US00D804436S

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

(10) **Patent No.: US D804,436 S**
(45) **Date of Patent: ** Dec. 5, 2017**

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

(71) Applicant: **Hitachi High-Technologies Corporation**, Minato-ku, Tokyo (JP)

(72) Inventors: **Susumu Tauchi**, Tokyo (JP); **Takashi Uemura**, Tokyo (JP); **Kohei Sato**, Tokyo (JP)

(73) Assignee: **Hitachi High-Technologies Corporation**, Tokyo (JP)

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

(21) Appl. No.: **29/544,068**

(22) Filed: **Oct. 30, 2015**

(30) **Foreign Application Priority Data**

Jun. 12, 2015 (JP) 2015-013035

(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)

Primary Examiner — Jeffrey D Asch
Assistant Examiner — Tracey J Bell
(74) *Attorney, Agent, or Firm* — Crowell & Moring LLP

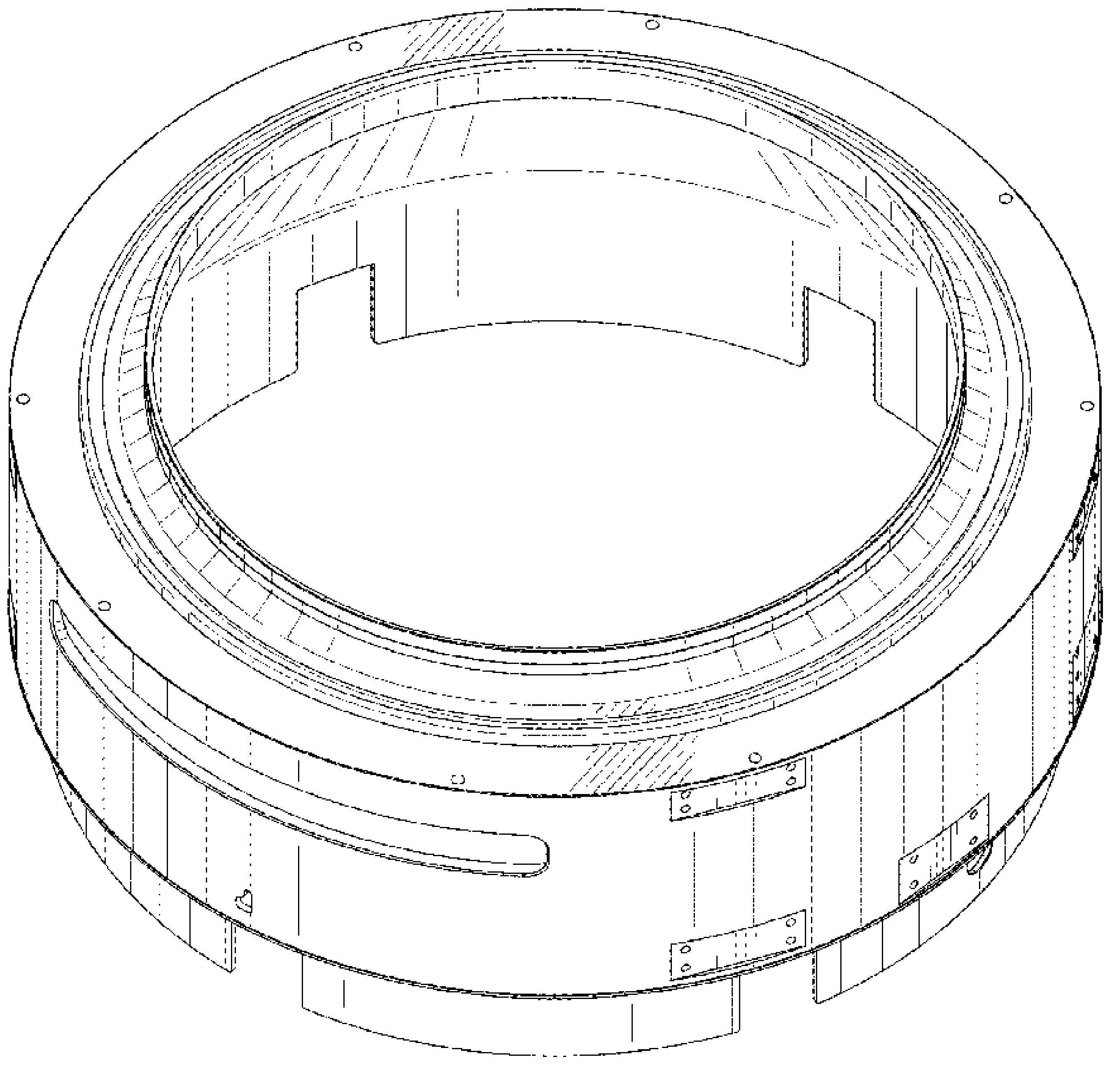
