



US00D802472S

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

(10) **Patent No.:** **US D802,472 S**

(45) **Date of Patent:** **** Nov. 14, 2017**

(54) **ELECTROSTATIC CHUCK FOR SEMICONDUCTOR MANUFACTURING EQUIPMENT**

(71) Applicant: **TOKYO ELECTRON LIMITED**,
Minato-ku, Tokyo (JP)

(72) Inventors: **Yasuharu Sasaki**, Miyagi (JP);
Tomoyuki Takahashi, Miyagi (JP)

(73) Assignee: **TOKYO ELECTRON LIMITED**,
Minato-Ku, Tokyo (JP)

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

(21) Appl. No.: **29/553,358**

(22) Filed: **Feb. 1, 2016**

(30) **Foreign Application Priority Data**

Aug. 6, 2015 (JP) 2015-017483

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

(52) **U.S. Cl.**
USPC **D11/182**

(58) **Field of Classification Search**
USPC D13/182; D15/140
CPC H01L 21/67098; H01L 21/67109; H01L
21/683; H01L 21/6831; H01L 21/6833;
H01L 21/6835; H01L 21/68; H01L 21/67;
B23Q 3/15; B23Q 3/154; B23Q 3/1543;
B23Q 3/1546; B23B 31/28; G03F
7/70708; G03F 7/707; H02N 13/00;
H02N 15/00

See application file for complete search history.

(56) **References Cited**

U.S. PATENT DOCUMENTS

3,078,565 A * 2/1963 Sanders B23Q 3/154
279/128
D363,464 S * 10/1995 Fukasawa D13/182

D404,372 S * 1/1999 Ishii D13/182
6,028,762 A * 2/2000 Kamitani H01L 21/6831
279/128
D425,919 S * 5/2000 Burkhart D15/140
6,721,162 B2 * 4/2004 Weldon C23C 16/4586
279/128
D489,739 S * 5/2004 Okugawa D15/140
D490,096 S * 5/2004 Okugawa D15/140
6,815,352 B1 * 11/2004 Tamura C30B 15/00
156/345.51
D546,784 S * 7/2007 Hayashi D13/182
D548,200 S * 8/2007 Hayashi D13/182
D548,705 S * 8/2007 Hayashi D13/182
D552,565 S * 10/2007 Nakamura D13/182

(Continued)

Primary Examiner — Elizabeth J Oswecki

(74) *Attorney, Agent, or Firm* — Leydig Voit & Mayer

(57) **CLAIM**

The ornamental design for an electrostatic chuck for semiconductor manufacturing equipment, as shown and described.

DESCRIPTION

FIG. 1 is a front view of an electrostatic chuck for semiconductor manufacturing equipment, showing our new design;

FIG. 2 is a rear view thereof;

FIG. 3 is a top plan view thereof;

FIG. 4 is a bottom plan view thereof;

FIG. 5 is a right side view thereof;

FIG. 6 is a left side view thereof;

