

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

Case: IPR2025-00389

U.S. Patent No. 11,923,498

**SUPPLEMENTAL DECLARATION OF JAMES L. KASCHMITTER, IN
SUPPORT OF PATENT OWNER'S RESPONSE**

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I, James L. Kaschmitter, do hereby declare and say as follows:

I. INTRODUCTION

1. I have been retained by Ningde Amperex Technology Ltd. (“ATL” or “Patent Owner”) as an independent technical expert in this proceeding before the United States Patent and Trademark Office (“PTO”) Patent Trial and Appeal Board (“PTAB”) regarding U.S. Patent No. 11,923,498 (the “’498 Patent”).

2. I understand that Zhuhai CosMX Battery Co., Ltd. (“Petitioner”) filed a petition for Inter Partes Review of the ’498 Patent (“Petition”), in which Petitioner asserts that:

- Claims 1-3, 6, 8, 17, and 19 are obvious over U.S. Patent Application Publication No. 2011/0111276 to Sato (“Sato”) and Japanese Patent Application Publication 2000/067907 to Takemura (“Takemura”)
- Claims 4, 5, 7, and 18 are obvious over Sato, Takemura and Japanese Patent Application Publication JP 2003/068271 to Nakamura (“Nakamura”)
- Claims 20 and 22 are obvious over Sato, Takemura, U.S. Patent Application Publication 2011/0104539 to Oh (“Oh-539”), and U.S. Patent Application Publication 2010/0035144 to Oh (“Oh-144”)

- Claims 9-11, 14, and 16 are Obvious Over Sato, Takemura, and Japanese Patent Application Publication No. 2010-055906 to Kobayashi (“Kobayashi”)
- Claims 12, 13, and 15 are Obvious Over Sato, Takemura, Kobayashi, and Nakamura
- Claim 21 is Obvious Over, Sato, Takemura, Kobayashi, Oh-539, and Oh-144
- Claims 1-3, 9-11, 17 are obvious over Takemura, Oh-539, and Kobayashi
- Claims 20-22 are obvious over Takemura, Oh-539, Kobayashi, and Oh-144

3. I previously submitted a Declaration in this proceeding in support of Patent Owner’s Preliminary Response to the Petition (Ex. 2015). I stand by that Declaration and submit this additional supplemental Declaration to address additional issues.

4. I have been asked to submit this Supplemental Declaration to analyze and respond to assertions in the Petition and Institution Decision and the evidence cited therein.

5. As explained below, in my opinion, the Petition fails to show that claims 1-22 of the '498 Patent are rendered obvious.

6. I am being compensated for my time spent on the present matter at my customary consulting rate of \$650 per hour. My compensation is in no way contingent on the nature of my opinions, the outcome of this or any other proceeding, or any of the issues involved therein. I have no other interest in this proceeding.

II. BASIS FOR OPINIONS

A. Qualifications

7. My qualifications and professional experience are described in my resume, a copy of which was provided with my original Declaration (Ex. 2015) as Ex. 2016. Also provided with my original Declaration as Ex. 2017 is a list of my papers and presentations. I also previously summarized my qualifications and professional experience in Paragraphs 7-17 of my original Declaration, and I incorporate those paragraphs by reference.

B. Materials Considered

8. The opinions contained in this Supplemental Declaration are based on the documents I reviewed, as well as my education, years of professional experience, and knowledge. In forming my opinions expressed in this Supplemental Declaration, I further reviewed the Petition and all exhibits or other material cited therein, the Patent Owner's Preliminary Response and all exhibits or other material cited therein,

the Board's Institution Decision, and any additional exhibits or other material cited in my original Declaration (Ex. 2015) and this Supplemental Declaration.

9. This Supplemental Declaration presents the opinions I have formed at the present time, and I reserve the right to revise, supplement, or amend my opinions stated in this Supplemental Declaration based on any new information that I may be asked to review.

10. As I discuss below, I disagree with Dr. von Sacken's and the Board's conclusions that the subject matter of any of Claims 1-22 of the '498 Patent would have been obvious.

III. LEGAL STANDARDS

11. I provided a summary of my understanding of certain legal standards in Paragraphs 20-36 of my original Declaration (Ex. 2015), and I incorporate those paragraphs by reference herein.

12. As I explained in my original Declaration, I am not an attorney, and I am relying only on instructions from Patent Owner's legal counsel for these legal standards.

IV. TECHNOLOGY OVERVIEW

13. I provided a brief technical overview in Paragraphs 37-49 of my original Declaration (Ex. 2015), and I incorporate those paragraphs by reference herein.

V. LEVEL OF ORDINARY SKILL IN THE ART

14. I understand that Petitioner provides the following definition of a person of ordinary skill in the art:

A POSA is presumed to be aware of all pertinent art. The POSA possesses the “understandings and knowledge reflected in the prior art” and thinks along conventional wisdom. *See Abbott Labs. v. Andrx Pharm., Inc.*, 452 F.3d 1331, 1336 (Fed. Cir. 2006).

For the '498 patent, a POSA at the time of the alleged invention 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. Ex. 1003, ¶¶27-30.

Pet., p. 3.

15. I further understand, that for purposes of the Institution Decision, the Board adopted “Petitioner’s proposal regarding the level of ordinary skill in the art.” Paper 10, 11. For purposes of this Supplemental Declaration in support of Patent Owner’s Response, I offer no independent opinion of the level of ordinary skill in the art but have adopted the definition proposed by Petitioner. *See also*, Ex. 2015, ¶¶51-54.

16. Each of the arguments below should be considered from the perspective of a POSITA in the field of the '498 Patent and during the relevant time frame (e.g., January 2014). During that time frame, I possessed at least the qualifications of a

POSITA, as defined above. Furthermore, I am familiar with the level of skill in the art that a POSITA would have had at the time, as during the relevant time frame I regularly supervised, interacted with, and taught persons who had this level of skill.

VI. THE CHALLENGED CLAIMS OF THE '498 PATENT ARE NOT UNPATENTABLE

17. I understand that in an *inter partes* review, Petitioner bears the burden of proving by a preponderance of the evidence on a claim-by-claim basis for each challenged claim that such a claim is unpatentable over the prior art. For at least the reasons I explain below, it is my opinion that none of the Challenged Claims are unpatentable. *See also*, Ex. 2015, ¶55.

A. Ground 1: Sato and Takemura Do Not Render Obvious Claims 1-3, 6, 8, 17, and 19

18. It is my understanding that for purposes of the Institution Decision, the Board determined “that the record establishes a reasonable likelihood that at least one challenged claim is unpatentable as obvious over Sato and Takemura.” Paper 10, 21. I disagree.

19. As previously explained in Paragraphs 56-96 of my original Declaration (Ex. 2015), in my opinion, Petitioner and Dr. von Sacken fail to show that claims 1-3, 6, 8, 17, and 19 of the '498 Patent are rendered obvious by Sato and Takemura, and I incorporate those paragraphs by reference herein.

1. The Petition Fails to Show That Sato and Takemura Render Obvious Claim 1

a. Takemura teaches away from the arrangement of tape in Figures 8 and 9, which show the prior art Takemura claims to improve over.

20. As previously explained in Paragraphs 58-71 of my original Declaration (Ex. 2015), in my opinion, Takemura teaches away from the proposed modifications based on the use of tape depicted in Takemura's Figures 8 and 9, and I incorporate those paragraphs by reference herein.

(i) Takemura expressly disparages the use of tape in Figures 8 and 9.

21. Dr. von Sacken relies on Sato as a primary reference but admits that "Sato does not explicitly disclose or illustrate that the additional polypropylene adhesive tape is located at 'a surface of the positive electrode active material layer opposite to the second recess across the separator in a thickness direction of the positive and negative plate.'" *See* Ex. 1003, ¶140. Dr. von Sacken further admits that "Sato is silent about the additional polypropylene adhesive tape having a width larger than a width of the second recess and a length larger than a length of the second recess." *See* Ex. 1003, ¶149. However, Sato does explain that, with respect to Battery 1, the "portion where the positive electrode current collector was exposed had a width of 8mm" and "[a]fter attachment of the leads to the electrodes, the leads were protected and insulated by a polypropylene adhesive tape with a width of 8 mm

in the positive electrode plate.” Ex. 1005, ¶¶[0111], [0113]. In other words, Sato confirms that the width of the insulating tape (i.e., 8 mm) is the same as the width of the exposed portion. A POSITA would understand that because Sato specifically disclosed that the width of the tape matches the width of the recess in one instance (i.e., Sato’s Battery 1), it would in other instances as well.

