Trials@uspto.gov
571-272-7822

Paper 11
Date: January 5, 2022

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.

IPR2021-01207
Patent 10,804,506 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 1–20 (all claims) of U.S. Patent No. 10,804,506 B2 (Ex. 1001, "the '506 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 '506 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 '506 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 IPR2021-01206 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 '506 Patent

The '506 patent is directed to "button cells having a housing consisting of two metal housing halves that contains a wound electrode separator assembly, and to a method for its production." Ex. 1001, 1:18–21.

Figure 1A of the '506 patent, as annotated by Patent Owner (Prelim. Resp. 5), is reproduced below:

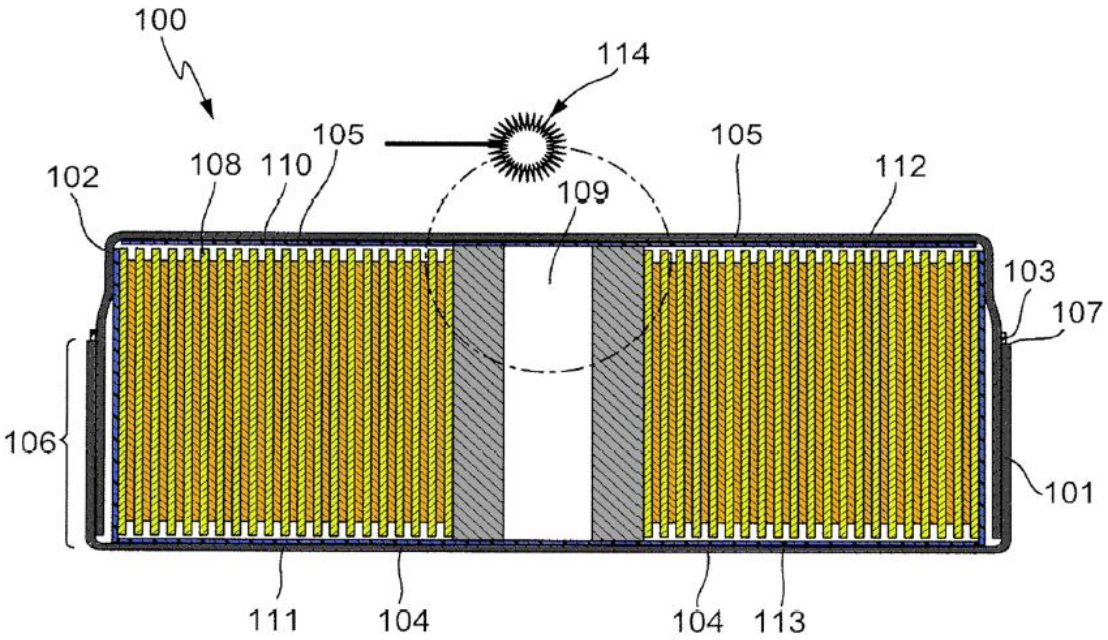


Figure 1A is a schematic cross-section of a preferred button cell of the ’506 patent. Ex. 1001, 3:22–23. As shown in Figure 1A, button cell 100 comprises metal cup part 101 and metal top part 102, which act as two metal housing halves. *Id.* at 7:18–19. Seal 103 lies between the two halves of the housing, allowing the two housing halves to be connected together in a “leaktight fashion.” *Id.* at 7:19–21. As connected, button cell 100 has a plane bottom region 104 and plane top region 105, which act as poles of the button cell from which current may be drawn by a load. *Id.* at 7:21–25.

Assembly 108 is formed of strip-shaped electrodes and strip-shaped separators, which are rolled into a spiral-shaped winding. *Id.* at 7:32–36. The assembly is wound on winding core 109 (a hollow plastic cylinder) at the center of button cell 100. *Id.* at 7:37–40. Metal foils 110 and 111 are connected to the electrodes and act as conductors, with insulating elements 112 and 113 shielding the conductors from the end sides of the winding. *Id.* at 7:43–47.

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 7:52–57. 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 7:57–62.

