

US00D793972S

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

(10) **Patent No.:** **US D793,972 S**
(45) **Date of Patent:** **** Aug. 8, 2017**

(54) **WAFER CARRIER WITH A 31-POCKET CONFIGURATION**

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

(72) Inventors: **Sandeep Krishnan**, Princeton, NJ (US); **Keng Moy**, Basking Ridge, NJ (US)

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

(**) Term: **14 Years**

(21) Appl. No.: **29/522,214**

(22) Filed: **Mar. 27, 2015**

(51) **LOC (10) Cl.** **13-03**

(52) **U.S. Cl.**
USPC **D13/182**; D23/386; D23/499

(58) **Field of Classification Search**
USPC D14/356; D10/93, 104.1, 108, 114; D8/4, 25, 52; D17/20, 22, 23; D23/323, D23/328, 333, 335, 336, 337, 341, 352, D23/357, 370, 385, 386, 397, 399, 400, D23/406, 411, 413, 499; D13/182
CPC H01R 13/5213; B60Q 1/04; B60Q 1/26; G10D 3/006; G10D 13/023; G10D 13/027; B25B 15/001; G10H 3/143; G10H 3/181; G10G 5/005; A42B 1/04; B64C 11/04; B64C 11/16; B64C 11/18; B64C 11/20; B64C 2001/009; F03D 3/062; F03D 11/04; F04D 19/002; F04D 25/068; F04D 25/088; F24F 1/0018; B64D 13/02; E04C 2/427; E06B 3/5892; B24B 37/04

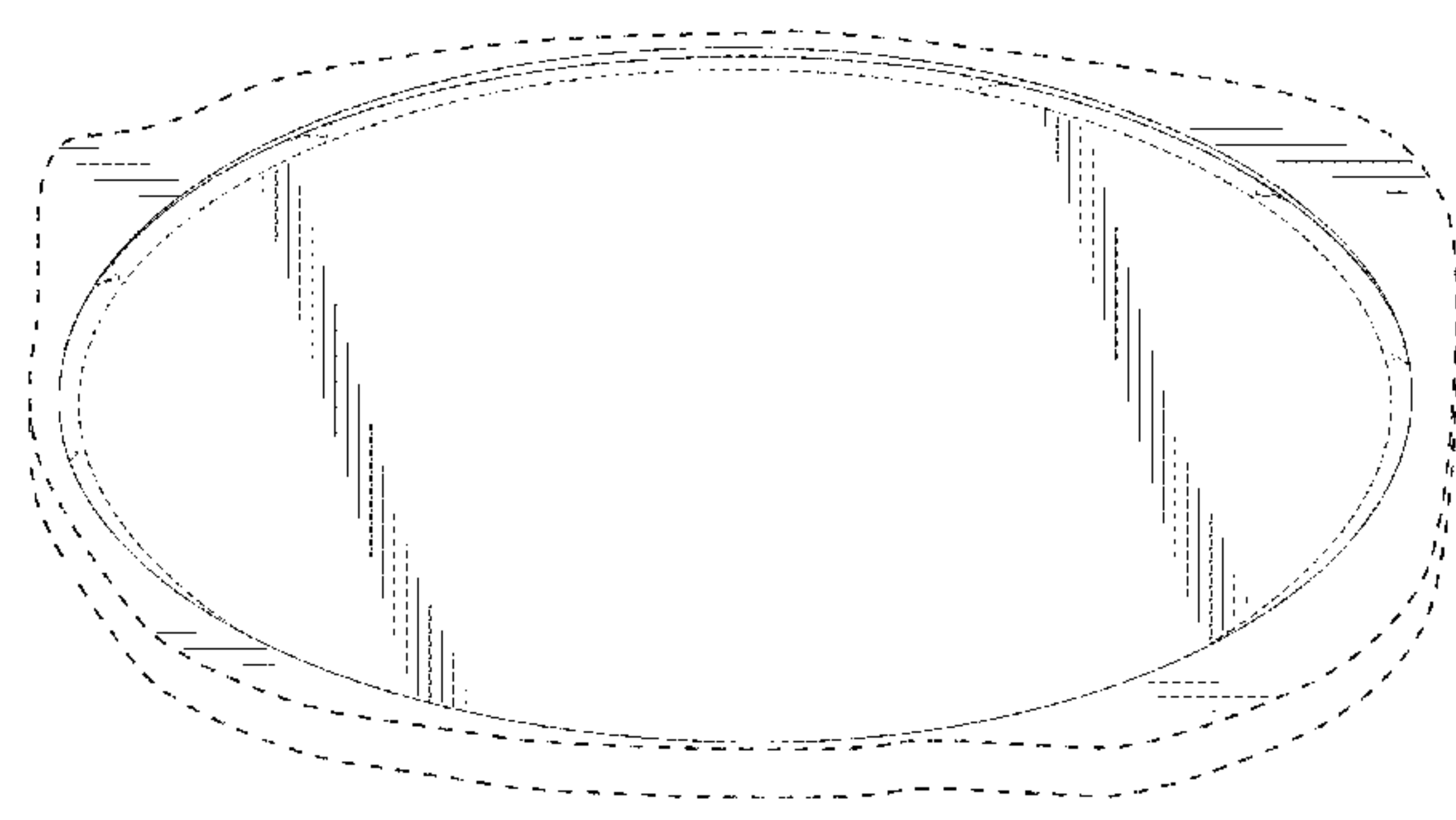
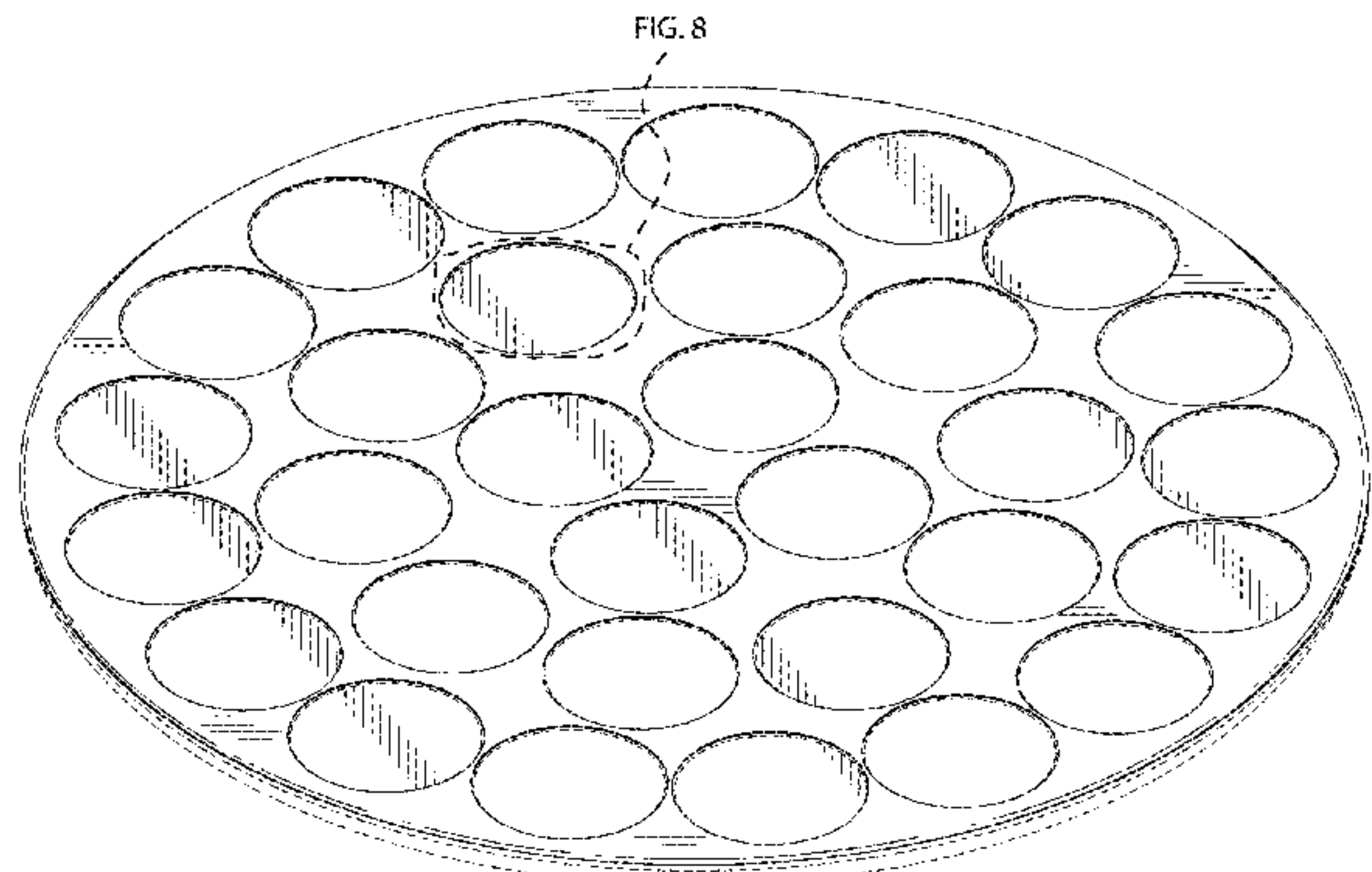
See application file for complete search history.

