

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

EVE ENERGY CO., LTD.,
Petitioner,

v.

VARTA MICROBATTERY GMBH,
Patent Owner.

IPR2022-01473
Patent 11,024,904 B2

Before CHRISTOPHER L. CRUMBLEY, CHRISTOPHER M. KAISER,
and BRIAN D. RANGE, *Administrative Patent Judges*.

RANGE, *Administrative Patent Judge*.

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

I. INTRODUCTION

Eve Energy Co., LTD. (“Petitioner”) filed a Petition requesting *inter partes* review of claims 1–25 of U.S. Patent No. 11,024,904 B2 (Ex. 1001, “the ’904 patent”). Paper 1 (“Pet.”). VARTA Microbattery GmbH (“Patent Owner”) filed a Preliminary Response. Paper 7 (“Pet.”). With Board authorization, Petitioner filed a Reply to the Preliminary Response (“Prelim. Reply,” Paper 8) and Patent Owner filed a Sur-reply to Petitioner’s Reply (“Prelim. Sur-reply,” Paper 9).

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 determine that Petitioner establishes a reasonable likelihood of prevailing with respect to the unpatentability of at least one claim of the ’904 patent, and we do not exercise discretion to deny the Petition. Accordingly, we institute an *inter partes* review of claims 1–25 of the ’904 patent.

At this juncture, we have not made a final determination as to the patentability of any challenged claim or any factual or legal issue underlying the patentability inquiry. Any final determination will be based on the record developed during trial. We place Patent Owner on express notice that any argument for patentability not asserted in a timely filed Response to the Petition or in another manner permitted during trial shall be deemed waived, even if that argument was presented in the Preliminary Response.

A. Real Parties in Interest

Each party identifies itself as the real party in interest. Pet. 1; Paper 6, 1.

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. 2; Paper 6, 4. The parties further identify several other *inter partes* reviews directed to patents related to the '904 patent. Pet. 2–3; Paper 6, 4–6.

C. The '904 patent

The '904 patent relates to “button cells having a housing consisting of two metal housings halves” that contain “a wound electrode separator assembly.” Ex. 1001, 1:18–21. The '904 patent teaches that the two housing halves (the “housing cup” and the “housing top”) are separated by an electrically insulating seal to form “a housing having a plane bottom region and a plane top region parallel thereto.” *Id.* at 2:58–3:24. Arranged inside the housing is at least one positive electrode and at least one negative electrode, “each in the form of flat electrode layers” that are “preferably connected to one another by at least one flat separator.” *Id.* at 4:22–30. This electrode assembly is provided in the form of a winding that is “arranged such that its end sides face in the direction of the plane bottom region and the plane top region of the housing.” *Id.* at 4:31–41.

The '904 patent explains that the “button cell always also comprises metal conductors which electrically connect the at least one positive electrode and/or the at least one negative electrode respectively to one of the housing halves.” Ex. 1001, 4:42–50. The conductor connected to the positive electrode preferably consists of aluminum, and the conductor connected to

the at least one negative electrode preferably consists of nickel or copper. *Id.* at 4:42–50. “On the electrode side, the conductors are preferably connected to current collectors,” which “are generally metal foils or meshes conventionally coated on both sides with active electrode material.” *Id.* at 4:51–60. “These current collectors preferably consist of aluminum on the side of the positive electrode, and preferably nickel or copper on the side of the negative electrode.” *Id.* at 4:54–57.

The ’904 patent explains that, particularly in lithium ion button cells, the electrodes are subject to volume changes during the charging-discharging cycle that may result in contact problems between the conductors and the housing halves. *Id.* at 5:21–27. The ’904 patent teaches that welding the conductors to the respective housing halves alleviates these problems, and the conductors are preferably welded onto the inner side of the housing of the plane bottom region or the plane top region, respectively. *Id.*

D. Illustrative Claim

Claim 1 is an independent claim. Ex. 1001, 9:38–67. Claims 2–10 depend from claim 1. *Id.*, 2:1–30. Claim 1 is reproduced below with Petitioner’s labeling of elements in brackets.

1. [1.pre] A rechargeable button cell having a height-to-diameter ratio less than one, comprising:
 - [1.1] two metal housing components separated from one another by an electrically insulating injection-molded seal or film seal forming a housing having a plane bottom region and a plane top region parallel thereto;
 - [1.2] an electrode separator assembly comprising a positive electrode and a negative electrode inside the housing, the electrode separator assembly being provided in the form of a

winding, end sides of which face in a direction of the plane bottom region and the plane top region such that layers of the electrode separator assembly are oriented essentially orthogonally to the plane bottom region and plane top region; and

[1.3] current collectors as respective parts of the positive and the negative electrodes, the current collectors provided in the form of metal foils or meshes, wherein the metal foils or meshes are coated on both sides with active electrode material,

[1.4] wherein a first of the current collectors provided in the form of the metal foil or mesh includes an uncoated section that is not coated with active electrode material, the uncoated section being directly connected, by one or more spot welded connections and/or linear welded connections, to a first of the housing components to establish an electrical connection between the first of the current collectors and the first of the housing components, and

[1.5] wherein the button cell is configured as a secondary lithium ion battery.

Id., 9:38–67; *see also* Pet. viii–xv (Petitioner’s listing and labeling of elements for all claims).

Claim 11 is an independent claim. Ex. 1001, 10:31–65. Claims 12–16 depend from claim 11. *Id.*, 10:31–11:19. Claim 17 is an independent claim. Ex. 1001, 11:19–12:15. Claims 18–25 depend from claim 17. *Id.*, 12:16–45.

