

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

ZHUHAI COSMX BATTERY CO., LTD.,
Petitioner

v.

NINGDE AMPEREX TECHNOLOGY LIMITED,
Patent Owner

Case IPR2025-00389
U.S. Patent No. 11,923,498

**DECLARATION OF ULRICH VON SACKEN, PH.D. IN SUPPORT OF
PETITIONER'S REPLY**

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Zhuhai CosMX Battery Co. EX1033
IPR2025-00389
U.S. Patent No. 11,293,498

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1. I, Ulrich von Sacken, hereby declare as follows

I. INTRODUCTION

2. I have been retained on behalf of ZHUHAI COSMX BATTERY CO., LTD (“Petitioner” or “CosMX”) to provide my opinions in the above-captioned *inter partes* review (“IPR”) proceeding involving U.S. Patent No. 11,923,498 (“the ’498 patent”). I previously submitted a declaration (EX1003) in support of the Petition for *inter partes* review of the ’498 patent. This declaration is in support of Petitioner’s Reply to Patent Owner’s Response in the same proceeding, IPR2025-00389.

3. I understand that Patent Owner Ningde Amperex Technology LTD. (“Patent Owner”) submitted a Patent Owner Preliminary Response (“POPR,” Paper 8) accompanied by a First Declaration from James Kaschmitter (EX2015) and a Patent Owner Response (“POR,” Paper 20) accompanied by a Second Declaration from James Kaschmitter. (EX2018).

4. My background and qualifications were provided in paragraphs 4-11 of my First Declaration, Exhibit 1003, and my CV was submitted as Exhibit 1004. My statements and opinions in my First Declaration regarding my review of the ’498 patent and related materials remain unchanged. In reaching my opinions in this declaration, I reviewed the POPR, POR, my First Declaration, and the materials reviewed as part of my First Declaration. EX1003, ¶22 (listing references

considered in my First Declaration). In addition, I reviewed and refer to the following materials:

Paper	Description
8	Patent Owner's Preliminary Response
10	Institution Decision
20	Patent Owner's Response

Exhibit #	Description
1034	Kaschmitter Deposition Transcript
1035	<i>Intentionally Left Blank</i>
1036	<i>Intentionally Left Blank</i>
1037	<i>Intentionally Left Blank</i>
1038	<i>Intentionally Left Blank</i>
1039	U.S. Patent No. 11,329,352 to Guo et al.
1040	Kaschmitter Declaration in IPR2023-00585
1041	U.S. Patent Pub. No. 2004/0096735 to Komatsu
1042	U.S. Patent Pub. No. 2014/0120258 to Anderson
1043	U.S. Patent No. 6,423,446 to Miyazaki
2015	Declaration of James L. Kaschmitter, Ph.D
2016	<i>Curriculum Vitae</i> of James L. Kaschmitter, Ph.D.
2017	Papers and Presentations of James L. Kaschmitter, Ph.D.
2018	Supplemental Declaration of James L. Kaschmitter, Ph.D.
2019	CosMX Proposed Construction of Claim Terms, Ningde Amperex Tech. Ltd. v. Zhuhai CosMX Battery Co., No. 2:24-cv-00728-JRG

Exhibit #	Description
2020	Deposition Transcript of Ulrich von Sacken, Ph.D., dated November 25, 2025 from IPR2025-00389

5. I have reviewed all other materials cited herein. I confirm that to the best of my knowledge the accompanying exhibits are true and accurate copies of what they purport to be, and that an expert in the field would reasonably rely on them to formulate opinions such as those set forth in this declaration.

6. My work in this case is being billed at a rate of \$500 per hour, with reimbursement for actual expenses. My compensation is not contingent upon the outcome of this proceeding.

II. LEVEL OF ORDINARY SKILL IN THE ART

7. I incorporate by reference my understanding of the person of ordinary skill in the art (“POSA”) as set forth in paragraphs 27-29 of my previous declaration. I note that Mr. Kaschmitter did not appear to understand the concept about evaluating obviousness over the prior art from the perspective of a POSA during his deposition. EX1034, 54:2-63:7. When questioned whether he provided his analysis through the level of ordinary skill in the art, Mr. Kaschmitter struggled to answer the question, maintaining that he was qualified as an expert and applied his perspective based on his “35 years of experience in [the] lithium-ion” field. EX1034, 56:6-63:7.

III. UNDERSTANDING OF THE LAW

8. I incorporate by reference my understanding of the legal principles, including my discussion of claim construction and obviousness, as set forth in my previous declaration. EX1003, ¶¶12-21. I include here certain additional legal understandings.

9. As stated in my prior declaration, I understand that a patent claim can be considered obvious to a POSITA at the time the application was filed and that the teachings of two or more prior art references may be combined if that combination would have been obvious to a POSITA. EX1003, ¶¶12-21.

10. I further understand that whether a prior art reference teaches away from the claimed invention is a factor to be considered in determining obviousness. I also understand that it is improper to combine references that teach away from their combination. I understand that though a reference may be said to teach away when a person of ordinary skill, upon reading the reference, would be discouraged from following the path set out in the reference, the mere disclosure of alternative designs does not teach away.

11. I understand that it is improper to criticize references individually when an obviousness rationale is based on a combination of prior art references and that obviousness is determined by what the combined teachings of the references would have suggested to those having ordinary skill in the art. It is also

my understanding that obviousness cannot be overcome simply by the fact that some teachings in the prior art conflict with others. Further, it is my understanding that so long as a prior art reference teaches a suitable option for addressing the same problem, then there is motivation to combine the prior art references. It is my understanding that a determination of obviousness does not require showing that a combination is the best option, only that it be a suitable option.

12. It is my understanding that the motivation for combining prior art need not be the same motivation that inspired the patent owner. It is my understanding that the motivation for combining prior art can arise from interrelated teachings of multiple patents; the effects of demands known to the design community or present in the marketplace; and the background knowledge possessed by a person having ordinary skill in the art.

13. It is my understanding that in combining the teachings of the references, a POSA is not compelled to adopt every single aspect of its teaching without the exercise of independent judgment. It is my understanding that obviousness requires assessing the knowledge, creativity, and common sense that an ordinary skilled artisan would have brought to bear when considering combinations or modifications.

14. It is my understanding that figures may be relied on for relative proportions when the reference provides scale information.

**IV. GROUNDS 1-6: THE SATO-TAKEMURA COMBINATIONS
RENDER ALL CHALLENGED CLAIMS OBVIOUS.**

A. A POSA would have been motivated to combine the teachings of Takemura’s insulating tape placement and tape size with Sato’s battery.

15. My first declaration clearly showed that a POSA would have been motivated to combine the teachings of Takemura’s tape placement and sizing with the tape in Sato’s battery to prevent lithium plating. EX1003, ¶¶108-13, 145-48, 153-55. In its Institution Decision, the Board agreed with my analysis, noting 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.” DI, 26. In response to my first declaration and the Board’s Institution Decision, Patent Owner and Mr. Kaschmitter contend that there “would not have been motivat[ion] to combine the conventional battery in Takemura with Sato because of the very problems Takemura identifies and attempts to solve.” EX2018, ¶24. Patent Owner and Mr. Kaschmitter are incorrect as explained below.

1. Sato’s disclosure of the claimed “second insulating glue layer” is the starting point in Grounds 1-6 of my first declaration.

16. My first declaration identified how Sato discloses a propylene adhesive tape on the positive electrode active material facing a negative terminal. EX1003, ¶¶138-42. Specifically, Sato describes a “polypropylene adhesive tape” located on the “positive electrode surface facing the negative electrode lead” to

“prevent lithium deposition.” EX1005, ¶[0137]. In view of paragraph [0137] of Sato, a POSA would have understood that Sato alone discloses the recited “second insulating glue layer. I further explained that to the extent that Sato does not expressly disclose the recited placement of the second insulating glue layer, Takemura would have taught a POSA how to apply and size Sato’s tape to avoid lithium plating. EX1003, ¶¶143-44, 182. As provided in my first declaration, a skilled artisan would have been motivated “to locate Sato’s insulating tape, as taught by Takemura, opposite to the negative lead connection on Sato’s negative lead” and size Sato’s 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” to “ensure[] that Sato’s negative lead 5L and adjacent exposed metal in Sato’s recess (exposed portion 12) were protected from undesirable lithium plating.” EX1003, ¶¶112, 153.

17. Patent Owner and Mr. Kaschmitter contend that there would be no “motivation to use Takemura’s tape” in Sato’s battery. EX2015, ¶69; EX2018, ¶23 (arguing that there is “motivat[ion] to combine the tape of Takemura’s Figures 8 and 9 with Sato’s battery.”). Patent Owner’s and Mr. Kaschmitter’s argument rests on a misunderstanding of how I combined the teachings of Sato and Takemura in Grounds 1-6 of my first declaration. EX1003, ¶¶114-348.

18. My first declaration does not propose inserting or adding Takemura's tape into Sato's battery. EX1003, ¶¶108-13, 138-48, 282, 291-93. Nor does my first declaration propose altering Takemura's active material removal technique shown in Figures 1-7. EX1003, ¶¶108-13, 138-48, 282, 291-93. Rather, when addressing claim element [1.H], I explained that "it would have been obvious to a POSA to *apply Sato's additional polypropylene adhesive tape* to '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.'" EX1003, ¶145 (emphasis added). That is, Sato's second propylene adhesive tape is the starting point in the prior art combinations. EX1003, ¶¶138-47. Sato discloses that the "positive electrode surface facing the negative electrode lead position was insulated by a polypropylene adhesive tape in order to prevent lithium deposition." EX1005, ¶[0137]. Sato's description confirms that this additional polypropylene adhesive tape in Sato covers a portion of the positive electrode active layer (4B/9) to isolate that portion from the negative lead and exposed metal on the negative electrode where the lead is attached. EX1005, ¶[0148] ("The position to which the lead is attached on the negative electrode is at the middle po[r]tion in the length direction thereof, and thus, 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.") While Sato does not explicitly illustrate where the

additional polypropylene adhesive tape is located relative to the negative lead, a POSA would have understood that Sato's additional polypropylene adhesive tape is located on Sato's positive electrode active material (4B/9) in a position that faces the exposed foil 12/14 (recess) where Sato's negative lead 11 is located to avoid lithium plating. EX1003, ¶140.

19. Patent Owner's argument about *adding* Takemura's tape to Sato's battery is not relevant to the obviousness rationales provided in my first declaration. EX1003, ¶¶108-13, 138-48, 263-72, 282, 291-93.

2. Takemura does not teach away from using tape to prevent lithium plating.

20. My first declaration established that a POSA would have been motivated to combine the teachings of Takemura's tape placement and sizing with Sato to protect Sato's exposed portion and negative lead "from undesirable lithium plating." EX1003, ¶¶108-12, 145.

21. In response to my first declaration, Patent Owner and Mr. Kaschmitter argue that Takemura disparages the use of tape. POR, 11-15; EX2018, ¶¶20-37. Specifically, Patent Owner and Mr. Kaschmitter contend that Takemura's use of Comparative Example 1 to explain purported benefits of its invention—removing active material from the current collector's surface instead of using tape according to Figures 8 and 9—would have taught away from the use of tape. *See* POR, 11-15; EX2018, ¶¶27-33. I disagree.

22. It is my understanding that for a reference to teach away from the claimed invention, that reference must criticize or discourage the use of the claimed invention. It is also my understanding that obviousness cannot be overcome simply by the fact that some teachings in the prior art conflict with others. Further, it is my understanding that so long as a prior art reference teaches a *suitable option* for addressing the same problem, then there is motivation to combine the prior art references. In view of this understanding, it remains my opinion that a POSA would have been motivated to combine the teachings of Takemura's tape placement and sizing with Sato to protect Sato's exposed portion and negative lead from undesirable lithium plating.

23. Takemura discloses two alternative options suitable for preventing lithium plating. First, as shown in Figures 8 and 9, for example, Takemura discloses placing an insulating tape 7 on the positive electrode active material layer 3 adjacent to a negative lead 2 and exposed portions of the negative current collector 6. EX1006, ¶¶[0003], [0008], FIGS. 8, 9. Second, as shown in Figures 4 and 7, for example, Takemura also discloses removing the active material layer from the surface of the positive electrode current collector 5 that is located opposite the exposed portions of the negative current collector 6 and negative lead 2. EX1006, ¶¶[0018]-[0020], [0035], FIG. 7.