E. Illustrative Claim

Petitioner challenges claims 1–20 of the '506 patent. Pet. 11–12. Claim 1 is illustrative of the challenged claims and is reproduced below:

1. A rechargeable button cell comprising:

a housing including metal housing halves separated from one another by an electrically insulating injection-molded seal or film seal, one of the housing halves including a planar bottom region and another housing half including a planar top region substantially parallel to the planar bottom region, the housing having a height-to-diameter ratio of less than one;

an electrode separator assembly comprising a positive electrode and a negative electrode disposed inside the housing, wherein the electrode separator assembly is in the form of a winding, end sides of the winding respectively facing in directions of the planar bottom region and the planar top region such that layers of the electrode separator assembly are oriented essentially orthogonally to the planar bottom region and the planar top region of the housing, the winding having a substantially centrally located axis and an open cavity extending along the axis interiorly of the winding, the open cavity having axially spaced opposite ends, the planar top and bottom regions of the housing each having a subregion, each subregion disposed both radially and axially adjacent one of the ends of the open cavity, the positive electrode and the negative electrode each including a current collector in the form of a metal foil or a metal mesh coated on both sides with active electrode material, and each of the current collectors comprises an uncoated section;

two metal foils functioning as conductors and electrically connecting the positive and the negative electrode to the housing halves, wherein both metal foils bear flat on an inner surface of the planar bottom region or the planar top region, one of the metal foils is attached by a weld to one of the uncoated sections and one of the planar bottom and top regions, another one of the metal foils is attached by a weld to another one of the uncoated sections and to another one of the planar bottom and top regions; and

at least one insulator disposed to prevent direct electrical contact between one of the metal foil conductors and an adjacent one of the end sides of the electrode separator assembly,

wherein the button cell is configured as a secondary lithium ion cell, and the open cavity includes no winding core.

Ex. 1001, 9:2–46.

F. Prior Art and Asserted Grounds

Petitioner asserts that claims 1–20 would have been unpatentable on the following grounds (Pet. 11–12):

Claims Challenged	35 U.S.C. §[1]	Reference(s)/Basis
1–9, 11–19	103	Kannou[2], Kawamura[3]

[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 '506 patent issued from a divisional application that claims 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 Patent Publication No. US2007/0218356 A1, published September 20, 2007. Ex. 1007 ("Kawamura").

Claims Challenged	35 U.S.C. §[1]	Reference(s)/Basis
10, 20	103	Kannou, Kawamura, Kaun[4]
1–9, 11–19	103	Kannou, Kawamura, Kubota[5]
1–9, 11–19	103	Kannou, Kawamura, Myerberg[6]
10, 20	103	Kannou, Kawamura, Kaun, Myerberg

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 '506 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 '506 patent require construction for purposes of this Decision. Pet. 21; Prelim. Resp. 13–14. And, upon review of the parties' arguments and supporting evidence, we agree that no terms of the '506 patent require construction. *See Nidec Motor Corp. v. Zhongshan Broad Ocean Motor Co.*, 868 F.3d 1013, 1017 (Fed.

[4] US Patent Publication No. US2005/0233212 A1, published October 20, 2005. Ex. 1008 ("Kaun").
[5] US 5,654,114, issued August 5, 1997. Ex. 1009 ("Kubota").
[6] US Patent Publication No. 2007/0117011 A1, published May 24, 2007. Ex. 1010 ("Myerberg").

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.")).

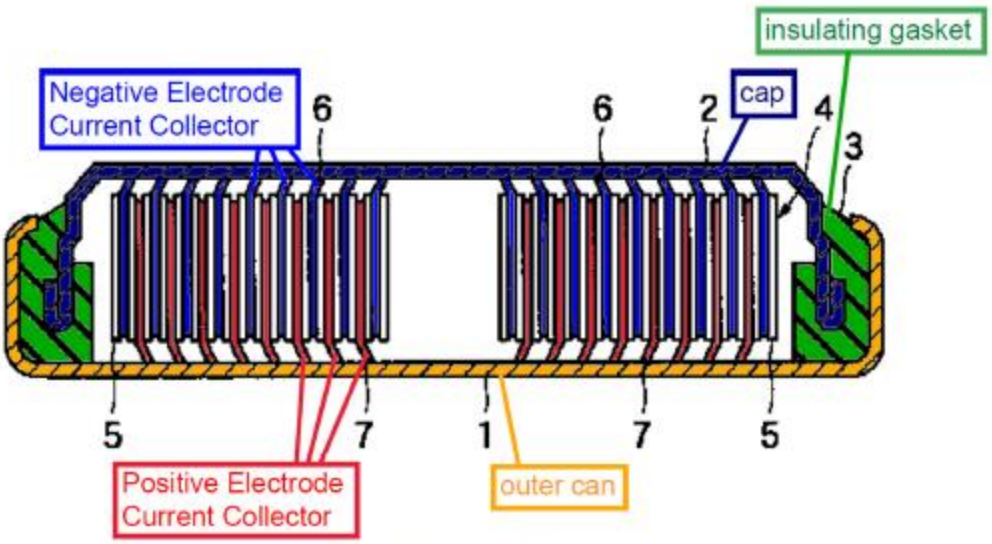
B. Claims 1–9 and 11–19 over Kannou and Kawamura

