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<th>APPLICATION NO.</th>
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**EXAMINER**
CHMIELECKI, SCOTT J

**ART UNIT**
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

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A. STATEMENT OF THE CASE

The Appellants filed an appeal under 35 U.S.C. § 134(a) from an Examiner’s decision finally rejecting claims 1 and 6–8. We have jurisdiction under 35 U.S.C. § 6(b).

We AFFIRM.

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1 The real party in interest is said to be HITACHI MAXELL, LTD. Appeal Brief dated September 23, 2016 (“Br.”), at 1.
2 Claims 9–17 are also pending but have been withdrawn from consideration.
Representative claim 1 is reproduced below from the Claims Appendix of the Appeal Brief. The limitations at issue are italicized.

1. A battery module comprising three or more thin plate batteries that are placed one on top of the other, the three or more thin plate batteries each having a substantially rectangular shape as viewed from above, wherein

   the three or more thin plate batteries each have a front side, a pair of lateral sides adjacent to the front side, an electrode laminate, an electrolyte, a laminate sheet, a positive electrode tab, and a negative electrode tab,

   the electrode laminate and the electrolyte are sandwiched between the laminate sheet, and sides of the laminate sheet meet and are sealed to form a sealing region,

   the positive electrode tab and the negative electrode tab extend from a front sealing part of the sealing region in which the laminate sheet is sealed along the front side,

   a projecting region that corresponds to the electrode laminate projects away relative to the front sealing part, thus creating a level difference between the projecting region and the front sealing part on one side of each of the three or more thin plate batteries,

   all the three or more thin plate batteries are arranged such that the front sides thereof face the same side,

   the positive electrode tab and the negative electrode tab of adjacent thin plate batteries face each other,

   the positive electrode tab and the negative electrode tab that extend from the front side and face each other are electrically connected via a connecting member such that an electrically conducting path is formed to connect the three or more thin plate batteries in series, and

   the electrically conducting path between the adjacent thin plate batteries, which includes the positive electrode tab and the negative electrode tab extending from the front side, is folded at the connecting member along a first folding line that is parallel
to the lateral side adjacent to the front side and is folded at the positive electrode tab and the negative electrode tab along a second folding line that is parallel to the front side such that the connecting member faces the front sealing part and is accommodated in a space created by the level difference.

Br., Claims Appendix 1-2.

The following grounds of rejection are maintained on appeal:

(1) claims 1 and 6 under 35 U.S.C. § 103(a) as unpatentable over Kodama et al.\(^3\) in view of Yoon et al.\(^4\) and Nortoft et al.;\(^5\)

(2) claim 8 under 35 U.S.C. § 103(a) as unpatentable over Kodama in view of Yoon and Nortoft, and further in view of Sanada et al.;\(^6\) and

(3) claim 7 under 35 U.S.C. § 103(a) as unpatentable over Kodama in view of Yoon and Nortoft, and further in view of Houchin-Miller et al.\(^7\)

B. DISCUSSION

The Appellants’ Figures 3B and 3C, reproduced below, illustrate a battery module comprising three thin plate batteries according to one embodiment of the invention.

\(^5\) US 6,773,848 B1, issued August 10, 2004 (“Nortoft”).
Appellants’ Figure 3B is a perspective view of a battery module.

According to the Appellants:

[The positive electrode tab (11p) and the negative electrode tab (11n) that face each other are electrically connected via the connecting member (30a, 30b) such that three or more thin plate batteries (10) are connected in series. The electrically conducting path between the adjacent thin plate batteries is folded along the first folding line (42, 43)[, shown in Appellants’ Figure 3C, reproduced below,] and the second folding line (41, 44)[, shown in Appellants’ Figure 3B, reproduced above,] such that the connecting member (30a, 30b) faces the front sealing part (15f) and is accommodated in a space created by the level difference [, shown in Appellants’ Figure 3C, reproduced below].

Br. 6 (emphasis added).
The Appellants disclose:

The *first folding line* (42, 43) is parallel to the lateral side (14s), and the connecting member (30a, 30b) of the electrically conducting path is folded along the first folding line (42, 43). The *second folding line* (41, 44) is parallel to the front side (14f), and the positive electrode tab (11p) and the negative electrode tab (11n) of the electrically conducting path are folded along the second folding line (41, 44).

Br. 6.

The Examiner does not find that Kodama or Yoon discloses the first and second folding lines recited in claim 1. Rather, the Examiner finds that Kodama discloses a thin plate battery comprising, *inter alia*, positive and negative electrode tabs (31, 32) extending from a front sealing part (10b). Final Act. 3.\(^8\) Kodama Figure 1 is reproduced below.

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\(^8\) Final Office Action dated April 21, 2016.
Kodama Figure 1 is a perspective view of a battery according to one embodiment of the invention.

The Examiner also finds Kodama discloses that a level difference is created between a projecting region (10a) and the front sealing part (10b) on one side of the thin plate battery. Final Act. 3.