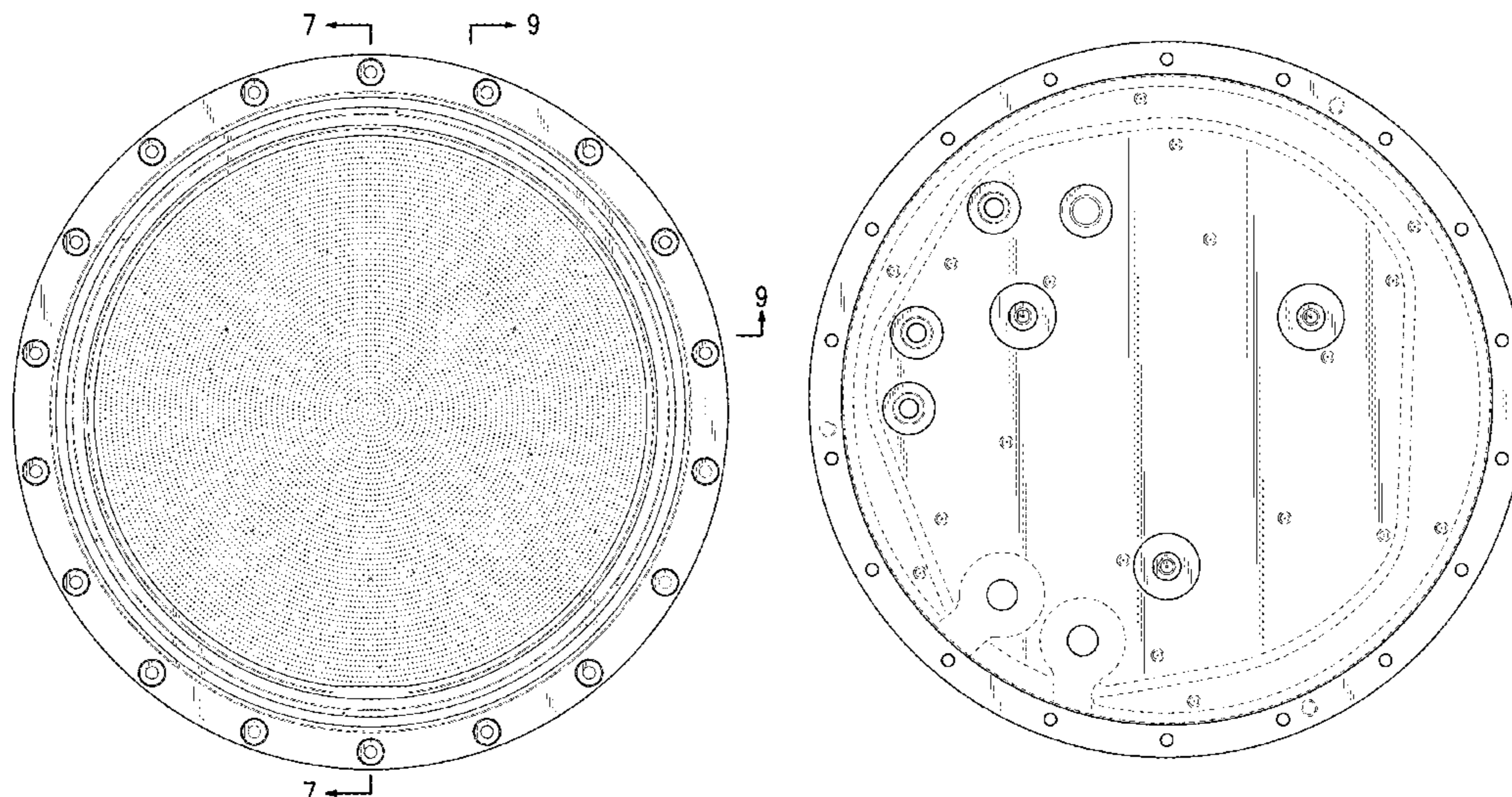
FIG. 7 is a cross sectional view taken along the lines of 7-7 of FIG. 1;

FIG. 8 is an enlarged view of a portion taken along lines of 8-8 of FIG. 7; and,

FIG. 9 is an enlarged view of a portion taken along lines of 9-9 of FIG. 1.

The features shown in broken lines depict environmental subject matter only and form no part of the claimed design.

1 Claim, 9 Drawing Sheets



(56)

References Cited

U.S. PATENT DOCUMENTS

D553,104 S * 10/2007 Oohashi D13/182
 D557,226 S * 12/2007 Uchino D13/182
 D559,993 S * 1/2008 Nagakubo D24/232
 D559,994 S * 1/2008 Nagakubo D24/232
 D587,222 S * 2/2009 Sasaki D13/182
 D609,655 S * 2/2010 Sugimoto D13/182
 D614,593 S * 4/2010 Lee D13/182
 D699,200 S * 2/2014 Nagakubo D13/182
 D709,536 S * 7/2014 Yoshimura D15/138
 D709,537 S * 7/2014 Kuwabara D15/138
 D709,538 S * 7/2014 Mizukami D15/138
 D709,539 S * 7/2014 Kuwabara D15/138
 D716,742 S * 11/2014 Jang D13/182
 D723,077 S * 2/2015 Sakata D13/182
 D724,553 S * 3/2015 Choi D13/182
 D743,357 S * 11/2015 Vyne D13/182
 D770,992 S * 11/2016 Tauchi D13/182

