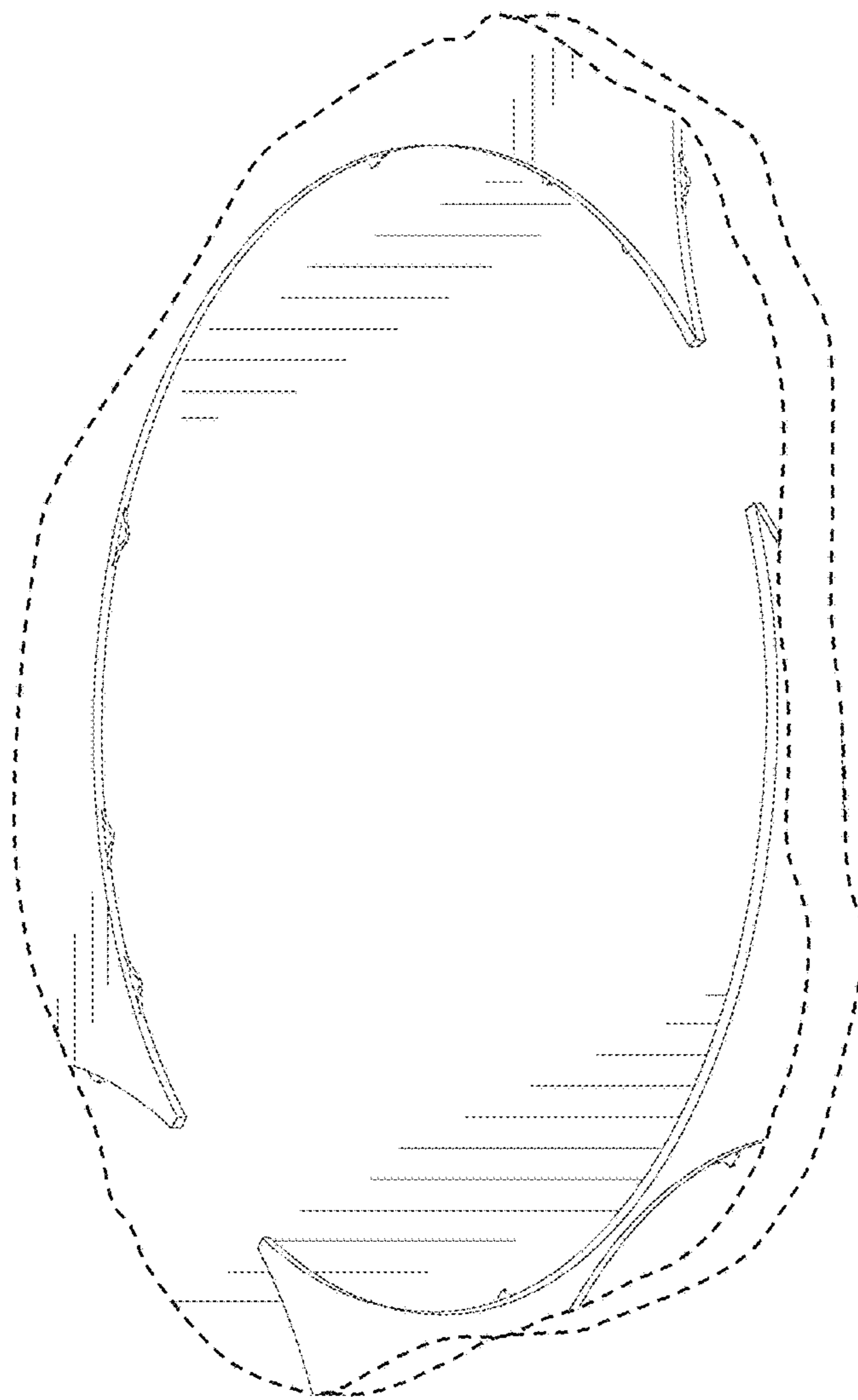


Fig. 3



Fig. 4

