

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

AVX CORPORATION,
Petitioner,

v.

WILSON GREATBATCH LTD.,
Patent Owner.

Case IPR2015-00101
Patent 6,219,222 B1

Before MICHAEL J. FITZPATRICK, JENNIFER MEYER CHAGNON,
and J. JOHN LEE, *Administrative Patent Judges*.

FITZPATRICK, *Administrative Patent Judge*.

FINAL WRITTEN DECISION
35 U.S.C. § 318(a)

I. INTRODUCTION

Petitioner, AVX Corporation, filed a Petition for an *inter partes* review of claims 1–14, 25–36, 47, and 48 of U.S. Patent No. 6,219,222 B1 (“the ’222 patent”). Paper 1 (“Pet.”). Patent Owner, Wilson Greatbatch, Ltd., filed a Preliminary Response pursuant to 35 U.S.C. § 313. Paper 8 (“Prelim. Resp.”). In a May 8, 2015, Institution Decision, we instituted trial on a subset of those claims, namely claims 1–14, 25–32, 35, 36, 47, and 48. Paper 9 (“Inst. Dec.”).

During the trial, Patent Owner filed a short Response, conceding that all claims on which trial was instituted are unpatentable. Paper 13 (“PO Resp.”). Patent Owner also filed a Motion to Amend the ’222 patent (Paper 12, “Mot.”), Petitioner filed an Opposition thereto (Paper 15, “Opp.”), and Patent Owner filed a Reply in support of its Motion (Paper 16, “Reply”). Neither party requested oral argument, and no hearing for such was held.

We hold claims 1–14, 25–32, 35, 36, 47, and 48 unpatentable, and we deny the Motion to Amend.

II. THE ’222 PATENT

The ’222 patent relates to an electrolyte suitable for activating a capacitor. Ex. 1001, 1:17–18. It has a solvent that includes water and ethylene glycol with an ammonium salt dissolved therein. *Id.* at 1:18–20. One or more acids can be used as an additive to achieve the appropriate pH, conductivity, and breakdown voltage for a particular capacitor application. *Id.* at 1:20–23.

III. THE INSTITUTED GROUNDS

Trial was instituted on the following three grounds: (1) claims 1–4 and 25–27 as anticipated by Burger¹; (2) claims 5–9 as anticipated by Hildegard²; and (3) claims 10–14, 28–32, 35, 36, 47, and 48 as obvious over Evans I³ and Hildegard. Inst. Dec. 19. The Institution Decision explains how the Petition had demonstrated a reasonable likelihood of prevailing on these grounds against the included claims, showing where each limitation of the same was taught or suggested in the prior art. *See* Inst. Dec. 7–18. As noted in the Institution Decision (Inst. Dec. 7, 9, 15), Patent Owner’s Preliminary Response did not present arguments to the contrary. Prelim. Resp. 7, 9, 27. During trial, Patent Owner went one step further and “concede[d] that claims 1 to 14, 25 to 32, 35, 36, 47 and 48 are unpatentable.” PO Resp. 1.

Based on the arguments in the Petition, and the evidence presented in support (which are discussed at pages 7 to 18 of the Institution Decision), as well as Patent Owner’s concession of unpatentability, we hold: (1) claims 1–4 and 25–27 were anticipated by Burger, (2) claims 5–9 were anticipated by Hildegard, and (3) claims 10–14, 28–32, 35, 36, 47, and 48 would have been obvious over Evans I and Hildegard.

¹ U.S. Patent No. 3,138,746 (June 23, 1964). Ex. 1002.

² U.S. Patent No. 3,580,845 (May 25, 1971). Ex. 1004.

³ U.S. Patent No. 5,369,547 (Nov. 29, 1994). Ex. 1007.

IV. PATENT OWNER'S MOTION TO AMEND

During an *inter partes* review, a patent owner may file a motion to amend the patent by proposing substitute claims for challenged claims. 35 U.S.C. § 316(d)(1)(B). Any such amendment may not enlarge the scope of the claims of the patent or introduce new matter. *Id.* § 316(d)(3).

A. The Proposed Claims

Patent Owner's Motion seeks to amend the '222 patent by substituting, for challenged (and unpatentable) claims 10, 35, and 36, proposed claims 49, 50, and 51, respectively. Mot. 1. Like claims 10, 35, and 36, each of proposed claims 49–51 is directed to a capacitor comprising an anode, cathode, and electrolyte. Claim 49 is representative and is reproduced below, as provided by Patent Owner in the "Claim Appendix (Marked-Up)" appended to the Motion, which shows its differences with unpatentable claim 10.

