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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

Ex parte FRANK MERSCH and UWE WILKENHOENER

Appeal 2018-009000
Application 14/563,595
Technology Center 1700

BEFORE CATHERINE Q. TIMM, JAMES C. HOUSEL, and
JEFFREY R. SNAY, *Administrative Patent Judges*.

HOUSEL, *Administrative Patent Judge*.

DECISION ON APPEAL¹

STATEMENT OF THE CASE

Pursuant to 35 U.S.C. § 134(a), Appellant² appeals from the Examiner's decision to reject claims 1–11 under 35 U.S.C. § 112(a) as failing to comply with the written description requirement. We have jurisdiction under 35 U.S.C. § 6(b).

¹ An oral hearing in this appeal was conducted on January 27, 2020. A copy of the transcript from this hearing will be made of record in due course.

² We use the word Appellant to refer to “applicant” as defined in 37 C.F.R. § 1.42(a). Appellant identifies the real party in interest as Kronos International, Inc. Appeal Brief (“Appeal Br.”) filed April 16, 2018, p. 1.

We REVERSE.³

CLAIMED SUBJECT MATTER

The claims are directed to a composite pigment containing calcium phosphate. Spec. ¶ 2.

Claim 1, reproduced below from the Claims Appendix to the Appeal Brief, is illustrative of the claimed subject matter:

1. A composite pigment containing calcium phosphate, comprising:
 - titanium dioxide pigment particles having an average primary particle size from about 200 nm to about 400 nm;
 - precipitated, particulate crystalline calcium phosphate in quantities of at least about 10% by weight, referred to the composite pigment; and
 - wherein the precipitated calcium phosphate has a particle size of at least about 0.2 μm .

REFERENCES

Appellant's arguments rely on the following prior art:

Name	Reference	Date
Gerhard Auer et al., <i>Pigments, Inorganic, 2. White Pigments</i> , in ULLMANN'S ENCYCLOPEDIA OF INDUSTRIAL CHEMISTRY P, 1–41 (2011). ("Auer")		
S. Wiechers et al., <i>Titanium Dioxide Particle Size vs. Sun Protection Performance</i> , in 5 COSMETICS & TOILETRIES 128, 332–339 (May 2013). ("Wiechers")		

³ Our Decision additionally refers to the Specification ("Spec.") filed Dec. 8, 2014, the Examiner's Answer ("Ans.") dated July 27, 2018, and the Reply Brief ("Reply Br.") filed Sept. 21, 2018.

OPINION

The sole issue before us in this appeal is whether there is adequate written description support in the original disclosure, including the Specification and drawings, that reasonably conveys that Appellant was in possession of a composite pigment containing titanium dioxide pigment particles of average *primary* particle size from about 200 nm to about 400 nm. During prosecution before the Examiner, Appellant introduced the term “primary” into claim 1 in order to distinguish over the prior art. Appeal Br. 4–5. In particular, Appellant wished to distinguish between the recited titanium dioxide pigment from photocatalytic titanium dioxide by reciting the size of the primary pigment particles. *Id.* at 5. The Examiner rejected claim 1 and its dependent claims on the basis that Appellant’s original disclosure fails to provide support for the average titanium dioxide particle size referring to “primary” particles.

After review of the Examiner’s and Appellant’s opposing positions and the appeal record before us, we determine that Appellant’s arguments are sufficient to identify reversible error in the Examiner’s written description rejection. *In re Jung*, 637 F.3d 1356, 1365 (Fed. Cir. 2011). Accordingly, we reverse the stated rejection for substantially the reasons set forth in the Appeal and Reply Briefs.

There is no dispute that the Specification fails to provide literal written descriptive support for the term “primary” in the recitation, “titanium dioxide pigment particles having an average *primary* particle size from about 200 nm to about 400 nm” in claim 1. *Compare* Appeal Br. 3, *with* Ans. 3. However, Appellant argues that one of ordinary skill in the art would understand that the expressly recited particle size range for the titanium

dioxide pigment particles refers to the primary particle size rather than agglomerate particle size. Appeal Br. 3. In particular, Appellant contends that Figures 1 and 2 depict both primary particles as well as agglomerates along with a scale such that the ordinary artisan would be able to determine that the primary particles fall within the size range recited in claim 1. *Id.* at 3–4.