E. Asserted Grounds

Petitioner asserts that claims 1–25 would have been unpatentable based on the following grounds:¹

¹ According to Petitioner: “For clarity, several grounds rely upon the same prior art references because each ground entails different modifications to the primary reference. A similar approach was countenanced by the Board in *Amazon.com, Inc. v. CustomPlay, LLC*, IPR2018-01496, Paper 12 at 22

	Claims Challenged	35 U.S.C. §²	References/Basis
1A	1–8, 10–14, 16	103	Brown, ³ Higuchi, ⁴ Fujita ⁵
1B	17, 19–24	103	Brown, Higuchi, Fujita
1C	9, 15	103	Brown, Higuchi, Kaun ⁶
1D	25	103	Brown, Higuchi, Fujita, Kaun
1E	18	103	Higuchi, Fujita, Kubota ⁷
2A	1–8, 10–14, 16	103	Higuchi, Kobayashi ⁸
2B	17, 19–24	103	Higuchi, Kobayashi, Fujita
2C	9, 15	103	Higuchi, Kobayashi, Kaun
2D	25	103	Higuchi, Kobayashi, Fujita, Kaun
2E	18	103	Higuchi, Kobayashi, Fujita, Kubota

Pet 5–6. Petitioner relies on the Declaration of Marc Juzkow (Ex. 1002) in support of its contentions.

(PTAB Mar. 7, 2019).” Pet. 6, n.1.

² The relevant sections of the Leahy-Smith America Invents Act (“AIA”), Pub. L. No. 112–29, took effect on March 16, 2013. The ’904 patent claims priority to applications with filing dates before this date. *See* Ex. 1001, code (60), (63). For the purposes of this Decision, pre-AIA statutes apply.

³ US 3,748,182, published July 24, 1973, Ex. 1005 (“Brown”).

⁴ CN 101286572A, published October 15, 2008, Ex. 1006 (“Higuchi”) (Chinese Patent Application Publication with foreign translation and declaration therefor).

⁵ JP H2-285745, published June 5, 1992, Ex. 1007 (“Fujita”) (Japanese Patent Application with foreign translation and declaration therefor).

⁶ US 2007/0160901 A1, published July 12, 2007, Ex. 1008 (“Kaun”).

⁷ US 5,654,114, published Aug. 5, 1997, Ex. 1010 (“Kubota”).

⁸ JP 2007294111A, published August 8, 2007, Ex. 1009 (“Kobayashi”) (Japanese Patent Application with foreign translation and declaration therefor).

II. ANALYSIS

A. 35 U.S.C. § 314(a)

Under 35 U.S.C. § 314(a), the Director has discretion to deny institution of an *inter partes* review. *Cuozzo Speed Techs., LLC v. Lee*, 136 S. Ct. 2131, 2140 (2016) (“[T]he agency’s decision to deny a petition is a matter committed to the Patent Office’s discretion.”); *SAS Inst. v. Iancu*, 138 S. Ct. 1348, 1356 (2018) (“[Section] 314(a) invests the Director with discretion on the question *whether* to institute review.”); *Harmonic v. Avid Tech., Inc.*, 815 F.3d 1356, 1367 (Fed. Cir. 2016) (“[T]he PTO is permitted, but never compelled, to institute an IPR proceeding.”).

In determining whether to exercise discretion to deny institution under 35 U.S.C. § 314(a), the Board considers the trial date in related litigation as part of an assessment of all relevant circumstances of the case, including the merits, in an effort to balance considerations such as system efficiency, fairness, and patent quality. *Apple Inc. v. Fintiv, Inc.*, IPR2020-00019, Paper 11 at 5–6 (PTAB Mar. 20, 2020) (precedential) (“*Fintiv* Order”); *see also NHK Spring Co. v. Intri-Plex Techs., Inc.*, IPR2018-00752, Paper 8 at 19–20 (PTAB Sept. 12, 2018) (precedential) (denying institution relying, in part, on § 314(a) because the parallel district court proceeding was scheduled to finish before the Board reached a final decision). In particular, the Board evaluates the following factors (“*Fintiv* factors”):

1. whether the court granted a stay or evidence exists that one may be granted if a proceeding is instituted;
2. proximity of the court’s trial date to the Board’s projected statutory deadline for a final written decision;
3. investment in the parallel proceeding by the court and the parties;

4. overlap between issues raised in the petition and in the parallel proceeding;
5. whether the petitioner and the defendant in the parallel proceeding are the same party; and
6. other circumstances that impact the Board's exercise of discretion, including the merits.

Fintiv Order, 5–6. In evaluating these factors, “the Board takes a holistic view of whether efficiency and integrity of the system are best served by denying or instituting review.” *Id.* at 6.

On June 21, 2022, the Director of the United States Patent and Trademark Office (“USPTO”) issued a Memorandum⁹ to clarify “the PTAB’s current application of *Fintiv* to discretionary institutions where there is parallel litigation” and “confirm[] that the precedential import of *Fintiv* is limited to the facts of that case.” Memorandum, 2. In particular, the Memorandum sets forth that: (1) the PTAB will not rely on the *Fintiv* factors to discretionarily deny institution “where a petition presents compelling evidence of unpatentability” (*id.* at 2); (2) the *Fintiv* factors do not apply to parallel U.S. International Trade Commission proceedings (*id.* at 2–3); (3) the PTAB will not discretionarily deny institution “where a petitioner presents a stipulation not to pursue in a parallel proceeding the same grounds or any grounds that could have reasonably been raised before the PTAB” (*id.* at 3); and (4) “the PTAB will consider the median time from filing to disposition of the civil trial for the district in which the parallel litigation resides” (*id.*).

