Trials@uspto.gov
571-272-7822

Paper No. 10
Date: September 9, 2025

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

ZHUHAI COSMX BATTERY CO., LTD.,
Petitioner,

v.

NINGDE AMPEREX TECHNOLOGY LTD.,
Patent Owner.

IPR2025-00389
Patent 11,923,498 B2

Before DONNA M. PRAISS, KEVIN W. CHERRY, and DEBRA L. DENNETT, *Administrative Patent Judges*.

CHERRY, *Administrative Patent Judge*.

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

I. INTRODUCTION

Zhuhai CosMX Battery Co., Ltd. ("Petitioner") filed a Petition to institute *inter partes* review of claims 1–22 of U.S. Patent No. 11,923,498 B2 (Ex. 1001, "the '498 patent"). Paper 1 ("Pet."). Ningde Amperex Technology Ltd. ("Patent Owner") filed a Preliminary Response. Paper 8 ("Prelim. Resp."). Further, Patent Owner filed a Discretionary Denial Brief. Paper 6. Petitioner filed an Opposition to Patent Owner's Discretionary Denial Brief. Paper 7. The Acting Under Secretary of Commerce for Intellectual Property and Acting Director of the United States Patent and Trademark Office issued a Decision denying Patent Owner's request for discretionary denial and further ordering that the Petition is referred to the Board. Paper 9.

We have authority under 35 U.S.C. § 314 to determine whether to institute an *inter partes* review. The standard for instituting an *inter partes* review is set forth in 35 U.S.C. § 314(a), which provides that an *inter partes* review may not be instituted unless "there is a reasonable likelihood that the petitioner would prevail with respect to at least 1 of the claims challenged in the petition." The Supreme Court has held that the Board, in a decision to institute under 35 U.S.C. § 314(b), may not institute review on less than all claims challenged in the petition. *SAS Inst. Inc. v. Iancu*, 138 S. Ct. 1348, 1355–56 (2018). Moreover, in accordance with our rules, "[w]hen instituting *inter partes* review, the Board will authorize the review to proceed on all of the challenged claims and on all grounds of unpatentability asserted for each claim." 37 C.F.R. § 42.108(a) (2025); *see also PGS Geophysical AS v. Iancu*, 891 F.3d 1354, 1360 (Fed. Cir. 2018) (interpreting

the statute to require "a simple yes-or-no institution choice respecting a petition, embracing all challenges included in the petition").

Applying those standards, and upon considering the Petition, the Preliminary Response, and the evidence of record, we determine the information presented shows a reasonable likelihood that Petitioner would prevail in establishing the unpatentability of at least one of the challenged claims of the '498 patent. Accordingly, we institute an *inter partes* review of all challenged claims (i.e., claims 1–22) of the '498 patent, based on the grounds asserted in the Petition.

II. BACKGROUND

A. Related Matters

The parties identify the following district court proceeding between the parties concerning the '498 patent: *Ningde Amperex Technology Ltd. v. Zhuhai CosMX Battery Co., Ltd.*, Case No. 2:24-cv-00728 (E.D. Tex.). Pet. 111; Paper 3, 1.[1] The parties state Petitioner has filed petitions for *inter partes* review of patents also at issue in the above district court proceeding in the following Board proceedings:

Proceeding No.	**U.S. Patent No.**
IPR2025-00405	11,769,910
IPR2025-00432	11,575,148

Pet. 111–12; Paper 3, 1.

Patent Owner further states Petitioner has filed a petition for *inter partes* review of a patent also at issue in the above district court proceeding

[1] Patent Owner lists the parties in the reverse order. The order above is that used by the district court. Ex. 1027.

in the following Board proceeding: IPR2025-00385 (U.S. Patent No. 10,964,927).

B. Real Parties in Interest

Petitioner identifies its real party in interest as "Petitioner Zhuhai CosMX Battery Co., Ltd." Pet. 111.

Patent Owner identifies "Ningde Amperex Technology Ltd., the owner of U.S. Patent No. 11,923,498 B2" as its real party in interest. Paper 3, 1.

C. The '498 Patent

The '498 patent is titled "Lithium-ion Battery Having Desirable Safety Performance." Ex. 1001, Code (54). The '498 patent issued from application number 17/746,755, filed May 17, 2022. *Id.* at Codes (21), (22). The '755 application is a continuation of application number 17/407,081, filed August 19, 2021, which is a continuation of application number 16/113,938, filed August 27, 2018, which is a continuation of application number 14/596,873, filed January 14, 2015. *Id.* at Code (63). The '498 patent also claims priority to Chinese application 201420030319.4, filed January 17, 2014. *Id.* at Code (30).

The '498 patent describes that an increase in the thickness of a lithium-ion battery due to leads limits the energy density of a battery. *Id.* at 1:45–48. The patent further describes that providing a recess on a positive plate and/or a negative plate can reduce the thickness of the battery but has disadvantages. *Id.* at 1:49–2:3.

According to one embodiment, a battery includes a first plate, comprising a first film and a first lead, and a second plate, comprising a

second lead. *Id.* at 2:13–19. A first insulating glue layer is disposed on a surface of the first lead and a second insulating glue layer is disposed on a surface of the first film corresponding to the second lead. *Id.*

Illustrative embodiments are depicted in Figures 1 to 5. *Id.* at 4:11–25. Figure 5 is a cross-sectional view of a lithium-ion battery and is reproduced below. *Id.* at 4:23–25.

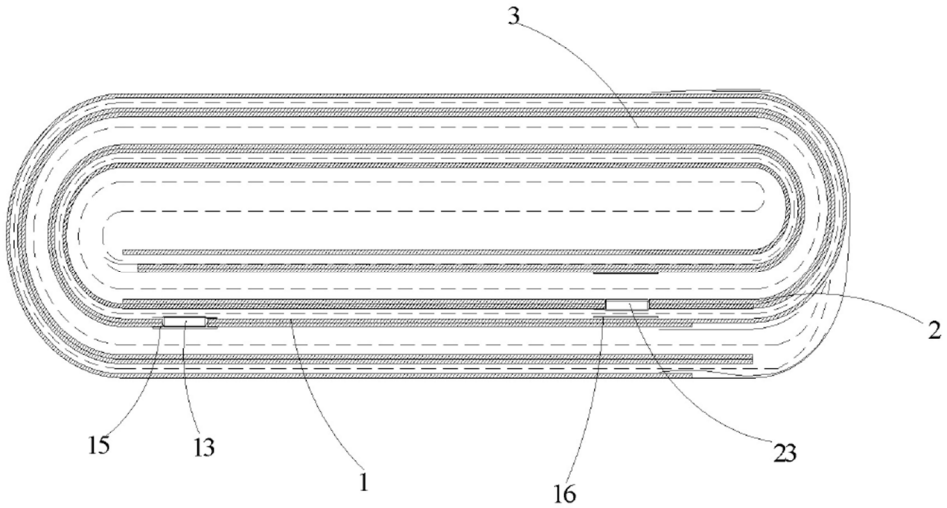


FIG. 5

Figure 5 above depicts positive plate 1, negative plate 2, separator 3 disposed between the positive plate and the negative plate, positive lead 13, first insulating glue layer 15, second insulating glue layer 16, and negative lead 23 where positive plate 1 and negative plate 2 are coiled with separator polyethylene film 3 interposed between them. *Id.* at 4:66–5:21, 6:46–49.

