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EXAMINER
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BEFORE THE PATENT TRIAL AND APPEAL BOARD

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*Ex parte* HISATAKA MINAMI, RYOUTA SAISYO, JIN AMANOKURA,  
YUUHEI OKADA, and HIROSHI ONO

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Appeal 2017-003040  
Application 13/377,457  
Technology Center 1700

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Before ROMULO H. DELMENDO, LINDA M. GAUDETTE, and  
MICHAEL P. COLAIANNI, *Administrative Patent Judges*.

DELMENDO, *Administrative Patent Judge*.

DECISION ON APPEAL

The Applicants (“Appellants”)<sup>1</sup> appeal under 35 U.S.C. § 134(a) from the Primary Examiner’s final decision to reject claims 11, 13–15, 19, 28–31, 33, 40, 41, 43, 50, 51, 53, and 55–64.<sup>2, 3</sup> We have jurisdiction under 35 U.S.C. § 6(b).

We affirm.

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<sup>1</sup> The Appellants identify the real party in interest as “Hitachi Chemical Company, Ltd.” (Appeal Brief filed April 5, 2016 (“Appeal Br.”) 1).

<sup>2</sup> Appeal Br. 5–31; Reply Brief filed December 15, 2016 (“Reply Br.”), 2–12; Final Office Action entered September 9, 2015 (“Final Act.”), 2–30; Examiner’s Answer entered October 20, 2016 (“Ans.”), 2–41.

<sup>3</sup> Oral arguments were heard from the Appellants’ representative on January 17, 2019.

## I. BACKGROUND

The subject matter on appeal relates to a chemical mechanical polishing (CMP) method (Specification filed December 9, 2011 (“Spec.”), ¶¶ 1–2). According to the Appellants, “an object of the present invention [is] to provide a CMP polishing liquid for polishing palladium which, compared to the case using a conventional polishing liquid, allows to increase the polishing rate for a palladium layer and allows polishing at a stable polishing rate” (*id.* ¶ 15).

Representative claim 28 is reproduced from the Claims Appendix to the Appeal Brief, with key limitations emphasized, as follows:

28. A polishing method for a substrate whereby a substrate is polished with a polishing cloth while supplying a CMP polishing liquid between the substrate and the polishing cloth, wherein:
- the substrate is a substrate with a palladium layer on a side facing the polishing cloth,
  - the CMP polishing liquid is a CMP polishing liquid comprising an organic solvent, an amino acid, 1,2,4-triazole, a phosphorus acid compound, ***hydrogen peroxide as an oxidizing agent***, and an abrasive, ***the organic solvent being included in the CMP polishing liquid in an amount such that palladium-containing compounds generated during polishing are dissolved***, and ***the organic solvent comprising at least one kind selected from among a glycol, a glycol derivative and an alcohol***, and
  - wherein the organic solvent and the amino acid are chosen such that*** a solid produced in a solution obtained by dissolving 5 mg of palladium acetate in a mixture of 2.5 g of the organic solvent, 0.05 g of the amino acid and 2 g of water and standing for 1 day, is not greater than 0.1 mg, so as to inhibit reduction of palladium ion in the polishing liquid, during polishing, to palladium metal.

(Appeal Br. 33.)

## II. REJECTIONS ON APPEAL

The claims on appeal stand rejected as follows:

- A. Claims 28, 30, 31, 33, 40, 41, 43, 62, and 63 under pre-AIA 35 U.S.C. § 103(a) as unpatentable over De Rege Thesauro et al.<sup>4</sup> (referred to as “Brusic”);
- B. Claims 11, 13, 14, 19, 55, 57–59, and 61 under 35 U.S.C. § 103(a) as unpatentable over Brusic and Chelle et al.<sup>5</sup> (“Chelle”);
- C. Claims 15 and 56 under 35 U.S.C. § 103(a) as unpatentable over Brusic, Chelle, and Small et al.<sup>6</sup> (“Small”);
- D. Claim 29 under 35 U.S.C. § 103(a) as unpatentable over Brusic, and Small;
- E. Claims 50, 51, 53, and 54<sup>7</sup> under 35 U.S.C. § 103(a) as unpatentable over Brusic and de Rege Thesauro et al.<sup>8</sup> (referred to as “Thesauro”);
- F. Claim 60 under 35 U.S.C. § 103(a) as unpatentable over Brusic, Thesauro, and Chelle;
- G. Provisionally, claims 11, 13, 14, 19, 28, 30, 31, 33, 40, 41, 43, 50, 51, 53, and 57–64 under the judicially-created doctrine of

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<sup>4</sup> US 2004/0266196 A1, published December 30, 2004. The Examiner and the Appellants refer to this document by the second-named inventor’s last name, “Brusic” (Ans. 2; Appeal Br. 7). To avoid further confusion, we also refer to this document as “Brusic.”

