

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

GUANGDONG MIC-POWER NEW ENERGY CO. LTD., PEAG LLC
d/b/a JLAB AUDIO, AUDIO PARTNERSHIP LLC, AUDIO
PARTNERSHIP PLC d/b/a CAMBRIDGE AUDIO, GN AUDIO A/S, and
GN AUDIO USA INC. d/b/a JABRA,
Petitioner,

v.

VARTA MICROBATTERY GMBH,
Patent Owner.

IPR2021-01206
Patent 10,971,776 B2

Before CHRISTOPHER L. CRUMBLEY, JON B. TORNQUIST, and
AVELYN M. ROSS, *Administrative Patent Judges*.

TORNQUIST, *Administrative Patent Judge*.

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

I. INTRODUCTION

A. *Background and Summary*

Guangdong Mic-Power New Energy Co. Ltd., PEAG LLC d/b/a JLab Audio, Audio Partnership LLC, Audio Partnership PLC d/b/a Cambridge Audio, GN Audio A/S, and GN Audio USA Inc. d/b/a Jabra (collectively “Petitioner”) filed a Petition (Paper 1, “Pet.”) requesting an *inter partes* review of claims 1–30 (all claims) of U.S. Patent No. 10,971,776 B2 (Ex. 1001, “the ’776 patent”). VARTA Microbattery GMBH filed a Preliminary Response to the Petition. Paper 9 (“Prelim. Resp.”).

We have authority to determine whether to institute an *inter partes* review. 35 U.S.C. § 314; 37 C.F.R. § 42.4(a). The standard for institution is set forth in 35 U.S.C. § 314(a), which provides that an *inter partes* review may not be instituted “unless the Director determines . . . there is a reasonable likelihood that the petitioner would prevail with respect to at least 1 of the claims challenged in the petition.”

After considering the parties’ arguments and evidence, and for the reasons set forth below, we determine that Petitioner has not demonstrated a reasonable likelihood of prevailing with respect to any challenged claim of the ’776 patent. Accordingly, we do not institute an *inter partes* review.

B. *Real Parties-in-Interest*

Petitioner identifies itself as the real parties-in-interest. Pet. 1. Patent Owner identifies itself as the real party-in-interest. Paper 7, 2.

C. *Related Matters*

The parties inform us that the ’776 patent is the subject of four district court cases: *VARTA Microbattery GmbH v. GN Audio A/S and GN Audio USA Inc. d/b/a Jabra*, United States District Court for the District of Delaware, No. 1-21-cv-00134-RGA (stayed); *VARTA Microbattery GmbH v.*

Guangdong Mic-Power New Energy Co., Ltd., United States District Court for the Eastern District of Texas, No. 2-21-cv-00036-JRG (pending); *VARTA Microbattery GmbH v. Audio Partnership LLC d/b/a Cambridge Audio USA et al.*, United States District Court for the Eastern District of Texas, No. 2-21-cv-00037-JRG (pending); *VARTA Microbattery GmbH v. PEAG LLC d/b/a JLab Audio*, United States District Court for the Eastern District of Texas, No. 2-21-cv-00038-JRG (pending). Pet. 1; Paper 7, 2–3.

The parties further inform us that a petition directed to similar subject matter was filed in IPR2021-01207 and that petitions were filed against related patents in IPR2020-01211, -01212, -01213, and -01214. Pet. 1–2; Paper 7, 4 (Patent Owner also identifying IPR2021-00474 as a related matter).

D. The '776 Patent

The '776 patent is directed to “button cells having a housing consisting of two metal housing halves, which contains a wound electrode separator assembly, and to a method for its production.” Ex. 1001, 1:21–24.

Figure 1A of the '776 patent, as annotated by Patent Owner, is reproduced below (Prelim. Resp. 5):

Metal foils 110 and 111 are welded by laser 114, preferably in a location in the sub-region that delimits the axial cavity at the center of the winding. *Id.* at 7:24–29. This creates a weld bead that passes fully through the housing of button cell 100 from the outside inward and firmly connects metal foils 110 and 111 to the inner side of the housing. *Id.* at 7:29–34.