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.	
D325,934 S	5/1992	Ramljak	
5,152,842 A	10/1992	Urata et al.	
5,191,738 A	3/1993	Nakazato	
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 H01L 21/02024 257/E21.237
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 B24B 37/042 451/41
6,454,635 B1	9/2002	Zhang et al.	
D464,420 S	10/2002	Tolar	
D466,597 S	12/2002	Carr et al.	
6,492,625 B1	12/2002	Boguslavskiy et al.	
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 B24B 37/30 451/28
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 G01R 31/02 324/756.07
D490,183 S	5/2004	Benensohn et al.	
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	

(56) **References Cited**
U.S. PATENT DOCUMENTS

3,461,537 A * 8/1969 Lotz H01L 21/67132
206/710

3,731,435 A 5/1973 Boettcher et al.



US D793,972 S

D511,827 S	11/2005	Wilson, Jr.		D713,492 S	9/2014	Sawchuk et al.
D512,500 S	12/2005	Wilson, Jr.		D714,488 S	9/2014	Chen et al.
D512,501 S	12/2005	Wilson, Jr.		D716,742 S	11/2014	Jang et al.
6,988,942 B2	1/2006	Chen et al.		D717,086 S	11/2014	Pendleton
D517,073 S	3/2006	McDonald et al.		D720,309 S	12/2014	Kaneko et al.
7,008,308 B2	3/2006	Bjelopavlic		D720,313 S	12/2014	Flynn et al.
D523,825 S *	6/2006	Egawa	D13/180	D721,417 S	1/2015	Sawchuk et al.
D544,452 S	6/2007	Nakamura et al.		D722,150 S	2/2015	Heine
7,235,139 B2	6/2007	Boguslavskiy et al.		D723,077 S	2/2015	Sakata
D552,565 S *	10/2007	Nakamura	D13/182	D724,553 S	3/2015	Choi et al.
D566,880 S	4/2008	Silver		9,000,605 B2	4/2015	Glass
D570,075 S	5/2008	Wood et al.		D731,409 S	6/2015	Erlich et al.
D571,436 S	6/2008	Genord et al.		D732,647 S	6/2015	McPhilliamy et al.
D577,159 S	9/2008	Hasapoglou		9,068,264 B2	6/2015	Yang et al.
D591,695 S	5/2009	Oh et al.		D736,941 S	8/2015	Nicholson et al.
D597,639 S	8/2009	Chen Lee		D746,437 S	12/2015	Blomberg et al.
D606,952 S *	12/2009	Lee	D13/182	D747,454 S	1/2016	Stewart et al.
D609,655 S *	2/2010	Sugimoto	D13/182	D748,593 S	2/2016	Dempster et al.
D610,290 S	2/2010	Yoshinobu et al.		D751,380 S	3/2016	Torrison et al.
D611,042 S	3/2010	Ferrari et al.		D751,381 S	3/2016	Torrison et al.
D614,593 S *	4/2010	Lee	D13/182	D751,382 S	3/2016	Torrison et al.
D618,328 S	6/2010	Chan		D751,383 S	3/2016	Torrison et al.
D621,804 S	8/2010	Sip et al.		D751,384 S	3/2016	Torrison et al.
D624,692 S	9/2010	Mackin et al.		D751,773 S	3/2016	Gailen
D629,547 S	12/2010	Salm		D751,999 S	3/2016	Sharma et al.
D633,452 S	3/2011	Namiki et al.		D752,199 S	3/2016	Berkman et al.
D648,289 S *	11/2011	Mayer	D13/182	D752,202 S	3/2016	Berkman et al.
D649,126 S *	11/2011	Takahashi	D13/182	D752,728 S	3/2016	McPhilliamy et al.
8,177,993 B2	5/2012	Seah et al.		D753,269 S	4/2016	Yamagishi et al.
8,182,315 B2 *	5/2012	Nguyen	B24B 53/017 451/443	D754,785 S *	4/2016	Gibson
				D756,907 S *	5/2016	Secard
				9,328,908 B2 *	5/2016	Clifford
8,183,315 B2	5/2012	Nugyen		D758,905 S *	6/2016	Evans
D664,285 S	7/2012	Toft		D760,180 S *	6/2016	Dempster
D664,708 S	7/2012	Toft		D760,883 S *	7/2016	Mann
8,216,379 B2	7/2012	Ishikawa et al.		D761,746 S *	7/2016	Toyoshima
D668,211 S	10/2012	Feng et al.		9,388,493 B2 *	7/2016	Chang
D668,577 S	10/2012	Musk		D762,506 S *	8/2016	Windstrup
D672,915 S	12/2012	Toft		D764,957 S *	8/2016	Bhattacharya
D673,113 S	12/2012	Fowler		D765,608 S *	9/2016	Park
D674,759 S	1/2013	Chang et al.		D766,850 S *	9/2016	Morisaki
D674,961 S	1/2013	Baran et al.		D768,538 S *	10/2016	Chen
D675,171 S	1/2013	Tanaka		D771,622 S *	11/2016	Akana
D677,422 S	3/2013	Lin et al.		D771,785 S *	11/2016	Huang
D678,294 S	3/2013	Weaver, II et al.		D772,334 S *	11/2016	Nishi
D679,446 S	4/2013	Harrington, Jr.		D772,735 S *	11/2016	Mansueto
8,414,361 B2 *	4/2013	Nguyen	B24B 37/30 451/28	9,490,157 B2 *	11/2016	Goela
				9,500,341 B2 *	11/2016	Jungwirth
D681,867 S	5/2013	Wegger et al.		D774,128 S *	12/2016	Young
D682,028 S	5/2013	Preisler		D774,934 S *	12/2016	Akana
D686,175 S	7/2013	Gurary et al.		D778,247 S *	2/2017	Gurary
D686,354 S	7/2013	Feigenbaum				
D686,582 S	7/2013	Krishnan et al.		D778,416 S *	2/2017	Bu
D686,713 S	7/2013	Kimpara		D778,422 S *	2/2017	Gajewski
D687,788 S *	8/2013	Chen	D13/180	D778,423 S *	2/2017	Buzanowski
D687,790 S	8/2013	Krishnan et al.		D778,651 S *	2/2017	Jackson
D687,791 S	8/2013	Krishnan et al.		2002/0027762 A1	3/2002	Yamaguchi
8,535,445 B2	9/2013	Volf et al.		2002/0185068 A1	12/2002	Gurary et al.
D690,671 S	10/2013	Gurary et al.		2003/0029570 A1 *	2/2003	Kawamura
D690,840 S	10/2013	Feigenbaum				H01L 21/67309 156/345.51
D690,841 S	10/2013	Feigenbaum		2003/0036341 A1 *	2/2003	Myoung
D693,782 S *	11/2013	Mori	D13/182			B24B 53/017 451/41
D695,241 S	12/2013	Gurary et al.		2003/0057089 A1	3/2003	Nguyen
D695,242 S	12/2013	Gurary et al.		2004/0124413 A1 *	7/2004	Arai
D697,038 S *	1/2014	Matsumoto	D13/182			H01L 21/67259 257/48
D697,581 S	1/2014	Sawchuk et al.		2004/0259332 A1 *	12/2004	Fukuoka
D698,434 S	1/2014	Wolff				B24B 7/228 438/464
D699,199 S	2/2014	Kuwabara et al.		2006/0186096 A1 *	8/2006	Schramm
D699,201 S	2/2014	Petsch				B23K 26/04 219/121.69
D699,691 S *	2/2014	Yang	D13/180	2007/0269684 A1	11/2007	Machida et al.
D700,987 S	3/2014	Nepple et al.		2007/0281592 A1 *	12/2007	Benner
D701,939 S	4/2014	Sawchuk et al.				B24B 53/00 451/72
D702,356 S	4/2014	Vosch et al.		2008/0170396 A1 *	7/2008	Yuan
D702,357 S	4/2014	Vosch et al.				F21K 9/00 362/244
D703,162 S *	4/2014	Tamaso	D13/182	2009/0155028 A1	6/2009	Boguslavskiy et al.
D704,155 S	5/2014	Chang et al.		2009/0194026 A1	8/2009	Burrows et al.
D708,346 S	7/2014	Harder		2009/0224175 A1	9/2009	Lee et al.
D708,728 S	7/2014	Yoo et al.		2009/0247057 A1	10/2009	Kobayashi et al.
8,795,480 B2 *	8/2014	Mayer	C25D 5/08 204/212			

