

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

EVE ENERGY CO., LTD.,
Petitioner,

v.

VARTA MICROBATTERY GMBH,
Patent Owner.

IPR2023-00122
Patent 11,258,092 B2

Before CHRISTOPHER L. CRUMBLEY, JO-ANNE M. KOKOSKI, and
CHRISTOPHER M. KAISER, *Administrative Patent Judges*.

KOKOSKI, *Administrative Patent Judge*.

DECISION
Denying Institution of *Inter Partes* Review
35 U.S.C. § 314

I. INTRODUCTION

Eve Energy Co., Ltd. (“Petitioner”) filed a Petition to institute an *inter partes* review of claims 1–22 (the “challenged claims”) of U.S. Patent No. 11,258,092 B2 (“the ’092 patent,” Ex. 1001). Paper 1 (“Pet.”). VARTA Microbattery GmbH (“Patent Owner”) filed a Preliminary Response. Paper 9 (“Prelim. Resp.”). With Board authorization, Petitioner filed a Reply to the Preliminary Response (“Prelim. Reply,” Paper 10) and Patent Owner filed a Sur-reply to Petitioner’s Reply (“Prelim. Sur-reply,” Paper 11).

Institution of an *inter partes* review is authorized by statute when “the information presented in the petition . . . and any response . . . shows that there is a reasonable likelihood that the petitioner would prevail with respect to at least 1 of the claims challenged in the petition.” 35 U.S.C. § 314 (2018); *see also* 37 C.F.R. § 42.4 (2021). For the reasons discussed below, we deny the Petition and do not institute an *inter partes* review.

A. *Real Parties in Interest*

Each party identifies itself as the real party in interest. Pet. 1; Paper 7, 2.

B. *Related Matters*

The parties identify *VARTA Microbattery GmbH v. Eve Energy Co., Ltd.*, 2:21-cv-00399 (E.D. Tex. 2021) as a related matter. Pet. 1; Paper 7, 4. The ’092 patent is also the subject of IPR2023-00121, filed by Petitioner. Paper 3, 1; Paper 7, 5. The parties further identify several other *inter partes* reviews directed to patents related to the ’092 patent. Pet. 1; Paper 7, 4–6.

C. *The ’092 Patent*

The ’092 patent “relates to button cells comprising two metallic housing half-parts separated from one another by an electrically insulating

seal” that “form a housing with a flat bottom area and a flat top area parallel to it.” Ex. 1001, 1:23–26. Arranged inside the housing is “an electrode-separator assembly comprising at least one positive and at least one negative electrode, which are in the form of flat layers and are connected to one another by at least one flat separator.” *Id.* at 1:26–30.

The ’092 patent teaches that it is “preferable for at least one of the electrodes, preferably both the at least one negative electrode and the at least one positive electrode in [the] button cell, to be connected to the flat bottom and top areas [of the housing] via one or more output conductors.”

Ex. 1001, 6:3–7. “On the electrode side, the output conductors may, for example, be connected to a current collector. The output connectors can be connected to the housing and/or to the current collectors by, for example, welding or via [a] clamped joint.” *Id.* at 6:7–13. The button cell may also include “at least one insulating means, which prevents a direct mechanical and electrical contact between the end faces of the winding and the flat bottom and top areas.” *Id.* at 6:34–38.

D. Challenged Claims

Petitioner challenges claims 1–22 of the ’092 patent. Pet. 2. Claim 1, the only independent challenged claim, is illustrative of the claimed subject matter, and is reproduced below.