E. Illustrative Claim

Petitioner challenges claims 1–30 of the '776 patent. Pet. 14. Claim 1, reproduced below, is the only independent claim of the '776 patent and is illustrative of the challenged claims:

1. A method for producing a button cell, the method comprising:

providing a metal cell cup, the metal cell cup having a cell cup plane region connected to a cell cup lateral surface region;

providing a metal cell top, the metal cell top having a cell top plane region connected to a cell top lateral surface region;

providing a cylindrical electrode winding, the electrode winding having a first end side, a second end side, and an outer side, the electrode winding being formed from a multi-layer assembly that is wound in a spiral shape about an axis, the multi-layer assembly including:

a positive electrode formed from a first current collector coated with a first electrode material,

a negative electrode formed from a second current collector coated with a second electrode material, and

a separator disposed between the positive electrode and the negative electrode;

connecting a first conductor to one of the first current collector or the second current collector;

placing the electrode winding into the cell top;

inserting the cell top into the cell cup to form a housing in which a strip-shaped first portion of the first conductor lies flat between (i) the first end side of the electrode winding and (ii) a first plane region selected from the cell cup plane region and the cell top plane region, the strip-shaped first portion of the first conductor having a maximum length that is less than a diameter of the first end side of the electrode winding; and

welding, after inserting the cell top into the cell cup to form the housing, the strip-shaped first portion of the first conductor to a surface of the first plane region located in the interior of the housing.

Ex. 1001, 8:66–9:35.

F. Prior Art and Asserted Grounds

Petitioner asserts that claims 1–30 would have been unpatentable on the following grounds (Pet. 15):

Claims Challenged	35 U.S.C. §¹	Reference(s)/Basis
1–30	103	Kannou ² , Martin ³
1–30	103	Kannou, Martin, Myerberg ⁴

¹ The Leahy-Smith America Invents Act (“AIA”), Pub. L. No. 112-29, 125 Stat. 284, 287–88 (2011), amended 35 U.S.C. §§ 102 and 103, effective March 16, 2013. The ’776 patent issued from a series of divisional applications that claim priority to PCT Application No. PCT/EP2010/058637, filed June 18, 2010. Ex. 1001, code (62). Accordingly, on this record, we understand that the pre-AIA version of these statutes apply. See 35 U.S.C. § 100(i)(2).

² JP Patent Publication No. 2003-31266, published January 31, 2003. Ex. 1005 (“Kannou”).

³ US 8,632,907 B2, issued January 21, 2014. Ex. 1006 (“Martin”).

⁴ US Patent Publication No. 2007/0117011 A1, published May 24, 2007. Ex. 1010 (“Myerberg”).

Claims Challenged	35 U.S.C. § ¹	Reference(s)/Basis
15, 16	103	Kannou, Martin, Kubota ⁵
25	103	Kannou, Martin, Lampe-Onnerud ⁶

In support of its grounds for unpatentability, Petitioner relies upon the declaration of William H. Gardner. Ex. 1003.

II. ANALYSIS

A. Claim Construction

In this proceeding, the claims of the '776 patent are construed “using the same claim construction standard that would be used to construe the claim in a civil action under 35 U.S.C. [§] 282(b).” 37 C.F.R. § 42.100(b). Under that standard, the words of a claim are generally given their “ordinary and customary meaning,” which is the meaning the term would have had to a person of ordinary skill at the time of the invention, in the context of the entire patent including the specification. *Phillips v. AWH Corp.*, 415 F.3d 1303, 1312–13 (Fed. Cir. 2005) (en banc).

Neither party asserts that any terms of the '776 require construction for purposes of this Decision. Pet. 24; Prelim. Resp. 12. And, upon review of the parties' arguments and supporting evidence, we agree that no terms of the '776 patent require construction. See *Nidec Motor Corp. v. Zhongshan Broad Ocean Motor Co.*, 868 F.3d 1013, 1017 (Fed. Cir. 2017) (quoting *Vivid Techs., Inc. v. Am. Sci. & Eng'g, Inc.*, 200 F.3d 795, 803 (Fed. Cir. 1999) (“[O]nly those terms need be construed that are in controversy, and only to the extent necessary to resolve the controversy.”)).

⁵ US 5,654,114, issued August 5, 1997. Ex. 1009 (“Kubota”).

⁶ US 7,811,708 B2, issued October 12, 2010. Ex. 1011 (“Lampe-Onnerud”).

