

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 IPR2026-00408
U.S. Patent No. 11,699,808

**PETITION FOR *INTER PARTES* REVIEW
OF U.S. PATENT NO. 11,699,808**

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PETITIONER'S EXHIBIT LIST

<i>Exhibit #</i>	<i>Description</i>
1001	U.S. Patent No. 11,699,808 B2 to Tao (“the ’808 patent”)
1002	Prosecution File History of U.S. Patent No. 11,699,808 B2 (“’808 File History”)
1003	Declaration of Ulrich von Sacken, Ph.D.
1004	<i>Curriculum Vitae</i> of Ulrich von Sacken, Ph.D.
1005	Korean Patent No. 10-0591439 B1 to Kim
1006	Japanese Patent App. Pub. No. 2001-250515 to Ueda
1007	U.S. Patent App. Pub. No. 2020/0111999 to Kim
1008	U.S. Patent App. Pub. No. 2014/0017556 to Liu
1009	Chinese Patent Pub. No. 205122651 U to Duan
1010	Japanese Patent App. Pub. No. JP2002-25512 to Arai
1011	U.S. Patent No. 9,350,041 B2 to Chen
1012	U.S. Patent App. Pub. No. 2009/0023058 to Kim
1013	U.S. Patent App. Pub. No. 2007/0264535 to Lee
1014	U.S. Patent No. 6,482,544 B1 to Shiota
1015	U.S. Patent No. 9,178,194 B2 to Park
1016	U.S. Patent App. Pub. No. 2014/0065474 to Werner
1017	U.S. Patent No. 9,379,371 B2 to Ahn
1018	U.S. Patent App. Pub. No. 2016/0087252 to Hong
1019	U.S. Patent No. 9,853,259 B2 to Lee
1020	U.S. Patent App. Pub. No. 2015/0364729 to Jang
1021	Korean App. No. 10-2016-0174845 to Kim
1022	Complaint filed in <i>Ningde Ampere Technology Ltd. V. Zhuhai CosMX Battery Co., Ltd.</i> , Case No. 2:26-cv-00139 (E.D. Tex.)

<i>Exhibit #</i>	<i>Description</i>
1023	Infringement Chart, Exhibit 14, filed <i>Ningde AmpereX Technology Ltd. V. Zhuhai CosMX Battery Co., Ltd.</i> , Case No. 2:26-cv-00139 (E.D. Tex.)
1024	U.S. Patent No. 8,790,817 B2 to Hong

I. INTRODUCTION

Petitioner Zhuhai CosMX Battery Co., Ltd. (“Petitioner” or “CosMX”) requests *inter partes* review (“IPR”) and cancellation of claims 1-27 of U.S. Patent No. 11,699,808 (“the ’808 patent”) to Ningde Amperex Technology Ltd. (“Patent Owner”).

The ’808 patent merely claims a conventional battery structure with a “second part” (flange) of the battery’s package folded during manufacturing. EX1001, 5:57-6:4. Additionally, the ’808 patent claims this part is adhered to a curved side face of the electrode body accommodated in a “first part” (casing) of the battery’s package. *Id.* But these features were well-known in the prior art—and the prosecution history demonstrates they were known to Patent Owner. EX1003, ¶¶[0036]-[0040], [0049]-[0055]. The ’808 patent contends this configuration improves sealing reliability and bonding strength. *See* EX1001, 1:23-25. But such a configuration—along with any benefit associated with such a combination—would have been obvious at the time of the purported invention.

Indeed, Kim-439’s battery accommodates an electrode body with curved side faces in a package having complimentary curved side faces, as well as a curved flange to improve the battery’s capacity. EX1005, p. 3. And Ueda’s package’s flange is folded along the side face with an adhesive layer between the flange and the side face, preventing fluttering of the flange and minimizing the battery’s

footprint. EX1006, ¶¶[0018], [0081]. So a person of ordinary skill in the art (POSA) would have been motivated to add Ueda's known adhesive layer and inward folding technique with Kim-439's battery (already having a folded, curved flange in its battery package) to achieve predictable improvements in bonding strength, compactness, and structural integrity. EX1003, ¶¶[0076]-[0088].

The Examiner apparently allowed the '808 patent based on the adhesive layer feature. *See* EX1002, 44. Patent Owner filed an IDS *after* the application was allowed, citing a prior art reference by Patent Owner that expressly disclosed such an adhesive layer. EX1002, 12-38. Because the IDS did not comply with the timing, fee, and certification requirements (as Patent Owner acknowledged, EX1002, 13), this late-filed information was not considered by the Office. As demonstrated herein, when considering such information, all claims of the '808 patent are unpatentable.

II. GROUNDS FOR STANDING (37 C.F.R. § 42.104(A))

The '808 patent is available for IPR. Petitioner is not barred or estopped from requesting IPR.

III. PRECISE RELIEF REQUESTED (37 C.F.R. § 42.22(a)) AND IDENTIFICATION OF CHALLENGE (37 C.F.R. § 42.104(b))

The Board should institute IPR under 35 U.S.C. §§ 311-319 and 37 C.F.R. §§ 42.1-.80 and 42.100-42.123, and find all claims of the '808 patent unpatentable under AIA 35 U.S.C. § 103(a) based on the following combinations:

Ground	Combination	Claims
1	Kim-439, Ueda	1-18, 20, 23, 24, 25, 27
2	Kim-439, Ueda, Kim-999	19, 21-22, 26

The '808 patent claims priority to a Chinese Utility Model Application, CN 201721567327.2, filed November 17, 2017. The applied art qualifies under § 102(a)(1) or (2):

- **Kim-439, KR Pat. No. 10-0591439**, published June 2, 2006;
- **Ueda, JP 2001-250515**, published September 14, 2001;
- **Kim-999, US 2020/0111999**, effectively filed December 20, 2016.

This Petition is supported by the declaration of Ulrich von Sacken, Ph.D., P.E., an expert in the field of battery materials, operation, manufacture, testing, and reliability and safety. EX1003, ¶¶[0001]-[0026], [0030].

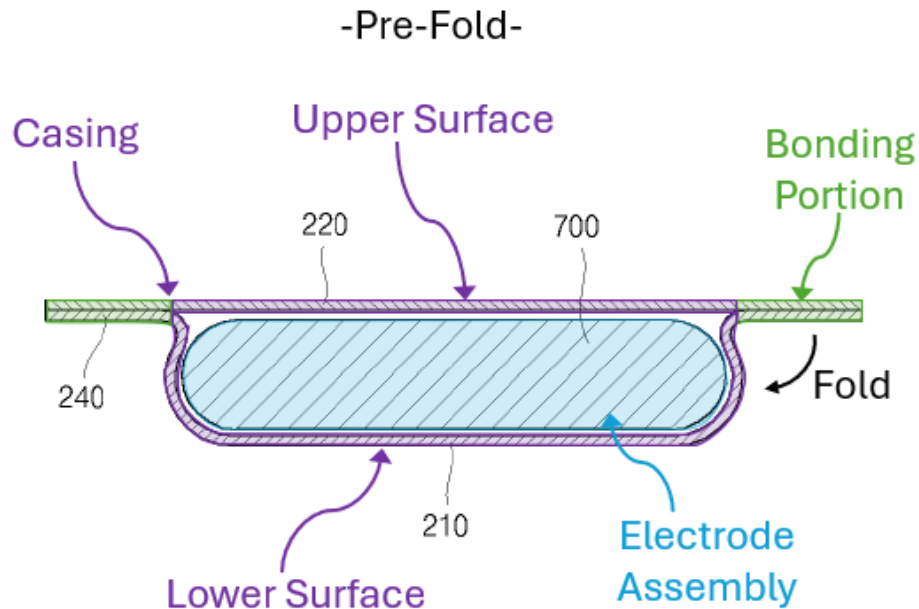
IV. PERSON OF ORDINARY SKILL IN THE ART (“POSA”)

