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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

Ex parte DIRK BOLLEN, NICOLAS VRIAMONT, and JOHAN LOCCUFIER

Appeal 2018-004128
Application 14/895,067
Technology Center 1700

Before DONNA M. PRAISS, JAMES A. WORTH, and SHELDON M. MCGEE, *Administrative Patent Judges*.

PRAISS, *Administrative Patent Judge*.

DECISION ON APPEAL[1]

Pursuant to 35 U.S.C. § 134(a), Appellant[2] appeals from the Examiner's decision to reject claims 16–32. We have jurisdiction under 35 U.S.C. § 6(b). We REVERSE.

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[1] In this Decision we refer to the Specification filed Dec. 1, 2015 ("Spec."), the Final Office Action dated Jan. 30, 2017 ("Final Act."), the Appeal Brief filed Aug. 28, 2017 ("Appeal Br."), the Examiner's Answer dated Jan. 9, 2018 ("Ans."), and the Reply Brief filed Mar. 8, 2018 ("Reply Br.").

[2] We use the word "Appellant" to refer to "applicant" as defined in 37 C.F.R. § 1.42. Appellant identifies the real party in interest as Agfa-Gevaert. Appeal Br. 2.

STATEMENT OF THE CASE

The invention relates to metallic nanoparticle dispersions, methods of preparing such dispersions, and printing and coating fluids made from these dispersions. Spec. 1:7–9. According to the Specification, metallic nanoparticle dispersions have unique properties that make them of interest for printed electronics, electrochemical, optical, magnetic, and biological applications. *Id.* at 1:17–23.

Independent claim 16, reproduced below from the Claims Appendix to the Appeal Brief, is illustrative of the subject matter on appeal (emphasis added).

> 16. A metallic nanoparticle dispersion comprising:
>
> metallic nanoparticles; and
>
> *an inorganic acid or a compound that generates the inorganic acid during curing of the metallic nanoparticle dispersion; wherein*
>
> *the inorganic acid or the compound that generates the inorganic acid is present in an amount less than 50 µmol/g metal*.

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 the positions of both Appellant and the Examiner, we are persuaded of

reversible error in the Examiner's rejections. Each rejection is addressed below.

Rejection 1: Obviousness of Claims 16–19, 21–24, and 28–32

The Examiner rejects claims 16–19, 21–24, and 28–32 under 35 U.S.C. § 103 over the combination of Harada[3] and Qiu[4] for the reasons provided on pages 3–7 of the Final Action. The Examiner acknowledges that Harada does not disclose an inorganic acid or a compound that generates the inorganic acid during curing, wherein the inorganic acid or compound that generates the inorganic acid is present in an amount of less than 50 μmol/g metal as required by claim 1. Final Act. 3. The Examiner finds that Qiu teaches adding HCl to a silver nanoparticle dispersion and controlling the ratio of silver to HCl for controlling the particle size of the silver nanoparticles. *Id*. at 4 (citing Qiu Abstract, ¶ 191). The Examiner determines that it would have been obvious to modify Harada by adding HCl and to optimize the ratio of silver to HCl because Qiu teaches that controlling the ratio of silver to HCl allows for control of the particle size of the silver nanoparticles. *Id.*

We are persuaded by Appellant's argument (Appeal Br. 4–5) that the Examiner reversibly erred in rejecting independent claim 1 because the Examiner's reason for combining Harada and Qiu does not have a rational underpinning to support it. In particular, Appellant points out that Harada is concerned with the electrical conductivity of its dispersions whereas Qiu, on

[3] US 2009/0321689 A1, published Dec. 31, 2009.
[4] US 2008/0181931 A1, published July 31, 2008.

the other hand, is directed to adding silver nanoparticles to contact lenses to provide antimicrobial properties. *Id*. at 4 (citing Qiu ¶ 9; Harada ¶ 17). Appellant also contends that the combination of Qui and Harada would result in a dispersion containing HCl in an amount far greater than claimed and an amount that would not have been suitable for Harada's intended purpose. *Id*. at 5. Appellant directs us to the molar ratio of silver to HCl taught by Qiu, which Appellant calculates would be at least 9,000 μmol/g metal, as well as the Specification, which discloses that the conductivity of a metallic nanoparticle dispersion decreases as the concentration of HCl increases. *Id*. (citing Qiu ¶ 184; Spec. ¶¶ 119, 121).

In the Answer, the Examiner finds that "it is generally known in the art that particle size and conductivity are correlated," and controlling particle size is important to Harada, and therefore a skilled artisan would have consulted Qiu's teaching that the ratio of HCl to metal particles affects particle size. Ans. 12–13. The Examiner further finds that both Qiu and Appellant's claims are directed to metal nanoparticle dispersions. *Id*. at 13. Regarding the amount of HCl used in Qiu's dispersions exceeding the claimed amount, the Examiner dismisses Appellant's argument on the basis that the teaching is from an example in Qiu. *Id*. at 13. The Examiner also dismisses Appellant's argument that conductivity is decreased with high HCl concentration as not being supported by sufficient evidence and on the basis that Qiu teaches optimizing the ratio of HCl to metal particles to control particle size. *Id*. at 13–14.