Figure 1 is a front view of a positive plate of a lithium-ion battery and is reproduced below. *Id.* at 4:11–13.

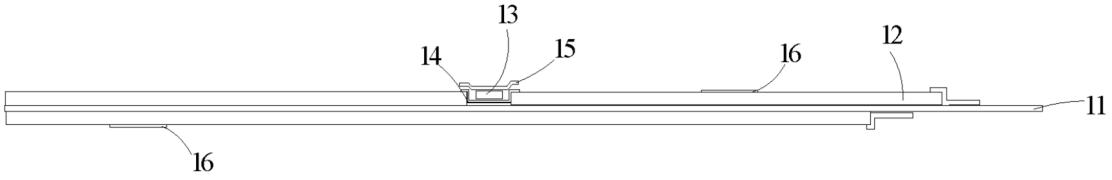


FIG. 1

Figure 1 above depicts positive current collector 11, positive film 12 provided on the positive current collector (11), and positive lead 13. *Id.* at 4:66–5:21. The positive film (12) defines first recess 14. *Id.* An upper surface and a lower surface of the positive lead (13) is formed with a first insulating glue layer 15. *Id.* Figure 1 further depicts second insulating glue layer 16. *Id.*

Figure 3 is a front view of a negative plate of a lithium-ion battery and is reproduced below. *Id.* at 4:17–19.

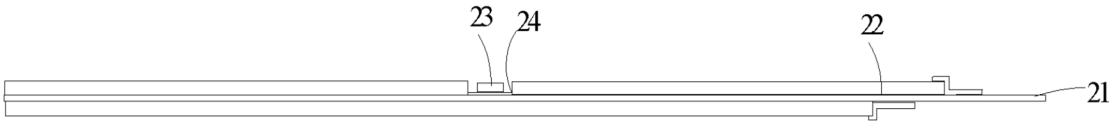


FIG. 3

Figure 3 above depicts negative current collector 21, negative film 22 provided on negative current collector 21, and negative lead 23. *Id.* at 4:66–5:21. The negative film (22) defines second recess 24. *Id.*

As illustrated in Figures 1, 3, and 5, a surface of positive film 12 corresponding to second recess 24 (in which negative lead 23 is seated) is pasted with second insulating glue layer 16. *Id.* "The second insulating glue layer **16** has a width larger than a width of the second recess **24**. The second insulating glue layer **16** has a length larger than a length of the second recess **24**." *Id.* at 5:18–21.

D. The Challenged Claims

Petitioner challenges claims 1–22 of the '498 patent. Pet. 1. Of the challenged claims, claims 1, 9, and 17 are independent; claim 1 is reproduced below with Petitioner's identifiers for the claim limitations, as illustrative of the subject matter recited in the challenged claims.

[1.P] A lithium-ion battery, comprising:

[1.A] a positive electrode comprising a positive current collector and a positive electrode active material layer containing $LiCoO_2$, wherein the positive electrode active material layer is formed on the positive current collector,

[1.B] the positive electrode active material layer being provided with a first recess accommodating a positive lead being coupled with the positive current collector;

[1.C] a negative electrode comprising a negative current collector and a negative electrode active material layer containing graphite or silicon, wherein the negative electrode active material layer is formed on the negative current collector,

[1.D] the negative electrode active material layer being provided with a second recess accommodating a negative lead being coupled with the negative current collector;

[1.E] a separator disposed between the positive electrode and the negative electrode; and

[1.F] an electrolyte,

[1.G] wherein, a top surface of the positive lead is provided with a first insulating glue layer,

[1.H] a surface of the positive electrode active material layer opposite to the second recess across the separator in a thickness direction of the positive plate and the negative plate is pasted with a second insulating glue layer,

[1.I] the second insulating glue layer has a width larger than a width of the second recess, and the second insulating glue layer has a length larger than a length of the second recess.

Ex. 1001, 10:42–11:2.

E. Evidence

Petitioner submits the following evidence:

Evidence	Exhibit No.
Declaration of Ulrich von Sacken, Ph.D., PE	1003
Sato, US 2011/0111276 A1 (published May 12, 2011, filed Apr. 13, 2010) ("Sato")	1005
Takemura, JP 2000-67907 (published Mar. 3, 2000, filed Aug. 21, 1998) ("Takemura")	1006
Kobayashi, JP 2010-55906 (published Mar. 11, 2010, filed Aug. 28, 2008) ("Kobayashi")	1008
Oh, US 2011/0104539 A1 (published May 5, 2011, filed Jan. 23, 2009) ("Oh-539")	1007
Nakamura, JP 2003-68271 (published Mar. 7, 2003, filed Nov. 20, 2001) ("Nakamura")	1012
Oh, US 2010/0035144 A1 (published Feb. 11, 2010, filed Jun. 19, 2009) ("Oh-144")	1017

Pet. 2–3.

Patent Owner supports its Preliminary Response with the Declaration of James L. Kaschmitter, Ph.D. (Ex. 2015).

F. Asserted Grounds of Unpatentability

Petitioner asserts the following grounds of unpatentability:

Ground	Claim(s) Challenged	35 U.S.C. §	Reference(s)/Basis
1	1–3, 6, 8, 17, 19	103[2]	Sato, Takemura
2	4, 5, 7, 18	103	Sato, Takemura, Nakamura
3	20, 22	103	Sato, Takemura, Oh-539, Oh-144
4	9–11, 14, 16	103	Sato, Takemura, Kobayashi
5	12, 13, 15	103	Sato, Takemura, Kobayashi, Nakamura

[2] The Leahy-Smith America Invents Act, Pub. L. No. 112-29, 125 Stat. 284 (2011) ("AIA"), amended 35 U.S.C. §§ 102, 103. The '498 patent claims benefit of a January 17, 2014 filing date, which is after the effective date of the applicable AIA amendments. Ex. 1001, Codes (30), (63). Petitioner cites "AIA 35 U.S.C. § 103(a)." Pet. 2. The correct cite for the AIA obviousness statute is § 103.

Ground	Claim(s) Challenged	35 U.S.C. §	Reference(s)/Basis
6	21	103	Sato, Takemura, Kobayashi, Oh-539, Oh-144
7	1–3, 9–11, 17	103	Takemura, Oh-539, Kobayashi
8	20–22	103	Takemura, Oh-539, Kobayashi, Oh-144

Pet. 2–3.

III. PATENTABILITY ANALYSIS

Petitioner contends that claims 1–22 of the '498 patent are unpatentable under 35 U.S.C. § 103 over the above-cited prior art. Pet. 2–3.

A patent claim is unpatentable under 35 U.S.C. § 103 if the differences between the claimed subject matter and the prior art are such that the subject matter, as a whole, would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. *KSR Int'l Co. v. Teleflex Inc.*, 550 U.S. 398, 406 (2007). The question of obviousness is resolved on the basis of 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) when in evidence, objective evidence of nonobviousness.[3] *Graham v. John Deere Co.*, 383 U.S. 1, 17–18 (1966).

