UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

GENERAL ELECTRIC CO.,
Petitioner,

v.

UNITED TECHNOLOGIES CORP.,
Patent Owner.

Case No. IPR2016-01289
U.S. Patent No. 7,060,360 B2

PETITIONER'S REPLY BRIEF ON REMAND

TABLE OF ABBREVIATIONS

GE	Petitioner General Electric Company
UTC	Patent Owner United Technologies Corporation
FWD	Final Written Decision Finding Claims 1-14 Unpatentable, filed December 19, 2017 (Paper 25)
Pet.	Petition for Inter Partes Review of U.S. Patent No. 7,060,360, filed June 28, 2016 (Paper 1)
Reply	Petitioner's Reply Brief in Support of its Petition for Inter Partes Review of U.S. Patent No. 7,060,360, filed June 27, 2016 (Paper 16)
GE R. Br.	Petitioner's Brief on Remand, filed April 15, 2019 (Paper 29)
UTC R. Br.	Patent Owner's Brief on Remand, filed April 22, 2019 (Paper 30)
360 Patent	U.S. Patent No. 7,060,360 B2, issued June 13, 2006 to Harry E. Eaton et al. (Ex. 1001)
Glaeser Decl.	Declaration of Andreas M. Glaeser, Ph.D. (Ex. 1003)
Terentieva	U.S. Patent No. 5,677,060, issued October 14, 1997 to Valentina Sergeevna Terentieva et al. (Ex. 1005)
Eaton	U.S. Patent No. 6,387,456 B1, issued May 14, 2002 to Harry Edwin Eaton, Jr. et al. (Ex. 1006)
POSITA	Person of Ordinary Skill in the Art
[Citation]	Identification of "record evidence previously cited in substantive brief" pursuant to Order on Remand Procedure and Briefing Schedule (Paper 28)
Emphasis	All emphasis added unless otherwise noted

Between the 360 Patent and Terentieva, ***only the latter*** describes its intermediate layer as having adherent properties. Terentieva ***explicitly*** states that its coating layer (corresponding to the claimed "bond layer") was designed to be adherent: the "heat treatment comprises a first step under vacuum enabling the desired protective coating to be formed and ***enabling the coating to adhere*** to the surface of the material to be protected…." Ex. 1005, col. 4:30-33 [cited in Pet. at 19-20; Reply at 21]. Terentieva also teaches that another layer may be formed on top of the coating layer, and a POSITA would readily understand that in that instance the intermediate coating layer would adhere to both the substrate and the top layer. GE R. Br. at 3-4, citing, *inter alia*, Glaeser Decl., ¶¶ 45-49, 51, 54-57. During prosecution the Examiner drew the same conclusion, which UTC never disputed. Ex. 1002.032 ("The layer of Terentieva serves as an intermediate layer when the outer layer is present, and is therefore considered to ***effectively function as a bond layer***.") [cited in Reply at 19]. The evidence confirms that Terentieva's coating layer meets the Federal Circuit's construction for "bond layer."

ARGUMENT

UTC's arguments on remand are without merit. UTC effectively asserts that there must be a statement in Terentieva that its coating layer is designed to directly adhere Eaton's BSAS layer to Terentieva's substrate. That is not what the Federal Circuit's claim construction requires. *UTC v. GE*, 2019 WL 332754, *2 (Fed. Cir.

Jan. 25, 2019) (construing bond layer as "a layer of material designed to adhere ***another layer*** to a substrate"). All GE needs to show is that Terentieva's coating layer is designed to adhere "another layer" to a substrate. Terentieva's outer layer (*e.g.*, silica, alumina, zirconia glass, or a non-oxide ceramic such as silicon carbide) is "another layer" that the coating layer adheres to the substrate. GE R. Br. at 3-4; *see* Reply at 21. The claim language and specification specifically allow for additional intermediate layers between the bond layer and substrate, and the bond layer and EBL layer. Ex. 1001, col. 1:26-29; 2:12-17; claim 1 (using the open-ended "comprising" term).

Even under UTC's improper attempt to re-cast its own construction that it obtained at the Federal Circuit, a POSITA would understand that Terentieva's coating layer adheres to Eaton's BSAS layer:

- Terentieva's coating layer was specifically designed via a heat treatment process to be adherent. Ex. 1005, col. 4:30-33. Terentieva's examples confirmed the adherent properties of the coating layer. *Id.*, col. 4:53-57; col. 5:50-53 [cited in Reply at 21, Pet. at 31]; *see* GE R. Br. at 3-4;

- Eaton teaches that the BSAS layer is compatible with an "intermediate" layer between the substrate and the BSAS layer, whereby the intermediate layer "serve(s) to provide enhanced adhesion between the [BSAS] layer and the substrate…" Ex. 1006, col. 3:58-63 [cited in Pet. at 21]; and

• Eaton teaches that the BSAS layer is "particularly useful" when it is overlaid on a "molybdenum-silicon" alloy layer, *id*., col. 3:2-6, and Terentieva's coating layer ($TiMoSi_2$) is a type of molybdenum-silicon alloy. *See* Glaeser Decl., ¶¶ 45-49, 51, 54-57 [cited in Pet. at 28-29; Reply at 2, 9, 17]. A POSITA would recognize that Terentieva's coating layer, acting as an intermediate layer, would adhere to Eaton's BSAS layer, and thereby adhere the BSAS layer to the substrate. *Id*.; *see* Ex. 1006, col. 3:58-63 (noting that an intermediate layer provides "enhanced adhesion between the barrier layer and the substrate").

UTC's response is that the presence of titanium in Terentieva's coating layer "may" (***not*** "will") alter the properties of the coating layer, including the layer's CTE, which UTC infers may result in decreased adherence. UTC R. Br. at 4-5 (citing Dr. Clarke's declaration). This argument fails.

First, the 360 Patent refutes this argument, as it discloses and claims a bond layer that includes $TiMoSi_2$ (exactly as Terentieva discloses) in between a substrate and a BSAS layer (exactly as Eaton discloses). The 360 Patent identifies no concerns with mismatched CTEs or incompatibilities when using this (or any of the claimed) combinations. GE R. Br. at 7 (citing *In re Epstein*, 32 F.3d 1559, 1568 (Fed. Cir. 1994)). UTC acknowledges the evidence showing that $MoSi_2$ layers readily bonded with aluminosilicates like BSAS (UTC R. Br. at 4; GE R. Br. at 4-5), but suggests that $TiMoSi_2$ may not have such strong bonding properties. The

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