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

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(45) **Date of Patent:** **\*\* \*Nov. 8, 2011**

(54) **ELECTROPLATING FLOW SHAPING PLATE  
HAVING OFFSET SPIRAL HOLE PATTERN**

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(\*) Notice: This patent is subject to a terminal disclaimer.

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

(21) Appl. No.: **29/377,521**

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(51) **LOC (9) Cl.** ..... **13-03**

(52) **U.S. Cl.** ..... **D13/182**

(58) **Field of Classification Search** ..... D13/182;  
205/82, 96, 157; 204/297.01, 297.05, 230.2,  
204/252, 261, 273; 257/E21.175

See application file for complete search history.

(56) **References Cited**

U.S. PATENT DOCUMENTS

4,304,641	A *	12/1981	Grandia et al.	.....	205/96
5,078,852	A *	1/1992	Yee et al.	.....	204/297.05
5,660,699	A *	8/1997	Saito et al.	.....	204/297.03
5,744,019	A *	4/1998	Ang	.....	205/96
6,004,440	A *	12/1999	Hanson et al.	.....	204/279
6,080,291	A *	6/2000	Woodruff et al.	.....	204/297.01
6,398,926	B1 *	6/2002	Mahneke	.....	204/224 R
6,497,801	B1 *	12/2002	Woodruff et al.	.....	204/230.2

(Continued)

OTHER PUBLICATIONS

U.S. Appl. No. 61/405,608, "Flow diverters and flow shaping plates for electroplating cells", Mayer et al., filed Oct. 21, 2010.

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(57) **CLAIM**

We claim the ornamental design for an electroplating flow shaping plate having offset spiral hole pattern, as shown and described.

**DESCRIPTION**

FIG. 1 is a front plan view of an electroplating flow shaping plate having offset spiral hole pattern showing an embodiment of our new design;

FIG. 2 is a bottom view thereof;

FIG. 3 is a right side elevational view thereof, the left, top and bottom side elevational views being identical images thereof;

FIG. 4 is a front perspective view thereof; and

FIG. 5 is a rear perspective view thereof.

FIG. 6 is a front plan view of an electroplating flow shaping plate having offset spiral hole pattern showing a second embodiment of our new design;

FIG. 7 is a bottom view thereof;

FIG. 8 is a right side elevational view thereof, the left, top and bottom side elevational views being identical images thereof;

FIG. 9 is a front perspective view thereof; and

FIG. 10 is a rear perspective view thereof.

FIG. 11 is a front plan view of an electroplating flow shaping plate having offset spiral hole pattern showing a third embodiment of our new design;

FIG. 12 is a bottom view thereof; and

FIG. 13 is a right side elevational view thereof, the left, top and bottom side elevational views being identical images thereof;

FIG. 14 is a front perspective view thereof; and

FIG. 15 is a rear perspective view thereof.

FIG. 16 is a front plan view of an electroplating flow shaping plate having offset spiral hole pattern showing a fourth embodiment of our new design;

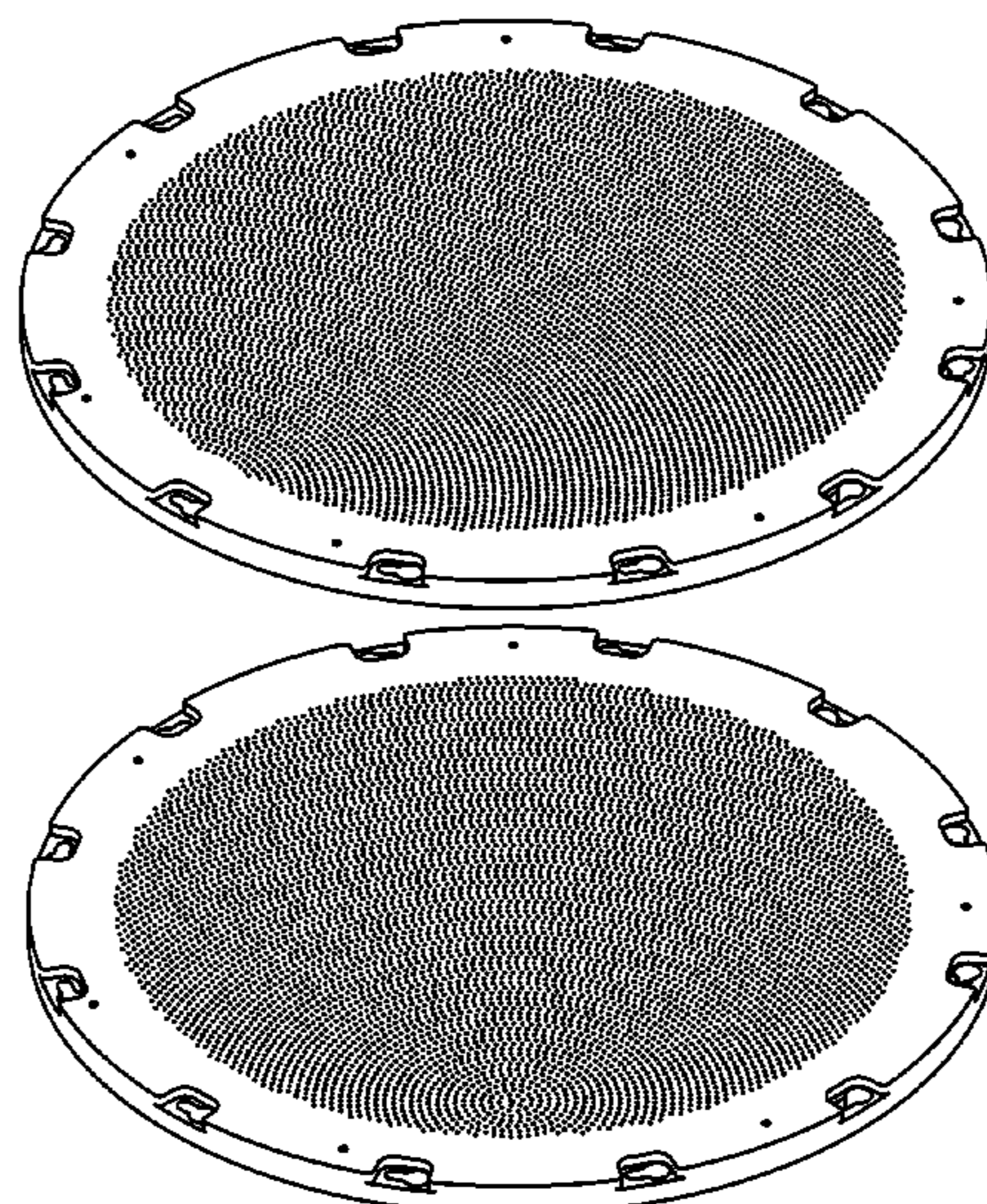
FIG. 17 is a bottom view thereof; and

FIG. 18 is a right side elevational view thereof, the left, top and bottom side elevational views being identical images thereof;

FIG. 19 is a front perspective view thereof; and,

FIG. 20 is a rear perspective view thereof.