22. I understand that Dr. von Sacken relies on disclosure in Takemura found in the background section. Notably, much of the disclosure upon which Dr. von Sacken relies is found under the heading “Technical Problem.” *See* Ex. 1006, ¶¶[0005]-[0012]. In this section of Takemura, Takemura describes “a cross-sectional view of the electrode structure portion of a conventional lithium-ion secondary battery.” Ex. 1006, ¶[0003].

23. I understand that Dr. von Sacken opines that a POSITA would be motivated to combine the tape of Takemura’s Figures 8 and 9 with Sato’s battery to prevent lithium plating. Specifically, I understand that Dr. von Sacken opines that “it would have been obvious to a POSA to locate Sato’s insulating tape, as taught by Takemura, opposite to the negative lead connection on Sato’s negative lead,” because such a modification would have “ensured that Sato’s negative lead 5L and adjacent exposed metal in Sato’s recess (exposed portion 12) were protected from undesirable lithium plating.” Ex. 1003, ¶112. In view of Takemura’s disclosure of

Figures 8 and 9, Dr. von Sacken opines that “it would have been obvious to a POSA to apply Sato’s additional polypropylene adhesive tape such that it had a width and length larger than the width and length of the exposed portion 12/14 (second recess) formed in Sato’s negative electrode active material layer 5B/9 accommodating the negative lead 11.” Ex. 1003, ¶153. But Takemura’s battery depicted in Figures 8 and 9 does not teach or suggest the placement or size of the tape relied upon by Dr. von Sacken.

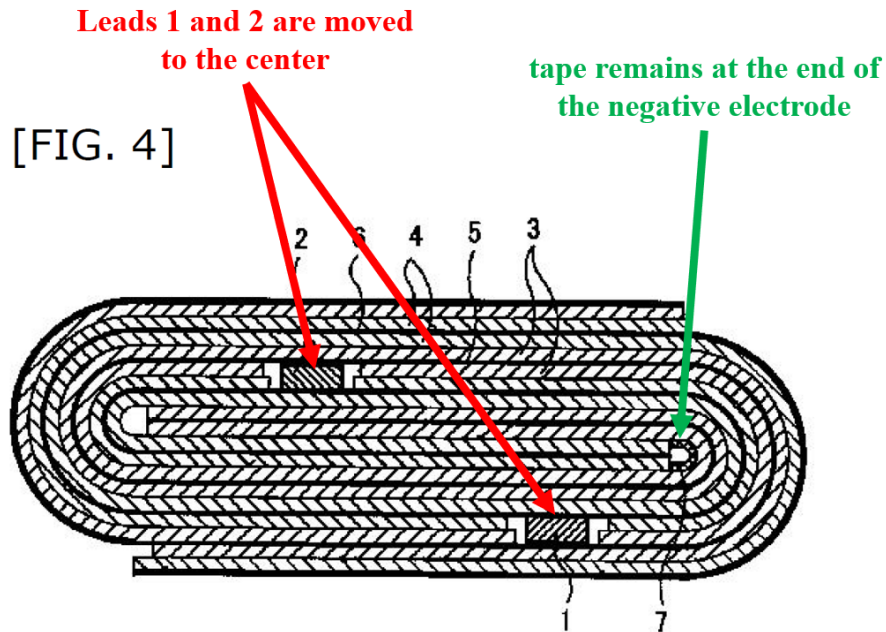
24. Takemura only introduces the battery depicted in Figures 8 and 9 to highlight the problems associated with the conventional approach and to use the conventional battery as a comparative example showing how Takemura’s invention improves upon the conventional battery. Dr. von Sacken never acknowledges that the disclosure in Takemura upon which he relies is found in the Background Art and Technical Problem sections of Takemura. Indeed, a POSITA *would not* have been motivated to combine the conventional battery in Takemura with Sato because of the very problems Takemura identifies and attempts to solve. Instead, a POSITA would have understood the problems described by Takemura and been dissuaded from such a combination. Specifically, Takemura disparages the use of tape shown in Figures 8 and 9 and, thus, discourages the proposed combination by explicitly

teaching that a POSITA should eliminate the use of tape on the leads as shown in the embodiments of Takemura's invention.

25. Takemura explains that “if there is no opposing negative electrode active material 4, such as the positive electrode active material 3 arranged around the negative electrode current collect 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.” Ex. 1006, ¶[0008]. But Takemura stresses that such a configuration “leads to problems such as an increased number of production steps and higher costs.” Ex. 1006, ¶[0008]. Takemura explains that “[t]he presence of extra active material and masking tape in positions where the positive electrode active material 3 and negative electrode active material 4 do not face each other leads to a decrease in energy density, an increase in the overall thickness of the battery, and an increase in cost due to an increase in production steps.” Ex. 1006, ¶[0010].

26. Indeed, Takemura explains that, in Figure 4, “active material layers facing the current collector terminals 1, 2 are not formed . . . preventing lithium metal deposition due to excess positive electrode active material.” Ex. 1006, ¶[0022]. Takemura's Figure 4 locates the leads in the central portion of the electrode,

but the tape is minimized as compared to Figures 8 and 9 as it remains at the end of the negative electrode (i.e., the tape is not provided with the leads in Figure 4), as illustrated below:



Ex. 1006, FIG. 4 (annotations added). Thus, Takemura shows that even when the leads are centrally located within Takemura's battery, no tape is provided with or opposite to the leads.

(ii) Takemura discusses Figures 8 and 9 in disfavored Comparative Example 1.

27. Later, Takemura uses the battery depicted in Figures 8 and 9 in disfavored comparative example 1 to highlight the advantages of its own battery over the battery in Figures 8 and 9. In comparative example 1, Takemura explains

that “the electrode structure shown in FIG. 9 was prepared with the same manufacturing method as in Example 3, using electrode made of the same material as in Example 1, with an electrode active material formed on one or both sides of the electrode current collector but without pattern coating.” Ex. 1006, ¶[0031]. Takemura explains that “[t]he battery created in Example 3 had a discharge capacity of 340 mAh, while the battery created in Comparative Example 1 had a discharge capacity of only 280 mAh.” Ex. 1006, ¶[0033]. Takemura further explains that “in Example 3, the active materials not involved in the battery reaction were removed, because the electrode active material layers were placed only where the positive electrode and negative electrode active materials face each other” and, as a result, “the amount of electrode active material layer that functions as a battery is greater in Example 3 than in Comparative Example 1.” Ex. 1006, ¶[0033]. Table 1 shows the increased discharge capacity in Example 3 over Comparative Example 1:

	Example 3	Comparative Example 1
Discharge Capacity (mAh)	340	280

Ex. 1006, Table 1.

28. Further, Takemura explains that “[i]n Comparative Example 1, as shown in the enlarged central portion of the electrode structure in FIG. 8, extra space readily occurs in the innermost portion due to the thickness of current collector

terminals 1, 2 and the insulating tape 7.” Ex. 1006, ¶[0035]. Conversely, “in Example 3, as shown in the enlarged central portion of the electrode structure in FIG. 7, extra space is less likely to exist.” Ex. 1006, ¶[0035]. Further, “in Example 3, the electrode active material layer to the inside of the innermost layer, where space is easily created and battery reactions are unlikely to occur, is eliminated to reduce excess thickness.” Ex. 1006, ¶[0035]. These improvements in Example 3 over Comparative Example 1 depicted in Figures 8 and 9 led to “a higher discharge capacity” and improved “volumetric energy density.” Ex. 1006, ¶[0035].

29. Takemura also conducted a cycle test “to compare the degradation in discharge capacity after 100 cycles by repeating charge-discharge cycles in which the batteries from Example 3 and Comparative Example 1 were charged at a current value of 100 mA until they reached 4.1 V and then discharged at the same current value 10 minutes later.” Ex. 1006, ¶[0036]. Again, the battery from Example 3 showed improved performance over the battery from Comparative Example 1 depicted in Figures 8 and 9.

