



US0D1069863S

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

(10) **Patent No.:** **US D1,069,863 S**

(45) **Date of Patent:** **\*\* Apr. 8, 2025**

(54) **DEPOSITION RING OF A PROCESS KIT FOR SEMICONDUCTOR SUBSTRATE PROCESSING**

FOREIGN PATENT DOCUMENTS

JP D1747664 \* 6/2023  
JP D1747763 \* 6/2023

(Continued)

(71) Applicant: **Applied Materials, Inc.**, Santa Clara, CA (US)

OTHER PUBLICATIONS

(72) Inventors: **Abhishek Chowdhury**, Bangalore (IN); **Nataraj Bhaskar Rao**, Bangalore (IN); **Edwin C. Suarez**, Pleasanton, CA (US); **Harisha Sathyanarayana**, Bangalore (IN); **Diego Ramiro Puente Sotomayor**, Phoenix, AZ (US); **Qanit Takmeel**, Mesa, AZ (US); **Mohammad Kamruzzaman Chowdhury**, Phoenix, AZ (US); **Arun Chakravarthy Chakravarthy**, Tamil Nadu (IN)

0020-27744 \_ Clamp Ring,8 SST,Clamp Degas @ E, 6 Pad \_ Applied Materials Amat \_ eBay, posted Jan. 6, 2023, [retrieved Nov. 21, 2024]. Retrieved from internet: <https://www.ebay.com/itm/304970564439> (Year: 2023).\*

(Continued)

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

*Primary Examiner* — Nicole C Shiflet

*Assistant Examiner* — Karen M. Jones

(74) *Attorney, Agent, or Firm* — Moser Taboada

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

(57) **CLAIM**

(21) Appl. No.: **29/848,746**

The ornamental design for a deposition ring of a process kit for semiconductor substrate processing, as shown and described.

(22) Filed: **Aug. 4, 2022**

(51) **LOC (15) Cl.** ..... **13-03**

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

USPC ..... **D15/138**; D13/182

(58) **Field of Classification Search**

USPC ..... D15/138, 140, 141, 144, 144.1, 144.2, D15/199; D13/118, 182, 184, 199

CPC ..... H01J 37/32623; H01J 37/32633; H01J 37/32642; H01J 37/32715; H01J 37/32733; H01J 37/32743; H01J 37/32897; H01J 37/3414; H01J 37/3423; H01L 21/00; H01L

(Continued)

**DESCRIPTION**

FIG. 1 is a top isometric view of a deposition ring of a process kit for semiconductor substrate processing, according to the novel design.

FIG. 2 is a bottom isometric view thereof.

FIG. 3 is a top plan view thereof.

FIG. 4 is a bottom plan view thereof.

FIG. 5 is a left elevation view thereof, enlarged to more clearly show details.

FIG. 6 is a right elevation view thereof, enlarged to more clearly show details.

FIG. 7 is a back elevation view thereof, enlarged to more clearly show details; and,

FIG. 8 is a front elevation view thereof, enlarged to more clearly show details.