<sup>5</sup> US 2009/0014415 A1, published January 15, 2009.

<sup>6</sup> US 2006/0234509 A1, published October 19, 2006.

<sup>7</sup> Claim 54 was canceled in an Amendment filed May 21, 2015. In addition, the Examiner discusses claim 64 under this rejection (Ans. 14), but the claim is not included in the statement of the rejection (*id.* at 11).

<sup>8</sup> US 2005/0211950 A1, published September 29, 2005.

obviousness-type double patenting as unpatentable over claims 6, 8, and 9 of Application 13/510,273 (“’273 Application”), which later issued as US 9,799,532 B2 to Minami et al. on October 24, 2017;

- H. Provisionally, claims 15, 29, 55, and 56 under the judicially-created doctrine of obviousness-type double patenting as unpatentable over claims 6, 8, and 9 of the ’273 Application in view of Chelle and Small;
- I. Claims 11, 13, 14, 19, 28, 30, 31, 33, 40, 41, 43, 50, 51, 53, and 57–64 under the judicially-created doctrine of obviousness-type double patenting as unpatentable over claims 1–9 of US 8,900,473 B2, issued to Minami et al. on December 2, 2014 (“’473 Patent”);
- J. Claims 15, 29, 56, and 57 under the judicially-created doctrine of obviousness-type double patenting as unpatentable over claims 1–9 of the ’473 Patent in view of Chelle and Small;
- K. Claims 11, 13, 14, 19, and 20 under the judicially-created doctrine of obviousness-type double patenting as unpatentable over claims 1, 2, 4, 10–15, 17, and 23–28 of US 8,889,555 B2, issued to Ono et al. on November 18, 2014 (“’555 Patent”) in view of Thesauro and Chelle;
- L. Claims 15, 55, and 56 under the judicially-created doctrine of obviousness-type double patenting as unpatentable over claims 1, 2, 4, 10–15, 17, and 23–28 of the ’555 Patent in view of Thesauro, Chelle, and Small;
- M. Claims 28, 30, 31, 33, 40, 41, 43, 50, 51, 53, and 57–64 under

the judicially-created doctrine of obviousness-type double patenting as unpatentable over claims 1, 2, 4, 10–15, 17, and 23–28 of the '555 Patent in view of Thesauro;

- N. Claims 29, 55, and 56 under the judicially-created doctrine of obviousness-type double patenting as unpatentable over claims 1, 2, 4, 10–15, 17, and 23–28 of the '555 Patent in view of Thesauro and Small;
- O. Claims 11, 13, 14, and 19 under the judicially-created doctrine of obviousness-type double patenting as unpatentable over claims 1, 7–13, 15, 21–27, 29, and 35–40 of US 8,859,429 B2, issued to Ono et al. on October 14, 2014 (“’429 Patent”);
- P. Claims 15, 55, and 56 under the judicially-created doctrine of obviousness-type double patenting as unpatentable over claims 1, 7–13, 15, 21–27, 29, and 35–40 of the '429 Patent in view of Thesauro, Chelle, and Small;
- Q. Claims 28, 30, 31, 33, 40, 41, 43, 50, 51, 53, and 57–64 under the judicially-created doctrine of obviousness-type double patenting as unpatentable over claims 1, 7–13, 15, 21–27, 29, and 35–40 of the '429 Patent in view of Thesauro; and
- R. Claims 29, 55, and 56 under the judicially-created doctrine of obviousness-type double patenting as unpatentable over claims 1, 7–13, 15, 21–27, 29, and 35–40 of the '429 Patent in view of Thesauro and Small.

(Ans. 2–41; Final Act. 2–30.)

### III. DISCUSSION

**Rejection A.** Although the Appellants provide arguments under various subheadings identified by certain claims, the arguments are substantially identical for all claims rejected on this ground (Appeal Br. 7–16). Therefore, we confine our discussion to claim 28, which we select as representative pursuant to 37 C.F.R. § 41.37(c)(1)(iv). As provided by this rule, claims 30, 31, 33, 40, 41, 43, 62, and 63 stand or fall with claim 28.

