UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

TAIWAN SEMICONDUCTOR MANUFACTURING COMPANY, LTD., TSMC NORTH AMERICA CORPORATION, FUJITSU SEMICONDUCTOR LIMITED, FUJITSU SEMICONDUCTOR AMERICA, INC., ADVANCED MICRO DEVICES, INC., RENESAS ELECTRONICS CORPORATION, RENESAS ELECTRONICS AMERICA, INC., GLOBAL FOUNDRIES U.S., INC., GLOBALFOUNDRIES DRESDEN MODULE ONE LLC & CO. KG, GLOBALFOUNDRIES DRESDEN MODULE TWO LLC & CO. KG, TOSHIBA AMERICA ELECTRONIC COMPONENTS, INC., TOSHIBA AMERICA INC., TOSHIBA AMERICA INFORMATION SYSTEMS, INC., TOSHIBA CORPORATION, and THE GILLETTE COMPANY

Petitioners

v.

ZOND, LLC
Patent Owner

Case IPR2014-000782[1]
Patent 7,147,759 B2

ZOND LLC'S PATENT OWNER RESPONSE

[1] Cases IPR2014-00850, IPR2014-00986, and IPR2014-01059 have been joined with the instant proceeding.

TABLE OF CONTENTS

I. INTRODUCTION 1

II. TECHNOLOGY BACKGROUND 7

A. Overview Of Magnetron Sputtering Systems. 7

B. The '759 patent: Dr. Chistyakov invents a new magnetically enhanced sputtering source that creates a multi-step ionization process generating highly-ionized plasma from weakly ionized plasma without forming an arc discharge. 8

III. SUMMARY OF THE PETITIONERS' PROPOSED GROUNDS FOR REVIEW 11

IV. CLAIM CONSTRUCTION. 12

A. The construction of "weakly ionized plasma" and "strongly ionized plasma." 13

B. The construction of "multi-step ionization process". 13

V. THE PETITIONERS CANNOT PREVAIL ON ANY CHALLENGED CLAIM OF THE '759 PATENT.....13

A. The Petition failed to demonstrate that a skilled artisan would have been motivated to combine the teachings of the prior art references to achieve the claimed invention of the '759 patent with a reasonable expectation of success or that combining the teachings of the prior art would have led to predictable results. 14

1. Scope and content of prior art. 17

a. Kudryavtsev – A. A. Kudryavtsev and V.N. Skerbov, Ionization relaxation in a plasma produced by a pulsed inert-gas discharge, Sov. Phys. Tech. Phys. 28(1), pp. 30-35, January 1983 (Ex. 1304), ...18

b. Wang – U.S. Patent No. 6,413,382 (Exhibit 1305).....20

2. The Petitioner Fails To Show That It Would Have Been Obvious To Combine The Cylindrical Tube System Without A Magnet Of Kudryavtsev With The Wang Magnetron Sputtering System. 23

B. The Petition fails to demonstrate how the alleged combinations teach every element of the challenged claims. 36

1. The cited references do not teach generating "an amplitude and a rise time of the voltage pulse being chosen to increase an excitation rate of ground state atoms that are present in the weakly-ionized plasma to create a multi-

step ionization process that generates a strongly-ionized plasma," as recited in independent claim 20, and as required by claims 22-33, 37, 46, 48, and 50 dependent therefrom.....36

2. The cited references do not teach a "multi-step ionization process comprising exciting the ground state atoms to generate excited atoms, and then ionizing the excited atoms within the weakly-ionized plasma without forming an arc discharge," as recited in claim 20, and as required by claims 22-33, 37, 46, 48, and 50 dependent therefrom.....47

3. The Cited References Do Not Teach "applying the electric field comprises applying a substantially uniform electric field," As Recited In Claim 22.....54