24. While Takemura's examples related to its purported invention tout the removal of active material on the positive electrode, a POSA would have understood that using insulating tape to mask active material from exposed conducting surfaces, as shown in Figures 8 and 9 of Takemura and similarly disclosed by Sato, was one well-known approach to prevent lithium plating. EX1003, ¶¶31-73. I note that during his deposition, Patent Owner's expert, Mr. Kaschmitter, acknowledged, unsurprisingly, that applying tape to insulate positive active material from conducting surfaces on the negative electrode was common practice to prevent lithium plating. EX1034, 30:13-21 ("Q. Common techniques for preventing lithium plating. A: Okay. So – Q. Are there any others? A. Yeah, there's other. So then there are things like taping, you know, where – you want to prevent those lithium ions from ever seeing—you know—being able to plate on a metal part, a tab, an edge, metal edge current collector.") Indeed, "taping" was a "[c]ommon technique[]" for preventing lithium plating.

25. In addition to Sato and Takemura, supporting evidence cited in my first declaration shows that a POSA would have understood tape application was a well-known approach to preventing safety issues, like lithium plating and short circuiting. EX1003, ¶¶[0138]-[0148]; EX1009, ¶¶[0007], [0008], [0013]; EX1011, ¶[0014]; EX1012, ¶¶[0052]-[0055]; EX1013, ¶¶[0008], [0012], [0062]; EX1014, ¶¶[0044], [0052], [0059]; EX1016, ¶[0012]. For example, my first declaration

referred to Aoki (EX1016) and Maejima (EX1009) as evidence that using insulating tape to prevent lithium plating was known over 15 years before the '498 patent's filing date. EX1003, ¶¶40-42, 61-65. In 1997, Maejima selectively placed a "lithium ion transfer preventing insulator" (insulator 4) between the positive electrode plate 1 and the negative electrode side lead 2c on the negative electrode plate 2 to prevent lithium plating at this location. EX1009, ¶¶[0007], [0008], [0013]; EX1003, ¶¶40-41. Similarly, in 2007, Aoki taught that the use of insulation material to cover exposed metal on the negative electrode was necessary because "lithium precipitation occurs on the exposed metal portion of the surface of the negative electrode layer." EX1016, ¶[010]; EX1003, ¶61. In view of the prior art, a POSA would have understood that Takemura's tape placement and sizing, as shown in Figures 8 and 9, was a reliable technique for preventing lithium plating.

26. Furthermore, I note that Mr. Kaschmitter also acknowledged during his deposition that the use of insulating tape was a common technique to prevent lithium plating. Specifically, when asked what were "[c]ommon techniques for preventing lithium plating," Mr. Kaschmitter responded, "so then there are things like taping ... to prevent lithium ions from ever seeing, you know being able to plate on a metal part, a tab, an edge, metal edge current collector that you don't want to have it on, so ... you can tape those." EX1034, 30:17-22. I agree with Mr. Kaschmitter's admission that the use of insulating tape was a common technique

for preventing lithium plating. A POSA would have recognized that Takemura's disclosure related to tape placement and sizing would inform a POSA how to place and size the additional tape on the positive active material within Sato's battery to prevent lithium plating.

27. A POSA would also have understood that Takemura never disparages the use of insulating tape. Instead, Takemura explicitly acknowledges tape as an alternative solution to removing active material. EX1006, ¶¶[0008], [0021]. In paragraph [0008], Takemura explains that "if there is no opposing negative active material 4...the surface of the positive electrode active material has to be covered with masking tape 7 *or* the positive electrode active material has to be shaved off." EX1006, ¶[0008] (emphasis added). Further, in describing the Figure 3 embodiment, Takemura discloses that the "positive electrode active material layer 3 opposite the beginning of the winding end of the negative electrode is covered with insulating tape 7 to prevent lithium metal deposition, but instead of covering it with insulating tape 7, the active material in this portion may be removed." EX1006, ¶[0021]. Thus, Takemura's own disclosure confirms that a POSA would have understood that Takemura recognizes the strategic placement of insulating tape and the selective removal of active material as two suitable alternatives for preventing lithium plating. A POSA would not have been discouraged from applying Takemura's teachings regarding insulating tape to Sato's battery, which

already included insulating tapes, even though Takemura describes some advantages associated with the removal of active material.

3. A POSA would have recognized the advantages achieved with Takemura's tape placement technique.

28. A skilled artisan would have understood that there are advantages to using tape instead of removing active material. As explained in my first declaration, the use of insulating tape in batteries was already widely adopted in the industry to promote safety. EX1003, ¶¶39-73. Selectively applying insulating tapes and adhesives to battery components has been common practice “to solve safety and performance problems such as short-circuiting, lithium (Li) plating, and undesirable thermal expansion.” EX1003, ¶39 (citing EX1006 and EX1008-1018). Simply put, applying insulating tape ensures safety in battery performance—an advantage gained by applying Takemura's disclosure related to tape to Sato's explicit disclosure of placing a tape on the positive electrode surface facing the negative electrode lead position to prevent lithium plating.

29. Furthermore, Takemura's alternative technique of selectively removing active material from the current collector suffers from its own disadvantages. EX1043, 2:32-4:25 (describing the state of art for providing “non-coated portions” on the electrode plate). Common techniques for creating bare patches on a current collector include: “pattern coating” and material removal (e.g., laser ablation or mechanical removal). EX1006, ¶[0025]. These techniques have

their own shortcomings, including the requirement for precise control of machinery and leaving rough edges or uneven application of active material that could puncture the separator. EX1042, ¶¶[0004]-[0008]; EX1043, 2:32-4:22 (describing “difficult[y] to perform the mechanical control of the coater head,” the “difficult[y] to exactly form a pattern of the non-coated portion at a high speed,” risk of “build-up (protruded) edge portion of the active material layer, and the “difficult[y] to make smooth the edge portions of the active material layer”).

30. Electrode coatings are typically produced using methods such as slot die or reverse roll coating. Intermittent pattern coating requires that a coating head stop discharging slurry or be pulled back from the current collector at precisely the right time to create a bare patch at the desired location on the current collector. EX1042, ¶¶[0005]-[0006] (describing to close the supply valve to a nozzle to stop discharge of die coater); EX1043, 2:66-3:24. A POSA would have understood that precise control of the machinery is needed to execute pattern coating effectively and that this would be challenging for high-speed manufacturing. EX1043, 2:66-3:4 (“[I]t becomes difficult to perform the mechanical control of the coater head so as to accord with the coating speed, and it becomes impossible to exactly form the pattern in which the coated portions and the not-coated portions are alternately repeatedly formed.”) At coating initiations, some excess material is typically deposited which can cause damage during electrode compression. EX1043, 3:38-

43. And “local coating amount becomes slightly excessive at the respective supply-start positions.” EX1043, 3:9-13. On the other hand, at coating terminations the deposit tends to taper off, also referred to as tailing, and the coating edge becomes poorly defined. EX1043, 3:13-16. And the “[b]oundary line of the edge portion of the active layer provides a wave-shape, thus being inconvenient.” EX1043, 3:22-25. Among other issues, this interferes with automatic edge detection. EX1043, 3:44-63. What is more, these problems increase with coating speed so “it is extremely difficult to exactly form a pattern of the non-coated portion at high speed.” EX1043, 3:7-8. I noted that Mr. Kaschmitter acknowledged that patch-coating “increases the risk of uneven edges in the active material,” stating “[a]ny time you have an edge in the lithium-ion [layer], you have a potential problem.” EX1034, 46:2-10.

31. Another common method used to create exposed spots on the current collector is material removal, which can be done mechanically or by laser ablation. EX1043, 2:38-46 (describing to form “non-coated portions” by “locally peeling the coated film by mechanical means”); EX1039, 1:19-31; EX1040, ¶49; EX1034, 42:11-20 (Mr. Kaschmitter acknowledging “mechanical or laser” as two techniques for “patch coating or pattern coating”). Mechanically removing the material, such as peeling with a knife, forms jagged edges of active material that are “difficult to make smooth.” EX1043, 4:18-25 (“[I]n the method in which the

coated film is partially peeled by mechanical means such as knife after the formation of the coating film on the entire surface of the collector, the patterning performance is not made high and it is difficult to make smooth the edge portions of the active material layer, so that production of powder at the edge portion is caused, thus providing problems.”) Removing material via laser ablation typically involves the application of a high-powered pulse layer to ablate the active material from the current collector, which can damage the electrode plate. EX1040, ¶49. For example, applying the laser with too much power can form sharp, rough edges of active material, leading to the risk of burring. EX1040, ¶49 (Mr. Kaschmitter admitting in his declaration submitted in the IPR proceeding of U.S. Patent No. 11,329,352 that “laser ablation employs high temperature pulsed laser beams to remove active material, [which] can create defects such as dislocations and burrs in the areas treated with the laser beams.”). Indeed, Mr. Kaschmitter acknowledged the risk of burring when using high power lasers to selectively remove active material from the current collector. EX1034, 46:22-47:25 (acknowledging that applying a laser at “too high a power ... can cause a problem,” such as “burrs”).

32. In sum, these techniques for selectively exposing additional regions on the positive currently collector would have added potentially problematic processing steps to the fabrication of Sato’s battery. Considering such issues, a POSA would have applied Takemura’s tape placement and sizing techniques to the

already-existing tape in Sato’s battery. The prior art confirms that placing insulating tape on the battery is relatively simple and well within the level of ordinary skill in the art. EX1010, ¶¶[0007], [0032]; EX1013, ¶¶[0012], [0036]; *see also* EX1034, 30:13-24 (explaining that “things like taping” is a common technique to prevent lithium plating). For example, Yamauchi describes that “protective tape” can “be simply and easily affixed at a fixed position without shifting, and that effectively prevents electrical contact between opposing electrode tabs and plates.” EX1010, ¶¶[0007], [0032] (“easily and securely affixed without any misalignment”). Moreover, Patent Owner’s and Mr. Kaschmitter’s assertion that combining Takemura’s teachings with Sato would “create new problems,” namely “increas[ing] battery thickness” is incorrect. POR, 22; EX2018, ¶¶27-33. Sato’s battery already includes tape—a first piece of tape associated with the positive lead and a second piece of tape associated with the negative lead. EX1005, ¶¶[0113], [0137]. Modifying Sato’s tape placement based on Takemura’s teachings would not increase the thickness of Sato’s battery, which already includes two pieces of tape. EX1003, ¶¶134-36, 149-55.

33. Lastly, Patent Owner incorrectly alleges that “Takemura does not support the use of tape to prevent lithium deposition.” POR, 17; EX2018, ¶¶34-37. I strongly disagree. Takemura expressly discloses that covering positive active material opposite exposed metal with tape prevents lithium plating. *See* EX1006,

¶[0008] (describing that “the positive electrode active material 3 has to be covered with masking tape 7”). Likewise, Mr. Kaschmitter acknowledged insulating tape was commonly used to prevent lithium deposition. EX1034, 30:17-22.

34. Accordingly, applying one of Takemura’s alternative techniques—strategically placing insulating tape or removing active material—results in known tradeoffs without discouraging one solution over the other. For example, a POSA would have selected applying tape over removing active material when desiring a simpler manufacturing process and proven reliability for preventing short-circuit. And while the use of insulating tape may have disadvantages in some situations, such as increasing the thickness of the battery cell, a POSA would have understood that Takemura’s insulating tape technique would have been a suitable (if not the most suitable) option to improve Sato’s battery reliability and safety, which again, already included tapes. For example, a POSA would have selected applying tape over removing active material when desiring a simpler manufacturing process and proven reliability for preventing short-circuit.

4. The lithium plating concerns at Takemura’s electrode end apply equally to Sato’s recesses.

35. I agree with the Board’s finding in its Institution Decision that Takemura’s ultimate approach of selectively removing active material in Figures 1-7 does “not diminish Takemura’s teachings of a known size and placement that was conventionally used in the art.” DI, 24-25. Patent Owner and Mr. Kaschmitter

argue that the Board overlooked “shortcomings” of Takemura that would have discouraged a POSA from combining Sato and Takemura as presented in my first declaration. POR, 19-20; EX2018, ¶¶21-37; EX1003, ¶¶108-13. The alleged “shortcomings” identified in the Patent Owner’s Response and Mr. Kaschmitter’s declaration fail to address what the combination of Sato and Takemura teaches as a whole. POR, 19-22, 28-30; EX2018, ¶¶21-40; EX2015, ¶¶77-78. Specifically, Patent Owner contends that Takemura applies tape only opposite the negative electrode’s bare end, not the recesses shown in Figure 4 because active material is removed. POR, 19-22, 28-30; EX2018, ¶¶21-40.