2010/0162951	A1 *	7/2010	Pinotti	A61K 8/35 118/642
2010/0162957	A1	7/2010	Boyd et al.	
2010/0190418	A1	7/2010	Yasuoka et al.	
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.	
2012/0037927	A1 *	2/2012	Lai	B29C 45/14311 257/88
2012/0156374	A1	6/2012	Gurary et al.	
2012/0240859	A1	9/2012	Chen et al.	
2013/0009179	A1 *	1/2013	Bhat	H05K 1/0209 257/89
2013/0043493	A1 *	2/2013	Wang	H01L 25/0753 257/88
2013/0276704	A1	10/2013	Krishnan et al.	
2014/0190405	A1	7/2014	Chang 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.	
2015/0118009	A1	4/2015	Hsieh et al.	
2015/0187620	A1	7/2015	Gurary et al.	
2015/0330601	A1	11/2015	Jungwirth	
2016/0372321	A1 *	12/2016	Krishnan	H01L 21/67103

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	3020110006713	8/2012
KR	3020110006715	8/2012
KR	3020110006717	8/2012
KR	3006565580001	12/2012
KR	3020110006714	12/2012
KR	3020110006716	12/2012
KR	3020110006718	12/2012
KR	3006909570001	9/2013
KR	3007655720000	10/2014
TW	M420823	1/2012
WO	WO7900510	8/1979
WO	WO 7900510	8/1979
WO	WO 2013/133204	9/2013
WO	WO2013133204	9/2013

OTHER PUBLICATIONS

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>>.*

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. 29/522,212, 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.

AIX G5 HT, image post date Jan. 31, 2011, site visited Apr. 30, 2016.

* cited by examiner

Primary Examiner — Kevin Rudzinski
Assistant Examiner — Sean D Lough
 (74) *Attorney, Agent, or Firm* — Patterson Thuentle Pedersen, P.A.

(57) **CLAIM**

We claim the ornamental design for a wafer carrier with a 31-pocket configuration, as shown and described.

DESCRIPTION

FIG. 1 is a perspective view of a wafer carrier with a 31-pocket configuration according to the new design of the first embodiment.

FIG. 2 is a top plan view of a wafer carrier with a 31-pocket configuration according to the new design thereof.

FIG. 3 is a right side view of a wafer carrier with a 31-pocket configuration according to the new design, with the left side, front, and rear views being the same as the right side view thereof.

FIG. 4 is a bottom plan view of a wafer carrier with a 31-pocket configuration according to the new design thereof.

FIG. 5 is a perspective view of a wafer carrier with a 31-pocket configuration according to the new design of the second embodiment.

FIG. 6 is a right side view of a wafer carrier with a 31-pocket configuration according to the new design, with the left side, front, and rear views being the same as the right side view thereof.

FIG. 7 is a bottom plan view of a wafer carrier with a 31-pocket configuration according to the new design thereof; and,

FIG. 8 is a detail view of a portion of the wafer carrier with a 31-pocket configuration shown in FIG. 1 according to the new design showing a single pocket from a perspective view of the first embodiment.

The broken lines, where present, in FIGS. 1, 2, 3, 4, and 8, illustrate portions of the wafer carrier with a 31-pocket configuration that represent environment of the claimed design and form no part of the claimed design. The broken lines of FIG. 1 that define the area corresponding to the enlarged portion shown in FIG. 8 form no part of the claimed design. The broken lines in FIG. 8 that represent the edge of the enlarged portion of the design form no part of the claimed design.

