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COMPONENTS, INC., TOSHIBA AMERICA INC., TOSHIBA
AMERICA INFORMATION SYSTEMS, INC.,
TOSHIBA CORPORATION, and
THE GILLETTE COMPANY,
Petitioners,

v.

Zond, LLC.
U.S. Patent No. 7,147,759¹
IPR Case No. IPR2014-00781

PETITIONER'S DEMONSTRATIVE EXHIBITS FOR ORAL ARGUMENT

¹ Case No. IPR2014-01047, IPR2014-00985, and IPR2014-00845 have been joined with the instant proceeding.

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BEFORE THE PATENT TRIAL AND APPEAL BOARD

The '759 Patent:

GlobalFoundries U.S. Inc., GlobalFoundries Dresden Module One LLC & Co. K
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Components, Inc., Toshiba America Inc., Toshiba America Information Systems, Inc., and
Corporation

v. Zond, LLC

IPR2014-00781 and IPR2014-00782

GlobalFoundries U.S. Inc., GlobalFoundries Dresden Module One LLC & Co.
GlobalFoundries Dresden Module Two LLC & Co. KG, and The Gillette Comp
v. Zond, LLC

IPR2014-01083, IPR2014-01086 and IPR2014-01087

Overview

- Overview of '759 Patent
- Grounds Instituted
- Overview of Prior Art
- Summary of Disputes with Respect to Independent Claims
 - Claim Constructions
 - Response to Patent Owner's Arguments
- Summary of Disputes and Responses Related to Dependent

The '759 Patent



US007147759B2

(12) **United States Patent**
Chistyakov

(10) **Patent No.:** US 7,147,759 B2
(45) **Date of Patent:** *Dec. 12, 2006

(54) **HIGH-POWER PULSED MAGNETRON SPUTTERING**

(75) **Inventor:** Roman Chistyakov, Andover, MA (US)

(73) **Assignee:** Zond, Inc., Mansfield, MA (US)

(*) **Notice:** Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

This patent is subject to a terminal disclaimer.

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(58) **Field of Classification Search** 204/192.12, 204/192.13, 298.03, 298.06, 298.08, 298.14, 204/298.19, 298.26
See application file for complete search history.

(56) **References Cited**

U.S. PATENT DOCUMENTS

5,516,820 A	6/1979	Maly Jr et al.	.....	372,87
4,953,174 A	8/1989	Eldridge et al.	.....	372,87
4,965,248 A	10/1989	Poppe et al.	.....	505,1
5,015,493 A	5/1991	Cruzen	.....	427,38
5,616,224 A	4/1997	Boeing	.....	372,86
5,875,207 A	2/1999	Osmanow	.....	372,86
5,942,089 A	8/1999	Sprood et al.	.....	372,86
6,083,361 A	7/2000	Kobayashi et al.	.....	204/192.12
6,296,742 B1	10/2001	Kozrakov	.....	204/192.12
6,342,132 B1	1/2002	Rossnagel	.....	204/192.12

6,398,929 B1 *	6/2002	Chiang et al.	.....	204/298.11
6,413,382 B1	7/2002	Wang et al.	.....	204/192.12
6,436,251 B1	8/2002	Gopitaja et al.	.....	204/298.12
6,440,280 B1	8/2002	Burton et al.	.....	204/298.12
6,456,642 B1	9/2002	Hillard	.....	204/192.12
2002/0033480 A1	3/2002	Kawanata et al.	.....	204/192.12
2005/0252763 A1 *	11/2005	Chistyakov	.....	204/192.12

FOREIGN PATENT DOCUMENTS

DE 3210351 A1 9/1983
(Continued)

OTHER PUBLICATIONS

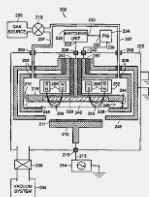
Booth, et al., The Transition From Symmetric To Asymmetric Discharges In Pulsed 13.56 MHz Capacity Coupled Plasmas, J. Appl. Phys., Jul. 15, 1997, pp. 552-560, vol. 82 (2), American Institute of Physics.

