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

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(54) **SPUTTERING CHAMBER COIL**

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

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(51) **LOC (7) Cl.** **15-09**

(52) **U.S. Cl.** **D15/144.2**

(58) **Field of Search** D15/199, 144.2; 204/298, 192.12, 192.13, 298.03, 298.19, 298.2, 298.01, 298.02, 298.05; 315/111.21, 111.41, 111.51, 111.81

(56) **References Cited**

U.S. PATENT DOCUMENTS

118,252	8/1871	Lewis .	
565,698	8/1896	Sparks .	
4,154,011	5/1979	Rakestraw et al. .	
4,361,472	11/1982	Morrison, Jr. .	
4,478,437	10/1984	Skinner .	
5,001,816	3/1991	Oetiker .	
5,150,503	9/1992	Müller .	
5,429,070 *	7/1995	Campbell et al.	204/298.37
5,430,355 *	7/1995	Paranjpe	315/111.21
5,556,501	9/1996	Collins et al. .	
5,637,961	6/1997	Ishii et al. .	
5,669,975	9/1997	Ashtiani .	
5,681,393	10/1997	Takagi .	
5,683,537	11/1997	Ishii .	
5,707,498	1/1998	Ngan .	
5,721,021	2/1998	Tobe et al. .	
5,770,098	6/1998	Araki et al. .	
5,783,492	7/1998	Higuchi et al .	

FOREIGN PATENT DOCUMENTS

0653776	10/1994	(EP) .
0727923	2/1996	(EP) .
0758148	8/1996	(EP) .
0807954	11/1997	(EP) .
0813227	12/1997	(EP) .
0836218	4/1998	(EP) .
0836219	4/1998	(EP) .
0840351	5/1998	(EP) .
0727807	9/1999	(EP) .

OTHER PUBLICATIONS

Search report in PCT/US98/10058 issued 4Nov98.

U.S. Patent Application Serial No. 29/109,892 (Atty. Dkt. 3979D/PVD/DV).

U.S. Patent Application Serial No. 29/109,870 (Atty. Dkt. 3980/PVD/DV).

U.S. Patent Application Serial No. 29/109,893 (Atty. Dkt. 3981/PVD/DV).

U.S Patent Application Serial No. 08/559,345 filed Nov. 15, 1995 (Atty Dkt 938.X1/4479).

U.S. Patent Application Serial No. 08/730,722 filed Oct. 8, 1996 (Atty Dkt 1207/4784).

U.S. Patent Application Serial No. 09/049,276 Mar. 27, 1998 (Atty Dkt 938.D2/5703).

U.S. Patent Application Serial No. 09/049,839 Mar. 27, 1998 (Atty Dkt 938.D1/5702).

Applied Materials, Inc., Exhibit A, Dated Prior to Jul. 13, 1998, the filing date of the present application.(Exhibit A is a drawing of a prior art coil design which is prior to the design of the present application.).

* cited by examiner

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(57) **CLAIM**

The design for sputtering chamber coil, as shown and described.

DESCRIPTION

FIG. **1** is a front elevational view;

FIG. **2** is a top view;

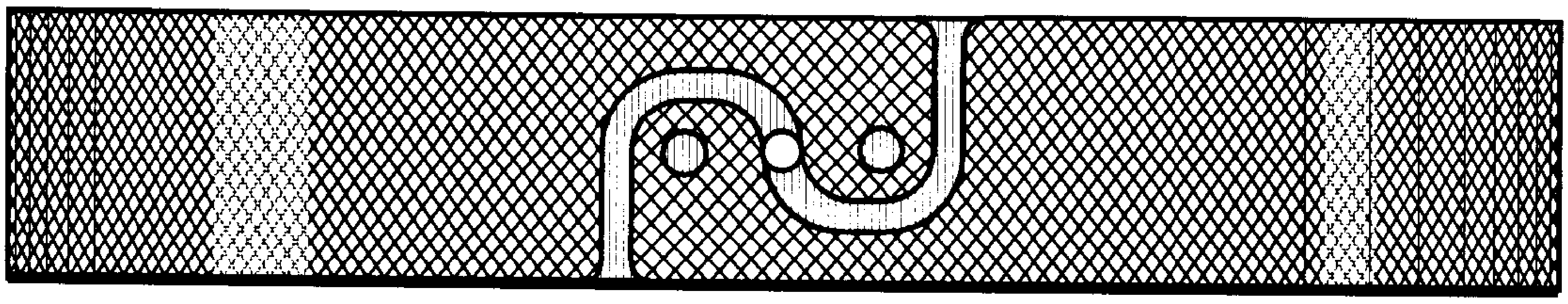
FIG. **3** is a right side elevational view;

FIG. **4** is a bottom view; and,

FIG. **5** is a rear elevational view of our sputtering chamber coil.