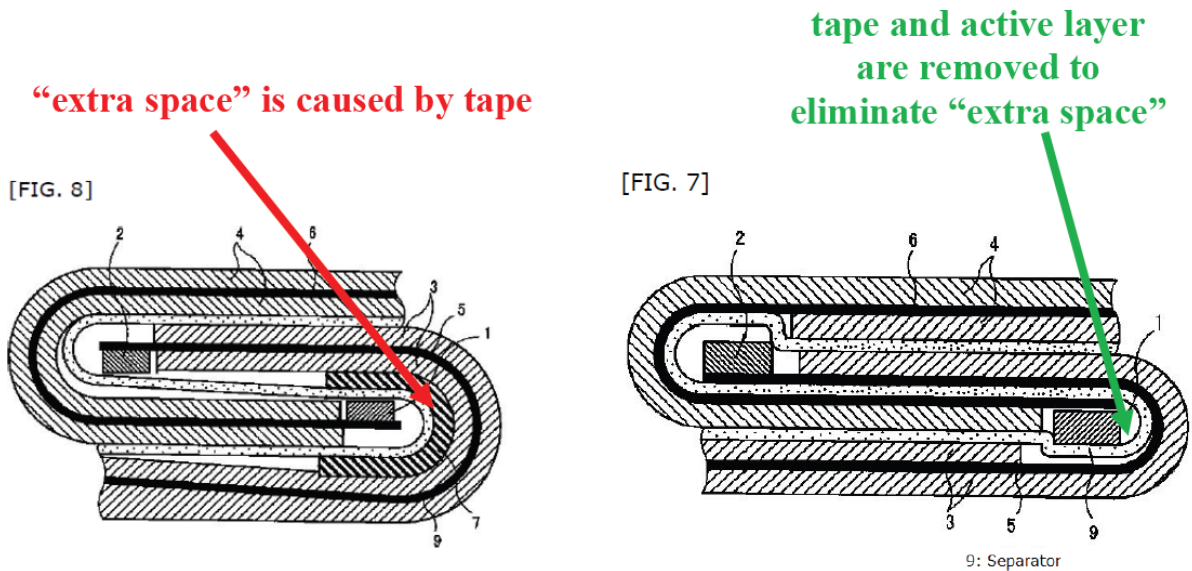
30. Specifically, “[t]he battery in Example 3 maintained more than 90% of its initial discharge capacity after 100 cycles, while the battery in Comparative Example 1 had approximately 86% of its initial discharge capacity.” Ex. 1006, ¶[0036]. Further, “[i]n Comparative Example 1, extra negative electrode active

material exists in the innermost and outermost layers, and when the charge-discharge cycle is repeated, lithium ions are taken in by the extra negative active material portions during charging.” Ex. 1006, ¶[0036]. Takemura explains that “removing excess active material from the outermost and innermost layers improves cycle characteristics, suppresses battery degradation with respect to repeated use, and has the effect of extending battery life.” Ex. 1006, ¶[0036]. Table 2 shows the increased initial discharge capacity, discharge capacity after 100 cycles, and deterioration after 100 cycles in the battery from Example 3 over the battery from Comparative Example 1 depicted in Figures 8 and 9:

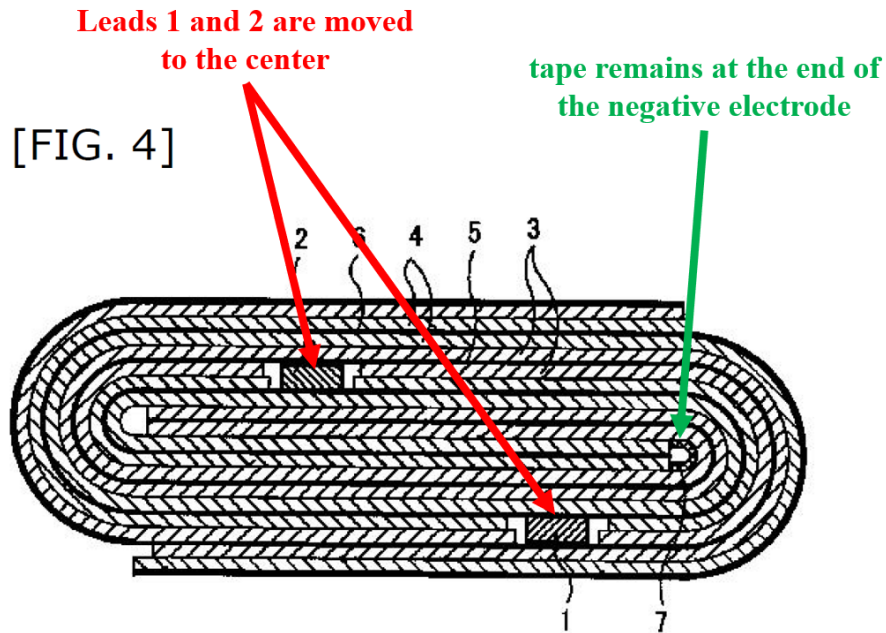
	Example 3	Comparative Example 1
Initial Discharge Capacity (mAh)	340	280
Discharge Capacity After 100 Cycles (mAh)	308	240
Deterioration (%) After 100 Cycles	90.6	85.7

Ex. 1006, Table 2.

31. Based on the problems identified with respect to comparative example 1 depicted in Figures 8 and 9, Takemura stressed the importance of eliminating the use of tape provided with the leads as in the battery from Example 3. Indeed, the elimination of tape and, as a result, the elimination of extra space to achieve improved performance can be seen by comparing Figures 8 with Figure 7:



32. Additionally, Takemura explains that, in Figure 4, “active material layers facing the current collector terminals 1, 2 are not formed . . . preventing lithium metal deposition due to excess positive electrode active material.” Ex. 1006, ¶[0022]. Takemura’s Figure 4 moves the leads to the central portion of the battery, but the tape is minimized as compared to Figures 8 and 9 and remains at the end of the negative electrode (i.e., the tape is not provided with the leads in Figure 4), as illustrated below:

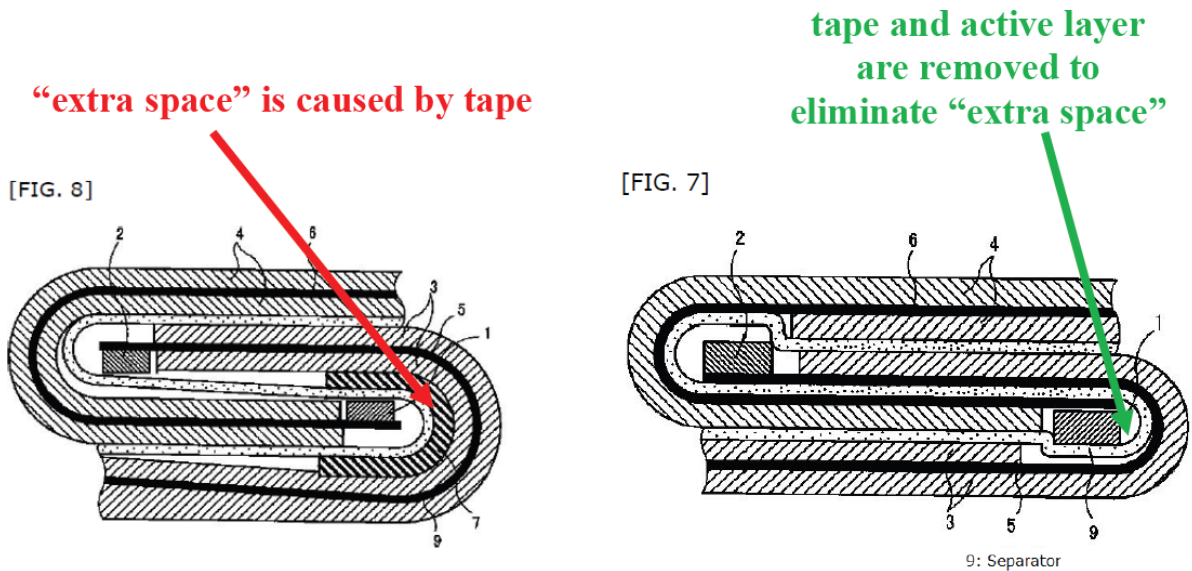


Ex. 1006, FIG. 4 (annotations added).

