

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

INTEL CORPORATION,
Petitioner,

v.

ZOND, LLC,
Patent Owner.

Case IPR2014-00444
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 2, 3, 5–9, 13–16, 19, 41–43, and 45 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 2, 3, 5–9, 13–16, 19, 41–43, and 45 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 2, 3, 5–9, 13–16, 19, 41–43, and 45 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 apparatus. Ex. 1101, 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 Claims

Claims 2, 3, 5–9, 13–16, 19, 41–43, and 45 depend, directly or indirectly, from claim 1. Claims 1 and 6, reproduced below, are illustrative:

1. A magnetically enhanced sputtering source comprising:

a) an anode;

b) a cathode assembly that is positioned adjacent to the anode, the cathode assembly including a sputtering target;

c) an ionization source that generates a weakly-ionized plasma proximate to the anode and the cathode assembly;

d) a magnet that is positioned to generate 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

e) a *power supply generating a voltage pulse* that produces an electric field between the cathode assembly and the anode, the power supply being configured to generate the voltage pulse with an amplitude and a rise time that *increases 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. 1101, 21:22–48 (emphases added).

6. The sputtering source of claim 1 wherein the rise time of the voltage pulse is chosen to increase the ionization rate of the excited atoms in the weakly-ionized plasma.

Id. at 21:57–59.

D. Prior Art Relied Upon

Intel relies upon the following prior art references:

Wang US 6,413,382 July 2, 2002 (Ex. 1105)

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. 1103) (“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. 1104) (“Kudryavtsev”).

E. Asserted Grounds of Unpatentability

Intel asserts the following grounds of unpatentability:

Claims	Basis	References
2, 3, 5–9, 13–16, 19, 41–43, and 45	§ 103(a)	Mozgrin and Kudryavtsev
2, 3, 5–9, 13–15, 19, and 41–43	§ 103(a)	Wang and Kudryavtsev
16 and 45	§ 103(a)	Wang, Kudryavtsev, and Mozgrin

III. ANALYSIS

A. Claim Construction

In an *inter partes* review, claim terms in an unexpired patent are given their broadest reasonable construction in light of the specification of the patent in which they appear. 37 C.F.R. § 42.100(b). Claim terms are given

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