36. Patent Owner’s characterization of Takemura is incorrect. Patent Owner’s focus on Takemura’s tape placement in Figure 4 is not relevant to how a skilled artisan would have combined the teachings of Sato and Takemura. As explained in my first declaration and noted above, Sato already discloses locating the second polypropylene tape on the positive active material to “face” the second recess. EX1005, ¶[0137]; EX1003, ¶¶138-40. Takemura adds that any positive active material opposite the exposed current collector surface and lead tab “*has to be covered* with masking tape” (or removed) to prevent lithium plating. EX1006, ¶[0008]. A POSA would have understood that the concerns of preventing lithium plating at the electrode’s bare end in Takemura apply equally to the exposed portions 12/14 disclosed in Sato. The fact that the tape in Takemura’s Figures 8

and 9 embodiment wraps around the negative electrode's end does not diminish its teachings with respect to the placement, size, and benefits of insulating tape. Given Sato's disclosure of the second polypropylene tape to prevent lithium plating and Takemura's teaching to mask positive active material opposite the negative lead with insulating tape to prevent lithium plating, a POSA would have been motivated to locate and size Sato's second tape to cover all positive active material that is opposite the exposed metal of the negative electrode at the lead connection.

EX1003, ¶¶141, 146-47.

37. Patent Owner takes statements made in my first declaration about the exposed ends of Takemura's electrodes in Figures 8 and 9 out of context. In paragraph [0367] of my first declaration, I stated that "Takemura does not disclose a first recess *in the positive active material layer 3* for accommodating the positive lead 1." Similarly, in paragraph [0379] of my first declaration, I stated that "Takemura does not disclose a second recess *in the negative active material layer 4* for accommodating the negative lead 2." Patent Owner argues these statements are allegedly an admission that the exposed ends of Takemura's electrodes are not a recess. POR, 9, fn. 4. This is a mischaracterization of my testimony. Patent Owner ignores that my first declaration specifies the first recess being "in the positive active material" and the second recess being "in the negative active material." EX1003, ¶¶367, 379. The language "in the active material" means that

the recesses are located away from the ends. During my deposition, I clarified this point, explaining that “I should have qualified that to say ‘doesn’t show a first recess *in the center of* the electrode.’” EX2020, 26:15-18.

38. Additionally, the issue of whether the exposed ends of Takemura’s electrodes are considered “recesses” is not relevant to my rationale for combining the teachings of Sato and Takemura. A POSA would have understood that Takemura’s teaching to mask active material applies to exposed surface at the ends of the negative electrode and exposed surface formed in the middle portion of the negative electrode. Accordingly, a POSA would have understood that Takemura’s teaching to mask active material opposite the exposed current collector surface applies to Sato’s recesses.

B. The combination of Sato and Takemura render obvious a “second insulating glue layer” that “has a length larger than a length of the second recess.”

39. As explained in my first declaration, a POSA would have understood in view of Takemura that the only practical way to size Sato’s second tape to avoid lithium plating is to have the tape extend beyond the width and length of the opposing recess. EX1003, ¶¶152-55. Based on my experience in the field of battery manufacturing, a POSA would have prioritized safety above all designed considerations to avoid the catastrophic risk of short-circuiting. To no surprise, Mr. Kaschmitter agreed with this point during his deposition. EX1034, 25:18-28:2.

Specifically, Mr. Kaschmitter acknowledged that battery explosion and fire “are the worst-case scenario for a battery” and that “lithium-ion batteries can lead to what you call a catastrophic situation in the battery.” EX1034, 25:18-28:2. Mr. Kaschmitter further acknowledged that “lithium plating [is] something that people of [ordinary] skill in your field look to prevent from occurring in a lithium-ion battery[.]” EX1034, 28:3-7. Because safety considerations outweigh all other design factors, a POSA would have had every reason to extend Sato’s tape wider and longer than its second recess, in view of Takemura’s teachings, to avoid the catastrophic consequences of short-circuiting caused by lithium plating.

40. In response, Patent Owner and Mr. Kaschmitter contend that “none of the references relied upon by Petitioner” teach the claimed glue layer length and that the Petition relies solely on expert testimony. POR, 23-27; EX2018, ¶¶38-40. I disagree because Patent Owner and Mr. Kaschmitter fail to appreciate the understanding of a POSA would have had and the inferences drawn based on Takemura’s teaching to mask positive active material opposing exposed current collector surface and lead tabs.

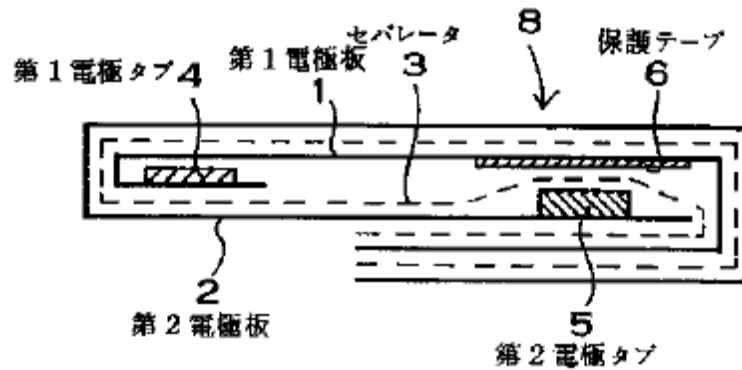
1. A POSA would have understood in view of Takemura to extend Sato’s second tape slightly beyond the length and width of the opposing recess.

41. Takemura discloses when positive active material faces a negative lead, that surface “*has to be covered* with masking tape.” EX1006, ¶[0008]

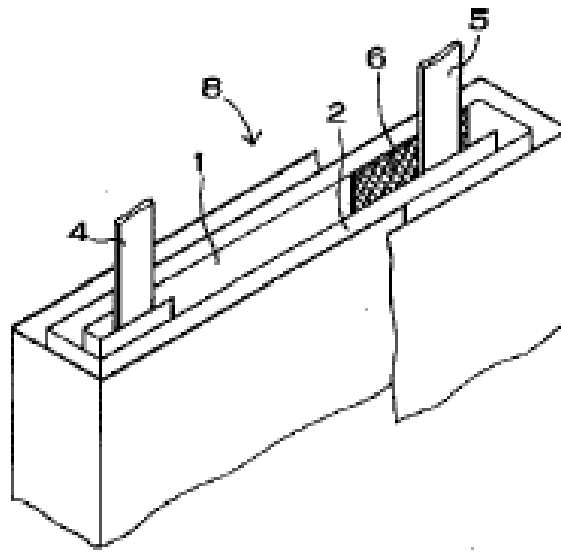
(emphasis added). And Takemura's Figures 8 and 9 clearly show the insulating tape extending beyond the recess width. I note that during his deposition, Mr. Kaschmitter acknowledged that Takemura's Figures 8 and 9 show the insulating tape extending beyond the edge of the active material in the width direction. EX1034, 141:14-142:2. When asked whether Figure 8 "shows that the upper portion of the insulating tape that's above the lead extending to the left beyond the edge of the negative active material layer 4," Mr. Kaschmitter answered, "it appears to do that." EX1034, 141:14-21. I agree, it does. A POSA would have recognized that this overextension is deliberate—sized to accommodate inevitable alignment variances between positive and negative electrodes during manufacturing. EX1003, ¶152; EX1034, 38:23-39:8 (Mr. Kaschmitter acknowledging that a POSA would "increas[e] the size of the tape" to account for "potential misalignment" in "lithium-ion battery design and manufacture.")). The combination of Takemura's written disclosure (e.g., paragraph [0008]) and Figures 8 and 9 informs a POSA to extend Sato-Takemura's tape past the full length of the exposed current-collector surface—a concept that was already known in the art, as I discussed in my first declaration and discuss further below. EX1008, FIGS. 2A-B; EX1010, ¶[0019]; EX1041, ¶[0227]-[0228]; EX1003, ¶152.

42. Additional prior art, including Yamauchi and Kobayashi (cited in my first declaration), and Komatsu, teaches to overextend insulation tape to ensure

coverage despite manufacturing tolerances. EX1010, ¶[0019]; EX1008, FIGS. 2A-B; EX1041, ¶¶[0227]-[0228], FIGS. 23, 25. For example, Yamauchi (EX1010) is directed to a battery 8 that includes a protective tape 6 located on the active material of a positive electrode plate 1 that is “opposite to the second [negative] electrode [lead] tab 5” that is located on a negative electrode plate 2, as shown below. EX1010, ¶¶[0018]-[0022]. Yamauchi teaches that the “protective tape 6 is wider than the width of the second electrode tab 5” so that the “wide protective tape 6 can insulate the second electrode tab 5 and the first electrode plate 1 even if the position at which it is affixed deviates slightly relative to the position of the second electrode tab 5.” EX1010, ¶[0019]. Yamauchi establishes that a skilled artisan typically modifies the dimensions of battery components to account for potential misalignment deviations between the positive and negative electrodes. Specifically, Yamauchi shows that a skilled artisan would have understood that insulating tape applied to a positive electrode needs to extend wider and longer than an opposing conducting surface on the negative electrode to ensure that the conducting surface (e.g., a negative lead location) is insulated even in the event of alignment variances.



EX1010, FIG. 4.

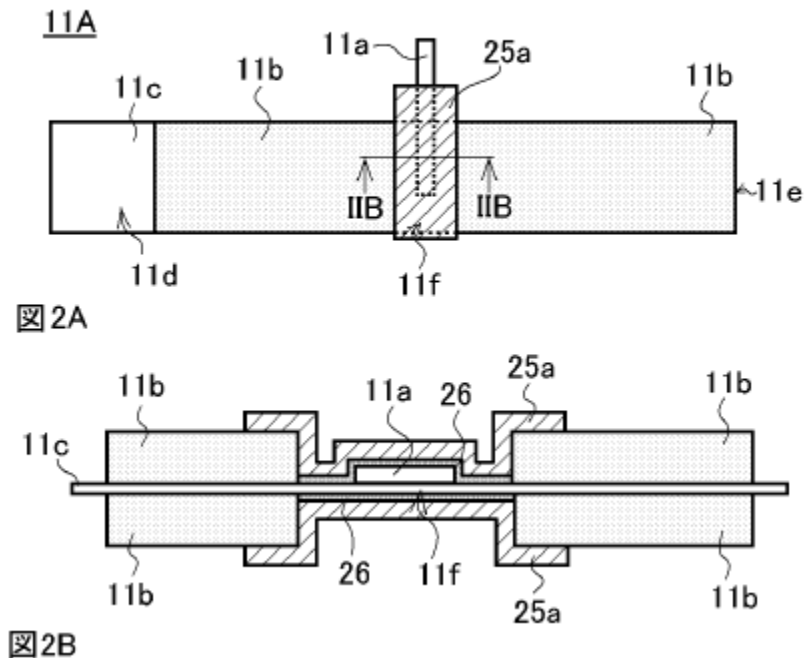


EX1010, FIG. 5.

43. As another example, Kobayashi (EX1008) discloses a second battery 10 that includes an insulating tape 25A applied over a recess 11f with a lead tab 11a of positive electrode plate 11A. EX1008, ¶¶[0034]-[0035]. As shown below in Figure 2B, Kobayashi's insulating tape 25A extends beyond the width of recess 11f. Moreover, as shown below in Figure 2A, Kobayashi's insulating tape 25A

extends beyond the length of recess 11f. Kobayashi explains the reasoning behind the placement of the insulating tape is to prevent short-circuiting. EX1008, ¶[0005] (“[I]nsulating tape is affixed at potential short-circuit locations where such short-circuits can be expected to occur in order to prevent short-circuits due to contact with the opposing electrode at potential short-circuit locations.”), see also ¶[0010] (“[I]f the edges of the positive electrode active material layer and the negative electrode active material layer are not covered with insulating tape, it is not possible to suppress the occurrence of short circuits.”). Kobayashi is an example of how a POSA would have understood that it was common practice to provide a tape having a width greater than the width of the recess and a length greater than the length of recess to avoid safety issues, such as short-circuiting.