1 Claim, 8 Drawing Sheets

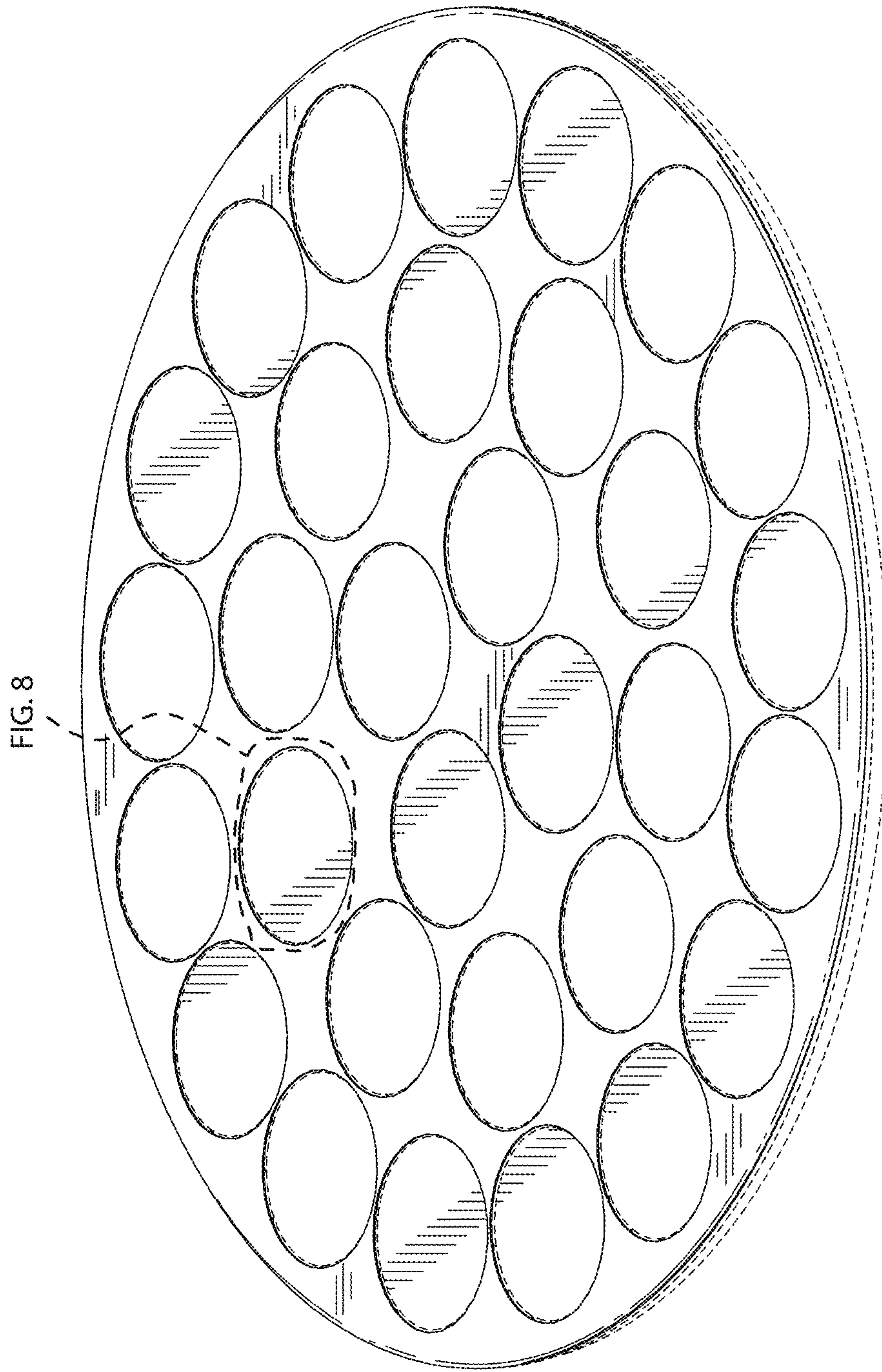


FIG. 8

Fig. 1