[3] Patent Owner does not present arguments or evidence of secondary considerations in its Preliminary Response. Therefore, secondary considerations do not constitute part of our analysis herein. Petitioner states Petitioner is not aware of any evidence of alleged secondary considerations of non-obviousness having nexus to the challenged claims. Pet. 109.

"In an [*inter partes* review], the petitioner has the burden from the onset to show with particularity why the patent it challenges is unpatentable." *Harmonic Inc. v. Avid Tech., Inc.*, 815 F.3d 1356, 1363 (Fed. Cir. 2016) (citing 35 U.S.C. § 312(a)(3) (requiring *inter partes* review petitions to identify "with particularity . . . the evidence that supports the grounds for the challenge to each claim")). This burden of persuasion never shifts to Patent Owner. *See Dynamic Drinkware, LLC v. Nat'l Graphics, Inc.*, 800 F.3d 1375, 1378 (Fed. Cir. 2015) (discussing the burden of proof in *inter partes* review).

We organize our patentability analysis into four sections. First, we address the level of ordinary skill in the art. Second, we address claim construction. Third, we provide an overview of the asserted references. And fourth, taking account of the information presented, we consider whether the Petition satisfies the threshold requirement for instituting an *inter partes* review under 35 U.S.C. § 314(a).

A. Level of Ordinary Skill in the Art

We consider the asserted grounds of unpatentability in view of the understanding of a person of ordinary skill in the art. In assessing the level of ordinary skill in the art, various factors may be considered, including the "type of problems encountered in the art; prior art solutions to those problems; rapidity with which innovations are made; sophistication of the technology; and educational level of active workers in the field." *In re GPAC Inc.*, 57 F.3d 1573, 1579 (Fed. Cir. 1995) (quoting *Custom Accessories, Inc. v. Jeffrey-Allan Indus., Inc.*, 807 F.2d 955, 962 (Fed. Cir. 1986)). "[O]ne or more factors may predominate." *Id.*

Relying on the declaration testimony of Dr. von Sacken, Petitioner contends that a person of ordinary skill in the art for the '498 patent "would have had a Bachelor's Degree in Physics or an Engineering field relevant to battery technology (e.g., Electrical or Mechanical Engineering) and at least two years of industry experience in lithium-ion battery manufacturing and/or design." Pet. 3 (citing Ex. 1003 ¶¶ 27–30).

Patent Owner states for purposes of the Patent Owner's Preliminary Response, Patent Owner adopts the definition proposed by Petitioner. Prelim. Resp. 10.

Based on this record, we adopt Petitioner's articulation of the level of ordinary skill in the art, which is consistent with the '498 patent and the asserted prior art, and we apply it in our obviousness evaluations below. *See Okajima v. Bourdeau*, 261 F.3d 1350, 1355 (Fed. Cir. 2001) (the prior art, itself, can reflect appropriate level of ordinary skill in art).

B. Claim Construction

Next, we turn to claim construction. In interpreting the claims of the '498 patent, we "us[e] the same claim construction standard that would be used to construe the claim[s] in a civil action under 35 U.S.C. [§] 282(b)." *See* 37 C.F.R. § 42.100(b) (2025). The claim construction standard includes construing claims in accordance with the ordinary and customary meaning of such claims as would have been understood by one of ordinary skill in the art and the prosecution history pertaining to the patent. *See id.*; *Phillips v. AWH Corp.*, 415 F.3d 1303, 1312–14 (Fed. Cir. 2005) (en banc).

Petitioner "does not believe any claim terms require specific construction." Pet. 10–11. Patent Owner states "no claim construction is necessary to deny institution because Patent Owner's arguments for denial

do not rely on the outcome of an actual controversy about claim interpretation." Prelim. Resp. 10.

Having considered the record, we determine that no express claim construction is necessary for any claim terms. *See Nidec Motor Corp. v. Zhongshan Broad Ocean Motor Co.*, 868 F.3d 1013, 1017 (Fed. Cir. 2017) (holding that only claim terms in controversy need to be construed, and only to the extent necessary to resolve the controversy (citing *Vivid Techs., Inc. v. Am. Sci. & Eng'g, Inc.*, 200 F.3d 795, 803 (Fed. Cir. 1999))).

C. The Prior Art

Before turning to Petitioner's asserted grounds of unpatentability, we provide brief summaries of the asserted references.

1. Sato (Ex. 1005)

Sato is titled "Electrode Plate for Nonaqueous Electrolyte Secondary Battery and Nonaqueous Electrolyte Secondary Battery." Ex. 1005, Code (54). Figure 1, reproduced below, is a vertical cross-sectional view schematically illustrating a structure of a nonaqueous electrolyte secondary battery. *Id.* ¶ 16.

FIG. 1

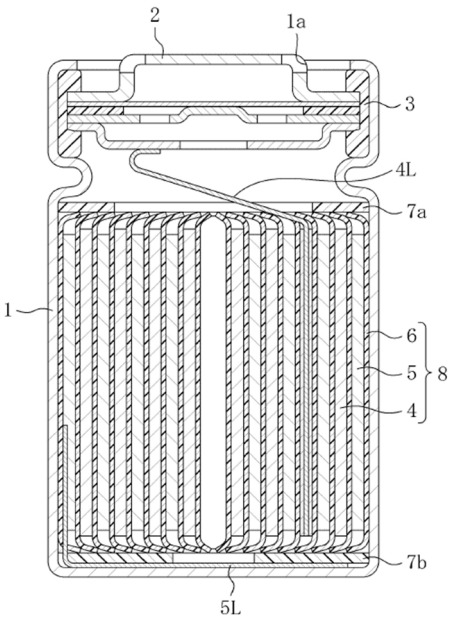


Figure 1 above depicts an electrode group 8 including positive electrode plate 4, negative electrode plate 5, and porous insulating layer (i.e., a separator) 6. *Id.* ¶ 30.

Figure 3, reproduced below, is an enlarged cross-sectional view schematically illustrating a structure of a position to which a lead is attached.

FIG. 3

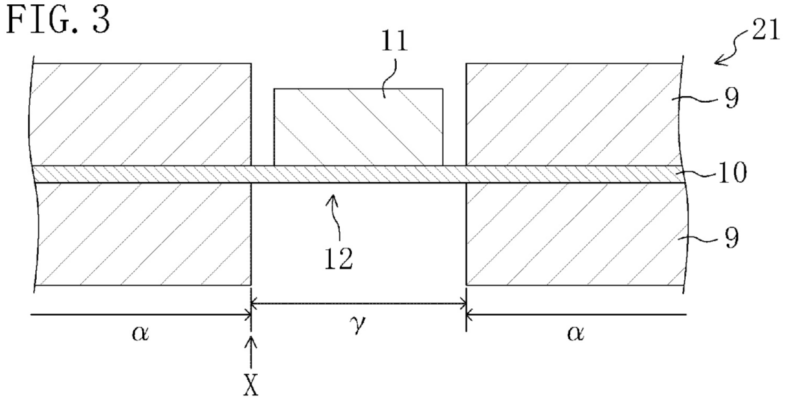


Figure 3 above illustrates mixture layer 9, current collector 10, extension lead 11, exposed portion 12, and electrode plate 21. *Id.* ¶¶ 38, 39.

