

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

SNAP-ON INC.,
Petitioner,

v.

MILWAUKEE ELECTRIC TOOL CORPORATION,
Patent Owner.

Case IPR2015-01242 (Patent 7,554,290 B2)
Case IPR2015-01243 (Patent 7,944,173 B2)
Case IPR2015-01244 (Patent 7,999,510 B2)¹

Before GRACE KARAFFA OBERMANN, PATRICK R. SCANLON, and
CARL M. DEFRANCO, *Administrative Patent Judges*.

OBERMANN, *Administrative Patent Judge*.

FINAL WRITTEN DECISION

Inter Partes Review

35 U.S.C. § 318(a) and 37 C.F.R. § 42.73

¹ Petitioner raises substantially identical arguments in each case identified in the caption. IPR2015-01242 (“IPR 242”), Paper 1, 34–48; IPR2015-01243 (“IPR 243”), Paper 2, 36–52; IPR2015-01244 (“IPR 244”), Paper 2, 35–50. Patent Owner responds with “substantially identical” oppositions in all three cases. IPR 242, Paper 24, 9 n.1. Accordingly, we issue a single Final Written Decision to be entered in each case.

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I. INTRODUCTION

This is a consolidated Final Written Decision in three *inter partes* reviews. Petitioner challenges the patentability of:

(1) Claims 1–8, 10, and 11 of the U.S. Patent No. 7,554,290 B2 (IPR 242, Ex. 1001 (“the ’290 patent”));

(2) Claims 1–8 and 10–13 of U.S. Patent No. 7,944,173 B2 (IPR 243, Ex. 1003 (“the ’173 patent”)); and

(3) Claims 1–6 and 8–19 of U.S. Patent No. 7,999,510 B2 (IPR 244, Ex. 1005 (“the ’510 patent”)).

In this Final Written Decision, we refer to the above-identified claims of the ’290, ’173, and ’510 patents collectively as the “challenged claims.”

We have jurisdiction under 35 U.S.C. § 6. We hold that Petitioner fails to establish by a preponderance of the evidence that the challenged claims are unpatentable under 35 U.S.C. § 103. We *deny* the parties’ Motions to Exclude. We *grant* the parties’ Motions to Seal.

A. Procedural History

The Petitions for *inter partes* review were filed pursuant to 35 U.S.C. § 311. IPR 242, Paper 1 (“Pet.”); IPR 243, Paper 2; IPR 244, Paper 2. Patent Owner filed a Preliminary Response in each proceeding. IPR 242, Paper 9; IPR 243, Paper 8, IPR 244, Paper 8.

In each proceeding, we instituted trial on a single ground of unpatentability based on obviousness under 35 U.S.C. § 103(a) over the

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combined disclosures of Fohr,² Sato,³ and Hallaj.⁴ IPR 242, Paper 10, 15 (“Dec.”); IPR 243, Paper 9, 15; IPR 244, Paper 9, 15.

In each proceeding, Patent Owner filed a Response (IPR 242, Paper 24, “Resp.”; IPR 243, Paper 23; IPR 244, Paper 23) and Petitioner filed a Reply (IPR 242, Paper 84, “Reply”; IPR 243, Paper 80; IPR 244, Paper 81 (public versions)). During an interlocutory teleconference held June 13, 2016, we authorized Patent Owner to file a Sur-Reply limited to responding to arguments and evidence, presented in Petitioner’s Reply, which relate to conception and reduction to practice of the claimed inventions. IPR 242, Paper 87, “Sur-Reply”, IPR 243, Paper 88; IPR 244, Paper 88 (public versions); *see* IPR 242, Paper 40; IPR 243, Paper 41, IPR 244, Paper 41 (orders authorizing Sur-Reply in each proceeding).

The patentability challenge in each proceeding turns on essentially the same substantive arguments and evidence pertaining to the disclosures of Fohr, Sato, and Hallaj. Pet. 34–48; IPR 243, Paper 2, 36–52; IPR 244, Paper 2, 35–50; Resp. 9 n.1. The dispositive issue before the Board is whether the combined disclosures of those asserted references would have suggested the limitation, specified in each challenged claim, requiring a battery pack for a hand held power tool comprising a plurality of lithium-based battery cells capable of producing an average discharge current greater

² European Patent Publication No. EP 1 266 725 A1, published Dec. 18, 2002 (certified English translation) (“Fohr”) (Ex. 1014).

³ Japanese Publication No. JP 2002-110254 A, published April 12, 2002 (certified English translation) (“Sato”) (Ex. 1011).

⁴ U.S. Patent No. 6,468,689 B1, issued Oct. 22, 2002 (“Hallaj”) (Ex. 1015).

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than or equal to approximately 20 amps. IPR 242, Ex. 1001, 12:18–22; IPR 243, Ex. 1003, 12:15–19; IPR 244, Ex. 1005, 12:6–11, 24–39, 44–49, 56–61; 13:1–6, 11–16; 13:21–14:5; 14:12–18 (recitation of that limitation in each independent challenged claim).