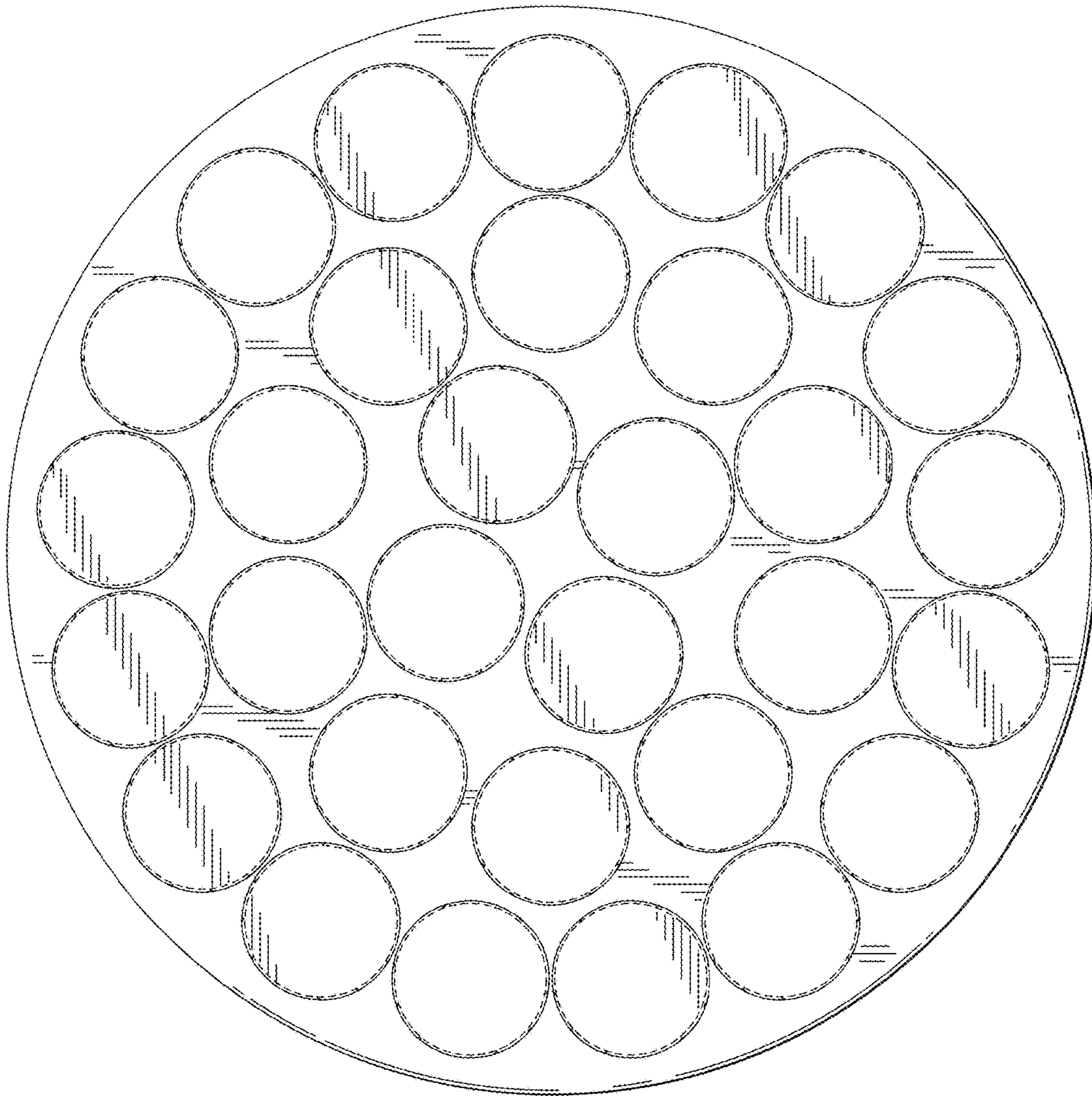


Fig. 2



Fig. 3

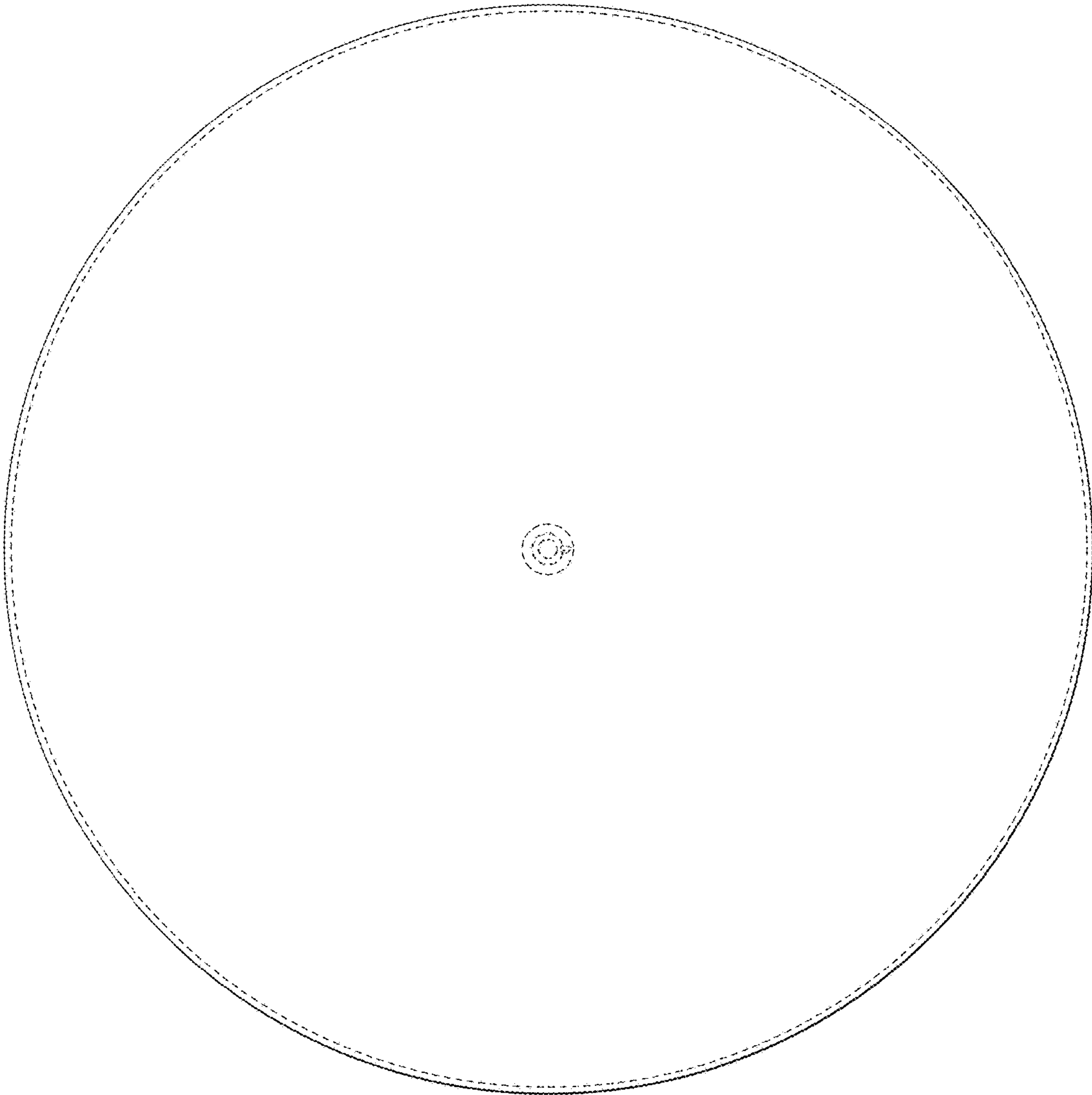


