

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

BEDRA INC., BERKENHOFF GMBH,
and POWERWAY GROUP CO. LTD.,
Petitioners,

v.

KI-CHUL SEONG,
Patent Owner.

IPR2018-01415
Patent 8,822,872 B2

Before CARL M. DeFRANCO, CHRISTOPHER G. PAULRAJ, and
RYAN H. FLAX, *Administrative Patent Judges*.

FLAX, *Administrative Patent Judge*.

REHEARING DECISION
Denying Patent Owner's Request for Rehearing
37 C.F.R. § 42.71(d)

I. INTRODUCTION

Ki-Chul Seong (“Patent Owner”) is the first-named inventor and owner of U.S. Patent 8,822,872 B2 (“the ’872 patent”). Bedra Inc., Berkenhoff GmbH, and Powerway Group Co. Ltd. (“Petitioner”) filed a Petition requesting *inter partes* review of claims 1–13 and 15 of the ’872 patent (claim 14 was not included). Paper 1 (“Pet.”). After a trial on the merits, we issued a Final Written Decision holding that Petitioner had shown the challenged claims to be unpatentable by a preponderance of the evidence. Paper 26 (“Final Decision”). Patent Owner filed a Request for Rehearing of that Final Decision. Paper 27 (“Request for Rehearing” or “Req. Reh’g”). For the reasons set forth herein, we deny Patent Owner’s Request for Rehearing.

II. STANDARD OF REVIEW

A party requesting rehearing of a Board decision has the burden to show that the decision should be modified. Pursuant to 37 C.F.R. § 42.71(d), the rehearing request must identify, specifically, all matters the party believes the Board misapprehended or overlooked, and the place where each matter was previously addressed in a motion, an opposition, or a reply. When rehearing a decision on a petition, we review the decision for an abuse of discretion. 37 C.F.R. § 42.71(c). An abuse of discretion may arise if a decision is based on an erroneous interpretation of law, if a factual finding is not supported by substantial evidence, or if an unreasonable judgment is made in weighing relevant factors. *In re Gartside*, 203 F.3d 1305, 1315–16 (Fed. Cir. 2000).

III. DISCUSSION

Patent Owner asserts essentially one issue it believes the Board should reconsider in its Final Decision that is determinative of whether Petitioner carried its burden of showing the claimed invention of the '872 patent would have been obvious. Throughout its Request for Rehearing, Patent Owner asserts that we incorrectly concluded that the prior art reference Tomalin¹ discloses an embodiment (Example 1) where three materials are present on a wire's surface (i.e., ϵ brass alloy, γ brass alloy, α brass alloy).

Patent Owner first argues that Tomalin's Example 1 expressly limits the only disclosed wire to two materials, and so it does not disclose three materials in a "grain." Req. Reh'g 1. Patent Owner next argues that the complete absence of any mention of epsilon phase material, despite more than 30 references to gamma phase material in Tomalin's Example 1 and Example 2 wire coatings, further supports that only two materials are present in the Example 1 wire. *Id.* at 4. Patent Owner next argues that Figure 9 of Tomalin does not apply to the EDM wire disclosed in Figure 4 of Tomalin. *Id.* at 7. Patent Owner finally argues that epsilon material is not present in the Tomalin Example 1 EDM wire inherently or otherwise. *Id.* at 11.

None of Patent Owner's arguments is persuasive. Patent Owner does not identify any issues or evidence that we did not fully consider in rendering our Final Decision.

To summarize the conclusions in our Final Decision of import, the evidence of record, most notably Tomalin itself (Ex. 1003), the declaration of Petitioner's expert witness (Ex. 1002, "Tomalin Declaration"), and the

¹ U.S. Patent No. 5,945,010 (issued Aug. 31, 1999) (Ex. 1003, "Tomalin").

deposition of Patent Owner's expert witness (Ex. 1029, "Medlin Deposition"), establishes that the electro-discharge machining (EDM) wires disclosed in Tomalin's Examples 1 and 3 were very similar or essentially the same. The only difference between these two Examples was that the sequence of the annealing and drawing steps performed on the wire during its manufacture was switched, where the Example 3 wire was drawn *before* annealing and the Example 1 wire was drawn *after* annealing, causing the former to be smooth-surfaced and the later to have a cracked surface. Final Decision 11–16, 39–55 (citing Ex. 1003, Abstract, 3:60–4:9, 6:37–47, 8:1–67, 10:38–43, 12:4–31, Figs. 2–6, 9; Ex. 1029, 69:12–70:12, 130:22–25). Thus, changing the sequence of the annealing and drawing steps resulted in the surface composition of the wire in each example being different.

