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UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE PATENT TRIAL AND APPEAL BOARD

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*Ex parte* WAYDE R. SCHMIDT, DAVID C. JARMON, and  
WILLIAM K. TREDWAY

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Appeal 2018-005168  
Application 14/522,746  
Technology Center 1700

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Before MARK NAGUMO, DONNA M. PRAISS, and JANE E. INGLESE,  
*Administrative Patent Judges.*

PRAISS, *Administrative Patent Judge.*

DECISION ON APPEAL<sup>1</sup>

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<sup>1</sup> In this Decision, we refer to the Specification filed Oct. 24, 2014 (“Spec.”), the Final Office Action dated June 14, 2017 (“Final Act.”), the Appeal Brief filed Jan. 16, 2018 (“Appeal Br.”), the Advisory Action (“Adv. Act.”) dated Feb. 6, 2018, the Examiner’s Answer dated Feb. 23, 2018 (“Ans.”), and the Reply Brief filed Apr. 23, 2018 (“Reply Br.”).

Pursuant to 35 U.S.C. § 134(a), Appellant appeals from the Examiner’s decision to reject claims 1–10 and 13–19.<sup>2, 3</sup> We have jurisdiction under 35 U.S.C. § 6(b).

We AFFIRM.

#### STATEMENT OF THE CASE

The invention relates to ceramic materials. Spec. ¶ 2. The Specification describes a ceramic component as a porous structure having fibers and a coating on the fibers, ceramic material located within pores of the porous structure, and a glass or glass/ceramic material also located within pores of the porous structure. *Id.* ¶ 3. The components are said to enhanced densification, thermal conductivity or other target properties for uses such as cooled turbine engine components. *Id.* ¶ 26.

Claims 1 and 7, reproduced below, are illustrative of the subject matter on appeal (emphasis added).

1. A ceramic component comprising:
  - a porous structure including fibers and a coating on the fibers;
  - a ceramic material within pores of the porous structure;
  - and
    - a glass or glass/ceramic material within pores of the porous structure, wherein one of the ceramic material or the glass or glass/ceramic material is within internal residual*

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<sup>2</sup> We use the word “Appellant” to refer to “applicant” as defined in 37 C.F.R. § 1.42. United Technologies Corporation is identified as the real party in interest. Appeal Br. 2.

<sup>3</sup> Claims 11 and 12 are not in this Appeal because they have been cancelled. Adv. Act.

porosity of the other of the ceramic material or the glass or glass/ceramic material.

7. The ceramic component as recited in claim 6, wherein the glass material further includes a silicon-containing filler[.]

Appeal Br. 8 (Claims Appendix).

## ANALYSIS

We review the appealed rejections for error based upon the issues Appellant identifies, and in light of the arguments and evidence produced thereon. *Ex parte Frye*, 94 USPQ2d 1072, 1075 (BPAI 2010) (precedential) (cited with approval in *In re Jung*, 637 F.3d 1356, 1365 (Fed. Cir. 2011) (“[I]t has long been the Board’s practice to require an applicant to identify the alleged error in the examiner’s rejections.”). After considering the argued claims in light of the case law presented in this Appeal and each of Appellant’s arguments, we are not persuaded of reversible error in the Examiner’s rejections.

The Examiner rejects claims 1–10 and 13–19 under 35 U.S.C. § 103(a) over the combination of Domergue<sup>4</sup> and Sakai<sup>5</sup> alone and together with secondary references<sup>6</sup> for the reasons provided in the Final Office Action. Final Act. 6–19.

Appellant separately argues the rejections of independent claim 1 and dependent claim 7. Appeal Br. 3–9. Therefore, in view of the lack of arguments directed to the remaining claims, claims 2–6 and 8–10 stand or fall with claim 1. *See* 37 C.F.R. § 41.37(c)(1)(iv). We consider the

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<sup>4</sup> US 6,221,475 B1, issued Apr. 24, 2001.

