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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

Ex parte TATSUYA KANAMARU and TATSUYA UEHARA

Appeal 2018-006133
Application 13/715,271
Technology Center 1700

Before ROMULO H. DELMENDO, DONNA M. PRAISS, and
SHELDON M. MCGEE, *Administrative Patent Judges*.

DELMENDO, *Administrative Patent Judge*.

DECISION ON APPEAL

The Appellant¹ appeals under 35 U.S.C. § 134(a) from the Examiner's decision to reject claims 1–4, 6–8, 10, and 11.^{2, 3} We have jurisdiction under 35 U.S.C. § 6(b).

We affirm. For the reasons given below, however, we designate our affirmance as including a new ground of rejection pursuant to 37 C.F.R. § 41.50(b).

BACKGROUND

The subject matter on appeal relates to an electroconductive liquid resin composition, which is used as an adhesive or a sealing material for an electronic part (Specification filed December 14, 2012 (“Spec.”), 1, ll. 12–17). Representative claim 1 is reproduced from the Claims Appendix to the Appeal Brief, as follows:

1. An electroconductive liquid resin composition, comprising
 - (A) an epoxy resin having at least two epoxy groups in a molecule,
 - wherein the epoxy resin is at least one selected from the group consisting of phenol novolac epoxy resins, cresol novolac epoxy resins, bisphenol A epoxy resins,

¹ We use the word “Appellant” to refer to “applicant,” as defined in 37 C.F.R. § 1.42, which is listed as “SHIN-ETSU CHEMICAL CO., LTD.” (Application Data Sheet filed December 14, 2012, 4). The Appellant is also identified as the real party in interest (Appeal Brief filed November 14, 2017 (“Appeal Br.”), 1).

² See Appeal Br. 5–28; Reply Brief filed May 16, 2018 (“Reply Br.”), 1–15; Non-Final Office Action entered August 15, 2017 (“Non-Final Act.”), 2–8; Examiner’s Answer entered March 16, 2018 (“Ans.”), 3–12).

³ We heard oral arguments from the Appellant’s representative on September 19, 2019, a written transcript of which will be entered into the record when it is made available.

bisphenol F epoxy resins, biphenyl epoxy resins, phenolaralkyl epoxy resins, dicyclopentadiene epoxy resins, naphthalene epoxy resins, amino group-containing epoxy resins, multi-functional epoxy resins having one aromatic ring, and silicone-modified epoxy resins,

(B) *a phenolic resin that is a curing agent* in such an amount that an equivalent ratio of a phenolic hydroxy group of the phenolic resin to the epoxy group of the epoxy resin (A) ranges from 0.8 to 1.25,

wherein the components (A) and (B) are liquid at 25°C, and the curing agent consists essentially of the phenolic resin,

(C) a curing promoter in an amount of 0.05 to 10 parts by mass, per total 100 parts by mass of the components (A) and (B),

(D) an electroconductive filler in an amount of 300 to 650 parts by mass, per total 100 parts by mass of the components (A) and (B), and

(E) particles of a thermoplastic resin which is solid at 25°C in an amount of 3 to 50 parts by mass, per total 100 parts by mass of the components (A) and (B),

wherein a total of the amounts of components (D) and (E) is 700 parts by mass or less per 100 parts by mass of a total of the amounts of components (A) and (B),

the electroconductive liquid resin composition does not contain a solvent or a reactive diluent, and

when the composition is heated, an average particle diameter of the component (E) after heating becomes at least one and a half times an average particle diameter of the component (E) before the heating.

(Claims Appendix A-1–A-2 (emphases added)).

REJECTIONS ON APPEAL

The claims on appeal stand rejected under pre-AIA 35 U.S.C. § 103(a) as follows:

- A. Claims 1, 2, 4, 6–8, and 11 as unpatentable over Lin⁴ and Yoneda et al.⁵ (“Yoneda”); and
 - B. Claims 3 and 10 as unpatentable over Lin, Yoneda, and Honda et al.⁶ (“Honda”).
- (Ans. 3–12; Non-Final Act. 2–8).