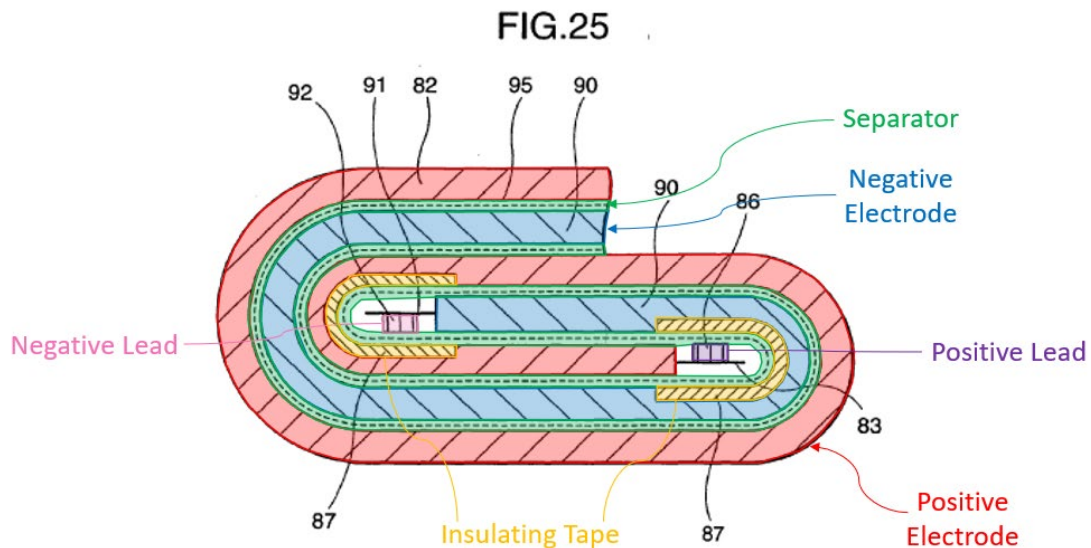
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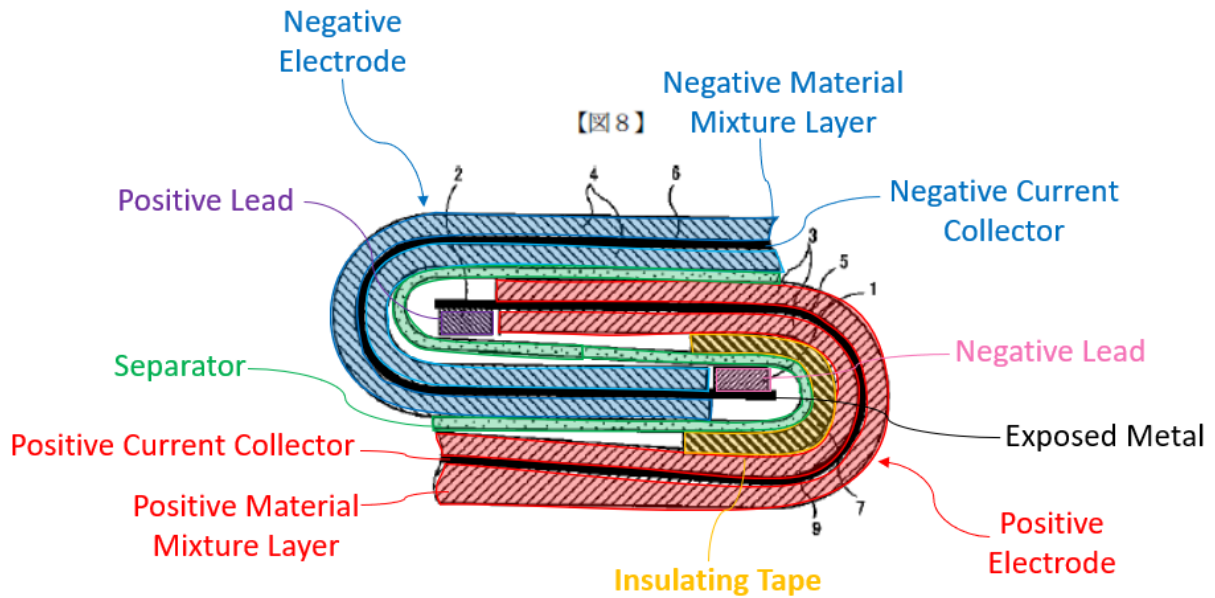
EX1008, FIGS. 2A and 2B.

44. Komatsu provides another example of a battery that includes insulating tape that is both wider and longer than the bare end of the negative electrode to prevent short-circuiting. EX1041, ¶¶[0227]-[0228]. Komatsu discloses a “secondary electrolytic battery” shown in Figures 22-25. EX1041, ¶[0226]. Komatsu’s battery includes an “electricity-generating element 80” (i.e., a battery cell) formed from a “positive electrode plate 82” (red), a “negative electrode plate 90” (blue) and a “separator 95” (green) that are wound together, as illustrated in Figure 25, reproduced below. EX1041, ¶¶[0226]-[0229]. Komatsu’s battery further includes a positive lead 86 (purple) connected to an exposed end of positive electrode plate 82 and a negative lead 92 (pink) on an exposed end of negative

electrode plate 90. EX1041, ¶¶[0227]-[0229]. Komatsu's battery also includes insulating tape 87 (yellow) that is positioned on the positive coating opposite negative lead 92 across separator 95 in a thickness direction and an insulating tape (yellow) that is positioned on the negative coating opposite positive lead 86 across separator 95 in the thickness direction. EX1041, ¶¶[0227]-[0229]. A POSA would have understood that Komatsu's tape arrangement is similar to Takemura's tape arrangement, as shown below.



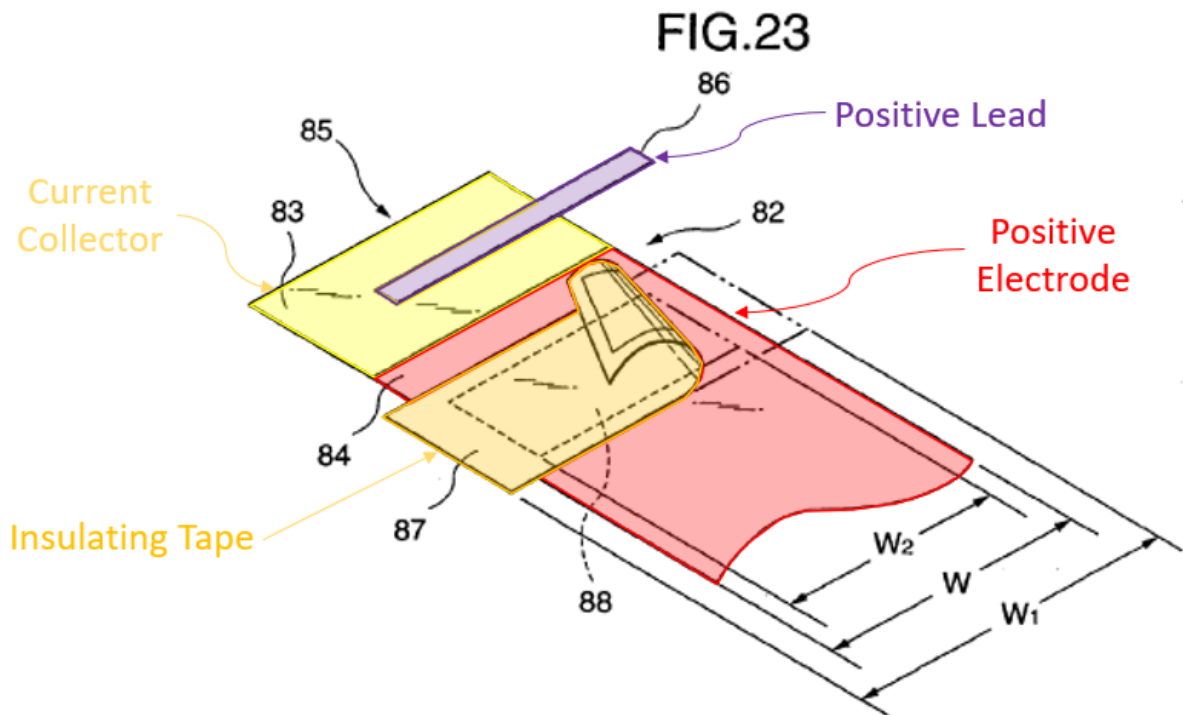
EX1041, FIG. 25 (annotated).



EX1006, FIG. 8 (annotated).

45. Komatsu discloses that “insulating tape 87 has a width W of 55 mm and a length of 25 mm.” EX1041, ¶[0227]. The width of Komatsu’s insulating tape 87—indicated by reference numeral “W1” in Figure 23, reproduced below—corresponds to the “length” direction recited in the claims of the ’498 patent by extending transverse to the longitudinal direction of positive electrode plate 82. EX1041, ¶[0227]. In comparison, Komatsu’s negative electrode plate 90 has “a width of 51 mm,” which is 4 mm less than the width of insulating tape 87. EX1041, ¶[0228]. Given that the bare end of Komatsu’s negative electrode plate 90 extends across the plate’s entire width, the “length” of Komatsu’s recess in negative electrode plate 90 corresponds to the width of the negative plate 90. Accordingly, the length of Komatsu’s insulating tape 87 is 4 mm greater than the

length of the recess in Komatsu's negative electrode plate 90. Consistent with Komatsu, a POSA would have understood Takemura's tape likewise extends beyond the bare end of the negative electrode because all active material opposite the recess/lead "has to be covered with masking tape" to prevent lithium plating.



EX1041, FIG. 23 (annotated)

46. These references collectively show a well-known design principle: sizing the insulating tape to be wider and longer than the opposing recess. EX1008, FIGS. 2A-B; EX1010, ¶[0019]; EX1041, ¶¶[0227]-[0228]. When combining the teachings of Takemura's tape placement and sizing with Sato, a POSA would have possessed knowledge of these teachings from the prior art. EX1034, 53:19-54:1

(agreeing that “a POSA possesses the understandings and knowledge reflected in the prior art”). Extending Sato-Takemura’s tape beyond the recess length and width would have been the most reliable way to insulate the positive active material from any exposed metal on the negative current collector. No alternative sizing would better promote battery safety by preventing lithium plating and short-circuiting.

2. The ’498 patent does not provide any criticality to the insulating glue layer width and length.

47. As explained in my first declaration, a POSA would have appreciated that sizing Sato’s second tape beyond the recess’s dimensions would predictably guard against lithium plating and short-circuiting. EX1003, ¶¶35-73, 149-55. I note that the ’498 patent does not identify any criticality in the tape length. Nor does the ’498 patent disclose any unexpected results associated with the tape size. Indeed, the ’498 patent only describes twice that the insulating glue layer has a length larger than the second recess. First, in the summary of invention section, the ’498 patent discloses that “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.” EX1001, 3:9-12. But the ’498 patent provides no explanation in this section as to why the second insulating glue layer is longer and wider than the second recess. Second, in the detailed description section, the ’498 patent discloses that “second insulating glue layer 16 has a length larger than

a length of the second recess 24.” EX1001, 5:18-21. Likewise, the ’498 patent does not provide any further reasoning behind why the second insulating glue layer is longer than the second recess. Without providing any explanation or evidence that sizing the tape longer and wider than the recess is significant, the ’498 patent fails to establish any particular importance for the claimed tape sizing.

48. As I explained in my first declaration and further established by the prior art, changing the sizing of tape to account for variances is well within the level of ordinary skill in the art. EX1003, ¶¶149-55; EX1010, ¶[0019]; EX1008, FIGS. 2A-B; EX1041, ¶¶[0227]-[0228]; EX1034, 38:23-39:8 (acknowledging that a POSA would “increas[e] the size of the tape” to “account for potential misalignment” between the electrodes). The only practical way to accommodate dimensional and alignment variances between the tape and recess is to size the insulating tape larger than the opposing recess—both wider and longer than the recess. Accordingly, a POSA would not have found the claimed “insulating glue layer” width and length relative to the recess to provide any technological distinction over the prior art.

3. A POSA would have been motivated to use wider and longer tape as a safety measure.

49. Patent Owner’s assertion is wrong that my first declaration failed to explain why sizing tape wider and longer than the recess is desirable. POR, 20. It clearly did. EX1003, ¶152. My first declaration explained that using a wider and

longer tape is desirable for safety because it ensures that the positive active material remains insulated from any exposed metal, despite the inevitable alignment variances between the electrodes. EX1003, ¶152 (citing EX1022, 51). Even before addressing claim 1 in my grounds, my first declaration explained that “[i]t was also well known before January 17, 2014, to position protective layers and tapes at strategic locations within battery cells to prevent various potential reliability and safety issues, including lithium plating issues.” EX1003, ¶39. Then, my first declaration described twelve example prior art references using tapes and protective layers to prevent lithium plating and short-circuiting. EX1003, ¶¶31-73. Taken together, my first declaration provided meaningful context for both the placement and sizing of insulating tapes, consistent with the rationales set forth in my analysis. That context reflects a single overarching principle: a skilled artisan would take necessary measures to prioritize safety and reliability, including sizing the tape to account for dimensional and alignment variances.