<sup>5</sup> US 2001/0037659 A1, published Nov. 8, 2001.

<sup>6</sup> US 4,314,852, issued Feb. 9, 1982 (“Brennan”); US 5,573,985, issued Nov. 12, 1996 (“Weaver”); US 5,837,364, issued Nov. 17, 1998 (“Zank”).

arguments advanced by Appellant in support of patentability of claim 7 to the extent applicable to the separate rejections of claims 13–19. We separately address claims 1 and 7 below.

*Claim 1*

Appellant contends that the Examiner erred in combining the teachings of Domergue and Sakai because the proposed combination would render Domergue unsuitable for its intended purpose. Appeal Br. 3. According to Appellant, Sakai’s glass matrix surrounds an interior ceramic matrix and fibers to smooth the outer and inner surfaces of the ceramic matrix. *Id.* at 3 (citing Sakai ¶ 34, Fig. 1). Appellant argues that applying Sakai’s glass matrix to Domergue’s friction element would cover Domergue’s friction face making it unsuitable as a friction element because the glass matrix would be exposed rather than Domergue’s carbon/carbon/silicon carbide composite. *Id.* at 4. According to Appellant, Sakai does not explicitly teach only filling the voids or using only part of the glass matrix because the reference lacks any example without a coated surface and it teaches improving oxidation by sealing the composite and the outside surfaces with the glass matrix. *Id.* at 4–5 (citing Sakai ¶¶ 33, 43, Figs. 1, 3).

The Examiner responds that the rejection is not based on the entire glass matrix of Sakai, but, rather, its benefits with respect to filling in the voids of fiber-reinforced ceramics. Ans. 12. The Examiner finds impregnating the voids with glass is beneficial because it eliminates the reduced strength due to the notches in the matrix, which cannot be achieved by coating the surface. *Id.* at 13 (citing Sakai ¶ 17). The Examiner also finds filling the voids with glass increases the room temperature strength of the

ceramic matrix. *Id.* The Examiner further finds that Sakai states that the coating alone is insufficient, teaches that at least the voids must be filled to achieve the beneficial results, and does not state that the coating is necessary. *Id.* at 13–14 (citing Sakai ¶¶ 12, 17). The Examiner determines that a person having ordinary skill in the art would have recognized filling the voids without coating the surface is a predictable variation because Sakai explicitly discloses the benefits of filling the voids in a ceramic matrix. *Id.* at 13.

In the Reply Brief, Appellant contends that Sakai does not state that the glass on the surface is not necessary or present. Reply Br. 2. According to Appellant, the fact that glass on the surface “does provide some level of oxidation resistance demonstrates that the glass also serves to block oxygen when on the surfaces.” *Id.* at 3. Appellant maintains that Sakai requires glass on the surface as well as in the voids because otherwise oxygen would be permitted to infiltrate through the surfaces and diminish oxidation resistance. *Id.* Appellant asserts that the notch effect cited by the Examiner “actually requires that the surface be coated with glass for smoothing.” *Id.* at 4 (citing Sakai ¶¶ 34, 35). Appellant also asserts that Sakai’s glass is applied by immersion which would inherently coat the outer surfaces of Domergue rendering it unsuitable for its intended purpose. *Id.* (citing Sakai ¶¶ 20, 24). According to Appellant, the method of getting to the alleged structure must be rational for a skilled artisan to expect to achieve the alleged structure. *Id.* at 6.

Appellant’s arguments do not persuade us that the Examiner reversibly erred in rejecting the claims as obvious over the teachings of Domergue and Sakai. Specifically, we are not persuaded that the Examiner

erred in finding that Sakai discloses the benefit of glass being present in the pores of a porous structure, as claim 1 requires. Appellant has not adequately shown Domergue would have been rendered inoperable for its intended purpose by the combination with Sakai. The preponderance of the evidence in this appeal record supports the Examiner's conclusion that the claimed subject matter would have been obvious in view of Domergue and Sakai. Accordingly, we sustain the Examiner's rejection for essentially those reasons expressed in the Answer, including the Response to Argument section, and we add the following primarily for emphasis.