1. A button cell comprising:
 - [a] a housing, the housing including:
 - a cell cup having a flat bottom area, and
 - a cell top having a flat top area;
 - [b] an electrode-separator assembly winding disposed within the housing, the electrode-separator assembly winding including a multi-layer assembly that is wound

in a spiral shape about an axis, the multi-layer assembly including:

- [c] a positive electrode formed from a first portion of a first metallic foil, the first portion of the first metallic foil being coated with a first electrode material,
- [d] a negative electrode formed from a first portion of a second metallic foil, the first portion of the second metallic foil being coated with a second electrode material, and
- [e] a separator disposed between the positive electrode and the negative electrode;
- [f] a first metallic foil output conductor, the first metallic foil output conductor at least partially lying flat between (i) a first end face of the electrode-separator assembly winding and (ii) a first of the flat bottom area or the flat top area; and
- [g] a second metallic foil output conductor, the second metallic foil output conductor at least partially lying flat between (i) a second end face of the electrode-separator assembly winding and (ii) a second of the flat bottom area of the flat top area;
- [h] a first insulator disposed between the first end face of the electrode-separator assembly winding and the first metallic foil output conductor; and
- [i] a second insulator disposed between the second end face of the electrode-separator assembly winding and the second metallic foil output conductor,
- [j] wherein the first metallic foil output conductor is welded to the first of the flat bottom area or the flat top area and the second metallic foil output conductor is welded to the second of the flat bottom area or the flat top area, and
- [k] wherein the first electrode material is a lithium-intercalating electrode material and the button cell is a rechargeable lithium-ion button cell.

Ex. 1001, 12:64–13:38 (bracketed material added).

E. Asserted Grounds

Petitioner asserts that claims 1–22 would have been unpatentable based on the following grounds:

Claim(s) Challenged	35 U.S.C. §	Reference(s)/Basis
1–10, 13–22	103 ¹	Brown, ² Higuchi, ³ Okochi ⁴
11	103	Brown, Higuchi, Okochi, Brenner ⁵
12	103	Brown, Higuchi, Okochi, Kubota ⁶

Pet. 4. Petitioner relies on the Declaration of Marc Juzkow (Ex. 1003) in support of its contentions.

II. ANALYSIS

A. Level of Ordinary Skill in the Art

Petitioner contends that a person having ordinary skill in the art (“POSITA”) would have had “a bachelor’s degree in engineering (mechanical, electrical or chemical), general science, materials science or the equivalent and 3-4 years of work experience with electrochemical cell packaging systems.” Pet. 5 (citing Ex. 1003 ¶¶ 39–41). Petitioner further

¹ The Leahy-Smith America Invents Act (“AIA”), Pub. L. No. 112–29, 125 Stat. 284 (2011), revised 35 U.S.C. §§ 102 and 103 effective March 16, 2013. Petitioner argues, and Patent Owner does not contest, that the pre-AIA statutory provisions apply to this case. *See* Pet. 5 n.1. Neither party indicates the result would change based on which version of the statute the Board applies for purposes of deciding whether to institute review.

² Brown, US 3,748,182, issued July 24, 1973 (Ex. 1016).

³ Higuchi, Chinese Patent App. Pub. CN101286572 A, published October 15, 2008 (Exs. 1009 (English translation), 1010 (original Chinese)).

⁴ Okochi, EP 0829105 B1, published May 21, 2003 (Ex. 1013).

⁵ Brenner, DE 102005058132 A1, published June 6, 2007 (Ex. 1014, with English translation).

⁶ Kubota, US 5,654,114, issued August 5, 1997 (Ex. 1015).

contends that “[l]ess work experience may be compensated by a higher level of education, such as a master’s or doctorate degree,” and “less education may be compensated by more work experience.” *Id.* Patent Owner states that the Preliminary Response “establishes that Petitioner’s arguments fail under its proffered definition of” a person of ordinary skill in the art.

Prelim. Resp. 11. Patent Owner does not propose a different level of skill in the art at this stage of the proceeding. *See id.* (“Patent Owner reserves the right to dispute Petitioner’s definition of a [person of ordinary skill in the art] if an IPR is instituted.”).

To the extent necessary, and for purposes of this Decision, we accept the uncontested assessment offered by Petitioner.