50. Indeed, Mr. Kaschmitter confirmed this safety rationale during his deposition. EX1034, 26:15-28:20 (acknowledging that a POSA would “prioritize preventing” short-circuiting because it “is the most hazardous”); 28:22-30:24 (acknowledging “taping” as a “common technique[] for preventing lithium plating”); 38:23-39:8 (admitting to “increasing the size of the tape” to prevent lithium plating). Given that safety is prioritized above other performance

considerations, including storage capacity, a POSA would have understood—particularly in view of Takemura—to size Sato’s tape longer and wider than the recess. A POSA seeking to maximize cell reliability would therefore have favored a longer and wider tape configuration to ensure continuous insulation coverage under real-world manufacturing conditions. The length and width of both the tape and recess cannot be controlled with absolute precision. Rather, they will exhibit dimensional variances determined by the manufacturing equipment. Similarly, the position of the tape relative to the recess cannot be controlled with absolute precision, both vertical and horizontal tape positioning will exhibit alignment variances determined by the manufacturing equipment. A POSA would have been well aware of the need to size the tape larger than the recess in order to accommodate such manufacturing variances. Any other sizing approach increases the risk of exposing positive active material to bare anode foil, thereby leading to lithium plating which increases the risk of short-circuiting and catastrophic failures. *See* EX1003, ¶35.

51. Patent Owner and Mr. Kaschmitter further assert that Sato “undercuts” the obviousness rationale provided in my first declaration by describing a tape with the same width as the recess. POR, 23-24; EX2018, ¶¶38-39; EX1003, ¶¶149-55. Patent Owner and Mr. Kaschmitter are incorrect. First, Sato’s description of the tape sizing is not relevant to how I explained that a POSA

would have combined the teachings of Sato and Takemura in the asserted grounds of my first declaration. EX1003, ¶¶108-13, 138-55. My first declaration relies on the disclosure of Takemura, not Sato, to show that the tape sizing elements of claim 1 would have been obvious to a skilled artisan. EX1003, ¶¶149-55. Second, a POSA would have understood that unlike Sato's second tape intended to prevent lithium plating, Sato's first tape is intended primarily to protect against burrs on the cathode tab and issues like short circuiting. *See* EX1005, ¶[0113]; *see also* EX1003, ¶¶66-67 (citing Kobayashi). Third, a POSA would have understood that alignment concerns associated with Sato's second tape facing the opposing electrode are not as prevalent for Sato's first tape that is applied directly on the positive electrode's first recess. As acknowledged by Mr. Kaschmitter, a POSA would have prioritized safety above all other performance considerations, including storage capacity, and thus, would have understood to extend Sato's tape beyond the recess' length. EX1034, 26:15-28:20 (acknowledging that a POSA would "prioritize preventing" short-circuiting because it "is the most hazardous"); 28:22-30:24 (acknowledging "taping" as a "common technique[] for preventing lithium plating"), 38:23-39:8 (admitting to "increasing the size of the tape" to prevent lithium plating). Thus, even though Sato describes a first tape matching a recess width, that first tape is for a different purpose than Sato's second tape, and a skilled artisan would have known to size the tape on Sato's positive active material

slightly larger to accommodate dimensional and alignment variances and improve safety by decreasing the likelihood of exposing conductive surfaces to potential lithium plating.

C. Sato discloses a “first recess” in the positive electrode and a “second recess” in the negative electrode.

1. Sato discloses “*at least one of the positive electrode and the negative electrode*” includes a recess, meaning *both* electrodes can include a recess.

52. My first declaration clearly established that Sato discloses a battery embodiment having a first recess in the positive electrode and a second recess in the negative electrode. EX1003, ¶115. Sato discloses a “first recess” in the positive electrode and a “second recess” in the negative electrode. EX1003, ¶102 (“A POSA would have understood that the arrangement of mixture layer 9 and extension lead 11 on current collector 10 shown in Figures 3 and 5 is representative of the mixture layer and lead on the current collector of positive electrode plate 4...*and* representative of the mixture layer and lead on the current collector of negative electrode plate 5); ¶115 (“Sato discloses that...(iii) both the positive electrode and the negative electrode can have a recess for accommodating the positive lead and the negative lead, respectively”). A POSA would understand that the arrangement of the recess shown in Figures 3 and 5 of Sato “is suitable for both positive and negative electrodes and that combining them would reduce the ‘current collection resistance.’” EX1003, ¶102 (quoting EX1005, ¶[0024]).

53. Indeed, as stated in the foundation of my analysis (EX1003, ¶115), Sato expressly states that the lead attachment position “is preferably located in the region from 1/4 to 3/4” of the electrode and that “*at least one* of the positive electrode and the negative electrode satisfies [these] conditions for the lead attachment position.” EX1005, ¶[0094]. Before addressing any of the claim elements, my first declaration explained that a POSA would have understood that the language “at least one” within the context of Sato’s disclosure to cover “the positive electrode and/or the negative electrode.” EX1003, ¶115.

54. This interpretation is reinforced by other descriptions in Sato, as explained in my first declaration. EX1003, ¶¶102, 115, 120, fn. 4, 136, fn. 5. For example, when introducing the Sato reference in my first declaration (EX1003, ¶102), I cited and quoted paragraph [0036] of Sato, which describes “[i]n a portion of at least one of the positive electrode plate 4 and the negative electrode plate 5 to which the lead is connected, the mixture layer is not formed on one surface of the current collector connected to the lead.” EX1005, ¶[0036]. As Mr. Kaschmitter agreed in his deposition, a POSA would have understood that the language “at least one” in paragraph [0036] of Sato to mean *one or both* the positive electrode and negative electrode. EX1034, 121:21-124:20. Specifically, Mr. Kaschmitter acknowledged that “the phrase ‘at least one’ as used in paragraph 36 *means that one or both* of the positive and negative electrode plates have a portion where the

mixture layer is not formed on one surface of the current collector connected to the lead.” EX1034, 122:12-19 (emphasis added).

55. As another example, in the “Solution to the Problem” section of Sato, starting at paragraph [0010], Sato describes a general “electrode plate,” not specifically limited to the positive electrode plate and negative electrode plate. EX1005, ¶[0010]. In this paragraph, Sato describes connecting a lead to a first surface of “an exposed portion” of the current collector, where the “mixture layer is not provided.” EX1005, ¶[0010]. A POSA would have understood that the “exposed portion” described in paragraph [0010] corresponds to the claimed “recess.” Later in that same section, Sato describes that “*at least one of* the positive electrode plate and the negative electrode plate is the electrode plate described above.” EX1005, ¶[0013]. The language “at least one” in paragraph [0013] is clear that the “exposed portion” for lead attachment described in paragraph [0010] is not limited to a single electrode, but also both the positive and negative electrodes. I note that during his deposition, when asked about paragraph [0013], Mr. Kaschmitter agreed. EX1034, 121:14-19 (acknowledging that “the phrase ‘at least one’ as used in paragraph 13 means that *one or both* of the positive and negative electrodes can have the electrode plate structure described above in paragraph 10.”)

56. Likewise, Sato’s claim 1 is directed to an electrode plate without specifying that the electrode plate is a positive electrode plate or a negative

electrode plate. In this claim, Sato recites that the “the extension lead is connected to the first surface of the exposed portion” of the current collector. EX1005, claim 1. Later, in claim 6, Sato recites “*at least one* of the positive electrode plate and the negative electrode plate is the electrode plate of claim 1.” EX1005, claim 6 (emphasis added). The language “at least one” in claim 6 is clear that the “exposed portion” for lead attachment recited in claim 1 is not limited to a single electrode but can be for both the positive and negative electrodes. During his deposition, when asked about claim 6, Mr. Kaschmitter also agreed with this understanding. EX1034, 117:22-118:4 (acknowledging that “the term ‘at least one’ as recited in Claim 6 of Sato means that *one or both* of the positive and elec -- positive and negative electrodes can have the electrode plate structure recited in Claim 1.”)

57. I also note that during his deposition, Mr. Kaschmitter acknowledged that the phrase “at least one,” as described in paragraphs [0051], [0067], and [0082], means “*one or both*.” EX1034, 97:21-104:6. For example, Mr. Kaschmitter acknowledged that the “the phrase ‘at least one’ means that the active material in Me [as described in paragraph [0051]] can include one or more of those listed elements.” EX1034, 100:2-5. Mr. Kaschmitter acknowledged that Sato’s description that the silicon solid solution can be obtained by substituting “at least one of the elements selected from the group” in paragraph [0067] can mean that “the silicon can be substituted by various combinations of the listed elements.”

EX1034, 101:4-11. Mr. Kaschmitter also acknowledged that Sato's description "at least one selected from the group consisting of vinylene carbonate, vinyl ethylene carbonate, and divinyl ethylene carbonate" in paragraph [0082] can "include all three." EX1034, 102:7-104:6. Mr. Kaschmitter's admissions confirm that a POSA would have understood Sato's use of the phrase "at least one" to encompass one or more members of the listed groups, including multiple or all listed elements.

58. A POSA would have recognized that the lead attachment location described in paragraphs [0013], [0036], [0094], and claim 6 applies to Sato's entire invention, not just a single example. Indeed, Sato's paragraphs [0036] and [0094] are provided in a part of a description of Sato, spanning paragraphs [0029]-[0098], that describes the overall battery configuration and example electrode structures. Paragraph [0098] indicates a clear transition in Sato from the description of the overall battery configuration to specific illustrative examples—Batteries 1-11—by reciting "[e]xamples will be described in detail hereinafter." This transition signals that the remaining discussion in paragraphs [0099]-[0148]—describing Batteries 1-11—is intended to provide concrete, non-limiting examples of the previously described invention.

59. Thus, Sato clearly discloses that (i) the positive electrode (for example, the positive electrode of Battery 1) can have a recess for accommodating a positive lead, (ii) the negative electrode (for example, the negative electrode of

Battery 8) can have a recess for accommodating the negative lead, *or* (iii) both the positive electrode and the negative electrode can have a recess for accommodating the positive lead and the negative lead, respectively. EX1003, ¶[0115].

60. Mr. Kaschmitter does not dispute this. In fact, Mr. Kaschmitter repeatedly agreed that “at least” one means that one or both of Sato’s electrodes can have a recess for accommodating a lead. EX1034, 91:5-120:6. Rather than address the entirety of Sato’s disclosure, Patent Owner relies on a strained and shortsighted reading of certain examples disclosed by Sato divorced from Sato’s disclosure as a whole.

61. In response to my first declaration, Patent Owner and Mr. Kaschmitter incorrectly contend that Sato only discloses two configurations: (1) one having a recess on the positive electrode and no recess on the negative electrode, and (2) another having a recess on the negative electrode with no recess on the positive electrode. POR, 31; EX2015, ¶81; EX2018, ¶¶41-45. Patent Owner’s and Mr. Kaschmitter’s characterization of Sato is wrong.

62. Patent Owner and Mr. Kaschmitter focus solely on the example embodiments, namely Batteries 1-11, described in paragraphs [0099]-[0143], instead of Sato’s overall description governing all the embodiments. POR, 31; EX2015, ¶81; EX2018, ¶¶41-45. Before disclosing details of the various embodiments, Sato expressly states that the lead attachment position “is preferably

located in the region from 1/4 to 3/4” of the electrode and that “at least one [i.e., one *or both*] of the positive electrode and the negative electrode satisfies [these] conditions for the lead attachment position.” EX1005, ¶[0094]. As explained in my first declaration, a POSA would have interpreted “at least one” in paragraph [0094] as covering the “positive electrode and/or the negative electrode.” EX1003, ¶115. That reading is reinforced throughout Sato—including the summary, detailed description, and the claims—and confirmed by Mr. Kaschmitter. EX1005, ¶[0013] (same “at least one” language); ¶[0036] (active material removal for “at least one” electrode); claim 6 (same); EX1034, 117:22-118:4, 121:14-19. What is more, that reading fits Sato’s core purpose: placing recesses in the central portion of the electrodes to reduce current-collection resistance. EX1005, ¶[0040]; *see also* ¶¶[0007]-[0009], [0015], [0024]; EX1003, ¶102.

2. My first declaration relies on Sato’s comprehensive disclosure to show a “first recess” in the positive electrode and a “second recess” in the negative electrode.