In rejecting claims under 35 U.S.C. § 103, it is incumbent upon the Examiner to establish a factual basis to support the legal conclusion of obviousness. *See In re Fine*, 837 F.2d 1071, 1073 (Fed. Cir. 1988). In so doing, the Examiner must make the factual determinations set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 17 (1966) (noting that 35 U.S.C. § 103 leads to three basic factual inquiries: (1) the scope and content of the prior art; (2) the differences between the prior art and the claims at issue; and (3) the level of ordinary skill in the art). If the Examiner's burden is met, the burden then shifts to the Appellant to overcome the prima facie case with argument and/or evidence. Obviousness is then determined on the basis of the evidence as a whole and the relative persuasiveness of the arguments. *See In re Oetiker*, 977 F.2d 1443, 1445 (Fed. Cir. 1992).

Appellant does not dispute the Examiner's findings (Ans. 12–13, 15) that Sakai teaches filling the voids of fiber-reinforced ceramics provides benefits and that the benefits are oxidation resistance and strength (reduction of the notch effect). Instead, Appellant argues that a person having ordinary skill in the art would not understand from Sakai's disclosure that these

benefits are attributable to filling the voids alone without glass also coating the surface. According to Appellant, it can be inferred from Sakai that glass on the surfaces is necessary because Sakai indicates some level of oxidation protection can be attributed to the glass on the surface. Reply Br. 2. The problem with Appellant's argument is that even if a ceramic with both the voids filled and the surface coated provides more oxidation resistance and strength than a ceramic in which only the voids are filled, the record supports the Examiner's finding that there are benefits associated with filling the voids as compared to the conventional technique of only coating the surface. Sakai ¶¶ 11–14, 17.

Appellant also directs us to Sakai's disclosure of smoothing the inner and outer surfaces as evidence that glass coated surfaces are necessary to achieve the noted benefits. Reply Br. 4 (citing Sakai ¶¶ 34, 35). The problem with Appellant's argument is that Appellant does not adequately explain why filling the voids up to the surface without also coating the surface would not smooth the outer surface as described by Sakai.

Appellant's assertion (Reply Br. 4) that Sakai's disclosure of filling the voids by immersion would inherently result in the outer surfaces being coated is not persuasive of error for two reasons. First, this is a new argument that was not presented in the Appeal Brief. Appellant has not proffered a showing of good cause explaining why the argument could not have been presented in the Appeal Brief. Therefore, we will not consider this new and untimely argument in our assessment of the Examiner's § 103 rejections. 37 C.F.R. §§ 41.37, 41.41. Second, even if we were to consider Appellant's untimely argument, Appellant's assertion is merely attorney argument that is not supported by evidence. It is well settled that arguments

of counsel cannot take the place of factually supported objective evidence. *See, e.g., In re Huang*, 100 F.3d 135, 139–40 (Fed. Cir. 1996); *In re De Blauwe*, 736 F.2d 699, 705 (Fed. Cir. 1984).

In sum, Appellant’s position (Reply Br. 6) that the Examiner’s findings are insufficient to establish obviousness by the combination of Domergue and Sakai is not persuasive of error because Appellant does not adequately show that a person having ordinary skill in the art would understand Sakai requires both the pores and the surface of the matrix to be covered with glass. Nor has Appellant adequately shown that the combination with Sakai would have rendered Domergue unfit for its intended purpose. Accordingly, we affirm the Examiner’s rejection of claim 1 as well as claims 2–6 and 8–10 under 35 U.S.C. § 103 over Domergue and Sakai.