49. (Proposed substitute for original claim 10) A capacitor, which comprises:

(a) an anode of tantalum [a valve metal];

(b) a cathode of ruthenium oxide; and

(c) an electrolyte activating the anode and the cathode, the electrolyte [comprising] consisting essentially of:

(i) a mixed solvent of water and ethylene glycol, wherein the water is present, by weight, up to about 85% and the ethylene glycol is present, by weight, up to about 95%;

(ii) a solute of [an] ammonium acetate present, by weight, up to about 50% [salt dissolved in the solvent];
and

(iii) a mixed [an] acid of acetic acid and phosphoric acid, wherein the acetic acid is present, by weight, up to about 80% and the phosphoric acid is present, by weight, up to about 6%.

Mot. 7. As can be seen above in claim 49, and which is also true for claims 50 and 51, the anode must be made of tantalum, and the electrolyte must include a solute of ammonium acetate and a mixed acid of acetic acid and phosphoric acid. Mot. 7–8. Additionally, in each of claims 49–51, “the electrolyte consisting essentially of” language “permit[s] inclusion [within the electrolyte] of components not listed in the claim, provided that they do not materially affect the basic and novel properties of the invention.” *AK Steel Corp. v. Sollac and Ugine*, 344 F.3d 1234, 1239 (Fed. Cir. 2003) (citations and internal quotation marks omitted).

B. Analysis

As the moving party, Patent Owner bears the burden of proof to establish that it is entitled to the relief requested. 37 C.F.R. § 42.20(c). Thus, the burden is not on Petitioner to prove that the proposed claims are unpatentable. Rather, Patent Owner must prove that they are patentable over prior art already of record and any additional material prior art made of record in the current proceeding pursuant to Patent Owner’s duty of candor under 37 C.F.R. § 42.11. See *MasterImage 3D, Inc. v. RealD Inc.*, No. IPR2015-00040, Paper 42, at 2–3 (PTAB July 15, 2015) (“*MasterImage 3D*”).

*1. Patent Owner Has Not Demonstrated That The
Proposed Claims Are Patentable Over The Prior Art*

Patent Owner's Motion states only the following with respect to patentability of the proposed claims:

V. THE SUBSTITUTE CLAIMS ARE PATENTABLE OVER THE ART

Substitute independent claims 49 to 51 are each directed to a capacitor comprising a tantalum anode and a ruthenium oxide cathode activated with aspects of the electrolytes set forth in independent claims 33 and 34. Claims 33 and 34 were determined to be valid over the prior art of record in the Decision dated May 8, 2015.

Mot. 6.

The premise on which the sole basis for patentability presented by Patent Owner in its Motion is based (i.e., that we have already determined that claims 33 and 34 are valid over the prior art of record) is an erroneous one. First, the Institution Decision does not address all "prior art of record" relevant to the Motion to Amend.⁴ Rather, it addresses only the art presented in the Petition and only the subset of that art asserted by Petitioner against claims 33 and 34. Second, we have not determined that any claim is "valid" over any prior art. Rather, and with respect to claims 33 and 34 in particular, what we determined in the Institution Decision was that Petitioner had not shown a reasonable likelihood of prevailing on either of the two

⁴ Prior art of record includes: "a. any material art in the prosecution history of the patent; b. any material art of record in the current proceeding, including art asserted in grounds on which the Board did not institute review; and c. any material art of record in any other proceeding before the Office involving the patent." *MasterImage 3D*, at 2.

grounds presented to challenge those claims. Inst. Dec. 13 (“Petitioner has not shown a reasonable likelihood that it would prevail in challenging claims 33 and 34 as anticipated by Hildegard.”), 14 (“On the record before us, Petitioner has not shown a reasonable likelihood that it would prevail in challenging claims 33 and 34 as obvious over Burger in view of Alwitt or Bernard.”). In particular, we noted that claims 33 and 34 include the transitional phrase “the electrolyte consisting essentially of” and determined that the Petition failed, in both grounds, to address whether inclusion of an additional component present in the asserted prior art electrolyte would affect the basic and novel properties of the inventions of claims 33 and 34. Inst. Dec. 13–14.⁵

In its Opposition, Petitioner argues that Patent Owner has not met its burden to prove claims 49–51 are patentable over the prior art of record and material prior art known to Patent Owner. Opp. 3–5. We agree with Petitioner. Unquestionably, the Motion to Amend does not show patentability of the proposed claims over any prior art, nor does it identify any additional material prior art not already of record in this proceeding.