⁹ Available at:

https://www.uspto.gov/sites/default/files/documents/interim_proc_discretionary_denials_aia_parallel_district_court_litigation_memo_20220621_.pdf

Patent Owner argues we should exercise our discretion under 35 U.S.C. § 314(a) to deny institution in view of *VARTA Microbattery GmbH v. Eve Energy Co., Ltd.*, 2:21-cv-00399 (E.D. Tex. 2021). Prelim. Resp. 22–32. Petitioner asserts that it stipulated that “if the petitions for *Inter Partes* Review of the ’904 patent are instituted, it will not assert invalidity in the parallel district court proceedings . . . based on grounds that were raised or reasonably could have been raised in the instituted IPRs.” Prelim. Reply 1; *see also* Ex. 1013. Our binding guidance states that the Board “will not discretionarily deny institution of an IPR or PGR in view of parallel district court litigation where a petitioner stipulates not to pursue in a parallel district court proceeding the same grounds as in the petition or any grounds that could have reasonably been raised in the petition.” Memorandum, 7. Accordingly, in view of Petitioner’s stipulation, we decline to exercise our discretion under § 314(a) to deny institution of *inter partes* review.

B. 35 U.S.C. § 325(d)

Patent Owner argues that we should exercise our discretion under 35 U.S.C. § 325(d) to deny institution because the same prior art was previously considered by the Patent Office. In particular, Patent Owner argues that (1) Brown, Higuchi, Kaun, Kobayashi, and Fujita were also considered during examination of the ’904 Patent (Resp. 33–34), (2) with respect to Ground 1A–1E, the Board already considered Brown in detail in the 0474 IPR of the ’581 patent (*id.* at 34–35), and (3) with respect to Ground 2A–2E, whether Higuchi teaches output conductor leads was addressed during prosecution of related U.S. Patent No. 10,804,506 (*id.* at

35). We provide an overview of the relevant legal framework and then address each of these positions.

1. *Legal Framework*

Section 325(d) provides that, in determining whether to institute an *inter partes* review, “the Director may take into account whether, and reject the petition or request because, the same or substantially the same prior art or arguments previously were presented to the Office.” The Board uses a two-part framework for evaluating arguments under § 325(d):

(1) whether the same or substantially the same art previously was presented to the Office or whether the same or substantially the same arguments previously were presented to the Office;
and

(2) if either condition of first part of the framework is satisfied, whether the petitioner has demonstrated that the Office erred in a manner material to the patentability of challenged claims.

Advanced Bionics, LLC v. MED-EL Elektromedizinische Geräte GmbH, IPR2019-01469, Paper 6 at 8 (PTAB Feb. 13, 2020) (precedential) (“*Advanced Bionics*”). In applying this framework, we consider the *Becton, Dickinson*¹⁰ factors that address discretion to deny when a petition presents the same or substantially the same prior art or arguments previously presented to the Office, including:

- (a) the similarities and material differences between the asserted art and the prior art involved during examination;
- (b) the cumulative nature of the asserted art and the prior art evaluated during examination;

¹⁰ *Becton, Dickinson & Co. v. B. Braun Melsungen AG*, IPR2017-01586, Paper 8 at 17–18 (PTAB Dec. 15, 2017) (precedential as to § III.C.5, first paragraph) (“*Becton, Dickinson*”).

(c) the extent to which the asserted art was evaluated during examination, including whether the prior art was the basis for rejection;

(d) the extent of the overlap between the arguments made during examination and the manner in which Petitioner relies on the prior art or Patent Owner distinguishes the prior art;

(e) whether Petitioner has pointed out sufficiently how the Examiner erred in its evaluation of the asserted prior art; and

(f) the extent to which additional evidence and facts presented in the Petition warrant reconsideration of the prior art or arguments.

Becton, Dickinson, Paper 8 at 17–18. Factors (a), (b), and (d), relate to whether the same or substantially the same art or arguments were previously presented to the Office, and factors (c), (e), and (f) relate to whether the petitioner demonstrates that the Office erred in a manner material to the patentability of the claims. *Advanced Bionics*, Paper 6 at 9–11. Only if the same or substantially the same art or arguments were previously presented to the Office do we then consider whether the petitioner has demonstrated a material error by the Office. *Id.*

2. *Examination of the '904 Patent*

Although Patent Owner argues that the Petition asserts references previously in the Patent Office's records, Patent Owner does not argue that the Examiner previously considered the combinations of art that the Petition raises, namely, the combination of Brown, Higuchi, and Fujita or the combination of Higuchi and Kobayashi. Resp. 33–34. And, to the extent that Patent Owner argues that substantially the same art was previously presented, the record does not persuasively establish how the art is substantially the same or how the art is now relied upon in the same manner. Resp. 33–34. As such, the record does not establish that the '904

examination previously considered the art in a similar or cumulative way or to the same extent. As such, at least *Becton, Dickinson* factors (a), (b), (c), and (d) weigh against denial of institution.

3. *The Board's consideration of Brown*

Patent Owner argues that the Board previously considered Brown to such an extent that Petitioner is now estopped from re-litigating it. Resp. 34–35. This argument only relates to Petitioner's first ground. Here, we decline to address collateral estoppel in view of our determination that Petitioner does not, on this record, demonstrate a reasonable likelihood of prevailing in showing that any of claims 1–25 would have been obvious over the combined teachings of Brown, Higuchi, and Fujita. *See* Section II.E.4, *infra*.