**1 Claim, 16 Drawing Sheets**



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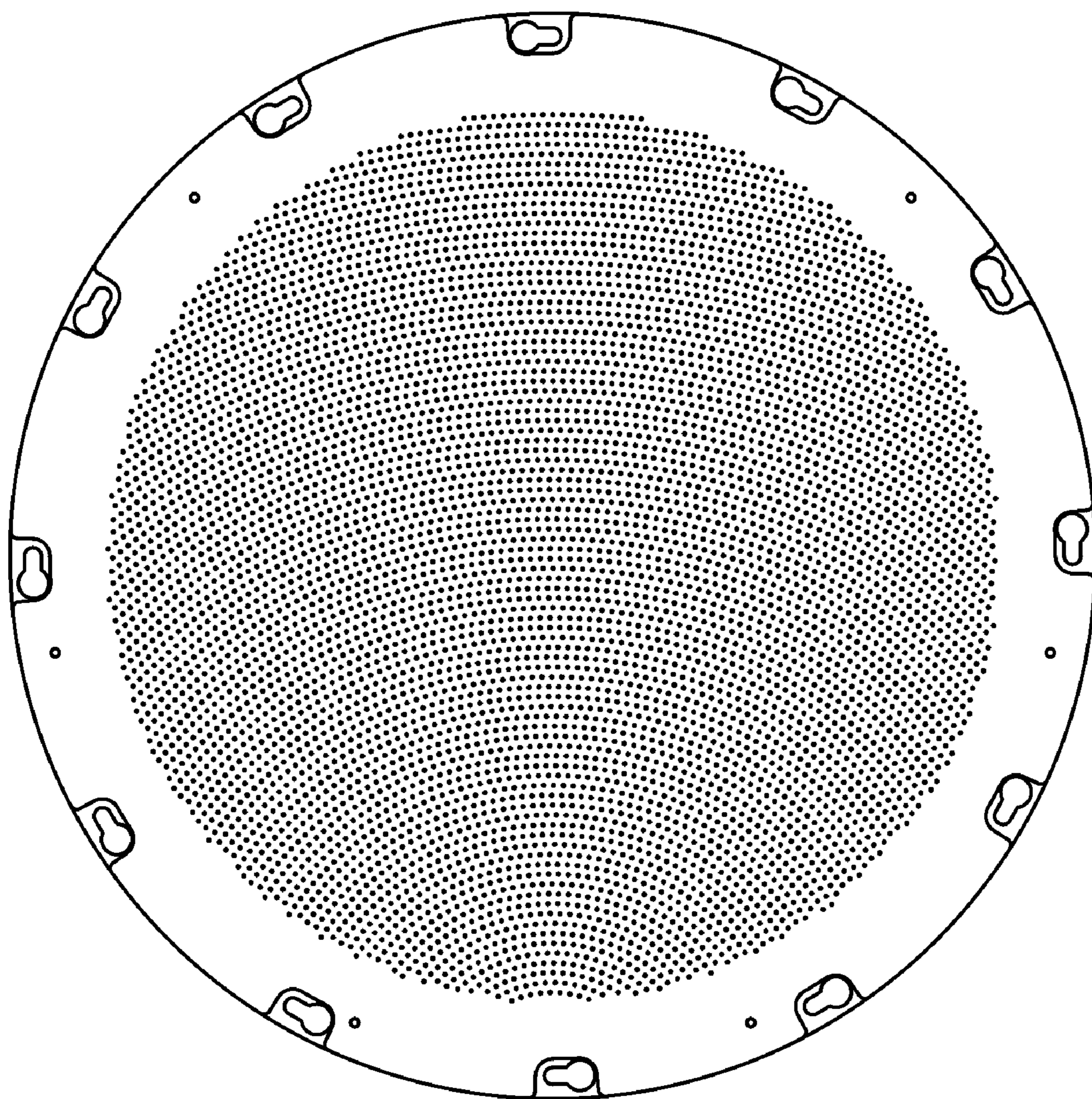
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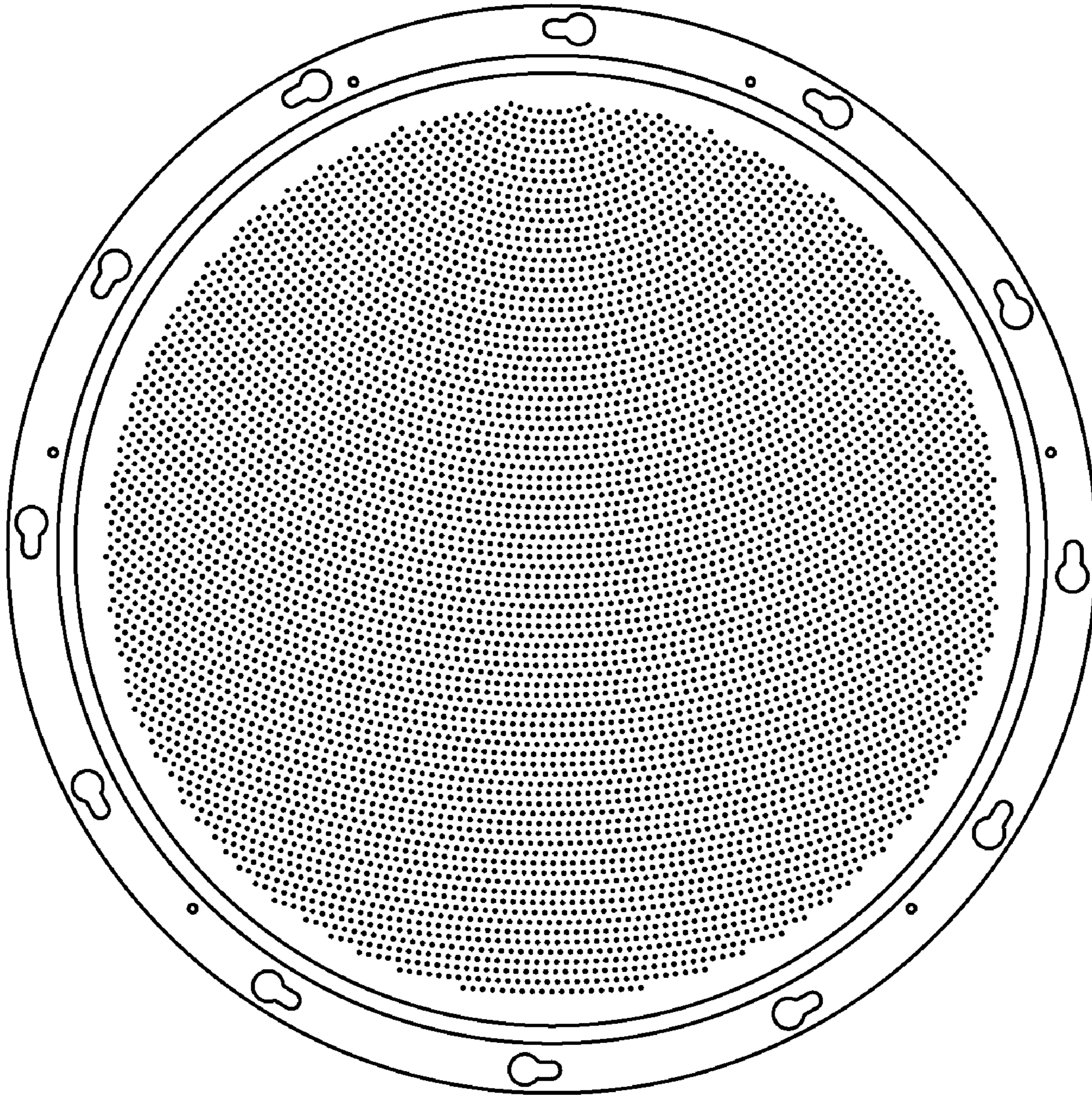
## U.S. PATENT DOCUMENTS

6,521,102	B1 *	2/2003	Dordi	.....	204/252	7,641,776	B2 *	1/2010	Nagar et al.	.....	204/297.01
6,632,335	B2 *	10/2003	Dordi et al.	.....	204/230.2	D609,652	S *	2/2010	Nagasaka et al.	.....	D13/182
6,921,468	B2 *	7/2005	Graham et al.	.....	204/212	D609,655	S *	2/2010	Sugimoto	.....	D13/182
D544,452	S *	6/2007	Nakamura et al.	.....	D13/182	7,670,465	B2 *	3/2010	Yang et al.	.....	204/193
D548,705	S *	8/2007	Hayashi	.....	D13/182	D614,593	S *	4/2010	Lee et al.	.....	D13/182
D552,565	S *	10/2007	Nakamura et al.	.....	D13/182	7,935,240	B2 *	5/2011	Singh et al.	.....	205/83
D553,104	S *	10/2007	Oohashi et al.	.....	D13/182	2007/0068819	A1 *	3/2007	Singh et al.	.....	205/83
D587,222	S *	2/2009	Sasaki et al.	.....	D13/182	2011/0031112	A1 *	2/2011	Birang et al.	.....	204/229.8