63. Patent Owner’s assertion that my first declaration combined Sato’s Battery 1 and Battery 8 to show a battery having first and second recesses is inaccurate and mischaracterizes my testimony. POR, 32-36; EX2015, ¶86; EX2018, ¶¶42-44. My first declaration relies on the totality of Sato’s disclosure to show that both electrodes include a recess. EX1003, ¶¶102, 115. I cited Sato’s description related to Batteries 1 and 8 as support for examples of electrode dimensions and tape

placement. When initially addressing the preamble of claim 1, my first declaration elaborated this point by mentioning that “[e]lectrodes having dimensions according to the electrodes in Sato’s Battery 1 and Battery 8 are referred to herein for context.” EX1003, ¶115. My first declaration also mentioned that the electrode structure shown in Figures 3-5 of Sato—showing a generic electrode having a recess defined in the active material—is applicable to both the positive electrode and the negative electrode. EX1003, ¶¶102, 120, fn. 4. Accordingly, my references to Batteries 1 and 8 are cited to provide context examples of electrode dimensions and tape placement.

64. Furthermore, a POSA would have understood that Sato’s Battery 8, as described in paragraphs [0136] and [0137], discloses a battery embodiment having a first recess and a second recess. In paragraph [0136], Sato describes “[a] positive electrode plate was formed in the same manner as in Example 1, except that attachment of a lead to the negative electrode plate was performed in a different manner as follows.” EX1005, ¶[0136]. A POSA would have understood that the term “except” in paragraph [0036] introduces the part of the battery that has changed relative to example 1 and the only process identified after the word “except” is the “attachment of a lead to the negative electrode plate.” EX1005, ¶[0136]. Accordingly, the only difference from Battery 1 described in [0136] is the manner of attaching the lead to the negative electrode plate. Then in paragraph

[0137], Sato initially describes how the negative lead is attached to a recess formed in the negative active material of the negative electrode. EX1005, ¶[0137]. At this point, paragraphs [0136]-[0137] of Sato disclose a battery embodiment in which the positive electrode includes a first recess and the negative electrode includes a second recess, which is consistent with Sato's broader teaching that the disclosed electrode structure may be implemented on one or both electrodes. EX1005, ¶¶[0010], [0036], [0094], claim 6. Contrary to Patent Owner's and Mr. Kaschmitter's assertions (POR, 35; EX2018, ¶¶42-44), my deposition testimony, stating that Sato's paragraphs [0136]-[0137] "first disclose[s] a battery with two centrally-located leads" (EX2020, 63:7-64:6), is consistent with the Sato's description.

D. PO's arguments against the dependent claims fail.

1. Sato discloses claims 2 and 3.

65. My first declaration showed that Sato locates the centers of its first and second recesses at the central portions of the electrodes, placing each recess within the claimed $\frac{1}{4}$ – $\frac{3}{4}$ range—a central portion of the electrode. EX1003, ¶¶102, 115, 120, fn. 4, 136, fn. 5, 156-161; EX1005, ¶¶[0094], [0104], [0111]-[0113], [0136], [0137].

66. Patent Owner and Mr. Kaschmitter do not dispute that Sato's recess locations fall within the recited range. Instead, Patent Owner and Mr. Kaschmitter

argue that Sato cannot meet the limitations of claims 2 and 3 because it supposedly does not disclose a battery with both a first and second recess. *See* POR, 41-42; EX2018, ¶53. Patent Owner's argument is based entirely on its incorrect premise that Sato lacks disclosure of a battery with two centrally-located recesses.

67. As explained in my first declaration and above, Sato discloses a battery having a first recess and a second recess located along a central portion of the electrode plates. EX1003, ¶¶156-67. Patent Owner's and Mr. Kaschmitter's arguments against claims 2 and 3 do not rebut the rationales provided in my first declaration showing how the Sato-Takemura combination discloses recited recess locations of claims 2 and 3. EX1003, ¶¶156-67.

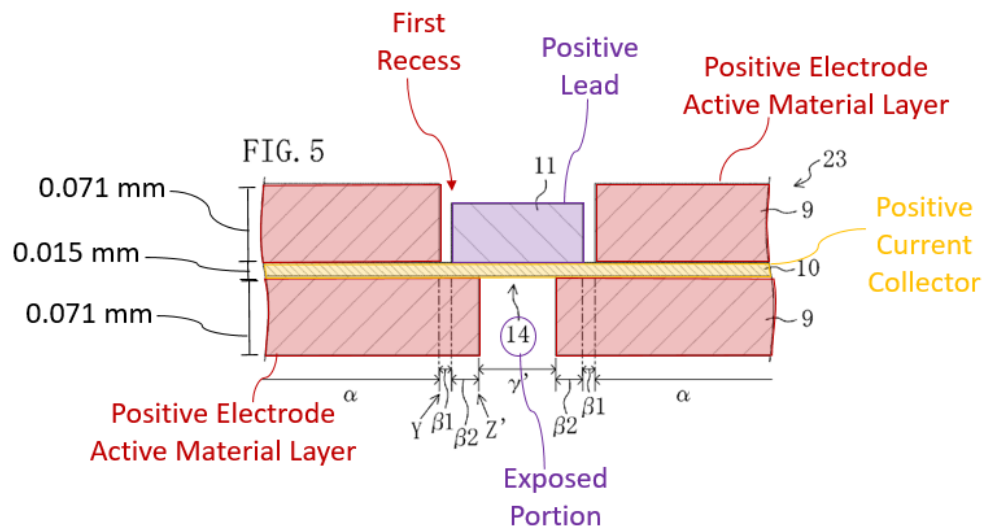
2. Sato's disclosure renders obvious claim 6.

68. Sato's Figures and its recitation of the active material layers' dimensions clearly teach the claimed recess thickness ranges of claim 6. EX1003, ¶¶168-70. Patent Owner contends that Sato cannot disclose the recess thickness being 0.005 mm to 0.1 mm larger than the lead thickness because Sato is silent on the thickness of the active material layer relative to the lead. POR, 44-45; EX2018, ¶¶57-61. I disagree because a POSA would have understood from Sato's Figures and corresponding description that the thickness of Sato's active material layers would be within a range of 0.005 mm to 0.1 mm larger than the thickness of the leads. EX1003, ¶¶168-70.

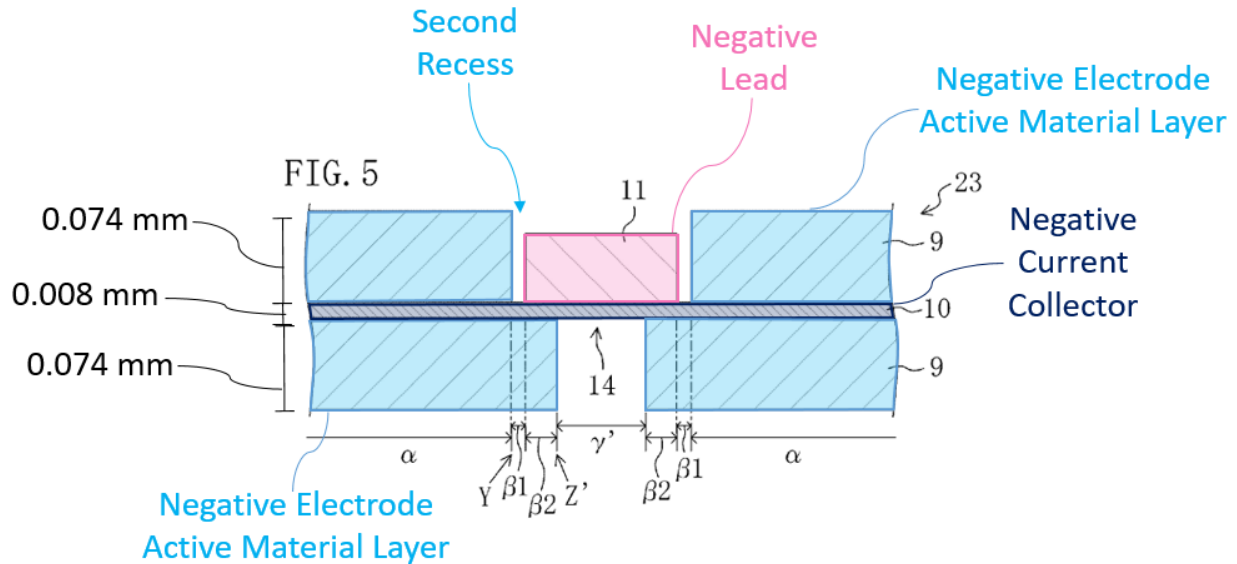
69. Sato's description provides scale information to show that the claimed depth ranges of claim 6 as obvious. Paragraphs [0104] and [0107] of Sato provide explicit numerical thickness values for the total thickness of the electrode plates and the current collectors, which supply the scale information necessary to interpret Figures 3-5 quantitatively. EX1005, ¶[0104] (positive electrode plate with a thickness of 0.157 mm and current collector with a thickness of 0.015 mm result in each active layer having a thickness of 0.071 mm); ¶[0107] (negative electrode plate with a thickness 0.156 mm and current collector with a thickness 0.008 mm result in each active layer having a thickness of 0.074 mm). Specifically, Sato discloses that the positive electrode plate has a total thickness of 0.157 mm with a 0.015 mm current collector, yielding individual active mixture-layer thicknesses of 0.071 mm on each side. EX1005, ¶[0104]; EX1003, ¶¶168-69. Likewise, Sato discloses that the negative electrode plate has a total thickness of 0.156 mm with a 0.008 mm current collector, yielding individual active mixture-layer thicknesses of 0.074 mm. EX1005, ¶[0107]; EX1003, ¶¶168-69.

70. Furthermore, in paragraph [0039], Sato describes the thickness of the lower and upper active material layers 9 shown in Figures 3-5 as having the *same thickness* "Ta." EX1005, ¶[0039] ("Suppose the thickness of the mixture layer 9 is Ta (corresponding to one layer) and the thickness of the current collector 10 is Tb, thickness at the boundaries X changes from (2Ta+ Tb) to Tb.") In that paragraph,

Sato defines the thickness of the mixture layer as a single value “Ta,” explicitly stating that Ta corresponds to “one layer” and using that same value for both the upper and lower mixture layers when describing the total thickness transition from $(2Ta + Tb)$ to Tb at boundary X. EX1005, ¶[0039]. A POSA would understand this formulation to mean that each mixture layer 9 on either side of the current collector has an identical thickness “Ta,” because Sato treats the two layers symmetrically and does not describe any thickness differentiation between the upper and lower mixture layers. Given that Sato’s mixture layers 9 have the same thickness “Ta,” a POSA would have understood that each positive material layer is 0.071 mm and each negative material layer is 0.074 mm, as identified in my first declaration. Pet., 41-43; EX1003, ¶¶168-169.



EX1005, FIG. 5 (annotations from EX1003, ¶168).



EX1005, FIG. 5 (annotations from EX1003, ¶169).

71. Sato's Figures 3-5 undisputably show the active material layer 9 extending above lead 11 in the vertical direction. Using the disclosed dimensions in paragraphs [0039], [0104], and [0107] as scale information, a POSA would have understood that Sato's disclosure teaches a depth of the mixture layer 9 falls within a range of 0.005 to 0.1 mm larger than the thickness of the leads for the positive and negative electrodes. Sato provides sufficient scale information—through the combination of its figures and the disclosed dimensions of the active material and current collector—for a POSA to ascertain that the depicted recess depth falls within the claimed depth range. EX1003, ¶¶168-69.