Also, mere prior consideration of Brown does not establish that the same or substantially the same prior the same or substantially the same art previously was presented to the Office or whether the same or substantially the same arguments previously were presented to the Office. To the contrary, Petitioner's grounds here involve different combinations of references rather than only Brown. As such, prior consideration of Brown does not favor discretionary denial.

4. *The '506 patent's history*

Patent Owner asserts that Petitioner contends that a POSITA “would be motivated to use Higuchi's leads to make connections to the housing of Kobayashi,” and argues that “[t]he issue of whether Higuchi teaches output conductor leads that could be so connected was addressed by the Patent Owner during prosecution of” the '506 patent. Prelim. Resp. 35 (citing Ex. 2037, 18–19. Petitioner responds “[t]he '506 patent is not a direct family

member of the '904 patent, so any prosecution history of the '506 patent was not before the Office in the '904 patent.” Prelim. Reply 6.

We read the *Becton, Dickinson* factors broadly “to apply to any situation in which a petition relies on the same or substantially the same art or arguments previously presented to the Office during a proceeding *pertaining to the challenged patent.*” *Advanced Bionics*, Paper 6 at 10 (emphasis added). The record before us does not establish that the prosecution of the '506 patent is a proceeding pertaining to the '904 patent. The '506 patent and the '904 patent issued from different divisional applications of the same parent application. The application that issued as the '506 patent was a direct division of the parent application. U.S. Patent No. 10,804,506 B2, code (62) (“Division of application No. 13/378,117). The application that issued as the '904 patent was a different division of the parent application. Ex. 1001, code (62). The '506 patent’s divisional application (U.S. Application No. 15/433,654) is not identified as “related U.S. application data” on the face of the '904 patent. Because the '904 patent is the product of a different line of divisions of the parent application than the '506 patent, that they share the same parent application is not sufficient to establish that the '506 patent prosecution pertains to the '904 patent for purposes of § 325(d). Accordingly, we determine that part one of the *Advanced Bionics* framework is not satisfied.

5. Conclusion

Based on our analysis within the *Advanced Bionics* framework, we find that the Petition does not implicate § 325(d) in a manner sufficient to warrant discretionary denial, and we decline to exercise our discretion to deny institution under § 325(d).

C. 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 level college degree in Mechanical, Electrical, Materials or Chemical Engineering, or Science, including Chemistry or Physics or a related field and three to four years of training and experience in the design of electrochemical cells and batteries.” Pet. 7. Petitioner further contends that “[a]dditional work or research experience can substitute for a lesser or different education, and vice-versa.” *Id.* Patent Owner states that the Preliminary Response “establishes that Petitioner’s arguments fail even under its proffered definition of” a person of ordinary skill in the art. Prelim. Resp. 14. 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.

D. 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 argues that the term “metal conductors,” as it appears in claim 6, should be construed as “the uncoated sections of the current collectors.” Pet. 11. Petitioner requests that all other claims terms “be accorded their plain and ordinary meaning as understood by a POSITA at the time of the purported invention.” Pet. 10. Patent Owner asserts that its arguments “do not hinge on the outcome of an actual controversy about any claim construction.” Prelim. Resp. 15 (citing *Vivid Techs., Inc. v. Am. Sci. & Eng’g, Inc.*, 200 F.3d 795, 803 (Fed. Cir. 1999)).

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

E. Ground 1A: Asserted Obviousness over Brown, Higuchi, and Fujita

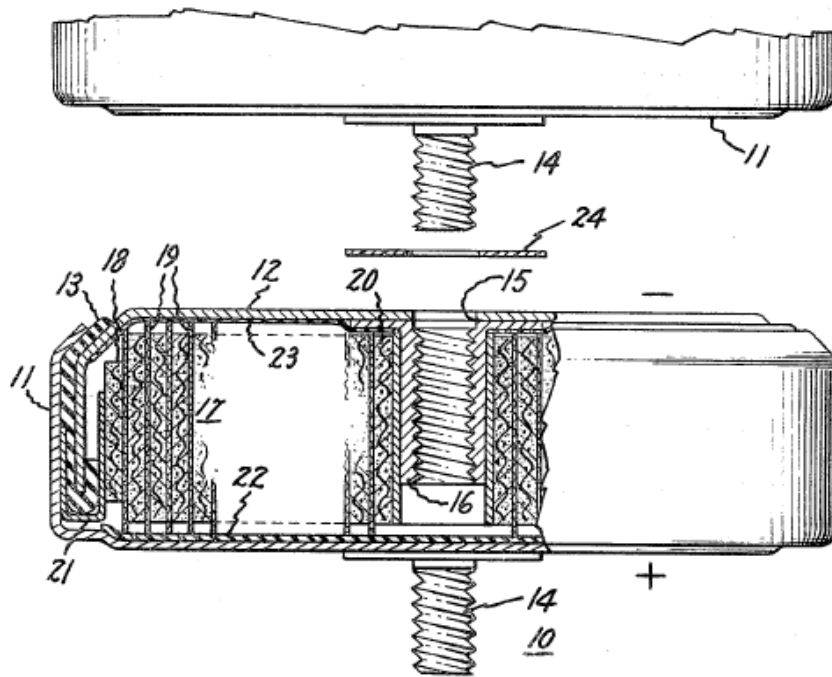
Petitioner contends that claims 1–8, 10–14, and 16 would have been obvious over the combined teachings of Brown, Higuchi, and Fujita.

Pet. 18–48.

1. Overview of Brown

Brown is a U.S. patent titled “BUTTON TYPE CELL CASING AND SEALED BUTTON TYPE BATTERY.” Ex. 1005 (cover page). Brown relates to “batteries of the sealed button type.” *Id.*, 1:23.

