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(12) **United States Design Patent** (10) **Patent No.:** **US D804,436 S**
Tauchi et al. (45) **Date of Patent:** **** Dec. 5, 2017**

(54) **UPPER CHAMBER FOR A PLASMA PROCESSING APPARATUS**

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(30) **Foreign Application Priority Data**

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

(52) **U.S. Cl.**
USPC **D13/182; D15/138**

(58) **Field of Classification Search**
USPC D13/158–177, 179, 180, 182, 199, 122, D13/144; D10/104.1, 108; D11/143, D11/144, 152; D14/216, 240, 356, 509; D17/22; D23/323, 328, 333, 335, 336, D23/337, 341, 352, 357, 370, 385, 386, D23/399, 400, 499; D12/303, 315; 118/50, 722, 715, 724, 733; 205/118, 205/123; D9/500, 452, 454; D15/122, D15/199, 138; D8/16, 19, 323, 399; D16/135, 219, 302; D7/367, 404, 503, D7/523, 584, 586, 624.1, 630, 640, 677; D26/24, 36, 110
CPC C25D 17/001; C25D 17/08; C25D 17/10; C25D 7/10; C25D 7/12; H01L 21/283; H01L 21/285; H01H 9/02; H01H 9/0214; H01H 13/04; H01H 21/08

See application file for complete search history.

(56) **References Cited**

U.S. PATENT DOCUMENTS

| | | | | |
|-------------------|---------|---------|-------|----------------------------|
| 4,153,907 A * | 5/1979 | Kofron | | H01L 21/283 136/256 |
| D274,836 S * | 7/1984 | Smith | | D23/337 |
| 5,641,375 A * | 6/1997 | Nitescu | | H01J 37/32495 156/345.1 |
| D404,369 S * | 1/1999 | Kawachi | | D13/182 |
| D448,729 S * | 10/2001 | Asao | | D13/122 |
| D491,963 S * | 6/2004 | Doba | | D15/144 |
| D716,240 S * | 10/2014 | Lau | | D13/182 |
| 2001/0023821 A1 * | 9/2001 | Harris | | H01L 21/67017 204/279 |

(Continued)

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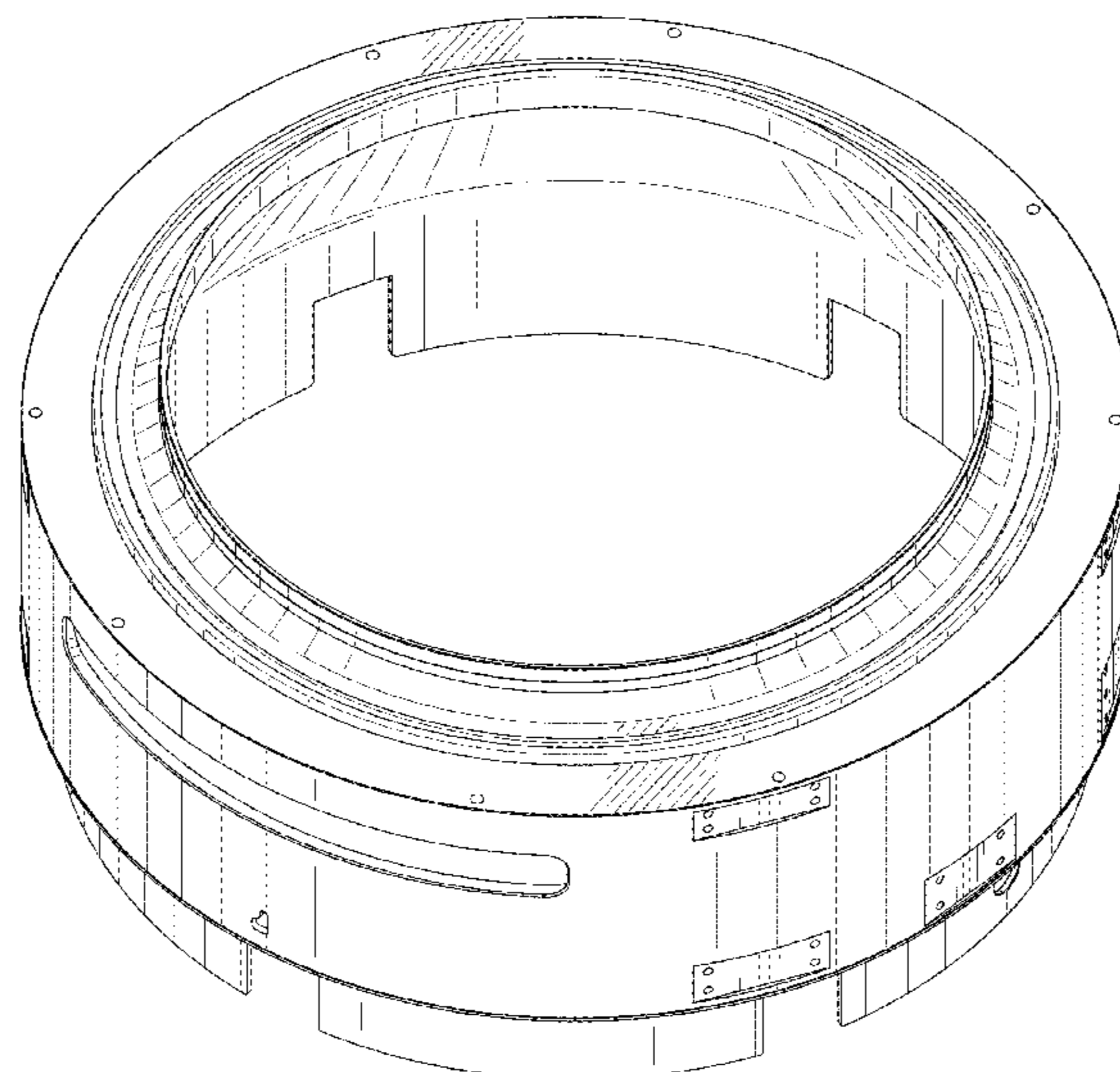
(57) **CLAIM**