Except as otherwise noted, citations are to papers filed in IPR 242. A consolidated final oral hearing was held September 13, 2016. The record includes a transcript of that hearing. Paper 92 (“Tr.”) (confidential portion of hearing); Paper 93 (public portion of hearing).

B. Related Proceedings

The Petition identifies four pending civil actions involving the ’290 patent, all filed in the Eastern District of Wisconsin: *Milwaukee Electric Tool Corp. v. Chervon N. Am., Inc.*, Case No. 2-14-cv-1289; *Milwaukee Electric Tool Corp. v. Hilti, Inc.*, Case No. 2-14-cv-1288; *Milwaukee Electric Tool Corp. v. Positec Tool Corp.*, Case No. 2-14-cv-1295; and *Milwaukee Electric Tool Corp. v. Snap-On Inc.*, Case No. 2-14-cv-1296. Pet. 1–2. The same civil actions are identified in connection with the ’173 patent and the ’510 patent. IPR 243, Paper 2, 1–2; IPR 244, Paper 2, 1–2.

The Petition also identifies five dismissed civil actions that involved the ’290 patent, all filed in the Eastern District of Wisconsin: *Milwaukee Electric Tool Corp. v. Richpower Indus., Inc.*, Case No. 2-14-cv-1286; *Milwaukee Electric Tool Corp. v. Sunrise Global Mktg., LLC*, Case No. 2-14-cv-1290; *Milwaukee Electric Tool Corp. v. Max USA Corp.*, Case No. 2-14-cv-1292; *Milwaukee Electric Tool Corp. v. Tooltechnic Sys. LLC*, Case No. 2-14-cv-1294; and *Milwaukee Electric Tool Corp. v. Hitachi Ltd.*, No. 2-09-cv-948. Pet. 2. The same civil actions are identified in connection

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with the '173 patent and the '510 patent. IPR 243, Paper 2, 2; IPR 244, Paper 2, 2.

Petitioner identifies two prior requests for *inter partes* review of the '290 patent: IPR2015-00596 (“IPR 596”) and IPR2015-01164 (“IPR 164”). Pet. 1. On July 28, 2016, we issued a Final Written Decision in IPR 596, holding that claims 1–11 of the '290 patent were not proven unpatentable over the combined disclosures of prior art not raised here. IPR 596, Paper 80, 20. Petitioner is not a party to IPR 596. Concurrently herewith, we issue a Final Written Decision in IPR 164. Petitioner is a party to IPR 164. IPR 164, Paper 24, 9 (granting joinder).

Petitioner identifies two prior requests for *inter partes* review of the '173 patent: IPR2015-00595 (“IPR 595”) and IPR2015-01165 (“IPR 165”). IPR 243, Paper 2, 1. On July 28, 2016, we issued a Final Written Decision in IPR 595, holding that claims 1–13 of the '173 patent were not proven unpatentable over the combined disclosures of prior art not raised here. IPR 595, Paper 80, 21. Petitioner is not a party to IPR 595. Concurrently herewith, we issue a Final Written Decision in IPR 165. Petitioner is a party to IPR 165. IPR 165, Paper 26, 6 (granting joinder).

Petitioner identifies two prior requests for *inter partes* review of the '510 patent: IPR2015-00597 (“IPR 597”) and IPR2015-01166 (“IPR 166”). IPR 244, Paper 2, 1. On July 28, 2016, we issued a Final Written Decision in IPR 597, holding that claims 1–19 of the '510 patent were not proven unpatentable over the combined disclosures of prior art not raised here. IPR 597, Paper 79, 20. Petitioner is not a party to IPR 597.

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Concurrently herewith, we issue a Final Written Decision in IPR 166.

Petitioner is a party to IPR 166. IPR 166, Paper 24, 6 (granting joinder).

The patentability of each challenged claim of the '290, '173, and '510 patents was confirmed during *inter partes* reexamination. Pet. 10–14; IPR 243, Paper 2, 11–15; IPR 244, Paper 2, 11–15. The patentability of each challenged claim of the '290 patent further was confirmed in an *ex parte* reexamination. See Resp. 7 (citing evidence of confirmation of patentability of the '290 patent claims during *ex parte* and *inter partes* reexaminations).

C. The '290 Patent (Ex. 1001)

Our analysis, which applies to all challenged claims, is presented in the context of claim 1 of the '290 patent. The '290 patent, titled “Lithium-Based Battery Pack for a Hand-Held Power Tool,” issued June 30, 2009. The '290 patent “generally relates to battery packs and, more particularly, to power tool battery packs.” Ex. 1001, 1:31–32. Battery pack 30 is connectable to cordless power tool 34. *Id.* at 5:42–44, Fig. 11A. Battery pack 30 includes housing 42 supporting battery cells 46. *Id.* at 5:48–50. Battery cells 46 may be connected to give battery pack 30 a variety of nominal voltages, such as 9.6 volts, 12 volts, 14.4 volts, 21 volts, or 24 volts. *Id.* at 5:50–56. The battery cells may be of any chemistry type, including lithium, lithium-ion, or other lithium-based chemistry. *Id.* at 5:62–65. Battery pack 30 can supply an average discharge current greater than or equal to approximately 20 amps. *Id.* at 10:23–25.