Sato further describes leads being protected and insulated by adhesive tape. *Id.* ¶ 113. "The positive electrode surface facing the negative electrode lead position was insulated by a polypropylene adhesive tape in order to prevent lithium deposition." *Id.* ¶ 137. "[A] portion of the positive electrode active material which should originally operate is insulated by a tape and does not operate, thereby causing a decrease in the capacity." *Id.* ¶ 148.

2. Takemura (Ex. 1006)

Takemura is titled "Electrode Structure and Battery Using the Same." Ex. 1006, Code (54).

Figure 9, reproduced below, is a cross-sectional view of a conventional spiral electrode structure. *Id.* at p. 11.

[FIG. 9]

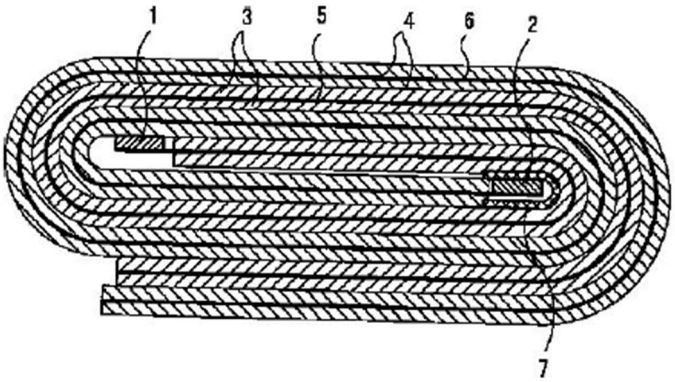


Figure 9 above depicts positive electrode collection terminal 1, negative electrode collection terminal 2, positive electrode active material 3, negative electrode active material 4, positive electrode current collector 5, negative electrode current collector 6, and insulating tape 7. *Id.* ¶ 3. An electrolyte layer such as a separator (not shown) is provided between the positive electrode active material 3 and the negative electrode active material 4. *Id.* The electrolyte layer is made of a separator impregnated

with a non-aqueous electrolyte solution in which an electrolyte has been dissolved. *Id.* Takemura describes:

> [I]f there is no opposing negative electrode active material 4, such as the positive electrode active material 3 arranged around the negative electrode current collector terminal 2 in FIG. 9, the surface of the positive electrode active material 3 has to be covered with masking tape 7 or the positive electrode active material 3 has to be shaved off so that there is virtually no positive electrode active material 3 facing the negative electrode active material 4.

Id. ¶ 8.

Figure 8, reproduced below, is an enlarged cross-sectional view of a center of a flat spiral electrode structure. *Id.* at p. 11.

[FIG. 8]

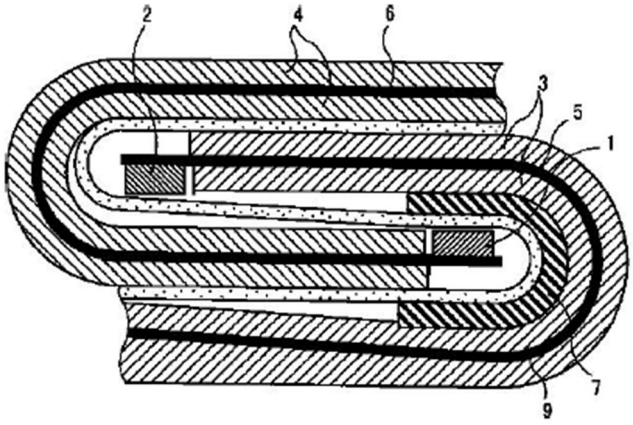


Figure 8[4] above shows current collector terminals 1 and 2, and insulating tape 7. *Id.* ¶ 35.

[4] Petitioner contends Takemura mislabels positive lead 1 and negative lead 2 in Figure 8 and that the lead labeled "1" should be "2" and the lead labeled "2" should be "1." Pet. 13 n.2 (citing Ex. 1006 ¶ 3).

3. Kobayashi (Ex. 1008)

Kobayashi is titled "Non-Aqueous Electrolyte Secondary Battery." Ex. 1008, Code (54).

Figures 2A and 2B are reproduced below. Figure 2A is a plan view of a positive electrode plate used in an Example 1 and Figure 2B is an enlarged cross-sectional view of Figure 2A from line IIB-IIB. *Id.* ¶ 46.

[FIG. 2]

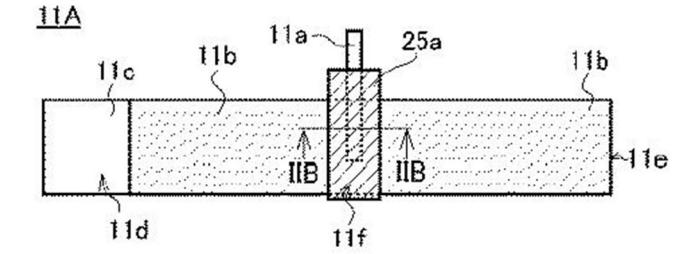


FIG. 2A

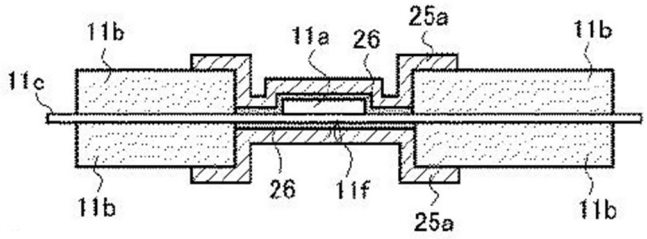


FIG. 2B

Figures 2A and 2B illustrate positive electrode plate 11A including positive electrode current collecting tab 11a, positive electrode active material layer 11b, positive electrode core portion 11c, first positive electrode exposed core portion 11d, second positive electrode exposed core portion 11f, and insulating tape 25a. *Id.* ¶¶ 34, 35.

Figure 6B, reproduced below, is a plan view of a negative electrode plate of a conventional example. *Id.* ¶ 46.

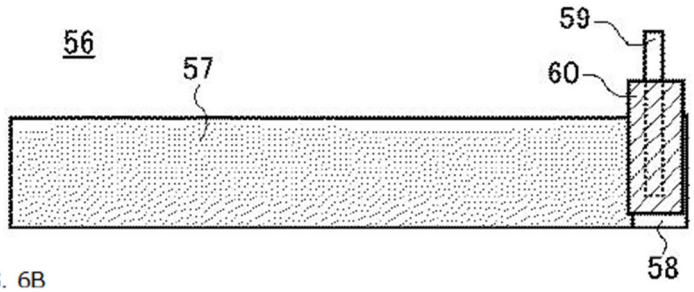


FIG. 6B

Figure 6B above illustrates negative electrode plate 56, negative electrode active material layer 57, negative electrode exposed core portion 58, negative electrode tab 59, and insulating tape 60. *Id.* ¶ 7.

