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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

The Gillette Company, Fujitsu Semiconductor Limited, and Fujitsu Semiconductor
America, Inc.
Petitioners,

v.

Zond, LLC.
Patent Owner of U.S. Patent No. 6,896,775

Trial No. IPR2014-00604¹

PETITIONERS' DEMONSTRATIVE EXHIBITS FOR ORAL ARGUMENT

¹ Case IPR2014-01482 has been joined with the instant proceeding.

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

The '775 Patent:

The Gillette Company, Fujitsu Semiconductor Limited, and Fujitsu
Semiconductor America, Inc.

v.

Zond, LLC.

IPR2014-578 (joined with IPR2014-01494) and

IPR2014-604 (joined with IPR2014-01482)

May 26, 2015

Overview

Overview of the '775 Patent

The Instituted Combinations

Issues Raised by Patent Owner

Conclusion

United States Patent

(10) Patent No.: **US 6,896,775 B2**
 (45) Date of Patent: **May 24, 2005**



(54) **HIGH-POWER PULSED MAGNETICALLY ENHANCED PLASMA PROCESSING**

(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 386 days.

(21) Appl. No.: **10/065,551**

(22) Filed: **Oct. 29, 2002**

(65) Prior Publication Data

- US 2004/0062187 A1 Apr. 29, 2004
- (51) Int. Cl. **C23C 1/03, C23F 1/00**
- (52) U.S. Cl. **204/298.33; 204/192.32; 204/298.31; 216/71; 150/345.43; 150/345.44; 150/345.46**
- (58) Field of Search **204/192.32; 298.31; 204/298.33; 298.34; 298.37; 216/67; 71; 150/345.43; 345.44; 345.46**

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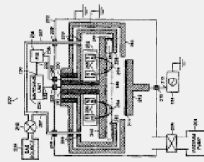
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(57) **ABSTRACT**

Magnetically enhanced plasma processing methods and apparatus are described. A magnetically enhanced plasma processing apparatus according to the present invention includes an anode and a cathode that is positioned adjacent to the anode. The cathode is positioned proximate to the anode. A magnetic field 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 cathode. A power supply produces an electric field in a gap between the anode and the cathode. The electric field generates excited atoms in the weakly-ionized plasma and secondary electrons ionize the excited atoms, thereby creating a strongly-ionized plasma. A voltage supply applies a bias voltage to a substrate that is positioned proximate to the cathode that causes ions in the plurality of ions to impact a surface of the substrate in a manner that causes etching of the surface of the substrate.

37 Claims, 18 Drawing Sheets



GILLETTE 1001

he '775 Patent
relates to "magnetically
enhanced plasma
processing apparatus"

magnetic field applied using
permanent magnets (256)
circular pulse applied across
anode (238) and **cathode**
6) through pulsed **power**
supply (234)

plasma generated in
plasma region (245/246)

substrate provided to
substrate (211)

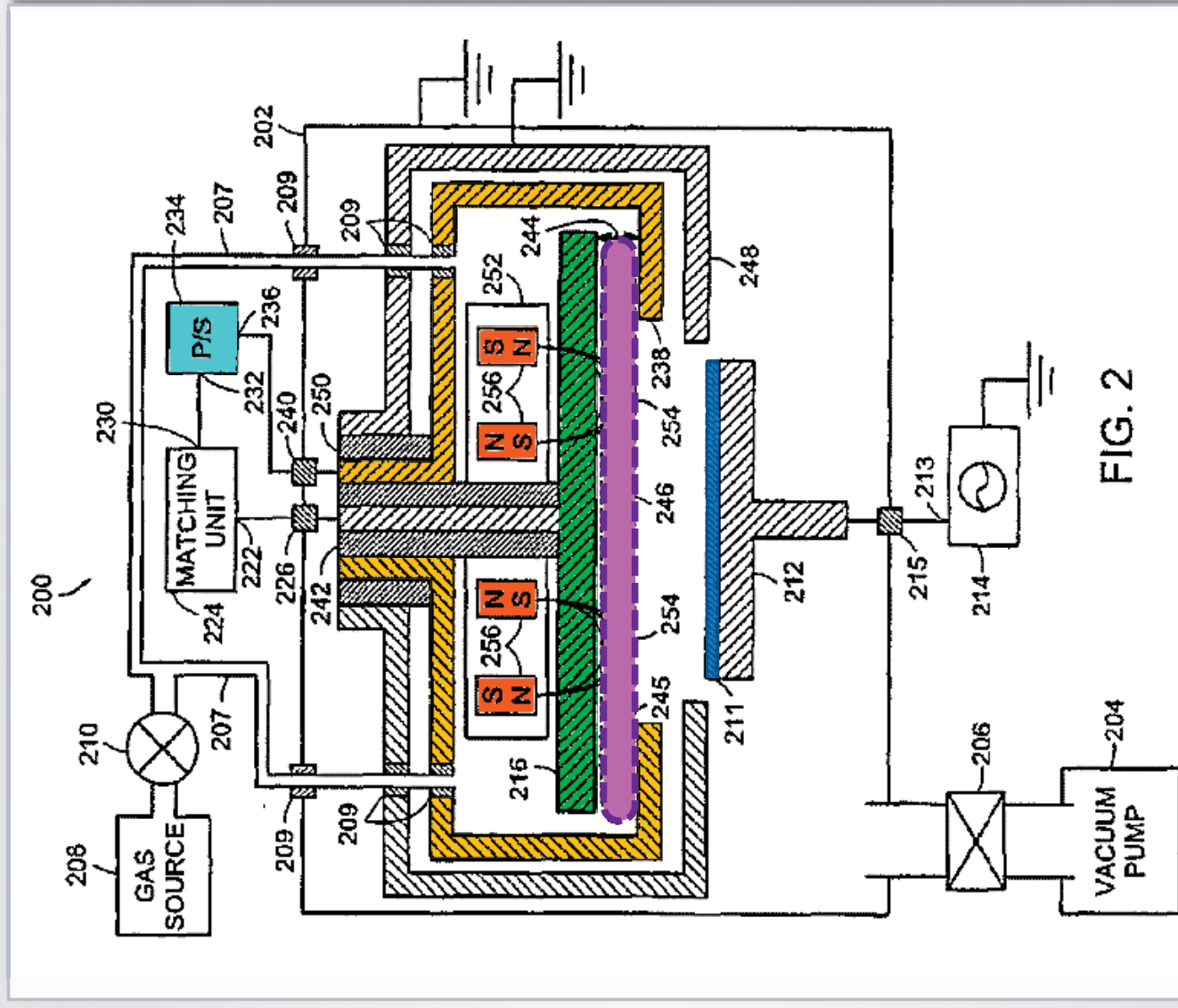


FIG. 2

'775 Patent, Fig. 2, IPR2014-00578, Ex. 1001 (with annotations)

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