The ornamental design for an upper chamber for a plasma processing apparatus, as shown and described.

DESCRIPTION

FIG. 1 is a front and top perspective view of an upper chamber for a plasma processing apparatus according to the design;
FIG. 2 is a front elevational view thereof;
FIG. 3 is a rear elevational view thereof;
FIG. 4 is a left side elevational view thereof;
FIG. 5 is a right side elevational view thereof;
FIG. 6 is a top plan view thereof;
FIG. 7 is a bottom plan view thereof;
FIG. 8 is a cross-sectional view taken along line 8-8 of FIG. 6; and,
FIG. 9 is a partially enlarged view taken along line 9-9 of FIG. 8.

1 Claim, 7 Drawing Sheets



(56)

References Cited

U.S. PATENT DOCUMENTS

2001/0035131 A1* 11/2001 Sakuma C23C 16/46
118/724
2004/0069223 A1* 4/2004 Tzeng H01L 21/67069
118/715
2012/0018402 A1* 1/2012 Carducci H01J 37/32082
216/67
2013/0292254 A1* 11/2013 Kumar C25D 17/001
205/81
2014/0097088 A1* 4/2014 Stowell C25D 21/18
205/99
2016/0307743 A1* 10/2016 Brown H01J 37/32816

* cited by examiner

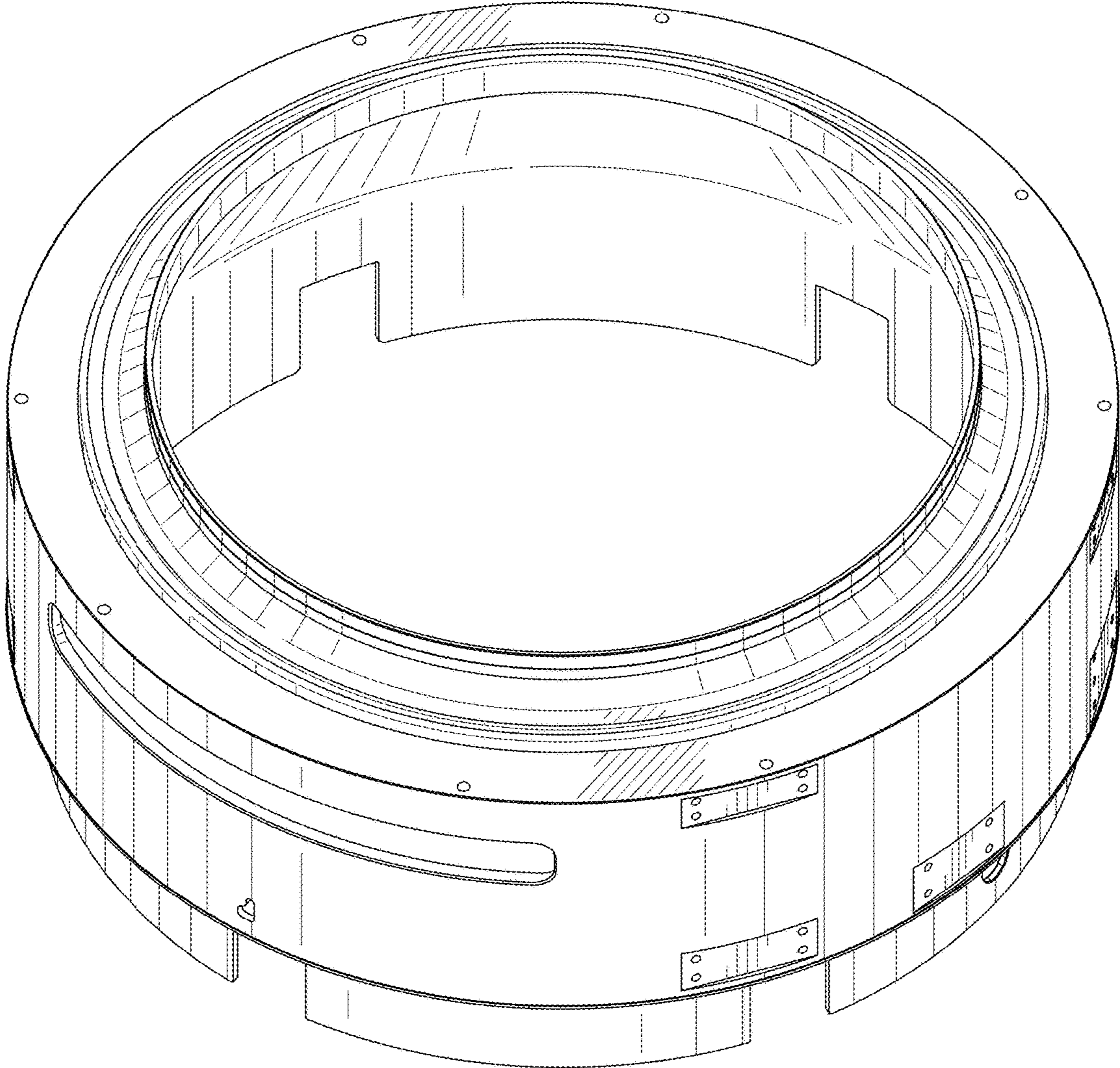