2002/0027762 A1* 3/2002 Yamaguchi G03F 7/707
 361/234
 2002/0159217 A1* 10/2002 Tsuruta C23C 16/4586
 361/234
 2004/0179323 A1* 9/2004 Litman H01L 21/6831
 361/234
 2004/0218339 A1* 11/2004 Nakamura H01L 21/67109
 361/234
 2006/0002053 A1* 1/2006 Brown H01L 21/6831
 361/234
 2006/0221539 A1* 10/2006 Morita H01L 21/6831
 361/234
 2007/0146961 A1* 6/2007 Morioka H01L 21/6831
 361/234
 2008/0037194 A1* 2/2008 Kamitani H02N 13/00
 361/234
 2008/0144251 A1* 6/2008 Tao H01L 21/6833
 361/234

* cited by examiner

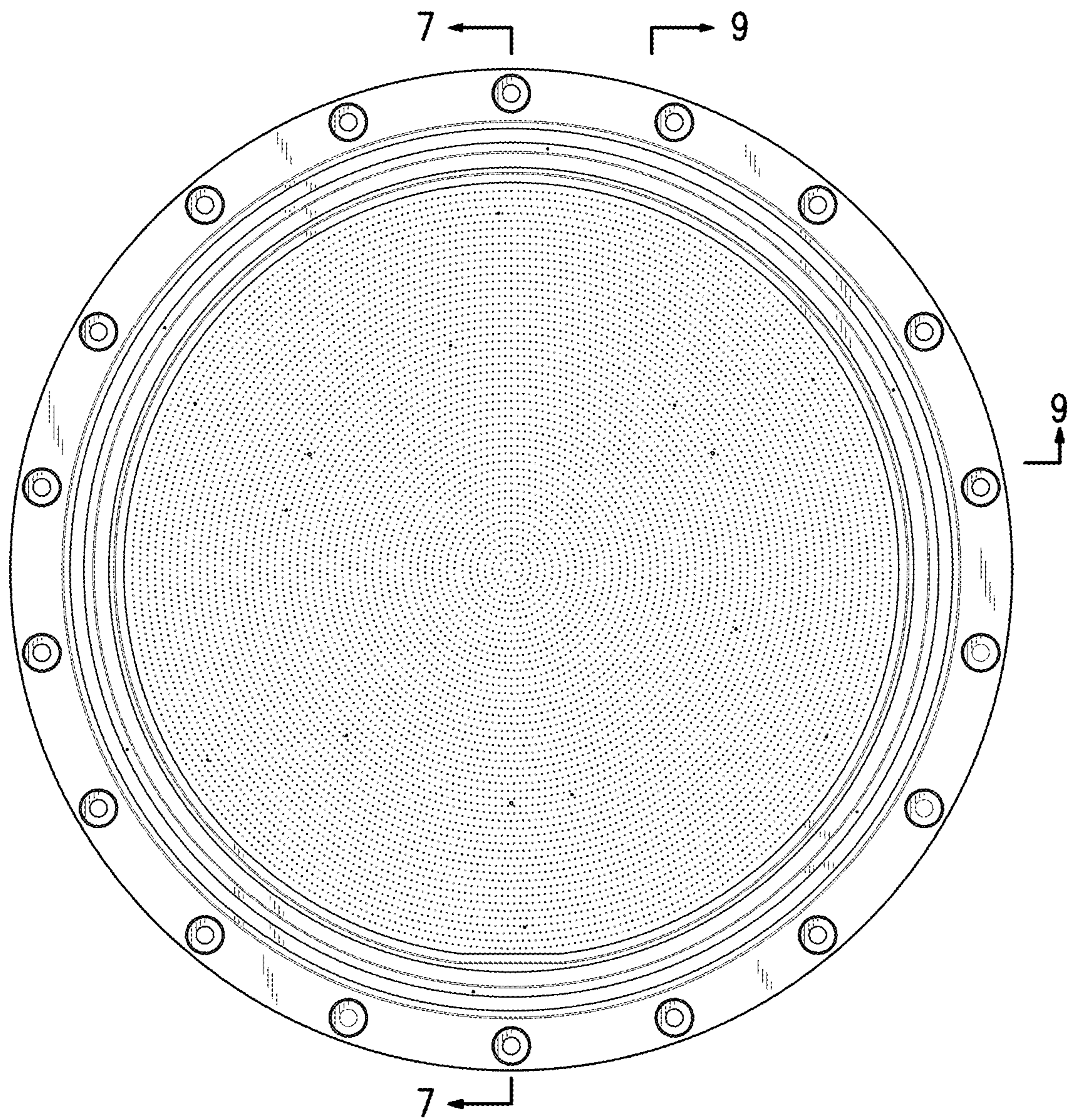


FIG. 1

