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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

Ex parte NIKOLA ANASTASIJEVIC, JEAN-PAUL NEPPER,
MARTIN KOENEKE, DIRK LOHRBERG, TOM MARTTILA, and
HENRI VIRTANEN

Appeal 2018-006758
Application 10/589,592
Technology Center 1700

Before ADRIENE LEPIANE HANLON, CATHERINE Q. TIMM, and
JAMES C. HOUSEL, *Administrative Patent Judges*.

HOUSEL, *Administrative Patent Judge*.

DECISION ON APPEAL

STATEMENT OF THE CASE

Pursuant to 35 U.S.C. § 134(a), Appellant¹ appeals from the
Examiner's decision to finally reject claims 1–5, 7, 8, 11–22, and 34–41. We
have jurisdiction under 35 U.S.C. § 6(b).

¹ 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 Outotec Oyj. Appeal Brief (“Appeal Br.”) filed June 21, 2017, p. 1.

We REVERSE.²

CLAIMED SUBJECT MATTER

The claims are directed to a process for electrodepositing copper. Spec. 1, Title. The invention relates to a process for electrochemical winning or refining of copper by electrodepositing copper from an electrolyte solution containing ionogenic copper. Spec. 1:5–6. The electrolyte is passed through an electrolysis plant comprising at least one electrolytic cell having a tank for receiving the electrolyte solution, and at least two electrodes immersed in the solution by hanger bars and serving as anode and cathode alternately arranged at a distance from each other. *Id.* at 1:6–10. According to Appellant, the invention achieves a sufficiently uniform deposition of copper on the cathodes at electrode immersion depths of more than 1.2 m, resulting in greater copper production per cathode and reduced costs per ton of extracted copper. *Id.* at 4:1–10.

Claim 34, reproduced below from the Claims Appendix to the Appeal Brief, is illustrative of the claimed subject matter (the limitation at issue is italicized):

A process for electrodepositing copper from an electrolyte solution containing the metal in ionogenic form, the process comprising:

passing an electrolyte through an electrolysis plant comprising at least one electrolytic cell having an electrolyte tank for receiving the electrolyte which includes at least one electrode serving as an anode and at least one electrode serving

² Our Decision additionally refers to the Specification (“Spec.”) filed August 15, 2006, the Examiner’s Answer (“Ans.”) dated April 19, 2018, and Appellant’s Reply Brief (“Reply Br.”) filed June 18, 2018.

as a cathode, the electrodes being alternately arranged at a distance from each other;

immersing, during operation of the electrolysis, the at least one cathode into the electrolyte over a length of at least 2 meters; and

obtaining one meter by one meter copper sheets from the at least one cathode by at least one of a stripping operation, a bending operation and a mechanical separation.

REFERENCES

The prior art relied upon by the Examiner is:

Name	Reference	Date
Morin	US 2,443,112	June 8, 1948
Billett	US 3,530,047	Sept. 22, 1970
Andersen et al. ("Andersen")	US 4,098,668	July 4, 1978
Gensini et al. ("Gensini")	US 5,651,024	July 22, 1997
Anastasijevic et al. ("Anastasijevic")	US 5,679,240	Oct. 21, 1997
Hiai et al. ("Hiai")	US 5,865,967	Feb. 2, 1999
Virtanen et al. ("Virtanen")	US 6,342,136 B1	Jan. 29, 2002
Juric et al. ("Juric")	US 2003/0173214 A1	Sept. 18, 2003
Anastasijevic et al. ("Nikola") ³	DE 19940698 A1	Mar. 8, 2001

REJECTIONS

The Examiner maintains, and Appellant requests our review of, the following grounds of rejection under 35 U.S.C. § 103(a):

- 1) Claims 1–5 and 7 as unpatentable over Anastasijevic in view of Virtanen, Morin, and Billett;

³ Without objection, the Examiner refers to this reference as "Nikola," in reference to the first name of the first named inventor.

- 2) Claim 8 as unpatentable over Anastasijevic in view of Virtanen, Morin, and Billett, and further in view of Juric;
- 3) Claims 11 and 12 as unpatentable over Anastasijevic in view of Virtanen, Morin, and Billett, and further in view of Nikola;
- 4) Claims 13–17 as unpatentable over Anastasijevic in view of Virtanen, Morin, and Billett, and further in view of Gensini;
- 5) Claims 18–21 as unpatentable over Anastasijevic in view of Virtanen, Morin, Billett, Nikola, and Gensini, and further in view of Andersen;
- 6) Claim 22 as unpatentable over Anastasijevic in view of Virtanen, Morin, and Billett, Nikola, Gensini, and further in view of Hiai; and
- 7) Claims 34–41 as unpatentable over Anastasijevic in view of Billett.