4. Oh-539 (Ex. 1007)

Oh-539 is titled "Lithium Secondary Battery and Manufacturing Method for Same." Ex. 1007, Code (54).

Figure 1, reproduced below, is a perspective view showing a lithium secondary battery according to an embodiment. *Id.* ¶ 12.

FIG. 1

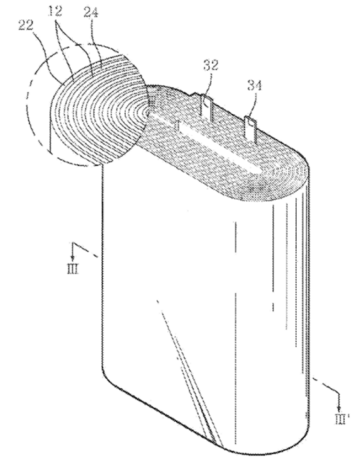


Figure 1 above illustrates first electrode 22 (cathode), second electrode 24 (anode), separator 12, and an electrode group including first electrode tap 32 (cathode tab) connected to the cathode and second electrode tap 34 (anode tab) connected to the anode. *Id.* ¶ 39.

Figure 2, reproduced below, is a plan view showing an unrolled cathode connected with a cathode tab in the lithium secondary battery of Figure 1. *Id.* ¶ 13.

FIG. 2

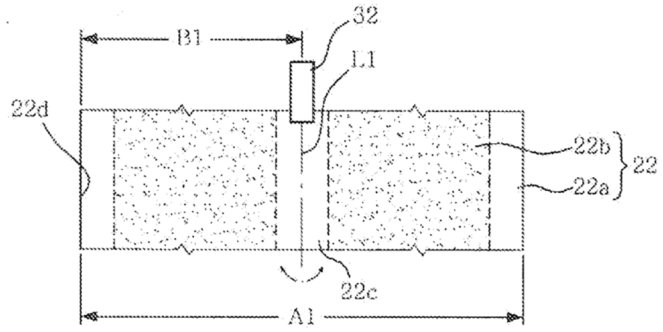


Figure 2 above illustrates first current collector 22a (cathode current collector) and first active material patterns 22b (cathode active material patterns) formed on at least one side of the cathode current collector 22a, first center non-coated portion 22c (cathode center non-coated portion), end 22d of the cathode, and cathode tab 32. *Id.* ¶¶ 43, 45, 52. A relationship between A1 and B1 is described. *See id.* ¶¶ 50–52.

Figure 3, reproduced below, is a plan view showing an unrolled anode connected with an anode tab in the lithium secondary battery of Figure 1. *Id.* ¶ 14.

FIG. 3

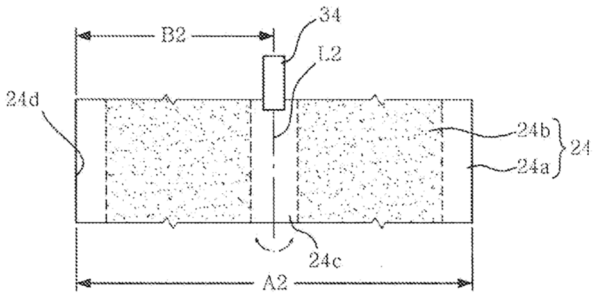


Figure 3 above illustrates second current collector 24a (anode current collector), second active material patterns 24b (anode active material

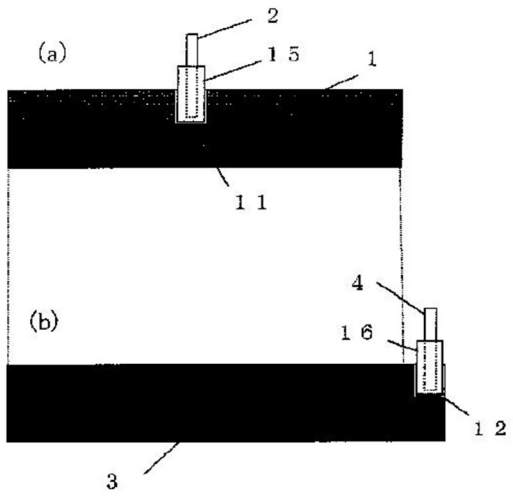
patterns) formed on at least one side of the anode current collector 24a, second center non-coated portion 24c (anode center non-coated portion), end 24d of the anode 24, and anode tab 34. *Id.* ¶¶ 56, 58, 62. A relationship between A2 and B2 is described. *See id.* ¶¶ 60–62.

5. Nakamura (Ex. 1012)

Nakamura is titled "Lithium Secondary Battery and Manufacturing Method for Positive Electrode Plate Used in This Battery." Ex. 1012, Code (54).

Figures 1(a) and 1(b) are reproduced below. Figure 1(a) is a plan view of a positive electrode plate and Figure 1(b) is a plan view of a negative electrode plate. *Id.* at 12.

[FIG. 1]



Figures 1(a) and 1(b) illustrate positive electrode plate 1, positive electrode lead 2, negative electrode plate 3, negative electrode lead 4, positive electrode active material-free portion 11, negative electrode active material-free portion 12, positive electrode insulating tape 15, and negative electrode insulating tape 16. Ex. 1012, p. 12; *see also* Ex. 1012 ¶¶ 3, 7, 12, 28–29, 52–53.

6. Oh-144 (Ex. 1017)

Oh-144 is titled "Electrode Assembly and Lithium Secondary Battery Using the Same." Ex. 1017, Code (54).

Figure 3, reproduced below, is a cross-sectional view illustrating an electrode assembly 100. *Id.* ¶ 22.

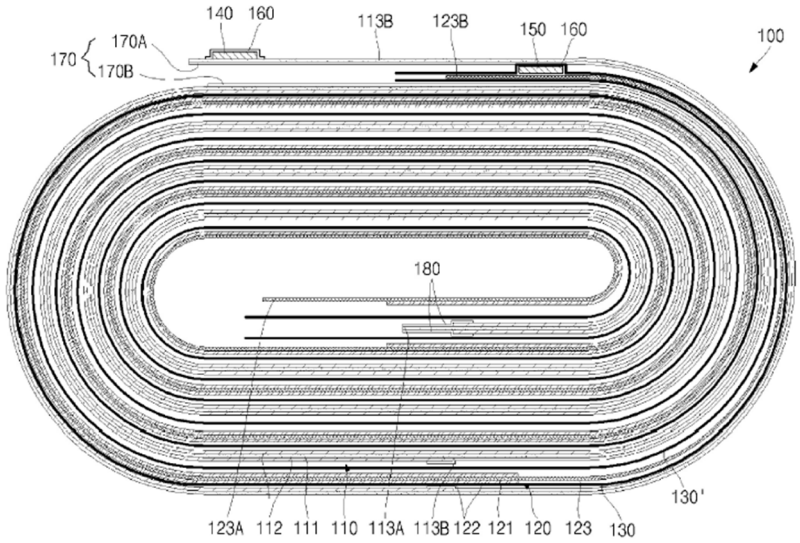


Figure 3 above illustrates cathode plate 110, anode plate 120, separator 130, cathode collector 111, cathode active material layer 112, uncoated cathode portions 113, anode collector 121, anode active material layer 122, and uncoated anode portions 123. *Id.* ¶¶ 25–27.