DISCUSSION

Rejection A. The Appellant’s arguments focus only on claim 1 (Appeal Br. 5–27). Therefore, we confine our discussion to claim 1, which we select as representative pursuant to 37 C.F.R. § 41.37(c)(1)(iv). Claims 2, 4, 6–8, and 11 stand or fall with claim 1.

The Examiner finds that Lin describes a conductive adhesive composition including most of the limitations recited in claim 1, including a liquid epoxy resin component and a curing agent for the liquid epoxy resin component (Ans. 3–4). The Examiner acknowledges, however, that Lin does not disclose a liquid phenolic resin as the curing agent, although the reference teaches that the curing agent is selected based on the type of epoxy resin component (*id.* at 4, 8–9). To resolve this difference, the Examiner relies on Yoneda, which was found to teach a liquid phenolic resin as a preferred curing agent for a liquid epoxy resin in a solvent-free composition in which the liquid phenolic resin performs the same function as Lin’s curing agent and has good miscibility with the epoxy resin, making it a

⁴ US 4,581,158, issued April 8, 1986.

⁵ US 2010/0056730 A1, published March 4, 2010.

⁶ US 2009/0133833 A1, published May 28, 2009.

preferred curing agent (*id.* at 4–5). Based on these findings, the Examiner concludes:

A person of ordinary skill in the art would have been motivated to combine the liquid phenolic curing agent of Yoneda . . . with the resin composition of Lin in order to obtain a conductive resin composition including an effective curing agent which has good miscibility with the epoxy resin.

(*Id.* at 5).

Regarding the Examiner’s finding that Lin teaches selecting an appropriate curing agent based on the type of liquid epoxy resin, the Appellant argues that a person having ordinary skill in the art would not have had any reasonable expectation of success in combining Lin and Yoneda “because Lin allegedly teaches that the curing agent is chosen based on the particular epoxy, and Lin does not describe or suggest using a liquid phenolic resin in combination with the particular epoxies described in Lin” (Appeal Br. 16). According to the Appellant, “one of ordinary skill in the art would not have been motivated to have combined Lin and Yoneda, because doing so would result in a composition with adhesion that is significantly inferior to using the particular epoxy of Lin with the curing agent of Lin” (*id.*). The Appellant also contends that the subject matter recited in claim 1 would not have been obvious to a person having ordinary skill in the art in view of Lin and Yoneda because “[t]he evidence in the numerous Declarations submitted under 37 CFR § 1.132, in conjunction with the Examples and Comparative Examples in the specification, indicate that claim 1 achieves unexpected results over Lin and Yoneda” (*id.* at 5⁷).

⁷ The “numerous Declarations” are: (i) Declaration of Koichi Tsuda, who is an employee engaged in research and development at Shin-Etsu Chemical Co., Ltd., filed January 23, 2015 (“Tsuda Declaration I” or “Tsuda Decl. I”);

The Appellant’s arguments are not persuasive. We start with the Appellant’s argument regarding a lack of reasonable expectation of success as that argument relates to whether a prima facie case of obviousness has been established. We agree with the Examiner, (*see* Ans. 12), that the Appellant’s unsupported argument fails to establish that a person having ordinary skill in the art would not have had a reasonable expectation of success in combining Lin and Yoneda in the manner recited in claim 1. As an initial matter, it is well-settled that only a reasonable expectation—not absolute predictability—is required to establish obviousness. *In re O’Farrell*, 853 F.2d 894, 903–904 (Fed. Cir. 1988). But more importantly, Yoneda’s disclosure directly refutes the Appellant’s unsupported argument because Yoneda teaches that a liquid phenolic resin provided successful results when used as a curing agent for liquid epoxy resin in a similar composition as that disclosed in Lin (Yoneda ¶¶ 2, 10, 51–54). *See O’Farrell*, 853 F.2d at 904 (“The information in the Polisky reference, when combined with the Bahl reference provided such a reasonable expectation of success.”); *see also Regents of Univ. of Calif. v. Broad Institute, Inc.*, 903 F.3d 1286, 1294–95 (Fed. Cir. 2018) (approving the Board’s analysis based on factual findings that are relevant to success or failure in similar methods or products).

