

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

INTEL CORPORATION,
Petitioner,

v.

ZOND, LLC,
Patent Owner.

Case IPR2014-00468
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

I. INTRODUCTION

On March 7, 2014, Intel Corporation (“Intel”) filed a Revised Petition requesting *inter partes* review of claims 1, 2, 8, 10–13, 15–17, 22–25, 27–30, 33, 34, 38, 39, 42, 43, and 46–48 (“the challenged claims”) of U.S. Patent No. 7,811,421 B2 (“the ’421 patent”). Paper 4 (“Pet.”). Zond, LLC (“Zond”) filed a Patent Owner 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.

Taking into account Zond’s Preliminary Response, and based on the information presented in the Petition, we are persuaded a reasonable likelihood exists that Intel would prevail in challenging claims 1, 2, 8, 10–13, 15–17, 22–25, 27–30, 33, 34, 38, 39, 42, 43, and 46–48 as unpatentable. Pursuant to 35 U.S.C. § 314, we hereby authorize an *inter partes* review as to claims 1, 2, 8, 10–13, 15–17, 22–25, 27–30, 33, 34, 38, 39, 42, 43, and 46–48 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-JLT (D. Mass.). Pet. 1 and Ex. 1022. Intel also

identifies other matters where Zond asserted the claims of the '421 patent against third parties. *Id.*

B. The '421 patent

The '421 patent relates to a high-deposition sputtering apparatus. Ex. 1001, Abs. 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 that have 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 increasing the power applied between the target and anode can increase the amount of ionized gas and, therefore, increase 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 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 Claim

Of the challenged claims, claims 1, 17, 34, and 46–48 are independent. Claims 2, 8, 10–13, 15, 16, 22–25, 27–30, 33, 38, 39, 42, and 43 depend directly or indirectly from claims 1, 17, and 34. Claim 1, reproduced below, is 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.

Ex. 1001, 22:14–24 (emphases added).

D. The Prior Art Relied Upon

Intel relies upon the following prior art references:

Wang US 6,413,382 B1 July 2, 2002 (Ex. 1004)
Lantsman US 6,190,512 B1 Feb. 20, 2001 (Ex. 1005)

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. 1003) (hereinafter “Mozgrin”).

E. The Asserted Grounds of Unpatentability

Intel asserts the following grounds of unpatentability:

Claim	Basis	References
1, 2, 8, 10–13, 15, 16, 34, 38, 39, 43, 46–48	§ 102	Mozgrin
1, 2, 8, 10–13, 16, 17, 22–25, 28–30, 33, 34, 39, 42, 43, 46–48	§ 102	Wang
17, 22–25, 27–30, 33, 42	§ 103	Mozgrin and Lantsman
15, 27, 38	§ 103	Wang and Mozgrin

III. DISCUSSION

A. Claim Interpretation

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 their ordinary and customary meaning as would be understood by one of ordinary skill in the art in the context of the entire disclosure. *In re Translogic Tech. Inc.*, 504 F.3d 1249, 1257 (Fed. Cir. 2007). An inventor

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