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D. Illustrative Claim

Claim 1, the only independent claim of the '290 patent, is illustrative of the challenged claims and recites:

1. A battery pack for powering a hand held power tool, the battery pack comprising:
 - a housing connectable to and supportable by the hand held power tool; and
 - a plurality of battery cells supported by the housing, ***the battery cells being capable of producing an average discharge current greater than or equal to approximately 20 amps***, the battery cells having a lithium-based chemistry.

Ex. 1001, 12:14–22 (emphasis added).

We refer to the above-emphasized term in claim 1 of the '290 patent as the “20 Amp Limitation.” All challenged claims at issue in these three proceedings require a battery pack comprising a plurality of lithium-based battery cells capable of meeting the 20 Amp Limitation in a hand held power tool application. IPR 242, Ex. 1001, 12:18–22; IPR 243, Ex. 1003, 12:15–19; IPR 244, Ex. 1005, 12:6–11, 24–39, 44–49, 56–61; 13:1–6, 11–16; 13:21–14:5; 14:12–18 (recitations of the terms in each independent challenged claim that specify the 20 Amp Limitation).

The nub of the dispute is whether the combined disclosures of Fohr, Sato, and Hallaj disclose or suggest a battery pack, useful for powering a hand held power tool, comprising a plurality of lithium-based battery cells meeting the 20 Amp Limitation. Our resolution of that issue is dispositive of Petitioner’s challenge in each proceeding.

II. DISCUSSION

The patentability of the challenged claims turns on substantially identical assertions pertaining to the disclosures of Fohr, Sato, and Hallaj.

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Pet. 34–48; IPR 243, Paper 2, 36–52; IPR 244, Paper 2, 35–50. Petitioner supports its challenge with, among other evidence, the Declaration of Dr. Bart Riley. Ex. 1007. Patent Owner defends the challenge by advancing evidence that includes the Declaration of Dr. Mark Ehsani (Ex. 2105) and the Declaration of Dr. George E. Blomgren (Ex. 2147). For reasons that follow, we hold that Petitioner fails to demonstrate by a preponderance of the evidence that any challenged claim is unpatentable.

A. Principles of Law

Petitioner bears the burden of proving unpatentability of the challenged claims, and that burden never shifts to Patent Owner. *Dynamic Drinkware, LLC v. Nat’l Graphics, Inc.*, 800 F.3d 1375, 1378 (Fed. Cir. 2015). To prevail, Petitioner must establish facts supporting its challenge by a preponderance of the evidence. 35 U.S.C. § 316(e); 37 C.F.R. § 42.1(d).

A patent claim is unpatentable under 35 U.S.C. § 103(a) if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious to a person of ordinary skill in the art at the time the invention was made. *KSR Int’l Co. v. Teleflex Inc.*, 550 U.S. 398, 406 (2007). Obviousness is resolved based on underlying factual determinations, including: (1) the scope and content of the prior art; (2) any differences between the claimed subject matter and the prior art; (3) the level of ordinary skill in the art; and (4) objective evidence of nonobviousness, i.e., secondary considerations. *See Graham v. John Deere Co.*, 383 U.S. 1, 17–18 (1966).

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B. Level of Ordinary Skill in the Art

We hold that the prior art references asserted in the Petition are representative of the level of ordinary skill in the art. *See Okajima v. Bourdeau*, 261 F.3d 1350, 1355 (Fed. Cir. 2001) (absence of specific findings on “level of skill in the art does not give rise to reversible error ‘where the prior art itself reflects an appropriate level and a need for testimony is not shown’” (quoting *Litton Indus. Prods., Inc. v. Solid State Sys. Corp.*, 755 F.2d 158, 163 (Fed. Cir. 1985))). To the extent that a more specific definition is required, we hold that an ordinary artisan would include one holding a Bachelor’s Degree in Electrical Engineering with two or three years of experience in battery design. That definition comports with the very similar definitions advanced by the parties. In that regard, Petitioner asserts that an ordinary artisan would encompass a person holding a Bachelor’s Degree in Electrical Engineering with three years of experience in battery design. Pet. 8; Ex. 1007 ¶ 9. Patent Owner similarly asserts that an ordinary artisan would include a person holding a Bachelor’s Degree in Electrical Engineering with two years of battery design experience. Resp. 8; Ex. 2105 ¶ 24.