#### *Claim 7*

In addition to the arguments presented with respect to claim 1 distinguishing the disclosures of Sakai (Appeal Br. 6), which we do not find persuasive of error as discussed above, Appellant contends that the Examiner erred in rejecting claim 7 because the modification of Domergue/Sakai to include the silicon carbide fibers of Brennan are not explicitly addressed. *Id.* According to Appellant, Brennan impregnates glass powder into a silicon carbide tow (fiber) and is then hot pressed. *Id.* (citing Brennan 2:53–3:33). Because glass is added to the fiber in the cited references, Appellant argues that it is unclear how the fibers of Brennan would come to be added with the glass into the pores of Domergue. *Id.*

The Examiner responds that claims 1 and 7 are directed to products, not processes, and that a silicon-containing filler being present in the glass material increases toughness and flexural strength at high temperature. Ans. 21–22.

In the Reply Brief, Appellant asserts “if the methods to get to the alleged structure are not rational, one of ordinary skill in the art would not expect to achieve the alleged structure.” Reply Br. 6.

Appellant’s arguments do not persuade us that the Examiner reversibly erred in rejecting claim 7 over the cited prior art references. As discussed above in connection with claim 1, we are not persuaded of error in the Examiner’s finding that Domergue and Sakai disclose the ceramic component of claim 1 in which glass is within internal pores. The record supports the Examiner’s finding that Brennan discloses “exceptional flexural strength of a borosilicate glass-silicon carbide fiber reinforced composite utilizing silicon carbide yarn.” Brennan 3:34–40; Final Act. 11. Appellant does not adequately explain why a person having ordinary skill in the art would not have understood how to modify the glass used in the ceramic component of Domergue as modified by Sakai in view of Brennan’s teaching that silicon carbide fiber reinforced glass has the benefit of high flexural strength and toughness at high temperature.

Appellant’s focus on Brennan’s hot pressing example does not persuade us that one of ordinary skill in the art would not have expected to achieve the structure of claim 7. Reply Br. 6. While Brennan refers to hot pressing a mixture of silicon fibers and powdered glass as its preferred method, Brennan also discloses “a variety of methods can be used to produce the articles of the present invention, e.g. methods conventionally

used to produce glassware articles.” Brennan 2:53–55. In a determination of obviousness, a reference may be relied upon for all that it would have reasonably suggested to one having ordinary skill in the art. *Merck & Co. Inc. v. Biocraft Labs., Inc.*, 874 F.2d 804, 807 (Fed. Cir. 1989) (“That the [prior art] patent discloses a multitude of effective combinations does not render any particular formulation less obvious.”). Moreover, “a reference is not limited to the disclosure of specific working examples.” *In re Mills*, 470 F.2d 649, 651 (CCPA 1972) (citation omitted).

Accordingly, we affirm the Examiner’s rejection of claim 7 as well as claims 13–19 under 35 U.S.C. § 103(a).

For these reasons and those the Examiner provides, we uphold the Examiner’s rejection of claims 1–10 and 13–19 under 35 U.S.C. § 103(a) as obvious over the cited prior art references.

No time period for taking any subsequent action in connection with this appeal may be extended under 37 C.F.R. § 1.136(a)(1)(iv).

### CONCLUSION

In summary:

<b>Claims Rejected</b>	<b>35 U.S.C. §</b>	<b>Basis</b>	<b>Affirmed</b>	<b>Reversed</b>
1–6, 8–12	103(a)	Domergue, Sakai	1–6, 8–12	
7	103(a)	Domergue, Sakai, Brennan	7	
13–17	103(a)	Domergue, Sakai, Brennan, Weaver	13–17	

Appeal 2018-005168  
Application 14/522,746

<b>Claims Rejected</b>	<b>35 U.S.C. §</b>	<b>Basis</b>	<b>Affirmed</b>	<b>Reversed</b>
18, 19	103(a)	Domergue, Sakai, Brennan, Weaver, Zank	18, 19	
<b>Overall Outcome</b>			1–10, 13–19	

AFFIRMED