Appellant asserts that the drawings provide scanning electron microscope images that have a scale permitting primary particles, whether alone or part of an agglomerate, to be measured. Appeal Br. 5. Appellant asserts that the Declaration under 37 C.F.R. § 1.132 of Frank Mersch (“Declaration” or “Decl.”) filed April 12, 2017, explains how one skilled in the art would have been able to use known mathematical equations and the visible crystal lengths in these drawings to determine the average size of the primary particles. *Id.* Further, Appellant urges that doing so establishes that the primary particles have sizes within the recited 200–400 nm range, whereas the agglomerates are all larger than 400 nm. *Id.* Appellant contends, therefore, that the drawings clearly convey to one of ordinary skill in the art that the recited average particle size range is directed to primary particles. *Id.*

Moreover, Appellant contends that the prior art informs those skilled in the art that the relevant pigment particle size range would be describing primary pigment particles. Appeal Br. 4. Appellant first directs attention to Wiechers as disclosing a similar determination of the average primary particle size of titanium dioxide pigment by statistically analyzing the primary particles visible in transmission electron microscopy images. *Id.* at

6. Appellant also asserts that Auer teaches that other techniques are used to measure the overall size of agglomerates, rather than primary particles. *Id.*

Appellant further directs attention to the Specification which teaches that the composite particles preferably contain the pigment in ideally dispersed form, which a skilled artisan would understand to mean in a form without agglomerates of the pigment particles. Appeal Br. 6, citing Spec. ¶ 29. Appellant urges that this teaching indicates that the recited particle size range necessarily refers to primary particles and not to agglomerates. *Id.*

Additionally, Appellant argues that under Mie's theory, a pigment has an ideal primary particle size that is one-half the wavelength of visible light, which corresponds to a primary particle size range of about 200–400 nm. Appeal Br. 7, citing Decl. ¶ 7, Wiechers 332. Appellant states Wiechers experimentally demonstrated this theory, that visible light scattering became stronger as primary particle size increased to within this ideal range, and that titanium dioxide agglomerates formed from primary particles smaller than this ideal range do not have a significant impact on visible light scatter. *Id.* at 8, citing Wiechers 338. Appellant thus contends that the skilled artisan would necessarily understand the underlying theory that a pigment's ability to reflect visible light is based on the size of the primary pigment particles, rather than the presence or size of any agglomerates. *Id.*

Still further, Appellant contends that Auer supports the reference to the size of the pigment particles as primary particles. Appeal Br. 9. Appellant asserts that although Auer simply refers to the particle size of the titanium dioxide pigment particles, it is clear that Auer is referring to primary pigment particles. *Id.*, citing Auer §§ 2.3.1, 2.5, 2.8, 2.9, and 3.2.1. Moreover, Appellant asserts that Nonami (US 2004/0171505 A1, published

Sept. 2, 2004), cited during prosecution before the Examiner, also refers to the size of primary particles simply as “particle size,” but distinguishes agglomerates by referring to these particles as microparticles or secondary particles. *Id.*, citing Nonami ¶¶ 68, 76, 89, 109. Appellant similarly asserts that Sanbayashi (US 2002/0160910 A1, published Oct. 31, 2002) also refers to primary particles when discussing the “average particle size.” *Id.* at 9–10, citing Sanbayashi ¶¶ 3, 48.

Finally, Appellant urges that the Examiner acknowledges that there is no evidence of record that suggests that a skilled artisan would use “particle size” of titanium dioxide pigment to refer to anything other than primary particle size. Appeal Br. 10. Therefore, Appellant argues that those skilled in the art would only understand the original disclosure in this case to be referring to the primary particle size when disclosing the average particle size of the titanium dioxide pigment particles. *Id.*

Appellant’s arguments are persuasive. We begin by noting that the Examiner fails to address or otherwise respond to Appellant’s evidence including Auer, Nonami, and Sanbayashi. As Appellant argues, this evidence supports Appellant’s position that those skilled in the art would only understand the original disclosure in this case to be referring to the primary particle size when disclosing the average particle size of the titanium dioxide pigment particles. The Examiner also fails to address Appellant’s assertion that Specification paragraph 29 further supports that the titanium dioxide pigment particles of claim 1 are primary particles.