(57) **CLAIM**

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

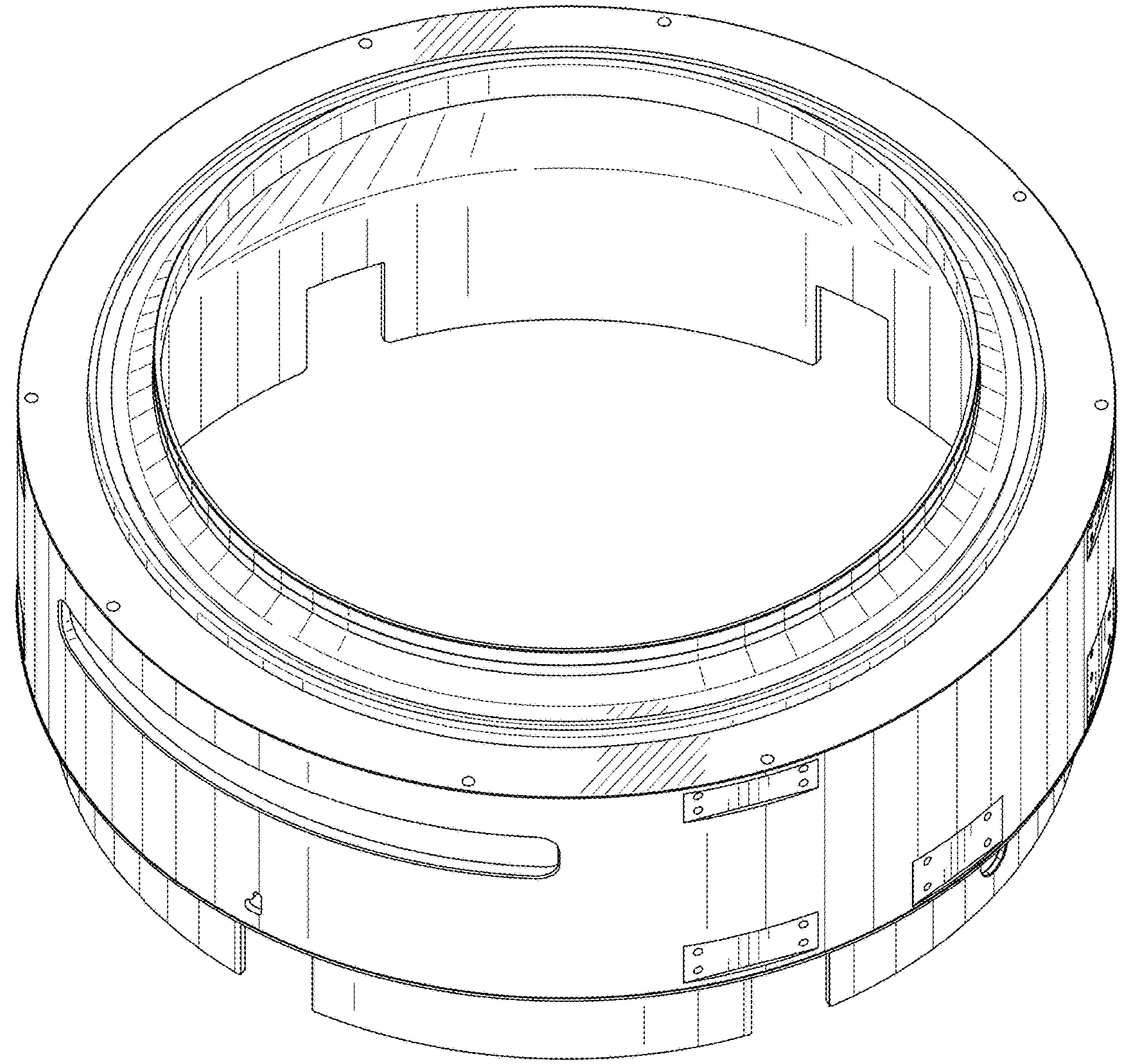


FIG. 1

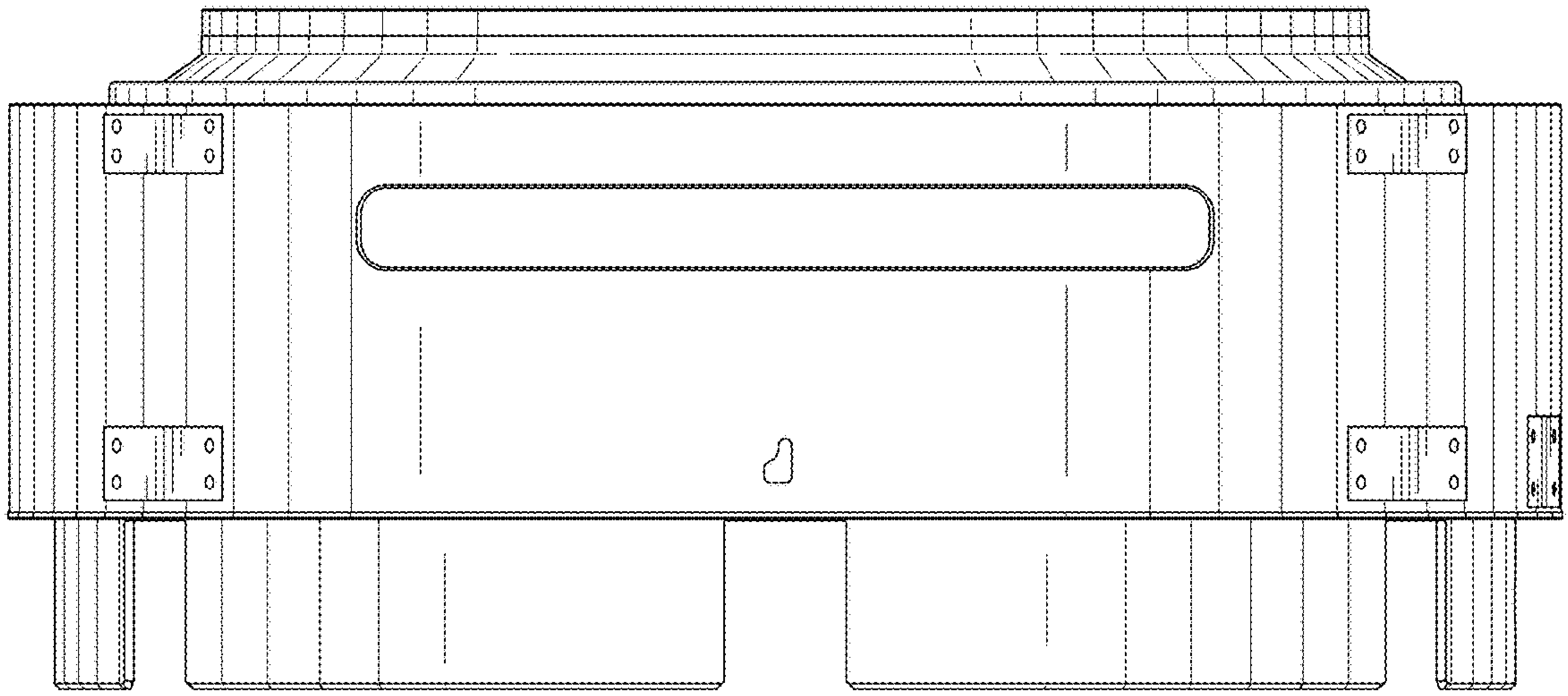


FIG. 2