We found that the evidence of record supports the conclusion that the heating steps (parameters) for annealing and the starting wires were the same for these two Examples, except for Example 1's wire having more zinc coating initially (which would result in its retaining an ϵ brass material on its surface). *Id.* at 44–45, 49–50 (citing Ex. 1003, 8:1–67, 10:38–43; Ex. 1029, 69:12–70:12, 130:22–25, 163:9–17). We further concluded that Tomalin's Example 3, because it was drawn before annealing, was shown to have a smooth, un-cracked surface composed of ϵ brass, with an underlying layer of γ brass and an α brass core. *Id.* at 13–14 (citing Ex. 1003, 4:6–9, 5:54–57, 10:38–49, Figs. 5, 6). We further concluded that Tomalin's Figure 9, which shows a step-wise distribution of ϵ , γ , and α brass in a wire *after annealing*, accurately depicted the Tomalin Example 3 wire's final form, again, because the wire was drawn *before* annealing (the anneal process creates the ϵ and γ

alloys from the α brass core and overlying pure zinc). *Id.* at 15–16, 41–43 (citing Ex. 1003, 5:49–57, 5:63–64, 8:61–67, 12:4–40, Fig. 9; Ex. 1002 ¶ 71).

We further concluded that Tomalin’s Example 1 wire, because it had an annealing step *followed* by a drawing step, was shown to have a cracked surface composed of grains of ϵ , γ , and α brass where that drawing step cracks the ϵ brass surface and underlying γ layer to expose the α brass core (ϵ and γ brass was formed in the anneal, just as in Example 3, but the subsequent drawing cracks these layers and exposes the underlying α brass). *Id.* 14–15, 43, 48–52 (citing Ex. 1003, 5:47–53, 6:43–47, 8:58–67, Figs. 2–4; Ex. 1029, 69:12–70:12, 75:13–24, 76:2–11, 130:22–25 149:1–3, 150:21–151:4, 179:22–180:3, 182:16–183:3, 189:23–190:3). Therefore, we concluded, Tomalin’s Figure 9 accurately depicts the Example 1 wire’s intermediate form after annealing and before drawing, again, because the starting materials of Examples 1 and 3 were the same and because the annealing parameters of Examples 1 and 3 were the same. *Id.* 14–15, 43–52 (citing Ex. 1003, 5:47–53, 6:37–53, 8:58–9:6, 12:4–40, Figs. 2–4; Ex. 1002 ¶¶ 71–82, 98; Ex. 1029, 155:5–156:10, 162:19–163:8).

Finally, we concluded that after its drawing step, the wire of Tomalin’s Example 1 would retain ϵ brass on its surface, along with the γ brass exposed in cracks therethrough and along with α brass exposed in cracks through both of these uppermost materials (ϵ and γ brass), leaving a finished wire with all three materials (ϵ , γ , and α brass) at its surface as *grains* (groupings), as claimed. *See, e.g.*, Ex. 1029, 105:25–106:17, 152:7–11, 182:2–15; 189:18–190:3 (“Q. It’s more likely that there is going to be

epsilon in [Tomalin's] Specimen 1 than Specimen 3; correct? A. Based on those assumptions and the calculations we went through, I agree with that statement, it's more likely if there is but for some reason it's not explained [in Tomalin.]); *see also* Final Decision 22–30 (interpreting “grain”).

As illustrated by the portions of the record identified above, our conclusions were supported by Tomalin, *inter alia*, where it expressly indicates that its Figure 9 data relates to the wires of its Figures 3 and 4, which show the wire of Example 1. *See, e.g.*, Ex. 1003, 5:49–64, 8:61–62, 12:4–40. Our conclusions are supported by the statements of Dr. Tomalin, Petitioner's expert witness and the named inventor of the Tomalin reference, who explained his prior art patent as teaching such a three-material surface of an EDM wire. *See, e.g.*, Ex. 1002 ¶¶ 53, 71–82, 98–100. And, these conclusions are supported by the testimony of Patent Owner's expert witness, Dr. Medlin, who confirmed that such a result would necessarily, inherently, occur. *See, e.g.*, Ex. 1029, 69:12–70:12, 75:13–24, 76:2–11, 130:22–25, 139:25–140:4, 149:1–3, 150:21–151:4, 155:5–156:10, 162:19–163:17, 179:22–180:3, 182:16–183:3, 189:23–190:3.

We address each of Patent Owner's specific arguments below.

Regarding Patent Owner's argument that Tomalin's Example 1 expressly limits the only disclosed wire to two materials, and so it does not disclose three materials in a “grain” (Req. Reh'g 1), the preponderance of evidence of record does not support Patent Owner's position.