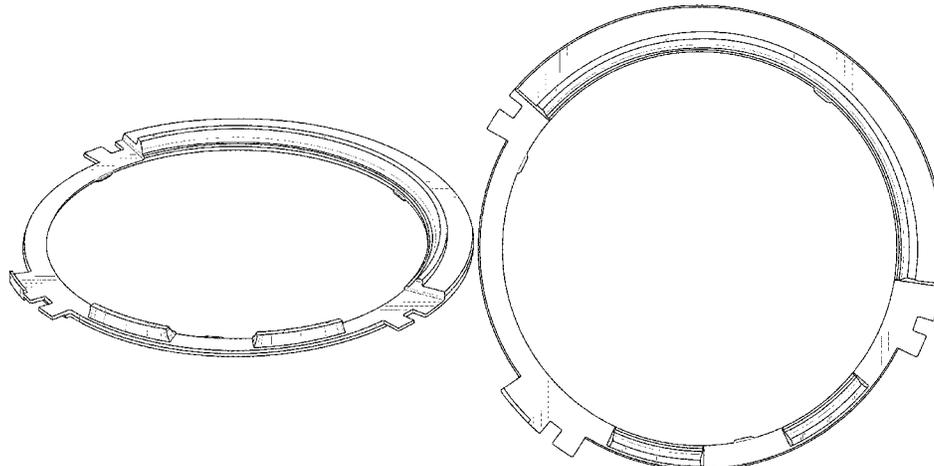
(56) **References Cited**

U.S. PATENT DOCUMENTS

4,407,654 A 10/1983 Irwin  
5,310,339 A 5/1994 Ushikawa

(Continued)

**1 Claim, 6 Drawing Sheets**



(58) **Field of Classification Search**

CPC .... 21/0226; H01L 21/02263; H01L 21/02266;  
 H01L 21/02269; H01L 21/02271; H01L  
 21/02631; H01L 21/67; H01L 21/67005;  
 H01L 21/67011; H01L 21/67017; H01L  
 21/67063; H01L 21/67075; H01L  
 21/67098; H01L 21/67115; H01L  
 21/67742; H01L 2221/67; H01L  
 2221/68363; C23C 14/34; C23C 14/35;  
 C23C 16/00; C23C 16/458; C23C 16/44;  
 C23C 16/04; C23C 16/4582; C23C  
 16/4583; C23C 16/4585

See application file for complete search history.

(56) **References Cited**

U.S. PATENT DOCUMENTS

6,123,804 A 9/2000 Babassi et al.  
 6,231,036 B1 5/2001 Keyser et al.  
 6,287,435 B1\* 9/2001 Drewery ..... H01J 37/32477  
 204/298.18  
 D655,255 S 3/2012 Takebayashi et al.  
 8,485,128 B2 7/2013 Kellogg et al.  
 D711,331 S \* 8/2014 Lau ..... D13/182  
 D716,239 S \* 10/2014 Lau ..... D13/182  
 D717,746 S \* 11/2014 Lau ..... D13/182  
 8,980,005 B2\* 3/2015 Carlson ..... C23C 16/45578  
 118/715  
 9,818,585 B2 11/2017 Green et al.  
 D812,014 S 6/2018 Katagiyama et al.  
 D888,903 S 6/2020 Gunther et al.  
 D925,481 S 7/2021 Kagaya et al.  
 D933,725 S 10/2021 Koppa et al.  
 D933,726 S 10/2021 Savandalah et al.  
 D934,315 S 10/2021 Lavitsky et al.  
 D939,459 S \* 12/2021 Shimada ..... D13/182  
 11,798,823 B2\* 10/2023 Miyake ..... H01L 21/68742  
 D1,005,245 S \* 11/2023 Nakatani ..... D13/182  
 D1,034,493 S \* 7/2024 Kwon ..... D15/144.1  
 D1,040,304 S \* 8/2024 Gunther ..... H01J 37/3441  
 D15/138  
 2005/0150452 A1 7/2005 Sen et al.  
 2009/0050272 A1 2/2009 Rosenberg et al.  
 2012/0042825 A1 2/2012 Hawrylchak  
 2012/0103257 A1 5/2012 Rasheed et al.

2012/0240853 A1 9/2012 Carison et al.  
 2013/0055952 A1 3/2013 Su Braman et al.  
 2013/0206070 A1 8/2013 Chen  
 2014/0262763 A1 9/2014 Rasheed et al.  
 2015/0181684 A1 6/2015 Banna et al.  
 2016/0322250 A1 11/2016 Male et al.  
 2017/0002461 A1 1/2017 Johanson et al.  
 2018/0264621 A1\* 9/2018 Yoo ..... H01L 21/68721  
 2019/0259635 A1 8/2019 Parathithasan et al.  
 2019/0259647 A1 8/2019 Thirunavukarasu et al.  
 2020/0027705 A1 1/2020 Kim et al.  
 2020/0090915 A1\* 3/2020 Kerschbaumer .... H01J 37/3414  
 2020/0194243 A1 6/2020 Gunther et al.  
 2020/0234928 A1 7/2020 Vishwanath  
 2022/0157572 A1 5/2022 Chowdhury et al.  
 2022/0165551 A1 5/2022 Pei et al.  
 2022/0344134 A1 10/2022 Mustafa et al.  
 2022/0406573 A1 12/2022 Gunther et al.  
 2024/0044002 A1\* 2/2024 Chowdhury ..... C23C 16/4586