The left side elevation view (not shown) is the same as the right side elevational view (FIG. **3**) because of coil symmetry.

1 Claim, 2 Drawing Sheets



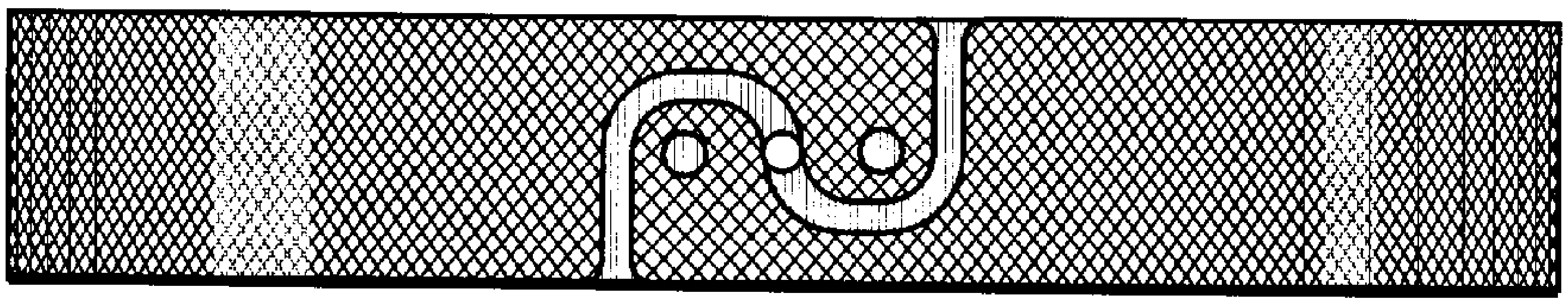


Fig. 1

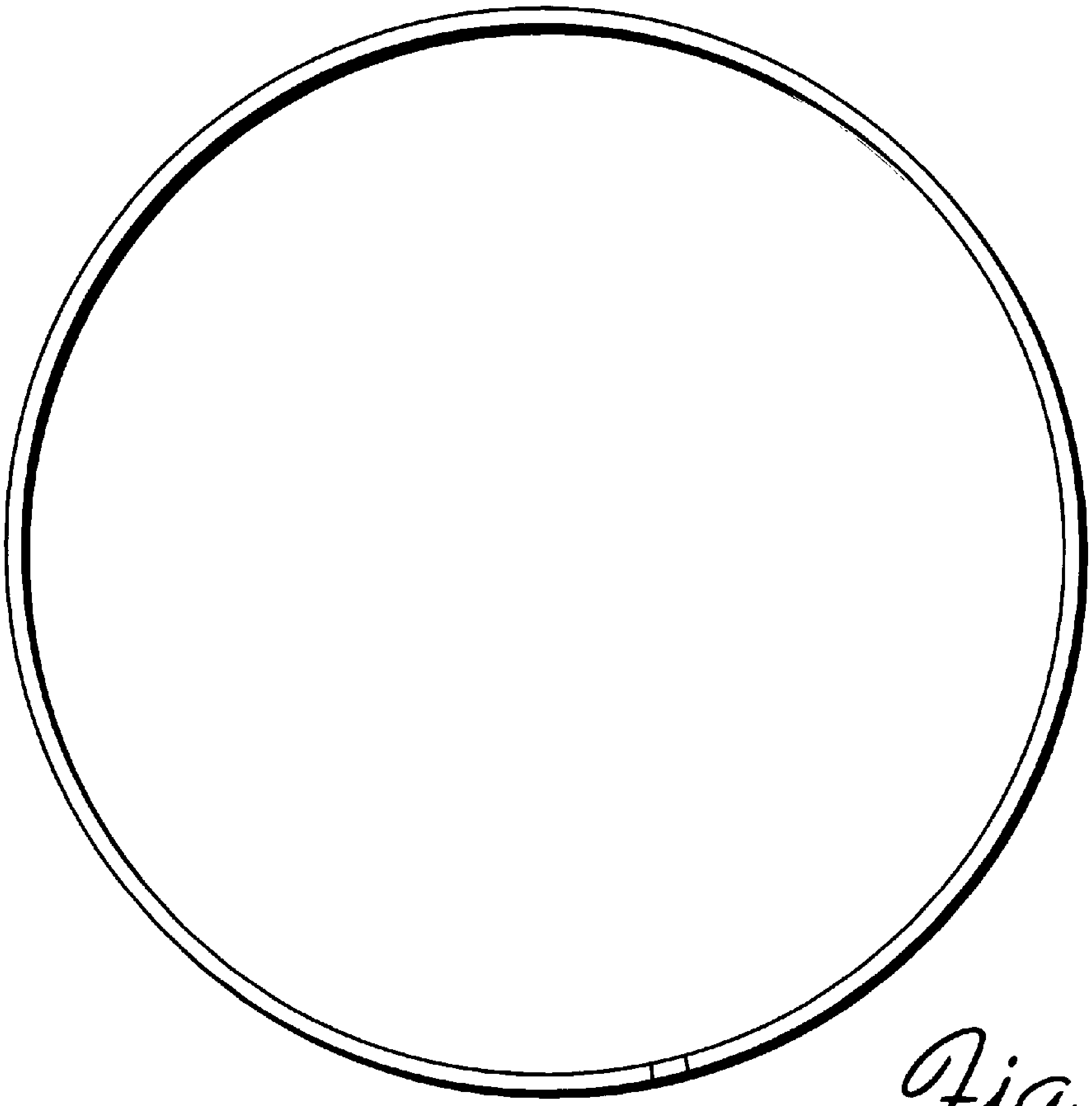


Fig. 2