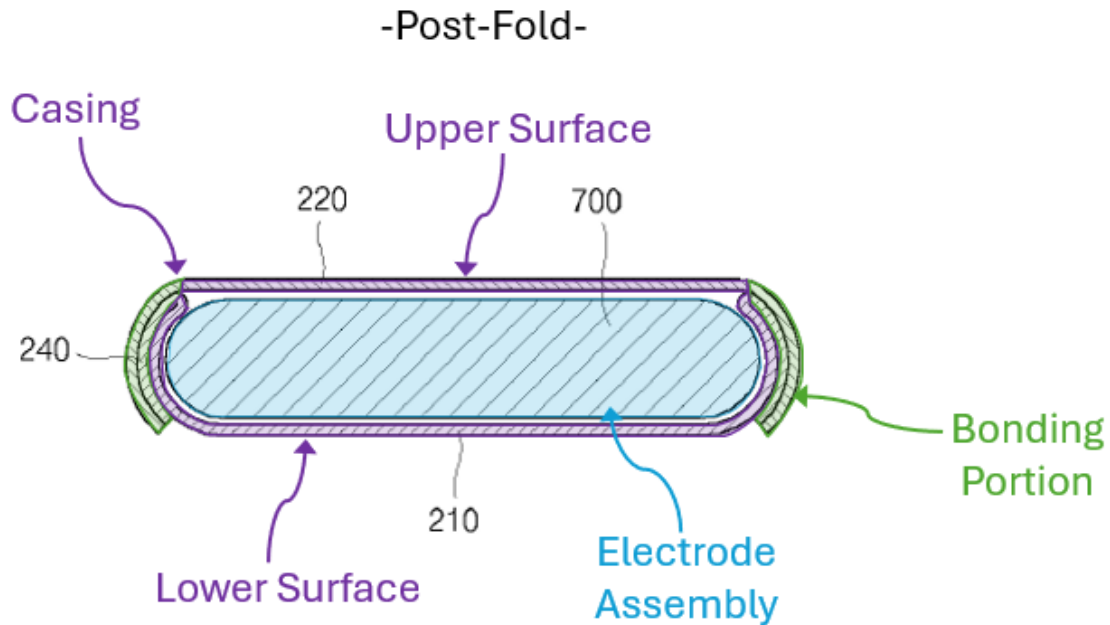
Here, a POSA during the relevant timeframe would have had a Bachelor’s Degree in Physics or an Engineering field relevant to battery technology (e.g., Electrical or Mechanical Engineering) and at least two years of industry experience in battery manufacturing and/or design. EX1003, ¶¶[0027]-[0029].

V. BACKGROUND OF THE ART

Conventional lithium-ion pouch-type batteries include packages formed from laminate metal sheets to enclose the battery’s electrode body. EX1005, p. 2; EX1007, ¶¶[0003]-[0004]; EX1018, ¶[0002]; EX1003, ¶¶[0031]-[0032]. The sheets

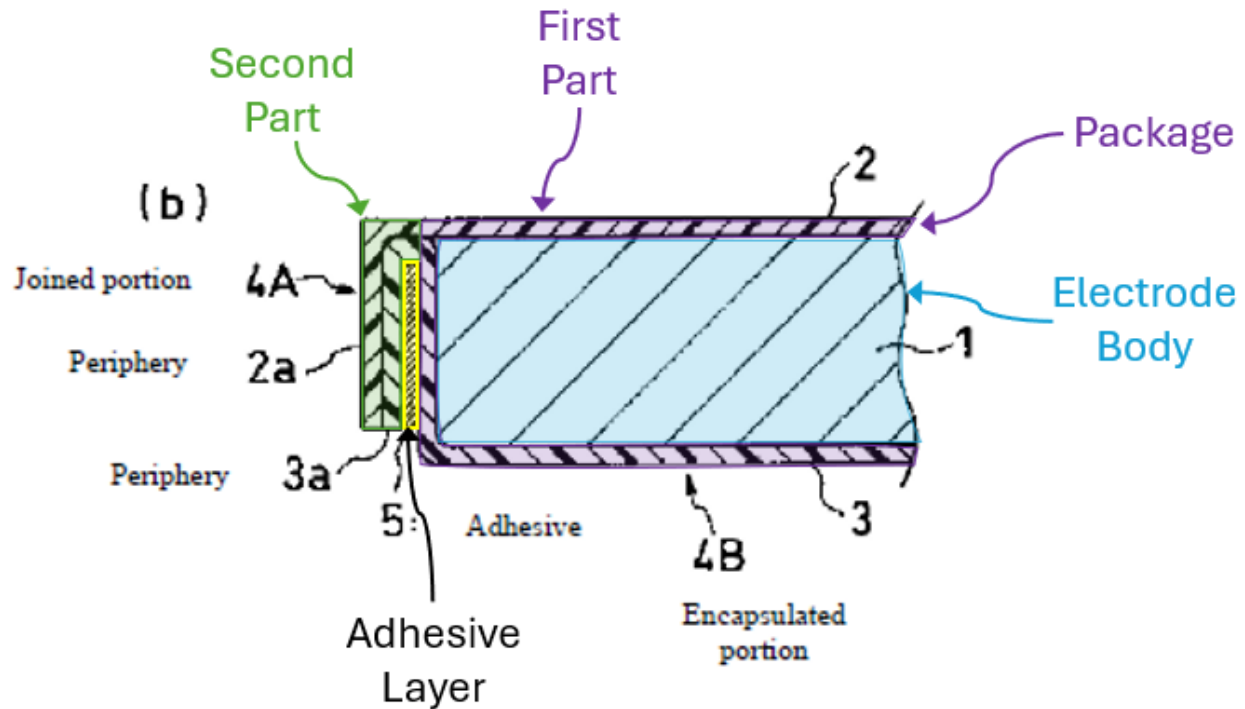
include metal and polymer layers formed into a laminate pouch casing. EX1005, pp. 3-5; EX1006, ¶[0002]; EX1013, ¶[0005]; EX1003, ¶¶[0033]-[0034]. The casing accommodates the electrode body—opposing sheets (e.g., upper/lower surfaces) are brought together and peripherally sealed, encapsulating the electrode body. EX1005, pp. 4-5; EX1009, ¶[0002]; EX1003, ¶¶[0031]-[0032]. The casing's sides are often rounded or curved, and sealing portions (flanges) extend from the main body of the casing before being folded over. EX1005, p. 5; EX1003, ¶¶[0034]-[0035].





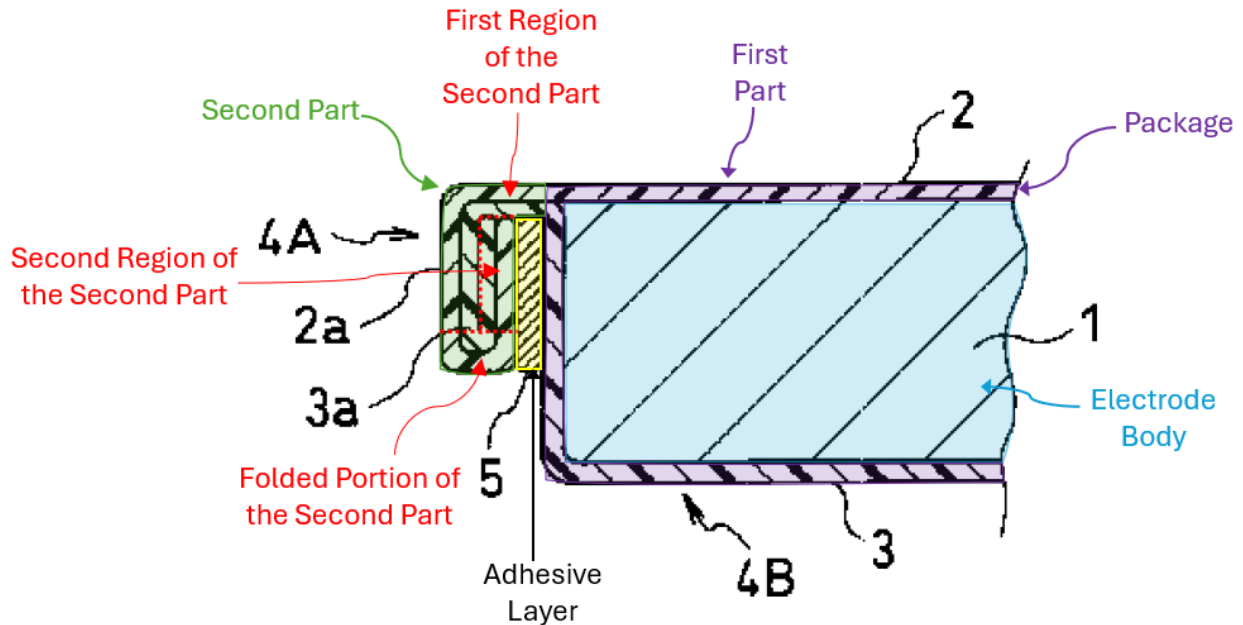
EX1005, FIGS. 4a, 5b (annotated).