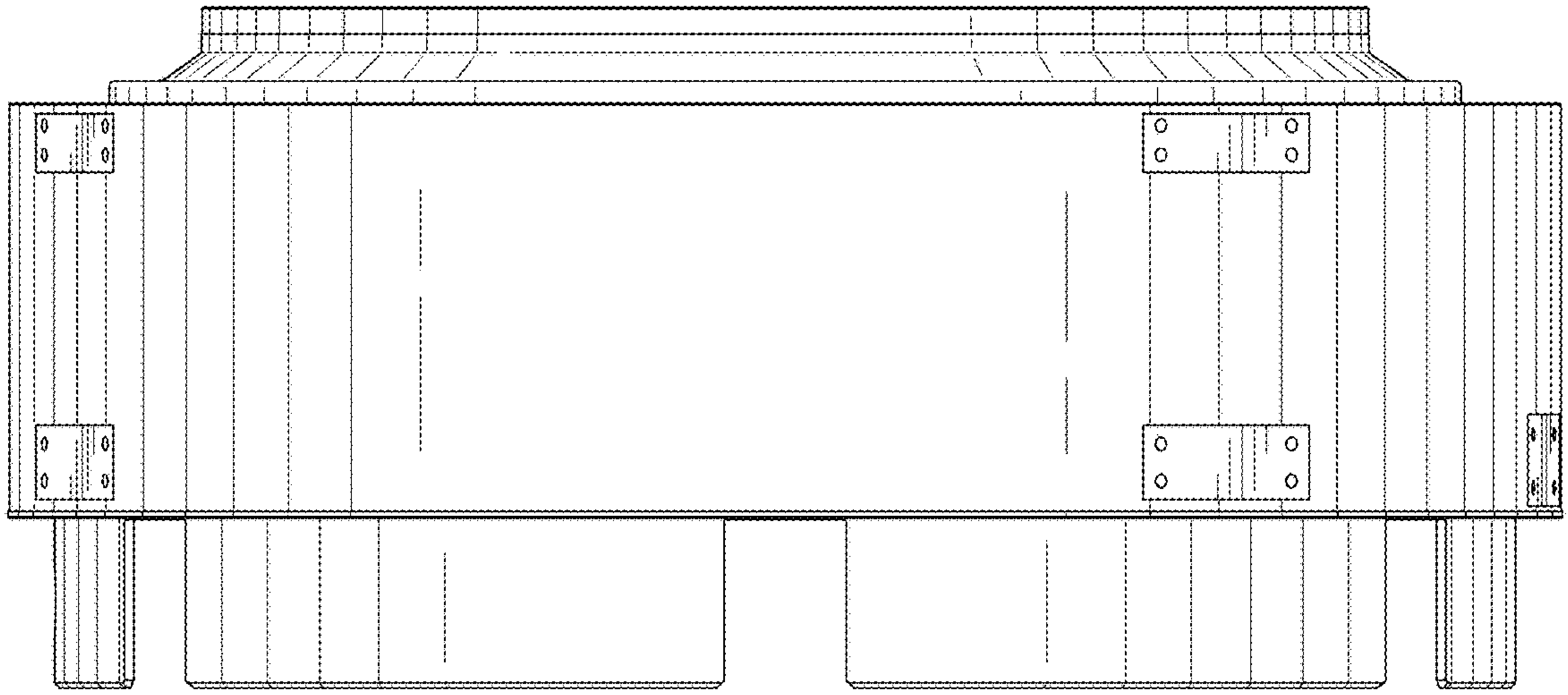


FIG. 3

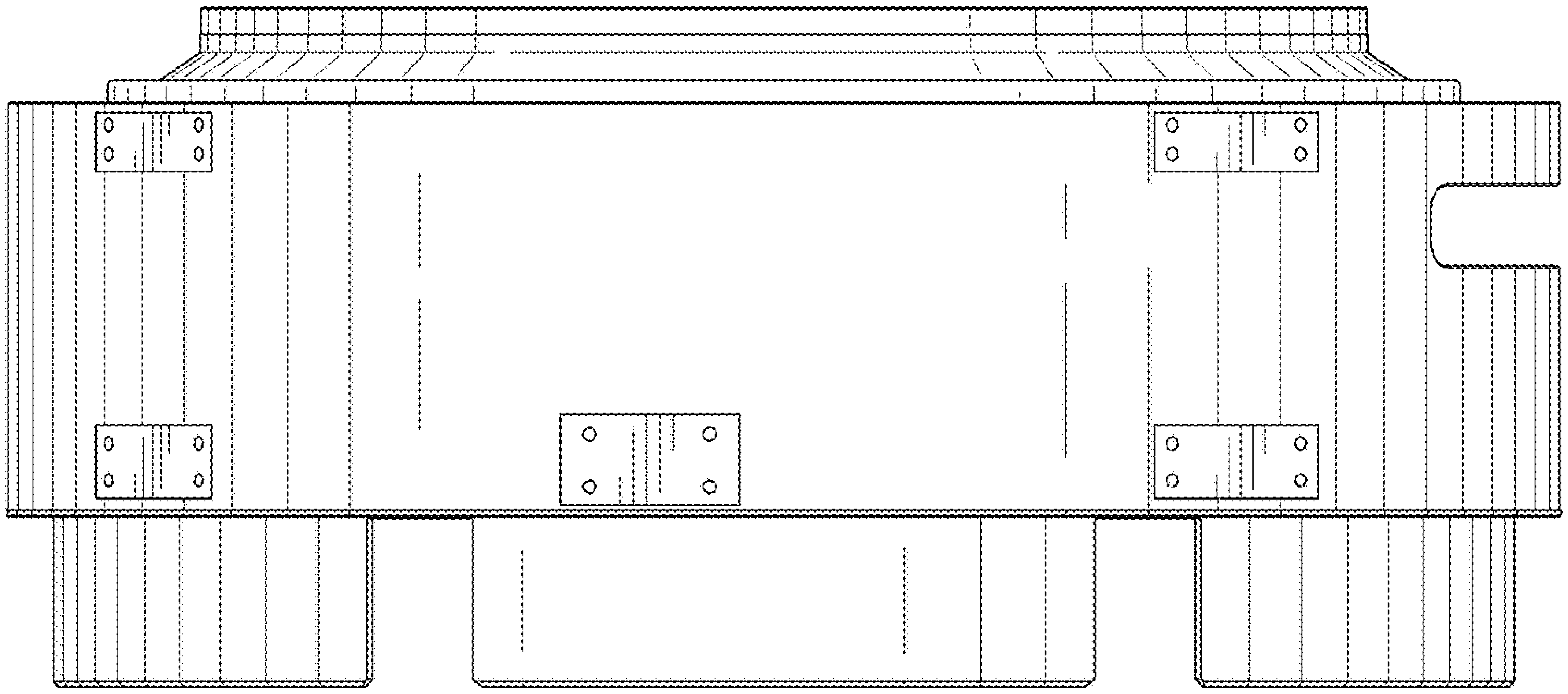


FIG. 4

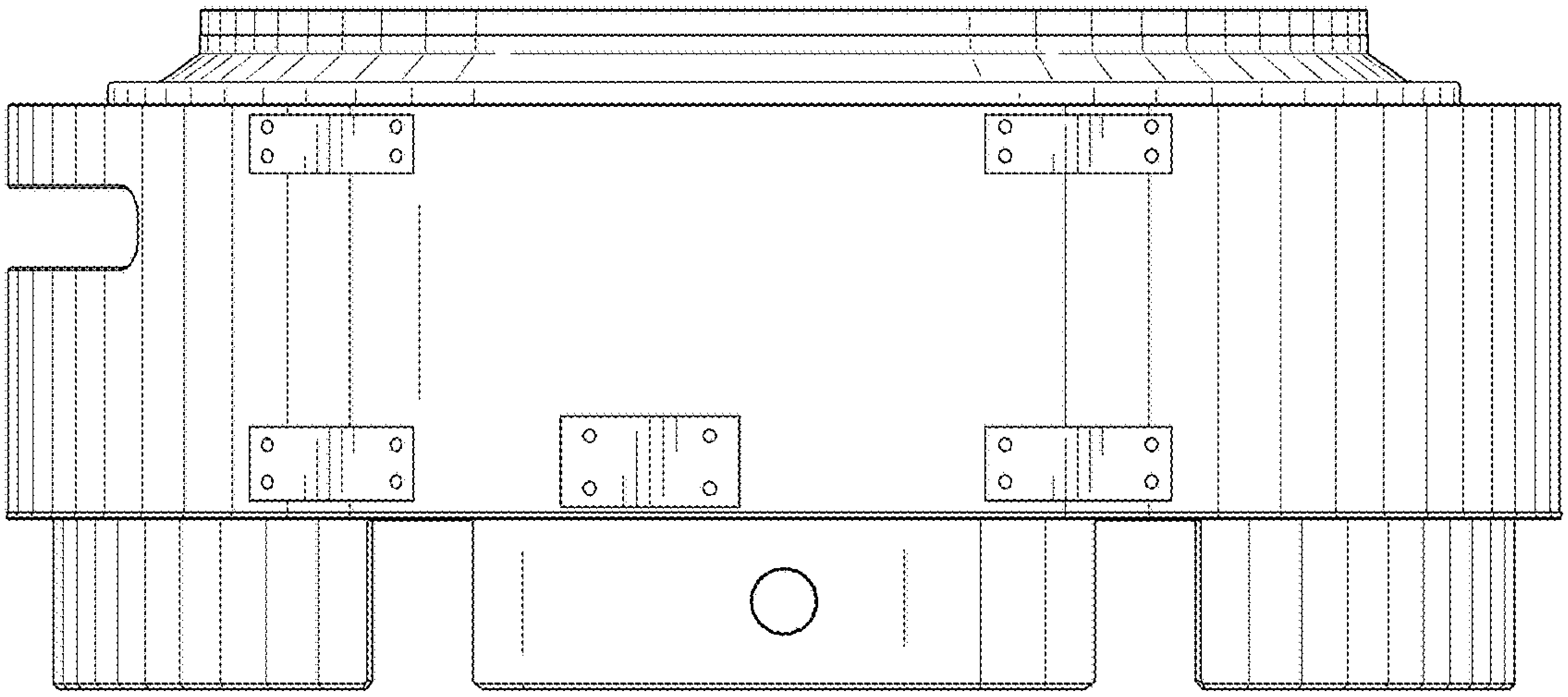


FIG. 5

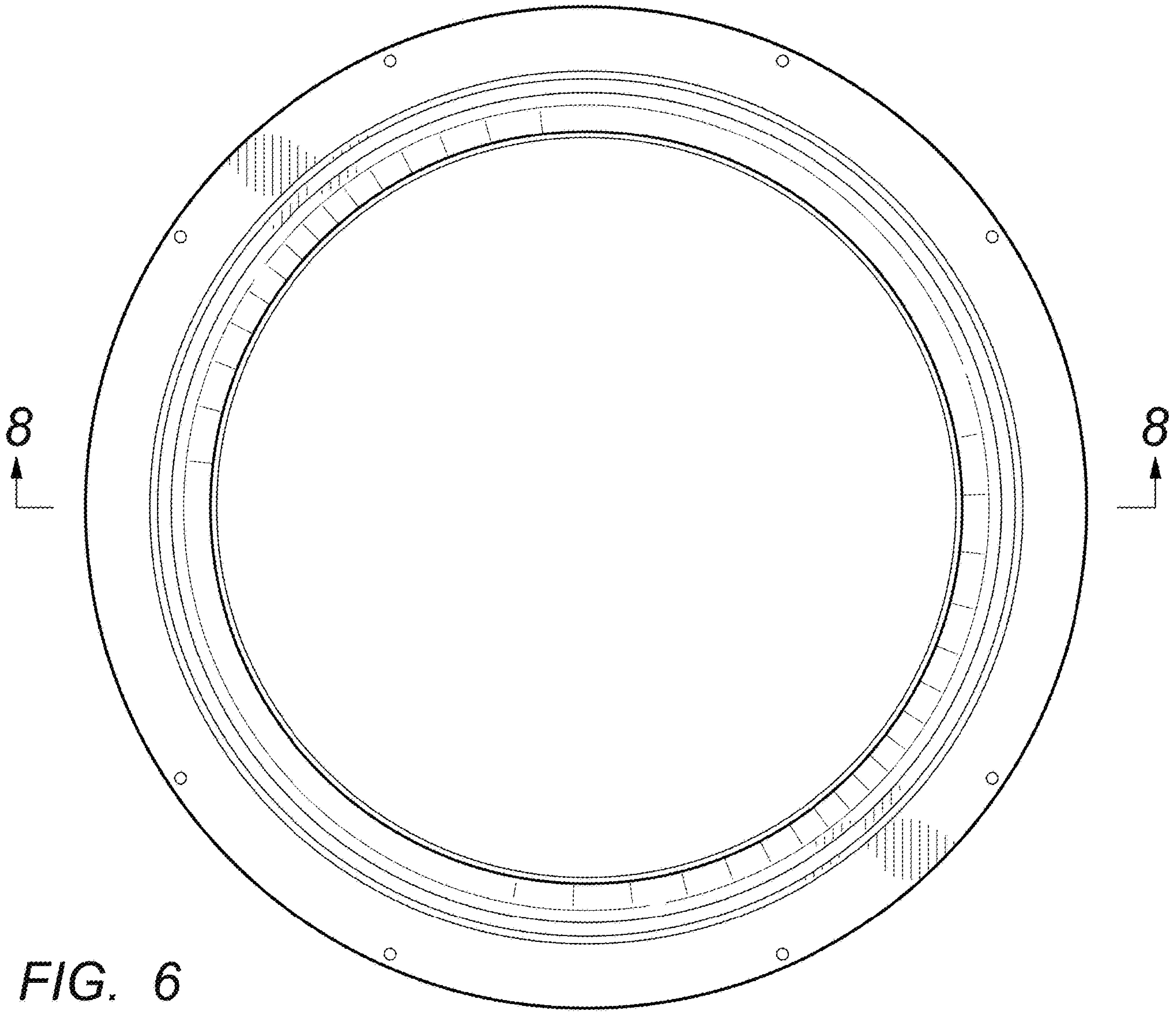