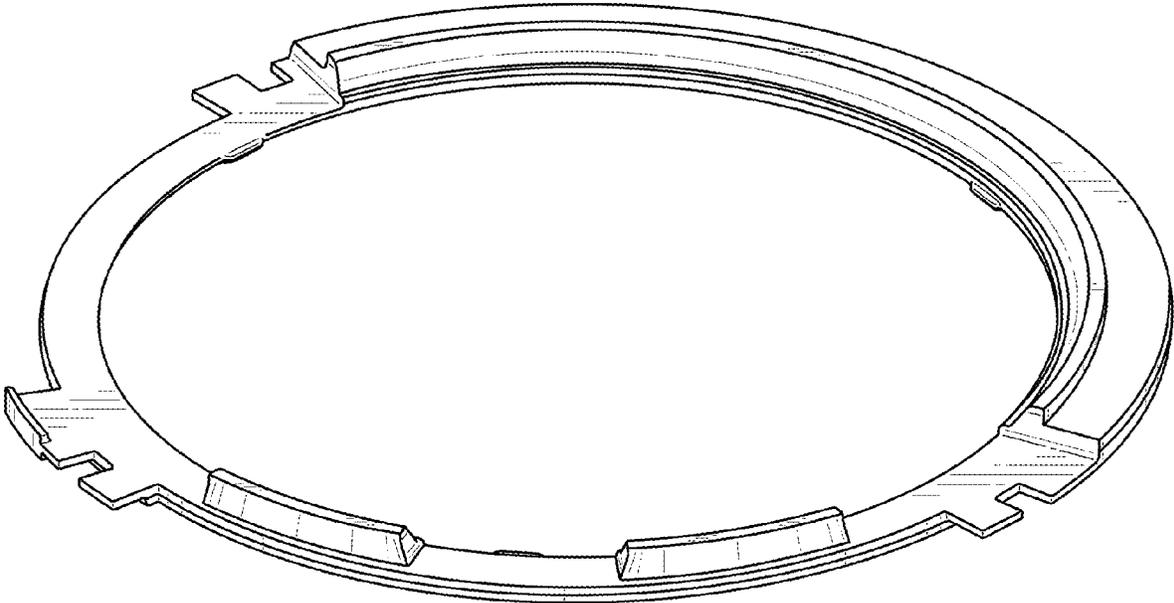
FOREIGN PATENT DOCUMENTS

JP D1747764 6/2023  
 KR 10-2009-0064113 A 6/2009  
 TW D211225 S 5/2021  
 TW D217060 S 2/2022

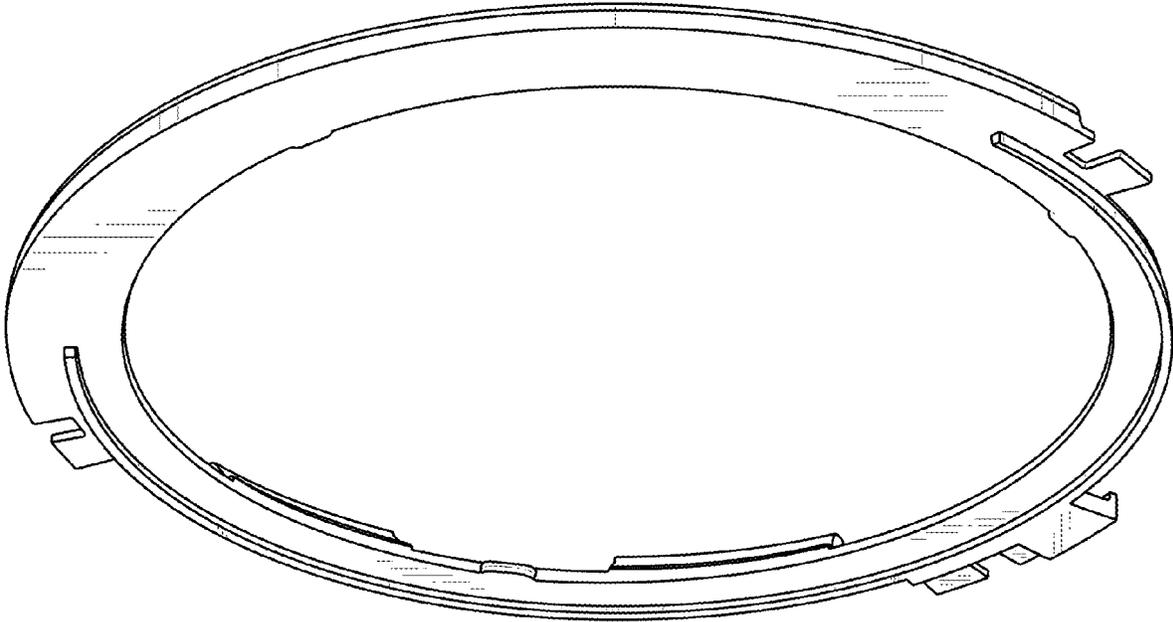
OTHER PUBLICATIONS

0021-15555 \_Deposition Ring,8 SNNF, ESC, Alum, High \_Applied  
 Materials Amat \_ eBay, posted Jan. 18, 2024, [retrieved Nov. 21,  
 2024]. Retrieved from internet: [https://www.ebay.com.sg/itm/  
 295417158877](https://www.ebay.com.sg/itm/295417158877) (Year: 2024).\*  
 PCT International Search Report and Written Opinion for PCT/  
 US2023/027370 dated Oct. 30, 2023.  
 0020-10059 \_ Ring Wafer Lift RP 0020-09844-0020-09183 \_  
 Applied Materials Amat \_ eBay, posted Aug. 22, 2022, [retrieved  
 Nov. 21, 2024]. Retrieved from internet; [https://www.ebay.com/itm/  
 295132073147](https://www.ebay.com/itm/295132073147) (Year: 2022).  
 0020-30483 \_Clamp Ring XTAL Notch EXT 8 QER \_ Applied  
 Materials Amat \_ eBay. posted Jan. 17, 2024. [retrieved Nov. 21,  
 2024]. Retrieved from internet: [https://www.ebay.com/itm/  
 295561026577](https://www.ebay.com/itm/295561026577) (Year: 2024).