OPINION

The dispositive issue before us in this appeal is whether the record supports the Examiner’s determination that Anastasijevic teaches or suggests cathode immersion depths substantially greater than one meter, including the recited immersion depth of at least two meters. After review of the Examiner’s and Appellant’s opposing positions and the appeal record before us, we determine that Appellant’s arguments and evidence are sufficient to identify reversible error in the Examiner’s obviousness rejections. *In re Jung*, 637 F.3d 1356, 1365 (Fed. Cir. 2011). In particular, we hold that the Examiner failed to properly treat Appellant’s 37 C.F.R. § 1.132 Declaration⁴ as an expert opinion declaration. Accordingly, we reverse the stated

⁴ Declaration of Nikola Anastasijevic under 37 C.F.R. § 1.132 (“Declaration” or “Decl.”) filed February 19, 2016.

rejections for substantially the reasons set forth in the Appeal and Reply Briefs.

The Examiner finds, in relevant part, that Anastasijevic's cathode is immersed into the electrolyte over a length of at least one meter during electrolysis operation. Ans. 2. In support of this finding, the Examiner cites Anastasijevic's teachings that the electrodes have a height of at least one meter (which the Examiner finds includes lengths greater than one meter such as two meters) and the electrodes are at least partially immersed into the electrolyte. *Id.* at 2–3. In addition, the Examiner finds that Anastasijevic's electrodes extend at least one half of their surface area into the electrolytic bath. *Id.* at 20. Therefore, the Examiner concludes that it would have been obvious to determine the optimum length of the electrode to be immersed into the electrolyte by routine experimentation. *Id.* at 3.

On the other hand, Appellant argues that one of ordinary skill in the art would not have understood Anastasijevic as disclosing that immersion lengths greater than one meter would have been possible. Appeal Br. 4, 11. Instead, Appellant contends that Anastasijevic teaches that electrode lengths may be greater than one meter, but does not disclose that immersion lengths may be greater than one meter. *Id.* Appellant asserts that, “in order to effectively obtain copper in a stripping operation following electrolysis, it is necessary to obtain a uniform current distribution along the length of the cathodes.” *Id.* at 10–11, citing Spec. 2:12–15. Appellant further asserts that “[b]ecause it was known that the uniformity of the current distribution is, in particular, increasing by decreasing immersion length, experts believed, at the time of the present invention, that the maximally immersed surface area into the electrolyte should be no greater than 1 meter x 1 meter.” *Id.* at 11,

citing Spec. 2:16–24 and 3:29–33. Therefore, Appellant contends that experts in the art expected cathode immersion lengths greater than one meter would necessarily result in a non-uniform current distribution at the electrodes. *Id.* Appellant urges that this expectation is further supported by the fact that copper melting furnaces at the time of the invention were adapted for a maximum 1 m by 1 m copper sheet. *Id.* Given this expectation, Appellant argues that it was surprising to find that it was possible to obtain a uniform deposition of copper on the cathodes with immersion lengths of 1.2 meters or more. *Id.*, citing Spec. 3:29–4:10 and Decl. ¶ 5.

The Examiner determines that the Declaration is insufficient because it fails to establish, alone or in combination with the results disclosed in the Specification, unexpected results commensurate in scope with the claims. Ans. 18–19. In particular, the Examiner explains that Appellant failed to present a comparison of a sufficient number of tests of immersion lengths both inside and outside the recited range of at least about 2 meters. *Id.*

However, Appellant contends that the Examiner failed to consider the Declaration and accord it appropriate weight in assessing whether there would have been an expectation of success in providing immersion lengths greater than one meter. Appeal Br. 4; Reply Br. 2. We agree. The Declaration does not attempt to establish that the results in the recited range are unexpectedly better than the results below this range, as the Examiner treats it. Rather, we find that the Declaration demonstrates that those skilled in the art did not have a reasonable expectation that immersion lengths greater than one meter would yield a successful result. As such, Appellant’s arguments are persuasive of reversible error.

In this regard, although factual evidence is preferable to opinion testimony, such testimony is entitled to consideration and some weight so long as the opinion is not on the ultimate legal conclusion at issue. While an opinion as to a legal conclusion is not entitled to any weight, the underlying basis for the opinion may be persuasive. *In re Chilowsky*, 306 F.2d 908, 916, (CCPA 1962); *In re Lindell*, 385 F.2d 453, 456 (CCPA 1967) (Although an affiant's or declarant's opinion on the ultimate legal issue is not evidence in the case, "some weight ought to be given to a persuasively supported statement of one skilled in the art on what was not obvious to him.").