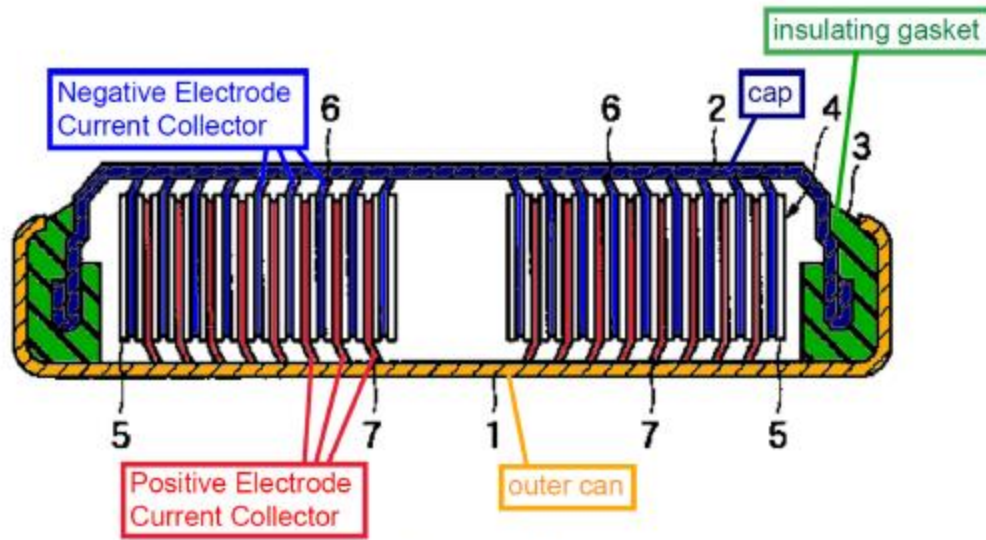
B. Claims 1–30 over Kannou and Martin

Petitioner contends the subject matter of claims 1–30 would have been obvious over the combined disclosures of Kannou and Martin. Pet. 37–74.

1. Kannou

Kannou discloses “a flat-type non-aqueous secondary battery with improved discharge capacity.” Ex. 1005, code (57). Kannou notes that in order to maximize the space used in a battery, it was known to make the height in the direction of the central axis of the roll smaller than the size in the direction perpendicular to the central axis. *Id.* ¶ 5. In one particular embodiment of such a battery, however, a “high discharge capacity cannot be obtained because the electrical connection is made by contact between” a tab and the container. *Id.* ¶ 6. To resolve this problem, Kannou discloses a battery wherein the end portions of the positive and negative electrode current collector protrude to directly contact the inner surface of the positive electrode and negative electrode container, respectively. *Id.* ¶¶ 8, 14, 15. According to Kannou, such a configuration allows for a battery with a significantly enhanced discharge capacity. *Id.* ¶ 43.

Figure 1 of Kannou, as annotated by Patent Owner, is reproduced below. Prelim. Resp. 26; *see also* Pet. 25 (providing a similar annotated version of Figure 1 of Kannou).



Kannou—FIG. 1

As shown in annotated Figure 1, electrode group 4 is stored in a sealed container formed by crimping cylindrical positive electrode container 1 to cylindrical negative electrode container 2, with an insulating gasket 3 disposed between the two parts around the edge of the sealed container.

Ex. 1005 ¶ 39. Electrode group 4 is composed of a spirally wound laminated member having a positive electrode and positive electrode current collector and a negative electrode and negative electrode current collector, with a separator 5 disposed between these layers. *Id.* ¶¶ 8, 10, 39. As shown in Figure 1, negative electrode current collector 6 protrudes from the roll surface and is bent to the inner circumference to contact the inner surface of negative electrode container 2. *Id.* Likewise, positive electrode current collector 7 protrudes from the second roll surface and is bent to the inner circumference to contact the inner surface of positive electrode container 1. *Id.*

Kannou notes that when the length of the electrode group in the direction perpendicular to the roll axis is made longer than the length in the roll axis direction, “the electrode group is easily deformed into a telescoping

roll shape by handling or the like during manufacturing, resulting in roll shifting and disintegration.” *Id.* ¶ 41. In Kannou’s inventive battery, however, “the electrodes and separator near the center of the roll surface can be restrained from protruding outward by the bent part, thereby reducing roll shifting and disintegration of the electrode group during manufacturing.” *Id.*

In addition to its inventive battery design, Kannou also discloses a different design that it uses as a comparative example. *Id.* ¶¶ 55–59, 65 (Table 1). Figures 6 and 7 of Kannou depict portions of this comparative example (Comparative Example 1) and are reproduced below, as annotated by Patent Owner. Prelim. Resp. 28; *see also* Pet. 42, 44 (Petitioner providing similar annotated versions of Figures 6 and 7 of Kannou).