B. Claim Construction

We construe each claim “in accordance with the ordinary and customary meaning of such claim as understood by one of ordinary skill in the art and the prosecution history pertaining to the patent.” 37 C.F.R. § 42.100(b) (2019). Under this standard, claim terms are generally given their plain and ordinary meaning as would have been understood by a person of ordinary skill in the art at the time of the invention and in the context of the entire patent disclosure. *Phillips v. AWH Corp.*, 415 F.3d 1303, 1313 (Fed. Cir. 2005) (en banc). Only those terms in controversy need to be construed, and only to the extent necessary to resolve the controversy. *Realtime Data LLC v. Iancu*, 912 F.3d 1368, 1375 (Fed. Cir. 2019).

Petitioner asserts that “no claim term requires construction.” Pet. 8. Patent Owner “reserves the right to advance its own constructions for any claim terms should an IPR be instituted.” Prelim. Resp. 11.

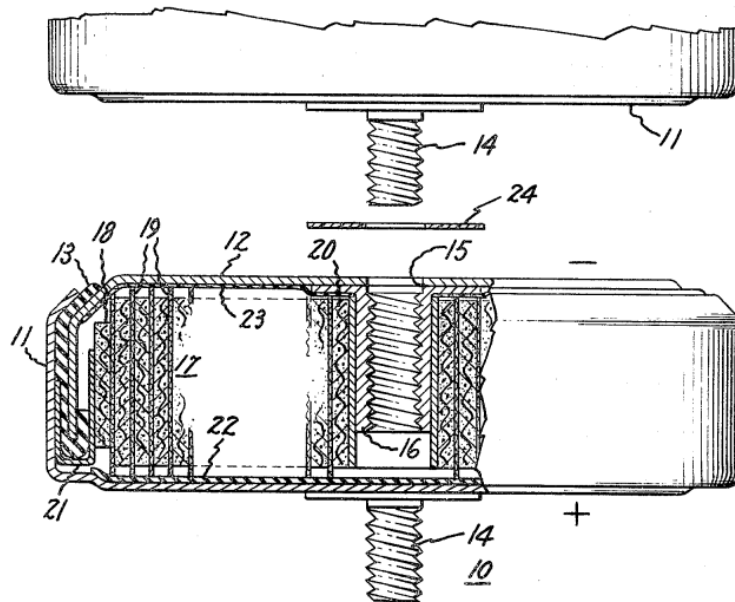
We determine that no claim term requires express construction for purposes of this Decision.

C. Ground 1: Asserted Obviousness over Brown, Higuchi, and Okochi

Petitioner contends that claims 1–10 and 13–22 would have been obvious over the combined teachings of Brown, Higuchi, and Okochi. Pet. 15–61.

1. Overview of Brown

Brown is directed to cell casings and sealed batteries, including button cell batteries. Ex. 1016, 1:21–23. Brown provides a Figure, reproduced below, that shows the structure of the described battery.



The Figure depicts a sectional view of a sealed button cell battery described in Brown. *Id.* at 1:64–66. Cell 10 includes positive components cathode 18, case 11, and threaded metal stud 14, and negative components anode 20, cover 12, and threaded socket 16. *Id.* at 2:2–21. Electrically insulating gasket 13 insulates case 11 and cover 12 from each other. *Id.* at 2:2–5. Spiral wound assembly 17 of cathode 18, separator 19, and anode 20, is positioned within case 11 and cover 12. *Id.* at 2:13–15. Metallic conducting strip 21 connects cathode 18 and case 11. *Id.* at 2:15–16.

2. Overview of Higuchi

Higuchi is a Chinese Patent Application entitled “Coin Type Non-Aqueous Electrolyte Secondary Battery.” Ex. 1009, code (54).⁷ Higuchi describes a coin type rechargeable battery having a strip-shaped anode, strip-shaped cathode, and strip-shaped separator that are wound together to form a cylindrical wound body. *Id.* at 3,⁸ Fig. 5B. Higuchi’s Figure 5B is reproduced below.