C. Claim Construction

In an *inter partes* review, a claim term in an unexpired patent shall be given its broadest reasonable construction in light of the specification of the patent in which it appears. 37 C.F.R. § 42.100(b); *see Cuozzo Speed Techs., LLC v. Lee*, 136 S. Ct. 2131, 2144–46 (2016) (upholding the use of the broadest reasonable interpretation standard). Under the broadest reasonable construction standard, claim terms are given their ordinary and customary meaning, as would be understood by one of ordinary skill in the art in the

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context of the entire disclosure. *In re Translogic Tech., Inc.*, 504 F.3d 1249, 1257 (Fed. Cir. 2007). Any special definition for a claim term must be set forth in the specification with reasonable clarity, deliberateness, and precision. *In re Paulsen*, 30 F.3d 1475, 1480 (Fed. Cir. 1994).

In our Decisions to Institute, we construed the 20 Amp Limitation to require that “the battery cells, when configured together in a battery pack, are capable of producing reasonably close to 20 amps of discharge current or greater over the course of delivering their entire rated capacity.” Dec. 5. Neither party disputes that construction, which we adopt for the purposes of this Final Written Decision. To the extent that any other claim term requires express construction, we discuss the construction in our analysis below. *See Vivid Techs., Inc. v. Am. Sci. & Eng’g, Inc.*, 200 F.3d 795, 803 (Fed. Cir. 1999) (only claim terms in controversy need be construed, and then only to the extent necessary to resolve the controversy). The following facts are supported by a preponderance of the evidence.

D. Fohr as Prior Art

As an initial matter, the parties dispute whether Fohr qualifies as prior art. Resp. 10–15; Reply 2–8; Sur-Reply 1–5. Specifically, Patent Owner seeks to antedate Fohr based on inventor testimony. Resp. 10–15; Sur-Reply 1–5. Petitioner responds that the named inventors are not true inventors with standing to establish facts sufficient to antedate Fohr. Reply 2–8.

We decline to reach the antedating issue because it is not necessary to our ultimate conclusion on the question of obviousness. Specifically, even if we accept Petitioner’s view that Fohr qualifies as prior art, we ultimately hold that Petitioner fails to establish by a preponderance of the evidence that any

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challenged claim would have been obvious over the combined disclosures of Fohr, Sato, and Hallaj. That is so because, as explained below, Petitioner fails to establish that one of ordinary skill in the art would have been led to combine Fohr with Sato and Hallaj in the manner claimed.

*E. Obviousness Challenge Based on the
Combined Disclosures of Fohr, Sato, and Hallaj*

Each challenged claim requires a battery pack for “a hand held power tool” comprising “a plurality” of lithium-based chemistry battery cells “being capable of producing an average discharge current” that satisfies the 20 Amp Limitation. *See, e.g.*, Ex. 1001, 12:14–22. Fohr discloses a battery pack for powering a rechargeable screwdriver, which is “a hand held power tool” within the meaning of the challenged claims. Pet. 35 (quoting Ex. 1014 ¶¶ 1–2, 9, 14, 16, Fig. 1).

Petitioner argues that Fohr discloses a battery pack comprising a plurality of lithium rechargeable battery cells that would have been “capable of producing an average discharge current greater than or equal to approximately 20 amps” as specified in the challenged claims. Pet. 37; *see* Ex. 1007 ¶ 65 (Petitioner’s witness, Dr. Riley, declaring that Fohr discloses a battery pack that includes “Li rechargeable batteries” capable of achieving “a continuous current capacity of from 20 to 30” amps.). For objective support, Petitioner directs us to “the abstract of Fohr” for such a disclosure. Reply 10 (citing Ex. 1014, 1).

Petitioner advances an “abstract of Fohr” that is not part of Fohr’s publication at all. *Id.* (directing us to Ex. 1014, 1). Petitioner cites to a page provided by the esp@cenet database of the European Patent Office. Paper 84, 1 (Patent Owner’s Motion for Observations) (citing Ex. 2246, 135:9–

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138:220). The actual Fohr abstract appears on page 10 of Exhibit 1014, does not match the abstract on page 1, and does not mention lithium batteries or 20 amps. Paper 84, 1–2 (citing Ex. 2246, 138:3–7, 139:24–140:5); *compare* Tr. 11, *with* Tr. 70.

*1. Fohr Does Not Disclose or
Suggest the 20 Amp Limitation*

We find that Fohr suggests a plurality of capacitors or battery cells as the energy store. Ex. 1014 ¶¶ 9, 17. Fohr discloses that a plurality of capacitors would have been capable of achieving a continuous current capacity from 20 to 30 amps. *Id.* at ¶¶ 8, 19. Although Fohr teaches that the capacitors “can advantageously alternatively be replaced by an energy store comprising rechargeable cells,” such as “Li rechargeable batteries,” Fohr does not disclose or suggest an energy store capacity for such batteries, much less establish that lithium batteries, available at the time of the invention, would have been suitable for use in a hand held power tool, or capable of achieving the 20 Amp Limitation of the challenged claims. *Id.* at ¶ 9.