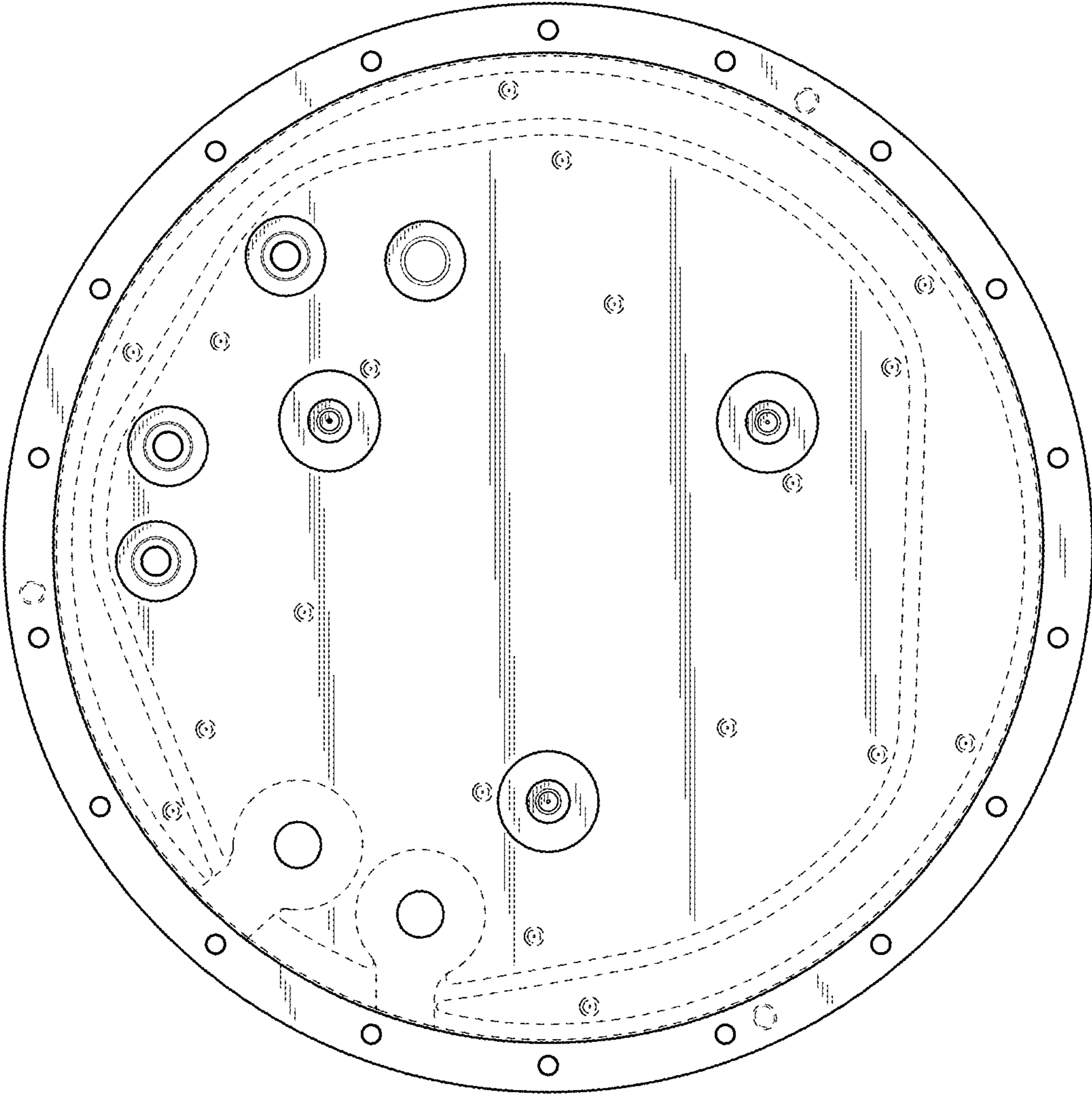


FIG. 2

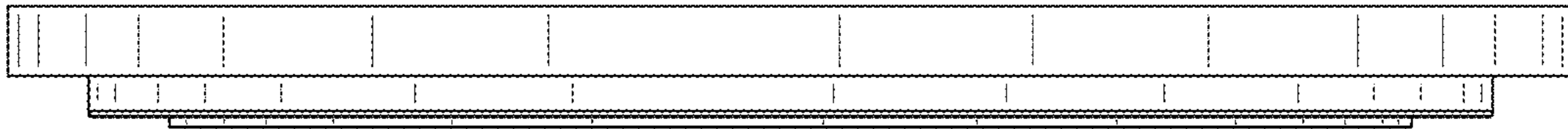


FIG. 3

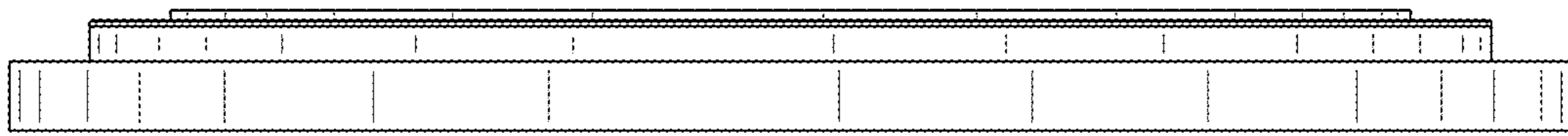


FIG. 4

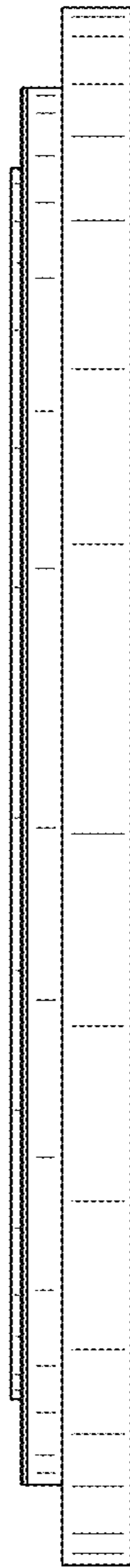


FIG. 5