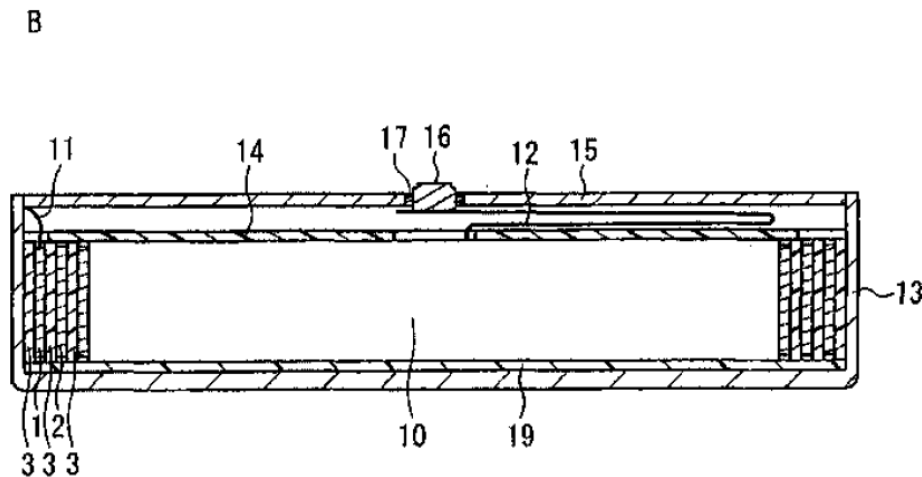


Figure 5

Figure 5B is a cross-sectional view of the battery described in Higuchi. *Id.* at 12. Lower insulating plate 19 is arranged on the bottom battery can 13. *Id.* Wound body 10 is structured such that strip-shaped separator 3 is interposed between the strip-shaped positive electrode 1 and strip-shaped negative electrode 2 and wound into a spiral. *Id.* Positive electrode lead 11 is provided on the outside peripheral side of wound body 10, and negative electrode lead 12 is provided on the inner peripheral side (not shown) of

⁷ Petitioner provides a certified English translation of Higuchi. Ex. 1010, 1. All citations to Higuchi are to the certified English translation.

⁸ We refer to the page numbers added by Petitioner in the lower-right corner of the page.

wound body 10. *Id.* at 11–12. Wound body 10 is inserted into cylindrical battery can 13 so that the winding axis direction matches the height direction of battery can 13. *Id.* at 12. Positive electrode lead 11 is inserted between battery can 13 and cap 15, so that battery can 13 and cap 15 can act as the positive electrode terminal. *Id.* Upper insulating plate 14 is placed on wound body 10, and negative lead 12 is welded to the inside of negative terminal 16 at the center of cap 15. *Id.* Insulating packing 17 insulates negative terminal 16 and cap 15. *Id.*

3. *Overview of Okochi*

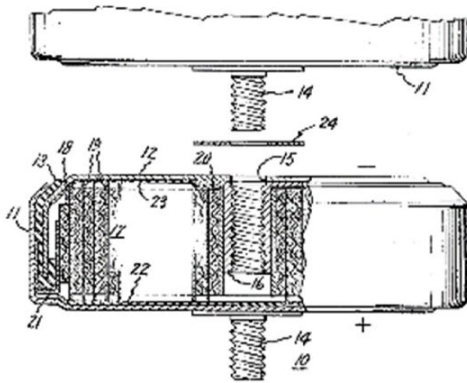
Okochi is a European Patent entitled “Non-Aqueous Electrolyte Secondary Batteries,” published March 18, 1998. Ex. 1013, codes (43), (54). Okochi describes a rechargeable battery having a spirally wound electrode assembly. *Id.* ¶¶ 1, 21. The positive and negative electrodes of Okochi’s battery have metal foils that act as collectors, and are spot welded to the electrode and the inner surface of the cell container. *Id.* ¶¶ 17, 25.