Critical to our analysis, Fohr never states what discharge currents can be achieved when lithium battery cells are used instead of capacitors as the energy source in a hand held power tool. Ex. 2147 ¶¶ 42, 58; *see generally* Ex. 1014 (Fohr). The Examiner, during reexamination, came to that exact same conclusion regarding Fohr’s disclosure, remarking that “there is nothing whatsoever in the reference that indicates the current produced by any lithium-based cells.” Ex. 1033, 11;⁵ Resp. 17.

⁵ We refer to the page numbers added by Petitioner.

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Further, the Examiner, in confirming the patentability of the challenged claims during reexamination, found that Fohr discusses discharge current levels “only in the context of embodiments using capacitors.” Ex. 1033, 11; Resp. 17. We agree. As explained by the Examiner, nothing in Fohr “suggests that lithium-based cells can also produce the current” disclosed in the reference for capacitors. Ex. 1033, 11; Resp. 17.

We are not persuaded by Dr. Riley’s testimony that Fohr effectively teaches that both lithium-based battery cells and capacitors can achieve the 20 Amp Limitation, on a theory that “it’s actually the tool that draws the power” and “the right lithium cell” would be “a drop in replacement for this application.” Ex. 2169, 121:12–16 (Dr. Riley’s deposition testimony); Resp. 17. Dr. Riley readily admitted an unfamiliarity with capacitors, and identified no suitable “drop in” ready lithium cells available at the time of the invention. Ex. 2169, 121:11–122:4 (“[I]f I had a cell that could do similar things, I’d certainly swap it in there.”). On that point, we find more credible Dr. Blomgren’s testimony that “there is no guarantee that a given pack of battery cells can provide the current that a tool tries to draw.” Resp. 17 (citing Ex. 2147 ¶ 60).

A dispositive question thus arises whether the combined disclosures of Fohr, Sato, and Hallaj would have suggested a battery pack for a hand-held power tool, comprising a plurality of lithium-based battery cells, capable of achieving the 20 Amp Limitation. In that regard, Petitioner directs us to Sato for disclosure of an individual battery cell capable of delivering “a current discharge” greater than or equal to 20 amps. Pet. 38.

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*2. Sato Discloses a Single Lithium-Based Cell and
Does Not Suggest a Plurality of Cells in a Battery Pack*

For purposes of this Final Written Decision, we accept Petitioner’s view that Sato describes a lithium-based battery cell “that can discharge at high currents, such as 100A and 200A.” *Compare* Ex. 1011 ¶ 7 (Petitioner’s translation of Sato, suggesting that a lithium cell capable of discharging at 100 to 200 amps “is possible”), *with* Ex. 2216 ¶ 7 (Patent Owner’s translation of Sato, referring to demand for a lithium cell capable of discharging at 100 or 200 amps, suggesting that such a high current discharge was merely aspirational).

Sato describes a single lithium-based battery cell—not “a plurality” of cells in a battery pack as required by the challenged claims. Ex. 1001, 12:18; *see* Ex. 1011 ¶ 7 (Sato’s disclosure of a battery cell). Here again, Sato was before the Examiner during reexamination, and the Examiner, in the course of confirming the patentability of the challenged claims, found that “Sato describes cells, but does not describe any pack including those cells” and, further, reflects “no information as to how Sato’s cells would be implemented in a pack.” Ex. 1033, 15 (emphasis omitted). Petitioner directs us to this same disclosure in Sato for disclosure of a single battery cell capable of providing a discharge current of 100 or 200 amps—without addressing the complication that the disclosed discharge current for that single cell is ten-fold higher than required for the plurality of cells specified in the challenged claims. Pet. 38; Ex. 1011 ¶ 7.

During reexamination, however, the Examiner determined that “the discharge rates described in Sato are *abnormally high*” for a power tool application and “would lead to overheating of the cells.” Ex. 1033, 14

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(emphasis added). Petitioner directs us to no evidence undercutting the Examiner’s conclusion that “a person of ordinary skill in the art would not expect to succeed in making” a power tool battery pack using a plurality of Sato’s battery cells. *Id.*; *see generally* Pet. 34–48. On the contrary, Petitioner’s own witness, Dr. Riley, acknowledged that the single cell voltage described in Sato for a single battery cell would not have been suitable for practical use in a hand held power tool. Resp. 19–20 (quoting Ex. 2169, 64:23–65:7).

