

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

MICRON TECHNOLOGY, INC.,
Petitioner,

v.

PRESIDENT AND FELLOWS OF HARVARD COLLEGE,
Patent Owner.

Case IPR2017-00664
Patent 8,334,016 B2

Before CHRISTOPHER L. CRUMBLY, JON B. TORNQUIST, and
CHRISTOPHER M. KAISER, *Administrative Patent Judges*.

TORNQUIST, *Administrative Patent Judge*.

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

I. INTRODUCTION

Micron Technology, Inc. (“Petitioner”) filed a Petition (Paper 1, “Pet.”) requesting an *inter partes* review of claims 1, 2, 7, 8, and 10 of U.S. Patent No. 8,334,016 B2 (Ex. 1001, “the ’016 patent”). The President and Fellows of Harvard College (“Patent Owner”) filed a Preliminary Response to the Petition (Paper 8, “Prelim. Resp.”).

We have authority to determine whether to institute an *inter partes* review. 35 U.S.C. § 314; 37 C.F.R. § 42.4(a). The standard for instituting an *inter partes* review is set forth in 35 U.S.C. § 314(a), which provides that an *inter partes* review may not be instituted “unless the Director determines . . . there is a reasonable likelihood that the petitioner would prevail with respect to at least 1 of the claims challenged in the petition.”

After considering the Petition and the Preliminary Response, we determine that Petitioner has demonstrated a reasonable likelihood of prevailing with respect to claims 1, 2, 7, 8, and 10 of the ’016 patent. Accordingly, we institute *inter partes* review with respect to those claims.

A. *Related Proceedings*

The parties note that the ’016 patent is at issue in *President and Fellows of Harvard College v. Micron Tech., Inc.*, 1:16-cv-11249 (D. Mass.), *President and Fellows of Harvard College v. GlobalFoundries U.S., Inc.*, IPR2017-00663, and IPR2017-00666. Pet. 2; Paper 5, 1. The parties further note that related U.S. Patent No. 6,969,539 is at issue in the above-noted district court proceedings as well as IPR2017-00662. Pet. 2; Paper 5, 1.

B. The '016 Patent

The '016 patent discloses “reagents for use in thin film deposition processes such as chemical vapor deposition (CVD) and atomic layer deposition (ALD).” Ex. 1001, 1:30–32.

“In CVD processes, a reactant vapor or vapor mixture is brought into contact with a heated surface on which a thin film is deposited.” *Id.* at 1:46–48. In ALD (which is a type of CVD process) “a metered amount of a first reactant component” is introduced into a deposition chamber to deposit a thin layer of this first reactant on a substrate. *Id.* at 20:57–60. Excess vapor is removed from the chamber and “a metered amount of a second reactant component is then introduced into the deposition chamber” where it “interacts with the already deposited layer of the first reactant.” *Id.* at 20:60–21:5. The '016 patent explains that, because the surface reactions in the ALD process are “self-limiting,” the process may be used to provide a “reproducible layer of predictable composition” with “improved step coverage and thickness uniformity compared to CVD with mixed vapors.” *Id.* at 1:48–54, 20:64–67, 21:5–7.

In certain embodiments of the '016 patent, metal or metalloid amides may be used as a reactant. *Id.* at 10:4–9. Table I of the '016 patent provides a list of known amides for use in the disclosed ALD process, including tetrakis(dimethylamino)–, tetrakis(diethylamino)–, and tetrakis(ethylmethylamino)–hafnium and zirconium. *Id.* at Table I.

C. Illustrative Claim

Claim 1, reproduced below, is the only independent claim of the '016 patent and is illustrative of the challenged claims:

1. A process for making an insulator in a microelectronic device, the process comprising:

introducing a first reactant component into a deposition chamber;

introducing a second reactant component into the deposition chamber; and

alternately repeating introducing the first reactant component and the second reactant component into the deposition chamber;

wherein deposition of the first reactant component and the second reactant component are self-limiting;

wherein said first reactant component comprises a metal alkylamide;

wherein said second reactant component interacts with the deposited first reactant component to form the insulator; and

wherein said insulator comprises oxygen and the metal from the metal alkylamide.

Ex. 1001, 30:9–26.

D. The Asserted Grounds of Unpatentability

Petitioner contends that claims 1, 2, 7, 8, and 10 of the '016 patent are unpatentable based on the following grounds (Pet. 29–50):¹

References	Basis	Claim(s) Challenged
Senzaki ² and Min ³	§ 103	1, 2, 7, and 10
Senzaki, Min, and Shin ⁴	§ 103	8

¹ Petitioner also relies on a declaration from Dr. Sanjay Banerjee (Ex. 1003).

² U.S. Patent No. 6,537,613 B1, filed Apr. 10, 2000 and issued Mar. 25, 2003 (Ex. 1005).

³ Jae–Sik Min, et al., *Atomic Layer Deposition of TiN Films by Alternate Supply of Tetrakis (ethylmethylamino)–Titanium and Ammonia*, 37 JAPANESE JOURNAL OF APPLIED PHYSICS, No. 9A, 1998, pp. 4999–5004 (Ex. 1006).

⁴ Korean Patent No. 0156980, published Jan. 28, 1997 (Ex. 1007).

Petitioner presents evidence that Min and Shin are prior art under 35 U.S.C. § 102(b) and Senzaki is prior art under §102(e). Pet. 22 n.10, 25 n.13, 27 n.14 (noting that Shin was published on January 28, 1997). Patent Owner does not, at this stage of the proceeding, challenge the prior art status of any reference.

II. ANALYSIS

A. Claim Construction

In an *inter partes* review, “[a] claim in an unexpired patent shall be given its broadest reasonable construction in light of the specification of the patent in which it appears.” 37 C.F.R. § 42.100(b); *Cuozzo Speed Techs., LLC v. Lee*, 136 S. Ct. 2131, 2142 (2016) (upholding the use of the broadest reasonable interpretation standard). In determining the broadest reasonable construction, we presume that claim terms carry their ordinary and customary meaning. *See In re Translogic Tech., Inc.*, 504 F.3d 1249, 1257 (Fed. Cir. 2007). A patentee may define a claim term in a manner that differs from its ordinary meaning; however, any special definitions must be set forth in the specification with reasonable clarity, deliberateness, and precision. *See In re Paulsen*, 30 F.3d 1475, 1480 (Fed. Cir. 1994).

Petitioner and Patent Owner do not propose a construction for any claim terms of the '016 patent. Pet. 21; Prelim. Resp. 22. And, upon review of the parties' arguments and supporting evidence, we determine that no claim terms require construction for purposes of this Decision. *See Vivid Techs., Inc. v. Am. Sci. & Eng'g, Inc.*, 200 F.3d 795, 803 (Fed. Cir. 1999) (“[O]nly those terms need be construed that are in controversy, and only to the extent necessary to resolve the controversy.”).

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