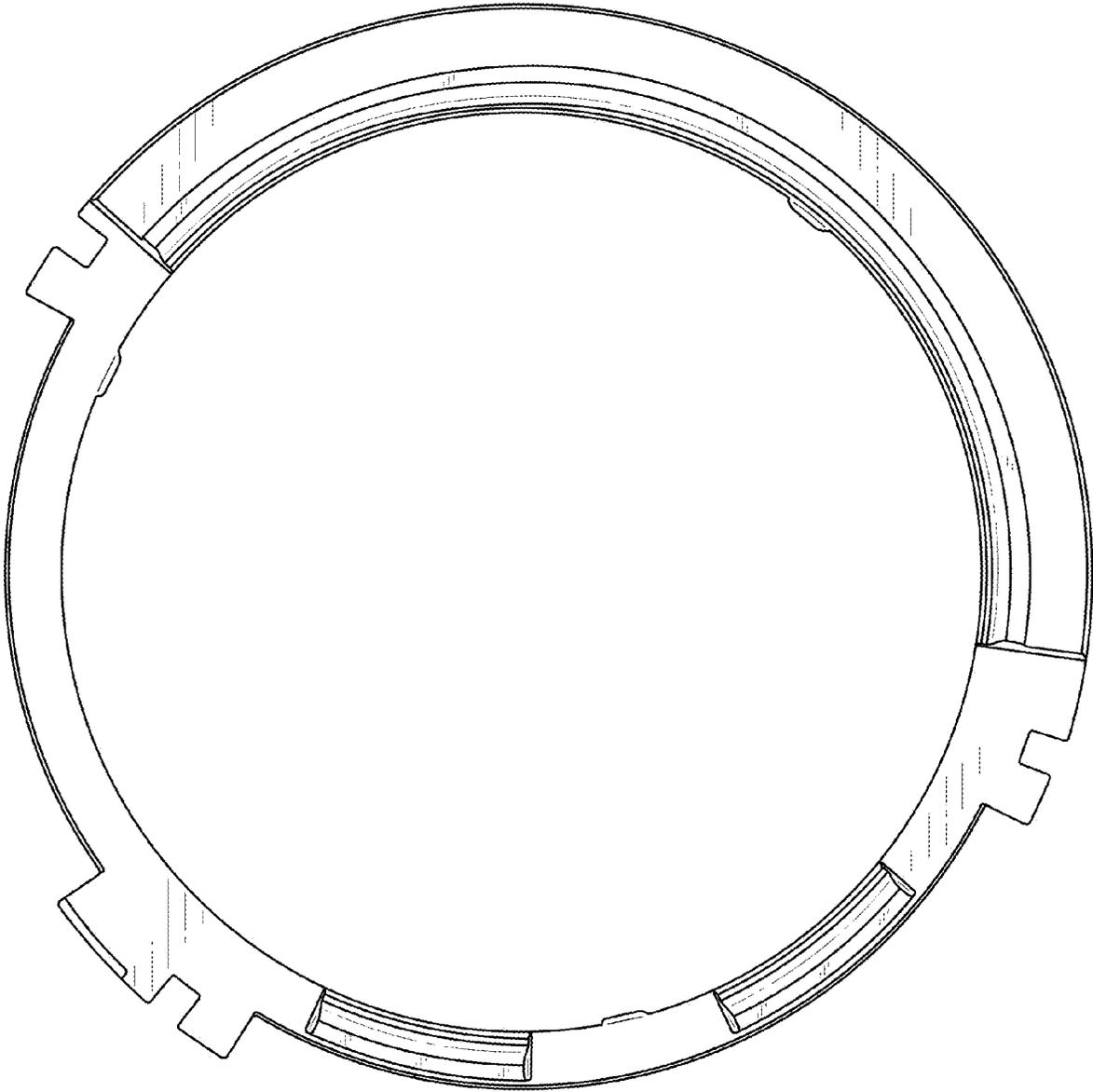
\* cited by examiner



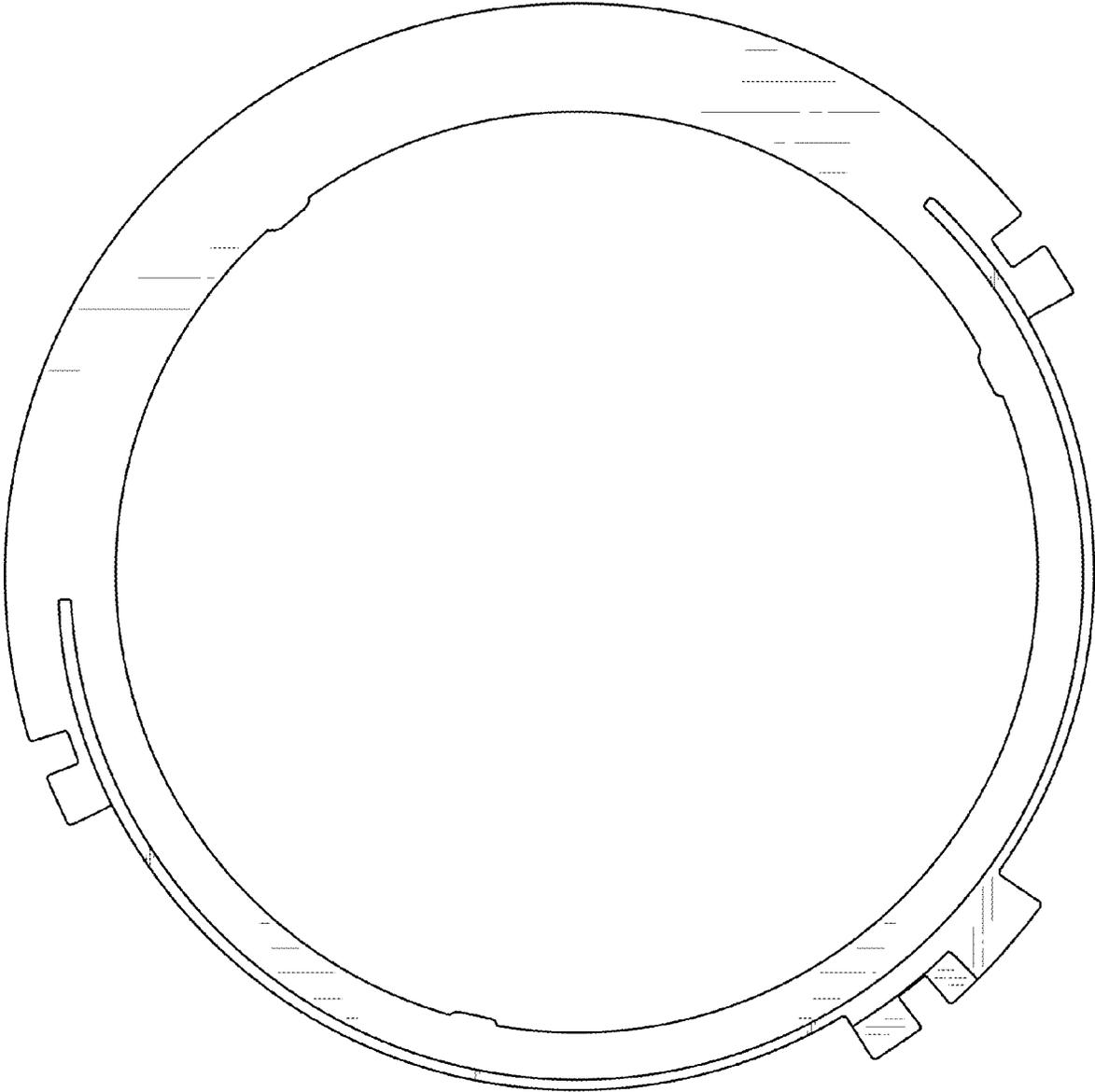
**FIG. 1**



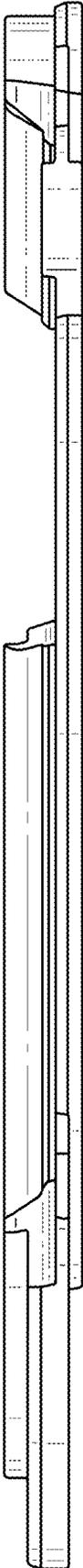
**FIG. 2**



**FIG. 3**



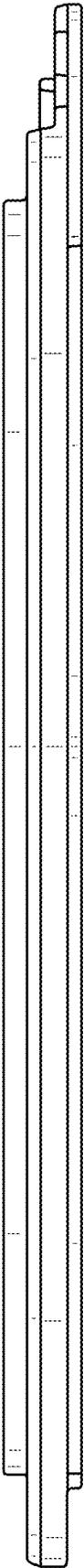
**FIG. 4**



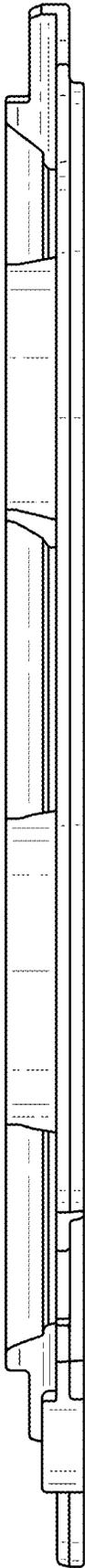
**FIG. 5**



**FIG. 6**



**FIG. 7**



**FIG. 8**