\* cited by examiner



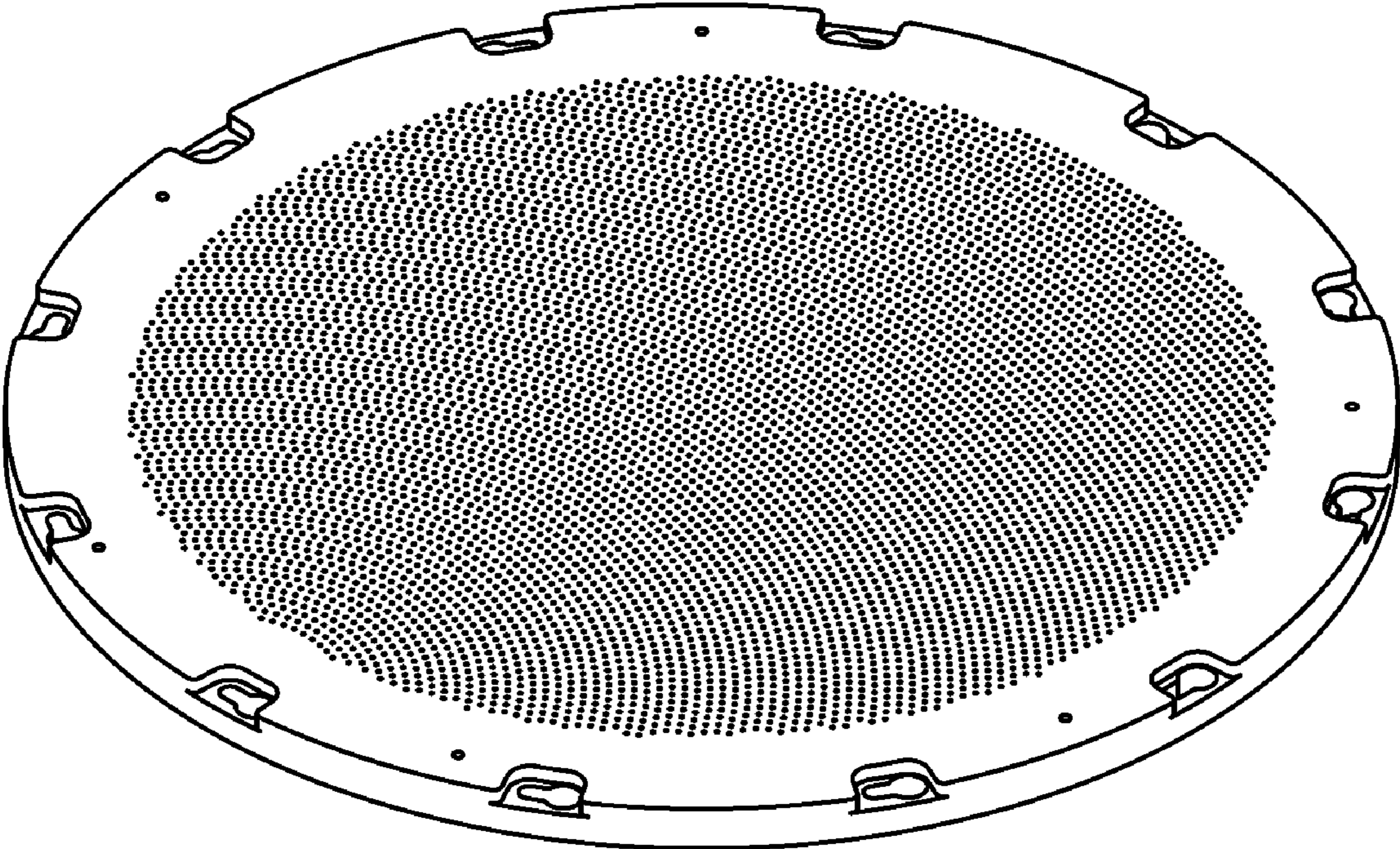
**Fig. 1**



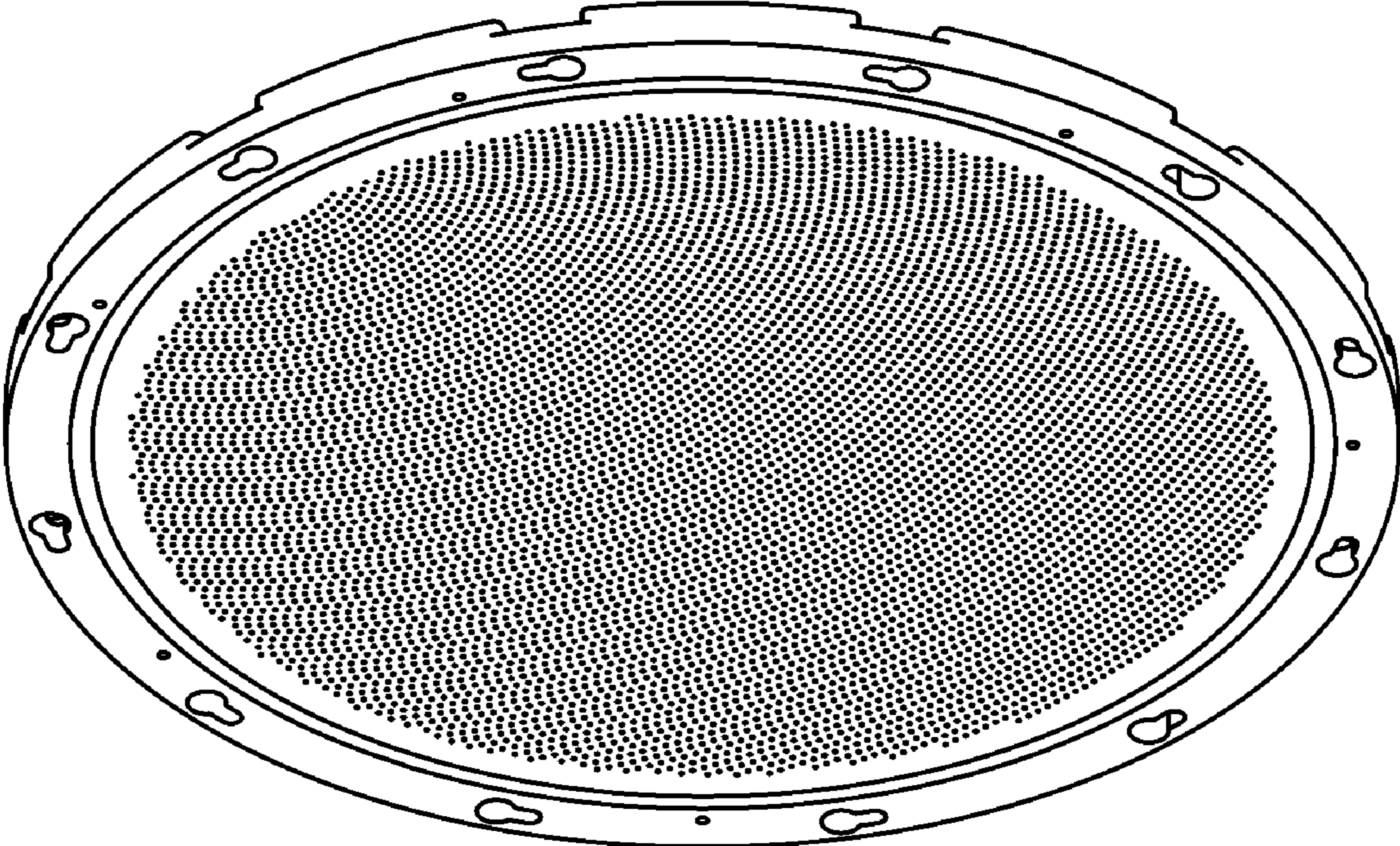
**Fig. 2**



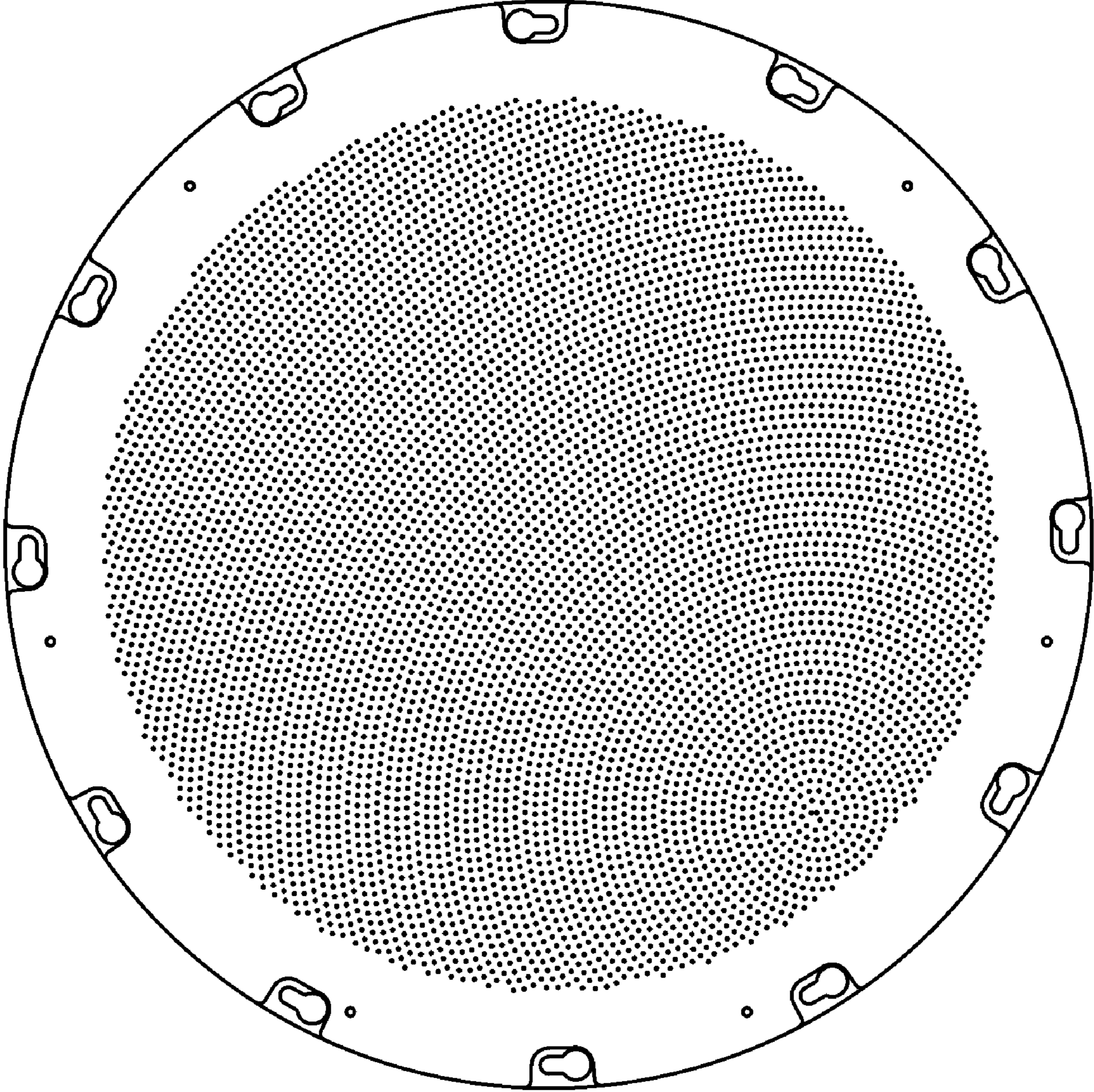