Figure 4, reproduced below, is a schematic view illustrating attachment of a laminating tape insulation member to the electrode assembly of Figure 3. *Id.* ¶ 23.

FIG. 4

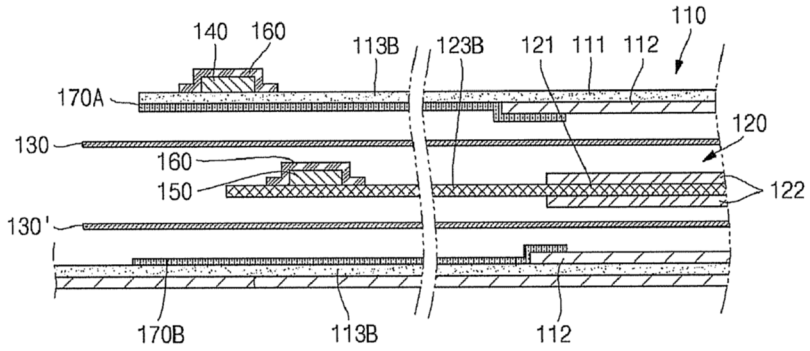


Figure 4 above illustrates protective tape 160 and laminating tape 170A and 170B. *Id.* ¶¶ 29, 37–41.

D. Alleged Ground of Unpatentability Over Sato and Takemura (Ground 1)

Petitioner contends that claims 1–3, 6, 8, 17, and 19 of the '498 patent are unpatentable under 35 U.S.C. § 103 as obvious over Sato and Takemura. Pet. 19–44. Patent Owner disagrees. Prelim. Resp. 11–37. Having considered the arguments and evidence before us, we determine that the record establishes a reasonable likelihood that at least one challenged claim is unpatentable as obvious over Sato and Takemura.

1. Claim 1

a) Parties' Contentions

Petitioner maps the limitations of claim 1 to the disclosures of Sato and Takemura. In particular, Petitioner contends that Sato discloses "a lithium-ion battery" (limitation [1.P], Pet. 23–24 (citing Ex. 1005 ¶ 27; Ex. 1003 ¶¶ 115, 175), "a positive electrode. . ." (limitation [1.A]), Pet. 24–26 (citing Ex. 1005 ¶¶ 33, 39, 51, Figs. 1, 2, 3, 5; Ex. 1003 ¶¶ 102, 116–119, 175); "a first recess" (limitation [1.B]), Pet. 26–27 (citing Ex. 1003 ¶¶ 39, 93, 111–113, Figs. 2, 3, 5; Ex. 1003 ¶¶ 120–122, 176); the "negative

electrode" (limitation [1.C]), Pet. 27–29 (citing Ex. 1005 ¶¶ 30, 34, 39, 66, Figs. 2, 3, 5; Ex. 1003 ¶¶ 123–126, 177); "a second recess" (limitation [1.D], Pet. 29–30 (citing Ex. 1005 ¶¶ 39, 93, Figs. 3, 5; Ex. 1003 ¶¶ 127–129, 178); "a separator" (limitation [1.E]), Pet. 30–31 (citing Ex. 1005 ¶¶ 30, 35, 44, 71, 113, Figs. 1, 2; Ex. 1003 ¶¶ 130–131, 179); an "electrolyte" (limitation [1.F]), Pet. 31 (citing Ex. 1005 ¶¶ 28, 44, 74–84; Ex. 1003 ¶¶ 132–133, 180); and "a first insulating glue layer" (limitation [1.G]), Pet. 31–32 (citing Ex. 1005 ¶¶ 104, 111–113; Ex. 1003 ¶¶ 134–136, 181).

Petitioner relies on Sato or Sato in combination with Takemura to account for the last two limitations of claim 1. *See* Pet. 33–39. Petitioner submits that Sato teaches that its "positive electrode surface facing the negative electrode lead position[is] insulated by a polypropylene adhesive tape in order to prevent lithium deposition," and that Sato's additional polypropylene adhesive tape is a "second insulating glue layer" (limitation [1.H]). Pet. 33 (citing Ex. 1005 ¶ 137; Ex. 1024, 8, 27, 28).

Petitioner contends that a person of ordinary skill "would have understood that Sato's additional polypropylene adhesive tape is located on Sato's positive active material (4B/9) in a position that overlaps the exposed portion 12 (recess) where Sato's negative lead 11 is located." *Id.* (citing Ex. 1005 ¶¶ 107, 112, 137, 148; Ex. 1003 ¶¶ 138–142). Petitioner argues that, to the extent that Sato does not expressly disclose that the additional polypropylene adhesive tape is located there, Takemura discloses additional adhesive tape "opposite to the second recess across the separator in a thickness direction of the positive plate," as required by limitation [1.H]. *Id.* (citing Ex. 1006 ¶ 3, Figs. 8, 9; Ex. 1003 ¶¶ 143–144, 182). Petitioner asserts that it would have been obvious to combine these teachings because

"[t]his modification would have simply been applying a known technique (Takemura's placement of insulating tape) to a known device (Sato's battery) to prevent lithium plating." *Id.* at 36 (citing Ex. 1003 ¶¶ 145–148, 182).

With respect to limitation [1.I]—"the second insulating glue layer has a width larger than a width of the second recess, and the second insulating glue layer has a length larger than a length of the second recess," Petitioner argues that "Sato is silent about the adhesive tape having a width larger than a width of the second recess and a length larger than a length of the second recess." *Id.* (citing Ex. 1005 ¶ 137; Ex. 1003 ¶ 149). However, Petitioner submits that Takemura discloses and renders obvious such tape sizing. *Id.* at 36–38 (citing Ex. 1006 ¶ 8; Ex. 1003 ¶¶ 150–152).

Patent Owner raises three arguments. First, Patent Owner argues that Takemura teaches away from the arrangement of tape taught in Takemura's Figures 8 and 9. Prelim. Resp. 11–22. Second, Patent Owner asserts that Takemura does not disclose or render obvious a "second insulating glue layer" that "has a length larger than a length of the second recess" (limitation [1.H]). *Id.* at 22–28. Finally, Patent Owner contends that Sato does not disclose a battery with both a "first recess" and a "second recess." *Id.* at 28–36.

b) Analysis

With respect to the undisputed limitations, we find that Petitioner has shown sufficiently that Petitioner has shown sufficiently that the combination of Sato and Takemura teaches or suggests those limitations. We focus our analysis on the arguments Patent Owner raised above.

(1) Takemura's Alleged Teaching Away

Patent Owner argues that the disclosure Petitioner relies on in Takemura relates to "background or prior art tape as shown in Takemura's Figures 8 and 9," but Patent Owner submits that Petitioner "overlook[s] the fact that Takemura disparages the use of tape" and "Takemura is clear that a POSITA should *not* use the structures depicted in Figs. 8 and 9." Prelim. Resp. 12–14.