FIG. 1

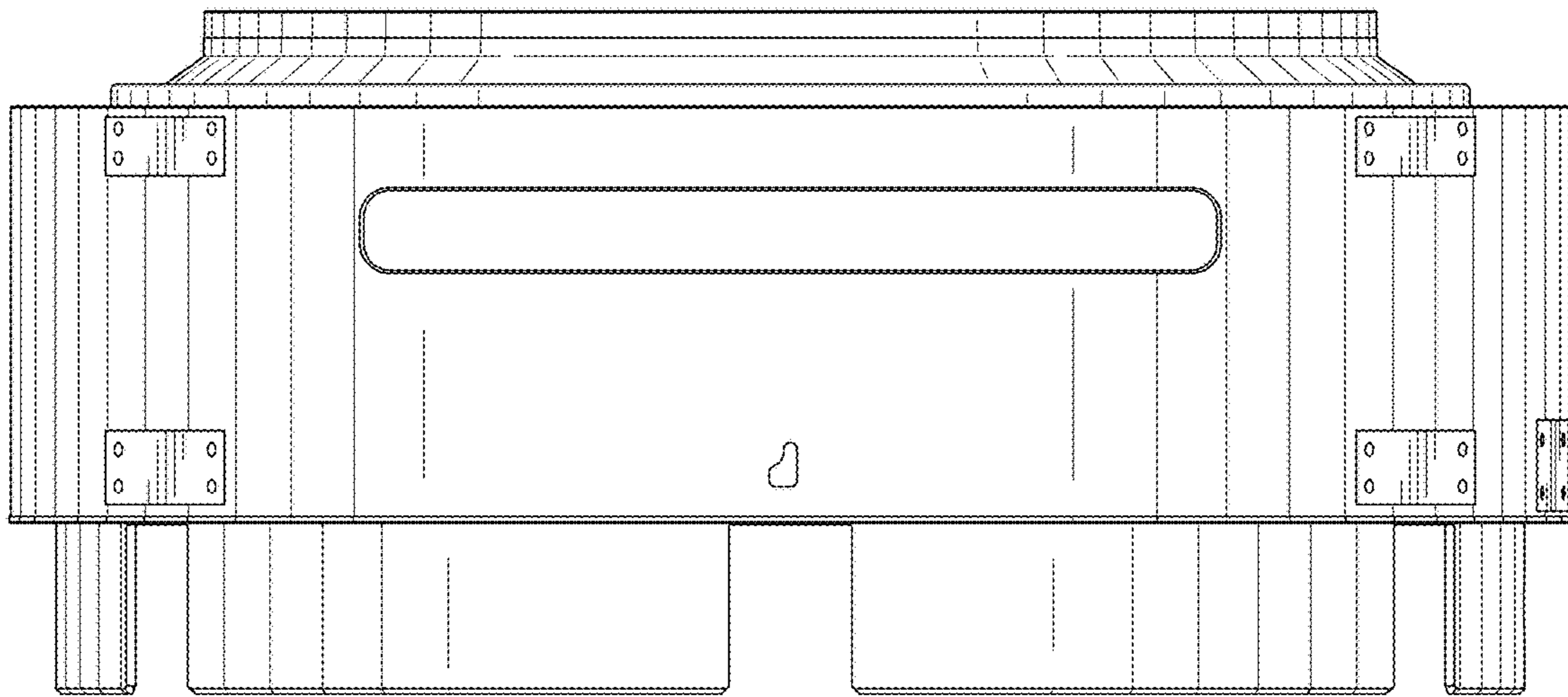


FIG. 2

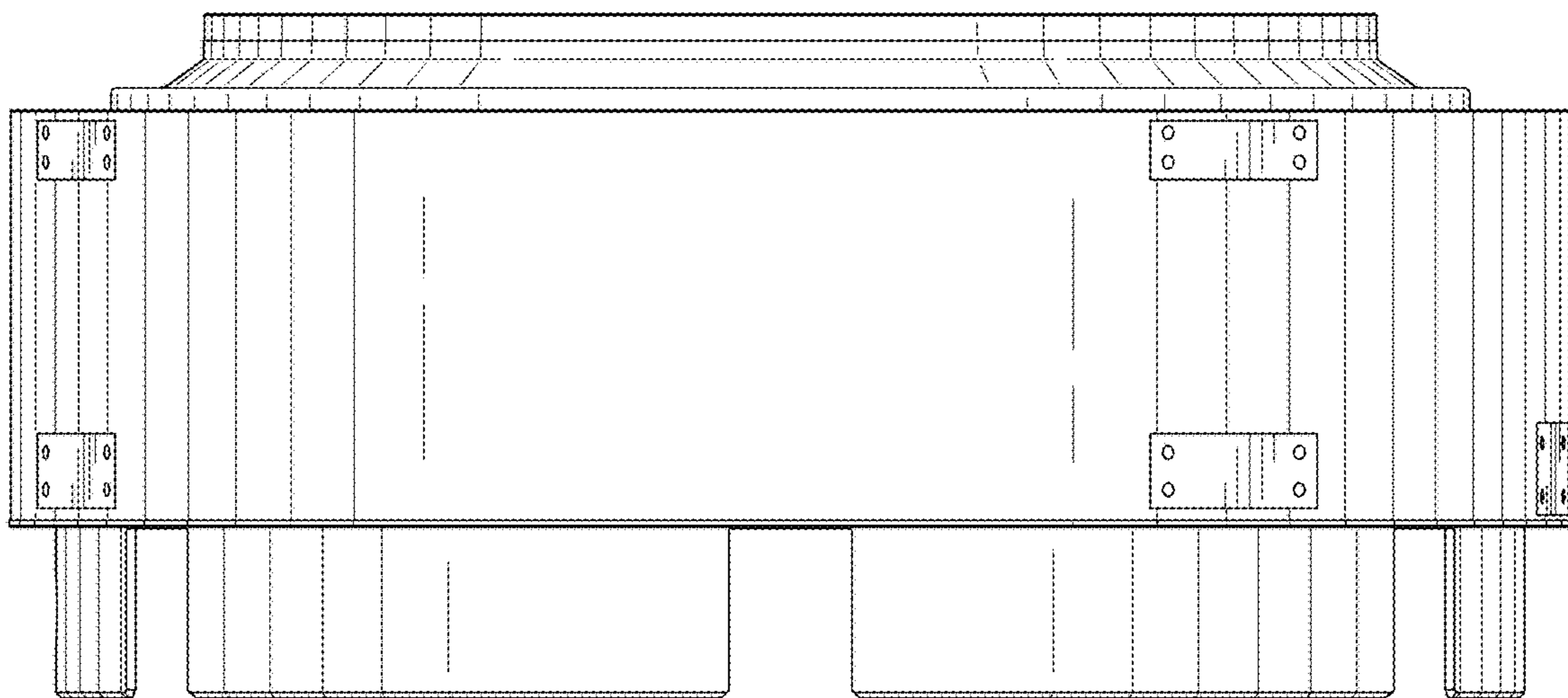


FIG. 3

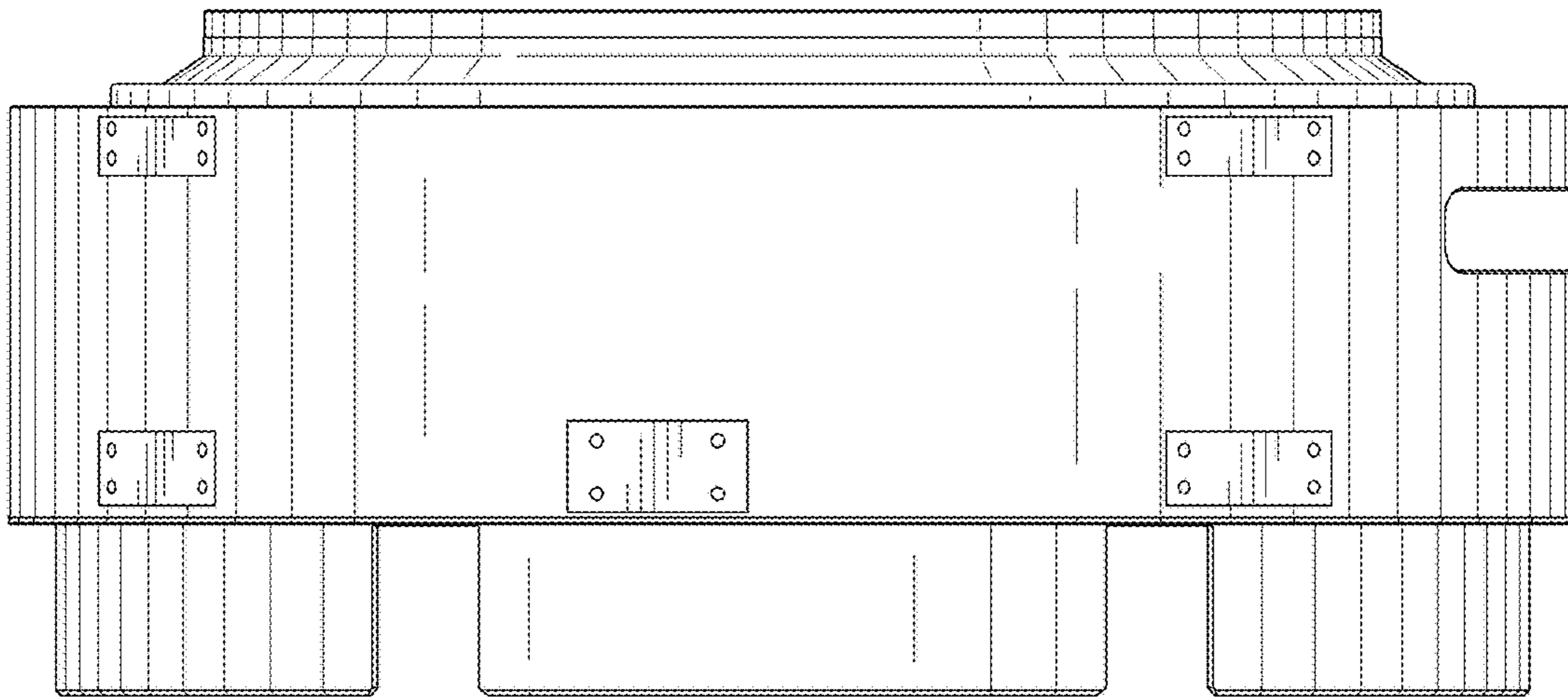


FIG. 4

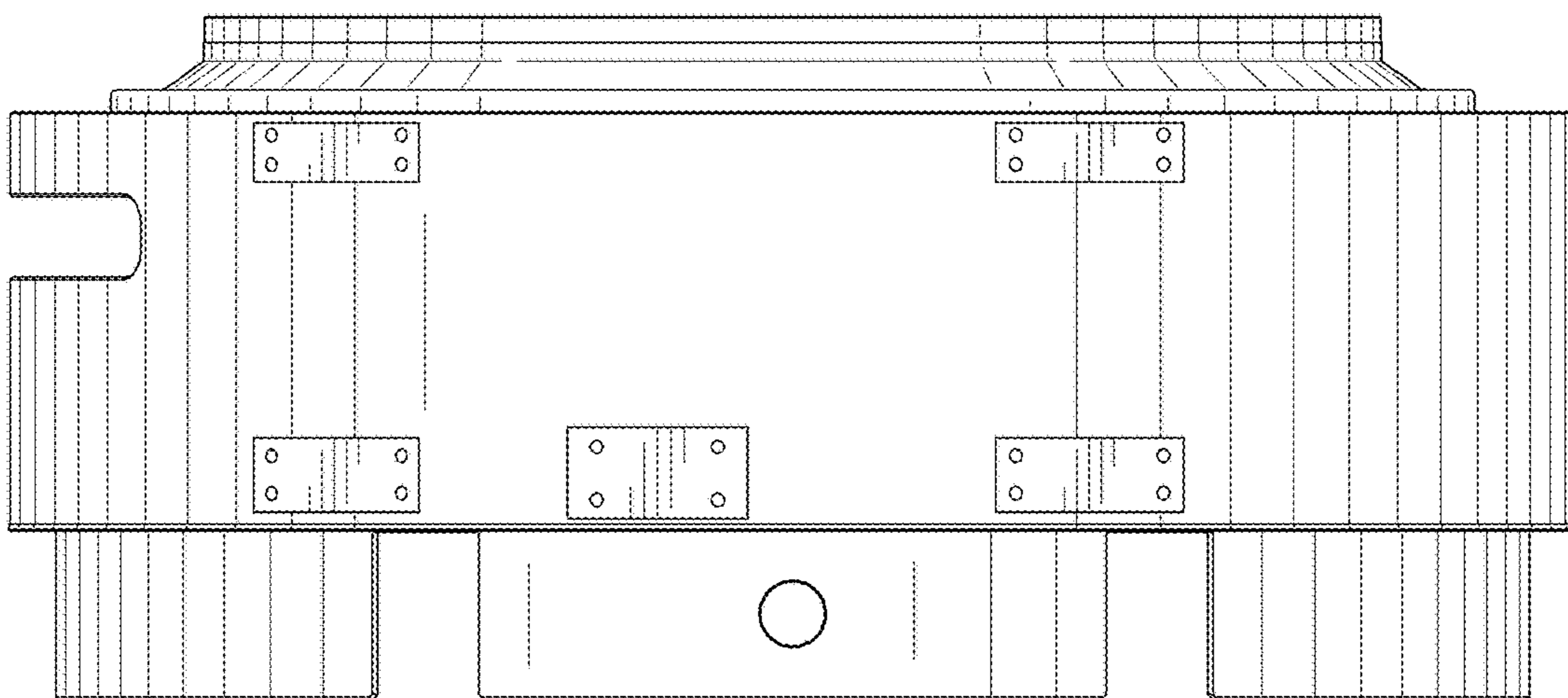
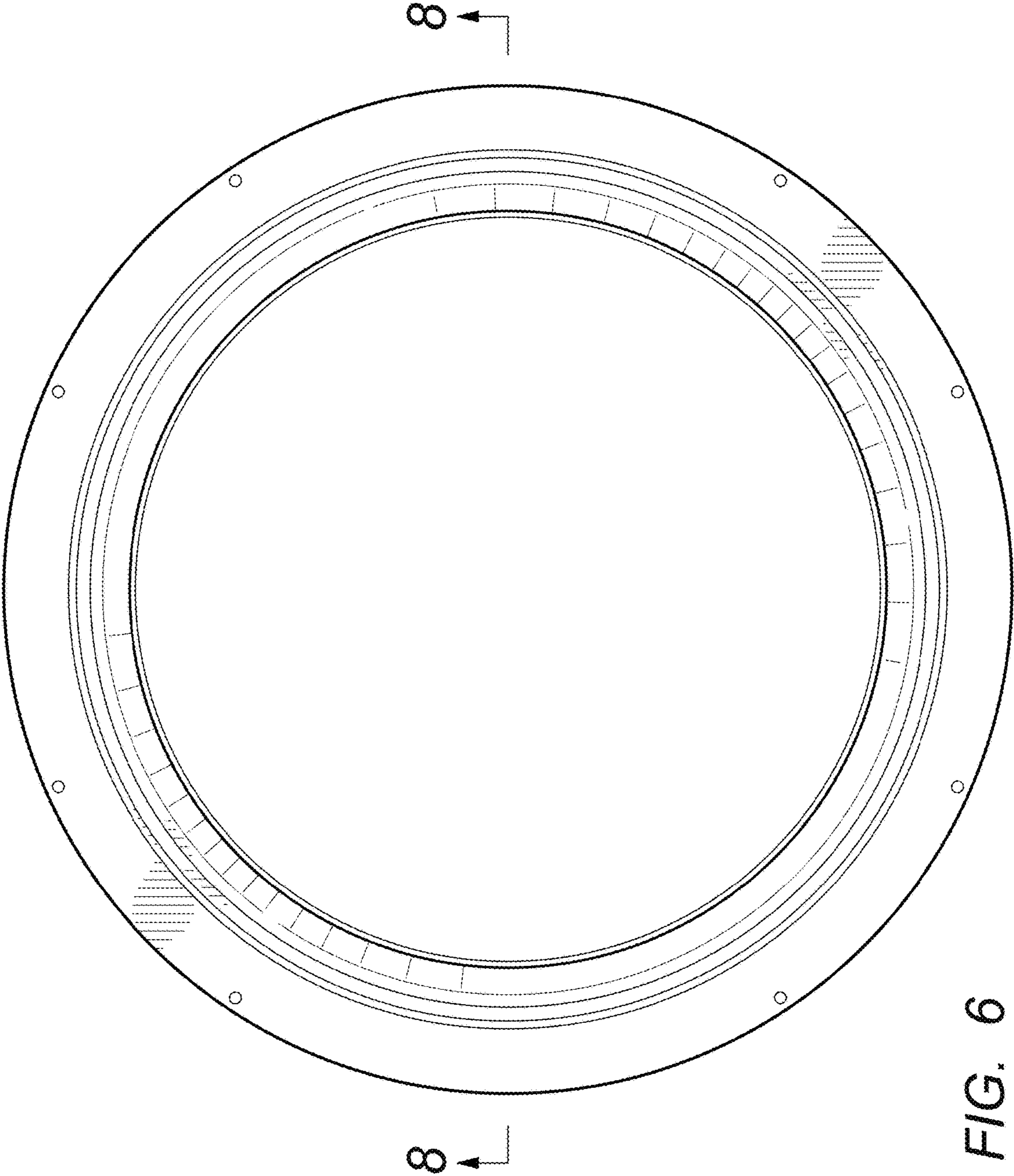