Here, we find that the Declaration sets forth an expert opinion as to the expectations of those skilled in the art regarding electrode immersion lengths in copper electrolysis, in particular that immersion lengths greater than one meter would not have been expected to produce a successful result. The Examiner erred in treating the Declaration, not as an expert opinion of the expectations of those skilled in the art, but as an attempt to demonstrate unexpected results for the recited range as compared to shorter immersion lengths.

Moreover, when properly weighed with the Specification and Anastasijevic, we are persuaded that there is insufficient evidence in the record before us to rationally underpin the conclusion that one of ordinary skill in the art would have found it obvious to modify Anastasijevic's process by immersing the cathodes to an immersion length of at least two meters as recited in both independent claims 1 and 34. *In re Kahn*, 441 F.3d 977, 988 (Fed. Cir. 2006) ("[R]ejections on obviousness grounds 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.”), *quoted with approval in KSR Int’l Co. v. Teleflex Inc.*, 550 U.S. 398, 418 (2007).

There is no dispute that Anastasijevic discloses that electrode lengths may be over one meter, that at least half the surface area of the electrodes may be immersed, and that the electrodes are at least partially immersed. Were this the only evidence regarding immersion lengths, we might reasonably conclude that immersion lengths greater than one meter would have been obvious to those skilled in the art. However, the Declaration sets forth that experts expected that cathode immersion lengths greater than one meter would necessarily result in a non-uniform current distribution at the electrodes. Decl. ¶ 3. Appellant discloses that the state of the art expected that the uniformity of the current distribution increases with decreasing width and, particularly, length of the immersed electrode. Spec. 2:15–19. Due to this expectation, the standard practice was to maximally immerse one meter square cathodes. *Id.* at 2:21–23; Decl. ¶ 4. Thus, the declarant was surprised that it was possible to obtain uniform copper deposition on the cathodes with immersion lengths of 1.2 meters or more. Decl. ¶ 5; *see also* Spec. 3:29–4:5. Indeed, Appellant found that copper quality achieved was independent of cathode size. Spec. 13:30–32.

Thus, Appellant’s Specification and the Declaration establish, by a preponderance of the evidence, that there was an expectation in the art that electrode immersion lengths greater than one meter would not have been successful. A reasonable expectation of success is required to establish a *prima facie* case of obviousness. *In re Droge*, 695 F.3d 1334, 1338 (Fed. Cir. 2012) (“Obviousness does not require absolute predictability of success . . . all that is required is a reasonable expectation of success.”) (citing *In re*

Kubin, 561 F.3d 1351, 1360 (Fed. Cir. 2009)); *see also In re O’Farrell*, 853 F.2d 894, 903–04 (Fed. Cir. 1988) (“For obviousness under § 103, all that is required is a reasonable expectation of success.”). The Examiner has not directed our attention to any evidence either rebutting Appellant’s evidence of a lack of an expectation of success or otherwise establishing that electrode immersion lengths greater than one meter were known. Absent a reasonable expectation of success, we cannot say that the Examiner has carried the burden of establishing that the claimed processes would have been prima facie obvious to those of ordinary skill in this art. *In re Oetiker*, 977 F.2d 1443, 1445 (Fed. Cir. 1992) (During examination, the Examiner bears the initial burden of presenting a prima facie case of obviousness.)

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 1–5, 7, 8, 11–22, and 34–41 under 35 U.S.C. § 103(a) as unpatentable over Anastasijevic in combination with Billett alone, or further combined with Morin, Virtanen, Juric, Nikola, Gensini, Andersen, and Hiai, is *reversed*.

DECISION SUMMARY

In summary:

Claims Rejected	35 U.S.C. §	References/Basis	Affirmed	Reversed
1–5, 7	103(a)	Anastasijevic, Morin, Virtanen, Billett		1–5, 7

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8	103(a)	Anastasijevic, Morin, Virtanen, Billett, Juric,		8
11, 12	103(a)	Anastasijevic, Morin, Virtanen, Billett, Nikola		11, 12
13–17	103(a)	Anastasijevic, Morin, Virtanen, Billett, Gensini		13–17
18–21	103(a)	Anastasijevic, Morin, Virtanen, Billett, Nikola, Gensini, Andersen		18–21
22	103(a)	Anastasijevic, Morin, Virtanen, Billett, Nikola, Gensini, Hiai		22
34–41	103(a)	Anastasijevic, Billett		34–41
Overall Outcome				1–5, 7, 8, 11–22, 34–41

REVERSED