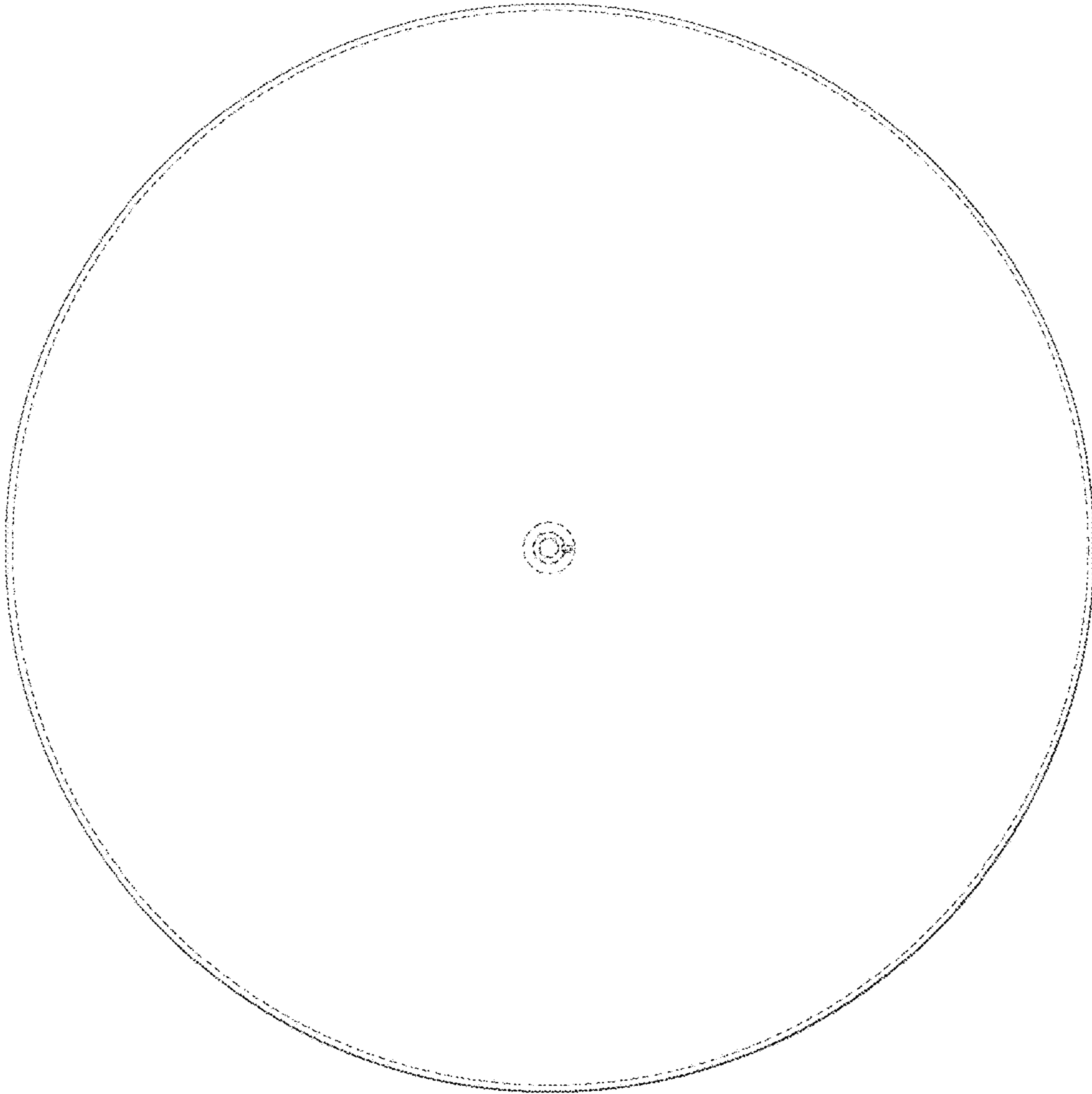


Fig. 5