Petitioner also directs us to Embodiment 1 in Sato for disclosure of a battery cell that delivers “a current discharge” of about 30 amps—but that disclosure, based on Figure 3 in Sato, is less than clear. Pet. 25, 25 n.2, 38. In any event, even if we accept Petitioner’s view that the cell disclosed in Embodiment 1 of Sato would have been capable of delivering a current of about 30 amps, Petitioner fails to meet its burden of proof in connecting that single cell voltage with the 20 Amp Limitation of the challenged claims, which pertains to a plurality of cells. *Id.*

Specifically, Petitioner fails to establish that a person of ordinary skill in the art would have expected “a plurality” of Sato’s cells to be useful in powering a hand held power tool by providing the “average discharge rate” required by the challenged claims. Ex. 1001, 12:19–20. As explained above, in our Decisions to Institute, we determined—and neither party has disputed—that the 20 Amp Limitation requires that “the battery cells, when configured together in a battery pack, are capable of producing reasonably close to 20 amps of discharge current or greater over the course of delivering their entire rated capacity.” Dec. 5. Petitioner discusses a “discharge rate” for

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Sato's single battery cell, but does not address, much less establish, how a pack comprising a plurality of those cells would be capable of producing reasonably close to 20 amps of discharge current or greater over the course of delivering its entire rated capacity. Pet. 25, 25 n.2, 38.

As explained in the next section, Petitioner's challenge falls short for another independent reason. Petitioner fails to articulate a rational reason why or how an ordinary artisan would have combined "a plurality" of Sato's individual cells in a battery pack to replace the capacitors in Fohr's hand held power tool. Ex. 1001, 12:18; IPR 243, Ex. 1003, 12:15; IPR 244, Ex. 1005, 12:6; *see* Ex. 1033, 15 (Examiner's observation that Sato reflects "no information as to how Sato's cells would be implemented in a pack"). For the feature of the challenged claims requiring "a plurality" of lithium-based cells implemented in a battery pack, and capable of achieving the 20 Amp Limitation in a hand held power tool, Petitioner relies on Hallaj. Pet. 36–37.

3. Petitioner Fails to Establish a Reason to Combine Fohr, Sato, and Hallaj

Petitioner alleges that an ordinary artisan "would have combined the battery pack described in Hallaj with the hand held power tool battery pack described in Fohr." *Id.* at 36. But Sato is the only asserted prior art reference that arguably suggests a lithium-based battery capable of attaining the 20 Amp Limitation. *Id.* at 38. For reasons that follow, Petitioner fails to carry its burden of showing that one of ordinary skill in the art would have employed "a plurality" of Sato's cells in the battery pack of Hallaj to replace the capacitors in Fohr's hand held power tool. Ex. 1001, 12:18.

Hallaj discloses a thermal management system for operating a battery module in cold-weather applications. Ex. 1015, Abstract, 6:38–48. Hallaj

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describes a thermal management system useful “in an electric vehicle battery module when under cold conditions” or in a satellite that “goes through a sudden temperature change when it moves from the light side to the dark side of the earth” and, thus, is exposed to very low temperatures. *Id.* at 6:27–48; Resp. 23–24. Given the cold-weather context of those applications, it is unsurprising that Hallaj is directed to a thermal management system for a battery module that is designed to retain heat and deliver heat back to the battery cells. Resp. 24 (citing Ex. 2147 ¶ 84); Ex. 1015, 1:14–2:15, 3:53–4:32, 6:49–58; Ex. 2169, 130:6–131:24.

We recognize that it may be necessary “to look to interrelated teachings of multiple patents . . . in order to determine whether there was an apparent reason to combine the known elements in the fashion claimed.” *KSR Int’l*, 550 U.S. at 418. Petitioner in these proceedings, however, directs us to no persuasive reason why an ordinary artisan would have turned to the heat-retaining battery module of Hallaj when working to implement a plurality of Sato’s cells in a pack to replace the capacitors in Fohr. Pet. 36–38 (nowhere addressing that critical point); Reply 13 (devoting four sentences to rebuttal of Patent Owner’s persuasive evidence that one would not have combined the disclosures of Hallaj, Fohr, and Sato in the manner claimed); *see* Ex. 1033, 15 (Examiner’s observation, in confirming the patentability of the challenged claims during reexamination, that Sato contains “no information as to how Sato’s cells would be implemented in a pack”).

We view Petitioner’s unexplained leap from the single battery cell of Sato to the heat-retaining battery module of Hallaj as a classic example of impermissible hindsight reconstruction driven not by any teaching in the prior

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art, but by the claim requirement of a “plurality” of cells implemented in a battery pack. Pet. 36–38; Reply 13. Patent Owner, by contrast, comes forward with persuasive evidence, which we credit, showing that one of ordinary skill in the art would not have been led to arrange a plurality of Sato’s cells in the heat-retaining battery module of Hallaj because such a modified battery pack would have been unsuitable for use as a replacement for the capacitors in Fohr. Specifically, we credit the testimony of Dr. Blomgren, who cogently explains why a person of ordinary skill in the art would not have been led to the proposed modification. Ex. 2147 ¶¶ 79–85.