(Continued)
Primary Examiner—Rodney G. McDonald
(74) *Attorney, Agent, or Firm*—Kurt Rauschenbach; Rauschenbach Patent Law Group, LLC

(57) **ABSTRACT**

Magnetically enhanced sputtering methods and apparatus are described. A magnetically enhanced sputtering source according to the present invention includes an anode and a cathode assembly having a target that is positioned adjacent to the anode. An ionization source generates a weakly-ionized plasma proximate to the anode and the cathode assembly. A magnet is positioned to generate a magnetic field proximate to the weakly-ionized plasma. The magnetic field substantially traps electrons in the weakly-ionized plasma proximate to the sputtering target. A power supply produces an electric field in a gap between the anode and the cathode assembly. The electric field generates excited atoms in the weakly ionized plasma and generates secondary electrons from the sputtering target. The secondary electrons ionize the excited atoms, thereby creating a strongly-ionized plasma having ions that impact a surface of the sputtering target to generate sputtering flux.

50 Claims, 18 Drawing Sheets



(10) **Patent No.:** US 7,147,759 B2
(45) **Date of Patent:** *Dec. 12, 2006

(54) **HIGH-POWER PULSED MAGNETRON SPUTTERING**

The '759 Patent

Anode (238)

Cathode Assembly (216)

Pulsed Power Supply (234)

Magnets (256)

Plasma (246)

Feed Gas Source (208)

Substrate (211)

Bias Power Supply (214)

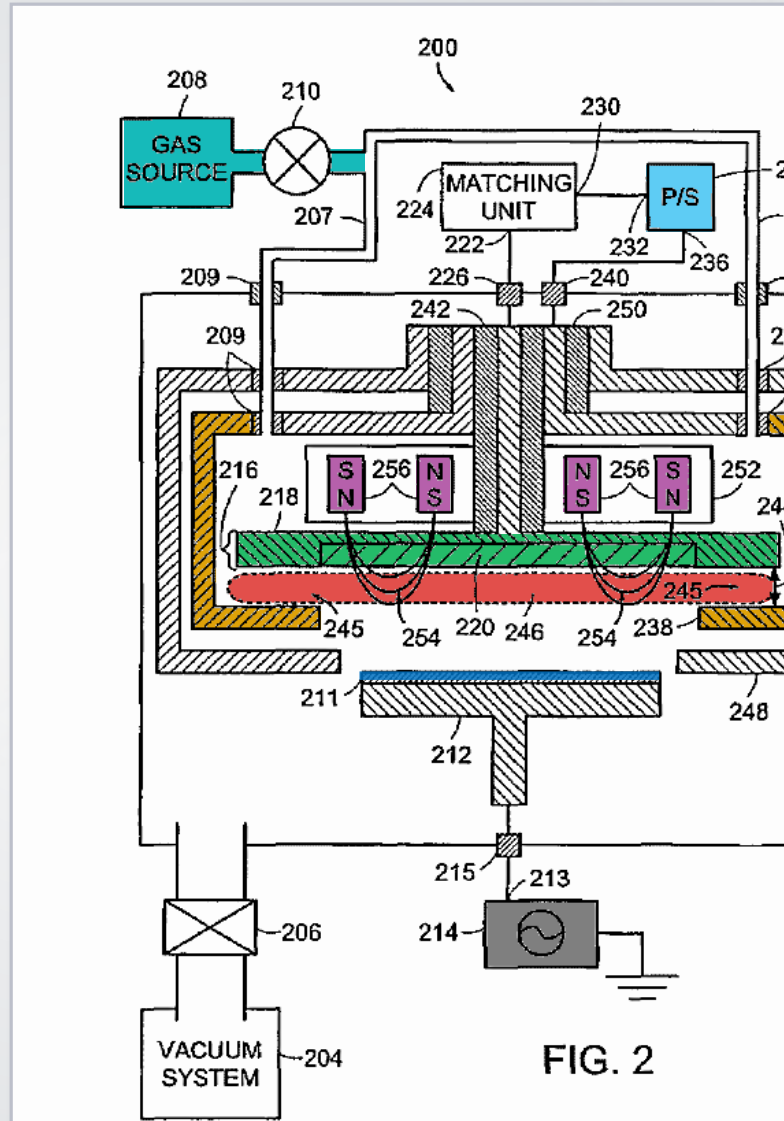


FIG. 2

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