#### *The Examiner's Position*

The Examiner finds that Brusic describes a method for polishing a substrate (e.g., a substrate with a palladium layer) with a CMP polishing liquid that may be formulated by selection to contain the same compounds recited in claim 28 (Ans. 2–3). Regarding “the organic solvent comprising at least one kind selected from among a glycol, a glycol derivative and an alcohol” limitation recited in claim 28, the Examiner finds that Brusic would have suggested including an ethylene glycol in the polishing liquid, albeit as a chelating agent rather than as an organic solvent (*id.* at 2–3, 32). Regarding the hydrogen peroxide oxidizing agent limitation, the Examiner finds that although Brusic teaches that oxidizing agents other than hydrogen peroxide, which is disclosed as a known oxidizing agent, are superior, the reference nonetheless does not teach away from using hydrogen peroxide as it is demonstrated to work (*id.* at 3–4). Regarding the “wherein” property limitations recited in the claim, the Examiner explains that this “limitation is interpreted as a limitation on the specific components used” (*id.* at 31). The Examiner determines, therefore, that “because the components of Brusic applied in the rejection include those indicated by the instant [S]pecification as suitable components, they would pass the test” recited in the limitation

(*id.*). Alternatively, the Examiner determines that “it would have been obvious to choose the components of the polishing liquid to prevent precipitation of palladium salts (i.e. salts of the material being polished) because precipitates forming in the solution would redeposit on the surface of the substrate being polished” (*id.* at 3; *see also id.* at 31–32).

*The Appellants’ Contentions*

The Appellants contend that “neither Brusica nor the Examiner provide[s] any apparent reason why specific components [i.e., the phosphorus acid, amino acid, glycol, 1,2,4-triazole, and hydrogen peroxide] would have been selected from the lists disclosed in Brusica to polish palladium” (Appeal Br. 8). The Appellants also argue that Brusica’s paragraph 16 does not disclose hydrogen peroxide as an oxidizing agent and that, although Brusica’s paragraph 6 discloses hydrogen peroxide, the reference appears to disclose hydrogen peroxide as an inferior oxidizing agent (*id.* at 8–9). In addition, the Appellants argue that the Examiner has not established that the property limitations recited in claim 28’s “wherein” clause would be inherent or necessarily flow from the subject matter disclosed in Brusica (*id.* at 9–10). In the Appellants’ view, the Examiner’s reliance on the Appellants’ Specification to support the Examiner’s finding regarding the property limitations in the “wherein” clause is impermissible (*id.* at 11–12). The Appellants further emphasize that Brusica teaches the compounds listed in paragraph 21 (e.g., a glycol) as a chelating or complexing agent—not an organic solvent—and that Brusica does not provide any reason for an organic solvent to be included in the CMP polishing liquid in an amount such that the palladium-containing compounds generated during polishing are dissolved (*id.* at 11). Furthermore, referring

to certain examples (Examples 20, 22–24, and 36–42) and comparative examples (Comparative Examples 2–8) as well as the data reported for these examples and comparative examples in Tables 2–4 (Spec. ¶¶ 131, 141–142), the Appellants urge that the invention recited in claim 28 (or claim 40) provides unexpectedly superior results over the subject matter disclosed in Brusic (Appeal Br. 10–11, 15).

*Opinion*

The Appellants’ arguments fail to identify any reversible error in the Examiner’s rejection. *In re Jung*, 637 F.3d 1356, 1365 (Fed. Cir. 2011).

Brusic describes a method for polishing a substrate comprising:

(i) contacting a substrate comprising a noble metal layer with a CMP system comprising (a) a polishing component (an abrasive, a polishing pad, or, desirably, a combination thereof), (b) an oxidizing agent, and (c) a liquid carrier; and (ii) abrading at least a portion of the noble metal layer to polish the substrate (Brusic ¶¶ 9, 11). Brusic teaches that the noble metals on the substrate’s noble metal layer include, but are not limited to, various identified noble metals such as palladium (*id.* ¶ 18). Brusic also teaches that a pH buffering agent such as phosphates, which the current Specification states are included within the scope of “[p]hosphorus acid compounds” (Spec. ¶ 48), may be included in the polishing composition. Additionally, Brusic teaches that the CMP system optionally comprises *any suitable* chemical additive that enhances the substrate layer’s removal rate, including identified chelating or complexing agents such as di-, tri-, or polyalcohols (e.g., ethylene glycol) and amine-containing compounds (e.g., amino acids) (Brusic ¶ 21). According to Brusic, some of these compounds may perform more than one function (*id.* ¶ 22). As an optional corrosion inhibitor (i.e., a

film-forming agent), Brusic teaches including an organic compound containing a heteroatom-containing functional group (e.g., a triazole, preferably 1,2,4-triazole) (*id.* ¶ 23). Regarding the oxidizing agent, Brusic teaches that, for example, a certain amount (2.2 wt.%) of a specific oxidizing agent (NaClO<sub>4</sub>) exhibited an improvement in terms of removal rate over a certain amount (0.6 wt.%) of hydrogen peroxide, which was previously used in the prior art (*id.* ¶ 6), when iridium is the noble metal (*id.* ¶ 43 (Table 3)). Regarding the liquid carrier, Brusic teaches that the carrier may be a mixture of water and a suitable miscible solvent (*id.* ¶ 15). In this regard, Brusic focuses on improving the dissolution rate of the noble metal being abraded (*id.* ¶¶ 34–40). Therefore, a person of ordinary skill in the art would have understood that the liquid carrier must be formulated to dissolve the abraded noble metal particles.

Given Brusic’s teachings, we agree with the Examiner that a person having ordinary skill in the art would have formulated Brusic’s liquid polishing composition to contain the same compounds recited in claim 28 because all of these compounds are identified in Brusic as suitable components that would work together in an expected fashion. *KSR Int’l Co. v. Teleflex Inc.*, 550 U.S. 398, 421 (2007) (“obvious to try” finite number of identified, predictable solutions within the technical grasp of a person of ordinary skill); *Wm. Wrigley Jr. Co. v. Cadbury Adams USA LLC*, 683 F.3d 1356, 1364–65 (Fed. Cir. 2012) (“strong case of obviousness” where the combination of ingredients recited in the claims were based on selections from a finite number of identified, predictable solutions); *Merck & Co., Inc. v. Biocraft Labs., Inc.*, 874 F.2d 804, 807 (Fed. Cir. 1989) (“That the [reference] discloses a multitude of effective combinations does not render

any particular formulation less obvious.”); *In re Corkill*, 771 F.2d 1496, 1500 (Fed. Cir. 1985) (obviousness rejection of claims affirmed in light of prior art teaching that “hydrated zeolites will work” in detergent formulations, even though “the inventors selected the zeolites of the claims from among ‘thousands’ of compounds”); *In re Arkley*, 455 F.2d 586, 587 (CCPA 1972) (“[P]icking and choosing may be entirely proper in the making of a [§] 103, obviousness rejection.”); *In re Lemin*, 332 F.2d 839, 841 (CCPA 1964) (“Generally speaking, there is nothing unobvious in choosing ‘some’ among ‘many’ indiscriminately.”).<sup>9</sup>

The Appellants’ argument that Brusic discloses hydrogen peroxide as being an inferior oxidizing agent does not compel a conclusion of nonobviousness. Although Brusic demonstrates that the removal rate for iridium is higher for 0.6 wt.% hydrogen peroxide (4 Å/min) compared to, e.g., 2.2 wt.% of NaClO<sub>4</sub> (112 Å/min), such a disclosure falls short of a teaching away from using hydrogen peroxide, as the Examiner aptly points out (Ans. 31). To the extent that hydrogen peroxide might be considered inferior to other oxidizing agents in certain situations, the Appellants demonstrate no discovery beyond what would have been expected. *In re Gurley*, 27 F.3d 551, 553 (Fed. Cir. 1994); *see also In re Mouttet*, 686 F.3d 1322, 1333–34 (Fed. Cir. 2012) (“[J]ust because better alternatives exist in

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<sup>9</sup> *But see In re Baird*, 16 F.3d 380, 383 (Fed. Cir. 1994) (A “disclosure of millions of compounds does not render obvious a claim to three [unidentified] compounds, particularly when that disclosure indicates a preference leading away from the claimed compounds.”); *In re Jones*, 958 F.2d 347, 350 (Fed. Cir. 1992) (no obviousness conclusion where prior art reference disclosed a “potentially infinite genus of ‘substituted ammonium salts’” without listing the claimed salt).

the prior art does not mean that an inferior combination is inapt for obviousness purposes.”).