Next, we address the Appellant’s proffered secondary considerations evidence. We concur with the Examiner, (Ans. 9–10), that the showing is

(ii) Tsuda Declaration filed October 15, 2015 (“Tsuda Declaration II” or “Tsuda Decl. II”); (iii) Tsuda Declaration filed August 8, 2016 (“Tsuda Declaration III” or “Tsuda Decl. III”); and (iv) Tsuda Declaration filed December 29, 2016 (“Tsuda Declaration IV or Tsuda Decl. IV”) (*id.* at 7, 10–11, 14, and 22).

not commensurate in scope with the claims. *See In re Kao*, 639 F.3d 1057, 1068 (Fed. Cir. 2011) (“Evidence of secondary considerations must be reasonably commensurate with the scope of the claims.”), cited by the Appellant (Appeal Br. 25).

Although the Appellant is correct that not every embodiment within the scope of the claims must be tested (*id.*), the showing must provide “an adequate basis to support the conclusion that other embodiments falling within the claim will behave in the same manner.” *Kao*, 639 F.3d at 1068.

Here, the Tsuda Declarations rely largely on experiments that are limited to a composition comprising bisphenol-F having an epoxy equivalent of 160 and a viscosity of 1.5 Pa·s at 25°F as the epoxy resin, a liquid phenol novolac resin having a phenol equivalent of 141 and a liquid viscosity of 2.5 Pa·s at 25°F, a 2-phenyl-4-methyl-5-hydroxyimidazol curing promoter, a flaky silver powder with a weight average diameter of 6.1 μm, a “[m]ethyl polymethacrylate” thermoplastic resin, and a silane coupling agent (*see, e.g.*, Tsuda Decl. I at 1–2; Spec. 13–14, 16 (Table)). By contrast, claim 1 is significantly broader in scope because it recites a wide variety of epoxy resins having at least two epoxy groups, any phenolic resin, any curing promoter, any electroconductive filler, any solid thermoplastic polymer particles, and any additional unrecited components (Claims Appendix A-1). Although Tsuda Declaration IV provides two additional experiments using a different epoxy resin (p-aminophenol type liquid epoxy resin) and a different thermoplastic resin (vinyl chloride resin), those experiments—even when taken together with the experiments described in the Specification and Tsuda Declarations I–III—are not sufficiently comprehensive to support the broad scope of claim 1. Indeed, Tsuda Declaration IV itself demonstrates the

unpredictability in results by varying the identities in the epoxy resin or thermoplastic resin selected (Tsuda Decl. IV at 3). Under these circumstances, the proffered evidence is not commensurate in scope with claim 1.

Moreover, consistent with the Examiner's position, "the comparative tests do not represent the closest prior art" (Ans. 11). As the Examiner points out, "Yoneda teaches only three preferred curing agents, one of which is the liquid phenolic resin curing agent" (*id.* at 10). Indeed, Yoneda teaches a composition that can include the same components recited in claim 1 (Yoneda ¶¶ 2, 10, 51–54, 58–61, Table 2 (describing experiments in which the formulations contain bisphenol-A epoxy resin and phenol resin)). The Appellant does not direct us to evidence that establishes any results that would be considered unexpected over Yoneda, which we find to be the closest prior art. *Kao*, 639 F.3d at 1068 ("Where the offered secondary consideration actually results from something other than what is both claimed and *novel* in the claim, there is no nexus to the merits of the claimed invention."); *In re Baxter Travenol Labs.*, 952 F.2d 388, 392 (Fed. Cir. 1991) ("[W]hen unexpected results are used as evidence of nonobviousness, the results must be shown to be unexpected compared with the closest prior art.").