Some such batteries were susceptible to deformation or separation of the flange from the casing during handling or operation. EX1006, ¶[0006]; EX1012, ¶[0008]; EX1003, ¶[0036]. But providing an adhesive layer between the casing's side face and the flange was expressly known to address this issue. EX1006, ¶[0015]; EX1007, ¶[0057]; EX1003, ¶[0037]. For example, both Ueda and Kim-999 use an adhesive layer between a folded flange (or tab portion) and the casing side surface for securement, thereby preventing fluttering, bending, or separation of the flange and improving structural integrity of the battery package. EX1006, ¶[0015]; EX1007, ¶[0057]; EX1003, ¶[0037]-[0038].



EX1006, FIG. 1 (annotated).

Additionally, folding the casing's flange inwardly—often two or more times—was understood to provide further benefits. EX1006, ¶[0013]; EX1007, ¶¶[0052]-[0056]; EX1003, ¶[0039]. Folding the flange inwardly allows protruding sealing portions to be repositioned along the side surface of the casing, preventing the flange from increasing the battery's effective thickness or overall footprint. EX1007, ¶¶[0053]-[0054]; EX1003, ¶¶[0039]-[0040]. Multi-fold arrangements also improve sealing reliability by increasing contact area between the flange and casing, which enables more effective adhesive bonding of the laminate sheets, improves structural integrity, and reduces deformation susceptibility. EX1006, ¶¶[0013], [0023], [0030]; EX1003, ¶¶[0039]-[0040].



EX1006, FIG. 2 (annotated).

VI. THE '808 PATENT

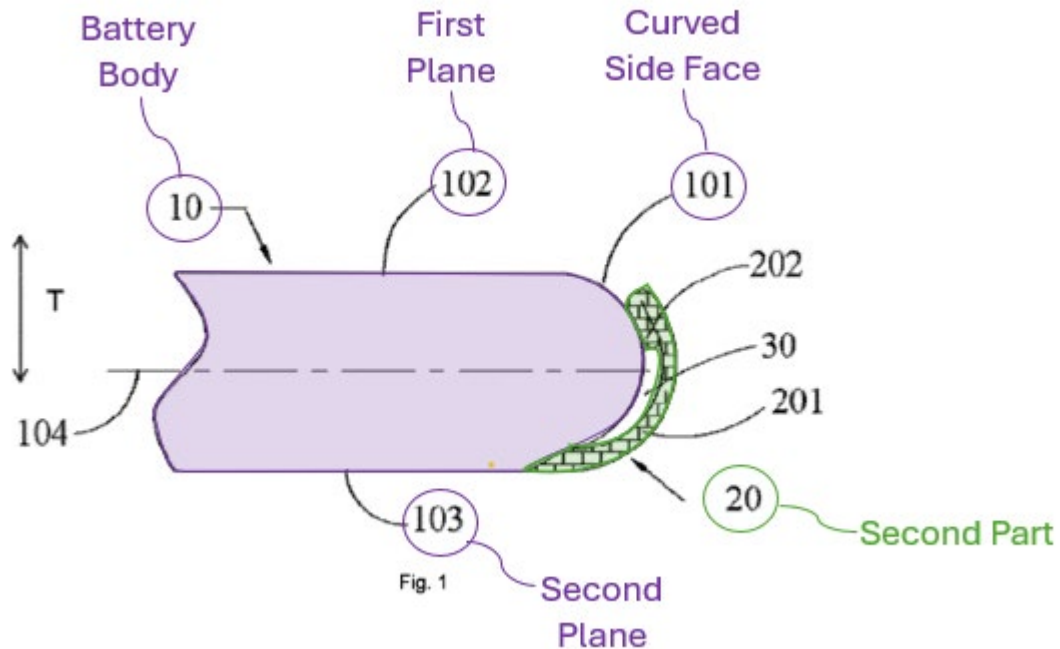
The '808 patent discusses “poor sealing reliability” and space concerns associated with “soft pack” batteries. EX1001, 1:20-25. The '808 patent merely combines common techniques—(i) adhering the package’s flange, via (ii) a curved structure to a curved side face of an electrode body within a package. These were known solutions to improve seal reliability and manage the battery’s footprint.

EX1001, 5:57-6:4; EX1003, ¶¶[0036]-[0040], [0076]-[0088].

A. Specification

The '808 patent’s “battery includes a battery body 10” and “a bare battery [that] is wrapped in the battery body 10.” EX1001, 1:57-58; EX1003, ¶¶[0041]-[0043]. Because battery body 10 wraps around the bare battery, a POSA would have understood that battery body 10 in the specification is an example of the claimed

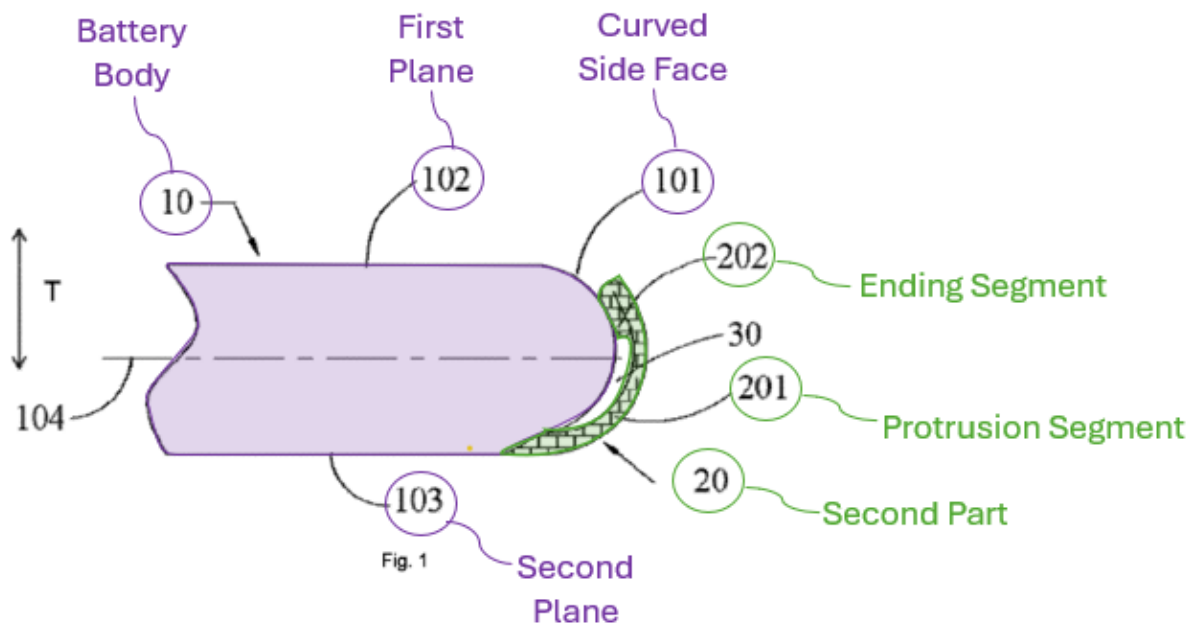
“package” encapsulating the “electrode body.” EX1003, ¶[0043]. This is because battery body 10 serves as an enclosure rather than the active electrode body structure itself (the “bare battery” mentioned in the ’808 patent’s specification). EX1003, ¶[0043]; EX1001, 5:55-61.



EX1001, FIG. 1 (annotated).

Additionally, a POSA would have understood that side face 101, first plane 102, and second plane 103 in the specification collectively provide an example of the claimed “first part”—together they define the portion of the battery that surrounds and houses the internal electrode body, consistent with the claimed “first part” of the package that covers to the electrode body’s surfaces. EX1003, ¶[0044]; EX1001, 5:55-62.

Flange portion 20 includes “protrusion segment 202 [that] is connected to the battery body 10” and “protrudes away from the battery body 10.” EX1001, 2:37-42. A POSA would have understood that flange portion 20 is an example of the claimed “second part” because flange portion 20 extends outwardly from the primary structure (side face 101, first plane 102, and second plane 103) that collectively encloses the electrode body of the battery. EX1003, ¶[0045].