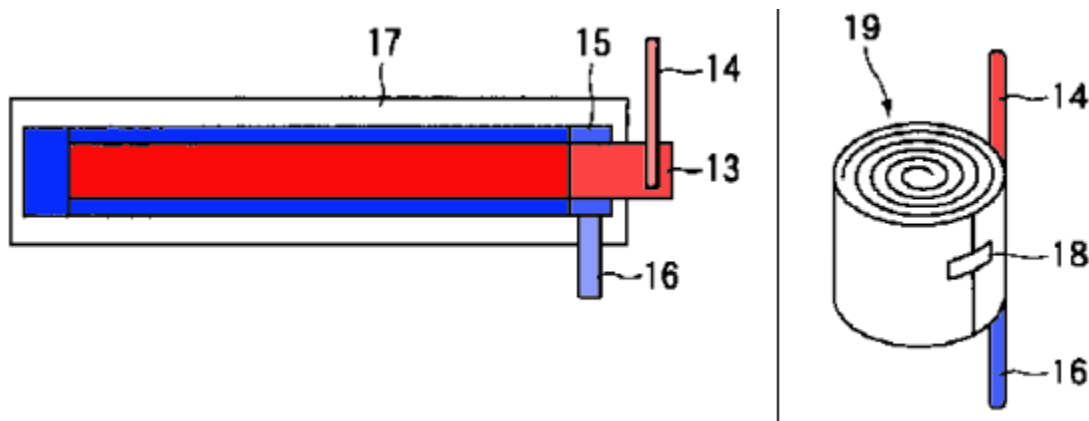


Figure 6 of Kannou (left) is a plan view illustrating the positional relationship between the positive and negative electrodes and the separator of the electrode group in the battery of Comparative Example 1. Ex. 1005 ¶ 68. Figure 7 (right) is a schematic diagram of the electrode group of Comparative Example 1. *Id.*

As show in Figure 6, in the battery of Comparative Example 1 the “positive electrode active material-containing layer was removed at the end part 13 in the short side direction of the positive electrode, and an aluminum tab 14 was welded to the positive electrode.” *Id.* ¶ 56. Likewise, the

“negative electrode active-material containing layer at the end part 15 in the short side direction of the negative electrode was removed, and then a nickel tab 16 was welded to the negative electrode.” *Id.* ¶ 57. A porous polyethylene film acts as separator 17 and is placed between the positive and negative electrodes, as well as on the positive side of the laminate member. *Id.* ¶ 58. As shown in Figure 7, the resulting laminate member is then rolled into a spiral shape and “the roll end part of the resulting rolled body” is secured with adhesive tape 18 “to obtain an electrode group 19 having separators [that] protrude from both roll surfaces.” *Id.* This rolled body is then placed within a housing similar to that shown above in Figure 1. *Id.* ¶ 59.

The batteries of inventive Example 1 and Comparative Example 1 of Kannou (as well as inventive Example 2 and Comparative Example 2⁷) were then tested for discharge capacity, internal resistance, and roll shifting. *Id.* ¶¶ 62–65. The results from these tests are provided in Table 1, below:

	1 st cycle		50 th cycle		100 th cycle		Roll shifting (of 100 parts)
	Discharge capacity (mAh)	Internal resistance (mΩ)	Discharge capacity (mAh)	Internal resistance (mΩ)	Discharge capacity (mAh)	Internal resistance (mΩ)	
Example 1	51	420	45.2	450	42.2	470	0
Example 2	50	450	41.6	490	39.5	510	0
Comparative Example 1	43	550	30.7	600	26.0	620	8
Comparative Example 2	45	500	35.3	540	29.3	560	3

⁷ The battery of inventive Example 2 differs from that of inventive Example 1 in that only the ends of the positive electrode protrude from the separator assembly. Ex. 1005 ¶¶ 51–52. The battery of Comparative Example 2 differs from that of Comparative Example 1 in that notches were formed in the positive and negative current collectors that protrude from the separator assembly. *Id.* ¶ 60.

Table 1 shows the results for the first, fiftieth, and one-hundredth discharge cycle for each battery tested, as well as the number of roll shifting events per 100 parts experienced by each battery type. *Id.* ¶ 65.

