UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

LAM RESEARCH CORP., Petitioner,

V.

DANIEL L. FLAMM, Patent Owner.

Case IPR2015-01767 Patent 6,017,221

Before DONNA M. PRAISS, CHRISTOPHER L. CRUMBLEY, and JO-ANNE M. KOKOSKI, *Administrative Patent Judges*.

KOKOSKI, Administrative Patent Judge.

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



I. INTRODUCTION

Lam Research Corp. ("Petitioner") filed a Corrected Petition ("Pet.") to institute an *inter partes* review of claims 1–7 of U.S. Patent No. 6,071,221 ("the '221 patent," Ex. 1001). Paper 4. Daniel L. Flamm ("Patent Owner") filed a Preliminary Response ("Prelim. Resp."). Paper 9. We have jurisdiction under 35 U.S.C. § 314.

Upon consideration of the Petition, Preliminary Response, and the evidence of record, we determine that Petitioner has established a reasonable likelihood of prevailing with respect to the unpatentability of claims 1, 4, and 5–7 of the '221 patent. Accordingly, we institute an *inter partes* review of those claims.

A. Related Proceedings

Petitioner states that "[t]he '221 patent is presently at issue in the declaratory judgment action *Lam Research Corp. v. Daniel L. Flamm*, Case 5:15-cv-01277-BLF (N.D. Cal.)." Pet. 3. Patent Owner also identifies a civil action, titled *Daniel L. Flamm*, *Sc.D. v. Samsung Electronics Co., Ltd.*, Case No. 1:15-cv-00613-LY (W.D. Tex.), as a related proceeding. Paper 6, 1.

B. The '221 Patent

The '221 patent, titled "Process Depending on Plasma Discharges Sustained by Inductive Coupling," is directed to a process for fabricating a product using plasma discharge. Ex. 1001, 6:14–16. The process "relies upon the control of the instantaneous plasma AC potential to selectively control a variety of plasma characteristics," such as "the amount of neutral species, the amount of charged species, overall plasma potential, the spatial extent and distribution of plasma density, the distribution of electrical



current, and others." *Id.* at 6:16–22. The process "can be used in applications including chemical dry etching (e.g., stripping, etc.), ionenhanced etching, plasma immersion ion implantation, chemical vapor deposition and material growth, and others." *Id.* at 6:22–26.

The process comprises subjecting a substrate to a composition of entities, where "[a]t least one of the entities emanates from a species generated by a gaseous discharge excited by a high frequency field in which the vector sum of the phase and anti-phase capacitive coupled voltages (e.g., AC plasma voltage) from the inductive coupling structure are substantially balanced." *Id.* at 6:31–37. According to the '221 patent, "[t]his process provides for a technique that is substantially free from stray or parasitic capacitive coupling from the plasma source to chamber bodies (e.g., substrate, walls, etc.) at or near ground potential." *Id.* at 6:37–41.

The '221 patent also describes a plasma discharge apparatus that includes a plasma source and a plasma applicator. *Id.* at 7:26–28. "A wave adjustment circuit (e.g., RLC circuit, coil, transmission line, etc.) is operably coupled to the plasma applicator" and "can selectively adjust phase and antiphase potentials of the plasma from an rf power supply." *Id.* at 7:30–34. Figure 2A of the '221 patent is reproduced below:

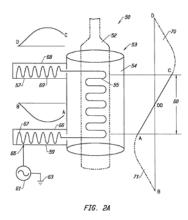


Figure 2A is a simplified configuration using wave adjustment circuits. *Id.* at 7:46–47. Embodiment 50 includes discharge tube 52, inductive applicator 55, exterior shield 54, upper wave adjustment circuit 57, lower wave adjustment circuit 59, plasma source region 60, and rf power supply 61. *Id*. at 10:3–8. "In this embodiment, the wave adjustment circuits are adjusted to provide substantially zero AC voltage at one point on the inductive coil (refer to point 00 in FIG. 2A)," providing "substantially equal phase 70 and anti-phase 71 voltage distributions in directions about this point (refer to 00-A and 00-C in FIG. 2A)" and "substantially equal capacitance coupling to the plasma from physical inductor elements (00-C) and (00-A), carrying the phase and anti-phase potentials." Id. at 10:14–22. According to the '221 patent, "[s]ince the capacitive current increases monotonically with the magnitude of the difference of peak phase and anti-phase voltages, which occur at points A and C in FIG. 2A, this coupling can be lessened by reducing this voltage difference," which is achieved by way of wave adjustment circuits 57 and 59. *Id.* at 10:31–37.

C. Illustrative Claim

Petitioner challenges claims 1–7 of the '221 patent. Claim 1 is the only independent claim, and reads as follows:

1. A process for fabricating a product using a plasma source, said process comprising the steps of subjecting a substrate to entities, at least one of said entities emanating from a gaseous discharge excited by a high frequency field from an inductive coupling structure in which a phase portion and an antiphase portion of capacitive currents coupled from the inductive coupling structure are selectively balanced;

wherein said inductive coupling structure is adjusted using a wave adjustment circuit, said wave adjustment circuit



adjusting the phase portion and the anti-phase portion of the capacitively coupled currents.

Ex. 1001, 22:58-23:2.

D. The Prior Art

Petitioner relies on the following prior art references:

Reference	Description	Date	Exhibit No.
Knapp	US 4,877,999	Oct. 3, 1989	1004
Collins	US 5,065,118	Nov. 12, 1991	1005
Dible	US 5,573,595	Nov. 12, 1996	1003
Hopwood	Review of Inductively Coupled Plasmas for Plasma Processing, Plasma Sources Sci. Technol. 1 (1992) 109–116	Apr. 1, 1992	1006
Lieberman93	Design of High-Density Plasma Sources for Materials Processing, University of California, Berkeley Technical Report No. UCB/ERL M93/3	Jan. 11, 1993	1002
Lieberman94	Design of High-Density Plasma Sources for Materials Processing, Plasma Sources for Thin Film Deposition and Etching (Physics of Thin Films Vol. 18)	Aug. 18, 1994	1012

E. The Asserted Grounds of Unpatentability

Petitioner challenges the patentability of claims 1–7 of the '221 patent on the following grounds:



DOCKET

Explore Litigation Insights



Docket Alarm provides insights to develop a more informed litigation strategy and the peace of mind of knowing you're on top of things.

Real-Time Litigation Alerts



Keep your litigation team up-to-date with **real-time** alerts and advanced team management tools built for the enterprise, all while greatly reducing PACER spend.

Our comprehensive service means we can handle Federal, State, and Administrative courts across the country.

Advanced Docket Research



With over 230 million records, Docket Alarm's cloud-native docket research platform finds what other services can't. Coverage includes Federal, State, plus PTAB, TTAB, ITC and NLRB decisions, all in one place.

Identify arguments that have been successful in the past with full text, pinpoint searching. Link to case law cited within any court document via Fastcase.

Analytics At Your Fingertips



Learn what happened the last time a particular judge, opposing counsel or company faced cases similar to yours.

Advanced out-of-the-box PTAB and TTAB analytics are always at your fingertips.

API

Docket Alarm offers a powerful API (application programming interface) to developers that want to integrate case filings into their apps.

LAW FIRMS

Build custom dashboards for your attorneys and clients with live data direct from the court.

Automate many repetitive legal tasks like conflict checks, document management, and marketing.

FINANCIAL INSTITUTIONS

Litigation and bankruptcy checks for companies and debtors.

E-DISCOVERY AND LEGAL VENDORS

Sync your system to PACER to automate legal marketing.