We reproduce Brown’s sole figure (not numbered) below.



Brown's figure illustrates a sectional view of a sealed button type primary cell including a button type cell casing. *Id.*, 1:64–65. A sealed button type primary cell 10 includes a button type cell casing. *Id.*, 1:68–69. Cell 10 has a case 11 and a cover 12 each made of electrically conductive material forming spaced-apart negative and positive terminal walls. *Id.*, 1:70–2:1. Case 11 and cover 12 are insulated electrically from each other by an electrically insulating gasket 13 that provides a leak-tight seal therebetween. *Id.*, 2:2–5.

A first elongated electrically conductive member 14 in the preferred form of a threaded stud is affixed centrally to the exterior surface of case 11. *Id.*, 1:5–8. Cover 12 has a central aperture 15 therein. *Id.*, 2:8–9. A second elongated electrically-conductive, hollow-threaded member 16 is affixed to the interior surface of cover 12 and in communication with aperture 15. *Id.*, 2:9–13. The threaded first member 14 of one cell is tapped into the threaded second member 16 of another cell. *Id.*, 2:38–40.

A winding 17 of cathode 18, separator 19 with electrolyte, and anode 20, is encapsulated within 15 case 11 and cover 12. *Id.*, 2:13–15. A metallic connecting strip 21 contacts cathode 18 and the interior surface of case 11. *Id.*, 2:15–16. Winding 17 is otherwise insulated electrically from case 11 by an electrically insulating washer 22. *Id.*, 2:17–18. Winding 17 is insulated electrically from cover 12 by an electrically-insulating washer 23. *Id.*, 2:18–20. Hollow member 16 is in electrical contact with anode 20. *Id.*, 2:20–21.

2. *Overview of Higuchi*

Higuchi is a Chinese Patent Application entitled “Coin Type Non-Aqueous Electrolyte Secondary Battery.” Ex. 1006, code (54).¹¹ 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 25,¹² Fig. 5B. We reproduce Higuchi’s Figure 5B below.

¹¹ Petitioner provides a certified English translation of Higuchi. Ex. 1006, 1. All citations to Higuchi are to the certified English translation.

¹² We refer to the page numbers added by Petitioner in the lower-left corner of the page.

B

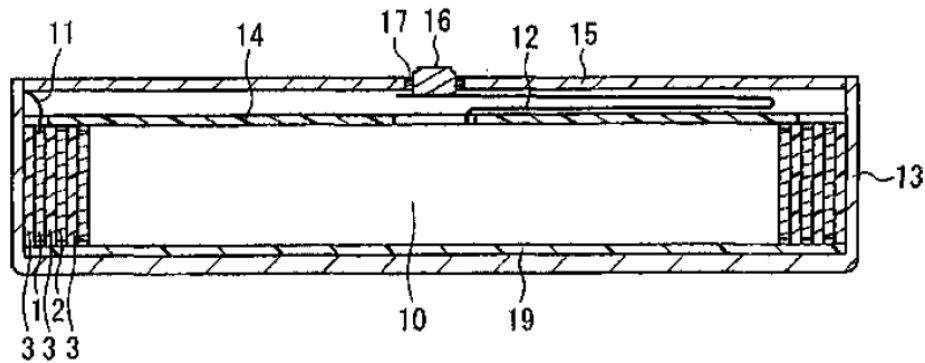


Figure 5

Figure 5B is a cross-sectional view of the battery described in Higuchi. *Id.* at 34. 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 wound body 10. *Id.* at 33–34. 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 34. 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 Fujita*

Fujita is a Japanese Unexamined Patent Application entitled “Method for Manufacturing Round Cylindrical Battery,” and “relates to a method for manufacturing a round cylindrical battery.” Ex. 1007, code (54), 10.¹³ Fujita describes a manufacturing method “wherein the lead is welded well to the bottom inner surface of the exterior case.” *Id.* at 11. Fujita teaches arrangement of its electrodes within its case can as follows,

after an electrode group wherein a positive electrode and a negative electrode, with a separator interposed therebetween, has been coiled into a coil shape, is placed in an exterior case can, a lead that leads out from either electrode of the electrode group is arranged so as to contact the bottom inner surface of the exterior case can, and the lead and bottom inner surface of the exterior case can are welded together, wherein the welding together of the lead and the bottom inner surface of the exterior case can is carried out through applying a laser beam or an electron beam to the bottom outer surface of the exterior case can.

Id. at 11.

4. *Petitioner’s proposed combination*

Petitioner contends that the combined disclosures of Brown, Higuchi, and Fujita teach or suggest 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. 18–38. Petitioner begins its analysis with Brown’s cell and contends that a person of ordinary skill in the art would have been motivated to modify Brown’s cell by “(1) remov[ing] Brown’s stacking

¹³ Petitioner provides a certified English translation of Fujita. Ex. 1007, 1–2. All citations to Fujita are to the certified English translation. We refer to the page numbers added by Petitioner in the lower-left corner of the page.

mechanism, (2) construct[ing] Brown's spiral wound assembly 17 with Higuchi's electrode layers, (3) replac[ing] Brown's metallic connecting strip with Higuchi's lead 11, and (4) bend[ing] lead 11 towards the center of the winding and weld lead 11 to Brown's case 11, as disclosed in Fujita." Pet. 18. Petitioner further contends that "[t]he result is a 'combination of familiar elements according to known methods' that 'does no more than yield predictable results.'" *Id.* (citing *KSR Int'l Co. v. Teleflex Inc.*, 550 U.S. 398, 416 (2007)).