As set forth in Table 1, Kannou reports that the battery of Example 1 has a higher discharge capacity and lower internal resistance than the battery of Comparative Example 1. *Id.* Moreover, the battery of Example 1 had zero roll shifting events per 100 parts as compared to eight roll shifting events per 100 parts for the battery of Comparative Example 1. *Id.*

2. *Martin*

Martin discloses “[a]n electrochemical cell [that] includes components that are welded from an external source after the components are assembled in a cell canister.” Ex. 1006, code (57). Figure 3A of Martin is reproduced below:

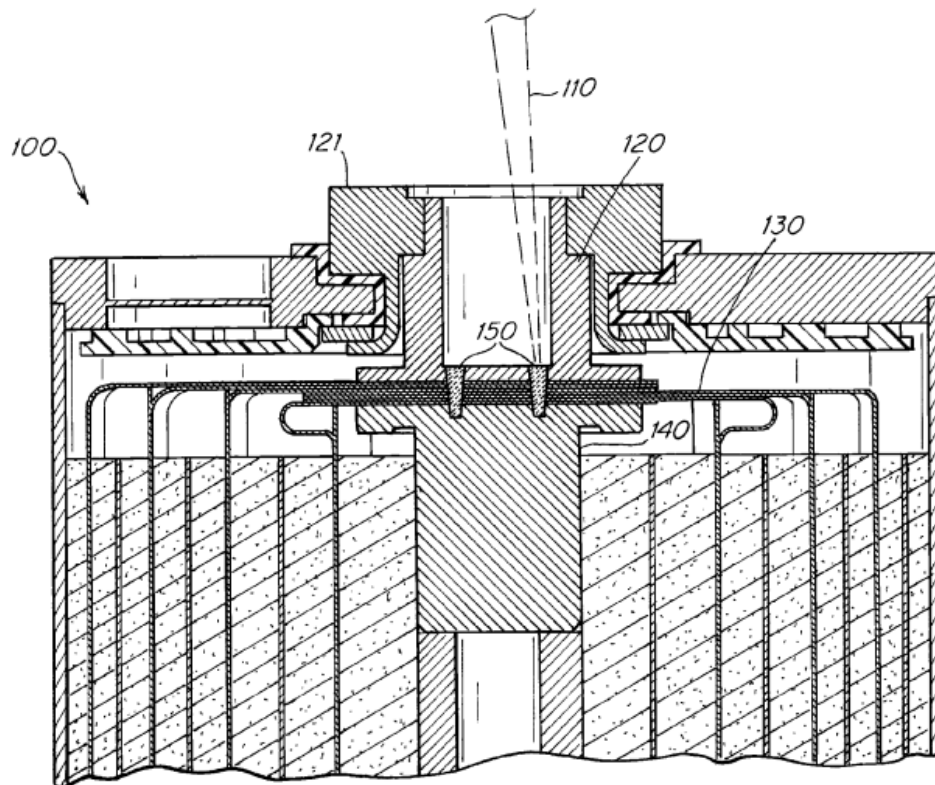


Fig. 3A

Figure 3A is “a cross-sectional view of a battery cell design utilizing an external laser welding of electrode tabs.” *Id.* at 3:14–15, 3:52–53. In the battery of Figure 3A, end cap insert 120 and jellyroll core insert 140 are disposed within an exemplary high power lithium ion battery cell 100 and end cap insert 120 is securely affixed to battery cell 100 via rivet 121. *Id.* at 3:50–54, 4:11–14. Electrode tabs 130, which extend from the jelly roll core, are overlapped and positioned between the lower portion of end cap insert 120 and the upper portion of jelly roll core insert 140. *Id.* at 3:50–60. “Externally generated laser energy 110” is then “directed at the surface of the cap insert 120, which subsequently penetrates and welds end cap insert 120 to the underlying tabs 130 and supporting core insert 140 by forming laser joining posts or weld nuggets 150.” *Id.* at 3:61–65.

Martin explains that core insert 140 prevents laser energy from damaging the jelly roll during welding and that the cup like design of cap insert 120 “restricts a keyhole welding path and keeps spatter to the cell exterior,” thereby “eliminating the possibility of generating small, free floating metallic particles and molten materials inside of the electrochemical cell.” *Id.* at 1:65–2:5, 2:53–58, 3:65–4:4, 4:19–24.