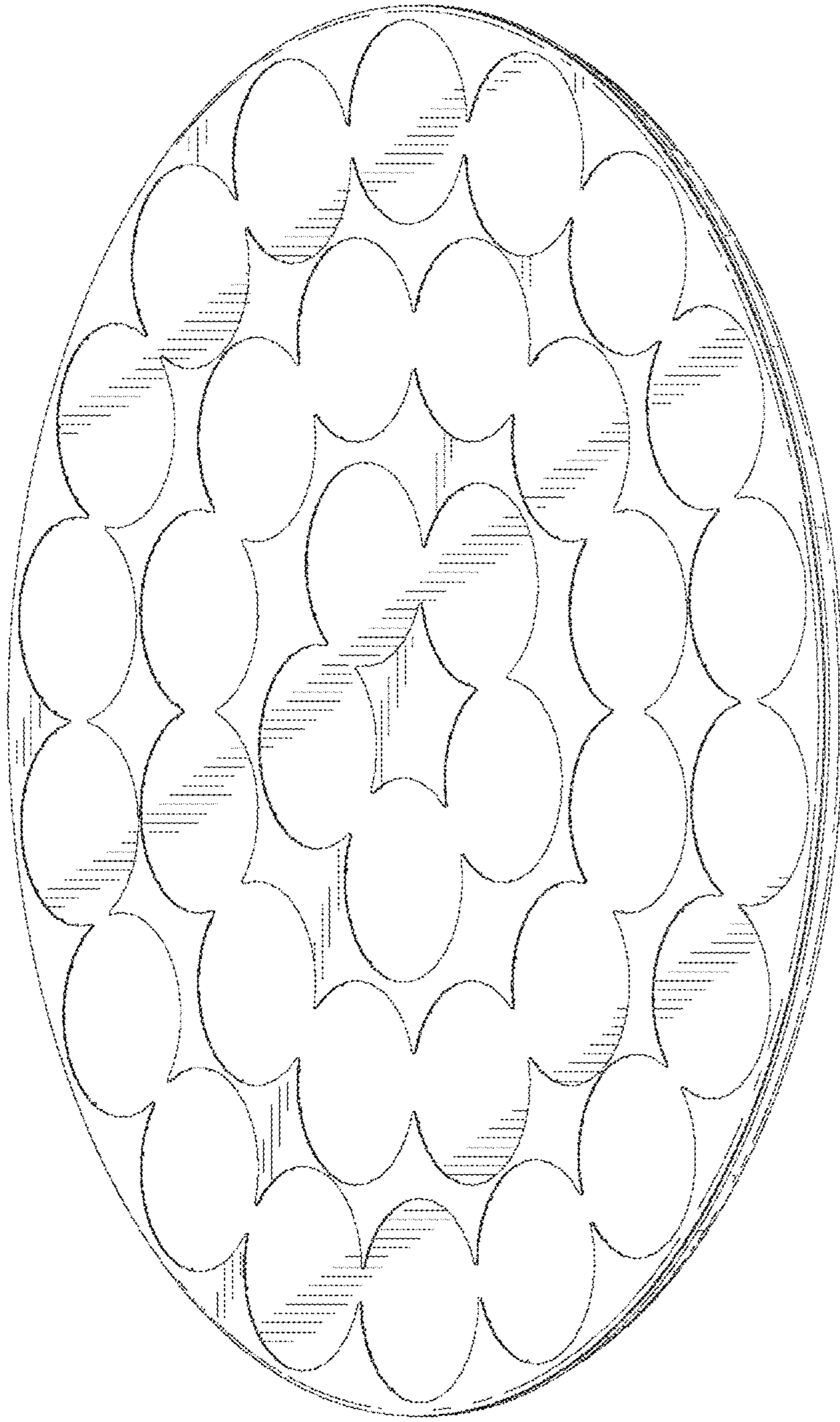


Fig. 6

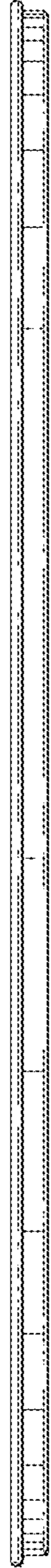