As for the property limitations recited in claim 28’s “wherein” clause, we are in complete agreement with the Examiner (Ans. 3, 31–32). The property in the “wherein” clause does not limit the relative amounts of any of the recited ingredients but merely the identities or suitabilities of the solvent (in any suitable amount) and the amino acid (in any suitable amount) that will be present together in the polishing liquid (Spec. ¶¶ 87–95; *see also, e.g., id.* ¶¶ 40–43, 85–86). Thus, when a glycol such as ethylene glycol and an amino acid are included in Brusic as the Examiner explains (Ans. 2–3),<sup>10</sup> the property limitations recited in the “wherein” clause would be satisfied because compounds and their respective properties are inseparable. *In re Dillon*, 919 F.2d 688, 697 (Fed. Cir. 1990) (en banc) (“[A] compound and all of its properties are inseparable and must be considered in the determination of obviousness.”); *id.* at 692–93 (Where the prior art gives reason or motivation to make or use the same composition recited in a claim, the burden and opportunity shifts to the applicant to rebut the prima facie case and the mere fact that the prior art does not explicitly disclose the same property discovered for the composition recited in a claim does not defeat that prima facie case.); *In re Kubin*, 561 F.3d 1351, 1357 (Fed. Cir. 2009) (“Even if no prior art of record explicitly discusses the [limitation], [applicant’s] application itself instructs that [the limitation] is not an additional requirement imposed by the claims on the [claimed invention], but rather a property necessarily present in [the claimed invention].”); *In re Wiseman*, 596 F.2d 1019, 1023 (CCPA 1979) (rejecting the appellants’

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<sup>10</sup> *In re Kerkhoven*, 626 F.2d 846, 850 (CCPA 1980).

argument that “a structure suggested by the prior art, and, hence, potentially in the possession of the public, is patentable to them because it also possesses an [i]nherent but hitherto unknown, function which they claim to have discovered”); *Ex parte Obiaya*, 227 USPQ 58, 60 (BPAI 1985) (“The fact that appellant has recognized another advantage which would flow naturally from following the suggestion of the prior art cannot be the basis for patentability when the differences would otherwise be obvious.”).

Regarding the Appellants’ argument that Brusnic would not have suggested including an organic solvent in an amount to dissolve the palladium-containing compounds generated during polishing, Brusnic explicitly teaches that the substrate’s metal layer may include suitable noble metals such as palladium (Brusnic ¶ 18), as we found above. In addition, although Brusnic teaches that an ethylene glycol may be included as a chelator or complexing agent, it would inherently function as a solvent because a compound and its properties are inseparable, consistent with Brusnic’s disclosure that the listed compounds may have more than one function (*id.* ¶¶ 21–22). In this regard, claim 28, properly construed, does not recite any amount limitation for the organic solvent. Most importantly, Brusnic’s objective is to improve dissolution rate (*id.* ¶ 34), and, therefore, a person having ordinary skill in the art would have understood that Brusnic’s polishing compositions including any amount of ethylene glycol would reasonably be expected to dissolve the abraded metal particles, although the dissolution *rate* would vary depending on the compositional makeup. In this regard, properly-construed claim 28, including the “wherein” clause, does not require any particular dissolution rate.

We find no persuasive merit in the Appellants' argument that the Examiner cannot rely on the Specification disclosure in analyzing whether the property recited in the claim confers patentability to the claim (Appeal Br. 11–12). The Examiner merely consulted the current Specification to determine what is encompassed by the claim reciting that property. Contrary to the Appellants' belief, such consultation of the Specification to determine the claim scope is permissible. *In re Thorpe*, 777 F.2d 695, 697 (Fed. Cir. 1985) (distinguishing the principle in *In re Wertheim*, 541 F.2d 257, 269 (CCPA 1976) that an applicant's own disclosure cannot be used to support a rejection absent an admission that the matter disclosed is prior art).