Dr. Blomgren explains that the proposed modified battery pack “would not have adequate heat dissipation and the Joule heating naturally occurring during operation” of such a pack “would lead to overheating and cell failure” in a power tool application. Resp. 24 (citing Ex. 2147 ¶ 84). That testimony is consistent with the Examiner’s observation, made during reexamination, that “the discharge rates described in Sato are abnormally high” for a power tool cell and “would lead to overheating of the cells.” Ex. 1033, 14. That testimony also is consistent with information provided by Petitioner’s own witness, Dr. Riley, who acknowledged on cross-examination that the battery pack of Fohr, as modified by Sato and Hallaj, would provide “the heat back to the system after a discharge” and, accordingly, would have no “practical applicability” in a power tool application. Resp. 24 (quoting Ex. 2169, 127:13–18, 131:12–24); *see* Ex. 2169, 127:9–128:2 (Petitioner’s own witness, Dr. Riley, further explaining that Hallaj is concerned with finding “a way of managing heat generation” in a power supply so that “heat can be used, pulled back into the batteries”).

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We credit Dr. Blomgren’s testimony that the “storing of heat” in Hallaj would have been “antithetical to” Sato’s lithium-based chemistry cells for use as the energy store in Fohr’s hand held power tool. Ex. 2147 ¶ 83. Petitioner’s own witness, Dr. Riley, provides testimony consistent with that view. Resp. 24 (citing Ex. 2169, 12713–18, 131:12–24) (Dr. Riley’s testimony on cross-examination); *see* Ex. 2147 ¶¶ 81–85 (Dr. Blomgren’s declaration testimony). That view is reinforced by evidence that the discharge rates supported by Hallaj are orders of magnitude lower than what would have been expected for a battery cell meeting the 20 Amp Limitation. Resp. 25; Pet. 38; Ex. 1015, 5:41-44; Ex. 2147 ¶¶ 79–80; *see* Ex. 1015, 5:41–44 (Hallaj, describing temperature profiles for discharge rates). We are persuaded that the heat-retaining battery module of Hallaj was not designed to handle, in a power tool application, the discharge currents disclosed for Sato’s individual lithium-based battery cell—much less the discharge currents that would be supplied by a plurality of Sato’s cells. Resp. 25 (citing Ex. 2147 ¶¶ 81, 84); *see also* Ex. 2147 ¶¶ 62–85 (testimony explaining why one of ordinary skill in the art would not have applied a plurality of Sato’s cells in the battery pack configuration of Hallaj to power Fohr’s hand held power tool).

We further find that one of ordinary skill in the art would not have been led to replace the capacitors in Fohr’s power tool with Hallaj’s battery module, modified to include a plurality of Sato’s lithium-based cells. Ex. 2147 ¶¶ 62–85. That combination would have presented a serious risk of overheating and, in light of that risk, an ordinary artisan would not have expected the modified battery pack of Hallaj to successfully power Fohr’s hand held power tool. *Id.*

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Petitioner does not respond adequately to Patent Owner’s persuasive evidence that the combined disclosures of Fohr, Sato, and Hallaj would not have suggested a battery pack comprising a plurality of lithium-based battery cells capable of achieving successfully the 20 Amp Limitation in a hand held power tool. *See* Reply 9–13 (and evidence cited therein). The patentability of the challenged claims in all three cases depends on substantially the same arguments and evidence regarding whether the combined disclosures of Fohr, Sato, and Hallaj would have suggested such a battery pack. Pet. 41–48; IPR 243, Paper 2, 36–52; IPR 244, Paper 2, 35–50. Accordingly, we hold that Petitioner fails to establish by a preponderance of the evidence that the subject matter of any challenged claim would have been obvious over the combined disclosures of Fohr, Sato, and Hallaj. Given that failure, we decline to address Patent Owner’s evidence of secondary considerations. *See* Resp. 26–59 (discussing that evidence).

III. MOTIONS TO EXCLUDE

In each proceeding, Petitioner filed a Motion to Exclude on August 30, 2016. Paper 70 (motion); *see* Paper 11 (Scheduling Order, requiring filing of any Motion to Exclude by July 25, 2015); Paper 41 (Stipulated Revised Scheduling Order, setting August 12, 2016, as date for filing Motions to Exclude); IPR 243, Paper 67 (motion); IPR 244, Paper 69 (motion). Patent Owner argues that, although served timely, Petitioner’s Motion to Exclude was untimely filed and should be denied on that basis alone. Paper 69, 1; IPR 243, Paper 65, 1; IPR 244, Paper 66, 1. Petitioner counters that the Motion was properly filed on August 12, 2016, advancing bare attorney argument that unidentified filing receipts and authorizations were received

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from the Board—although no documentation is included in support of those bare arguments. Paper 68, 5 (word-for-word identical reply filed in each proceeding). Even if we accept that Petitioner timely filed the Motion to Exclude in each proceeding, however, we are not persuaded that the Motion should be granted. The Motion is directed to evidence, pertaining to issues such as secondary considerations, which is not cited or relied upon in this Final Written Decision. Paper 70; IPR 243, Paper 67; IPR 244, Paper 69. Accordingly, in each proceeding, we *deny* Petitioner’s Motion to Exclude as moot.