⁵ Our Institution Decision includes a typographical error with respect to why we did not institute trial of claims 33 and 34 as anticipated by Hildegard. Wherein that Decision states that “Electrolyte B [of Hildegard] contains a component—chromic acid—that is not recited in claims 33 and 34,” we meant boric acid, not chromic acid, as is clear in Hildegard. *Compare* Inst. Dec. 12 (containing the typographical error), *with id.* at 10 (correctly describing components of Hildegard’s Electrolyte B and citing Ex. 1004, 2:42–57, 3:10).

Patent Owner belatedly provided some arguments for patentability for the first time in its Reply, but such arguments are untimely. *See* 37 C.F.R. § 42.23(b). Regardless, the arguments presented in the Reply are not persuasive. The Reply briefly summarizes several references cited in a contemporaneously filed Information Disclosure Statement (Ex. 2015), which Patent Owner had originally submitted to the Office on August 27, 1999, during the examination of the application from which the '222 patent issued. Reply 2–6. The Reply does not, however, discuss patentability of the claims over those references or identify what Patent Owner considers the closest prior art with respect to the proposed claims. In fact, the only prior art the Reply addresses in terms of patentability of the proposed claims is the combination of Evans I and Hildegard that Petitioner specifically raises in its Opposition. Reply 6–9. Even assuming this combination of references is the closest prior art, Patent Owner has not demonstrated that the proposed claims are patentable over them. Thus, Patent Owner has failed to carry its burden of establishing the patentability of the proposed substitute claims over all prior art of record.

*2. Patent Owner Has Not Demonstrated That The
Proposed Claims Are Patentable Over Evans I and
Hildegard*

Petitioner argues that the record demonstrates that claims 49–51 are unpatentable as obvious over Evans I and Hildegard. Opp. 5–8. Significantly, we have already determined, and Patent Owner has conceded, that claims 10–14, 28–32, 35, 36, 47, and 48 are unpatentable as obvious over these same references. PO Resp. 1 (“Patent Owner concedes that

claims 1 to 14, 25 to 32, 35, 36, 47 and 48 are unpatentable over Grounds 1 to 9 raised in the Petition.”). Claims 10–13 collectively include all of the limitations (or, in certain instances, narrower limitations) than those present in each of claims 49–51. The only material distinction is that claims 49–51 recite “the electrolyte consisting essentially of,” whereas claim 10 recites (and claims 11–13 incorporate) “the electrolyte comprising.”⁶

Before we address that distinction, we first address the prior art teachings of Evans I and Hildegard as applied to proposed claims 49–51.

a. Evans I

Evans I discloses a capacitor that has an anode made of tantalum, which meets the element (a) of each proposed claims 49–51. Ex. 1007, 5:31–37. The capacitor has a cathode that includes a metal body that may be titanium having a porous coating of ruthenium oxide, which meets the element (b) of each proposed claims 49–51. *Id.* at 5:37–41, 5:25–27, 5:6–15. Evans I also discloses an electrolyte in contact with the disclosed tantalum anode and ruthenium oxide-coated cathode, which meets the element (c) of each proposed claims 49–51 (but not sub-elements (i)–(iii)). *Id.* at 5:23–26.

⁶ In its Reply, Patent Owner asserts that there is a second distinction, stating: “Additionally, claims 49 to 51 include water, which is not present in [Hildegard’s] Electrolyte B.” Reply. 7. This is factually inaccurate, as Hildegard discloses an “aqueous solution” of ammonia in its Electrolyte B. Ex. 1004, 2:42–57, 3:10. In any event, Patent Owner has already admitted that Electrolyte B contains water by conceding, for example, that claim 5 (which requires water) is anticipated by Hildegard. PO Resp. 1.

b. Hildegard

Hildegard discloses electrolytes for use with capacitors. Ex. 1004, 1:14–15. In particular, it teaches an “Electrolyte B,” which discloses an electrolyte consisting of, by mass, 230 grams ammonia (25% aqueous solution), 410 grams of ethylene glycol, 93 grams of boric acid, 35 grams of phosphoric acid, and 231 grams of acetic acid. Ex. 1004, 2:42–57, 3:10.

Petitioner offers declaration testimony from Jan Petrzilek, Ph.D., that some of the acetic acid in Electrolyte B would react with the ammonia to form ammonium acetate. Ex. 1011 ¶ 19. Dr. Petrzilek, implying that some of the phosphoric acid also would react with the ammonia, testifies that not all of either the acetic acid or phosphoric acid would react with the ammonia, and, thus, some amount of those acids remain in Electrolyte B. Ex. 1011 ¶ 19. Dr. Petrzilek explains that this is because the molar amount of ammonia is lower than the molar amounts of those acids. *Id.* Thus, Dr. Petrzilek concludes that the final mixture of Electrolyte B necessarily includes ammonium acetate, acetic acid, and phosphoric acid. *Id.* We find Dr. Petrzilek’s testimony to be credible and persuasive.