As for unexpected results, we find that the relied-upon evidence is insufficient for the reasons given by the Examiner (Ans. 32, 35–36). Specifically, the Appellants rely on Examples 36–42 (Spec. ¶ 141 (Table 3)) and Comparative Examples 2–8 (*id.* ¶ 142 (Table 4)) (Appeal Br. 10, 15). In addition, the Appellants refer to Examples 20 and 22–24 (Spec. ¶ 131 (Table 2)) (Appeal Br. 10, 15). The polishing compositions described in Examples 36–42 include 5 mass% phosphoric acid, 0.5 mass% 1,2,4-triazole, 2.5 mass% ethanol, and various amounts of lactic acid, malic acid, citric acid, or glycine (pH=1.5 or 2.0). But claim 28 does not recite any relative amounts for the specified ingredients and does not require phosphoric acid, ethanol, lactic acid, malic acid, citric acid, or glycine. Nor does the claim recite any pH. Furthermore, the phrase “substrate with a palladium layer” in claim 28 does not require the substrate or the palladium layer to be made exclusively of palladium. Under these circumstances, we are in complete agreement with the Examiner that the showing is not commensurate in scope with claim 28. *See, e.g., In re Grasselli*, 713 F.2d 731, 743 (Fed. Cir. 1983) (“With

respect to appellants' broad claims to a catalyst with 'an alkali metal,' the experiments detailed in Friedrich III, being limited to sodium only, are not commensurate in scope, and are, therefore, insufficient to rebut the prima facie case."').

As for Examples 20 and 22–24, the Appellants do not explain their significance relative to claim 28 and the prior art with any reasonable degree of specificity. Therefore, we do not find these examples to be persuasive evidence of nonobviousness. *See In re Klosak*, 455 F.2d 1077, 1080 (CCPA 1972) (explaining that the burden of analyzing and explaining data to support an argument of unexpected results rests on the party asserting it).

Moreover, the Appellants do not direct us to objective evidence that a person having ordinary skill in the art would have considered the results in the Specification evidence to be unexpected in view of the relied-upon prior art references. In this regard, a mere difference in results does not suffice to establish unexpected results. *In re Harris*, 409 F.3d 1339, 1344 (Fed. Cir. 2005) ("The 32–43% increase in stress-rupture life . . . does not represent a 'difference in kind' that is required to show unexpected results."').

For these reasons, and those given by the Examiner, we uphold the Examiner's rejection as maintained against claim 28.

**Rejection B.** Chelle, which is further cited, strengthens the Examiner's obviousness conclusion (e.g., as to claim 11). Like Brusic, Chelle teaches that the substrate may comprise palladium (Chelle ¶ 96). According to Brusic, any suitable oxidizing agent (e.g., peroxides) may be used (*id.* ¶ 70). Furthermore, Chelle teaches adding an acid such as phosphoric acid to control the pH to between about 1.5 to about 3 (*id.* ¶ 51). In addition, Chelle teaches that the diluent (solvent) is preferably aqueous

but that about 10% to about 100% of the water may be replaced with an organic solvent such as a glycol (*id.* ¶¶ 73–75). These teachings provide additional evidence that the compounds selected in the Appellants’ claims are conventional, known options within the ordinary skilled artisan’s technical grasp and would have been expected to provide successful results. *KSR*, 550 U.S. at 421 (“If [the pursuit of known options] leads to the anticipated success, it is likely the product not of innovation but of ordinary skill and common sense.”).

The Appellants further rely on Examples 31–35 (Spec. ¶ 141 (Table 3)). Those examples are similar to Examples 36–42 but include propylene glycol monopropyl ether, propylene glycol monoethyl ether, propylene carbonate, ethyl lactate, or ethyl acetate as the organic solvent and omit an amino or organic acid. These examples, however, suffer from the same or similar deficiencies as Examples 36–42 discussed above.

For these reasons, we sustain Rejection B as well.

**Rejection C.** The Appellants rely on the same arguments offered in support of claim 11 (Appeal Br. 20–21), which we found unpersuasive. Therefore, we sustain this rejection for the same reasons.

**Rejection D.** The Appellants rely on the same arguments offered in support of claim 28 (*id.* at 21–22), which we found unpersuasive. Therefore, we also sustain Rejection D.

**Rejection E.** The Appellants offer the same or similar arguments submitted for previously-discussed claims (*id.* at 22–25), which we found unpersuasive. Therefore, we sustain Rejection E.

**Rejection F.** The Appellants offer the same or similar arguments submitted for previously-discussed claims (*id.* at 25–26), which we found unpersuasive. Therefore, we sustain Rejection F.