Patent Owner may be correct that the invention Takemura discloses seeks to improve on the "conventional" design disclosed in Figures 8 and 9, and, as part of its description of its inventions, Takemura discloses a variety of benefits to its approach over the approach disclosed in Figures 8 and 9. However, that does not negate the teachings provided in Figures 8 and 9. "A reference must be considered for everything it *teaches* by way of technology and is not limited to the particular *invention* it is describing and attempting to protect." *EWP Corp. v. Reliance Universal Inc.*, 755 F.2d 898, 907 (Fed. Cir. 1985) (emphases in original). As Petitioner explains, Sato discloses the use of tape, but does not provide details regarding its precise size and placement. *See* Pet. 34–39. Petitioner relies on Takemura for teaching how such tape would be sized and placed. *Id.* Indeed, Takemura teaches that such a placement was used in "conventional" lithium-ion batteries at the time. "It's not necessary to show that a combination is "the *best* option, only that it be a *suitable* option." *Intel Corp. v. Qualcomm Inc.*, 21 F.4th 784, 800 (Fed. Cir. 2021) (quoting *PAR Pharm., Inc. v. TWI Pharms., Inc.*, 773 F.3d 1186, 1197–98 (Fed. Cir. 2014)). Here, Petitioner only relies on Takemura for teaching how the tape disclosed in Sato would be sized and placed. Although Takemura might teach a different ultimate approach, that

does not diminish Takemura's teachings of a known size and placement that was conventionally used in the art. "[I]f a technique has been used to improve one device, and a person of ordinary skill in the art would recognize that it would improve similar devices in the same way, using the technique is obvious unless its actual application is beyond his or her skill." *KSR*, 550 U.S. at 417. Thus, we are not persuaded, on the current record, that Takemura teaches away from the particular combination that has been proposed.

(2) Whether Takemura Teaches Limitation [1.I]—"a second insulating glue layer" that "has a length larger than a length of the second recess"

Patent Owner argues that Petitioner's obviousness theory for limitation [1.I]—"a second insulating glue layer" that "has a length larger than a length of the second recess"—fails because Takemura teaches away from lengthening the tape. Prelim. Resp. 22–28. We disagree. As we explained above, the combination seeks to use Takemura's teachings regarding "conventional" lithium-ion batteries to implement and improve Sato's disclosed design. As Dr. von Sacken explains, using a tape that is wider and longer than the width and length of the exposed portion formed in Sato's negative electrode active layer would have ensured that all of the exposed metal portion was properly isolated from positive active material to avoid lithium plating. Ex. 1003 ¶ 153. Dr. von Sacken continues that "[s]izing Sato's additional polypropylene adhesive tape to have a width and/or length less than or equal to the width and/or length of the exposed portion 12/14 would only have invited lithium plating in Sato's battery, which would have been directly contrary to Sato's reason for adding this additional tape in the first place." *Id.* ¶ 154. Dr. von Sacken also notes that

"[s]izing Sato's additional polypropylene adhesive tape to have a width and length larger than the width and length of the exposed metal in the exposed portion 12/14 would also have been necessary to ensure that metal in the exposed portion 12/14 is not exposed to lithium plating as a result of alignment variances." *Id.* On the current record, we find this testimony well-reasoned and give it substantial weight.

Although Patent Owner may be correct, that Takemura's invention proposes another approach that offers other benefits, that does not negate the benefits obtained—in terms of preventing lithium plating on the terminal—that Petitioner's modification would provide. "[A] given course of action often has simultaneous advantages and disadvantages, and this does not necessarily obviate motivation to combine." *Medichem, S.A. v. Rolabo, S.L.*, 437 F.3d 1157, 1165 (Fed. Cir. 2006). On the current record, we find that a person of ordinary skill would have been motivated to size Sato's adhesive tape to fully protect the terminal in view of the teachings of Takemura's Figures 8 and 9 and based on the reasoning articulated by Dr. von Sacken. *See In re Urbanski*, 809 F.3d 1237, 1244 (Fed. Cir. 2016) (finding a person of ordinary skill would have been motivated to pursue the desirable properties taught by one reference even if it meant foregoing the benefit taught by another reference). Accordingly, we find that Petitioner has shown sufficiently that the combination of Sato and Takemura accounts for limitation [1.I].

(3) Whether Sato discloses a battery with both a "first recess" and a "second recess"

Patent Owner contends that Sato's battery only has a single electrode with a recess, and "Sato never discloses a battery with an electrode having a

'first recess' and another electrode having a 'second recess.'" Prelim. Resp. 28. Patent Owner asserts that Sato "only [discloses] two different configurations of batteries, each with only one electrode having a recess: (1) one configuration having a recess on the positive electrode and no recess on the negative electrode and (2) another configuration having a recess on the negative electrode with no recess on the positive electrode." *Id.* (citing Ex. 2015 ¶ 81). Patent Owner argues that Petitioner relies on two different embodiments of Sato and fails to provide adequate reasoning to combine these embodiments. *Id.* at 31–32. Patent Owner contends, instead of modifying Sato, that a person of ordinary skill in the art actually would have been motivated not to modify Sato. *Id.* at 32–36.

On the current record, we agree with Petitioner that Sato discloses a battery having a positive electrode with a first recess and a negative electrode with a second recess. As Petitioner alleges, Sato's battery 1[5] includes a positive electrode with a recess receiving the positive lead. Pet. 26 (citing Ex. 1005 ¶¶ 111–113, Fig. 1). We note that, contrary to Patent Owner's contentions, Sato appears to indicate that this same positive electrode is used in Sato's battery 8. *See* Ex. 1005 ¶ 136 ("Battery 8. A positive electrode plate was formed in the same manner as in Example 1."); Ex. 1003 ¶ 136, fn. 5; Pet. 32 (showing Dr. von Sacken's schematic representation of Sato's positive electrode used in batteries 1 and 8). Petitioner notes that Sato's battery 8 also includes a negative electrode with a second recess receiving the negative lead. Pet. 29, 33–34; Ex. 1005 ¶¶ 136–137 (attaching the negative lead to a recess defined in the negative

[5] Sato's "battery 1" and "battery 8" refers to the first and eighth embodiments of Sato, respectively.

electrode of battery 8); Ex. 1003 ¶¶ 127–128. Thus, on the current record, we find that, at least, Sato's battery 8 includes a positive electrode with a first recess and a negative electrode with a second recess, contrary to Patent Owner's contentions. Pet. 11–12, 26, 29, 33–34, 39–40; Ex. 1003 ¶¶ 102, 103, 115, 120, 121, 127, 128, 134–142; Ex. 1005 ¶¶ 7–9, 15, 24, 40, 94, claim 6.

c) Summary as to Claim 1

We find that Petitioner has shown sufficiently that the combination of Sato and Takemura accounts for all the limitations of claim 1 and that a person of ordinary skill in the art would have been motivated to combine Sato and Takemura with a reasonable expectation of success. Patent Owner does not raise any secondary considerations of nonobviousness at this stage of the proceeding. Thus, we conclude that Petitioner has shown a reasonable likelihood of prevailing in showing that claim 1 would have been obvious over the combination of Sato and Takemura.

