Trials@uspto.gov
571-272-7822

Paper 11
Entered: September 2, 2014

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

INTEL CORPORATION
Petitioner

v.

ZOND, LLC
Patent Owner

Case IPR2014-00470
Patent 7,811,421 B2

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

STEPHENS, *Administrative Patent Judge*.

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

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I. INTRODUCTION

On March 7, 2014, Intel Corporation ("Intel") filed a Petition requesting *inter partes* review of claims 9, 14, 21, 26, 35, and 37 of U.S. Patent No. 7,811,421 B2 ("the '421 patent"). Paper 1 ("Pet."). Zond, LLC ("Zond") filed a Patent Owner Preliminary Response. Paper 10 ("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.

Taking into account Zond's Patent Owner Preliminary Response, we conclude that the information presented in the Petition demonstrates there is a reasonable likelihood that Intel would prevail in challenging claims 9, 14, 21, 26, 35, and 37 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 9, 14, 21, 26, 35, and 37 of the '421 patent.

A. Related Matters

Intel indicates the '421 patent was asserted in *Zond, LLC v. Intel Corp.*, No.1:13-cv-11570-RGS (D. Mass.). Pet. 1 and Paper 5. Intel also identifies other matters where Zond asserted the claims of the '421 patent against third parties. *Id*.

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B. The '421 patent

The '421 patent relates to a high-deposition sputtering apparatus. Ex. 1201, Abstract At the time of the invention, sputtering was a well-known technique for depositing films on semiconductor substrates. *Id*. at 1:15–16. The '421 patent indicates prior art magnetron sputtering systems deposit films having low uniformity, poor target utilization (the target material erodes in a non-uniform manner), and relatively low deposition rate (low amount of material deposited on the substrate per unit time). *Id*. at 1:63–2:14. To address these problems, the '421 patent discloses that increasing the power applied between the target and anode can increase the amount of ionized gas, therefore, increasing the target utilization and sputtering yield. *Id*. at 3:20–22. However, increasing the power also "increases the probability of establishing an undesirable electrical discharge (an electrical arc) in the process chamber." *Id*. at 3:23–29.

According to the '421 patent, magnetron sputtering apparatus 200 includes cathode assembly 216, which includes cathode 218 and sputtering target 220. *Id.* at 6:46–49. Pulsed power supply 234 is directly coupled to cathode assembly 216. *Id.* at 7:7–9. Pulsed power supply 234 generates peak voltage levels of between about 5 kV and about 30 kV, and operating voltages are generally between about 50 V and 1 kV. *Id*. at 7:17–20.

The '421 patent forms a weakly-ionized or pre-ionized plasma that 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 9:16–19. Once the weakly-ionized plasma is

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formed, high-power pulses are applied between the cathode and anode to generate a strongly-ionized plasma from the weakly-ionized plasma. *Id*. at 9:29–31, 10:8–9.

C. Illustrative Claims

Of the challenged claims, none are independent. Claims 9, 14, 21, 26, 35, and 37 depend, directly or indirectly, from claims 1, 17, and 34. Claims 1 and 9, reproduced below, are illustrative:

> 1. A sputtering source comprising:
>
> a) a cathode assembly comprising a sputtering target that is positioned adjacent to an anode; and
>
> b) a *power supply that generates a voltage pulse* between the anode and the cathode assembly that creates a weakly-ionized plasma and then a strongly-ionized plasma from the weakly-ionized plasma *without an occurrence of arcing* between the anode and the cathode assembly, an amplitude, a duration and a rise time of the voltage pulse being chosen to increase a density of ions in the strongly-ionized plasma.
>
> 9. The sputtering source of claim 1 wherein the voltage pulse generated between the anode and the cathode assembly excites atoms in the weakly-ionized plasma and generates secondary electrons from the cathode assembly, the secondary electrons ionizing a portion of the excited atoms, thereby creating the strongly-ionized plasma.

Ex. 1201, 22:14–24, 22:52–57 (emphases added).

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D. The Prior Art Relied Upon

Intel relies upon the following prior art references:

Wang	US 6,413,382 B1	July 2, 2002	(Ex. 1204)
Lantsman	US 6,190,512 B1	Feb. 20, 2001	(Ex. 1205)

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) (hereinafter "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 (January 1983)(Ex. 1206) (hereinafter "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. 1207) (hereinafter "Mozgrin Thesis").[1]

[1] The Mozgrin Thesis is a Russian-language reference (Ex. 1208). The citations to the Mozgrin Thesis are to a certified English-language translation by Intel (Ex. 1207).

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