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Paper 9
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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

TAIWAN SEMICONDUCTOR MANUFACTURING COMPANY, LTD.
and TSMC NORTH AMERICA CORP.,
Petitioners,

v.

ZOND, LLC,
Patent Owner.

Case IPR2014-00827
Patent 6,853,142 B2

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

TURNER, *Administrative Patent Judge.*

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

I. INTRODUCTION

Taiwan Semiconductor Manufacturing Company, Ltd. and TSMC North America Corporation (collectively "TSMC") filed a Petition requesting *inter partes* review of claims 22, 23, 25, 29, 30, 33–36, 39, and 43 of U.S. Patent No. 6,853,142 B2 ("the '142 Patent"). Paper 1 ("Pet."). Zond, LLC ("Zond") filed a Preliminary Response. Paper 8 ("Prelim. Resp."). We have jurisdiction under 35 U.S.C. § 314, which provides that an *inter partes* review may not be instituted "unless . . . 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 TSMC's Petition and Zond's Preliminary Response, we conclude that the information presented in the Petition demonstrates that there is a reasonable likelihood that TSMC would prevail in challenging claims 22, 23, 25, 29, 30, 33–36, 39, and 43 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, 23, 25, 29, 30, 33–36, 39, and 43 of the '142 Patent.

A. Related Matters

TSMC indicates that the '142 Patent was asserted in *Zond, LLC v. Fujitsu*, No.1:13-cv-11634-WGY (D. Mass.), in which TSMC is a co-defendant. Pet. 1. TSMC also identifies other matters where Zond asserted the claims of the '142 Patent against third parties, as well as other Petitions for *inter partes* review that are related to this proceeding. *Id*.

B. The '142 Patent

The '142 Patent relates to methods and apparatus for generating high-density plasma. Ex. 1301, Abs. At the time of the invention, sputtering was a well-known technique for depositing films on semiconductor substrates. *Id*. at 1:16–24. The '142 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 3:32–36. To address these problems, the '142 Patent discloses that increasing the power applied between the target and anode can increase the uniformity and density in the plasma. *Id*. at 3:37–44. However, increasing the power also "can increase the probability of generating an electrical breakdown condition leading to an undesirable electrical discharge (an electrical arc) in the chamber 104." *Id*.

According to the '142 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 6:21–30. 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 7:23–36. The '142 Patent also discloses that the provision of the feed gas to the plasma allows for homogeneous diffusion of the feed gas in the weakly-ionized plasma and allows for the creation of a highly uniform strongly-ionized plasma. *Id*. at 6:31–35.

C. Illustrative Claims

Of the challenged claims, all are dependent and all depend from one of claims 21 or 31. Claims 21 and 22, reproduced below, are illustrative:

> 21. An apparatus for generating a strongly-ionized plasma, the apparatus comprising:
>
> an anode;
>
> a cathode that is positioned adjacent to the anode and forming a gap there between;
>
> an ionization source that generates a weakly-ionized plasma proximate to the cathode, the weakly-ionized plasma reducing the probability of developing an electrical breakdown condition between the anode and the cathode; and
>
> a power supply that produces an electric field across the gap, the electric field generating excited atoms in the weakly-ionized plasma and generating secondary electrons from the cathode, the secondary electrons ionizing the excited atoms, thereby creating the strongly-ionized plasma.
>
> 22. The apparatus of claim 21 wherein the power supply generates a constant power.

Ex. 1301, 21:61–22:11.

D. Prior Art Relied Upon

TSMC 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) (hereinafter "Mozgrin").

A. A. Kudryavtsev and V.N. Skerbov, *Ionization Relaxation in a Plasma Produced by a Pulsed Inert-Gas Discharge*, 28 SOV. PHYS. TECH. PHYS. 30–35 (Jan. 1983) (Ex. 1304) (hereinafter "Kudryavtsev").

E. Asserted Grounds of Unpatentability

TSMC asserts the following grounds of unpatentability:

Claim(s)	Basis	References
22, 23, 25, 29, 30, 33–36, 39, and 43	§ 103(a)	Mozgrin and Kudryavtsev
22, 23, 25, 29, 30, 33–36, 39, and 43	§ 103(a)	Wang and Kudryavtsev

II. 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 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 may rebut that presumption by providing a definition of the term in the specification with reasonable clarity, deliberateness, and precision. *In re Paulsen*, 30 F.3d 1475, 1480 (Fed. Cir. 1994). In the absence of such a definition, limitations are not to be read from the specification into the claims. *In re Van Geuns*, 988 F.2d 1181, 1184 (Fed. Cir. 1993).

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