33. In view of the clear advantages posed by eliminating the insulating tape used in Figures 8 and 9 and Takemura's disparagement of said tape, it is my opinion that Takemura teaches away from using the tape of Figures 8 and 9, and a POSITA would not have been motivated to combine Takemura's use of tape in Figures 8 and 9 with Sato. Likewise, a POSITA would not have been motivated to modify "the insulating tape [to have] a length larger than the length of the exposed metal on the negative electrode current collector," as Dr. von Sacken contends.

(iii) Takemura does not support the use of tape to prevent lithium deposition.

34. I understand that Dr. von Sacken argues that a POSITA would have been motivated to use the tape of Takemura's Figures 8 and 9 to prevent lithium deposition. I disagree. Takemura teaches preventing lithium deposition by removing active material instead of using tape, thus avoiding the various problems associated with using tape. *See* Ex. 1006, ¶[0033]. On this point, Takemura explains "in Example 3, the active materials not involved in the battery reaction were removed, because the electrode active material layers were placed only where the positive electrode active materials face each other" and, as a result, "the amount of electrode active material layer that functions as a battery is greater in Example 3 than in Comparative Example 1." Ex. 1006, ¶[0033]. Further, Takemura discloses that "in Example 3, as shown in the enlarged central portion of the electrode structure in FIG. 7, extra space is less likely to exist" and "the electrode active material layer to the inside of the innermost layer, where space is easily created and battery reactions are unlikely to occur, is eliminated to reduce excess thickness." Ex. 1006, ¶[0035]. Indeed, the elimination of tape and, as a result, the elimination of extra space to achieve improved performance can be seen by comparing Figures 8 with Figure 7:



35. Dr. von Sacken fails to address the problems associated with using the tape of Takemura's Figures 8 and 9 and fails to explain why a POSITA would be motivated to use the tape of Takemura's Figures 8 and 9 when Takemura provides a superior alternative which does not use tape and which results in multiple improved characteristics of the battery. Dr. von Sacken's suggestion that a POSITA would be motivated to combine Takemura's use of tape in Figures 8 and 9 with Sato contradicts the very teachings of Takemura which stress problems with providing tape on or opposite the leads and the benefits associated with eliminating tape and instead removing active material.

36. Further, the '498 Patent explains, and a POSITA would have understood, that the size and placement of insulating tape within a battery affects the battery's performance. For example, the '498 Patent explains that increasing the

thickness of a lithium-ion battery due to the lead decreases the energy density of the battery, and the energy density can be significantly improved by ensuring the leads do not increase the thickness of the battery. Ex. 1001, 1:44-47, 3:1-5. A POSITA would understand that high spots (i.e., localized high points in the electrode pair) should be avoided. Accordingly, when designing a battery, tradeoffs in battery performance must be considered when determining the size and placement of insulating tape.

37. Accordingly, it is my opinion that Takemura disparages, and thus teaches away from, the use of tape depicted in Figures 8 and 9, and therefore, a POSITA would not be motivated to combine the tape of Takemura's 8 and 9 with Sato.

b. Takemura does not render obvious a “second insulating glue layer” that “has a length larger than a length of the second recess.”

38. As previously explained in Paragraphs 72-80 of my original Declaration (Ex. 2015), in my opinion, Takemura does not render obvious a “second insulating glue layer” that “has a length larger than a length of the second recess,” and I incorporate those paragraphs by reference herein. As explained in my original Declaration, I understand Petitioner agrees that Sato and Takemura are silent *about the claimed length* of the “second insulating glue layer.” Pet., 22 (“Takemura does

not illustrate that the insulating tape has a length larger than the length of the exposed metal.”), 36 (“*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.”). Sato in fact discloses that the width of its polypropylene adhesive tape is equal to the width of the portion where the positive electrode current collector is exposed. Specifically, with respect to Battery 1, Sato discloses:

In the positive electrode plate described above, the positive electrode material mixture layer was peeled off from the surface of the positive electrode current collector connected to the lead such that *a portion where the positive electrode current collector was exposed had a width of 8 mm* from the position of 278 mm to the position of 286 mm in the length direction relative to the end. . . .

Ex. 1005, ¶[0111] (emphasis added). Sato further discloses:

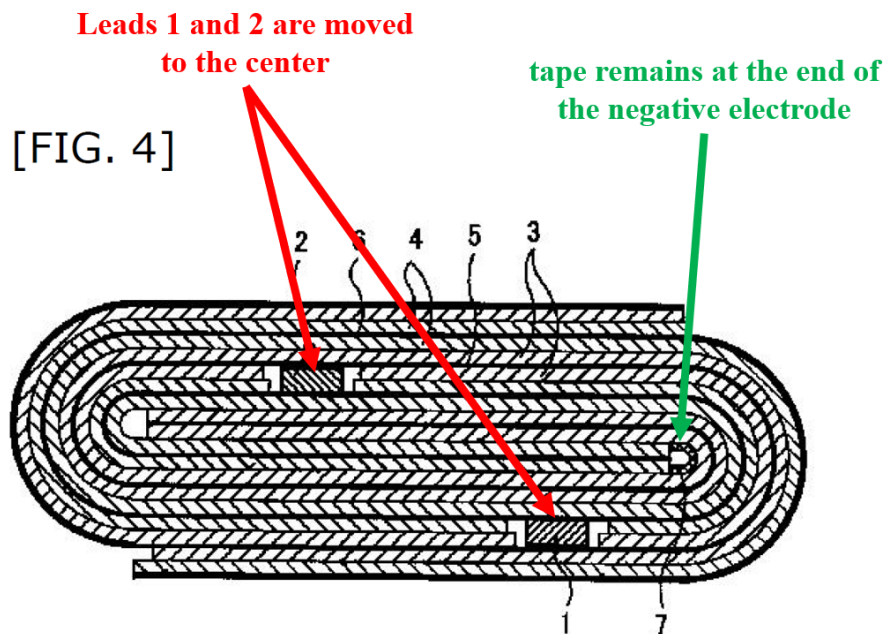
After the attachment of the leads to the electrodes, the leads were protected and insulated by *a polypropylene adhesive tape with a width of 8 mm* in the positive electrode plate and by a polyethylene adhesive tape in the negative electrode plate.

Ex. 1005, ¶[0113] (emphasis added).

39. Thus, Sato discloses that the width of the tape is 8 mm and the width of the exposed portion is also 8 mm. Ex. 1005, ¶[0111], [0113]. Dr. von Sacken further

confirmed that Sato discloses equal widths of 8 mm for the tape and the exposed portion. Ex. 2020, 52:4-53:3.

40. Takemura explains that, in Figure 4, “active material layers facing the current collector terminals 1, 2 are not formed . . . preventing lithium metal deposition due to excess positive electrode active material.” Ex. 1006, ¶[0022]. Takemura’s Figure 4 places the leads in the central portion of the battery, but the tape is minimized as compared to Figures 8 and 9 and remains at the end of the negative electrode (i.e., the tape is not provided with the leads in Figure 4), as illustrated below:



Ex. 1006, FIG. 4 (annotations added).

c. Sato does not disclose a battery with both a “first recess” and a “second recess.”

41. As previously explained in Paragraphs 81-94 of my original Declaration (Ex. 2015), in my opinion, Sato does not disclose a battery with both a “first recess” and a “second recess,” and I incorporate those paragraphs by reference herein.

(i) Sato does not disclose a single battery with centrally located recesses.

42. In Sato’s Battery 1, the positive lead is located within the middle of the positive electrode plate, but the negative lead is situated at the end of the negative electrode plate. Ex. 1005, ¶¶[0104], [0111] (“In the negative electrode plate, the position connected to the lead was located at the outermost portion of the negative electrode plate” and “[t]he surface where the lead connection portion was exposed in the negative electrode plate was located at the end (i.e., the outermost portion) thereof.”). Conversely, in Sato’s Battery 8, the negative lead is in the middle of the negative electrode (Ex. 1005, ¶¶[0107], [0136]-[0137]) and the positive lead is at the end of the positive electrode. Ex. 1005, ¶[0137] (“At this time, the [lead]¹ was

¹ Sato contains a typo referencing the “load” instead of the “lead.” Sato, here, is referring to the positive lead on the positive electrode.

located at an end of the positive electrode such that the lead was located at the innermost portion.”).