The final mixture of Electrolyte B contains water “up to about 85%” and ethylene glycol “up to about 95%,” which meets element (c)(i) of each of proposed claims 49–51. Ex. 1004, 2:50–52. After the ammonia and acetic acid react, the resulting ammonium acetate would have to constitute less than about 50% of the electrolyte by weight, which meets element (c)(ii) of each of proposed claims 49–51. Ex. 1011 ¶ 19. After the ammonia reacts with both acids, some amount of each acid would remain, and such remaining amounts would be less than the maximum limits recited in

element (c)(iii) of each of proposed claims 49–51. Ex. 1011 ¶ 19; Pet. 26–27.

c. Evans I In View Of Hildegard

The Petition asserts, and we determine, that it would have been obvious to modify the capacitor of Evans I to substitute its electrolyte with Hildegard’s Electrolyte B as a mere substitution of a prior art element according to its established function. Pet. 43 (citing *KSR Int’l Co. v. Teleflex Inc.*, 550 U.S. 398, 401 (2007); Ex. 1011 ¶¶ 26–27). Indeed, Patent Owner conceded that this was an obvious modification. PO Resp. 1.

d. “the electrolyte consisting essentially of”

Hildegard’s Electrolyte B contains boric acid. Ex. 1004, 2:42–57, 3:10. Although it is not a listed component of the electrolytes of proposed claims 49–51, the presence of boric acid, is not necessarily outside the scope of those claims.

“The phrase ‘consisting essentially of’ . . . represents a middle ground between the open-ended term ‘comprising’ and the closed-ended phrase ‘consisting of.’” *AK Steel*, 344 F.3d at 1239. “In view of the ambiguous nature of the phrase, it has long been understood to permit inclusion of components not listed in the claim, provided that they do not ‘materially affect the basic and novel properties of the invention.’” *Id.* (citations omitted). Thus, proposed claims 49–51 would encompass inclusion of boric acid in the electrolyte, as taught in Hildegard, unless its inclusion would materially affect the basic and novel properties of the invention.

As the moving party, it is Patent Owner's burden to prove that its proposed claims are patentable over the prior art. To meet that burden with respect to Evans I and Hildegard, Patent Owner must prove that the boric acid in Electrolyte B would materially affect the basic and novel properties of Patent Owner's invention, such that it would be excluded from the electrolytes of proposed claims 49–51. In that regard Patent Owner asserts, without citation to Hildegard or any other evidence, that Hildegard “clearly assert[s]” that boric acid would have a material effect. Reply 8 (quoting Prelim. Resp. 17). We are not persuaded by this attorney argument.

Patent Owner further asserts that Burger (Ex. 1002)⁷ “teaches that borates in ethylene glycol ‘are also unsuitable for use in capacitors requiring highly conducting electrolytes as exemplified by the so-called wet slug type of capacitor where the anode consists of a sintered, porous block (the ‘slug’) of a film forming metal, usually tantalum.’” Reply 9 (quoting Prelim. Resp. 24–25 (quoting Ex. 1002, 1:12–16) (emphasis added initially in Prelim. Resp.)). Patent Owner does not explain, and we do not discern, how this teaching by Burger proves that including boric acid in the electrolytes of proposed claims 49–51 would materially affect the basic and novel properties of the claimed invention. In particular, Patent Owner does not identify the basic and novel properties of its claimed invention, explain why boric acid is purportedly unsuitable for use in the capacitor of Evans I, or

⁷ Burger refers to U.S. Patent No. 3,138,746 (June 23, 1964), which was cited in the Petition in certain non-instituted grounds of unpatentability.

discuss how such unsuitability relates to the unidentified basic and novel properties of Patent Owner's claimed invention.

V. CONCLUSION

Based on the information presented in the Petition and Patent Owner's concession, we determine claims 1–4 and 25–27 were anticipated by Burger, claims 5–9 were anticipated by Hildegard, and claims 10–14, 28–32, 35, 36, 47, and 48 would have been obvious over Evans I and Hildegard.

The Motion to Amend is denied because Patent Owner has not demonstrated that the proposed claims are patentable over the prior art of record, including, for example, the art raised by Petitioner in its Opposition (i.e., Evans I and Hildegard).

VI. ORDER

Accordingly, it is

ORDERED that claims 1–14, 25–32, 35, 36, 47, and 48 of U.S. Patent No. 6,219,222 B1 are unpatentable;

FURTHER ORDERED that the Motion to Amend is denied; and

FURTHER ORDERED that, because this Decision is final, a party to the proceeding seeking judicial review of the Decision must comply with the notice and service requirements of 37 C.F.R. § 90.2.

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