Fig. 7

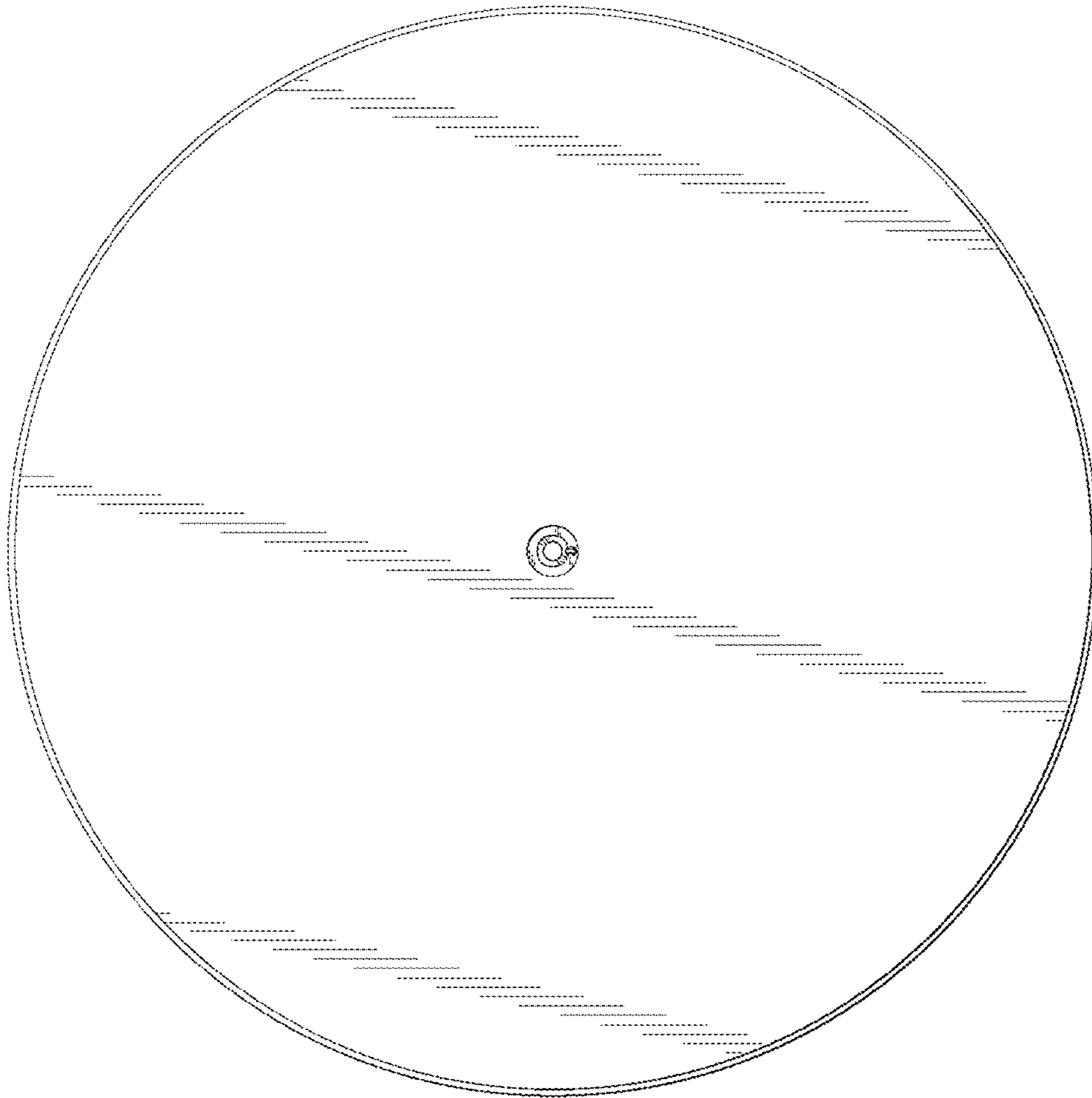


Fig. 8