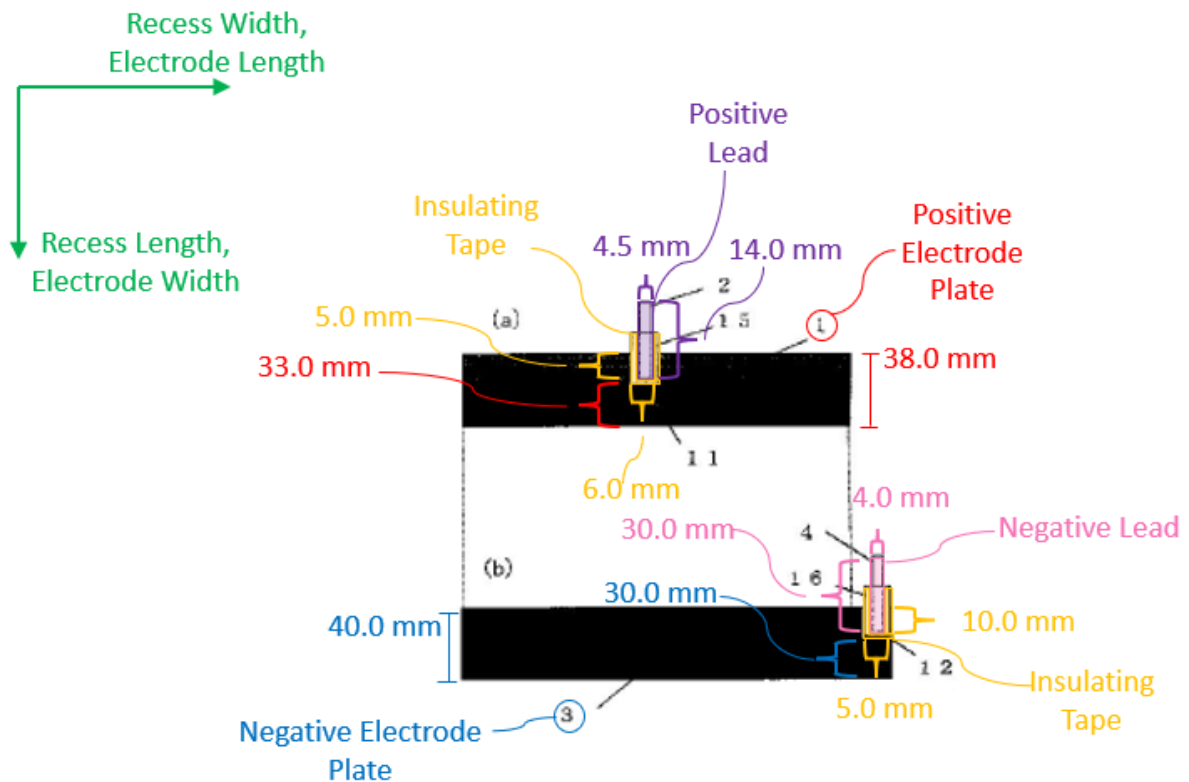
72. Lastly, as explained in my first declaration, making leads slightly thinner than the active-material layers such that Sato's recesses have a depth 0.005-0.1 mm larger than the leads would have been obvious. EX1003, ¶170. A POSA

would have recognized that coordinating the relative thicknesses of the lead and the surrounding active-material layers presents only three predictable options: (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. EX1003, ¶170. A POSA would have understood that making the leads slightly thinner than the active-material layers avoids creating a protrusion or bulge at the lead-attachment region, which could interfere with electrode winding, reduce volumetric efficiency, or compromise cell capacity. EX1003, ¶170 (“A POSA would also have understood that using a lead as thick or thicker than the recess depth could produce an undesirable bulge in the battery cell winding.”) Selecting a lead thickness slightly less than the depth of the recess therefore represents a straightforward optimization well within ordinary skill, yielding the expected result of a recessed lead connection without any unexpected technological effect. Indeed, multiple prior art references cited in my first declaration show leads that are thinner than the depth of exposed metal portions. *See* EX1003, ¶57 (citing EX1015, FIG .1); ¶66 (citing EX1008, FIG. 2A).

E. A POSA would have been motivated to combine the teachings of Nakamura with Sato, Takemura, and Kobayashi, rendering obvious the recited battery of claims 4, 5, 12, and 13.

73. My first declaration explained that a POSA would have been motivated to modify the size of Sato's recesses according to the dimensions taught in Nakamura, such as making the length of the recess less than the width of the electrode plate as shown below in Figure 1 of Nakamura, to preserve more active material on the electrode plate, thereby increasing the battery's storage capacity.

EX1003, ¶¶189-195, 203, 212.



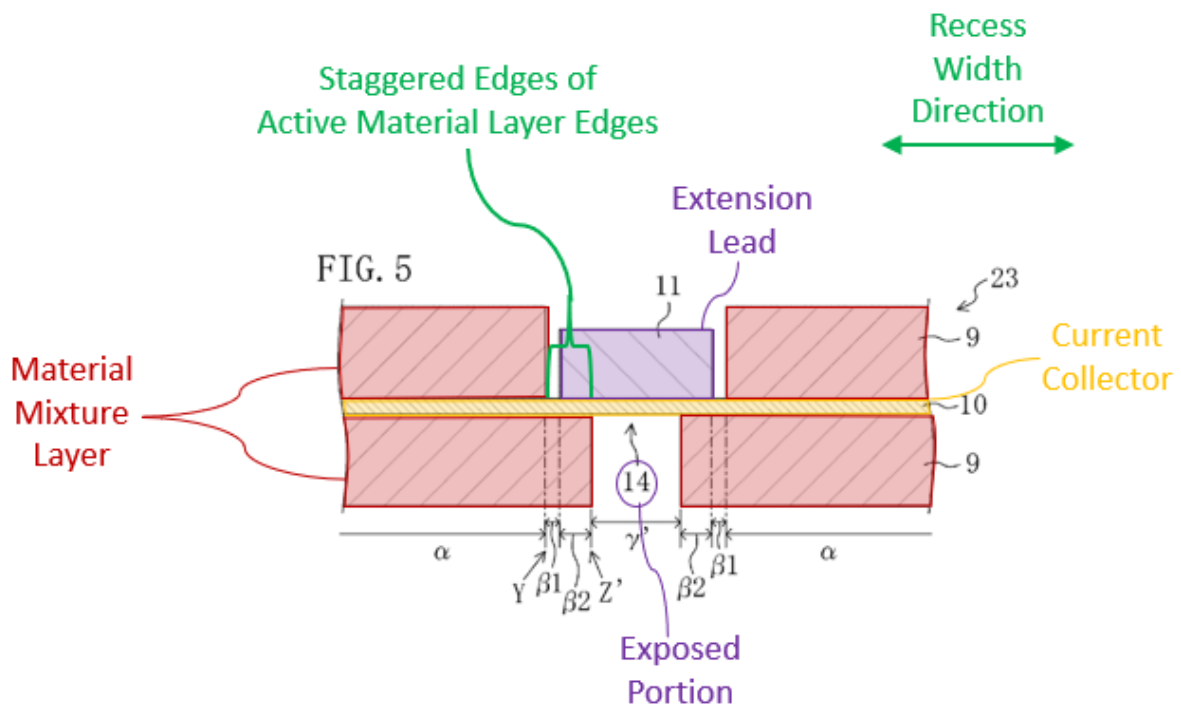
EX1012, FIG. 1 (annotated).

74. Patent Owner and Mr. Kaschmitter argue that reducing the length of Sato's recess to be less than the width of the current collector would "undercut" Sato's stated purpose of allowing the electrode plate to bend easier during the crush test. POR, 45-47; EX2018, ¶68. Attempting to support this argument, Patent Owner and Mr. Kaschmitter allege that the "band" shape of Sato's exposed portions is critical and modifying Sato's recesses according to Nakamura's dimensions would make the electrode plates susceptible to increased pressure. POR, 45-47; EX2018, ¶68. Patent Owner's and Mr. Kaschmitter's arguments about the combination of Sato and Nakamura are incorrect.

75. Patent Owner and Mr. Kaschmitter demonstrate their misunderstanding of Sato by alleging that the "band" shape of Sato's exposed portions is "critical" for the battery having sufficient flexibility to pass a crush test. The term "band," as described in paragraphs [0010] and [0033] of Sato, corresponds to the shape of the overall current collector, not just the exposed portion (recess) of the current collector. EX1005, ¶[0010] ("[A] current collector made of metal foil in the shape of a band"); ¶[0033] "The positive electrode current collector 4A is in the shape of a band, and is a conductive foil member").

76. The critical parts of Sato's exposed portions (recesses) that allows the electrode to "bend" during a crush test are the staggered edges of the active materials disposed on opposite sides of the current collector, as shown in Figure 5,

reproduced below, such that the recesses on opposite sides of current collector have different widths. EX1005, ¶¶37-40. Indeed, Sato discloses “[t]he width of the no-mixture-layer portion of the surface opposite to the surface connected to the lead is *preferably smaller* than that of the lead.” EX1005, ¶[0037] (emphasis added). That is, the width for Sato’s recess accommodating the lead is formed wider than the width of the recess not accommodating the lead to “disperse[]” the stress “induced by bending of the electrode plate” during the crush test. EX1005, ¶[0040].



EX1005, FIG. 5 (annotated).

77. Modifying the length of Sato’s recesses to be less than the width of the electrode plate does not negate this aspect—providing active material layers of

an electrode plate with staggered edges. Sato *never* requires that the exposed portion must extend across the *entire width* of the electrode plate. *See generally* EX1005. Moreover, Nakamura never suggests altering the dimensions of the recess located opposite to the recess accommodating the lead. *See generally* EX1012. Accordingly, a POSA would have understood that it would be possible to adjust the length of Sato's recess accommodating the lead while still preserving Sato's solution in staggering the coating edges around the recess to reduce the discontinuity. EX1003, ¶¶189-94.

F. Patent Owner raises no other arguments against Grounds 3-6 beyond those that were raised with respect to Ground 1.

78. I note that Patent Owner does not raise any new arguments against Grounds 3–6 of my first declaration. POR, 47-49; EX2018, ¶¶70-82. Specifically, in addressing Ground 3, Patent Owner contends that “claims [20 and 22] are not obvious for the same reasons discussed above with respect to claims 1 and 17.” POR, 47. In addressing Ground 4, Patent Owner contends that “claims [10, 11, 14, and 16] are not obvious for the same reasons discussed above with respect to claims 2, 3, 6, and 8.” POR, 47. In addressing Ground 5, Patent Owner contends that “Ground 5 fails for the same reasons identified for Ground 1 with respect to claim 1.” POR, 48. In addressing Ground 6, Patent Owner contends that “Ground 6 fails for the same reasons identified for Ground 1 with respect to claim 1.” POR, 48-49. In sum Patent Owner's arguments against Grounds 3-6 are premised

entirely on their arguments asserted against Grounds 1 and 2. For the same reasons explained above, Patent Owner's arguments against Grounds 3-6 are incorrect. *See supra* Section IV.A-E.

V. GROUND 7-8: THE TAKEMURA-OH-539-KOBAYASHI COMBINATIONS RENDER ALL CHALLENGED CLAIMS OBVIOUS.

A. A POSA would have been motivated to combine the teachings of Oh-539's lead placement with Takemura.

1. Combining Oh-539's lead placement with Takemura's battery would have been obvious for the reasons explained in my first declaration.

79. As explained in my first declaration, a POSA would have been motivated to move each lead in Takemura's Figures 8 and 9 embodiment from an electrode end to a central portion of the electrode to increase the discharge rate of the battery. EX1003, ¶¶353-56. In response, Patent Owner and Mr. Kaschmitter argue that there would have been no motivation to combine Oh-539's lead placement with Takemura because "Oh-539 has nothing to do with preventing lithium deposition or using tape." POR, 53; EX2015, ¶¶108-09; EX2018, ¶¶20-37. Patent Owner's and Mr. Kaschmitter's arguments are wrong because my declaration provides specific motivation for combining the teachings of Oh-539's lead placement with Takemura. EX1003, ¶¶353-56.

80. It is my understanding that the motivation for combining prior art need not be the same motivation that inspired the patent owner. Rather, the

motivation for combining prior art can arise from interrelated teachings of multiple patents; the effects of demands known to the design community or present in the marketplace; and the background knowledge possessed by a person having ordinary skill in the art.

81. Oh-539 describes moving the “electrode tab ... to a center non-coated portion” of the electrode plate “reduc[es] the distance the electric current moves,” thereby improving the discharge rate of the battery. EX1007, ¶¶[0009]-[0010], [0100]-[0105], FIGS. 8-11; EX1003, ¶35. Implementing Oh-539’s lead placement with Takemura therefore improves the battery’s discharge capacity. A higher discharge rate is a well-recognized and desirable performance characteristic because it enables a battery to deliver greater power on demand, improves responsiveness under load, and supports applications requiring rapid energy output without excessive voltage drop. EX1007, ¶[0009] (“[T]he lithium secondary battery can be used in places where a battery requiring high power is needed because its high-rate discharging characteristics can be improved.”). Improving discharge rate also reduces heat generation, thereby enhancing overall efficiency and operational reliability. EX1007, ¶¶[0009]-[0010] (“minimizing the exothermic phenomenon”), ¶[0060] “the high-rate discharging characteristics of the lithium secondary battery can be improved, and the exothermic phenomenon generated by the movement of electric current can be minimized.”) These performance benefits

alone would have motivated a skilled artisan to combine the teachings of Oh-539's lead placement with Takemura, regardless of whether Oh-539 discusses insulation tape or lithium plating.