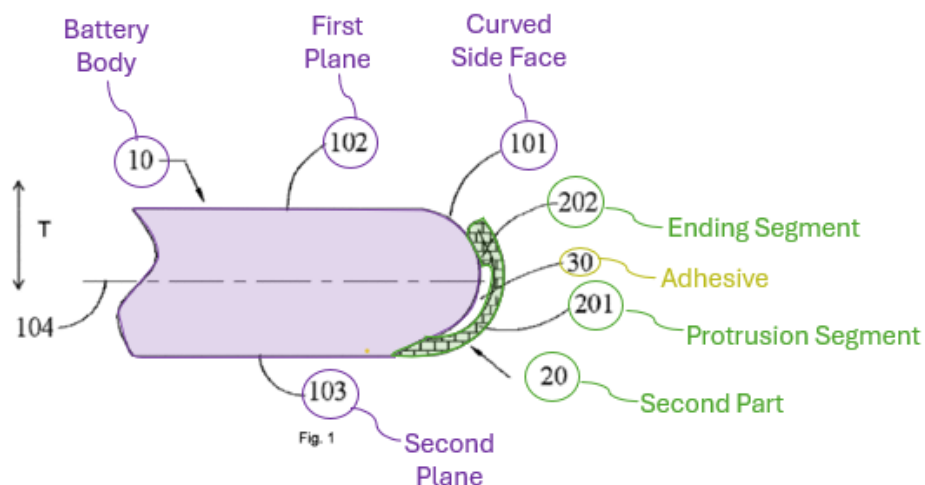


EX1001, FIG. 1 (annotated).

Flange portion 20 may include an “ending segment [that] is connected to an end of the protrusion segment 201” and “connected to the side face 101” of battery body 10. EX1001, 2:40-49. To form the shape of flange portion 20, “protrusion segment 201 is bent from the end of the second plane 103 toward the side where the first plane 102 is located, and the ending segment 202 is bent from the end of the

protrusion segment 201 to the side where the second plane 103 is located.” EX1001, 3:10-14; EX1003, ¶[0046].

A POSA would have understood that protrusion segment 201 is an example of the “first region” of the claimed “second part” because the specification describes protrusion segment 201 as the portion of the flange that initially extends and bends outward from the battery body. EX1003, ¶[0047]. A POSA would have also understood that ending segment 202 is an example of the “second region” of the claimed “second part” because the specification describes ending segment 202 as a further bent portion extending from protrusion segment 201 back toward and into contact with side face 101 of the battery body, thereby forming a distinct, subsequent segment positioned closer to and interfacing with the battery body. EX1003, ¶[0047].



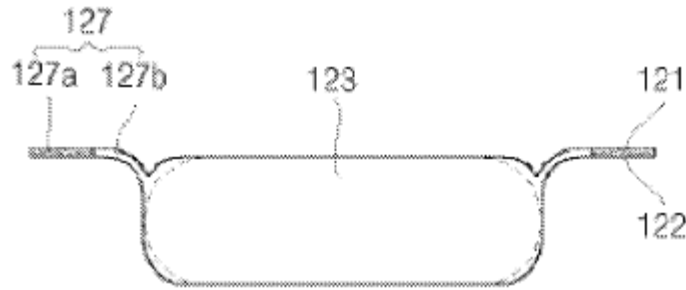
EX1001, FIG. 1 (annotated).

As shown above, the '808 patent's "battery further includes an adhesive layer 30" disposed between "the flange portion 20 and the battery body 10." EX1001, 4:51-65. Specifically, "[a]ny adjacent two of the protrusion segment 201, the ending segment 202, and the side face 101 are bonded by the adhesive layer 30." EX1001, 4:54-65. That is, adhesive layer 30 bonds protrusion segment 201 and ending segment 202 of the flange portion 20 directly to side face 101 of battery body 10 (corresponding to the claimed "package"), *not* the bare battery (corresponding to the claimed "electrode body"). EX1001, 1:57-58, 4:51-65; EX1003, ¶[0048].

B. Prosecution History

The '808 patent issued from U.S. Application No. 17/374,803 (the '803 application), filed as a continuation of U.S. Application No. 16/166,142 (the '142 parent application) on July 13, 2021. EX1001, 1:6-11; EX1003, ¶[0049].

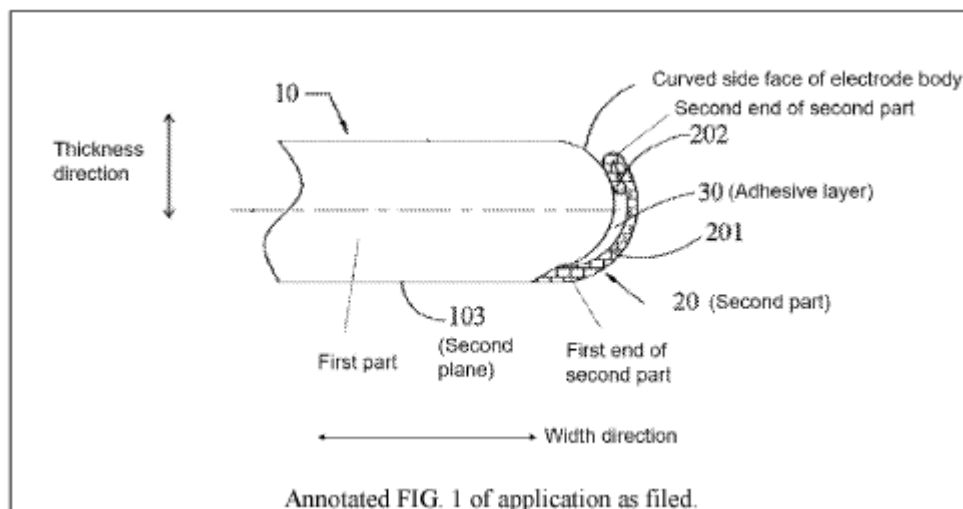
One Office Action issued before allowance. EX1002, 39-46, 75-84. The Examiner rejected: (1) claims 1-7 and 26-28 as anticipated by Korean Patent No. 100670438B1 to Kim (Kim-438), and (2) claims 8-25 as obvious over Kim-438 in view of U.S. Patent App. Pub. No. 2014/0212717 to Ariga (Ariga). EX1002, 75-84. The Examiner stated that wing portion 127 of Kim-438's pouch 120 corresponded to claim 1's "second part" and the heat-sealing layer within the laminate sheet to form Kim-438's pouch 120 corresponded to the "adhesive layer" of original claims 20 and 21. EX1002, 77-82; EX1003, ¶[0050].



EX1002, 70 (showing Kim-438, Figure 6).

In response, Patent Owner amended claim 1 to specify that the second part (flange) curved around and adhered to a curved side face of the electrode body.

EX1001, 63-71. Patent Owner also presented this annotated version of Figure 1:



EX1002, 69: Patent Owner’s Annotated Version of Figure 1 of the ’803 Application.

Patent Owner labeled battery body 10 as corresponding to the “first part” of the package, and identified side face 101 of battery body 10 as the “side face” of the *electrode body*. EX1001, 69. But the ’808 patent describes side face 101 as part of the *battery body* (that is, the way it describes its package), which connects opposing surfaces of the package—not the *electrode body* itself (referred to by the ’808 patent

only as “bare battery”). EX1002, 129-130 (¶¶[0011]-[0013] of the filed specification). This makes sense because the adhesive layer described in the ’808 patent is between the flange (second part) and the side face of the *battery body*, not any surface of the internal *electrode body* (“bare battery,” e.g., the electrode assembly). EX1002, 133-134 (¶[0024] of the filed specification); EX1003, ¶¶[0051]-[0054].

The Examiner accepted Patent Owner’s arguments, stating that the art did not disclose “the second part being adhered to the curved side face of the electrode body via an adhesive layer.” EX1002, 44. The Examiner appears to have treated this adhesive-based attachment as the distinguishing feature. EX1003, ¶[0055]. After allowance, Patent Owner filed an IDS citing *its own reference* that expressly disclosed such an adhesive layer. EX1002, 12-38. The submission acknowledged that the IDS did not comply with 37 C.F.R. § 1.97(a)-(d) and, accordingly, this late-filed information was not considered by the Office. EX1002, 13.