The Appellant appears to be arguing that Yoneda's disclosure is ineffective to establish obviousness because it does not appreciate the alleged unexpected results discovered by the Inventors in using a liquid phenolic resin as a curing agent for a liquid epoxy resin (Appeal Br. 12–13). That position is not tenable because, as we found above, Yoneda describes actual working examples of formulations in which a liquid phenolic resin is

used as a curing agent for a liquid epoxy resin (Yoneda ¶¶ 78, 81, Table 2). Because Yoneda's exemplified compositions also contain liquid phenolic resin, the prior art compositions would reasonably be expected to have the same or similar properties as those discovered by the Inventors. *Baxter Travenol*, 952 F.2d at 392 (“Here, the closest prior art was the Becker system, utilizing a DEHP primary bag. Mere recognition of latent properties in the prior art does not render non-obvious an otherwise known invention.”).

Our reviewing court, sitting *en banc*, “reaffirm[ed] that structural similarity between claimed and prior art subject matter . . . where the prior art gives reason or motivation to make the claimed compositions, creates a *prima facie* case of obviousness, and that the burden (and opportunity) then falls on an applicant to rebut that *prima facie* case.” *In re Dillon*, 919 F.2d 688, 692 (Fed. Cir. 1990) (*en banc*). Thus, “it is not necessary . . . that both a structural similarity between a claimed and prior art compound (or a key component of a composition) be shown and that there be a suggestion or expectation from *the prior art* that the claimed compound or composition will have the same or a similar [property] *as one newly discovered by applicant*.” *Id.* at 693.

For these reasons, we uphold Rejection A.

Rejection B. The Appellant relies on the same arguments offered against Rejection A, adding only that Honda does not cure the perceived deficiencies in the combination of the other references (Appeal Br. 27). Therefore, we sustain Rejection B for the same reasons given for Rejection A.

CONCLUSION

In summary:

Claims Rejected	Basis	Affirmed	Reversed	New Ground
1, 2, 4, 6–8, 11	§ 103(a) Lin, Yoneda	1, 2, 4, 6–8, 11		1, 2, 4, 6–8, 11
3, 10	§ 103(a) Lin, Yoneda, Honda	3, 10		3, 10
Overall Outcome	§ 103(a)	1–4, 6–8, 10, 11		1–4, 6–8, 10, 11

FINALITY AND RESPONSE

We designate our decision as including a new ground of rejection pursuant to 37 C.F.R. § 41.50(b), because we have relied on additional facts and reasoning in support of the obviousness conclusion. Our new ground of rejection designation preserves the procedural safeguards that must be afforded to the Appellant. *In re Leithem*, 661 F.3d 1316, 1319 (Fed. Cir. 2011) (“Mere reliance on the same statutory basis and the same prior art references, alone, is insufficient to avoid making a new ground of rejection when the Board relies on new facts and rationales not previously raised to the applicant by the examiner.”).

37 C.F.R. § 41.50(b) provides “[a] new ground of rejection pursuant to this paragraph shall not be considered final for judicial review.”

37 C.F.R. § 41.50(b) also provides that the Appellant, WITHIN TWO MONTHS FROM THE DATE OF THE DECISION, must exercise one of the following two options with respect to the new ground of rejection to avoid termination of the appeal as to the rejected claims:

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(1) *Reopen prosecution.* Submit an appropriate amendment of the claims so rejected or new evidence relating to the claims so rejected, or both, and have the matter reconsidered by the examiner, in which event the proceeding will be remanded to the examiner. . . .

(2) *Request rehearing.* Request that the proceeding be reheard under § 41.52 by the Board upon the same record. . . .

AFFIRMED; 37 C.F.R. § 41.50(b)