**Fig. 3**



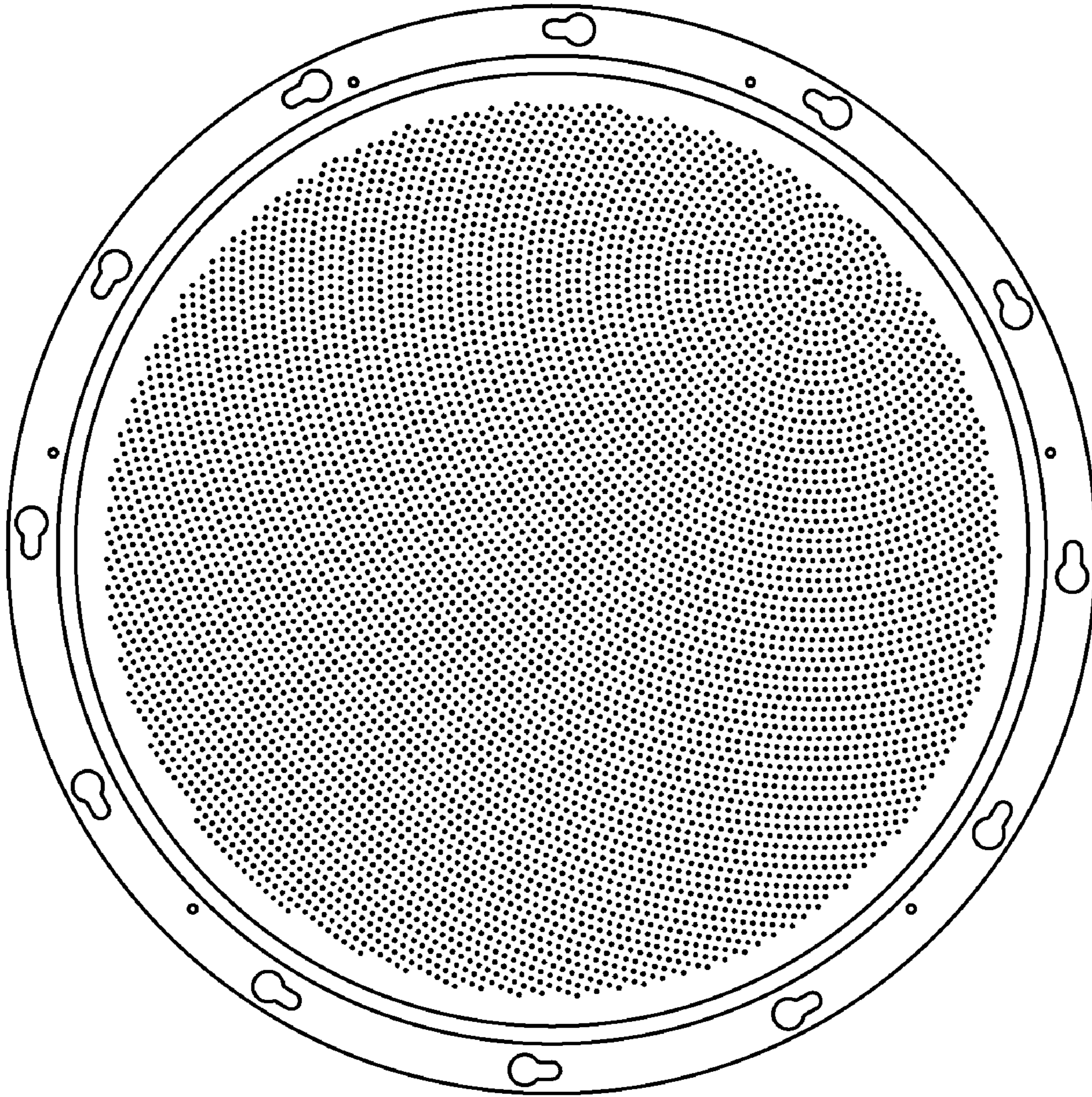
**Fig. 4**



**Fig. 5**



**Fig. 6**

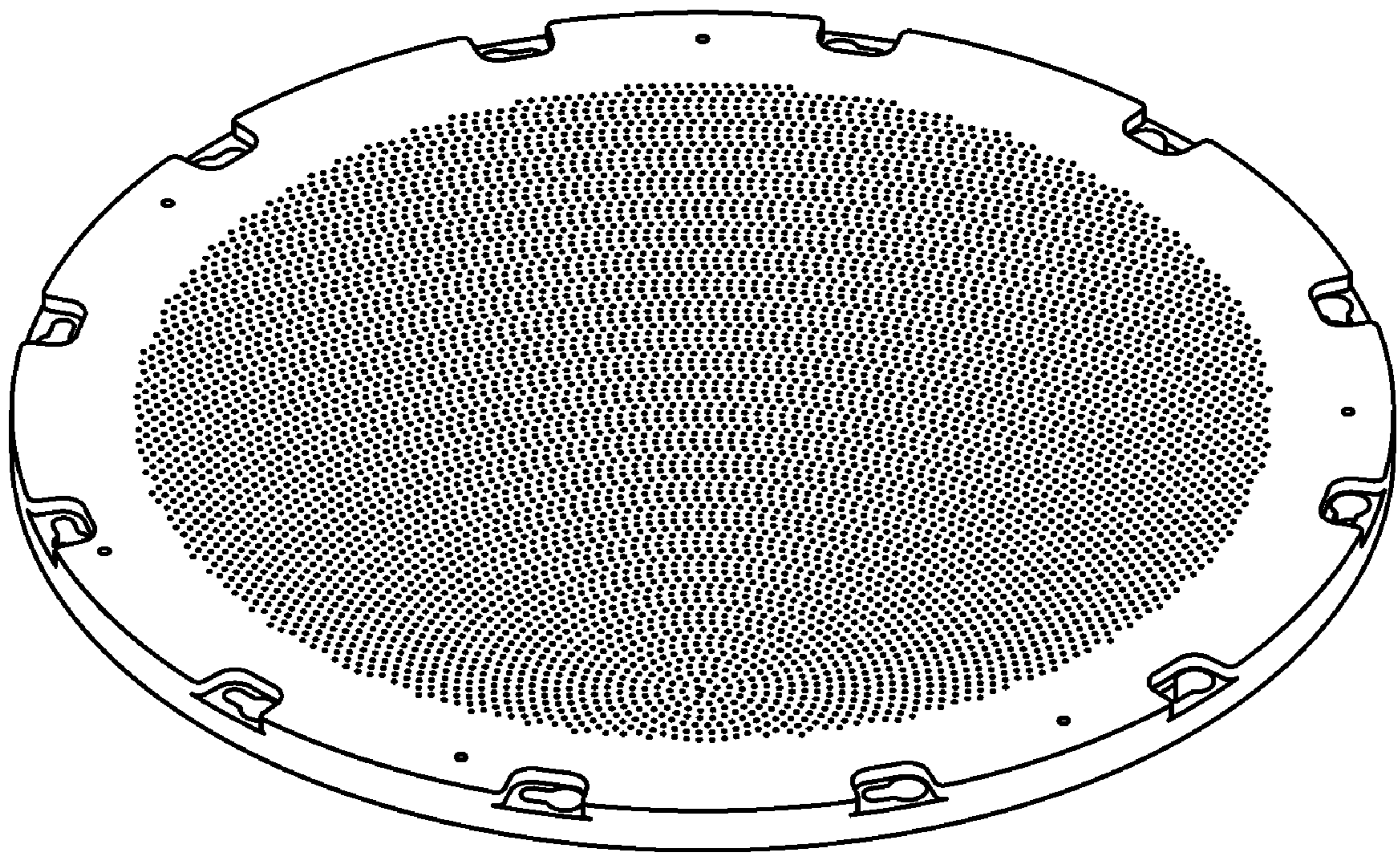