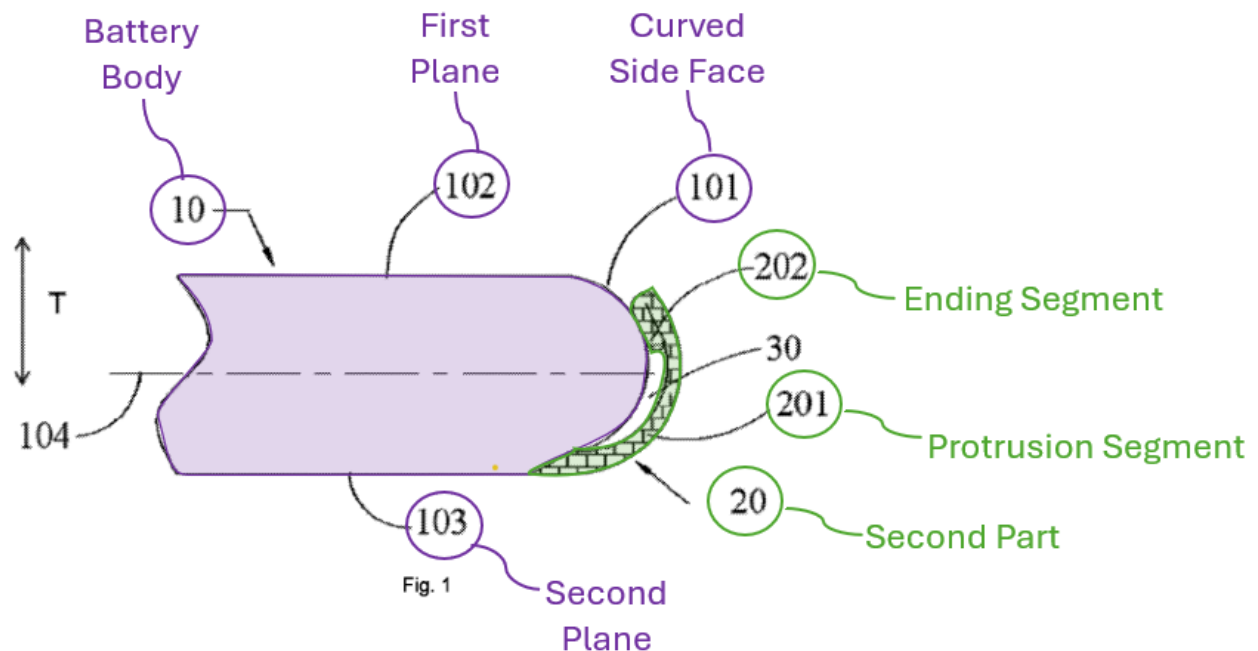
VII. CLAIM CONSTRUCTION

All claim terms should receive their plain and ordinary meaning, in the context of the ’808 patent specification, under *Phillips*. EX1003, ¶[0057]. The following claim elements should be understood as below.

A. Claim 1: “the second part is adhered to the curved side face of the electrode body via an adhesive layer”

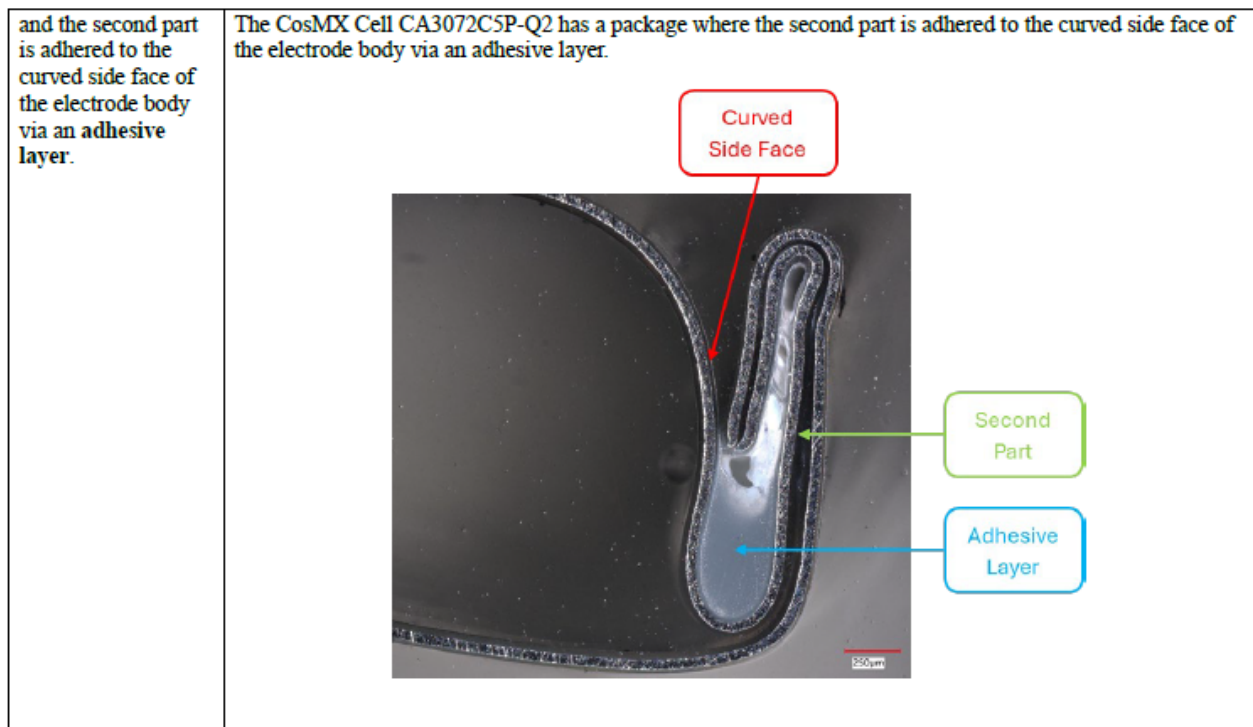
This element should not be construed as requiring direct contact between the second part and the electrode body’s curved side face. EX1003, ¶[0058]. The plain language of the claim does not exclude an intervening layer. And nothing in the claim suggests requiring direct adherence or otherwise disclaiming any intermediate layer(s). So the second part being indirectly adhered to the area where the curved side face of the electrode body is located satisfies this element.

The specification supports this construction—the adhesive layer bonds the protrusion segment 201 and ending segment 202 of the flange portion 20 (corresponding to the claimed “second part”) to the side face (101) of the battery body 10 (the claimed “package”), *not* the bare battery (the claimed “electrode body”). EX1001, 1:57-58, 4:51-65; EX1003, ¶[0059].



EX1001, FIG. 1.

Moreover, Patent Owner's prior infringement allegations point to accused products including intervening package layers between what Patent Owner labels as a second part and an electrode body, respectively. Patent Owner labels an adhesive layer as bonding a labeled second part to a first part of the *package*. See EX1023, 3-8; EX1003, ¶[0060].