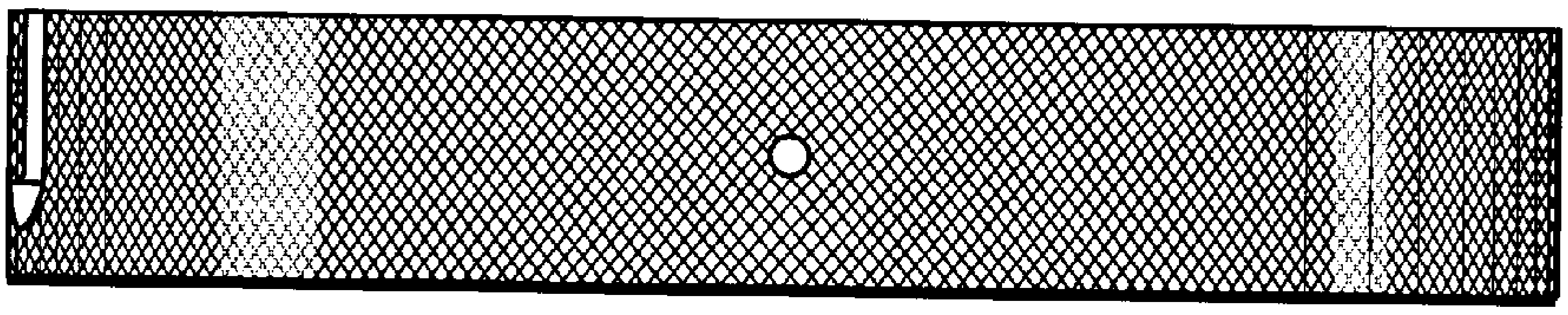


Fig. 3

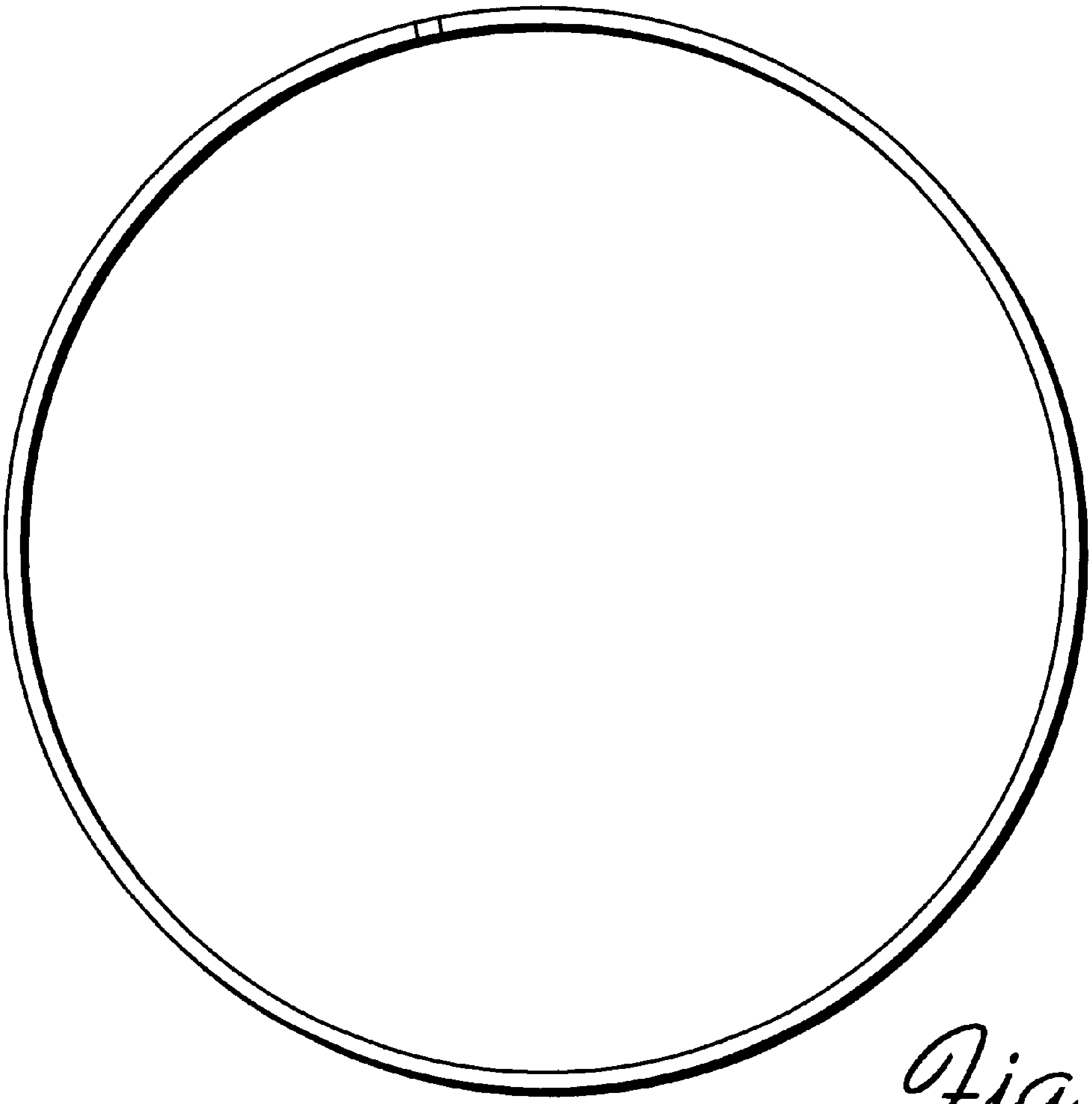


Fig. 4

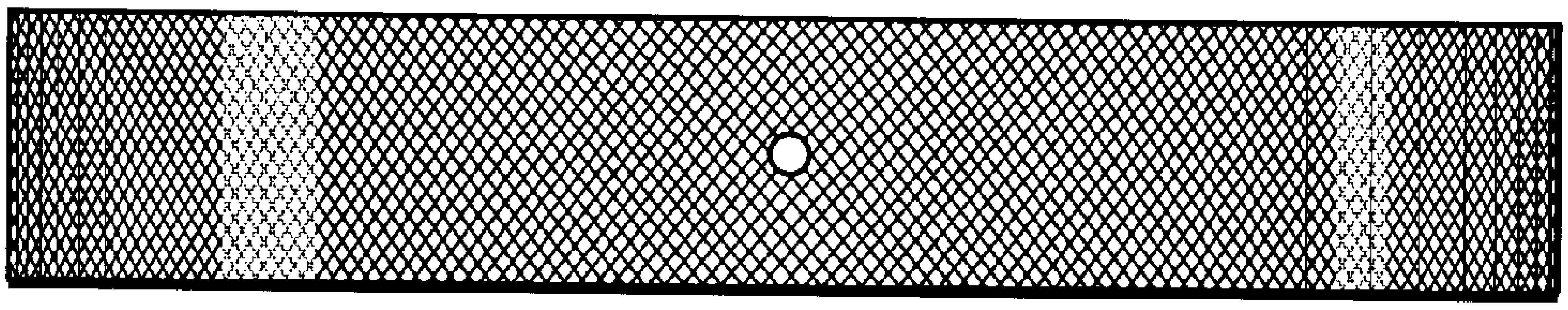


Fig. 5