Fig. 4

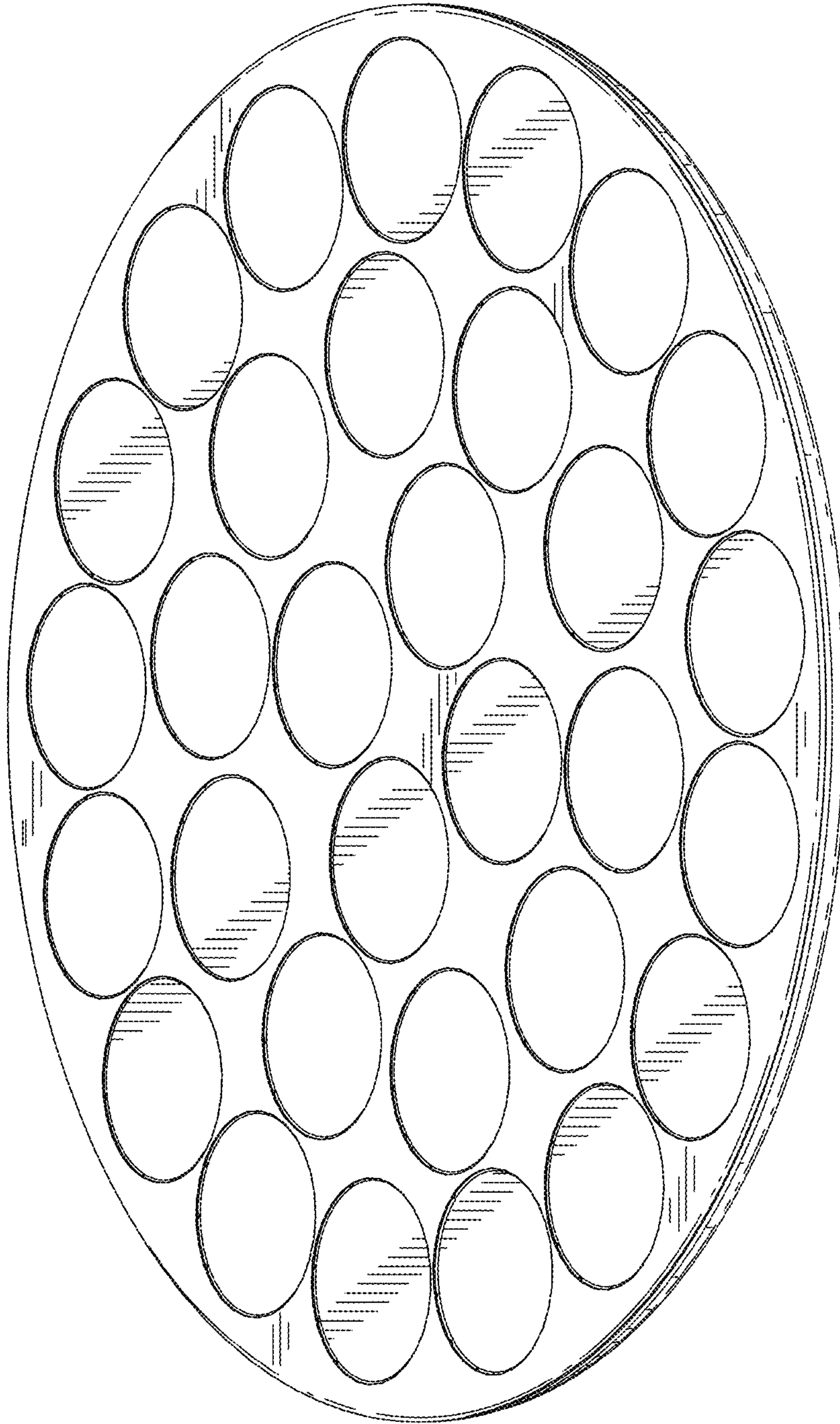


Fig. 5



Fig. 6