Indeed, not only does the Specification teach in a preferred embodiment that the pigment, i.e., the titanium dioxide pigment particles, are in “ideally dispersed form,” this dispersed form is contrasted with a

“flocculated” or agglomerated form. Spec. ¶ 29. The Specification also teaches that the calcium phosphate particles, which can be both primary particles and particle agglomerates, are larger than the titanium dioxide pigment particles. *Id.* ¶ 24.

The Examiner raises a concern that it is not possible to clearly identify single primary particles of titanium dioxide in Appellant’s drawings as these drawings are two-dimensional, and many of the particles therein have sizes less than 200 nm. Ans. 4. The Examiner submits that the only way to identify the size of the particles in the drawings is through the scale because no mathematical equation was disclosed. Ans. 5. However, the Examiner fails to explain in any detail or otherwise support why it is not possible to identify single primary particles or determine the size of these particles. We note that Figures 1 and 2 are SEM images that are two-dimensional images of three-dimensional space. As Appellant explains, the single primary particles would have the shape as shown in Annex II. *See Decl. Annex II.* One skilled in the art would readily recognize that only some of the single primary particles in Figures 1 and 2 would be visible in profile, while others would be at various oblique angles to this profile. Those single particles visible in profile in both Figures 1 and 2 appear to have lengths that fall within the range recited in claim 1.

With regard to Appellant’s assertion that Mie’s theory supports Appellant’ position, the Examiner submits that this theory does not mean that pigment particles with a primary particle size of larger or smaller size do not exist. Ans. 5–6. However, claim 1 recites that the titanium dioxide pigment particles have “an *average* primary particle size from about 200 nm to about 400 nm.” Claim 1 (emphasis added). As such, the presence of

primary pigment particles above or below this range is not excluded as this range is recited as the *average* primary particle size.

In rejecting a claim under 35 U.S.C. § 112(a) for lack of adequate descriptive support, it is incumbent upon the Examiner to establish that the originally-filed disclosure would not have reasonably conveyed to one having ordinary skill in the art that Appellant had possession of the now claimed subject matter. *Ariad Pharms., Inc. v. Eli Lilly & Co.*, 598 F.3d 1336, 1351 (Fed. Cir. 2010) (en banc). Adequate description under 35 U.S.C. § 112(a) does not require literal support for the claimed invention. *Purdue Pharma L.P. v. Faulding, Inc.*, 230 F.3d 1320, 1323 (Fed. Cir. 2000) (“In order to satisfy the written description requirement, the disclosure as originally filed does not have to provide *in haec verba* support for the claimed subject matter at issue.”); *In re Herschler*, 591 F.2d 693, 701 (CCPA 1979); *In re Edwards*, 568 F.2d 1349, 1351–52 (CCPA 1978); *In re Wertheim*, 541 F.2d 257, 262 (CCPA 1976). Rather, it is sufficient if the originally-filed disclosure would have conveyed to one having ordinary skill in the art that Appellant had possession of the concept of what is claimed. *In re Anderson*, 471 F.2d 1237, 1242 (CCPA 1973).

Here, Appellant has presented extensive evidence that one of ordinary skill in the art would have understood that the recited titanium dioxide pigment particles are primary particles having the recited size range, and the Examiner has failed to address much of this evidence. We are, therefore, persuaded that a preponderance of the evidence supports Appellant’s view that those skilled in the art would have readily understood that the recited particle size range necessarily refers to primary particles and not to

agglomerates. Accordingly, we do not sustain the Examiner’s written description rejection of claims 1–11.⁴

CONCLUSION

Upon consideration of the record, and for the reasons given above and in the Appeal and Reply Briefs, the decision of the Examiner rejecting claims 1–11 under 35 U.S.C. § 112(a) as failing to comply with the written description requirement is *reversed*.

DECISION SUMMARY

In summary:

Claims Rejected	35 U.S.C. §	Basis	Affirmed	Reversed
1–11	112(a)	Written Description		1–11

REVERSED

⁴ Although we determine there is support under 35 U.S.C. § 112(a) for “primary,” because the term is not used in the Specification, there is a basis for objecting to the Specification to compel Appellant to amend the Specification to provide proper antecedent basis for the added claim term. *See* MPEP § 608.01(o) (providing the reasons for so objecting to the specification and reproducing the form paragraph for such an objection). The Examiner and Appellant should consider resolving the issue of lack of antecedent basis on return of the case to the jurisdiction of the Examiner.