4. The Cited References Would Not Have Taught or Suggested That "selecting at least one of a pulse amplitude and a pulse width of the electrical pulse that causes the strongly-ionized plasma to be substantially uniform in an area adjacent to a surface of the sputtering target," As Recited In Dependent Claim 26, And As Similarly Recited in Dependent Claim 31.....56

5. The Cited References Would Not Have Taught or Suggested "the ions in the strongly-ionized plasma impact the surface of the sputtering target in a substantially uniform manner," As Recited In Claim 30.....58

VI. CONCLUSION.....60

Exhibit List

Exhibit No.	Description
Ex. 2004	U.S. Patent 6,398,929 to Chiang
Ex. 2005	Declaration of Dr. Hartsough, Patent Owner's expert.
Ex. 2006	Sinha, Naresh, K., Control Systems, Holt, Rinehart and Winston, 1986.
Ex. 2007	Eronini Umez-Eronini, System Dynamics and Control, Brooks Cole Publishing Co., CA, 1999, pp. 10-13.
Ex. 2008	Excerpts from Weyrick, Fundamentals of Automatic Control, McGraw-Hill Book Company, 1975.
Ex. 2009	Excerpts from Kua, Automatic Control, Prentice Hall Inc., 1987.
Ex. 2010	Transcript of deposition of Dr. Kortshagen, Petitioners' expert, for the '759 patent.
Ex. 2011	Transcript of deposition of Dr. Kortshagen, Petitioners' expert, for the '142 patent.

I. INTRODUCTION

The Petitioners' arguments hinge on fanciful misreadings of the prior art by their proffered expert, Dr. Uwe Kortshagen. As will be shown below, neither Wang nor Kudryavtsev teaches choosing ***the amplitude and rise time of a voltage pulse*** in order to increase the "excitation rate of ground state atoms . . . to create a multi-step ionization process that generates a strongly-ionized plasma. . . the multi-step ionization process comprising exciting the ground state atoms to generate excited atoms and then ionizing the excited atoms within the weakly-ionized plasma ***without forming an arc discharge***," as required by the claims of the '759 patent. Once the Board recognizes that Dr. Kortshagen essentially invented some of the alleged "teachings" in Wang and Kudryavtsev to suit the Petitioners' objectives, the Board should agree to confirm the challenged claims.

Neither Wang nor Kudryavtsev teaches the claimed voltage pulse. The '759 patent discloses carefully designing the amplitude and rise time of a voltage pulse. The patent shows that, with proper control of the voltage amplitude and rise time, the inventor, Dr. Chistyakov, was able to ignite a plasma ***without arcing***, rapidly grow that plasma to a high density, and sustain

DOCKET ALARM

Explore Litigation Insights

Docket Alarm provides insights to develop a more informed litigation strategy and the peace of mind of knowing you're on top of things.

Real-Time Litigation Alerts

Keep your litigation team up-to-date with **real-time alerts** and advanced team management tools built for the enterprise, all while greatly reducing PACER spend.

Our comprehensive service means we can handle Federal, State, and Administrative courts across the country.

Advanced Docket Research

With over 230 million records, Docket Alarm's cloud-native docket research platform finds what other services can't. Coverage includes Federal, State, plus PTAB, TTAB, ITC and NLRB decisions, all in one place.

Identify arguments that have been successful in the past with full text, pinpoint searching. Link to case law cited within any court document via Fastcase.

Analytics At Your Fingertips

Learn what happened the last time a particular judge, opposing counsel or company faced cases similar to yours.

Advanced out-of-the-box PTAB and TTAB analytics are always at your fingertips.

API

Docket Alarm offers a powerful API (application programming interface) to developers that want to integrate case filings into their apps.

LAW FIRMS

Build custom dashboards for your attorneys and clients with live data direct from the court.

Automate many repetitive legal tasks like conflict checks, document management, and marketing.

FINANCIAL INSTITUTIONS

Litigation and bankruptcy checks for companies and debtors.

E-DISCOVERY AND LEGAL VENDORS

Sync your system to PACER to automate legal marketing.