The Examiner finds Kodama does not disclose a battery assembly comprising three or more thin plate batteries as recited in claim 1. Final Act. 3. The Examiner, however, finds Yoon discloses a battery assembly comprising three thin plate batteries wherein “the negative tab of one cell faces the positive tab of an adjacent cell and . . . the adjacent tabs are electrically connected via a conducting path that connects all of the thin plate batteries in series.” Final Act. 3. More specifically, the Examiner finds Yoon discloses that bus bars 50 are welded to adjacent cathode and anode terminals to form the conducting path and connect the batteries in
Yoon Figure 4 illustrates three batteries electrically connected in series via bus bars 50.

The Examiner finds that “[o]ne with ordinary skill in the art would realize that providing three thin plate batteries in series would increase the battery module’s output and capacity and facilitate powering medium- and large-sized devices.” Final Act. 4 (citing Yoon ¶ 4). Therefore, the Examiner concludes that it would have been obvious to one of ordinary skill in the art to connect three of the single thin plate batteries disclosed in Kodama via bus bars as disclosed in Yoon “to facilitate powering medium- and large-sized devices.” Final Act. 4.

As for the first and second folding lines recited in claim 1, the Examiner finds Nortoft discloses a stack of thin plate batteries wherein connecting members are folded to save space. Final Act. 4–5 (citing
Nortoft, col. 4, ll. 28–39; annotated Nortoft Fig. 4e). Based on the teachings in Nortoft, the Examiner concludes that it would have been obvious to one of ordinary skill in the art to fold the conducting paths in Kodama’s modified battery assembly, which include bus bars 50, to save space. Final Act. 5.

The Appellants argue:

Nortoft . . . discloses that the positive electrode tab and the negative electrode tab are folded only along a folding line that is parallel to a front side, from which the positive electrode tab and the negative electrode tab extend (i.e., the “second folding line” in the present invention) (see FIG. 4e . . .).

Br. 8 (emphasis omitted). The Appellants argue that Nortoft “does not disclose that the connecting member [that connects the positive and negative electrode tabs] faces a front sealing part and . . . is accommodated in a space created by a level difference between a projecting region and the front sealing part” as recited in claim 1. Br. 8 (emphasis omitted).

The Appellants also argue:

Nortoft . . . does not disclose that the connecting member (see FIGS. 4b to 4d . . . ) that electrically connects the positive electrode tab and the negative electrode tab is folded along a folding line that is parallel to a lateral side adjacent to the front side (i.e., the “first folding line” in the present invention).

Br. 8 (emphasis omitted).

Significantly, the Appellants’ arguments do not consider the prior art as a whole. See In re Keller, 642 F.2d 413, 425 (CCPA 1981) (the test for obviousness is what the combined teachings of the references would have

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9 Annotated Nortoft Figure 4e is reproduced on page 6 of the Final Office Action.
suggested to one of ordinary skill in the art). There is no dispute on this record that Nortoft discloses a second folding line as recited in claim 1 (i.e., a line that is parallel to the front side of the battery). See Br. 8. In the modification proposed by the Examiner, when the conducting path\(^\text{10}\) of Kodama’s modified battery assembly is folded along the second folding line disclosed in Nortoft, the conducting path faces Kodama’s front sealing part (10b) and is accommodated in a space created by the level difference between Kodama’s projecting region (10a) and front sealing part (10b). Likewise, when two adjacent batteries in Kodama’s modified battery assembly are folded along the first folding line disclosed in Nortoft (i.e., a line that is parallel to the lateral side adjacent to the front side of the battery),\(^\text{11}\) bus bar 50 in Kodama’s modified battery assembly is also folded along the first folding line because the conducting path bridges the two adjacent batteries. See Yoon Fig. 4.

The Appellants also argue that the battery assembly disclosed in Nortoft includes a circuit board 5 that prevents Nortoft’s assembly from being folded as recited in claim 1. Br. 8–9. As explained by the Examiner, “[t]he rejection in no way states or even suggests including the circuit board in the structure [of Kodama].” Ans. 8.\(^\text{12}\) In that regard, we note that in the § 103(a) rejection on appeal, the Examiner modifies Kodama’s battery, not Nortoft’s battery assembly, to include the first and second folding lines disclosed in Nortoft and recited in claim 1.

\(^{10}\) The conducting path comprises the positive and negative electrode tabs and the connecting member (e.g., Yoon’s bus bar 50).

\(^{11}\) See Nortoft Figs. 3a, 3b.

\(^{12}\) Examiner’s Answer dated December 22, 2016.
Finally, the Appellants summarily argue that the Examiner “has indulged in impermissible hindsight in making the obviousness rejection.” Br. 9. The Appellants, however, do not direct us to any error in the Examiner’s reasons for modifying Kodama as proposed.

For the reasons set forth above, the § 103(a) rejection of claim 1 is sustained.

The Appellants do not present arguments in support of the separate patentability of any of claims 6–8. Therefore, the § 103(a) rejections of claims 6–8 also are sustained.

C. DECISION

The Examiner’s decision is affirmed.

No time period for taking any subsequent action in connection with this appeal may be extended under 37 C.F.R. § 1.136(a)(1).

AFFIRMED