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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

Ex parte KOJI MINAMITANI

Appeal 2019-004981
Application 14/702,920
Technology Center 1700

Before MICHAEL P. COLAIANNI, GEORGE C. BEST, and
DEBRA L. DENNETT, *Administrative Patent Judges*.

COLAIANNI, *Administrative Patent Judge*.

DECISION ON APPEAL

Pursuant to 35 U.S.C. § 134(a), Appellant¹ appeals from the Examiner's decision to reject claims 1, 3, 5–7, and 13. We have jurisdiction under 35 U.S.C. § 6(b).

We AFFIRM.

Appellant's invention is directed to an electrochemical device using a laminated material as an armoring body (Spec. ¶ 1). The Specification

¹ We use the word "Appellant" to refer to "applicant" as defined in 37 C.F.R. § 1.42. Appellant identifies the real party in interest as Showa Denko Packaging Co., LTD. (Appeal Br. 2).

describes that the armoring body can be used to armor lithium ion/polymer secondary batteries, which are loaded on mobile devices (*id.* ¶ 3). The laminated armoring material includes a metal foil employed in the center of resin layers (*id.* ¶ 5). According to the Specification, removing a resin layer to expose the metal foil allows the foil to be used as a conductor or a soldering section (*id.*; Claim 1; Figs. 1A, 4A).

Claim 1 is representative of the subject matter on appeal:

1. An electrochemical device comprising:

a device main body including a plurality of layers of each of a positive electrode and a negative electrode laminated to each other via a separator; and

an armoring body for accommodating the device main body; wherein

the armoring body is constituted by a laminated armoring material in which a heat-resistant resin layer is adhered to a first surface of a metal foil layer and a thermal fusion resin layer is adhered to a second surface of the metal foil layer;

at least one portion of the laminated armoring material has a concave portion for storing the device main body, and a flange that outwardly extends from an opening edge of the concave portion;

the concave portion includes a side surface and a flat bottom surface;

a metal exposed section in which the metal foil layer is exposed is formed on the first surface and the second surface of the metal foil layer as a conductive section;

each of the heat-resistant resin layer, the metal foil layer, and the thermal fusion resin layer of the laminated armoring material is located within the concave portion, forms the concave portion and the flange, and includes a side surface and a flat bottom surface that corresponds to the side surface and the flat bottom surface of the concave portion;

the metal exposed section on the second surface of the metal foil layer is formed at a portion of the flat bottom surface of the concave portion; and

a terminal end of at least one of the positive electrode and the negative electrode of the device main body is joined to the conductive section in the armoring body.

Appellant appeals the following rejections:

1. Claims 1, 5–7, and 13 are rejected under 35 U.S.C. § 103 as unpatentable over Langan et al. (US 2003/0059673 A1; pub. Mar. 27, 2003; “Langan”) in view of Yamashita et al. (US 2002/0142178 A1; iss. Oct. 3, 2002; “Yamashita”).
2. Claim 3 is rejected under 35 U.S.C. § 103 as unpatentable over Langan in view of Yamashita, and further in view of Yageta et al. (US 2009/0081542 A1; pub. Mar. 26, 2009; “Yageta”).
3. Claims 1, 6, and 7 are rejected under 35 U.S.C. § 102(a)(1) or § 102(a)(2) as anticipated by Fukuzawa et al. (JP 2004-031272; pub. Jan. 29, 2004, and relying on a machine translation; “Fukuzawa”).²
4. Claim 3 is rejected under 35 U.S.C. § 103 as unpatentable over Fukuzawa in view of Yageta.
5. Claims 5 and 13 are rejected under 35 U.S.C. § 103 as unpatentable over Fukuzawa in view of Langan.

² The Examiner and Appellant refer to JP 2004-031272 as “Nissan.” The translation indicates that Fukuzawa is the first named inventor on the JP 2004-031272 reference. Accordingly, we refer to JP 2004-031272 as Fukuzawa in this decision.

FINDINGS OF FACT & ANALYSIS

Rejection (1): *Obviousness over Langan in view of Yamashita*

Appellant argues independent claim 1 separately (Appeal Br. 3–10). Appellant’s argument regarding dependent claims 5–7 and 13 rely on arguments made regarding claim 1 (*id.* at 10). Therefore, claims 5–7 and 13 will stand or fall with claim 1.

Claim 1

The Examiner’s finding and conclusions regarding claim 1 are located on pages 2 to 4 of the Final Action and pages 3 to 5 of the Answer.