3. Claim 1

Petitioner contends that the battery of Kannou’s Comparative Example 1 discloses the majority of the limitations of claim 1, including:

- (1) providing a metal cell cup and top that have a cell top plane region and a top plane region connected to a lateral surface region (Pet. 39–40);
- (2) providing a cylindrical electrode winding formed from a multi-layer assembly that is wound in a spiral shape about an axis and comprises a positive electrode and negative electrode coated with first and second electrode materials, as well as a separator disposed between the positive and

negative electrodes (*id.* at 40–42); (3) connecting conductors to first and second current collectors (*id.* at 42); and (4) placing the electrode winding into a cell top and lying the conductor between the first side of the electrode winding and first plane region of the cell cup. (*id.* at 42–48). Petitioner concedes, however, that Kannou does not disclose welding the strip portion of the first conductor to a surface of the interior of the housing using a weld that is formed *after* inserting the cell top into the cell cup to form the housing. *Id.* at 37–38, 47–48.

Petitioner contends Martin discloses assembling a battery cell and housing before welding and that one of ordinary skill in the art would have sought to use Martin’s welding process in Kannou because it was understood that the welding process of Martin “ensures the tabs maintain contact with the housing halves, thereby improving the electrical connectivity and stability of the cell.” *Id.* at 38 (citing Ex. 1003 ¶ 256). According to Petitioner, one of ordinary skill in the art would have understood that the combination of Kannou and Martin would produce predictable results because “applying welding at the appropriate places to improve battery reliability” was well known in the art and requires no more than routine optimization to accommodate any differences between the designs. *Id.* at 38–39 (citing Ex. 1003 ¶ 257).

Patent Owner contends Petitioner’s arguments are insufficient to support institution because Kannou actually teaches away from using tab connectors in this type of battery, encouraging instead the use of direct connections between the current collectors and the housing in order to improve battery performance. Prelim. Resp. 36–41. Patent Owner further contends that Petitioner and Mr. Gardner do not account for the “vast differences” in design between Kannou’s button cell and Martin’s

conventional battery, including Martin's use of core insert 140 and end cap insert 120 to prevent the weld nugget 150 from penetrating into the internal structures of the battery. *Id.* at 43–45.

Upon review of the parties' arguments and supporting evidence, we agree with Patent Owner that Petitioner fails to adequately explain why one of ordinary skill in the art would have sought to use the welding technique of Martin when assembling the battery of Comparative Example 1.

Trivascular, Inc. v. Samuels, 812 F.3d 1056, 1066 (Fed. Cir. 2016) (noting that the Board must “be careful not to allow hindsight reconstruction of the references . . . without any explanation as to *how* or *why* the references would be combined to produce the claimed invention.”) (quoting *Kinetic Concepts, Inc. v. Smith & Nephew, Inc.*, 688 F.3d 1342, 1368 (Fed. Cir. 2012)). Nor has Petitioner demonstrated sufficiently that one of ordinary skill in the art would have had a reasonable expectation of success in combining Kannou and Martin to arrive at the subject matter of claim 1. *See Intelligent Bio-Systems, Inc. v. Illumina Cambridge Ltd.*, 821 F.3d 1359, 1367 (Fed. Cir. 2016) (explaining that a petitioner must demonstrate that one of ordinary skill in the art would have had a reasonable expectation of success in combining the identified references to meet the limitations of the claimed invention).

First, as noted by Patent Owner, Petitioner selects the battery of Comparative Example 1 for further improvement, which has a lower discharge capacity and higher internal resistance than the inventive examples disclosed in Kannou. This battery is also subject to roll shifting at a rate of 8 parts per hundred, which results in disintegration of the electrode during manufacturing. Ex. 1005 ¶¶ 41, 65 (Table 1), 66. Petitioner provides no persuasive explanation as to why one of ordinary skill in the art would have

selected the battery of Comparative Example 1 of Kannou from amongst the prior art battery designs disclosed in the record, and then sought to improve it by applying the welding process of Martin. For example, Petitioner and Mr. Gardner do not address the fact that they select the battery of Comparative Example 1 for further development, as opposed to the inventive battery design that is repeatedly praised in the reference as overcoming the limitations of prior art batteries, including those using multiple tabs to form an electrical connection within the container or housing.