Petitioner contends the subject matter of claims 1–9 and 11–19 would have been obvious over the combined disclosures of Kannou and Kawamura. Pet. 35–62.

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 length 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.* ¶¶ 6–7.

Figure 1 of Kannou, as annotated by Patent Owner, is reproduced below. Prelim. Resp. 28; *see also* Pet. 22 (Petitioner 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 fabricated by rolling a positive electrode, separator 5, and negative electrode in a spiral shape. *Id.* 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 battery 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. 30; *see also* Pet. 43, 46 (Petitioner providing similar annotated versions of Figures 6 and 7 of Kannou).

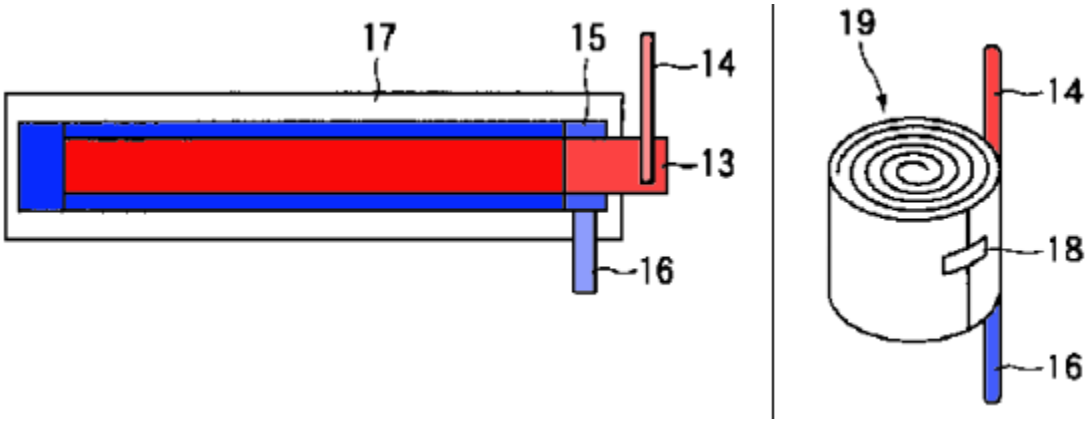


Figure 6 of Kannou (left) is a plan view illustrating the positional relationship between the positive and negative electrodes and the separator of the electrode group in the battery of Comparative Example 1. Ex. 1005 ¶ 68. Figure 7 (right) is a schematic diagram of the electrode group of Comparative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

As shown 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 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 2[7]) 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:

	1st cycle		50th cycle		100th cycle		Roll shifting
	Discharge capacity (mAh)	Internal resistance (mΩ)	Discharge capacity (mAh)	Internal resistance (mΩ)	Discharge capacity (mAh)	Internal resistance (mΩ)	(of 100 parts)
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

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

[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.