**Fig. 7**

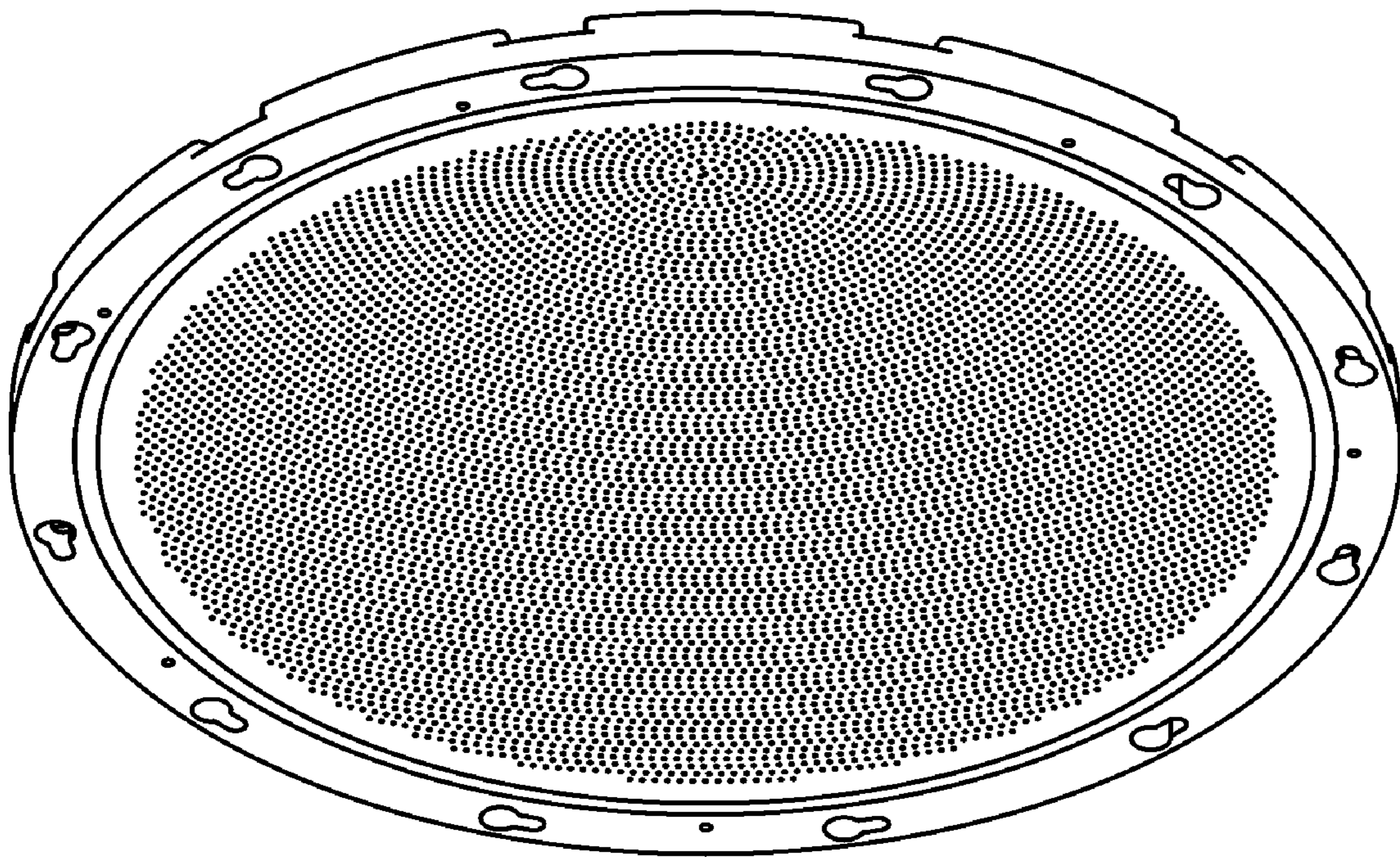


**Fig. 8**

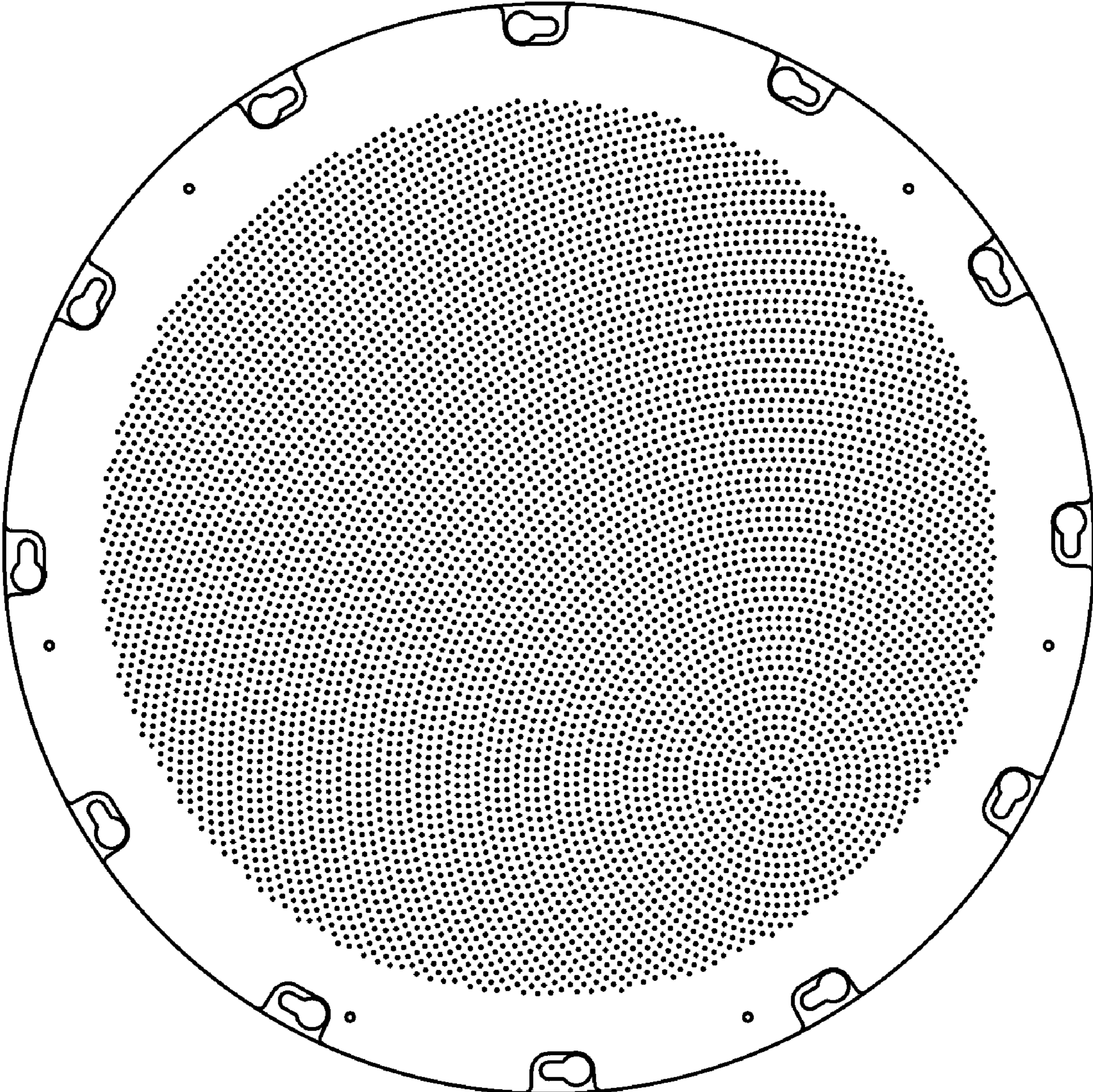




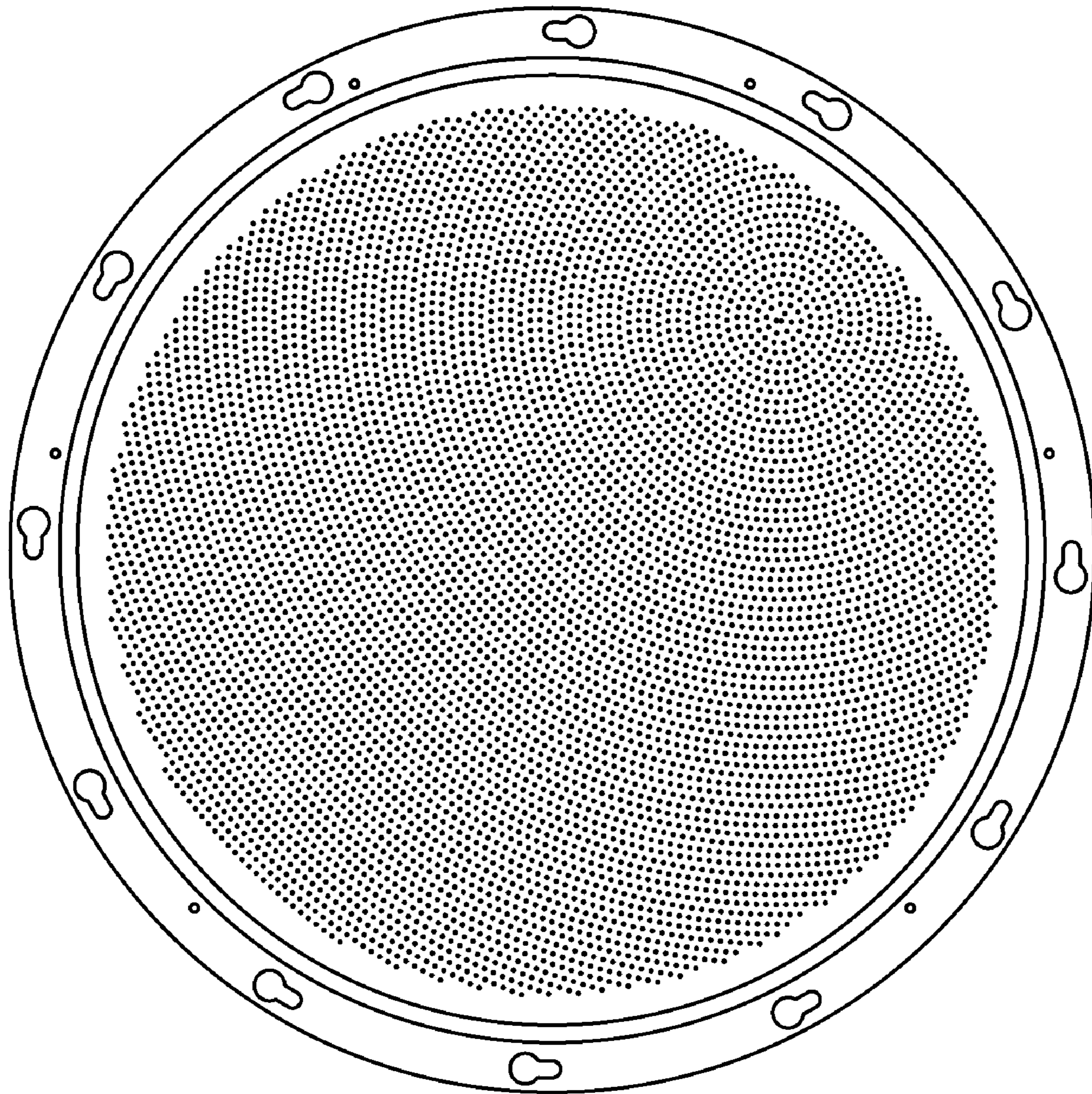