FIG. 5



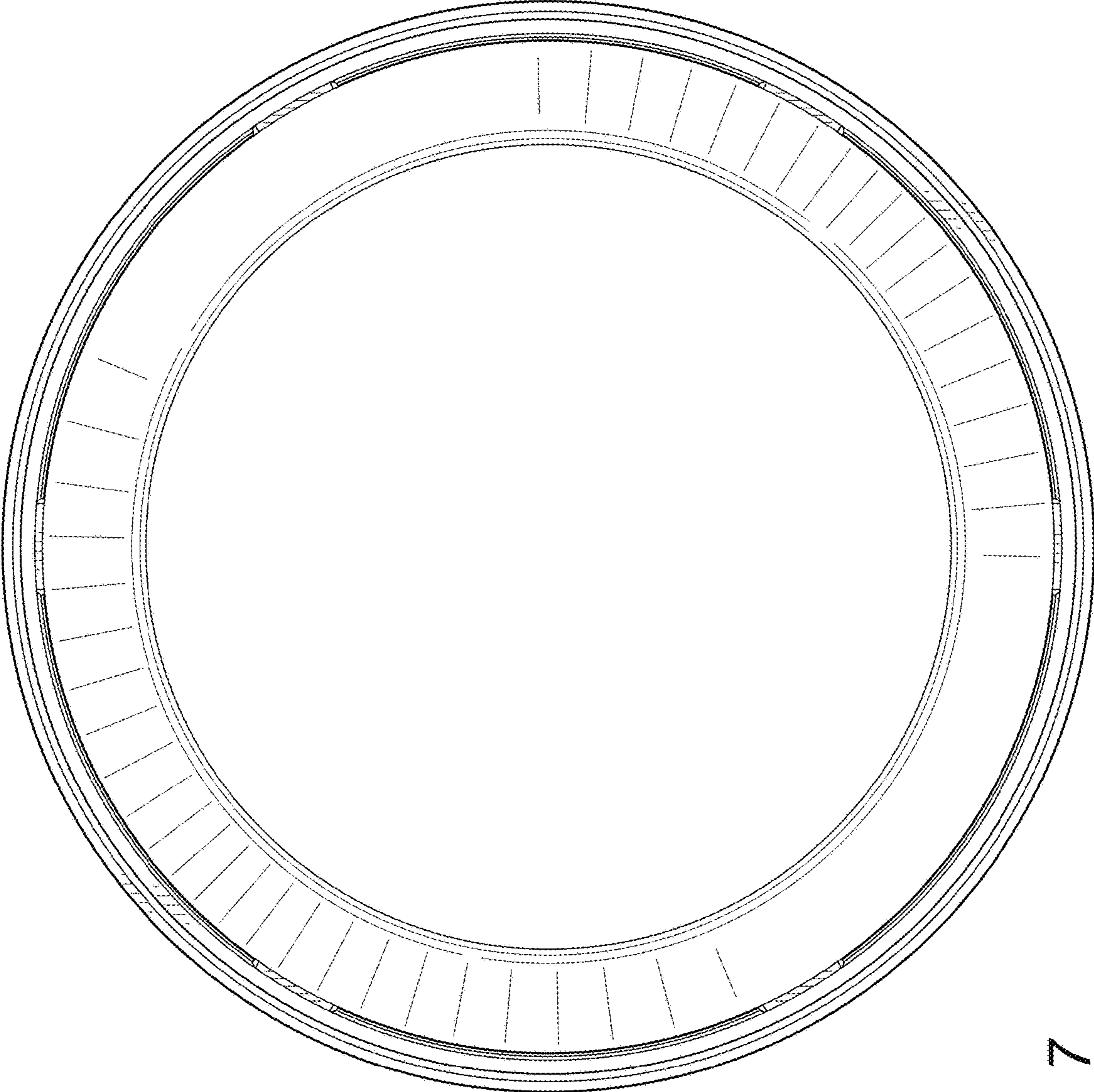


FIG. 7