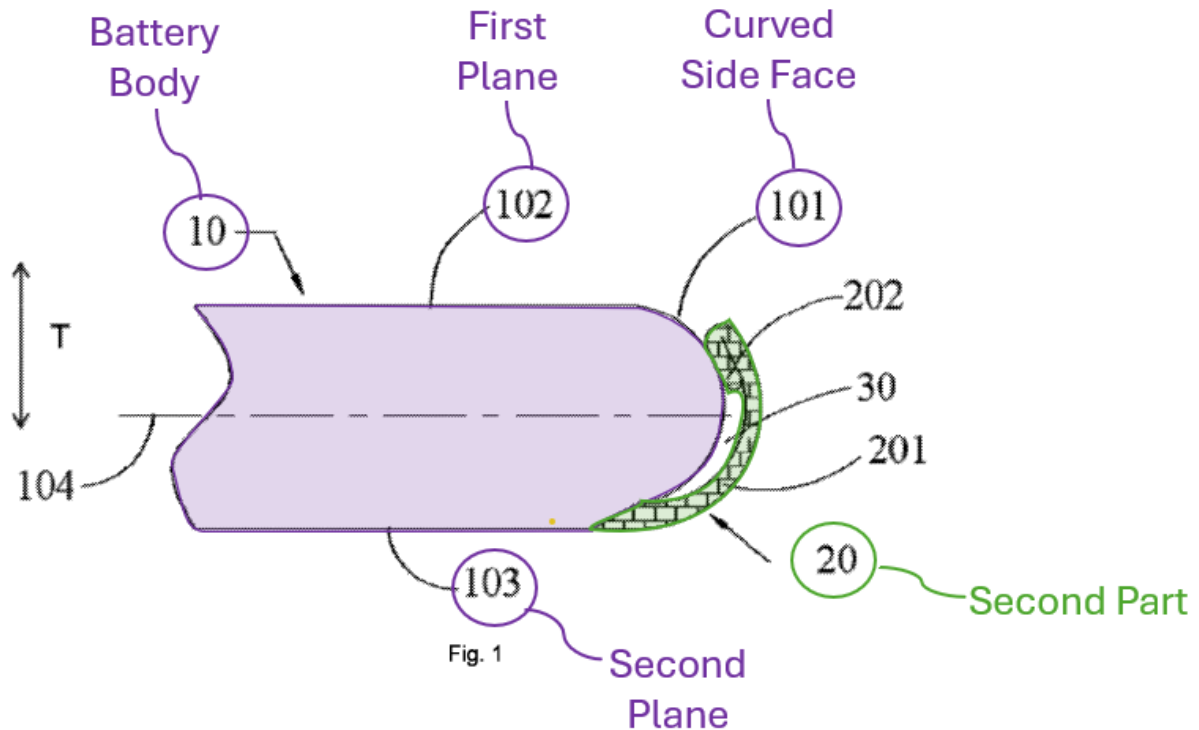


EX1003, ¶60; Patent Owner's infringement chart, EX1023, 3-8.

Accordingly, the Board should not construe claim 1 to require a direct adhesive bond to the electrode body itself, but rather interpret claim 1 as being satisfied by an indirect adhesive bond where the second part is bonded to the package's curved side face. EX1003, ¶[0061].

B. Claim 5: “the first part comprises: ... [a] curved side face [that] connects the first surface and the second surface”

The recited “curved side face” in this element of claim 5 should be construed as a structural element of the recited “first part” of the recited “package,” not the “electrode body,” to be consistent with the ’808 patent’s disclosure. Indeed, in view of the ’808 patent’s written description (EX1001, 1:50-2:1, 4:1-2), a POSA would have understood that battery body 10 corresponds to the recited “package,” as it wraps a bare battery (in other words an “electrode assembly”). EX1001, 1:57-58 (“a bare battery is wrapped in the battery body 10”); EX1003, ¶¶[0062]-[0063]. Furthermore, a POSA would have understood that side face 101 of battery body 10 corresponds to the recited “curved side face” of claim 5 because it is the surface that connects the opposing first and second surfaces of the package and possesses the disclosed curved geometry. EX1003, ¶[0063]. The claim itself supports this, reciting that the curved side face “connects the first surface and the second surface.” EX1001, 6:20-21.



EX1001, FIG. 1.

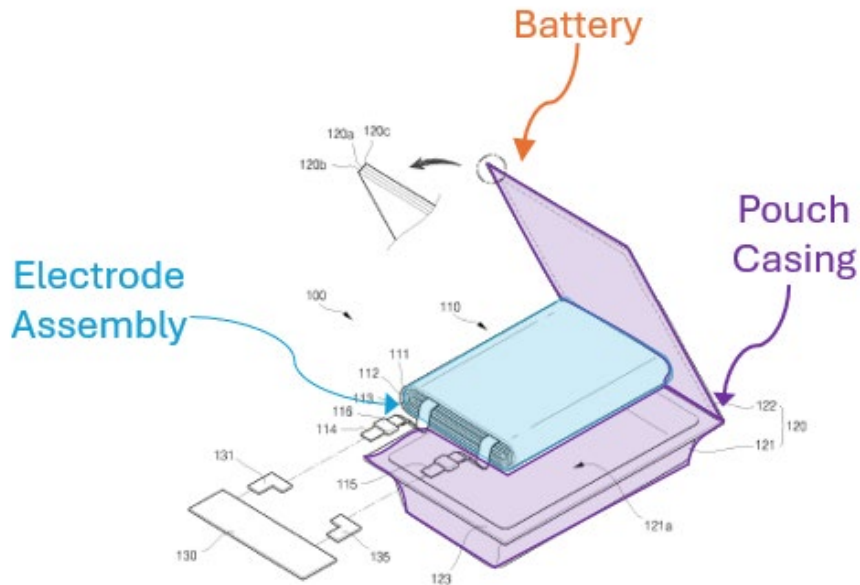
The prosecution history reinforces this interpretation, as the originally-filed claims recited the “side surface” as part of the structure of the first part of the package. EX1002, 136-138. Accordingly, the “curved side face” is a structural element of the first part that connects its first and second surfaces. EX1003, ¶[0064].

VIII. APPLIED REFERENCES

A. Kim-439

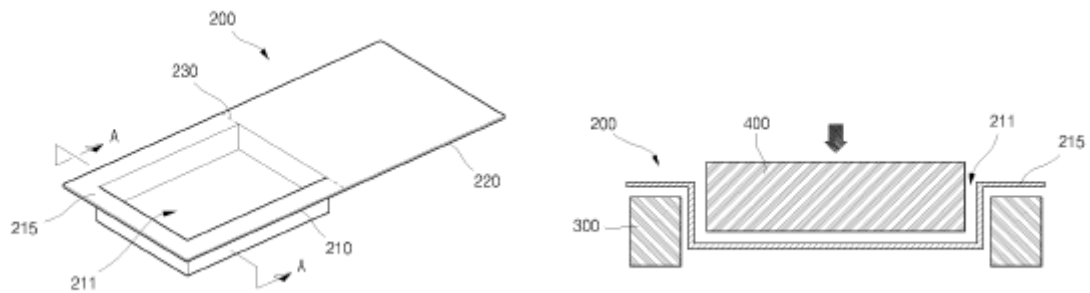
Kim-439 discloses a “pouch-type lithium secondary battery” like the ’808 patent. EX1005, Abstract; EX1001, 1:54-58; EX1003, ¶¶[0065]-[0066]. Kim-439’s battery 100 includes “an electrode assembly (110)” and “pouch casing (120)

accommodating the electrode assembly (110).” EX1005, p. 4; EX1003, ¶¶[0065]-[0066].



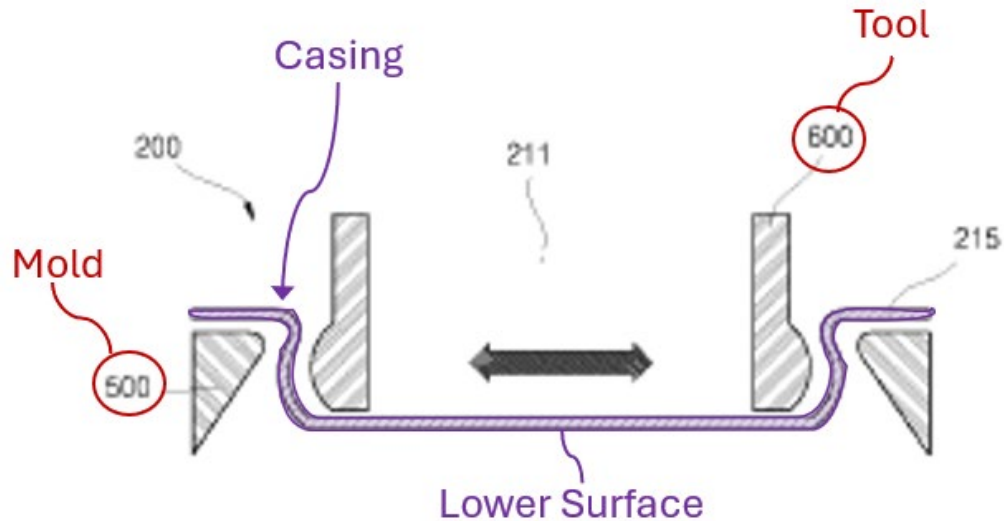
EX1005, FIG. 1a (annotated).

Kim-439 describes its manufacturing in Figures 2a-5b. EX1005, p. 4. Pouch casing 120/200 is formed by placing lower surface 210 “in a mold (300)” and “pressing a portion of the pouch casing (200)” to form “space (211) for accommodating the electrode assembly.” EX1005, p. 5.



