

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

GENERAL ELECTRIC COMPANY,
Petitioner,

v.

UNITED TECHNOLOGIES CORPORATION,
Patent Owner.

Case IPR2016-01289
Patent 7,060,360 B2

Before GRACE KARAFFA OBERMANN, CHRISTOPHER M. KAISER,
and MICHELLE N. ANKENBRAND, *Administrative Patent Judges*.

OBERMANN, *Administrative Patent Judge*.

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

I. INTRODUCTION

Petitioner requests an *inter partes* review of claims 1–14 of U.S. Patent No. 7,060,360 B2 (Ex. 1001, “the ’360 patent”). Paper 1 (“Pet.”). Patent Owner filed a Preliminary Response. Paper 6 (“Prelim. Resp.”). Applying the standard set forth in 35 U.S.C. § 314(a), which requires demonstration of a reasonable likelihood that Petitioner would prevail at trial with respect to at least one challenged patent claim, we institute an *inter partes* review of claims 1–14 of the ’360 patent.

Our findings of fact and conclusions of law at this preliminary stage of the proceeding are not final and are made for the sole purpose of determining whether Petitioner meets the threshold for initiating review. Any final written decision in this case will be based on the full trial record, including any Response timely filed by Patent Owner in accordance with the Scheduling Order entered with this Decision. In that regard, any arguments not raised in Patent Owner’s Response are deemed waived, even if they were included in the Preliminary Response.

Taking account of the information provided in the Petition and the Preliminary Response, we determine that Petitioner shows sufficiently the following facts for the purposes of trial institution.

A. *Related Matters*

The Petition identifies no related district court actions or administrative proceedings. Pet. 1.

B. *The ’360 Patent*

The ’360 patent is titled “Bond Coat for Silicon Based Substrates.” Ex. 1001, Title. The ’360 patent relates to an environmental barrier coating

for protecting a silicon-containing substrate, such as combustor and turbine sections of gas turbine engines. *Id.* at 1:7–18. Specifically, the coating protects the substrate from the adverse effects of oxidation in high temperature, aqueous environments, thereby increasing the service life of the components. *Id.* That coating comprises an alkaline earth aluminosilicate based on barium and strontium (also known as “BSAS”), or yttrium silicate. *Id.* at 1:22–24, claim 1; Pet. 9. A “bond layer” is located between the substrate and the BSAS coating. *Id.* at 1:19–47; claim 1.

The ’360 patent discloses that the BSAS coating was known in the prior art. *Id.* at 1:22–25. The specification also identifies, as prior art, a bond layer (located between the substrate and the BSAS coating) comprising “a dense continuous layer of silicon metal.” *Id.* at 1:21–22; Fig. 1. The inventors claim to have discovered that, by using a bond layer that includes an alloy comprising a refractory metal disilicide/silicon eutectic, instead of “a simple phase silicon metal bond coat,” the fracture toughness of the bond coat is increased, resulting in “more resistance to crack propagation.” *Id.* at 1:50–2:3; *see* claim 1 (specifying a bond coat including an alloy comprising a refractory metal disilicide/silicon eutectic).

C. Illustrative Claim

Claim 1, reproduced below, is illustrative of the subject matter:

1. An article comprising a silicon based substrate, at least one environmental barrier layer selected from the group consisting essentially of an alkaline earth aluminosilicate based on barium and strontium, and yttrium silicate, and a bond layer between the substrate and the environmental barrier layer, the bond layer comprises an alloy comprising a refractory metal disilicide/silicon eutectic.

Ex. 1001, 2:55–62.

D. Asserted Prior Art and Other Evidence

The Petition is supported by the Declaration of Dr. Andreas M. Glaeser (Ex. 1003) and asserts the following prior art references:

1. Valentina Sergeevna Terentieva, et al., U.S. Patent No. 5,677,060, issued Oct. 14, 1997 (Ex. 1005, “Terentieva”);
2. Harry Edwin Eaton, Jr., et al., U.S. Patent No. 6,387,456 B1, issued May 14, 2002 (Ex. 1006, “Eaton”);
3. J.D. Webster, et al., *Oxidation Protection Coatings for C/SiC Based on Yttrium Silicate*, J. Eur. Ceramic Soc’y 18 (1998) 2345–2350 (Ex. 1025, “Webster”);
4. Yoshikazu Suzuki, et al., *Improvement in Mechanical Properties of Powder-Processed MoSi₂ by the Addition of Sc₂O₃ and Y₂O₃*, J. Am. Ceramic Soc’y Vol. 18 Num. 12. (Dec. 1998) 3141–3149 (Ex. 1024, “Suzuki”).

The Preliminary Response is supported by the Declaration of Dr. David R. Clarke (Ex. 2001), which is new declaration evidence prepared for this proceeding. *Id.* at 52 (also identified as page 51),¹ (signature page, reflecting that Dr. Clarke executed the document on October 6, 2016, the filing date of the Preliminary Response). Where new testimonial evidence advanced by a patent owner creates a genuine issue of material fact, we view the issue in a light most favorable to the petitioner for the sole purpose of deciding whether to institute an *inter partes* review. 37 C.F.R. § 42.108(c).

¹ In this Decision, where possible, we refer to page numbers added by the parties, rather than the original page numbers of the Exhibits. Exhibit 2001 contains two sets of page numbers, without a clear indication of which represents added or original page numbers.

E. The Asserted Grounds of Unpatentability

Petitioner challenges the patentability of claims 1–14 of the '360 patent on the following grounds:

Claims	Basis	References
1–14	§ 103	Terentieva and Eaton
1–14	§ 103	Terentieva, Webster, Suzuki, and Allegedly Admitted Prior Art

II. ANALYSIS

For reasons that follow, we institute an *inter partes* review of claims 1–14 under 35 U.S.C. § 314(a).

A. Level of Ordinary Skill in the Art

We consider each ground of unpatentability in view of the understanding of a person of ordinary skill in the art. For purposes of this Decision, the prior art itself is sufficient to demonstrate the level of ordinary skill in the art at the time of the invention. *See Okajima v. Bourdeau*, 261 F.3d 1350, 1355 (Fed. Cir. 2001) (prior art itself can reflect appropriate level of ordinary skill in the art). Further, based on the information presented at this preliminary stage of the proceeding, we consider Petitioner’s witness, Dr. Glaeser, and Patent Owner’s witness, Dr. Clarke, qualified to opine from the perspective of an ordinary artisan at the time of the invention. Ex. 1004 (curriculum vitae of Dr. Glaeser); Ex. 2005 (curriculum vitae of Dr. Clarke).

B. Claim Interpretation

The Board interprets claims in an unexpired patent using the “broadest reasonable construction in light of the specification of the patent.” 37 C.F.R.

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