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). A

determination of unpatentability on a ground of obviousness, however, "cannot be sustained by mere conclusory statements; instead, there must be some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness.'" *KSR Int'l Co. v. Teleflex, Inc.*, 550 U.S. 398, 418 (2007) (quoting *In re Kahn*, 441 F.3d 977, 988 (Fed. Cir. 2006)). If the Examiner's burden is met, the burden then shifts to 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).

Although the Examiner has identified a reason to combine Qiu's teaching with Harada, that reason does not explain why a person having skill in the art at the time of the invention would have sought to modify the particle size in Harada's nanoparticle dispersion. The Examiner's unsupported finding that particle size correlates to conductivity does not adequately explain what that correlation is and how that finding would influence any modification of Harada's nanoparticle suspension. Similarly, the Examiner's finding that Qiu discloses a relationship between the ratio of HCl to metal particles and particle size does not adequately explain how that correlation would be applied to the teachings of Harada, i.e. whether the particle size would decrease with increased HCl concentration, whether decreased particle size is a desired modification from the prior art teachings, and whether the amount of HCl added to Harada's nanoparticle suspension would meet the claim requirement of less than 50 μmol/g metal. Without a clear benefit to Harada's nanoparticle suspension, there is no reasonable basis for modifying Harada's suspension in the same manner as a

nanoparticle particle suspension for contact lenses. Therefore, the Examiner's reason for the proposed combination of Harada with Qiu is not sufficient to support the legal conclusion of obviousness over Harada and Qiu.

Accordingly, we reverse the Examiner's rejection of claims 16–19, 21–24, and 28–32 under 35 U.S.C. § 103 over the combination of Harada and Qiu.

Rejection 2: Obviousness of Claim 20

The Examiner rejects claim 20 under 35 U.S.C. § 103 over the combination of Harada and Qiu as applied to claim 16 and further in view of Hinotsu[5] for the reasons provided on pages 7–8 of the Final Action.

Because the Examiner's reliance on Hinotsu does not cure the deficiency of the combination of Harada and Qiu for the reasons discussed above in connection with claim 16, we likewise reverse the Examiner's rejection of claim 20 under 35 U.S.C. § 103.

Rejections 3 and 4: Obviousness of Claims 25–27

The Examiner rejects claims 25 and 26 over the combination of Tomonari[6] with Qiu under 35 U.S.C. § 103 for the reasons provided on pages 8–9 of the Final Action. The Examiner finds that Tomonari teaches a method of making a metal particle solution where the solvent can be N-methylacetamide, which reads on Formula I of claim 25, and an inorganic

[5] US 2013/0153835 A1, published June 20, 2013.
[6] US 2007/0098608 A1, published May 3, 2007.

acid is added, however Tomonari does not teach the claimed amount of inorganic acid required by claim 25. Final Act. 8–9 (citing Tomonari ¶¶ 16, 18, 20, 22, 25). The Examiner determines that it would have been obvious to one of ordinary skill in the art to optimize the ratio of metal to inorganic acid in the method taught by Tomonari to control the particle size of the metal nanoparticles in view of Qiu. *Id*. at 9.

We are persuaded by Appellant's arguments and evidence that the Examiner's combination of Tomonari with Qiu based on the same rationale for combining the teachings of Harada and Qiu also is not sufficient to support the legal conclusion of obviousness over Tomonari and Qiu. As discussed above in connection with the rejection of claim 16, the Examiner's reason for modifying the prior art nanoparticle suspension with the teachings of Qiu does not explain why a person having skill in the art at the time of the invention would have sought to modify the particle size in the prior art nanoparticle dispersion. The Examiner's unsupported finding that particle size correlates to conductivity does not adequately explain what that correlation is and how that finding would influence any modification of Harada's nanoparticle suspension. Similarly, the Examiner's finding that Qiu discloses a relationship between the ratio of HCl to metal particles and particle size does not adequately explain how that correlation would be applied to the teachings of Tomonari, i.e. whether the particle size would decrease with increased HCl concentration, whether decreased particle size is a desired modification from the prior art teachings, and whether the amount of HCl added to Tomonari's nanoparticle suspension would meet the claim requirement of less than 50 μmol/g metal. Without a clear benefit to Tomonari's nanoparticle suspension, there is no reasonable basis for

modifying Tomonari's suspension in the same manner as a nanoparticle particle suspension for contact lenses.

Accordingly, we reverse the Examiner's rejection of claims 25 and 26 under 35 U.S.C. § 103 over the combination of Tomonari and Qiu.

Claim 27 stands rejected over the combination of Tomonari and Qiu further in view of Hinotsu for the reasons provided on page 10–11 of the Final Action. Because the Examiner relies on the same combination of Qiu with Tomonari to teach the claimed amount of inorganic acid present in an amount of less than 50 mol/g metal (Final Act.10–11), we likewise reverse the rejection of claim 27 for the same reasons discussed above in connection with claims 25 and 26.

CONCLUSION

In summary:

Claims Rejected	Basis	Affirmed	Reversed
16–19, 21–24, 28–32	§ 103 Harada and Qiu		16–19, 21–24, 28–32
20	§ 103 Harada, Qiu, and Hinotsu		20
25, 26	§ 103 Tomonari and Qiu		25, 26
27	§ 103 Tomonari, Hinotsu, and Qiu		27
Overall Outcome			16–32

REVERSED