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[Continued on next page]

(54) Title: MAGNET FOR PHYSICAL VAPOR DEPOSITION PROCESSES TO PRODUCE THIN FILMS HAVING LOW RESISTIVITY AND NON-UNIFORMITY

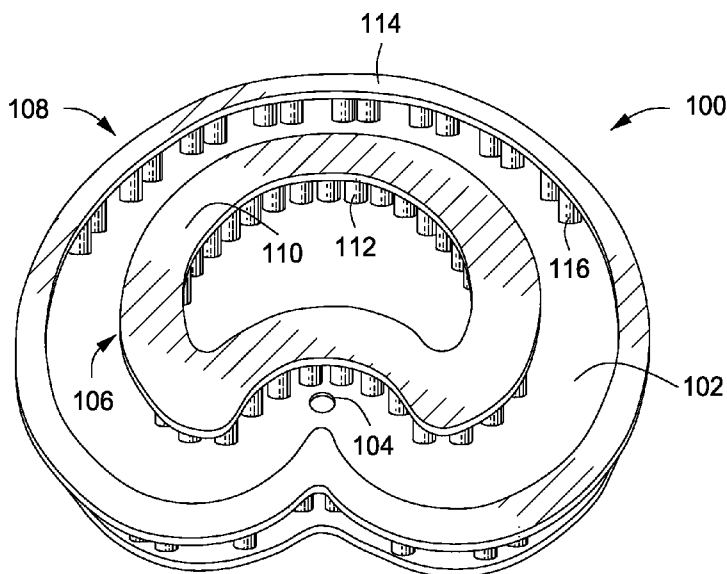


FIG. 1

(57) Abstract: Methods and apparatus for de-  
positing thin films having high thickness unifor-  
mity and low resistivity are provided herein. In  
some embodiments, a magnetron assembly in-  
cludes a shunt plate, the shunt plate rotatable  
about an axis, an inner closed loop magnetic pole  
coupled to the shunt plate, and an outer closed  
loop magnetic pole coupled the shunt plate,  
wherein an unbalance ratio of a magnetic field  
strength of the outer closed loop magnetic pole  
to a magnetic field strength of the inner closed  
loop magnetic pole is less than about 1. In some  
embodiments, the ratio is about 0.57. In some  
embodiments, the shunt plate and the outer closed  
loop magnetic pole have a cardioid shape. A  
method utilizing RF and DC power in combina-  
tion with the inventive magnetron assembly is  
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**B. FIELDS SEARCHED**

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Korean utility models and applications for utility models

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**C. DOCUMENTS CONSIDERED TO BE RELEVANT**

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 6440282 B1 (WADA, Y. et al.) 27 August 2002	1-4,6-10
Y	See columns 9-18, column 23, lines 1-14; and figures 1-7,9,17.	5,11-15
Y	US 7186319 B2 (YANG, H. S. et al.) 06 March 2007 See figure 2.	5
Y	US 2010-0105203 A1 (FU, X. et al.) 29 April 2010 See paragraphs [0026] and [0035].	11-15

 Further documents are listed in the continuation of Box C. See patent family annex.

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