We have identified above that our conclusions in the Final Decision on this issue are well supported in the evidence of record. Contrary to Patent Owner's assertions, nowhere does Tomalin “expressly” limit the materials

on the surface of its Example 1 wire to two materials. *See, e.g.*, Paper 25 (“Hr’g Tr.”), 25:7–12 (Patent Owner’s counsel conceding that Tomalin “didn’t say it [Example 1] has no epsilon”). Although we agree that Tomalin’s Example 1 was most focused on achieving an EDM wire with an α brass core and a cracked γ brass layer over that core exposing the core through its cracks, Tomalin never expressly indicates that this embodiment does not also include regions of ϵ brass at its surface, and the evidence of record establishes that the surface of the EDM wire in this embodiment would inherently have ϵ brass regions. *See supra* cites to Final Decision and evidence of record. In fact, although Tomalin does express that its processing steps of Example 1 are designed to foreclose having any β brass (another brass alloy) on its wire’s surface, to the contrary, it expresses that it is “certainly not objectionable” to have ϵ brass on its wire’s surface. Ex. 1003, 8:46–52, 12:20–25.

We are not persuaded by Patent Owner’s argument that the complete absence of any mention of epsilon phase material, despite more than 30 references to gamma phase material in Tomalin’s Examples 1 and 2 wire coatings, further supports only two materials being present in the Example 1 wire (Req. Reh’g 4). Regardless of how many times Tomalin indicates its Example 1 includes γ brass, this does nothing to diminish the fact that such a wire would also inherently include ϵ brass. Patent Owner’s own expert witness confirmed ϵ brass would necessarily be present, along with the γ and α brass in Tomalin’s example 1. *See supra* citations to record.

Regarding Patent Owner’s argument that Figure 9 of Tomalin does not apply to the EDM wire disclosed in Tomalin’s Figure 4 (Req. Reh’g 7),

we have explained, above, that the evidence of record supports that Tomalin's Figure 9 *does* apply to the EDM wire of Tomalin's Example 1 and its Figures 3 and 4, specifically to an intermediate stage of the wire's production. *See supra* citations to Final Decision and evidence of record. Tomalin explicitly ties its Figure 9 to its Example 1. *Id.*

We are also not persuaded by Patent Owner's argument that ϵ brass material is not present in Tomalin's Example 1 EDM wire inherently or otherwise (Req. Reh'g 11). Patent Owner's own expert witness confirmed that Tomalin's Example 1 wire necessarily has ϵ , γ , and α brass grains on its surface, as claimed in the '872 patent. *See, e.g.,* Ex. 1029, 155:5–156:10 (“Q: So based on that disclosure, shouldn't a person of ordinary skill in the art understand that Figure 9 relates to Specimen 1? A: Yes, that's correct.”). To quote a portion of the Final Decision:

Dr. Medlin confirmed that, if the Tomalin Example/Specimen 1 wire had these three alloy phases (α , γ , and ϵ brass) after annealing, as indicated by Tomalin's disclosure relating to its Figure 9, the three alloy phases would necessarily be on the outside of the wire after it was drawn (and cracked), because “that's exactly what's described [in the '872 patent], but [Dr. Medlin qualified,] it's not in this [Tomalin] patent [explicitly]. So your assumptions are true and that's clearly called out in the '872 patent, it will happen.” Ex. 1029, 75:13–24. The deposition examination of Dr. Medlin further proceeded as follows: Q: “If you took a wire with the three alloys and drew it using the technique described with reference to [Tomalin's] Specimen 1, would you have three alloys on the surface of the wire?” and A: “Well, again, I know for a fact that that would happen because that is described in the '872 patent.” *Id.* at 76:2–11. Dr. Medlin further testified that “[i]f [Tomalin's] Figure 9 - - assuming Figure 9 is a chemistry profile of Sample No. [Example/Specimen] 1, there would be epsilon [brass alloy] at

the surface” of the wire. Ex. 1029, 149:1–3; *see also id.* at 150:21–151:4.

Final Decision 49. Although Dr. Medlin’s testimony on such issues was rife with equivocation (“probably”), we are not persuaded that what he otherwise testified to is not a certainty, i.e., that the starting materials and processing steps of Tomalin’s Example 1 would necessarily result in an EDM wire with a cracked surface with grains of α , γ , and ϵ brass materials, as claimed. *See supra* cites to Final Decision and evidence of record.

Patent Owner has presented no arguments or facts in its Request for Rehearing that persuade us that we have misapprehended or overlooked any evidence, or misapplied any law, or that our Final Decision is otherwise incorrect. For the reasons set forth above, Patent Owner’s Request for Rehearing is *denied*.

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