**Fig. 9**



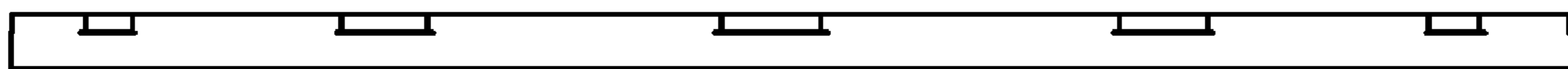
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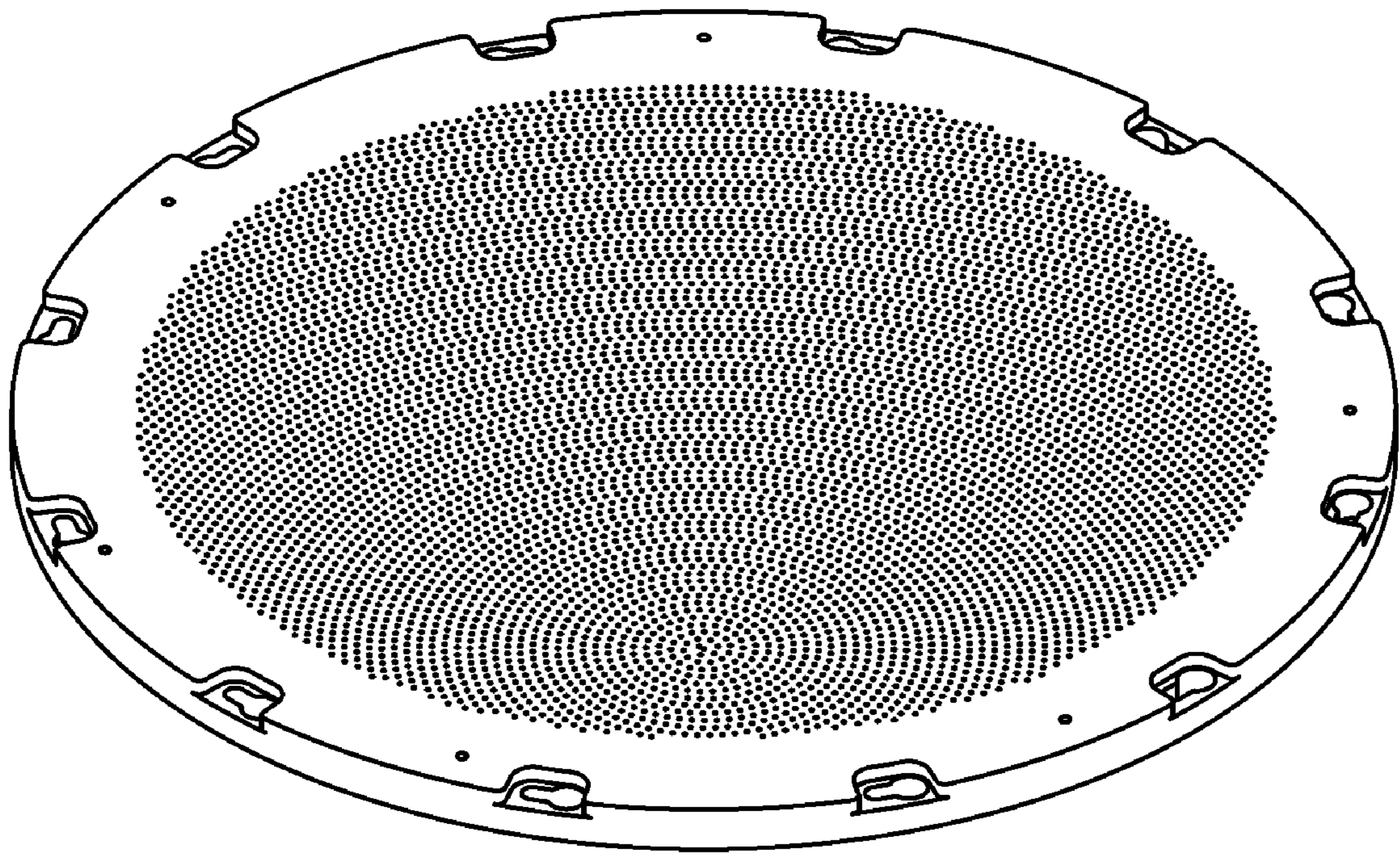
**Fig. 11**