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. Kawamura

Kawamura discloses a lithium secondary battery with improved capacity and cycle-characteristics. Ex. 1007 ¶ 2. Figure 5 of Kawamura is reproduced below:

FIG. 5

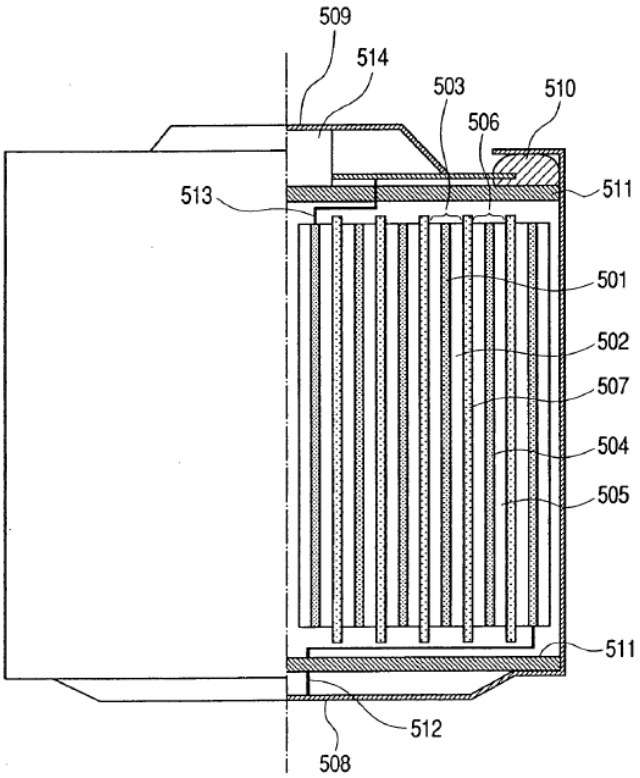


Figure 5 is a sectional view showing the structure of the spiral-wound type cylindrical battery of one embodiment of Kawamura. *Id.* ¶ 30. The battery of Figure 5 has negative electrode active material layer 502 formed on negative electrode current collector 501 and positive electrode active material 505 formed on positive electrode current collector 504. *Id.* ¶¶ 92–

93. Ionic conductor 507 is composed of a separator that retains an electrolyte solution therein. *Id.* ¶ 93. In combination, these various layers "form a stack" that is "rolled up multiple times." *Id*.

Positive electrode 506 is connected to positive electrode cap 509 "by way of the positive electrode lead 513" and negative electrode 503 is connected to negative electrode cap 508 "by way of negative electrode lead 512." *Id.* ¶ 95. Negative electrode lead 512 and positive electrode lead 513 are spot welded to the negative and positive electrode caps, respectively. *Id.* ¶ 116. Insulating plates 511 isolate the cylindrical electrode stack from the positive and negative electrode caps. *Id.* ¶¶ 92, 94.

3. Analysis: Independent 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 top plane region connected to a lateral surface region (Pet. 37–38); (2) a housing having a height-to-diameter ratio of less than one (*id.* at 39); (3) an electrode separator assembly comprising a positive and negative electrode disposed inside the housing with end sides facing the planar bottom region of the positive and negative electrode (*id.* at 39–41); (4) a winding having a substantially centrally located axis and an open cavity positioned along the axis interiorly of the winding (*id.* at 41); (5) the planar top and bottom regions having a sub-region that is disposed both radially and axially adjacent one of the ends of the open cavity (*id.*); (6) the positive and negative electrodes each having a current collector in the form of a metal foil coated with active electrode material (*id.* at 42); (7) two metal foils functioning as conductors and electrically connecting the positive and negative electrodes to the housing halves and bearing flat on an inner surface of the planar bottom and top

regions (*id.* at 42–44); and (8) at least one insulator disposed to prevent direct electrical contact between the metal conductors and the end side of the electrode separator assembly and wherein the button cell is configured as a secondary lithium ion battery and has no winding core (*id.* at 45–48).

Petitioner concedes that Kannou does not disclose welding the electrodes to the positive and negative planar bottom and top regions (the flat housing), but contends one of ordinary skill in the art would have sought to use the spot welding technique of Kawamura in the battery of Kannou in order to improve "the electrical connectivity and stability of the cell." *Id.* at 35, 44–46. Petitioner further contends that one of ordinary skill in the art would have sought to add an additional insulator between the tabs and the adjacent end sides of the electrode group of Kannou in order to further protect against short circuits, as disclosed in Kawamura. *Id.* at 36, 46–47.