With regard to Brown's stacking mechanism, Brown teaches "both a single and multi-cell battery." Pet. 19 (citing Ex. 1005 (1:17–18)). Brown teaches non-stacking variants. *Id.* (citing 3:2–18). Petitioner argues that where a plurality of cells is not needed, a person having ordinary skill in the art would have been motivated to remove Brown's stacking feature. *Id.* (citing Ex. 1002 ¶ 58).

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. 1005, 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 singlecell 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 explain 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. 19 (citing Ex. 1002 ¶ 57–59); *see* Ex. 1005, 1:11–18, 3:1–18. Mr. Juzkow’s testimony in this regard repeats the conclusory and unsupported assertions in the Petition, without citing to additional evidence or providing significant 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. Because Petitioner relies on its modified Brown with respect to Grounds 1A to 1E, we also conclude that that Petitioner does not, on this record, demonstrate a reasonable likelihood of prevailing in showing that any of claims 1–25 would have been obvious over the combined teachings of Brown, Higuchi, and Fujita. Pet. 18–31. Because of our determination regarding ground 2, however, this conclusion does not prevent institution. *See SAS Institute, Inc. v. Iancu*, 138 S. Ct. 1348 (2018). We invite the parties to develop the issue further at trial to the extent permitted under our rules and applicable law.¹⁴

F. Ground 2A: Asserted Obviousness over Higuchi and Fujita

Petitioner contends that claims 1–8, 10–14, and 16 would have been obvious over the combined teachings of Higuchi and Kobayashi. Pet. 64–86.

1. Overview of Higuchi

Higuchi is a Chinese Patent Application entitled “Coin Type Non-Aqueous Electrolyte Secondary Battery.” Ex. 1006, code (54).¹⁵ Higuchi

¹⁴ We remind Petitioner that “[i]t is of the utmost importance that petitioners in the IPR proceedings adhere to the requirement that the initial petition identify ‘with particularity’ the ‘evidence that supports the grounds for the challenge to each claim.’” *Intelligent Bio-Sys., Inc. v. Illumina Cambridge Ltd.*, 821 F.3d 1359, 1369 (Fed. Cir. 2016) (quoting 35 U.S.C. § 312(a)(3)).

¹⁵ Petitioner provides a certified English translation of Higuchi. Ex. 1006, 1. All citations to Higuchi are to the certified English translation.

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 25,¹⁶ Fig. 5B. Higuchi's Figure 5B is reproduced below.

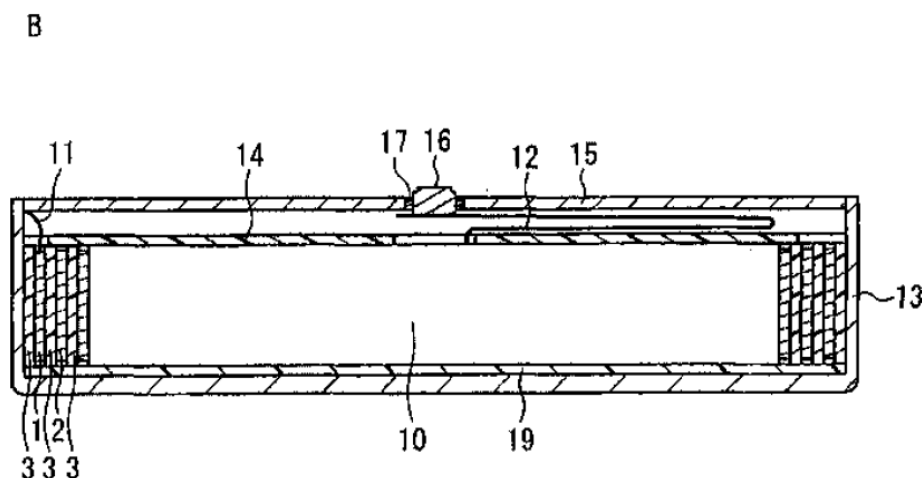


Figure 5

Figure 5B is a cross-sectional view of the battery described in Higuchi. *Id.* at 34. 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 wound body 10. *Id.* at 33–34. 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 34. 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

¹⁶ We refer to the page numbers added by Petitioner in the lower-left corner of the page.

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.*

2. *Petitioner's Proposed Combination*

Petitioner contends that the combined disclosures of Higuchi and Kobayashi teach or suggest 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. 64–83. Petitioner begins its analysis with Higuchi's cell, and contends that a POSITA would have been motivated to modify Higuchi's cell by “(1) replac[ing] Higuchi's housing with Kobayashi's housing, (2) modify[ing] Fujita's folding and welding techniques to Higuchi's lead 11 to extend from below the winding, and (3) weld Higuchi's negative electrode lead 12 to the inner surface of the upper housing.” Pet. 64 (citing Ex. 1002 ¶ 208).

a) replacing Higuchi's housing with Kobayashi's housing

Petitioner contends that Higuchi teaches that both battery can 13 and cap 15 act as the positive electrode terminal, and that a portion of negative electrode lead 12 is positioned near cap 15 without insulation. Pet. 65–66 (citing Ex. 1006, 34, Fig. 5B; Ex. 1002 ¶ 212). Petitioner contends that “[t]he proximity of the negative electrode lead to the positive electrode terminal poses a risk for short-circuit,” so Higuchi provides extra space at the top of the housing to distance negative electrode lead 12 from cap 15. *Id.* at 66. Petitioner further contends that Higuchi teaches that negative electrode lead 12 is formed from the negative electrode current collector “that could

be ‘made of copper foil with a thickness of 12 μm .’” *Id.* at 67 (citing Ex. 1006, 32, 37). Petitioner contends that “[a] POSITA would have understood such a material to be thin and soft, such that when Higuchi’s battery is placed upside down, shocked or vibrated, lead 12 would make contact with cap 15.” *Id.* (citing Ex. 1002 ¶ 215).