The Examiner finds that Langan teaches the features of the electrochemical device of claim 1, but fails to teach, *inter alia*, a flange that outwardly extends from an opening edge of the concave portion, which stores a device main body (Ans. 3–4). The Examiner finds that Langan does not teach that the concave portion includes a side surface and a flat bottom surface (*id.* at 4). The Examiner finds that Langan also does not teach that that a laminated armoring material’s heat resistant layer, metal foil layer, and thermal fusion resin layer: (i) forms the concave portion and the flange and (ii) includes a side surface and a flat bottom surface that corresponds to the side surface and the flat bottom surface of the concave portion (*id.*).

Langan's figure 1, as annotated by the Examiner and reproduced below, illustrates a cross sectional view of a battery:

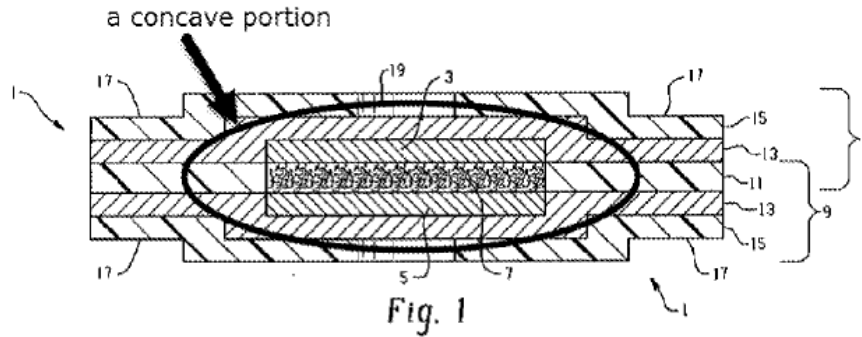


Figure 1 illustrates battery 1, including anode 3, cathode 5, separator 7 within housing or enclosure 9 (Langan ¶ 19). Langan's housing 9 material comprises conductive layer 13 sandwiched between pressure sealable polymer layer 11 and outer protective polymer layer 15 (*id.* ¶ 21). Langan's opening 19 in housing 9 forms an electrical contact of battery 1 by exposing a portion of the surface of conductive layer 13 (*id.* ¶ 26).

The Examiner finds that Yamashita teaches the limitations missing from Langan (Ans. 4–5). In particular, the Examiner finds that Yamashita teaches

the desirability for the armoring body to include a flange 9 that outwardly extends from an opening edge of the concave portion (hollow part 7), the concave portion includes a side surface (side wall 8) and a flat bottom surface (outer package body 5a), and that each of the heat resistant layer 61, metal foil layer 62, and thermal fusion resin layer 63 form[s] the concave portion and the flange and includes a side surface and a flat bottom

surface that corresponds to the side surface and the flat bottom surface of the concave portion.

(*Id.*). Yamashita's figure 2, reproduced below, illustrates views of different types of polymer battery module packages:

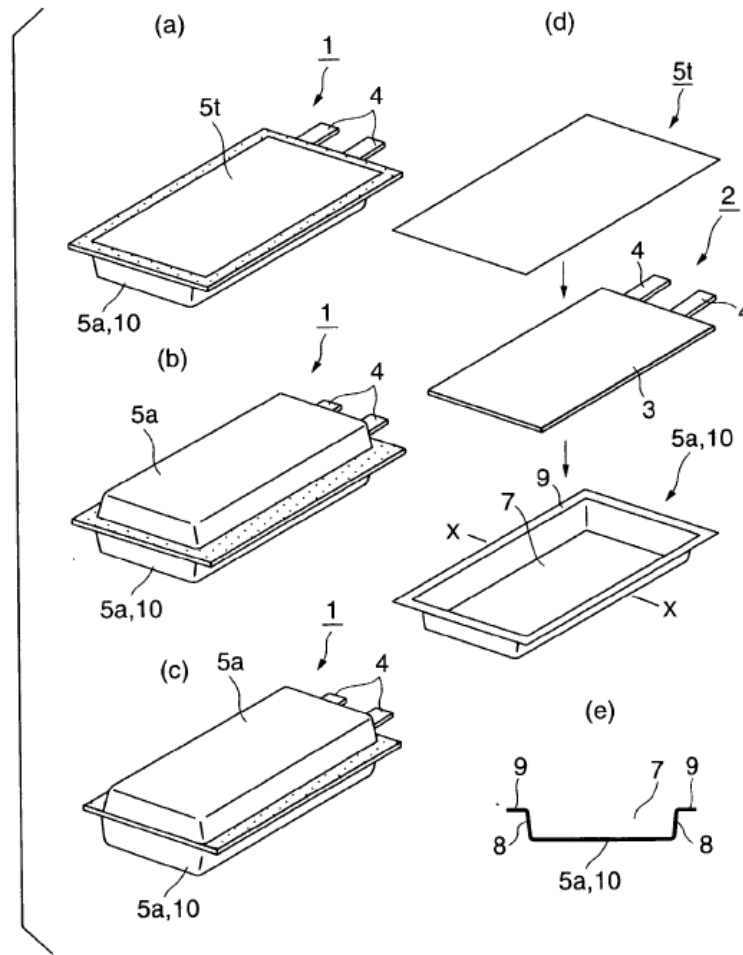


FIG.2

Figures 2(d) and 2(e) illustrate, *inter alia*, the formation of polymer battery 1, including polymer package body 5a, which is formed by embossing packaging laminated sheet 10 to thereby provide sheet 10 with hollow part 7 and flange 9 (Yamashita ¶ 46). Yamashita's polymer battery module 2 is placed in hollow part 7 of package body 5a; cover 5t is formed

by cutting packaging laminated sheet 10; and cover 5t is bonded to flange 9 of package body 5a by heat-sealing (Yamashita ¶ 46).

The Examiner finds Yamashita teaches that “forming the package bodies 5a with flanges and sidewalls[,] that rise as upright as possible[,] allow for the battery module 2 to be closely contained within the package . . . increasing the efficiency of the device” (Ans. 5 (citing Yamashita ¶¶ 46–50)). The Examiner concludes that it would have been obvious at the time of the invention to have formed Langan’s housing assembly with Yamashita’s flange, sidewalls, and flat bottom surfaces, which define the hollow section, in order to have close contact with the battery cells (Ans. 5).

Appellant argues that, given the context of Langan’s invention, the Examiner’s motivation for one of ordinary skill in the art to have modified Langan, in view of Yamashita, is illogical (Appeal Br. 7–8). Specifically, Appellant contends that the ordinarily skilled artisan would not have formed Langan’s housing assembly with Yamashita’s sidewalls, which rise as upright as possible to allow for a battery module to be closely contained within a package, because the sidewalls of Langan’s housing 9 “are already perfectly upright and in close contact with the device main body” (*id.* at 7; *see* Langan Fig. 1). Appellant argues that “the Examiner’s purported motivation to modify Langan in view of Yamashita is not supported by any prior art or evidence, and instead is entirely based on improper hindsight” (Appeal Br. 7). We agree.

The Examiner has not adequately shown why one of ordinary skill in the art would have viewed Yamashita’s upright sidewalls 8 as a modification that would have improved Langan’s housing 9. We find that the Examiner engaged in impermissible hindsight in rejecting claim 1.

On this record, we reverse the Examiner's § 103 rejection of claims 1, 5–7 and 13.

Rejection (2): *Obviousness of claim 3 over Langan in view of Yamashita and Yageta*

Appellant relies on arguments made regarding claim 1 (*id.* at 10). We find those arguments unpersuasive for the reasons noted above.

We reverse the Examiner's § 103 rejection of claim 3.

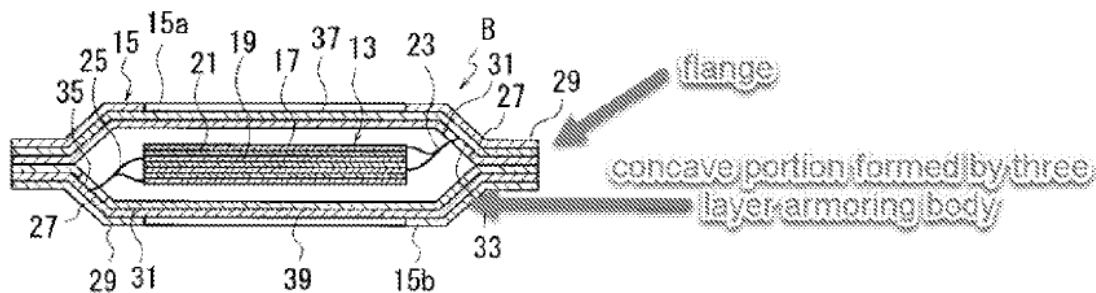
Rejection (3): *Anticipation of claims 1, 6, and 7 by Fukuzawa*

Appellant argues independent claim 1 separately (Reply Br. 2–3). Appellant's argument regarding dependent claims 6 and 7 rely on arguments made regarding claim 1 (*id.* at 3). Therefore, claims 6 and 7 will stand or fall with claim 1.