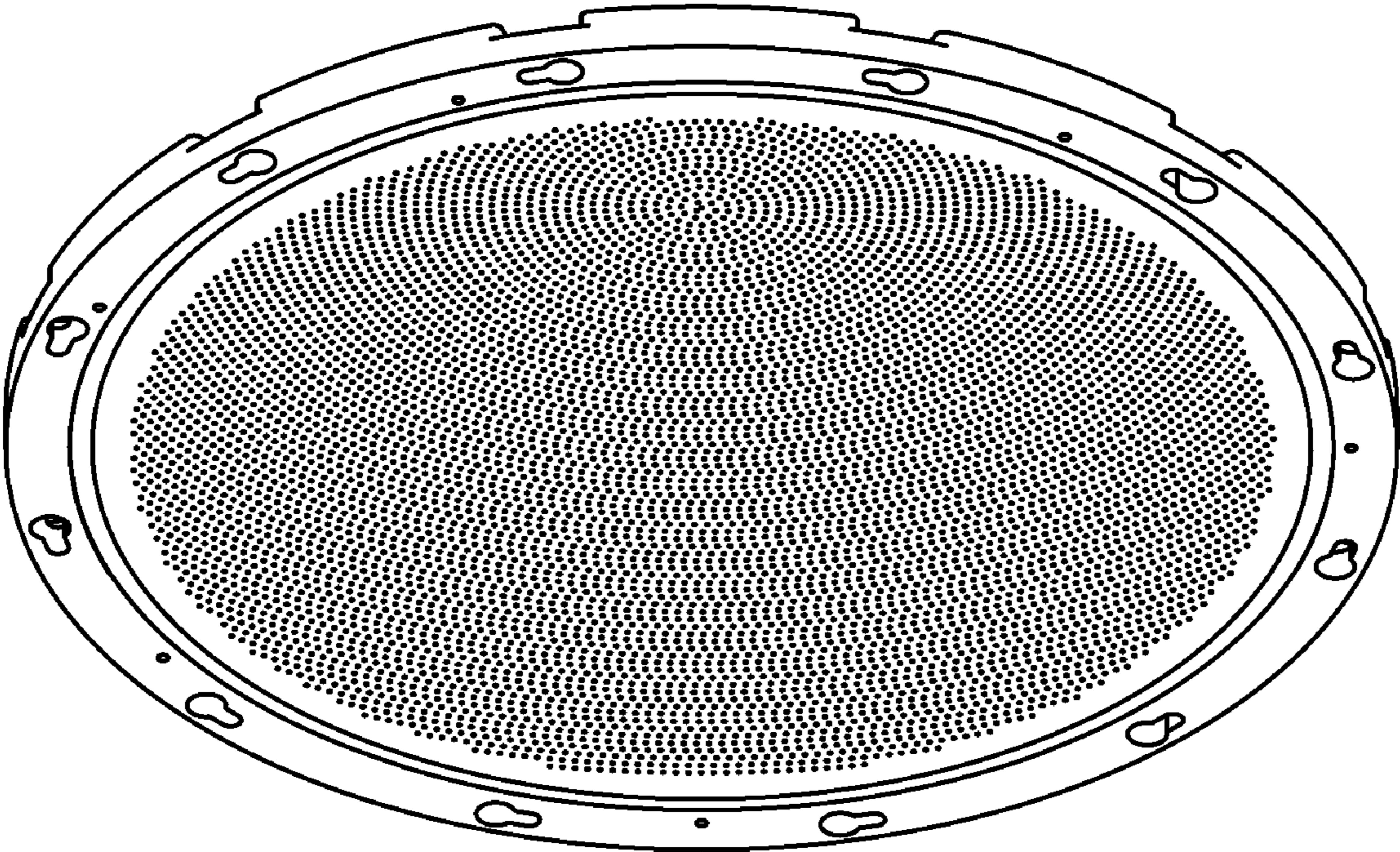
**Fig. 12**



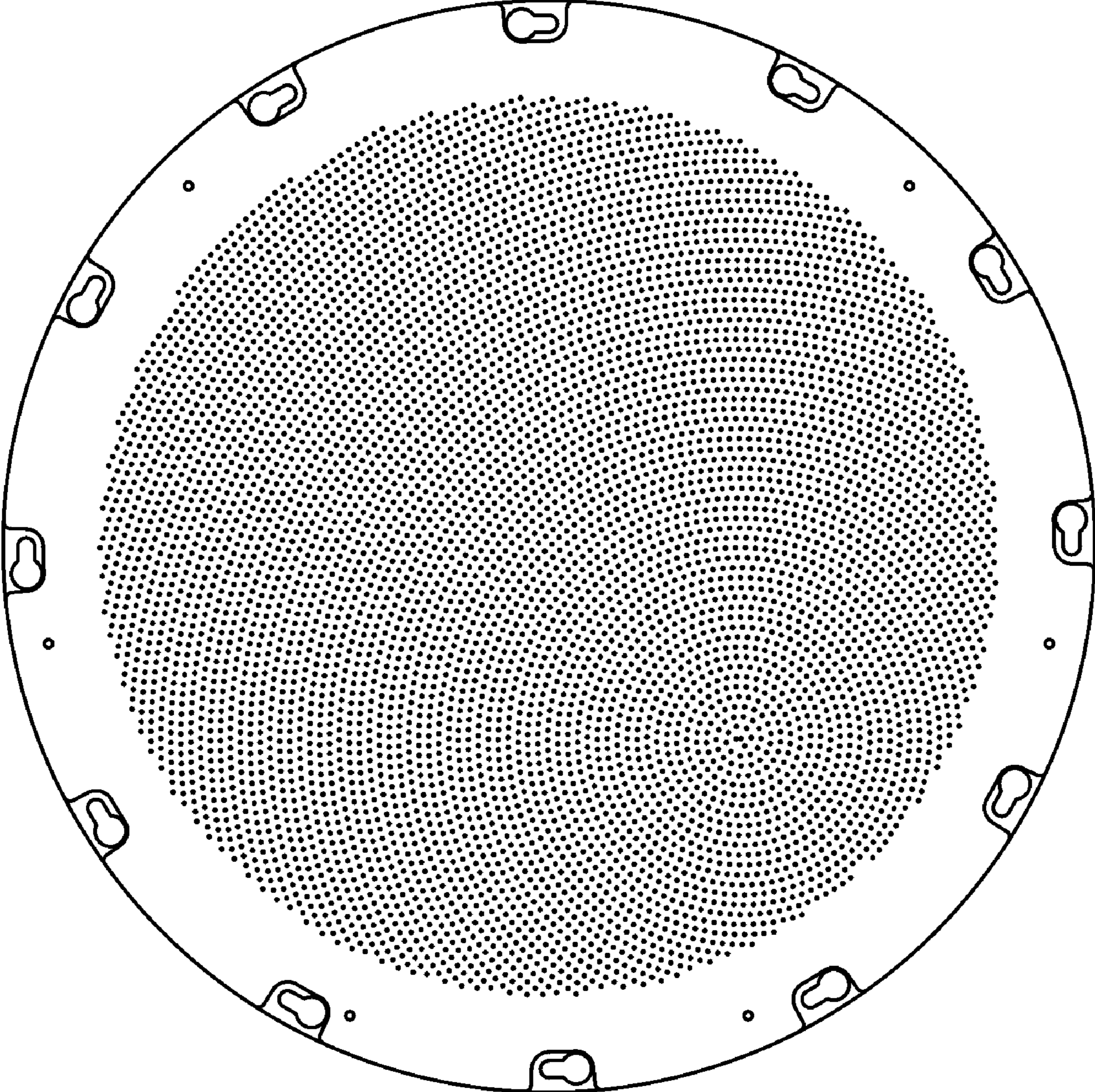
**Fig. 13**



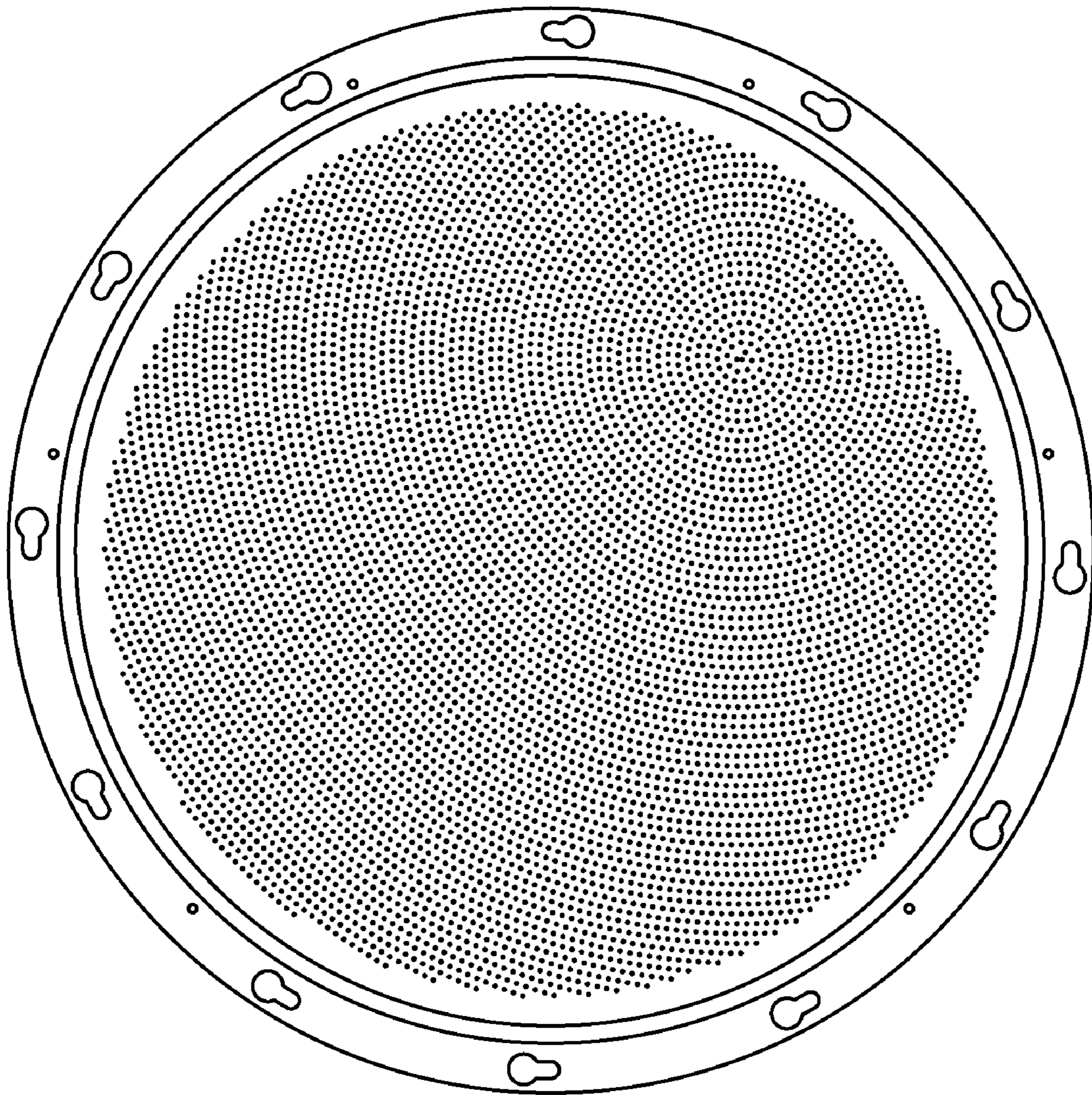