Patent Owner contends Petitioner's arguments and evidence do not support institution because Petitioner relies on the battery of Comparative Example 1 of Kannou, and not its inventive battery design. Prelim. Resp. 39–41. According to Patent Owner, one of ordinary skill in the art considering Kannou's teaching of removing output conductors in favor of direct contact between the electrodes and the housing would not have then selected the battery of Comparative Example 1 for improvement, as it was "provided to illustrate the problems associated with using an output conductor." *Id.* at 41 (asserting that Kannou teaches one of ordinary skill in the art to eliminate the use of output conductors in favor of short, axial current paths that are provided by direct contact between the electrodes and the housing).

Upon review of the parties' arguments and supporting evidence, we agree with Patent Owner that Petitioner has failed to adequately explain why

one of ordinary skill in the art would have sought to modify the battery of Comparative Example 1 to arrive at the subject matter of claim 1. *See 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)).

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 from amongst the potential battery designs disclosed in the record, and then sought to improve this battery by using an internal weld. Indeed, Petitioner and Mr. Gardner do not even discuss 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 electrical connections between the positive and negative current collectors and the container or housing. Pet. 21–23 (discussing Kannou's disclosures), 42–44; Ex. 1003 ¶¶ 88–92 (Mr. Gardner discussing Kannou's disclosures), 147–149.

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 disparages 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 that use tabs to form the electrical connection between the negative and positive electrodes and the container could not solve the problem of providing a battery with high discharge capacity), ¶¶ 41, 65 (indicating that the battery of Comparative Example 1 is subject to disintegration during manufacturing). Petitioner does not adequately provide such an explanation in the Petition, and fails to address the structural, electrical, or manufacturing differences between the inventive battery of Example 1 and the battery of Comparative Example 1 of Kannou.

In view of the foregoing, we determine that Petitioner has not explained sufficiently for purposes of institution why one of ordinary skill in the art would have combined the disclosures of Kannou and Kawamura to arrive at the subject matter of claim 1 of the '506 patent. Accordingly, Petitioner has not demonstrated a reasonable likelihood that claim 1 would have been obvious over these references.

4. Independent Claim 11 and Dependent Claims 2–9 and 12–19

Petitioner's arguments with respect to independent claim 11 and dependent claims 2–9 and 12–19 do not remedy the deficiencies noted above for independent claim 1. Pet. 35–37, 48–62. Thus, Petitioner has not demonstrated a reasonable likelihood that claims 2–9 and 11–19 would have been obvious over Kannou and Kawamura.

C. Claims 10 and 20 over Kannou, Kawamura, and Kaun; Claims 1–9 and 11–19 over Kannou, Kawamura, and Kubota; and Claims 1–9 and 11–19 over Kannou, Kawamura, and Myerberg

Petitioner contends the subject matter of claims 10 and 20 would have been obvious over the combined disclosures of Kannou, Kawamura, and Kaun, and that the subject matter of claims 1–9 and 11–19 would have been obvious over either the combination of Kannou, Kawamura, and Kubota or the combination of Kannou, Kawamura, and Myerberg. Pet. 62–84. In each of these grounds, Petitioner relies on its reasons for combining Kannou and Kawamura discussed above. *Id.* at 62, 70–71, 78. Accordingly, for the reasons set forth above, Petitioner fails to demonstrate a reasonable likelihood that any of claims 1–20 would have been obvious over the combination of Kannou, Kawamura, and Kaun/Kubota/Myerberg.

III. CONCLUSION

For the reasons set forth herein, Petitioner does not demonstrate a reasonable likelihood that it would prevail in showing that any of the challenged claims (claims 1–20) are unpatentable. As such, the Petition is denied.

IV. ORDER

In consideration of the foregoing, it is hereby:

ORDERED that the Petition is denied.

FOR PETITIONER:

Paul Ragusa
Jennifer Tempesta
BAKER BOTTS LLP
paul.ragusa@bakerbotts.com
jennifer.tempesta@bakerbotts.com

Scott McKeown
ROPES & GRAY LLP
Scott.mckeown@ropesgray.com

FOR PATENT OWNER:

H. Michael Hartmann
Wesley Mueller
Robert Wittmann
Paul Filbin
Brent Chatham
LEYDIG, VOIT & MAYER, LTD
mhartmann@leydig.com
wmueller@leydig.com
bwittmann@leydig.com
pfilbin@leydig.com
bchatham@leydig.com