FIG. 6

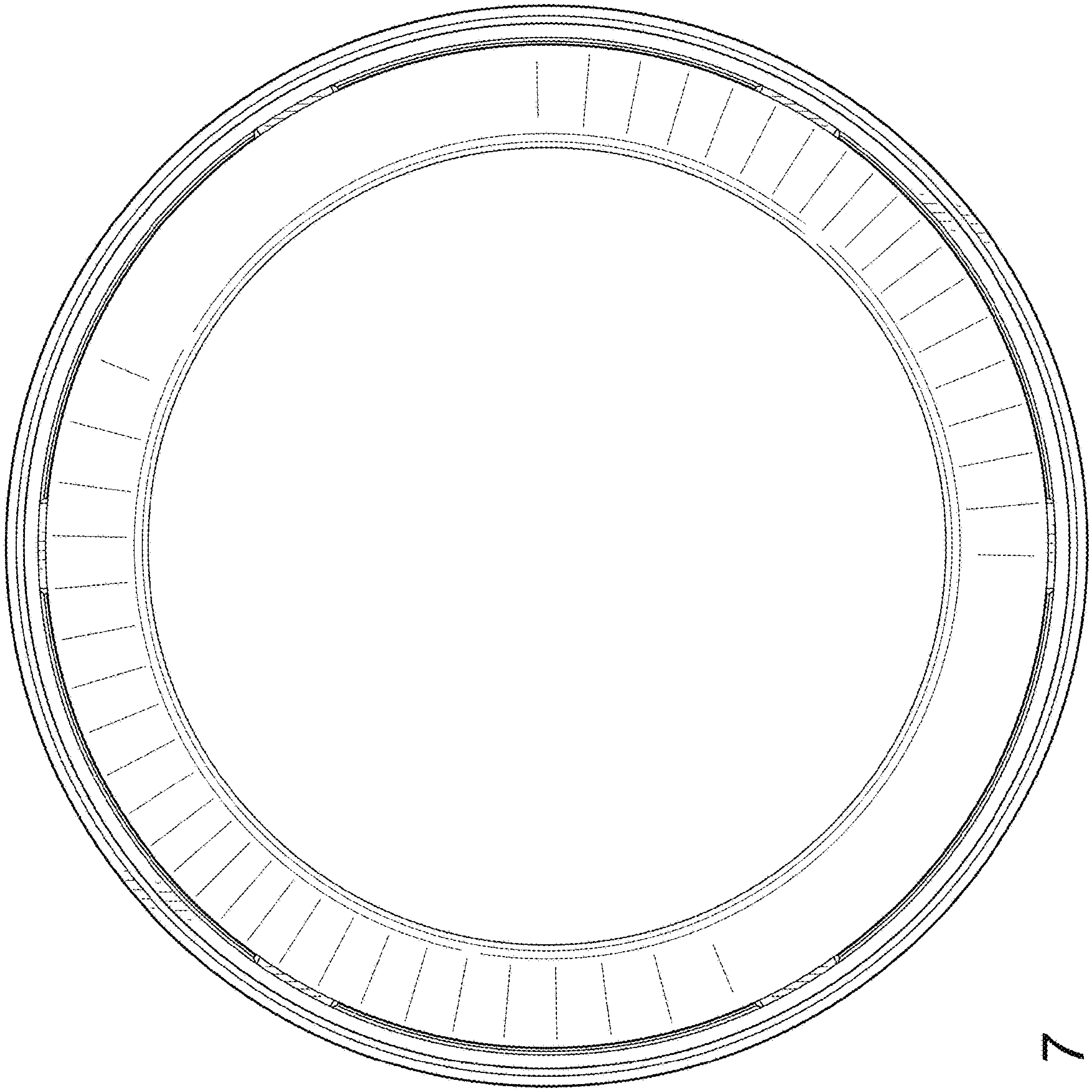


FIG. 7

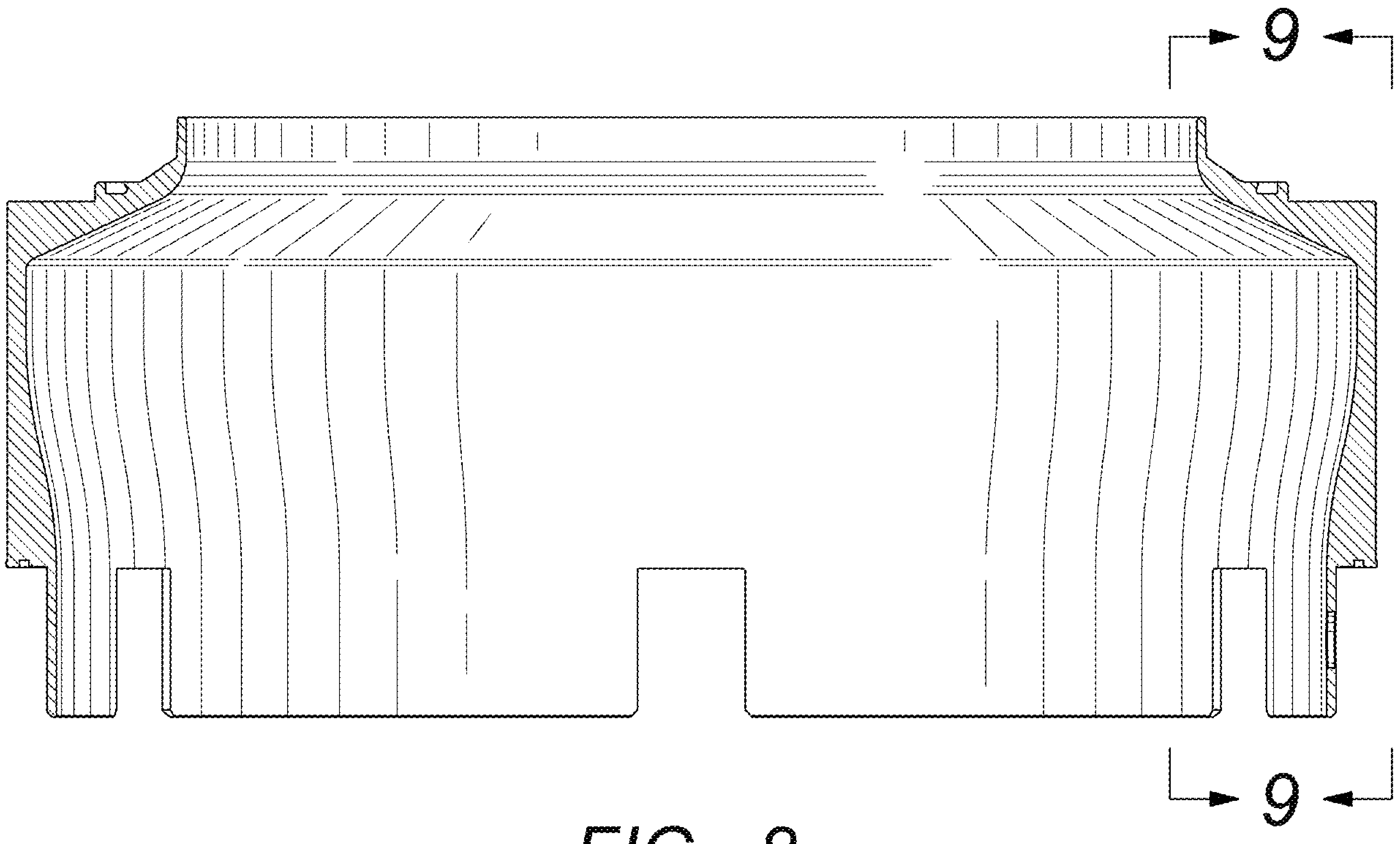


FIG. 8

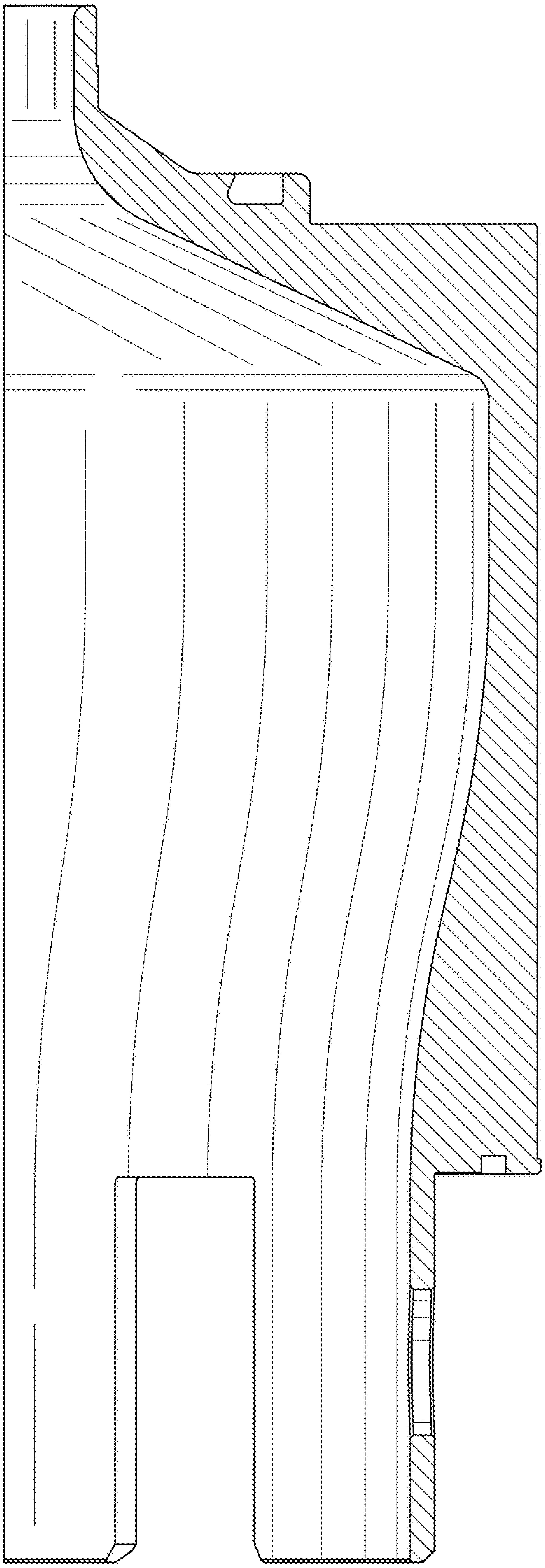


FIG. 9