Patent Owner filed a timely Motion to Exclude on August 12, 2016. Paper 89 (public version).⁶ Specifically, Patent Owner moves to exclude the Declarations of Dr. von Sacken based on assertions that go to the weight, and not the admissibility, of the evidence. Paper 89, 1–5; *see* Ex. 1117 (original declaration); Ex. 1360 (revised declaration). Patent Owner raises additional objections based, for example, on the hearsay exclusion, the rule of completeness, and a lack of foundation or authentication. Paper 89, 5–15. All of the objections, however, relate to evidence, pertaining to issues such as Patent Owner’s attempt to antedate Fohr, which is not cited or relied upon in this Final Written Decision. Paper 89, 1–15; *see* Paper 58 (sealed version). We, thus, *deny* Patent Owner’s Motion to Exclude as moot.

⁶ A “word-for-word identical paper” was filed in each proceeding. Paper 89 (caption page at n.1). *See* IPR 243, Paper 88; IPR 244, Paper 86 (public versions of motions filed by Patent Owner).

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IV. MOTIONS TO SEAL

Pending in these proceedings are two Motions to Seal⁷ certain papers. Paper 82 (Petitioner’s motion); Paper 86 (Patent Owner’s motion). Neither motion is opposed. Paper 79, 2; Paper 83, 1. The Board entered the parties’ Stipulated Modified Protective Order (Ex. 2149) on September 28, 2016. Paper 77. Except where a party requests sealing a document in its entirety, redacted public versions of the documents sought to be sealed, containing both parties’ assertions of confidential information, have been filed in each proceeding. Paper 79, 4 n.2.

We have considered the arguments presented by both parties and determine that both have established good cause for sealing the documents identified their respective Motions to Seal. Specifically, the parties demonstrate that the information sought to be sealed reflects confidential business information owned by Patent Owner, Petitioner, or a third party. Paper 79, Paper 83. Accordingly, we *grant* the parties’ Motions to Seal.

The record will be maintained undisturbed pending the outcome of any appeal taken from this decision. At the conclusion of any appeal, or if no appeal is taken, the documents may be made public. *See* Trial Practice Guide, 77 Fed. Reg. 48,756, 48,761 (Aug. 14, 2012). Further, either party may file a motion to expunge sealed documents from the record pursuant to 37 C.F.R. § 42.56. Any such motion will be decided after the conclusion of any appeal or the expiration of the time period for appealing.

⁷ “Word-for-word identical papers” were filed in each proceeding. Paper 82 (caption page at n.1); *see* Paper 83 (caption page at n.1) (“the word-for-word identical paper is filed in each proceeding”).

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V. CONCLUSION

We hold that Petitioner fails to establish by a preponderance of the evidence that any challenged claim is unpatentable under 35 U.S.C. § 103 over the combined disclosures of Fohr, Sato, and Hallaj. We *deny* both parties' Motions to Exclude in each proceeding. Papers 70, 89; IPR 243, Papers 67, 88; IPR 244, Papers 69, 86. We grant both parties' Motions to Seal in each proceeding. Papers 79, 83; IPR 243, Papers 83, 84; IPR 244 Papers 79, 83.

VI. ORDER

It is

ORDERED that Petitioner fails to establish by a preponderance of the evidence that claims 1–8, 10, and 11 of the '290 patent are unpatentable;

FURTHER ORDERED that Petitioner fails to establish by a preponderance of the evidence that claims 1–8 and 10–13 of the '173 patent are unpatentable;

FURTHER ORDERED that Petitioner fails to establish by a preponderance of the evidence that claims 1–6 and 8–19 of the '510 patent are unpatentable;

FURTHER ORDERED that Petitioner's Motion to Exclude is *denied* in each proceeding (IPR 242, Paper 70; IPR 243, Paper 67; IPR 244, Paper 69);

FURTHER ORDERED that Patent Owner's Motion to Exclude is *denied* in each proceeding (IPR 242, Paper 89; IPR 243, Paper 88; IPR 244, Paper 86) (public versions of motions);

FURTHER ORDERED that Petitioner's Motion to Seal is *granted* in each proceeding (IPR 242, Paper 79; IPR 243, Paper 83; IPR 244, Paper 79);

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FURTHER ORDRED that Patent Owner's Motion to Seal is *granted* in each proceeding (IPR 242, Paper 83; IPR 243, Paper 84; IPR 244, Paper 83);

FURTHER ORDERED that, because this is a Final Written Decision, any party to the proceeding seeking judicial review of the decision must comply with the notice and service requirements of 37 C.F.R. § 90.2.

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