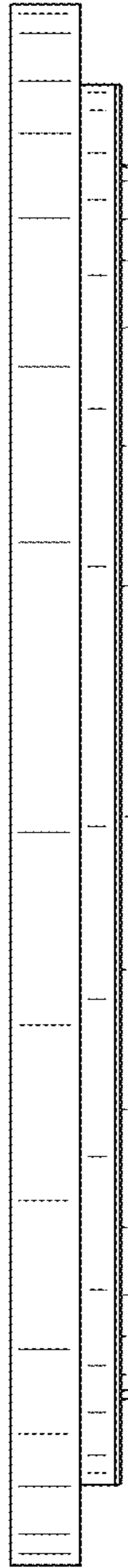


FIG. 6

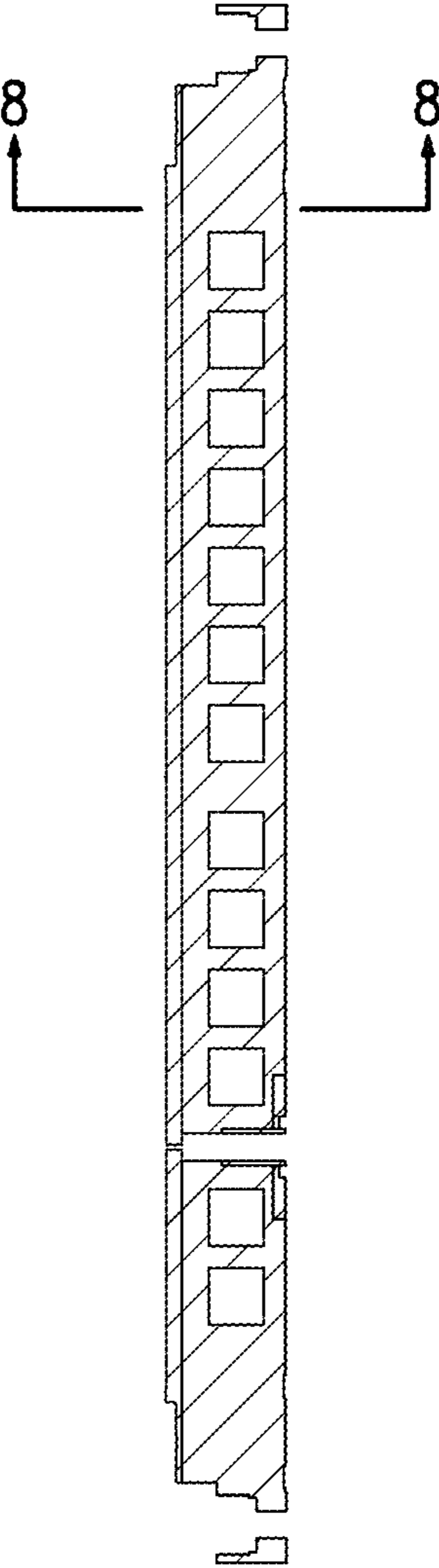


FIG. 7

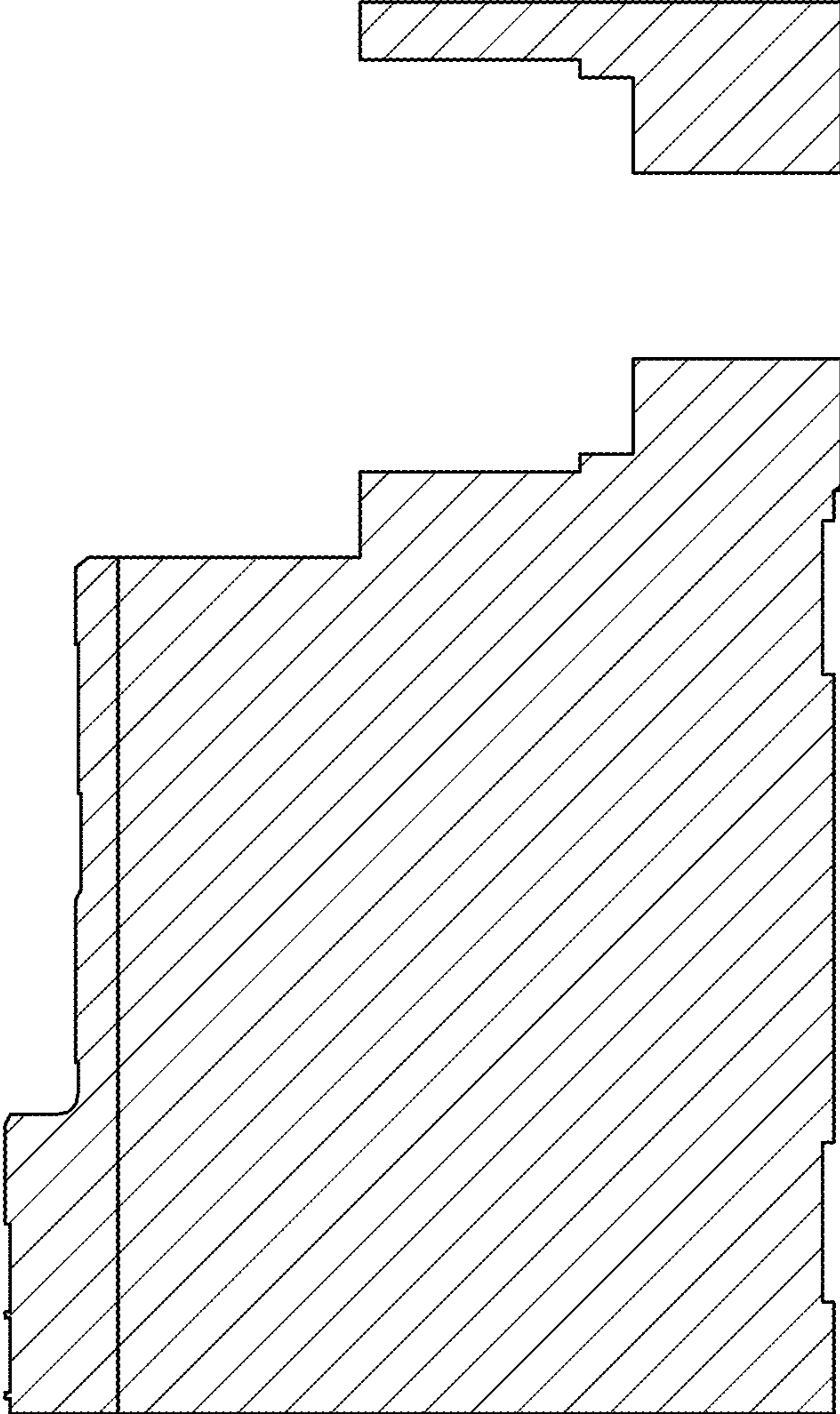


FIG. 8

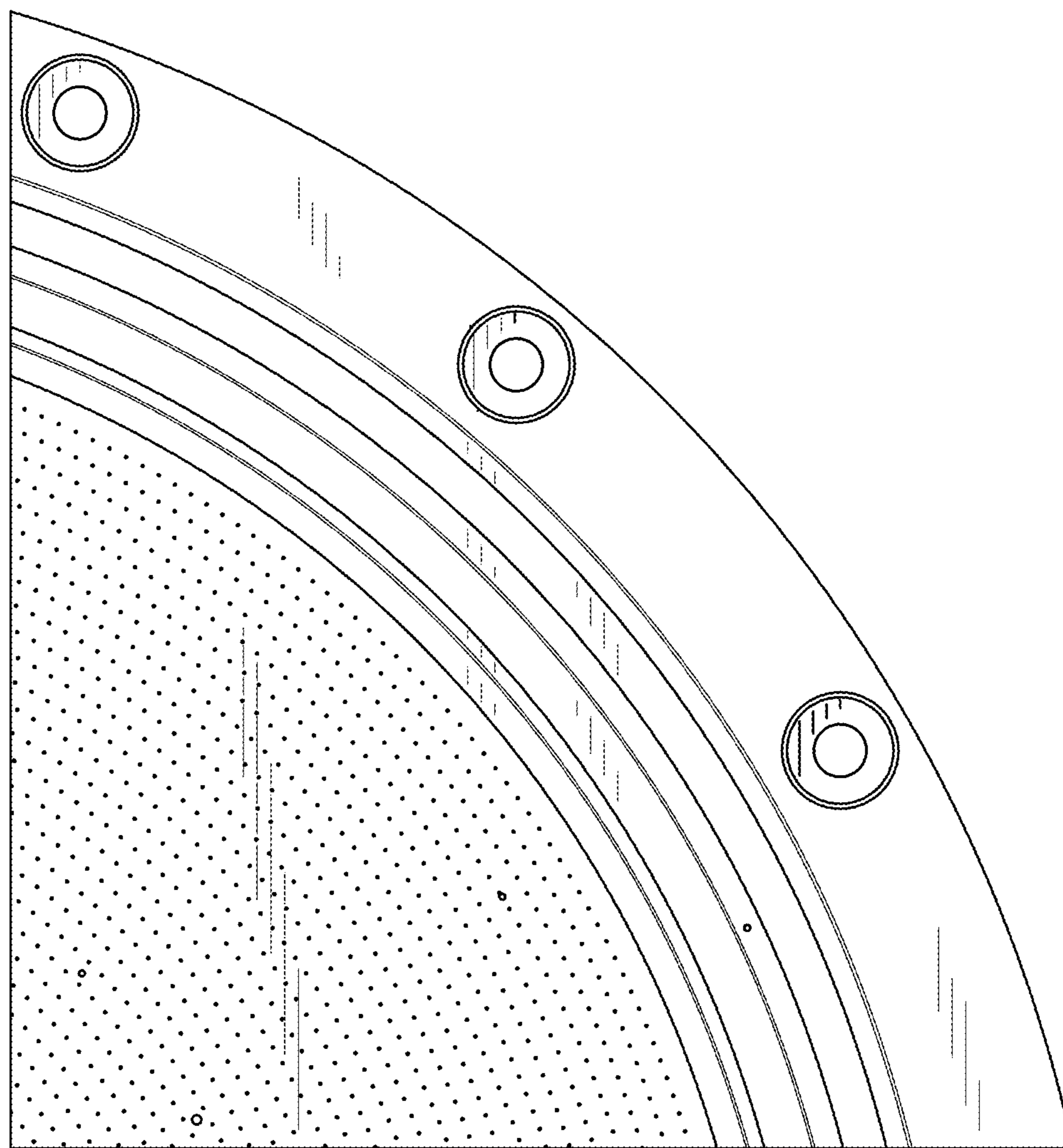


FIG. 9