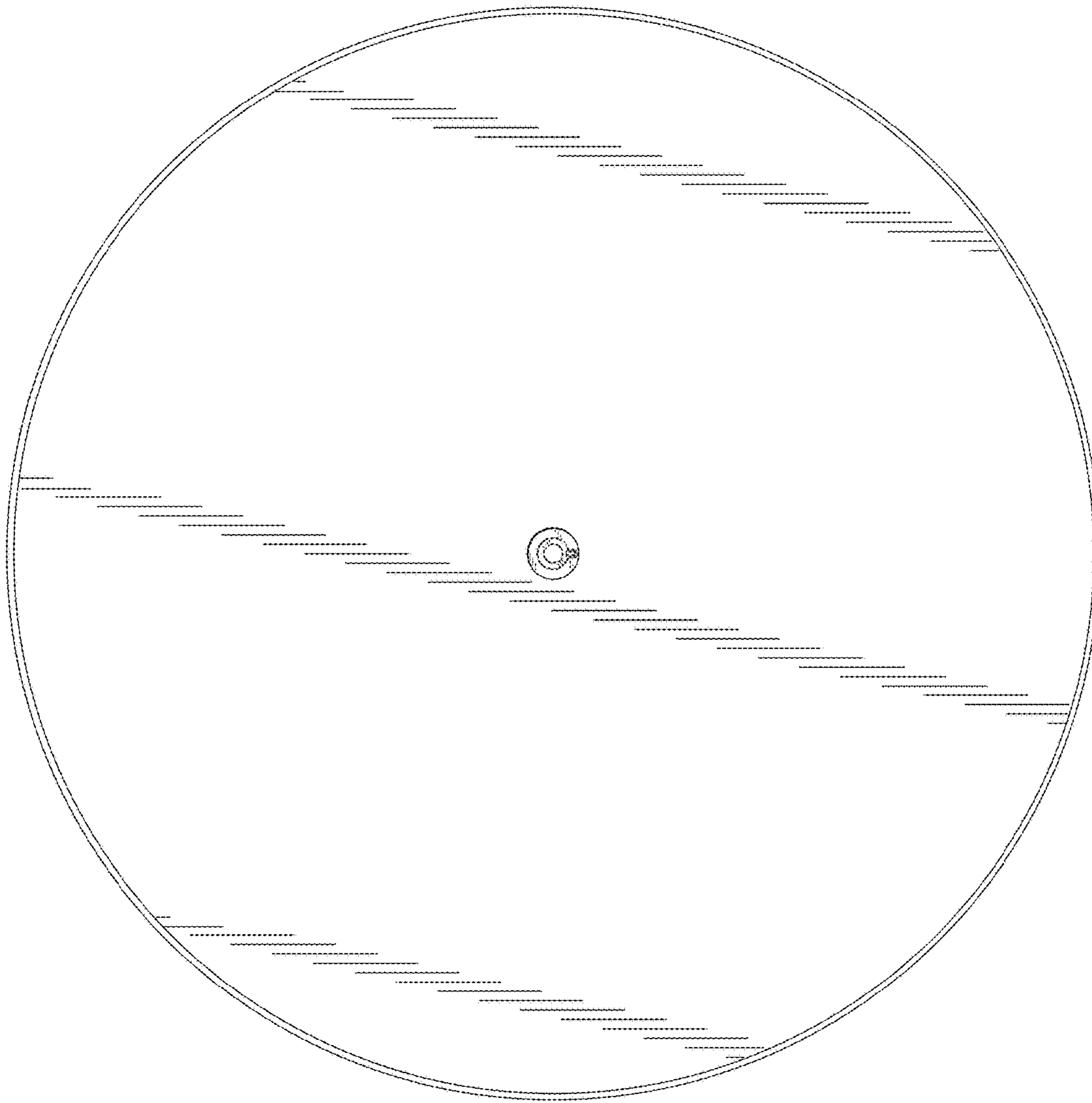


Fig. 7

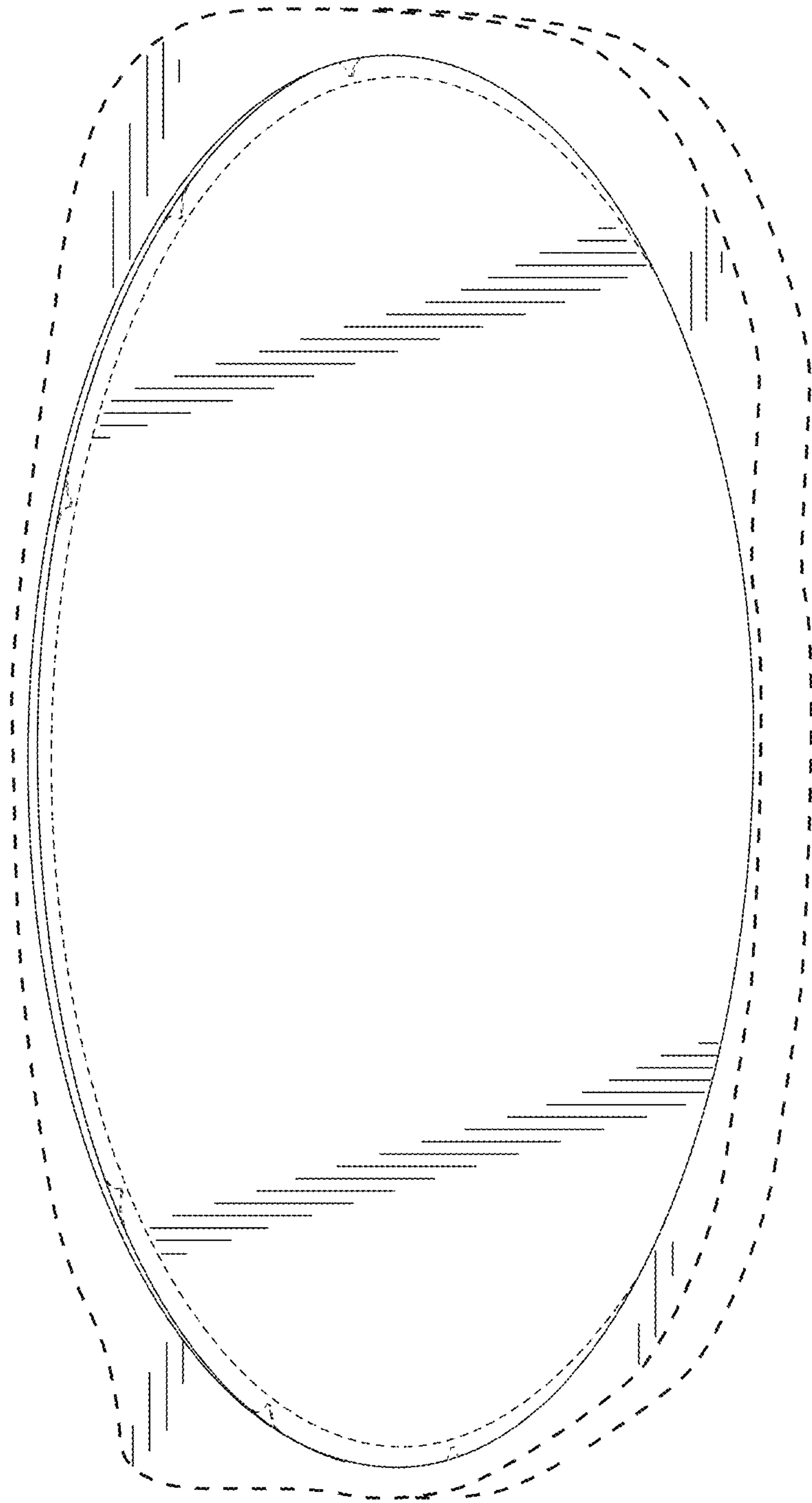


Fig. 8