**Rejections G and H (Provisional Double Patenting Based on ’273 Application Claims).** Rejections G and H were entered provisionally because they were based on obviousness-type double patenting over the then-copending ’273 Application. The ’273 Application, however, has undergone further prosecution and has now issued as US 9,799,532 B2, issued October 24, 2017 (’532 Patent). Under these circumstances, we decline to reach the issues raised in these rejections. *Ex parte Jerg*, <https://www.uspto.gov/sites/default/files/ip/boards/bpai/decisions/inform/fd2011000044.pdf> (citing *Ex parte Moncla*, 95 USPQ2d 1884 (BPAI 2010)).

In the event of continued examination, the Appellants and the Examiner should revisit the viability of these rejections as may be applicable to the claims that issued in the ’532 Patent.

**Rejections I and J (Double Patenting Based on ’473 Patent Claims).** The Examiner finds that claim 1 of the ’473 Patent describes every limitation recited in claim 11 on appeal except for the specified organic solvent (carbonic acid ester, a carboxylic acid ester, and/or a glycol derivative) (Ans. 18). To resolve this difference, the Examiner relies on *Chelle* (*id.*). With respect to claim 28, which also requires an amino acid, the Examiner again relies on *Chelle* (*id.* at 19).

The Appellants argue that neither the ’473 Patent claims nor *Chelle* would have suggested the “the amount of organic solvent as in the present claims, with advantages thereof” (Appeal Br. 29). With respect to claim 28, the Appellants argue that neither the ’473 Patent claims nor *Chelle* “would

have suggested the choosing of the organic solvent and amino acid/organic acid with no primary hydroxyl group, based upon requirements as in the present claims, with advantages thereof as recited in the claims.” (*id.* at 29–30).

These arguments are unpersuasive for the reasons given by the Examiner (Ans. 40–41). In addition, the Appellants do not direct us to any objective evidence (e.g., comparative experiments) showing that the inclusion of the specified organic solvent or the amino acid in any amount provides any advantage, let alone an unexpected result.

For these reasons, we uphold Rejections I and J.

**Rejections K–R (Double Patenting Rejections Based on the ’555 Patent Claims or ’429 Patent Claims).** The Appellants argue that the claims of the ’555 Patent or the ’429 Patent relate to polishing of copper, not a substrate with a palladium layer (Appeal Br. 27). Furthermore, the Appellants argue that the claims of the ’555 Patent or the ’429 Patent do not require an organic solvent, much less an organic solvent in an amount to dissolve the palladium-containing compounds generated during polishing (*id.*). Furthermore, the Appellants argue that the claims of the ’555 Patent or the ’429 Patent would not have suggested choosing an organic solvent and an amino acid/organic acid with no primary hydroxyl group and the advantages thereof (*id.* at 27–28). Finally, the Appellants argue that Chelle would not have suggested including an amount of organic solvent to dissolve the palladium-containing compounds and advantages thereof (*id.* at 29).

These arguments are not persuasive to identify any reversible error in the rejections. Although the ’555 Patent claims are directed to polishing copper, both Thesauro and Chelle provide a reasonable expectation that the

polishing liquids claimed in the '555 Patent would be useful to polish substrates that comprise some unspecified amount of palladium (e.g., Thesauro ¶ 38). As for the organic solvent, the Appellants fail to take account of Chelle, which suggests replacing some or all of water with an organic solvent (Chelle ¶ 75). Furthermore, contrary to the Appellants' belief, the claims on appeal do not recite any particular amount for the organic solvent nor any degree of dissolution of the palladium-containing compounds. The claims of the '555 Patent and the '429 Patent include an inorganic acid such as phosphoric acid, which would inherently function to dissolve oxidized metal such as palladium ('473 Patent, col. 4, ll. 1–6). *In re Baxter Travenol Labs.*, 952 F.2d 388, 390 (Fed. Cir. 1991) (“[E]xtrinsic evidence may be considered when it is used to explain, but not expand, the meaning of a reference.”).

For these reasons and those given by the Examiner, we sustain Rejections K–R.

#### IV. SUMMARY

Rejections A through F and I through R are sustained. Rejections G and H are dismissed. Therefore, the Examiner's final decision to reject claims 11, 13–15, 19, 28–31, 33, 40, 41, 43, 50, 51, 53, and 55–64 is affirmed.

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

AFFIRMED