Petitioner contends that, in contrast, Kobayashi’s anode case 11 “permits a safe connection between the negative electrode lead and a housing half.” Pet. 67. Petitioner also contends that “Kobayashi discloses a more robust design” wherein anode case 11 is in contact with anode terminal plate 5a, and cathode case 13 is in contact with cathode terminal plate 4a. *Id.* at 68 (citing Ex. 1009 ¶¶ 33, 34, Fig. 1). Petitioner contends that

a POSITA would have understood Kobayashi’s cases 11 and 13 to act as an extension of their respective terminals, and to be analogous to Higuchi’s cap 15 and negative terminal 16. [Ex. 1002] ¶ 221. Kobayashi separates these extensions of the positive and negative terminals (cases 11 and 13) by placing them on opposite ends of the battery. Kobayashi’s housing provides a more complete separation of the two terminals, and a more robust insulation between them.

Pet. 69. Therefore, according to Petitioner, “replacing Higuchi’s housing with Kobayashi’s eliminates Higuchi’s risk for short-circuit and increases Higuchi’s effective use of space and energy density.” *Id.* (citing Ex. 1002 ¶ 222).

Patent Owner responds that replacing Higuchi’s housing with Kobayashi’s “would have resulted in a drastic reduction of available space for active battery components.” Prelim. Resp. 50. Patent Owner argues that the button cell resulting from such a modification “would have considerably reduced energy discharge capability and reduced battery life,” and devices

using the button cell “would need to be recharged far more frequently.” *Id.* at 52.

Patent Owner also argues that Petitioner and Mr. Juzkow “recognized this deficiency in a petition directed to a related patent, where Petitioner argued that “a significant portion of the available space within [Kobayashi’s] cell is reduced by the process of crimping the cell closed.” Prelim. Resp. 52 (citing Ex. 2008, 2–3). Patent Owner argues that “Petitioner fails to explain why the beaded-over Kobayashi housing Petitioner itself disparaged in another petition would be used in the present combination of references proposed in this petition.” *Id.* at 54.

Patent Owner also argues that a POSITA would not have replaced Higuchi’s housing with Kobayashi’s to reduce the risk of short circuits. Prelim. Resp. 55. Patent Owner points to Petitioner’s arguments in a different proceeding, where Petitioner argues for a modification that “could reduce such risk of short circuits without the corresponding loss of volume associated with Kobayashi’s housing.” *Id.* (citing Ex. 2041). According to Patent Owner, “[i]f Petitioner’s argument that a [POSITA] would be motivated to adhere an insulation strip to both sides of Higuchi’s lead is correct, it would not be necessary” to replace Higuchi’s housing with Kobayashi’s “to reduce the risk of short circuits.” *Id.* at 56.

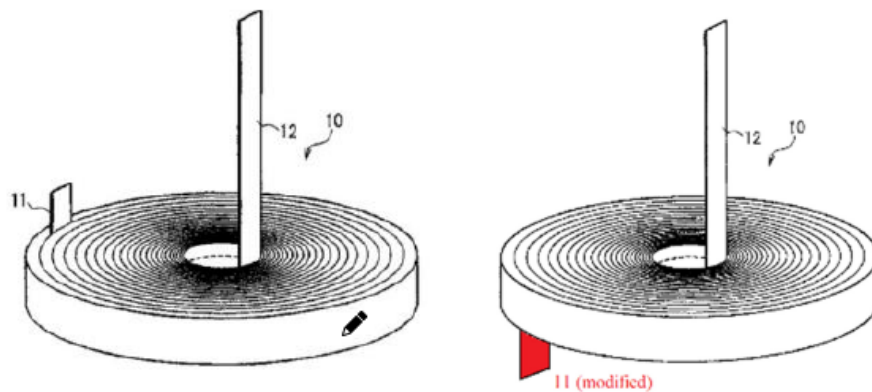
We have considered Patent Owner’s arguments, and although they cast doubt on Petitioner’s contentions and create a genuine issue of material fact, we are persuaded, on this record, that Petitioner provides sufficient reasoning with rational underpinning to support a motivation to combine the teachings of Higuchi and Kobayashi as proposed. Pet. 64–78. Specifically, Petitioner sufficiently establishes, for purposes of institution, that a POSITA

would have had reason to modify Higuchi's cell to use Kobayashi's housing in order to reduce the risk that the cell would short circuit. *Id.* at 65–69.

We invite the parties to develop these arguments further at trial, to the extent permitted under our rules.

b) *applying Fujita's folding and welding techniques to Higuchi's lead 11 and 12*

Petitioner contends that, before applying Fujita's folding and welding technique, a POSITA would have been motivated to move Higuchi's lead 11 "to dispose electrode lead 11 on the opposite side of electrode lead 12," as shown below. Pet. 75–77.



Higuchi Figure 1, depicting wound body 10 with lead 11 provided on its outer peripheral side and lead 12 provided on its inner peripheral side, is reproduced on the left, and Figure 1, modified to show lead 11 (in red) extending below wound body 10, is reproduced on the right. Pet. 75–77 (citing Ex. 1002 ¶ 236). Petitioner contends that, after replacing Higuchi's housing with Kobayashi's, "a POSITA would have been motivated to dispose electrode lead 11 on the opposite side of electrode lead 12 to further prevent the same problem previously discussed with respect to lead 12 and Higuchi's cap 15." *Id.* Petitioner contends that "Kobayashi would have prompted this modification" because moving lead 11 to the bottom of the

winding facilitates the connection between lead 11 and cathode case 13. *Id.* at 76–77 (citing Ex. 1002 ¶ 238).