43. In particular, Sato explains that “[e]xcept for these processes, a battery 8 was fabricated in the same manner as the battery 1.” Ex. 1005, ¶[0137]. In the same paragraph, Sato explains that the positive lead “was located at an end of the positive electrode such that the lead was located at the innermost portion.” Ex. 1005, ¶[0137]. Thus, in Battery 8, while the negative lead is located in the middle of the negative electrode plate, the positive lead (and the exposed portion on the positive electrode plate) is located at the end of the positive electrode plate. I understand that Dr. von Sacken further confirmed this understanding. Ex. 2020, 60:18-61:3 (“Q. And if we look at the sentence starting with ‘At this time,’ would you agree with me that in that sentence of paragraph 137, that Sato is disclosing a lead located at the end of the positive electrode? A. He appears to be introducing further modification of moving the positive lead to the end of the electrode.”). Finally, I interpret “A positive electrode plate was formed in the same manner as in Example 1” in paragraph 136 of Sato to related to the actual formation of the positive plate and not the leads. *See* Ex. 1005, ¶¶ [0103]-[104].

44. Dr. von Sacken argues that Sato’s Battery 8 is actually two different batteries: one battery with two centrally located recesses and one battery where the

positive lead is moved to the end. *See* Ex. 2020, 63:7-64:6. Given the clear disclosure in Sato that Battery 8 is a single battery, I disagree. With respect to Battery 8, Sato explains that “[a]t this time, the [lead] was located at an end of the positive electrode such that the lead was located at the innermost portion.” Ex. 1005, ¶[0137]. Further, Sato’s Table 2 depicts test results for Batteries 8-11 and contains only a single entry for Battery 8. Ex. 1005, Table 2; Ex. 2020, 62:15-18 (“Q. And when we look at Table 2, there’s a single entry for battery 8, correct? A. Yeah.”). Sato’s Battery 8 can thus only be understood to be a single battery with the positive lead located at an end of the positive electrode.

(ii) Petitioner relies on a combination of different embodiments disclosed in Sato.

45. As previously explained in Paragraphs 81-94 of my original Declaration (Ex. 2015), in my opinion, Petitioner relies on a combination of different embodiments disclosed in Sato, and I incorporate those paragraphs by reference herein.

2. Claims 17 is Not Unpatentable

46. As previously explained in Paragraph 95 of my original Declaration (Ex. 2015), Claim 17 is not unpatentable, and I incorporate that paragraph by reference herein.

3. Claims 2-3, 6, 8, and 19 Are Not Unpatentable

47. As previously explained in Paragraph 96 of my original Declaration (Ex. 2015), in my opinion, Claims 2, 3, 6, and 8 are not unpatentable, and I incorporate that paragraph by reference herein.

48. Additionally, Claims 2-3, 6, 8, and 19 are not unpatentable for the same reasons as discussed above with respect to independent Claims 1 and 17.

a. Claims 2 and 3 are Not Unpatentable

49. Dr. von Sacken argues that Sato's Battery 1 positions the exposed portion on the positive electrode plate such that the distance from the center of the exposed portion to the end of the positive active material layer is half of the length of the positive electrode of Battery 1. Ex. 1003, ¶158. Likewise, Dr. von Sacken argues that Sato's Battery 8 positions the exposed portion on the negative electrode plate such that the distance from the center of the exposed portion to the end of the negative active material layer is half of the length of the negative electrode of Battery 8. Ex. 1003, ¶159.

50. But Sato's Battery 1 and Battery 8 are different batteries configured in different ways, and no single battery in Sato positions both the exposed portion on the positive electrode and the exposed portion on the negative electrode such that the distances from the centers of the exposed portions to the end of the respective

active material layer is half of the electrode plate. That is, Sato does not disclose a single battery with two centrally located recesses.

51. Indeed, in Sato's Battery 1, the positive lead is located within the middle of the positive electrode plate, but the negative lead is situated at the end of the negative electrode plate. Ex. 1005, ¶¶[0104], [0111] ("In the negative electrode plate, the position connected to the lead was located at the outermost portion of the negative electrode plate" and "[t]he surface where the lead connection portion was exposed in the negative electrode plate was located at the end (i.e., the outermost portion) thereof."). On the other hand, in Sato's Battery 8, the negative lead is in the middle of the negative electrode (Ex. 1005, ¶¶[0107], [0136]-[0137]) and the positive lead is at the end of the positive electrode. Ex. 1005, ¶[0137] ("At this time, the [lead]² was located at an end of the positive electrode such that the lead was located at the innermost portion.").

52. To be clear, Sato explains that "[e]xcept for these processes, a battery 8 was fabricated in the same manner as the battery 1." Ex. 1005, ¶[0137]. In the same paragraph, Sato explains that the positive lead "was located at an end of the positive

² Sato contains a typo referencing the "load" instead of the "lead." Sato, here, is referring to the positive lead on the positive electrode.

electrode such that the lead was located at the innermost portion.” Ex. 1005, ¶[0137]. Thus, in Battery 8, while the negative lead is located in the middle of the negative electrode plate, the positive lead (and the exposed portion on the positive electrode plate) is located at the end of the positive electrode plate. I understand that Dr. von Sacken further confirmed this understanding. Ex. 2020, 60:18-61:3 (“Q. And if we look at the sentence starting with ‘At this time,’ would you agree with me that in that sentence of paragraph 137, that Sato is disclosing a lead located at the end of the positive electrode? A. He appears to be introducing further modification of moving the positive lead to the end of the electrode.”).

53. Accordingly, it is my opinion that neither Sato’s Battery 8 nor Sato’s Battery 1 satisfy the requirements of either Claim 2 or Claim 3.

b. Claim 6 is Not Unpatentable

54. Dr. von Sacken refers to Sato’s “Battery 1.” *See* Ex. 1003, ¶168. Sato discloses “a positive electrode plate prototype in the shape of a plate having a thickness of 0.157 mm.” Sato, [0104]. Sato further discloses that a that a “positive electrode material mixture slurry was applied onto both surfaces of aluminum foil with a thickness of 15 μ m as a positive electrode current collector.” Sato, [0104].

55. As a result, Dr. von Sacken argues that “[a] POSA would have understood that the thickness of each positive electrode active material layer applied

on the surface of the positive current collector is 0.071 mm” (i.e., $\frac{0.157 \text{ mm} - 0.015 \mu\text{m}}{2}$).

See Ex. 1003, ¶168. Dr. von Sacken further argues that “[a] POSA would have further understood that the depth of Sato’s exposed portion corresponds to the thickness of the active material layer” and that Sato describes “connecting a ‘positive electrode lead (with a width of 6 mm)’ to the exposed portion (i.e., the first recess) of Sato’s positive electrode.” *See* Ex. 1003, ¶168; Sato, [0112]. Dr. von Sacken references Sato’s figures 3 and 5 and explains that “a POSA would have understood that Sato’s first recess (annotated) has a depth of 0.005-0.071 mm larger than the thickness of positive lead (11).” *See* Ex. 1003, ¶168; Sato, FIGs. 3, 5.

56. Dr. von Sacken derives conclusions about the precise measurements of Sato’s battery without any support in the specification of Sato. First, Dr. von Sacken takes the total thickness of the plate (157 mm) and subtracts the thickness of the current collector (0.015 mm). Ex. 1003, ¶168. He then concludes that the active material layer on the top and bottom each make up exactly half of the remaining thickness (i.e., $157 \text{ mm} - 0.015 \text{ mm} = 0.142 \text{ mm}$ and exactly half of 0.142 mm is 0.071 mm). Ex. 1003, ¶168. The 0.071 mm measurement, however, is not disclosed in the cited portions of Sato. Sato does not explain that the top and bottom portions of the active material layer are exactly half of the total thickness of the plate minus the current collector. Likewise, Sato’s Figures 3 and 5 do not provide measurements for

the thickness of the top and bottom portions of the active material layer despite using variables to indicate other measurements in the figures. *See* Ex. 1005, FIGS. 3, 5. Sato is silent as to the thickness of the top and bottom portions of the active material layer in Sato's "Battery 1."

57. Nevertheless, Dr. von Sacken uses the 0.071 mm figure to define the depth of the alleged recess despite Sato failing to provide this measurement. Dr. von Sacken goes on to argue that a POSA would have understood from Figures 3 and 5 that the depth of the first recess is 0.005-0.071 mm larger than the thickness of the positive lead. *See* Ex. 1003, ¶168. Again, Sato does not provide the 0.071 mm measurement, but even if the depth of the first recess is 0.071 mm, as Dr. von Sacken asserts, Sato still fails to disclose that the depth of the recess is 0.005-0.071 mm larger than the thickness of the positive lead. In particular, the lead in Sato's Figures 3 and 5 could be equal to the depth of the alleged recess, in which case the depth of the first recess may be less than 0.005 mm larger than the thickness of the positive lead.