4. *Analysis*

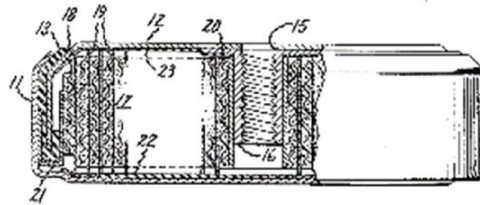
Petitioner contends that the combined disclosures of Brown, Higuchi, and Okochi teach all of the limitations of independent claim 1, and that a person of ordinary skill in the art would have been motivated to combine the teachings of the references in a manner that would result in the claimed button cell. Pet. 15–46. Petitioner begins its analysis with Brown’s cell, which Petitioner contends includes a housing with a cell cup having a flat bottom area and a cell top having a flat top area (*id.* at 32–33), a spiral wound assembly (*id.* at 34), and first and second insulators (*id.* at 42–44). Petitioner then contends that a POSITA would have been motivated to modify Brown’s cell by: (1) removing Brown’s stacking mechanism, (2) constructing Brown’s spiral wound assembly 17 with Higuchi’s electrode

layers, (3) replacing Brown's hollow member 16 with Higuchi's lead 12, and (4) repositioning Brown's metallic conducting strip 21 to be positioned at the bottom of the winding. *Id.* at 17–18. We focus our analysis on Petitioner's contention that a POSITA would have been motivated to modify Brown's cell by removing Brown's stacking mechanism, because it is dispositive for purposes of this Decision.

Petitioner contends that a POSITA would have been motivated to remove member 14 and washer 24 (which Petitioner calls Brown's "stacking mechanism") from Brown's cell as illustrated below:



Ex. 1016 at Fig. 1



Ex. 1003 ¶160.

Brown's Figure, depicting a sectional view of Brown's cell, is reproduced on the left, and Brown's Figure, modified by removing member 14 and washer 24 as proposed by Petitioner, is illustrated on the right. Pet. 18. Petitioner contends that, "[w]here a plurality of cells was not needed, a POSITA would have been motivated to remove the stacking feature to simplify the manufacturing process and to produce a battery with a smooth cup surface, thereby reducing the overall space occupied by the battery." *Id.* (citing Ex. 1003 ¶¶ 159–160). Petitioner contends that stacking is not Brown's sole focus, because "Brown pertains to 'both a single and multi-cell battery.'" *Id.* at 18–19 (citing Ex. 1016, 1:17–18). Therefore, according to

Petitioner, removing member 14 and washer 24 from Brown's cell "would not change the principle of operation of the battery disclosed by Brown, nor would it eliminate the advantages of Brown's electrode configuration." *Id.* at 19 (citing Ex. 1003 ¶ 161).

Patent Owner argues that removing the stacking mechanism from Brown's cell would eviscerate the fundamental purpose of Brown's invention. Prelim. Resp. 42–44. Patent Owner argues that Brown's primary objective is "to provide a means for connecting and accurately stacking primary cells to produce a multi-cell battery, . . . which is achieved by providing an aperture 15 in the housing top to allow the threaded stud 14 to engage the hollow member 16 for connecting multiple cells together." *Id.* at 42 (citing Ex. 1016, 1:47–51, Figure). Patent Owner asserts that "Brown does not disclose an embodiment of his cell which omits the stacking structure," and teaches only that the aperture is sealed when a single cell is used. *Id.* at 43 (citing Ex. 1016, 2:25–26).