2. Takemura does not teach away from using insulating tape with first and second recesses.

82. Patent Owner and Mr. Kaschmitter repeat the same argument that Takemura teaches away from the tape arrangement shown in Figures 8 and 9. *See* POR, 49-51 (“For the same reasons as discussed above in Grounds 1 and 4, Takemura teaches away from Oh-539.”); EX2018, ¶¶20-37, 87. Patent Owner’s and Mr. Kaschmitter’s assertion that Takemura teaches away from the claimed invention is wrong for the same reasons provided above. *See supra* Section IV.A.1-4.

83. It is my understanding that a determination of obviousness does not require showing that a combination is the best option, only that it be a suitable option. A POSA would have understood that Takemura’s ultimate approach to remove active material from the electrode does not undermine its express teaching that covering active material with insulating tape is a suitable option for preventing lithium plating. EX1006, ¶[0008]; EX1003, ¶¶393-396. As explained above, Takemura’s alternative techniques for preventing lithium plating—applying insulating tape and selectively removing active material—are interchangeable. *See supra* Section IV.A.2. Indeed, Takemura confirms these two approaches are

interchangeable alternatives for solving the same problem by stating that “positive electrode active material layer 3 opposite the beginning of the winding end of the negative electrode is covered with insulating tape 7 to prevent lithium metal deposition, *but instead of* covering it with insulating tape 7, the active material in this portion *may be* removed.” EX1006, ¶[0021] (emphasis added). Furthermore, a POSA would have understood tape has advantages over removing active material, namely a simpler manufacturing process and proven reliability for preventing short-circuiting. *See supra* Section IV.A.3.

84. Shifting Takemura’s lead placement in Figures 8 and 9 toward the electrode center, as taught by Oh-539, would not have deterred a POSA from applying tape to the positive active material that is wider and longer than the opposing recess for the negative lead. EX1003, ¶¶393-96. This practice was well known to prevent lithium plating, as evidenced by Takemura and other cited art. EX1003, ¶¶37-73, 393-96. For example, Maejima teaches that the “lithium ion transfer preventing insulator can be placed anywhere between the negative electrode side lead wire connection and the positive electrode plate,” including “the portion of the positive electrode plate corresponding to the negative electrode side lead wire connection and the separator winding layer located to the outside.” EX1009, ¶[0008]. Maejima further elaborates that “the lengths of the pair of extending portions 4b, 4b” of insulator 4 “are dimension[ed] [so] that [the insulator 4] can sufficiently prevent

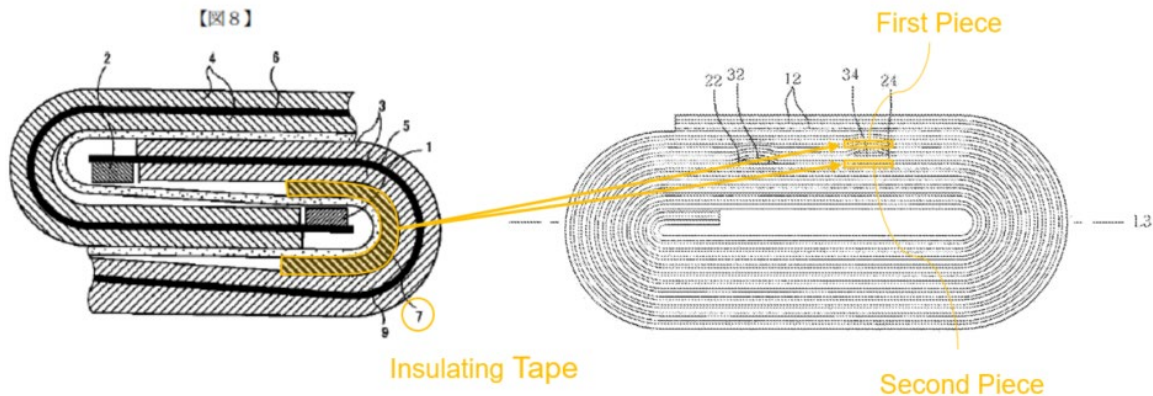
the migration of lithium ions.” EX1009, ¶[0013]. Accordingly, as confirmed by other prior art, such as Maejima, shifting and sizing Takemura’s insulating tape longer and wider than the negative-electrode recess would have been a predictable, desirable, and routine practice for implementing Oh-539’s lead placement in Takemura to prevent lithium plating.

B. The combination of Takemura, Oh-539, and Kobayashi renders obvious a “second insulating glue layer” located on “a surface of the positive electrode active material layer opposite to the second recess.”

1. Takemura’s teachings tie tape placement to lead location, not to electrode ends.

85. My first declaration explained that relocating Takemura’s negative lead from the electrode’s end to a central placement, as taught by Oh-539, would make the new lead attachment position susceptible to lithium plating. EX1003, ¶¶393-95. To address this issue, a POSA would have understood that the opposing positive active material must either be masked with insulating tape, as in Takemura’s Figures 8 and 9, or removed entirely, as in Takemura’s Figures 1-7. EX1003, ¶¶394-95; EX1006, ¶[0008] (“[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.*”)(emphasis added).

Starting with Takemura's Figures 8 and 9 embodiment, a POSA would have recognized the need to shift the tape placement so that it covers the positive active material opposite the second recess in the modified battery. EX1003, ¶¶394-95.



EX1003, ¶394.

86. In response, Patent Owner and Mr. Kaschmitter contend that when combining Oh-539's centrally-located leads with Takemura, a POSA would still apply tape only at the ends of the electrode—mirroring Takemura's Figure 4. *See* POR, 55-58; EX2015, ¶¶114-115; EX2018, ¶¶89-91. I disagree because Patent Owner and Mr. Kaschmitter fail to recognize the knowledge and creativity that a skilled artisan would have applied when combining the teachings of Oh-539's recesses with Takemura's battery shown in Figures 8 and 9.

87. It is my understanding that in combining the teachings of the references, a POSA is not compelled to adopt every single aspect of its teaching without the exercise of independent judgment. It is my understanding that obviousness requires assessing the knowledge, creativity, and common sense that

an ordinary skilled artisan would have brought to bear when considering combinations or modifications.

88. Takemura never instructs that insulating tape must always be wrapped around the electrode ends. Takemura's teaching is broader: remove or cover the portion of positive active material that opposes the lead and the exposed plate surface. EX1005, ¶[0008]. That guidance ties tape placement to where the lead is, not to a fixed location on the electrode, as supported by other prior art described in the background section of my first declaration. EX1003, ¶¶37-73. Accordingly, a POSA would have understood that leaving insulating tape at Takemura's electrode end, while relocating the negative lead toward the electrode center, would no longer protect the region of highest lithium-plating risk. Because lithium plating is induced by exposing positive active material to a negative lead and negative current collector surface, effective prevention of lithium plating requires shifting the tape to the relocated lead position. Shifting Takemura's tape from the electrode end to the portion of the electrode opposing the negative lead would therefore represent a logical and necessary adjustment to preserve Takemura's purpose of preventing lithium plating after implementing Oh-539's lead relocation.

89. In sum, once the lead is moved from the electrode end to a central placement—as taught by Oh-539—a POSA would have understood that the tape

must likewise shift to the section of positive active material opposite the recess accommodating the relocated lead. Nothing in Takemura discourages that straightforward adjustment.

2. Patent Owner and Mr. Kaschmitter attack Kobayashi individually rather than addressing the cited art combination's teachings as a whole.

90. My first declaration relies on Kobayashi to show that a POSA would have insulated Takemura's relocated positive lead with a first tape to prevent short-circuiting from pressure or burrs. EX1003, ¶¶357-59, 388-92. In response, Patent Owner and Mr. Kaschmitter do not dispute this rationale for insulating Sato's positive lead. POR, 59-60; EX2018, ¶¶93-96. Instead, Patent Owner and Mr. Kaschmitter contend that my first declaration selectively ignores Kobayashi's teaching to directly cover the negative lead with insulating tape, claiming this somehow "undercuts" the rationale to shift Takemura's second tape on the positive active material surface opposing the relocated negative lead. *See* POR, 59-60; EX2018, ¶¶93-96. This is incorrect because Patent Owner and Mr. Kaschmitter are addressing each reference individually, not considering what Takemura, Oh-539, and Kobayashi teach a POSA as a whole.

91. Patent Owner's and Mr. Kaschmitter's focus on Kobayashi's specific tape placement relative to the negative electrode is misplaced because it is irrelevant to the Takemura–Oh-539–Kobayashi combination discussed in Ground 7

of my first declaration. Takemura already teaches applying insulating tape to the positive active material surface opposing the negative lead to prevent lithium plating. *See* EX1006, ¶[0008]; EX1003, ¶¶393-96. Kobayashi does not discourage applying insulating tape to positive active material that is located opposite the negative lead. *See generally* EX1008. To the contrary, Kobayashi expressly recognizes that the negative electrode need not have the “same configuration” as the positive electrode, confirming that tape placement may vary depending on the electrode’s lead location. EX1008, ¶[0015]. A POSA would therefore have understood that Kobayashi’s disclosure of insulating the negative lead does not preclude following other well-established approaches—such as Takemura’s teaching to insulate the opposing positive active material—when the battery structure calls for it.

92. Moreover, Kobayashi’s negative lead is attached at “the beginning end of the winding” of the negative electrode plate, rather than at a central region of the electrode. EX1008, ¶[0035]. Because of this location, Kobayashi’s negative lead is not positioned opposite any positive active material, making direct insulation of the negative lead both sufficient and practical in that context. In contrast, Takemura’s battery, as modified by Oh-539, relocates the negative lead to a centrally located region that directly opposes positive active material. Under those circumstances, a POSA would recognize that insulating the opposing positive

active material—rather than merely covering the negative lead—would be a more reliable method of preventing lithium-plating. Furthermore, a POSA would have recognized that eliminating anode taping altogether and applying tape only to the cathode would simplify manufacturing.

93. Consistent with Takemura’s express teachings (EX1006, ¶[0008]), a POSA would therefore have implemented the insulating tape by masking the positive active material surface opposing the negative lead. EX1003, ¶¶393-95. Contrary to Patent Owner’s arguments, the rationale for locating the second insulating tape on the opposing positive active material surface flows directly from Takemura’s teachings as understood by a POSA, not from the challenged ’498 patent.

C. The combination of Takemura, Oh-539, and Kobayashi renders obvious a “second insulating glue layer” that “has a length larger than a length of the second recess.”

94. Patent Owner and Mr. Kaschmitter repeat their same argument that my first declaration supplies a missing limitation—the second insulating glue having a length larger than a length of a second recess—into Takemura. POR, 50; EX2015, ¶110; EX2018, ¶88. That mischaracterizes the combination and how the teachings of the references are applied in my first declaration. As I explained above and in my first declaration (EX1003, ¶¶397-98), Takemura’s teaching to cover the section of active material opposing the lead and the exposed metal with

insulating tape would have taught a POSA to make the length of the tape larger than the length of the second recess. EX1003, ¶¶397-98. *See supra* Section IV.B.1-3. In view of Takemura and the supporting prior art, a POSA would have understood to size insulating tape longer and wider than the opposing recess to reliably prevent lithium plating and short-circuiting. *See supra* Section IV.B.1; EX1006, ¶[0008]; EX1010, ¶[0019]; EX1008, Figures 2A-B; EX1041, ¶¶[0227]-[0228], FIGS. 23, 25. This overextension accounts for manufacturing tolerances and electrode misalignment, ensuring continuous insulation coverage of all positive active material facing exposed negative-electrode metal. EX1003, ¶¶397-98. Numerous references—including Takemura, Yamauchi, Kobayashi, and Komatsu—reflect this common design principle, confirming that sizing insulating tape beyond the recess dimensions was a routine and safety-driven practice well within the level of ordinary skill in the art. EX1006, ¶[0008]; EX1010, ¶[0019]; EX1008, Figures 2A-B; EX1041, ¶¶[0227]-[0228], FIGS. 23, 25. Accordingly, the claimed tape length reflects the routine application of Takemura’s teachings as understood by a POSA, not a limitation supplied by hindsight.

VI. CONCLUSION

I understand that this Declaration is to be filed as evidence in a contested IPR proceeding before the Patent Trial and Appeal Board. I acknowledge that I may be subject to cross-examination in the case and that cross-examination will take place within the United States. If cross-examination is required of me, I will appear for cross-examination within the United States during the time allotted for cross-examination.

I hereby declare that all statements made of my own knowledge are true and that all statements made on information and belief are believed to be true. I could testify to the matters in this declaration competently if called upon to do so. I further declare 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 the Title 18 of the United States Code.

Executed on this 5th day of March, 2026, in Sidney, BC.



Ulrich von Sacken, Ph.D.