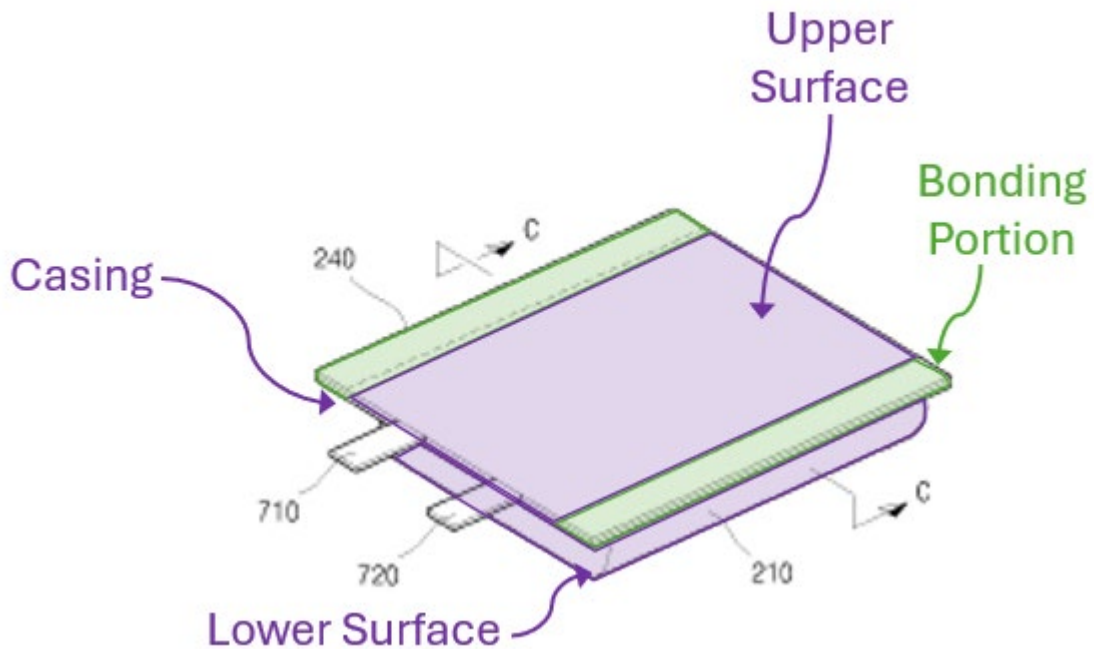
EX1005, FIGS. 2A and 2B

After forming space 211, “two opposing sides” of the pouch casing 120/200 are pressed to form “outwardly rounded sides,” as shown in FIG. 3b. EX1005, p. 5.



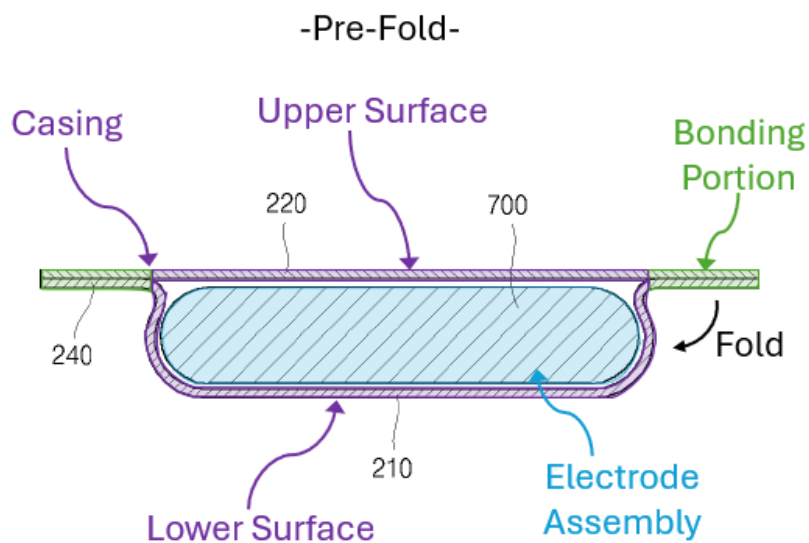
EX1005, FIG. 3b (annotated).

Then, the “upper surface (220) is folded...so that the upper surface (220) contacts the flange (215) of the lower surface (210), and the pouch casing (200) is sealed” to form the package. EX1005, p. 5. Kim-439 bonds “the portion where the flange (215) of the lower surface (210) and the upper surface (220) contact each other” to form a “bonding portion (240).” EX1005, p. 5; EX1003, ¶¶[0067]-[0069].

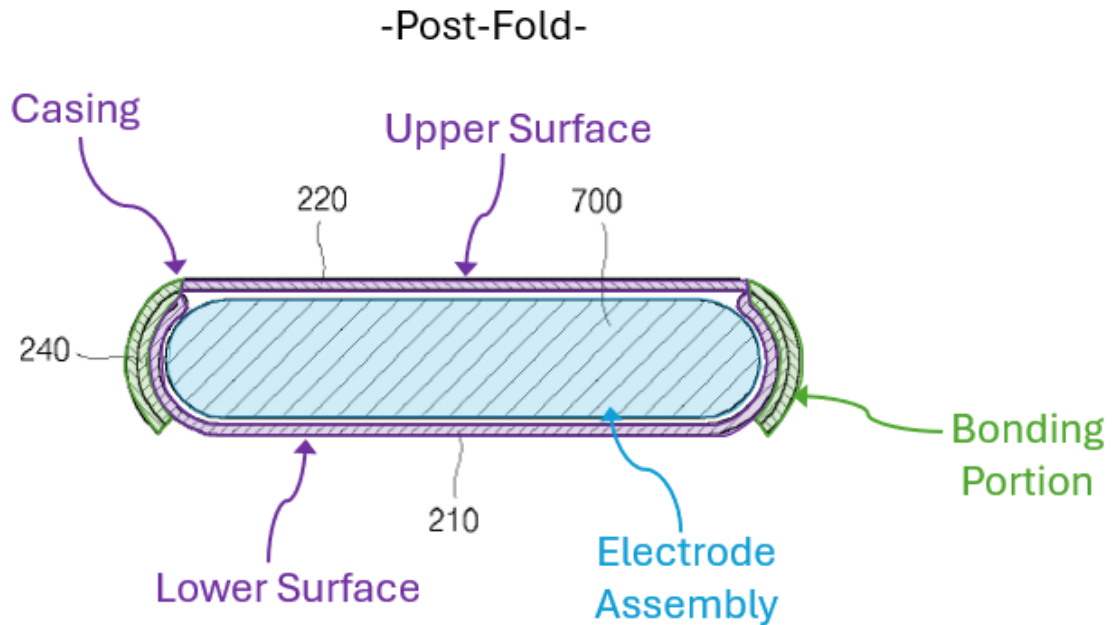


EX1005, FIG. 4b (annotated).

As shown below in Figures 5a and 5b, the “bonding portion (240) is folded along the outwardly rounded sides of the space (211)” EX1005, p. 5; EX1003, ¶[0070].



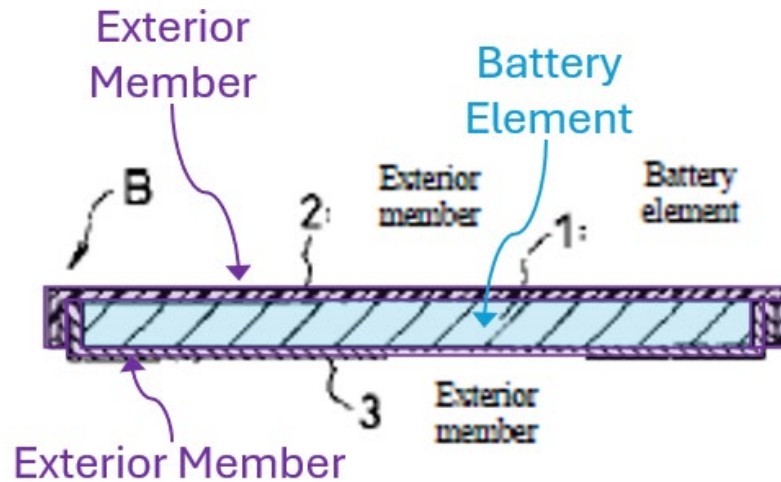
EX1005, FIG. 5a (annotated).



EX1005, FIG. 5b (annotated).

