

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

INTEL CORPORATION,
Petitioner,

v.

ZOND, LLC,
Patent Owner.

Case IPR2014-00446
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 22–33, 37, 46, 48, and 50 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 22–33, 37, 46, 48, and 50 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 22–33, 37, 46, 48, and 50 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. 1301, 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 22–33, 37, 46, 48, and 50 depend, directly or indirectly, from claim 20. Claims 20 and 32, reproduced below, are 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. 1301, 22:41–61 (emphases added).

32. The method of claim 20 wherein the peak plasma density of the weakly-ionized plasma is less than about 10^{12} cm⁻³.

Id. at 23:33–35.

D. Prior Art Relied Upon

Intel relies upon the following prior art references:

Wang US 6,413,382 B1 July 2, 2002 (Ex. 1305)

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. 1303) (“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. 1304) (“Kudryavtsev”).

E. Asserted Grounds of Unpatentability

Intel asserts the following grounds of unpatentability:

Claims	Basis	References
22–23, 37, 46, 48, 50	§ 103(a)	Mozgrin and Kudryavtsev
22–26, 28–31, 37, 46, 48	§ 103(a)	Wang and Kudryavtsev
27, 32, 33, 50	§ 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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