Based on the record before us at this stage of the proceeding, we are persuaded that Petitioner adequately establishes, for purposes of this Decision, that a POSITA would have been motivated to use Fujita’s bending and welding techniques as proposed. Pet. 75–77.

c) Welding Lead 12 to the inner surfaces of the housing

Petitioner then contends that it would have been obvious to weld Higuchi’s lead 12 to the inner surface of Kobayahi’s anode case 11. Pet. 78 (citing Ex. 1002 ¶ 241). Petitioner explains that Higuchi teaches welding together “negative lead 12 and the inside of the negative terminal 16 at the center of the cap 15.” *Id.* (citing Ex. 1006, 34). Petitioner argues that Kobayashi’s anode case 11 is analogous to Higuchi’s negative electrode terminal, thus motivating the modification.

Based on the record before us at this stage of the proceeding, we are persuaded that Petitioner adequately establishes, for purposes of this Decision, that a POSITA would have been motivated to use Fujita’s bending and welding techniques as proposed. Pet. 75–77.

d) Conclusion

Having considered the parties’ arguments and the evidence of record, we are persuaded that Petitioner provides sufficient reasoning with rational underpinning to support a motivation to combine the teachings of Higuchi, Kobayashi, and Fujita as proposed. Pet. 17–29.

3. Claims 1–8, 10–14, 16

Petitioner asserts, with supporting testimony from Mr. Juzkow, that the combination of Higuchi and Kobayashi teaches all of the limitations of

independent claim 1. Pet. 79–83. In particular, Petitioner relies on Higuchi for its teaching of elements of the button cell such as a wound body including a positive electrode and a negative electrode, an insulator, and a first and second current collector and relies on Kobayashi for its housing. *Id.*; *see also id.* at 64–78 (Petitioner’s proposed combination). At this stage of the proceedings, Patent Owner does not address Petitioner’s specific contentions with respect to claim 1’s recitations.

We have reviewed Petitioner’s contentions for all of the elements of independent claim 1, as well as the supporting evidence. Pet. 79–83. Based on the record before us, we are persuaded that Petitioner’s discussion of the particular structures and methods in Higuchi and Kobayashi establishes a reasonable likelihood that the combined teachings of Higuchi and Kobayashi teach or suggest all of the limitations of independent claim 1. *Id.* We have also reviewed Petitioner’s contentions with regard to claims 2–8, 10–14, 16, which depend, directly or indirectly, from claim 1. *Id.* at 83–86. We are persuaded that Petitioner establishes a reasonable likelihood that the teachings of Higuchi and Kobayashi teach or suggest all of the limitations of these dependent claims as well. *Id.*

G. Remaining Grounds

Petitioner contends that: (1) claims 17 and 19–24 would have been obvious over the combined teachings of Higuchi, Kobayashi, and Fujita (*id.* at 87–94); (2) claims 9 and 15 would have been obvious over the combined teachings of Higuchi, Kobayashi, and Kaun (*id.* at 94–96); (3) claim 25 would have been obvious over the combined teachings of Higuchi, Kobayashi, Fujita, and Kaun (*id.* at 97–98); and (4) claim 18 would have been obvious over the combined teachings of Higuchi, Kobayashi, Fujita,

and Kubota (*id.* at 98–100). At this stage of the proceeding, Patent Owner does not address Petitioner’s specific contentions with respect to these claims and grounds (aside from addressing independent claim 17 similarly to claim 1). *See, e.g.*, Prelim. Resp. 48 (“Grounds 1C–1E are directed to claims that depend . . . from [independent claims] and do not contain further analysis of the independent claims”). Having determined that Petitioner establishes a reasonable likelihood of showing that at least one of the challenged claims is unpatentable as set forth above, we institute an *inter partes* review based on these grounds as well. *See* 37 C.F.R. § 42.108(a) (“When instituting *inter partes* review, the Board will authorize the review to proceed on all of the challenged claims and on all the grounds of unpatentability asserted for each claim.”).

III. CONCLUSION

Based on the arguments in the Petition, the Preliminary Response, the Preliminary Reply, and the Preliminary Sur-reply, and the evidence of record, we determine that Petitioner establishes a reasonable likelihood that it will prevail on its challenge to at least one claim of the ’904 patent. Thus, we institute an *inter partes* review of all the challenged claims on all the grounds presented in the Petition.

The factual findings set forth in this Decision are preliminary and provided for the sole purpose of deciding whether to institute a review. Any final findings will be based on the full trial record, including any information presented in a timely filed response to the Petition. *See Trivascular, Inc. v. Samuels*, 812 F.3d 1056, 1068 (Fed. Cir. 2016) (noting that “there is a significant difference between a petitioner’s burden to establish a ‘reasonable likelihood of success’ at institution, and actually proving

invalidity by a preponderance of the evidence at trial”) (quoting 35 U.S.C. § 314(a) and comparing *id.* with § 316(e)).

IV. ORDER

In consideration of the foregoing, it is hereby:

ORDERED that an *inter partes* review is instituted with respect to the grounds asserted in the Petition; and

FURTHER ORDERED that, pursuant to 35 U.S.C. § 314(c) and 37 C.F.R. § 42.4, notice is hereby given of the institution of a trial, which shall commence on the entry date of this Decision.

IPR2022-01473
Patent 11,024,904 B2

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