58. Following similar logic with respect to the negative electrode, Dr. von Sacken likewise explains that "[i]n view of Figures 3 and 5 . . . a POSA would have understood that Sato's second recess . . . has a depth of 0.005-0.074 mm larger than

the thickness of negative lead (11).” Ex. 1003, ¶169. But Sato’s “Battery 8” is deficient for the same reasons as Sato’s “Battery 1.”

59. Seemingly recognizing the deficiencies of Sato, Dr. von Sacken argues that a POSA would have understood that there would be three predictable solutions for connecting a lead to an electrode plate: “(1) making the thickness of the lead greater than the depth of the recess, (2) making the thickness of the lead equal to the depth of the recess, and (3) making the thickness of the lead less than the depth of the recess.” *See* Ex. 1003, ¶170. Dr. von Sacken acknowledges that “[a]ll three of these solutions would have been well within the level of ordinary skill in the art, leading to the predictable result of connecting the lead to the electrode plate.” *See* Ex. 1003, ¶170. Yet, Dr. von Sacken asserts that a POSA would have “understood that a lead as thick or thicker than the depth of the recess could produce an undesirable bulge in the battery cell winding, which would not be an efficient use of space and would reduce cell capacity.” *See* Ex. 1003, ¶170. Dr. von Sacken, however, provides no support for his conclusion that a POSA would not have used a lead as thick as the depth of the recess.

60. Further, the ’498 Patent explains that “increase of thickness of a lithium-ion battery due to the lead” is “one of the key actors which limit the energy density of the lithium-ion battery.” Ex. 1001, 1:44-47. It is thus beneficial that the depth of

the recesses in the battery of the '498 Patent be 0.005 mm to 0.1 mm larger than the thickness of the leads. Sato, however, says nothing about the thickness of the top and bottom portions of the active material layer in relation to the thickness of the leads and thus does not disclose that the thickness of the recesses must be 0.005 mm to 0.1 mm larger than the thickness of the leads.

61. Thus, Sato fails to render Claim 6 obvious for these additional reasons.

B. Ground 2: Sato, Takemura, and Nakamura Do Not Render Obvious Claims 4, 5, 7, and 18

62. It is my understanding that for purposes of the Institution Decision, the Board determined “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.” Paper 10, 29.

63. As previously explained in Paragraph 97 of my original Declaration (Ex. 2015), in my opinion, Petitioner and Dr. von Sacken fail to show that claims 4, 5, 7, and 18 of the '498 Patent are rendered obvious by Sato, Takemura, and Nakamura, and I incorporate that paragraph by reference herein.

64. Additionally, Claims 4, 5, and 7 depend on Claim 1 and Claim 18 depends on Claim 17. Thus, Claims 4, 5, 7, and 18 are not unpatentable for the same reasons as discussed above with respect to independent Claims 1 and 17.

1. Claims 4 and 5 are Not Unpatentable

65. Claim 4 of the '498 Patent requires:

The lithium-ion battery of claim 3, wherein the first recess has a length of 1-100 mm less than a length of the positive lead, the first recess has a width of 1-10 mm larger than a width of the positive lead, the second recess has a length of 1-100 mm less than a length of the negative lead, and the second recess has a width of 1-10 mm larger than a width of the negative lead.

Ex. 1001, 11:17-23.

66. Claim 5 of the '498 Patent requires:

The lithium-ion battery of claim 1, wherein the first recess has a length of 1-100 mm less than a width of the positive electrode active material layer, and the second recess has a length of 1-100 mm less than a width of the negative electrode active material layer.

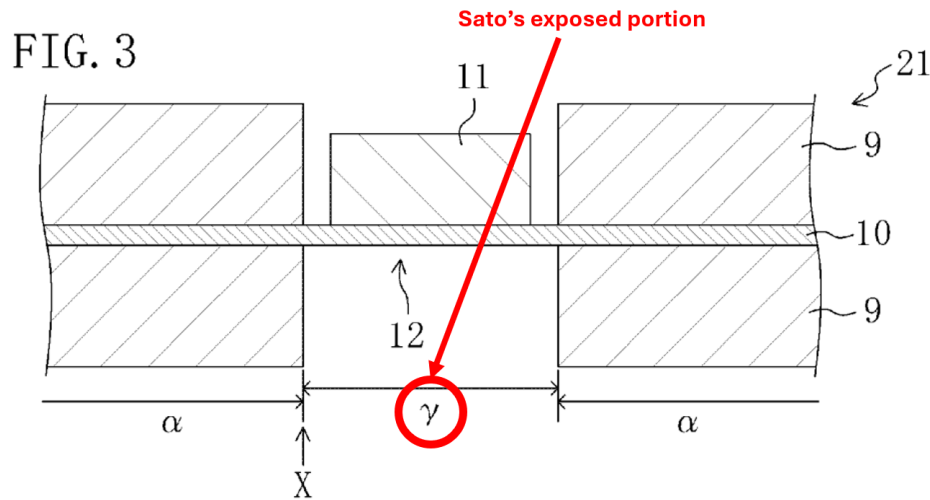
Ex. 1001, 11:24-28.

67. The exposed portion in Sato's Battery 1 and the exposed portion in Sato's Battery 8 are exposed because there is no active material on the current collector (Ex. 1005, ¶[0036] ("The exposed portion extends *perpendicularly to the length direction* of the positive electrode plate 4 or the negative electrode plate 5 *in the shape of a band.*") (emphasis added)) whereas the claimed recesses in the '498 Patent require a length dimension (Ex. 1001, 11:17-28 (requiring "*the first recess*

has a length of 1-100 mm less than a length of the positive lead . . . *the second recess has a length* of 1-100 mm less than a length of the negative lead” and “*the first recess has a length* of 1-100 mm less than a width of the positive electrode active material layer, and *the second recess has a length* of 1-100 mm less than a width of the negative electrode active material layer”) (emphasis added)). The exposed portion in Sato has a “band” shape with a width dimension and no length dimension. Ex. 1001, 5:66-6:3; *see also* Ex. 1003, ¶¶198, 207 (admitting that Sato is silent about the length dimension of the exposed portions on the positive and negative electrode).

68. With respect to Claim 4, Petitioner and Dr. von Sacken propose modifying the length of Sato’s exposed portions as taught by Nakamura such that “the length of Sato’s first and second” exposed portions are formed “to be 1-100 mm less than a length of the positive and negative leads.” Ex. 1003, ¶203. Further, with respect to Claim 5, Petitioner and Dr. von Sacken propose modifying the length of Sato’s exposed portions as taught by Nakamura such that “the length of Sato’s first and second” exposed portions are formed “to be 1-100 mm less than a width of the positive and negative active material mixture layers.” Ex. 1003, ¶212. This approach, however, would require the exposed portions in Sato to be modified such that a portion of the current collector in line with the exposed portion was no longer

exposed, and this would create fundamental problems with Sato's batteries. The exposed portions and their "band" shape in Sato are critical to Sato's invention because Sato discloses a cylindrical battery and the exposed portions are designed so that they easily bend. Indeed, the bending problem is particularly severe at the inner portion of the cylinder. Moreover, modifying Sato in this way would result in increased likelihood of cracking due to increased pressure at the innermost portion of the cylinder where the negative lead in Sato's Battery 1 and the positive lead in Sato's Battery 8 are located. *See* Ex. 1005, ¶¶[0111], [0137]. Thus, changing the exposed portion (i.e., "γ" in Sato's Figure 3, below) in Sato to an exposed portion with both a length dimension like the recesses in the '498 Patent would negatively impact the bendability of Sato's battery as well as create other problems like an increased likelihood of cracking and fracture of the active material in the unexposed portion which could result in the creation of particulates in the cell which can potentially lead to shorting and catastrophic failure of the cell, including fire and explosion.



Ex. 1005, FIG. 3.

69. A POSITA would thus not be motivated to combine Sato and Nakamura in the manner suggested by Petitioner and Dr. von Sacken.