We recognize that a petitioner is not necessarily precluded in an obviousness ground from relying on a comparative example, or an embodiment with lower performance than another embodiment in the same or a different reference. But when the reference itself criticizes the particular design selected by the petitioner and also notes that nearly 10% of such batteries are subject to disintegration during manufacturing due to their design, it is incumbent upon a petitioner to provide some explanation as to why one of ordinary skill in the art would have selected such a battery for further development or improvement. Ex. 1005 ¶ 6 (noting that batteries in which tabs are used to form the electrical connection between the negative and positive electrodes could not solve the problem of providing a battery with high discharge capacity), ¶¶ 41, 65 (indicating that the design of Comparative Example 1 is subject to disintegration during manufacturing). Petitioner fails to adequately provide such an explanation in the Petition; indeed, Petitioner does not even address the structural, electrical, and manufacturing differences between the inventive battery of Example 1 and the battery of Comparative Example 1 of Kannou.

Second, the welding method of Martin utilizes end cap insert 120, jellyroll core insert 140, and rivet 121. Rivet 121 serves to securely affix end cap insert 120 to battery cell 100, and jellyroll core insert 140 and end cap insert 120 are used to securely bond electrode tabs 130 while at the same time eliminating the risk of spatter of metallic particles inside the cell. *Id.* at 3:65–4:24. Petitioner does not explain how these components could be successfully implemented in the coin-type battery of Kannou or, in the alternative, how these structural elements could be successfully omitted and still achieve an acceptable button cell design and weld.

Petitioner does assert that applying the welding method of Martin in the battery of Kannou would require “no more than routine optimization to accommodate any difference between the designs.” Pet. 38–39 (citing Ex. 1003 ¶ 257). Petitioner does not explain why this is true, however, and the cited portion of Mr. Gardner’s declaration does not even discuss the end cap insert or rivet of Martin, focusing instead on Martin’s general use of welding. Ex. 1003 ¶ 257 (Mr. Gardner asserting that the combination of Kannou and Martin “would involve only the application of a known technique (welding) to the cell housing of Kannou in order to generate a welded connection between the output conductors and the housing”).

In view of the foregoing, Petitioner has not explained sufficiently for purposes of institution how or why one of ordinary skill in the art would have combined the disclosures of Kannou and Martin to arrive at the subject matter of claim 1 of the ’776 patent with a reasonable expectation of success. Accordingly, Petitioner has not demonstrated a reasonable likelihood that claim 1 would have been obvious over these references.

4. *Dependent Claims 2–30*

Claims 2–30 depend, directly or indirectly, from independent claim 1. Ex. 1001, 9:36–12:39. Petitioner’s arguments with respect to these claims do not remedy the deficiencies noted above with respect to claim 1. Thus, Petitioner has not demonstrated a reasonable likelihood that claims 2–30 would have been obvious over Kannou and Martin.

C. *Claims 1–30 over Kannou, Martin, and Myerberg*

Petitioner contends the subject matter of claims 1–30 would have been obvious over the combined disclosures of Kannou, Martin, and Myerberg. Pet. 75–80. In this ground, Petitioner relies upon Myerberg for its disclosure of using flat current collection tabs and an insulator. *Id.* at 75–76. Petitioner’s arguments for this ground, however, do not remedy the deficiencies noted above with respect to claim 1 and the proposed combination of Kannou and Martin. Accordingly, Petitioner fails to demonstrate a reasonable likelihood that claims 1–30 would have been obvious over Kannou, Martin, and Myerberg.

D. *Claims 15 and 16 over Kannou, Martin and Kubota and Claim 25 over Kannou, Martin and Lampe-Onnerud*

Petitioner contends the subject matter of claims 15 and 16 would have been obvious over the disclosures of Kannou, Martin, and Kubota and the subject matter of claim 25 would have been obvious over the combined disclosures of Kannou, Martin, and Lampe-Onnerud. Pet. 81–86. Petitioner’s arguments with respect to these proposed combinations do not remedy the deficiencies notes above with respect to claim 1 and the combination of Kannou and Martin. Accordingly, Petitioner fails to demonstrate a reasonable likelihood that claims 15, 16, and 25 would have been obvious over any of these proposed combinations.

III. CONCLUSION

For the reasons discussed above, Petitioner does not demonstrate a reasonable likelihood that it would prevail in showing that any of the challenged claims (claims 1–30) are unpatentable. As such, the Petition is denied.

IV. ORDER

In consideration of the foregoing, it is hereby:
ORDERED that the Petition is denied.

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