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Paper 12
Entered: August 27, 2014

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

INTEL CORPORATION,
Petitioner,

v.

ZOND, LLC,
Patent Owner.

Case IPR2014-00445
Patent 7,147,759 B2

Before KEVIN F. TURNER, DEBRA K. STEPHENS, JONI Y. CHANG, SUSAN L.C. MITCHELL, and JENNIFER M. MEYER,
Administrative Patent Judges.

CHANG, *Administrative Patent Judge.*

DECISION
Institution of *Inter Partes* Review
37 C.F.R. § 42.108

I. INTRODUCTION

Intel Corporation ("Intel") filed a Petition requesting *inter partes* review of claims 20, 21, 34–36, 38, 39, 47, and 49 of U.S. Patent No. 7,147,759 B2 ("the '759 patent"). Paper 4 ("Pet."). Zond, LLC ("Zond") filed a Preliminary Response. Paper 11 ("Prelim. Resp."). We have jurisdiction under 35 U.S.C. § 314.

The standard for instituting an *inter partes* review is set forth in 35 U.S.C. § 314(a), which provides:

> THRESHOLD.—The Director may not authorize an inter partes review to be instituted unless the Director determines that the information presented in the petition filed under section 311 and any response filed under section 313 shows that there is a reasonable likelihood that the petitioner would prevail with respect to at least 1 of the claims challenged in the petition.

Upon consideration of Intel's Petition and Zond's Preliminary Response, we conclude that the information presented in the Petition demonstrates that there is a reasonable likelihood that Intel would prevail in challenging claims 20, 21, 34–36, 38, 39, 47, and 49 as unpatentable under 35 U.S.C. § 103(a). Pursuant to 35 U.S.C. § 314, we hereby authorize an *inter partes* review to be instituted as to claims 20, 21, 34–36, 38, 39, 47, and 49 of the '759 patent.

A. Related Matters

Intel indicates that the '759 patent was asserted in *Zond, LLC v. Intel Corp.*, No.1:13-cv-11570-RGS (D. Mass.). Pet. 1. Intel also identifies other matters where Zond asserted the claims of the '759 patent against third

parties, as well as other Petitions for *inter partes* review that are related to this proceeding. *Id*.

B. The '759 patent

The '759 patent relates to a high-power pulsed magnetron sputtering method. Ex. 1201, Abs. At the time of the invention, sputtering was a well-known technique for depositing films on semiconductor substrates. *Id*. at 1:6–13. The '759 patent indicates that prior art magnetron sputtering systems deposit films having low uniformity and poor target utilization (the target material erodes in a non-uniform manner). *Id*. at 1:55–62. To address these problems, the '759 patent discloses that increasing the power applied between the target and anode can increase the amount of ionized gas and, therefore, increase the target utilization. *Id*. at 2:60–62. However, increasing the power also "increases the probability of establishing an undesirable electrical discharge (an electrical arc) in the process chamber." *Id*. at 2:63–67.

According to the '759 patent, forming a weakly-ionized plasma substantially eliminates the probability of establishing a breakdown condition in the chamber when high-power pulses are applied between the cathode and anode. *Id*. at 7:17–21. Once the weakly-ionized plasma is formed, high-power pulses are applied between the cathode and anode to generate a strongly-ionized plasma from the weakly-ionized plasma. *Id*. at 7:27–30, 7:65–66.

C. Illustrative Claim

Of the challenged claims, claim 20 is the only independent claim. Claims 21, 34–36, 38, 39, 47, and 49 depend, directly or indirectly, from claim 20. Claim 20, reproduced below, is illustrative:

> 20. A method of generating sputtering flux, the method comprising:
>
> a) ionizing a feed gas to generate a weakly-ionized plasma proximate to a sputtering target;
>
> b) generating a magnetic field proximate to the weakly-ionized plasma, the magnetic field substantially trapping electrons in the weakly-ionized plasma proximate to the sputtering target; and
>
> c) applying *a voltage pulse* to the weakly-ionized plasma, 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, which comprises ions that sputter target material, from the weakly-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*.

Ex. 1201, 22:41–61 (emphases added).

D. Prior Art Relied Upon

Intel relies upon the following prior art references:

Wang	US 6,413,382 B1	July 2, 2002	(Ex. 1205)
Müller-Horsche	US 5,247,531	Sep. 21, 1993	(Ex. 1221)
Yamaguchi	EP 1 113 088 A1	July 4, 2001	(Ex. 1222)

D.V. Mozgrin, et al., *High-Current Low-Pressure Quasi-Stationary Discharge in a Magnetic Field: Experimental Research*, 21 PLASMA PHYSICS REPORTS 400–409 (1995) (Ex. 1203) ("Mozgrin").

A. A. Kudryavtsev and V.N. Skrebov, *Ionization Relaxation in a Plasma Produced by a Pulsed Inert-Gas Discharge*, 28(1) SOV. PHYS. TECH. PHYS. 30–35 (Jan. 1983) (Ex. 1204) ("Kudryavtsev").

D.V. Mozgrin, *High-Current Low-Pressure Quasi-Stationary Discharge in a Magnetic Field: Experimental Research*, Thesis at Moscow Engineering Physics Institute (1994) (Ex. 1218) ("Mozgrin Thesis").[1]

Li et al., *Low-Temperature Magnetron Sputter-Deposition, Hardness, and Electrical Resistivity of Amorphous and Crystalline Alumina Thin Films*, 18 J. VAC. SCI. TECH. A 2333–38 (2000) (Ex. 1220) ("Li").

[1] The Mozgrin Thesis is a Russian-language reference. The citations to the Mozgrin Thesis are to the certified English-language translation submitted by Intel (Ex. 1217).

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