Claim 1

The Examiner finds that independent claim is anticipated by Fukuzawa (Ans. 7–8).

Figure 1 of Fukuzawa, as annotated by the Examiner and reproduced below, illustrates a cross sectional view of a battery:



Fukuzawa's figure 1 illustrates battery unit B, including electrode laminate 13 in which positive electrode plate 17, separator 21, and negative

electrode plate 19 are laminated and sealed to form outer case 15 made of laminate films 15a and 15b (Fukuzawa 1). Fukuzawa's laminate films 15a and 15b include outer resin layer 29, inner resin layer 31, on both surfaces of aluminum layer 27 (*id.*). Fukuzawa's figure 1 illustrates, *inter alia*, that a part of outer resin layer 29 is peeled off to form negative electrode terminal contact portion 39, in which aluminum layer 27 is exposed (*id.*).

The Examiner finds that Fukuzawa describes each feature of the electrochemical device of claim 1, including

an armoring body for accommodating the device main body; wherein the armoring body is constituted by a laminated armoring material in which a heat-resistant resin layer (inner resin layer 31) is adhered to a first surface of a metal foil layer (aluminum layer 27) and a thermal fusion resin layer (outer resin layer 29) is adhered to a second surface of the metal foil layer.

(Ans. 7).

Appellant argues that Fukuzawa does not anticipate claim 1 (Reply Br. 2). Specifically, Appellant argues that Fukuzawa does not describe a metal exposed section, which is formed at a portion of the flat bottom surface of the concave portion (*id.* at 3). Appellant argues that Fukuzawa's "metal exposed section is formed at a side surface of a concave portion and, thus, it is impossible to form a deep concave portion" (*id.*).

Appellant's argument does not persuade us that the Examiner reversibly erred. Contrary to Appellant's position, claim 1 does not require formation of "a deep concave portion" (*id.*). Furthermore, Appellant's focus on Fukuzawa's terminal contact portion 35 at a concave portion's side surface is misplaced (*see id.*). Claim 1 does not require that an electrode's terminal end must join the armoring body's conductive section only at "the

metal exposed portion . . . formed at a portion of the flat bottom surface of the concave portion.” Rather, claim 1 does not restrict where the connection between an electrode’s terminal end and the conductive section takes place. Therefore, it is not dispositive that Fukuzawa’s electrode current collector 25 is joined to exposed aluminum layer 27 at a side surface of a concave portion (*see* Fukuzawa Fig. 1). As the Examiner finds, claim 1 reads on Fukuzawa’s “metal exposed section []39 on the second surface of the metal foil layer 27 []formed at a portion of the flat bottom surface of the concave portion” (Ans. 8).

We find that the preponderance of the evidence favors the Examiner’s finding of anticipation. On this record, we affirm the Examiner’s § 102(a)(1) or § 102(a)(2) rejection of claims 1, 6, and 7.

Rejection (4): *Obviousness of claim 3 over Fukuzawa in view of Yageta*

Appellant relies on arguments made regarding claim 1 (Reply Br. 3). We find those arguments unpersuasive for the reasons noted above.

We affirm the Examiner’s § 103 rejection of claim 3.

Rejection (5): *obviousness of claims 5 and 13 over Fukuzawa in view of Langan*

Appellant relies on arguments made regarding claim 1 (Reply Br. 3). We find those arguments unpersuasive for the reasons noted above.

We affirm the Examiner’s § 103 rejection of claims 5 and 13.

CONCLUSION

In summary:

Claims Rejected	Basis	Reference(s)	Affirmed	Reversed
1, 5–7, 13	§ 103	Langan, Yamashita		1, 5–7, 13
3	§ 103	Langan, Yamashita, Yageta		3
1, 6, 7	§ 102(a)(1), § 102(a)(2)	Fukuzawa	1, 6, 7	
3	§ 103	Fukuzawa, Yageta	3	
5, 13	§ 103	Fukuzawa, Langan	5, 13	
Overall Outcome			1, 3, 5–7, 13	

TIME PERIOD FOR RESPONSE

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

AFFIRMED