We are not persuaded, on this record, that Petitioner adequately establishes that a POSITA would have been motivated to modify Brown in the manner proposed. Brown teaches that its battery casing with the stacking mechanism is used in both single and multi-cell batteries:

A cell casing for a primary dry cell battery of the button type is disclosed which includes a case with a first elongated electrically conductive member affixed centrally to its exterior surface, and a cover with a second elongated electrically conductive hollow member affixed centrally to its interior surface in communication with an aperture. Both a single and a multi-cell battery are described *which include the above battery casing*.

Ex. 1016, 1:11–18 (emphasis added). Consistent with this teaching, Brown's Example I describes a cell casing "formed generally in accordance"

with the casing depicted in Brown's Figure that includes a stacking mechanism, in particular a screw (member 14) welded to the outside center of case 11. *Id.* at 2:58–81. In Example II, Brown teaches using the “cell casing of Example I,” which includes the stacking mechanism, in a single-cell battery. *Id.* at 3:1–18. Brown explicitly states that the aperture in the cover is sealed when the cell is used in a single cell battery, but provides for no other modifications to the casing. *Id.* at 3:13–16 (“The aperture was then sealed by means of a short #2-56 round-head machine screw and a 10-mil thick polytetrafluoroethylene polymer gasket.”). In Example III, Brown similarly teaches a battery with fifteen stacked cell casings wherein, after each casing member of each cell was threaded into the hollow member of the cover of the adjacent, the aperture on the last cover was “sealed with a threaded screw as in Example II.” *Id.* at 3:19–29. These teachings demonstrate that Brown contemplated using the casing *with the stacking mechanism* in a single cell battery, and accounted for that by sealing the aperture in the cover.

In light of these disclosures in Brown, neither Petitioner nor Mr. Juzkow sufficiently explains why a POSITA would overlook Brown's teaching that the casing includes the stacking mechanism regardless of the number of cells in the battery, in order to simplify the manufacturing process and produce a battery with a smooth cup surface that would reduce the space occupied by the battery when only a single cell is used. Pet. 18 (citing Ex. 1003 ¶¶ 159–160); *see* Ex. 1016, 1:11–18, 3:1–18. Notably, Mr. Juzkow's testimony in this regard merely repeats the conclusory and unsupported assertions in the Petition, without citing to additional evidence or providing any reasoning to support his statement. Mr. Juzkow's testimony thus adds little to Petitioner's conclusory assertions regarding a

POSITA's motivation to modify Brown, and is entitled to little weight. *Xerox Corp. v. Bytemark, Inc.*, IPR2022-00624, Paper 9 at 15 (PTAB Aug. 24, 2022) (precedential).

For these reasons, we are not persuaded that Petitioner makes a sufficient showing that a POSITA would have been motivated to modify Brown as proposed. Accordingly, we conclude that Petitioner does not demonstrate a reasonable likelihood of prevailing in showing that independent claim 1, and claims 2–10 and 13–22 that depend, directly or indirectly, therefrom, would have been obvious over the combined teachings of Brown, Higuchi, and Okochi.

D. Remaining Grounds

Petitioner contends that claim 11 would have been obvious over the combined teachings of Brown, Higuchi, Okochi, and Brenner, and claim 12 would have been obvious over the combined teachings of Brown, Higuchi, Okochi, and Kubota. Pet. 61–65. Petitioner's contentions rely on Petitioner's arguments with respect to the combination of Brown, Higuchi, and Okochi set forth with respect to Ground 1, and Petitioner's arguments with respect to the remaining grounds do not remedy the deficiencies identified with respect to claim 1. *Id.* Accordingly, Petitioner does not demonstrate a reasonable likelihood of showing that dependent claims 11 and 12 would have been obvious as proposed by Petitioner.

III. CONCLUSION

Based on the arguments in the Petition, the Preliminary Response, and the evidence of record, we determine that Petitioner does not establish a reasonable likelihood that it will prevail on its challenge that claims 1–22 of the '092 patent are unpatentable.

IV. ORDER

In consideration of the foregoing, it is hereby:

ORDERED that the Petition is *denied* and no trial is instituted.

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