2. Claims 2, 3, 6, 8, 17, and 19

Patent Owner does not raise any other separate arguments regarding claims 2, 3, 6, 8, 17, and 19 other than those we have considered above with respect to claim 1. *See* Prelim. Resp. 36–37. We have reviewed Petitioner's contentions and evidence regarding these claims, and find that Petitioner has shown a reasonable likelihood of prevailing in showing that claims 2, 3, 6, 8, 17, and 19 are unpatentable as obvious over Sato and Takemura.

E. Alleged Ground of Unpatentability Over Sato, Takemura, and Nakamura (Ground 2)

Petitioner contends that claims 4, 5, 7, and 18 of the '498 patent are unpatentable under 35 U.S.C. § 103 as obvious over Sato, Takemura, and Nakamura. Pet. 44–57.

Patent Owner argues that this ground suffers from the same deficiencies discussed above with respect to the obviousness of claim 1 over Sato and Takemura considered above. Prelim. Resp. 37. On the current record, we find Petitioner's evidence sufficient for the reasons given above. We have reviewed Petitioner's contentions and evidence regarding claims 4, 5, 7, and 18, and determine that Petitioner shows a reasonable likelihood of prevailing with respect to the unpatentability of claims 4, 5, 7, and 18 as obvious over Sato, Takemura, and Nakamura.

F. Alleged Ground of Unpatentability Over Sato, Takemura, Oh-539, and Oh-144 (Ground 3)

Petitioner contends that claims 20 and 22 of the '498 patent are unpatentable under 35 U.S.C. § 103 as obvious over Sato, Takemura, Oh-539, and Oh-144. Pet. 57–65.

Patent Owner argues that this ground suffers from the same deficiencies discussed above with respect to the obviousness of claim 1 over Sato and Takemura considered above. Prelim. Resp. 37–38. On the current record, we find Petitioner's evidence sufficient for the reasons given above. We have reviewed Petitioner's contentions and evidence regarding claims 20 and 22, and determine that Petitioner shows a reasonable likelihood of prevailing with respect to the unpatentability of claims 20 and 22 as obvious over Sato, Takemura, Oh-539, and Oh-144.

G. Alleged Ground of Unpatentability Over Sato, Takemura, and Kobayashi (Ground 4)

Petitioner contends that claims 9–11, 14, and 16 of the '498 patent are unpatentable under 35 U.S.C. § 103 as obvious over Sato, Takemura, and Kobayashi. Pet. 65–72.

Patent Owner argues that this ground suffers from the same deficiencies discussed above with respect to the obviousness of claim 1 over Sato and Takemura considered above. Prelim. Resp. 38. On the current record, we find Petitioner's evidence sufficient for the reasons given above. We have reviewed Petitioner's contentions and evidence regarding claims 9–11, 14, and 16, and determine that Petitioner shows a reasonable likelihood of prevailing with respect to the unpatentability of claims 9–11, 14, and 16 as obvious over Sato, Takemura, and Kobayashi.

H. Alleged Ground of Unpatentability Over Sato, Takemura, Kobayashi, and Nakamura (Ground 5)

Petitioner contends that claims 12, 13, and 15 of the '498 patent are unpatentable under 35 U.S.C. § 103 as obvious over Sato, Takemura, Kobayashi, and Nakamura. Pet. 72–78.

Patent Owner argues that this ground suffers from the same deficiencies discussed above with respect to the obviousness of claim 1 over Sato and Takemura considered above. Prelim. Resp. 38. On the current record, we find Petitioner's evidence sufficient for the reasons given above. We have reviewed Petitioner's contentions and evidence regarding claims 12, 13, and 15 determine that Petitioner shows a reasonable likelihood of prevailing with respect to the unpatentability of claims 12, 13, and 15 as obvious over Sato, Takemura, Kobayashi, and Nakamura.

I. Alleged Ground of Unpatentability Over Sato, Takemura, Kobayashi, Oh-539, and Oh-144 (Ground 6)

Petitioner contends that claim 21 of the '498 patent is unpatentable under 35 U.S.C. § 103 as obvious over Sato, Takemura, Kobayashi, Oh-539, and Oh-144. Pet. 79–82.

Patent Owner argues that this ground suffers from the same deficiencies discussed above with respect to the obviousness of claim 1 over Sato and Takemura considered above. Prelim. Resp. 39. On the current record, we find Petitioner's evidence sufficient for the reasons given above. We have reviewed Petitioner's contentions and evidence regarding claim 21, and determine that Petitioner shows a reasonable likelihood of prevailing with respect to the unpatentability of claim 21 as obvious over Sato, Takemura, Kobayashi, Oh-539, and Oh-144.

J. Remaining Grounds

Petitioner contends that claims 1–3, 9–11, and 17 of the '498 patent are unpatentable under 35 U.S.C. § 103 as obvious over Takemura, Oh-539, and Kobayashi. Pet. 82–105. Petitioner also contends that claims 20–22 of the '498 patent are unpatentable under 35 U.S.C. § 103 as obvious over Takemura, Oh-539, Kobayashi, and Oh-144. Pet. 105–109. As we preliminarily conclude that Petitioner demonstrates that it is more likely than not that it will prevail on its challenge to claims 1–22 based on obviousness in view of the various grounds above based on Sato and Takemura, we institute review on all challenged claims on all grounds set forth in the Petition, including Petitioner's obviousness challenge to claims 1–3, 9–11, 17 based on Takemura, Oh-539, and Kobayashi, and obviousness challenge

to claims 20–22 based on Takemura, Oh-539, Kobayashi, and Oh-144. *See SAS*, 138 S. Ct. at 1354; *PGS*, 891 F.3d at 1360.

IV. CONCLUSION

After considering the arguments presented in the Petition, the Preliminary Response, and the evidence of record, we determine that Petitioner has demonstrated at least a reasonable likelihood of success in proving that at least one claim of the '498 patent is unpatentable. Thus, we institute an *inter partes* review of all challenged claims (i.e., claims 1–22) on all grounds set forth in the Petition. Our determinations at this stage of the proceeding are based on the evidentiary record currently before us. This decision to institute trial is not a final decision as to patentability of any claim for which we have instituted an *inter partes* review. *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"). We will base any final decision on the full record developed during trial.

V. ORDER

In consideration of the foregoing, it is hereby:

ORDERED that, pursuant to 35 U.S.C. § 314(a), an *inter partes* review is instituted for claims 1–22 of the '498 patent on the unpatentability 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 commences on the entry date of this decision.

FOR PETITIONER:

Jason Fitzsimmons
Jason Eisenberg
Chase Hammond
John Higgins
STERNE, KESSLER, GOLDSTEIN & FOX PLLC
Jfitzsimmons-ptab@sternekessler.com
Jasone-ptab@sternekessler.com
Chammond-ptab@sternekessler.com
Jhiggins-ptab@sternekessler.com

James Stein
Sen Yao
LEE & HAYES, P.C.
James.stein@leehayes.com
Kevin.yao@leehayes.com

FOR PATENT OWNER:

Christopher Douglas
Madeline Byrd
Miranda Sooter
Casey Hickey
ALSTON & BIRD LLP
Christopher.douglas@alston.com
Maddy.byrd@alston.com
Miranda.sooter@alston.com
Casey.hickey@alston.com