C. Ground 3: Sato, Takemura, Oh-539, and Oh-144 Do Not Render Obvious Claims 20 and 22

70. It is my understanding that for purposes of the Institution Decision, the Board determined “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.” Paper 10, 29.

71. As previously explained in Paragraph 98 of my original Declaration (Ex. 2015), in my opinion, Petitioner and Dr. von Sacken fail to show that claims 20 and 22 of the '498 Patent are rendered obvious by Sato, Takemura, Oh-539, and Oh-144, and I incorporate that paragraph by reference herein.

72. Additionally, Claim 20 depends on Claim 1 and Claim 22 depends on Claim 17. Thus, Claims 20 and 22 are not unpatentable for the same reasons as discussed above with respect to independent Claims 1 and 17.

D. Ground 4: Sato, Takemura, and Kobayashi Do Not Render Obvious Claims 9-11, 14, and 16

73. It is my understanding that for purposes of the Institution Decision, the Board determined “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.” Paper 10, 30.

74. As previously explained in Paragraphs 98-100 of my original Declaration (Ex. 2015), in my opinion, Petitioner and Dr. von Sacken fail to show that claims 9-11, 14, and 16 of the ’498 Patent are rendered obvious by Sato, Takemura, and Kobayashi, and I incorporate those paragraphs by reference herein.

75. Additionally, for Claims 10, 11, 14, and 16, Petitioner relies on its Ground 1 analysis for Claims 2, 3, 6, and 8, respectively. Pet. at 72. Therefore, these claims are unpatentable for the same reasons I discuss above with respect to Claims 2, 3, 6, and 8. *Supra*, Section VI.A.3.

E. Ground 5: Sato, Takemura, Kobayashi, and Nakamura Do Not Render Obvious Claims 12, 13, and 15

76. It is my understanding, that for purposes of the Institution Decision, the Board determined “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.” Paper 10, 30.

77. As previously explained in Paragraph 101 of my original Declaration (Ex. 2015), in my opinion, Petitioner and Dr. von Sacken fail to show that claims 12, 13, and 15 of the '498 Patent are rendered obvious by Sato, Takemura, Kobayashi, and Nakamura, and I incorporate that paragraph by reference herein.

1. Claims 12 and 13 are Not Unpatentable

78. Claim 12 of the '498 Patent requires:

The lithium-ion battery of claim 9, wherein the first recess has a length of 1-100 mm less than a length of the positive lead, the first recess has a width of 1-10 mm larger than a width of the positive lead, the second recess has a length of 1-100 mm less than a length of the negative lead, and the second recess has a width of 1-10 mm larger than a width of the negative lead.

Ex. 1001, 12:22-28.

79. Claim 13 of the '498 Patent requires:

The lithium-ion battery of claim 9, wherein the first recess has a length of 1-100 mm less than a width of the positive electrode active material layer, and the second recess has a length of 1-100 mm less than a width of the negative electrode active material layer.

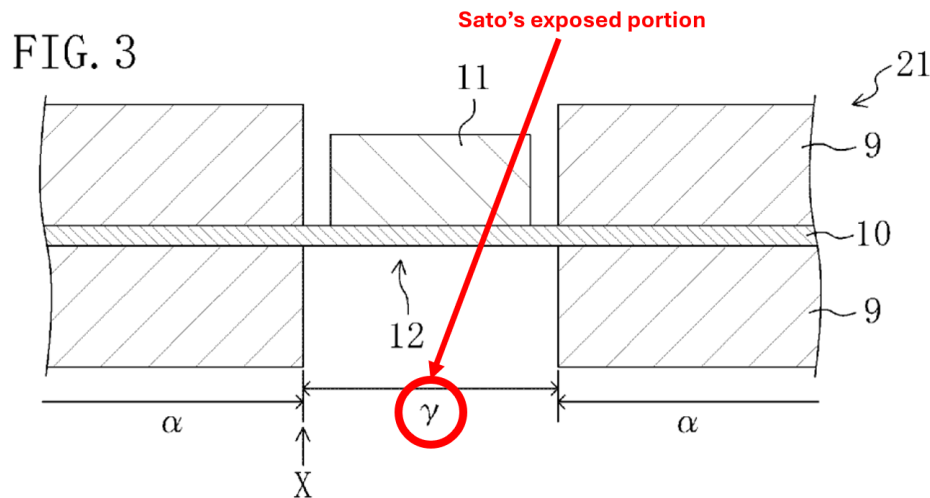
Ex. 1001, 12:29-33.

80. The exposed portion in Sato's Battery 1 and the exposed portion in Sato's Battery 8 are exposed because there is no active material on the current collector (Ex. 1005, ¶[0036] ("The exposed portion extends *perpendicularly to the length direction* of the positive electrode plate 4 or the negative electrode plate 5 *in the shape of a band.*") (emphasis added)) whereas the claimed recesses in the '498 Patent require a length dimension (Ex. 1001, 12:22-33 (requiring "*the first recess has a length* of 1-100 mm less than a length of the positive lead . . . *the second recess has a length* of 1-100 mm less than a length of the negative lead" and "*the first recess has a length* of 1-100 mm less than a width of the positive electrode active material layer, and *the second recess has a length* of 1-100 mm less than a width of the negative electrode active material layer") (emphasis added)). The exposed portion in Sato has a "band" shape with a width dimension and no length dimension. Ex. 1001, 5:66-6:3; *see also* Ex. 1003, ¶¶309, 318 (admitting that Sato is silent about the length dimension of the exposed portions on the positive and negative electrode).

81. With respect to Claim 12, Petitioner and Dr. von Sacken propose modifying the length of Sato's exposed portions as taught by Nakamura such that "the length of Sato's first and second" exposed portions are formed "to be 1-100 mm less than a length of the positive and negative leads." Ex. 1003, ¶314. Further, with

respect to Claim 13, Petitioner and Dr. von Sacken propose modifying the length of Sato's exposed portions as taught by Nakamura such that "the length of Sato's first and second" exposed portions are formed "to be 1-100 mm less than a width of the positive and negative active material mixture layers." Ex. 1003, ¶323. This approach, however, would require the exposed portions in Sato to be modified such that a portion of the current collector in line with the exposed portion was no longer exposed, and this would create fundamental problems with Sato's batteries. The exposed portions and their "band" shape in Sato are critical to Sato's invention because Sato discloses a cylindrical battery and the exposed portions are designed so that they easily bend. Indeed, the bending problem is particularly severe at the inner portion of the cylinder. Moreover, modifying Sato in this way would result in increased likelihood of cracking due to increased pressure at the innermost portion of the cylinder where the negative lead in Sato's Battery 1 and the positive lead in Sato's Battery 8 are located. *See* Ex. 1005, ¶¶[0111], [0137]. Thus, changing the exposed portion (i.e., "γ" in Sato's Figure 3, below) in Sato to an exposed portion with both a length dimension like the recesses in the '498 Patent would negatively impact the bendability of Sato's battery as well as create other problems like an increased likelihood of cracking and fracture of the active material in the unexposed portion, which could result in creation of particulates in the cell which can

potentially lead to shorting and catastrophic failure of the cell, including fire and explosion.



Ex. 1005, FIG. 3.

82. A POSITA would thus not be motivated to combine Sato and Nakamura in the manner suggested by Petitioner and Dr. von Sacken.

F. Ground 6: Sato, Takemura, Kobayashi, Oh-539, and Oh-144 Do Not Render Obvious Claim 21

83. It is my understanding, that for purposes of the Institution Decision, the Board determined “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.” Paper 10, 31.

84. As previously explained in Paragraph 102 of my original Declaration (Ex. 2015), in my opinion, Petitioner and Dr. von Sacken fail to show that claim 21

of the '498 Patent is rendered obvious by Sato, Takemura, Kobayashi, Oh-539, and Oh-144, and I incorporate that paragraph by reference herein.

G. Ground 7: Takemura, Oh-539, and Kobayashi Do Not Render Obvious Claims 1-3, 9-11, and 17

85. It is my understanding, that for purposes of the Institution Decision, the Board determined “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.” Paper 10, 31-32.

86. As previously explained in Paragraphs 103-118 of my original Declaration (Ex. 2015), in my opinion, Petitioner and Dr. von Sacken fail to show that claims 1-3, 9-11, and 17 of the '498 Patent are rendered obvious by Takemura, Oh-539, and Kobayashi, and I incorporate those paragraphs by reference herein.