**Fig. 14**



**Fig. 15**



**Fig. 16**

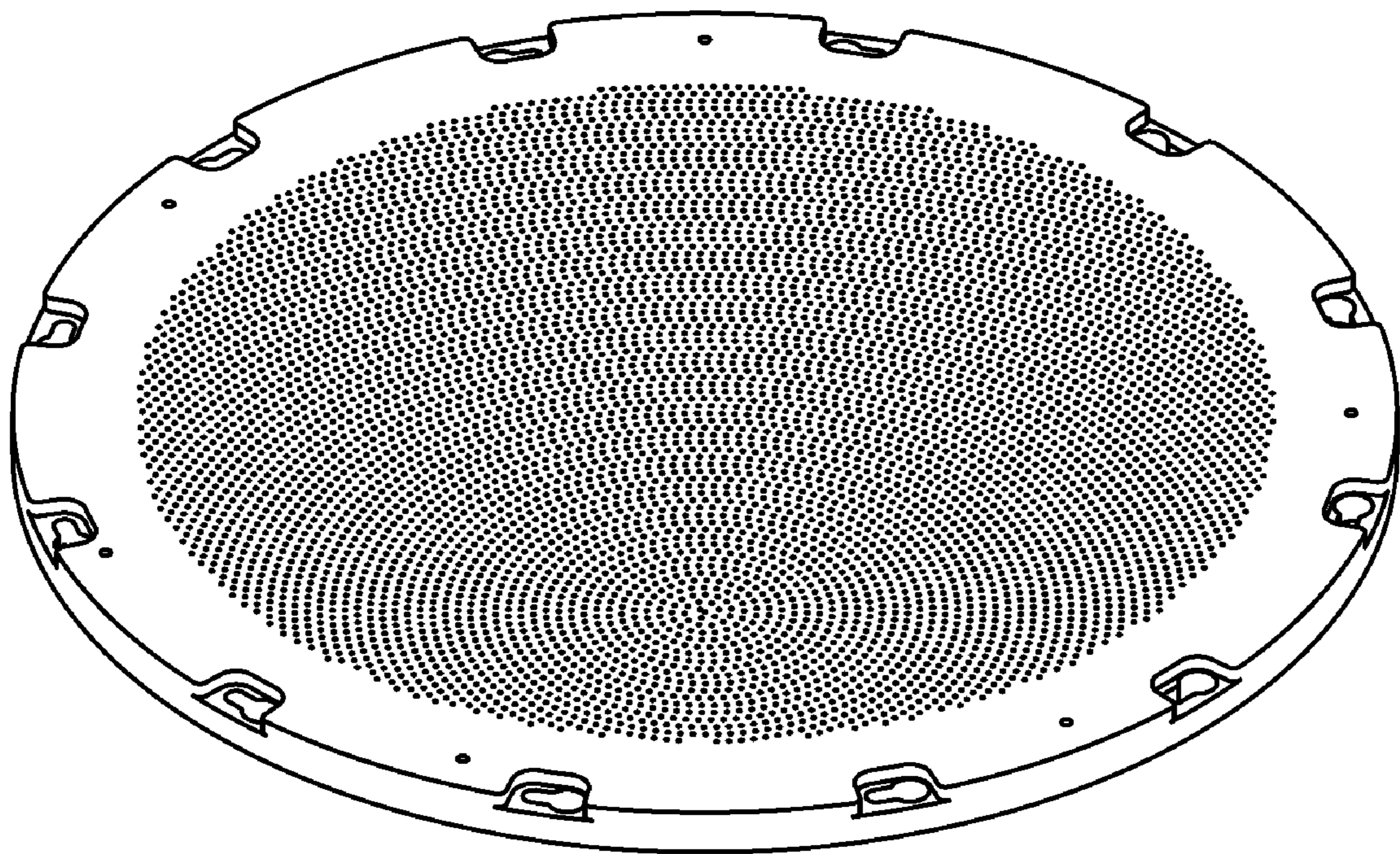


**Fig. 17**

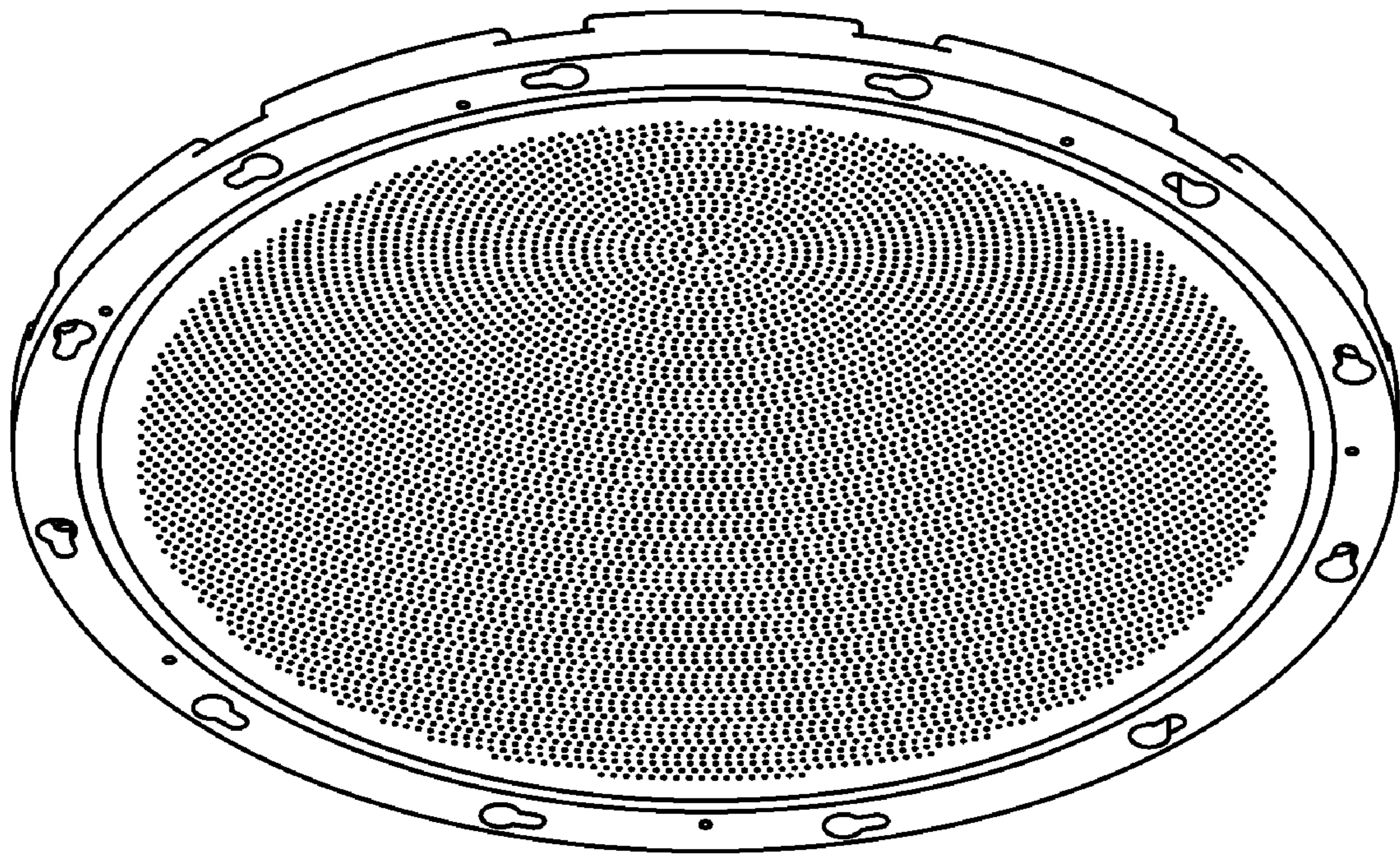


**Fig. 18**





**Fig. 19**



**Fig. 20**