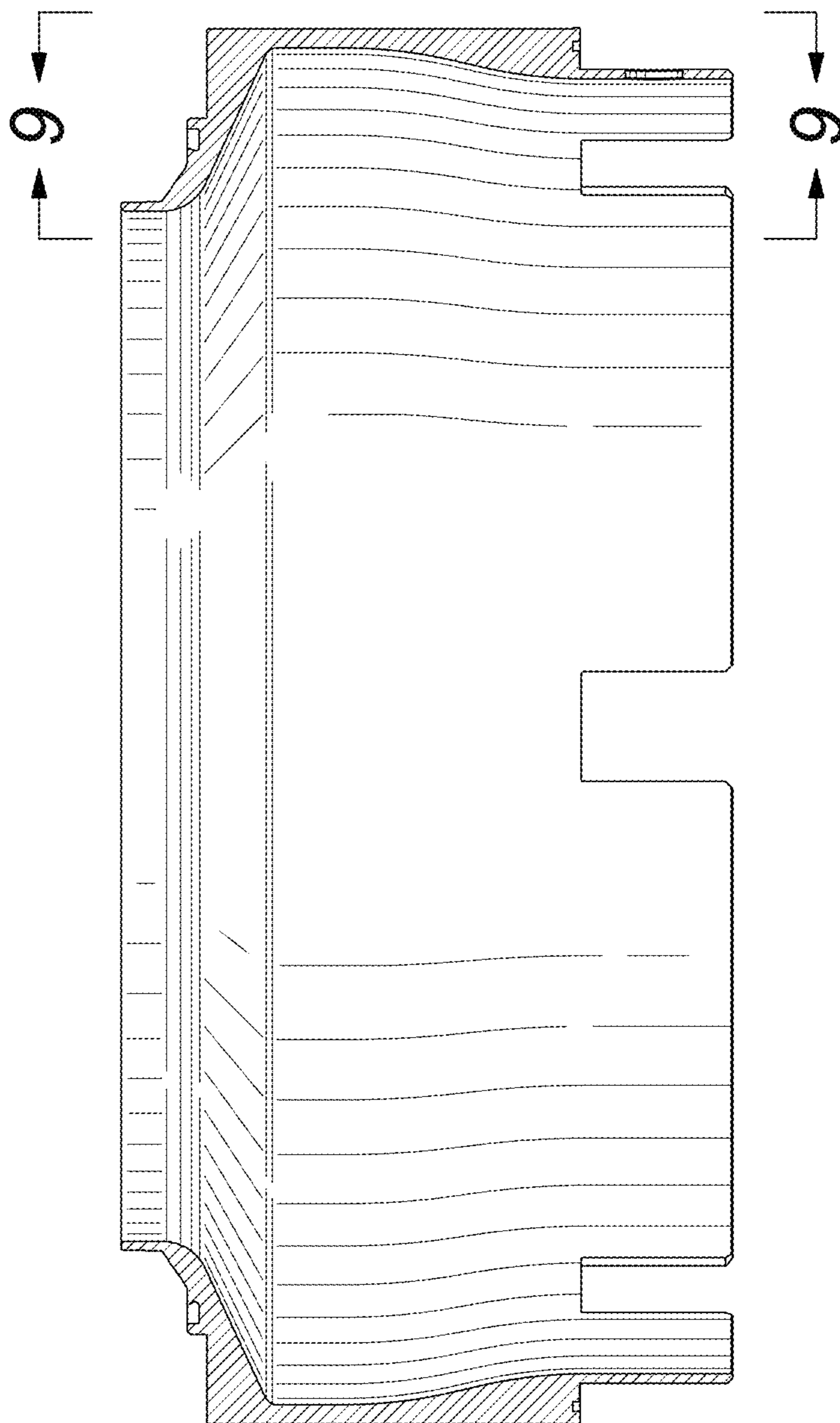


FIG. 8

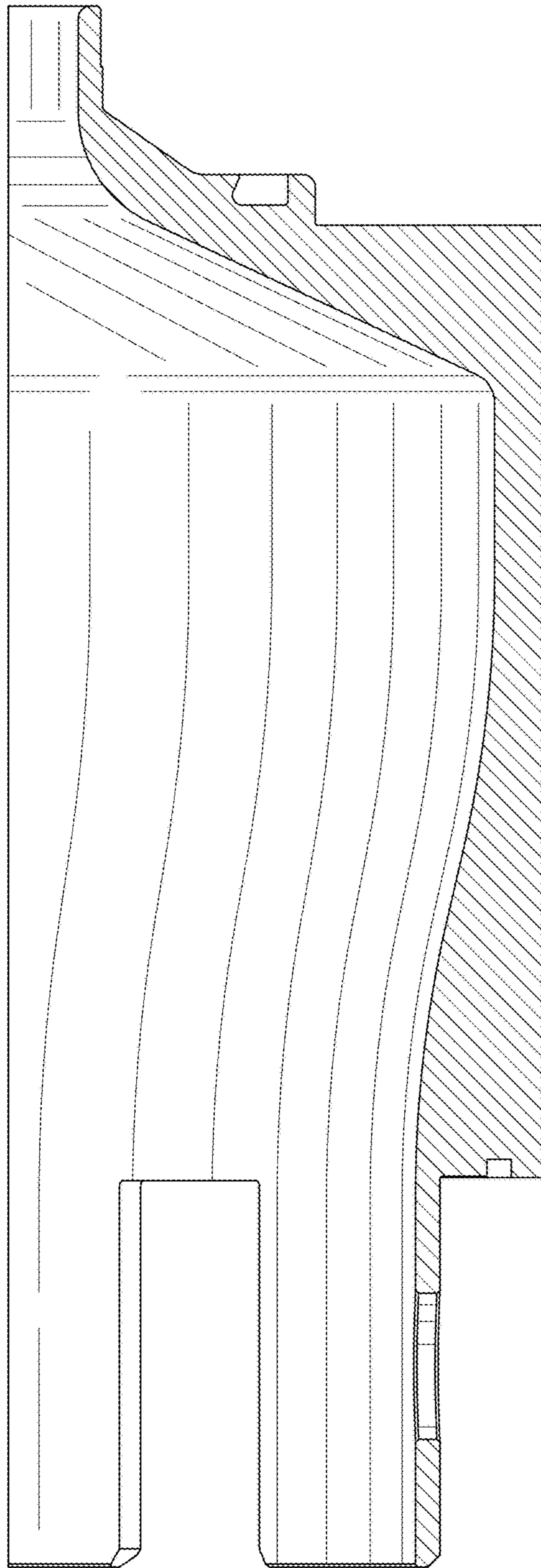


FIG. 9