1. The Petition Fails to Show That Takemura, Oh-539, and Kobayashi Render Obvious Claim 1

a. Takemura teaches away from the proposed arrangement of tape in Figures 8 and 9.

87. As previously explained in Paragraphs 58-71 and 105-109 of my original Declaration (Ex. 2015), in my opinion, Takemura teaches away from the use of tape depicted in Takemura's Figures 8 and 9, and I incorporate those paragraphs by reference herein.

b. Takemura does not render obvious a “second insulating glue layer” that “has a length larger than a length of the second recess.”

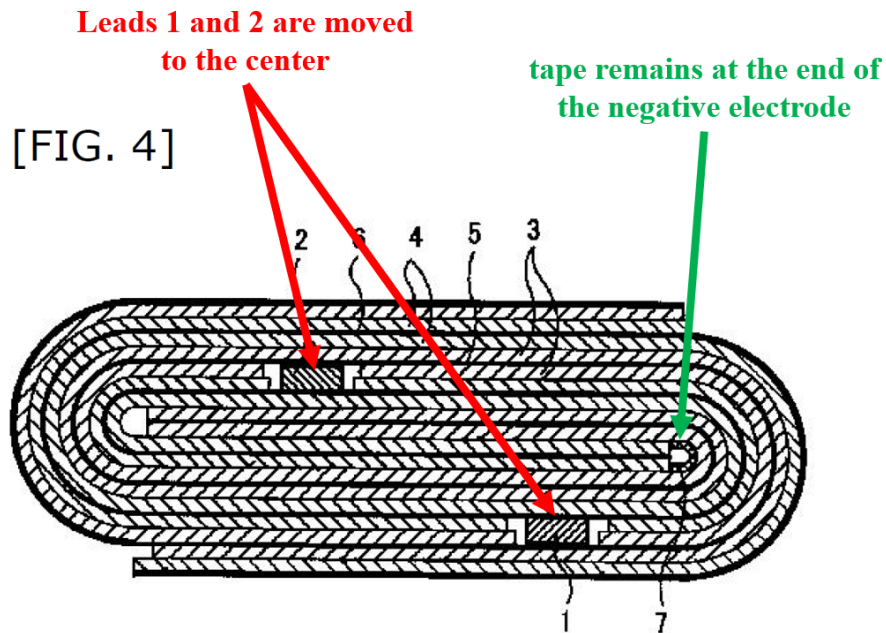
88. As previously explained in Paragraphs 72-80 and 110 of my original Declaration (Ex. 2015), in my opinion, Takemura does not render obvious a “second insulating glue layer” that “has a length larger than a length of the second recess,” and I incorporate those paragraphs by reference herein.

c. Figure 4 of Takemura demonstrates that the Petition relies on impermissible hindsight.

89. As previously explained in Paragraphs 111-116 of my original Declaration (Ex. 2015), in my opinion, even if combined, the resulting combination of Takemura with Oh-539 would not result in placing the “second insulating glue layer” at the claimed location, and I incorporate those paragraphs by reference herein.

90. In Figure 4—the only Takemura disclosure that includes leads in a recess, like Oh-539 is claimed to—Takemura explains that “active material layers facing the current collector terminals 1, 2 are not formed . . . preventing lithium metal deposition due to excess positive electrode active material.” Ex. 1006, ¶[0022]. Takemura’s Figure 4 moves the leads to the central portion of the battery, but the tape is minimized as compared to Figures 8 and 9 and remains at the end of

the negative electrode (i.e., the tape is not provided with the leads in Figure 4), as illustrated below:



Ex. 1006, FIG. 4 (annotations added). Thus, Takemura teaches placing tape only at the winding end (as shown in green in the above annotated figure) and not with the leads (as shown in red in the above annotated figure) to prevent lithium deposition.

91. A POSITA would understand that adding tape in the middle of Oh-539 would create additional “extra space” at the locations of Oh-539, something which Takemura teaches a POSITA to avoid. Ex. 1006, ¶[0035]. Instead, Takemura specifically disclosed not placing tape “opposite” a recess. Ex. 1006, ¶[0035]. Takemura teaches removing active material to form “an active material uncoated portion . . . which prevents lithium metal deposition.” Ex. 1006, ¶[0019].

d. Kobayashi's disclosure further undercuts Petitioner's combination.

92. As previously explained in Paragraphs 111-116 of my original Declaration (Ex. 2015), in my opinion, even if combined, the resulting combination of Takemura with Oh-539 would not result in placing the “second insulating glue layer” at the claimed location, and I incorporate those paragraphs by reference herein.

93. Kobayashi describes a conventional example of a non-aqueous electrolyte secondary battery with reference to Figure 6. Ex. 1008, ¶[0006]. Regarding Kobayashi's conventional battery, Kobayashi discloses that “the negative electrode plate 56 has one end of a negative electrode tab 59 connected to a negative electrode exposed core portion 58 where a portion of the negative electrode material layer 57 has been removed, and the edge of the negative electrode active material layer 57, the negative electrode tab 59, and the surface of the negative electrode exposed core portion 58 are covered with insulating tape 60 with a glue material layer.” Ex. 1008, ¶[0007].

94. Kobayashi states “[i]n the non-aqueous electrolyte secondary battery of the present invention, the negative electrode plate and the positive electrode plate can have the same configuration, but since the negative electrode plate is less likely to generate side reactions, it can have the same configuration as the conventional

example.” Ex. 1008, ¶[0015]. That is, in Kobayashi’s battery, the lead in the negative electrode is covered with tape.

95. Kobayashi further discloses that “[i]n the negative electrode plate 12, as in the conventional example, a negative electrode exposed core portion without any negative electrode active material layer is formed on the beginning end of the winding, a negative electrode tab is attached to the negative electrode exposed core portion, and the negative electrode tab, the negative electrode exposed core portion, and the surface of the negative electrode active material layer near the negative electrode exposed core portion are covered with an insulating tape. . . .” Ex. 1008, ¶[0035].

96. Accordingly, even in the proposed Takemura-Oh-539-Kobayashi combination, a POSITA would have covered the negative lead as taught by Kobayashi instead of placing tape on the opposite surface.

2. Claims 9 and 17 are Not Unpatentable

97. As previously explained in Paragraph 117 of my original Declaration (Ex. 2015), in my opinion, Petitioner and Dr. von Sacken fail to show Takemura, Oh-539, and Kobayashi render obvious Claim 17, and I incorporate that paragraph by reference herein. Additionally, for at least the same reasons discussed above for Claim 1, Claims 9 and 17 are not unpatentable.

3. Claims 2, 3, 10, and 11 are Not Unpatentable

98. As previously explained in Paragraph 118 of my original Declaration (Ex. 2015), in my opinion, Petitioner and Dr. von Sacken fail to show that Claims 2, 3, 10, and 11 are not unpatentable, and I incorporate that paragraph by reference herein.

99. Claims 2 and 3 depend from Claim 1 and are thus not unpatentable for at least the same reasons I discuss above with respect to Claim 1 and at least because they depend from Claim 1. Claims 10 and 11 depend from Claim 9 and are thus not unpatentable for at least the same reasons I discuss above with respect to Claim 9 and because they depend from Claim 9.

H. Ground 8: Takemura, Oh-539, and Oh-144 Do Not Render Obvious Claims 20-22

100. It is my understanding, that for purposes of the Institution Decision, the Board determined “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.” Paper 10, 31-32.

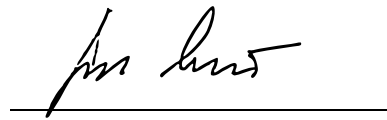
101. As previously explained in Paragraph 119 of my original Declaration (Ex. 2015), in my opinion, Petitioner and Dr. von Sacken fail to show that claims 20-22 of the '498 Patent are rendered obvious by Takemura, Oh-539, and Oh-144, and I incorporate that paragraph by reference herein.

VII. CONCLUSION

102. In sum, it is my opinion that Grounds 1-8 do not render Claims 1-22 of the '498 Patent unpatentable as obvious for the reasons I discuss above.

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on the information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code.

Executed on December 10, 2025, in Livermore, CA.

A handwritten signature in black ink, appearing to read "James L. Kaschmitter", is written over a horizontal line.

James L. Kaschmitter