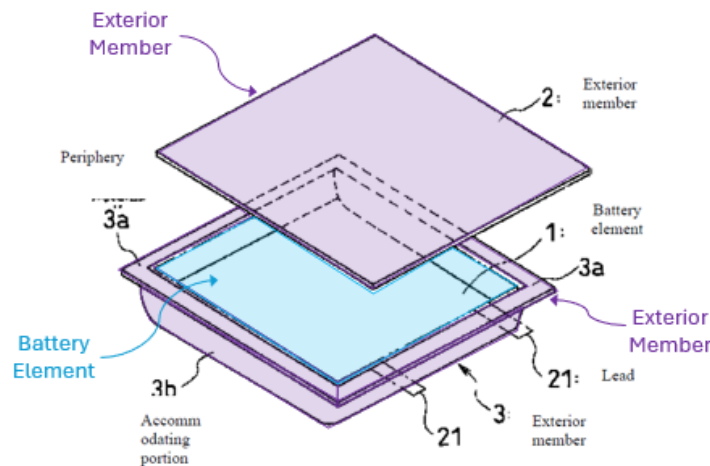
B. Ueda

Ueda discloses a battery like Kim-439 and the '808 patent. EX1006, Abstract; EX1005, Abstract; EX1001, 1:54-58; EX1003, ¶¶[0071]-[0072]. Ueda's battery includes "battery element 1 [that] is encapsulated with exterior members 2 and 3." EX1006, ¶¶[0014]-[0015]. The "battery element is formed by laminating a positive electrode and a negative electrode with an electrolyte layer interposed therebetween." EX1006, ¶¶[0058]-[0059].



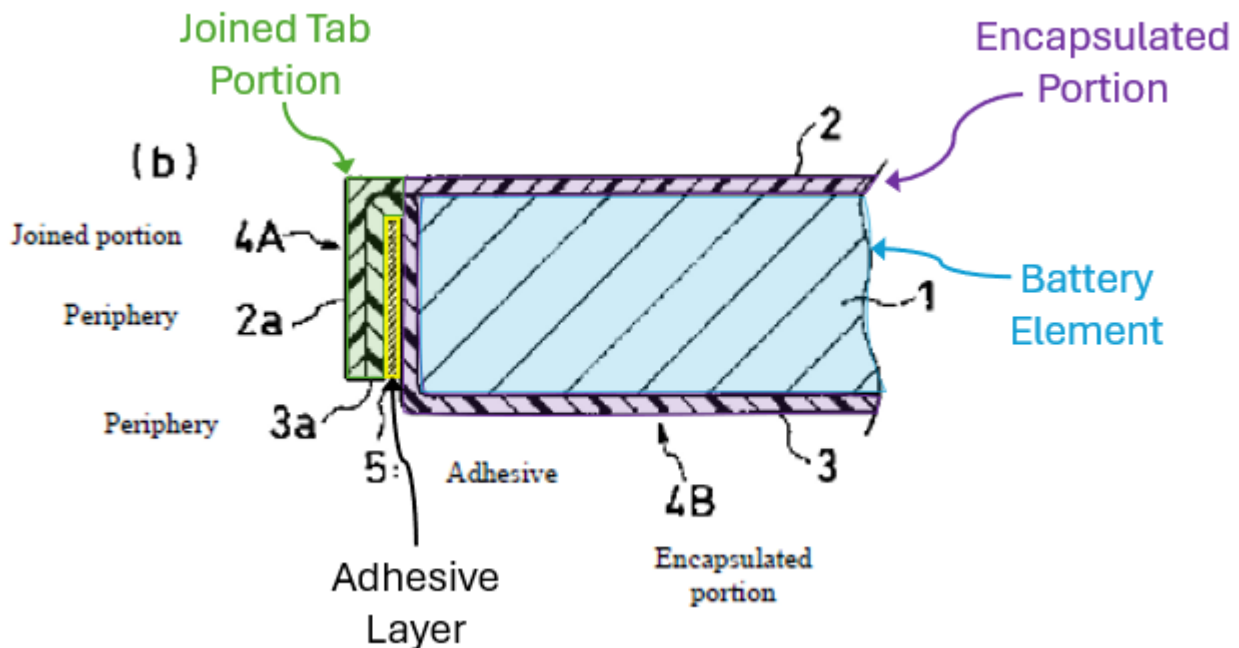
EX1006, FIG. 1a.

Ueda's "exterior member 3 is in the shape of a shallow lidless box having an accommodating portion 3b" and "peripheral portion 3a projecting outward in a flange shape from the four peripheral edges of the accommodating portion 3b." EX1006, ¶[0016], FIG. 4. The "battery element 1 is accommodated within the accommodating portion 3b of this exterior member 3, and the exterior member 2 is placed thereover." EX1006, ¶[0017]; EX1003, ¶[0073].



EX1006, FIG. 4.

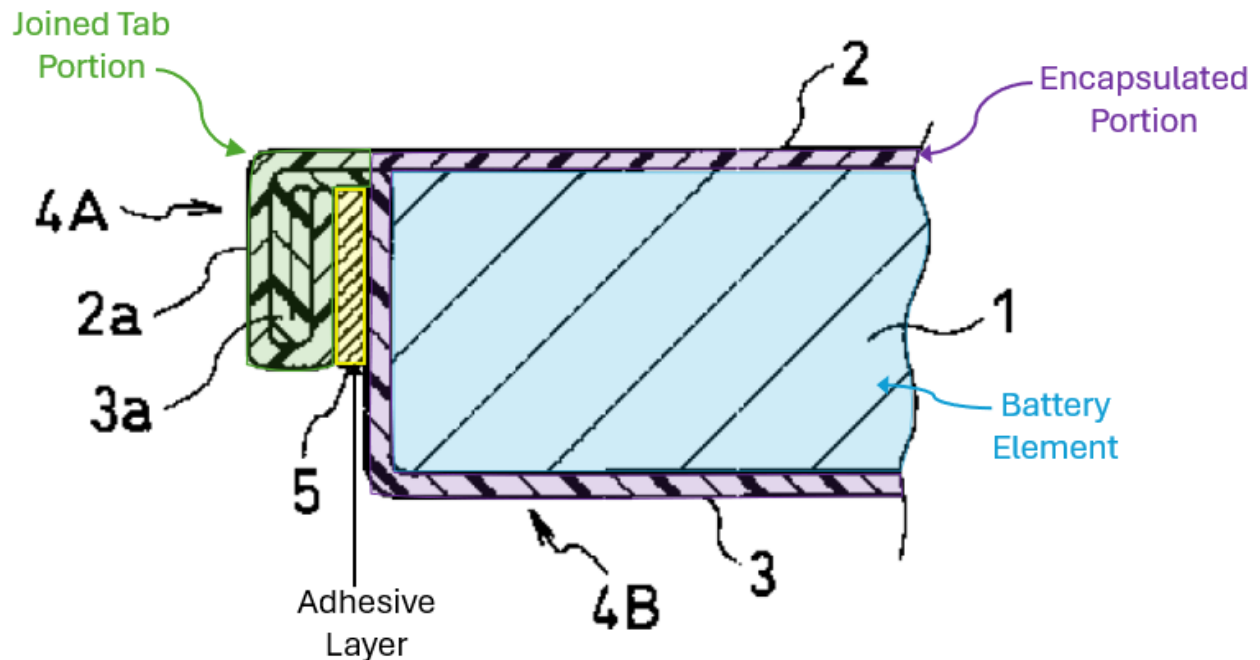
“[T]he peripheral portions 2a and 3a at the four peripheral edges of the exterior members 2 and 3 are airtightly joined to each other” forming a “joined tab portion 4A” that “projects outward from an encapsulated portion 4B that encapsulates the battery element 1.” EX1006, ¶¶[0017]-[0018]. The “joined tab portion 4A is folded so as to follow the encapsulated portion 4B and is adhered to a side surface of the encapsulated portion 4B with an adhesive 5.” EX1006, ¶[0018]. Adhering joined tab portion 4A to a side surface of encapsulated portion 4B “prevents the folded joined tab portion from separating from the encapsulated portion.” EX1006, ¶¶[0008], [0081]; EX1003, ¶[0074].



EX1006, FIG. 1b (annotated).

Ueda’s joined tab portion 4A can be “folded only once along its base,” as shown above in Figure 1b. EX1006, ¶[0023]. Alternatively, the joined tab portion

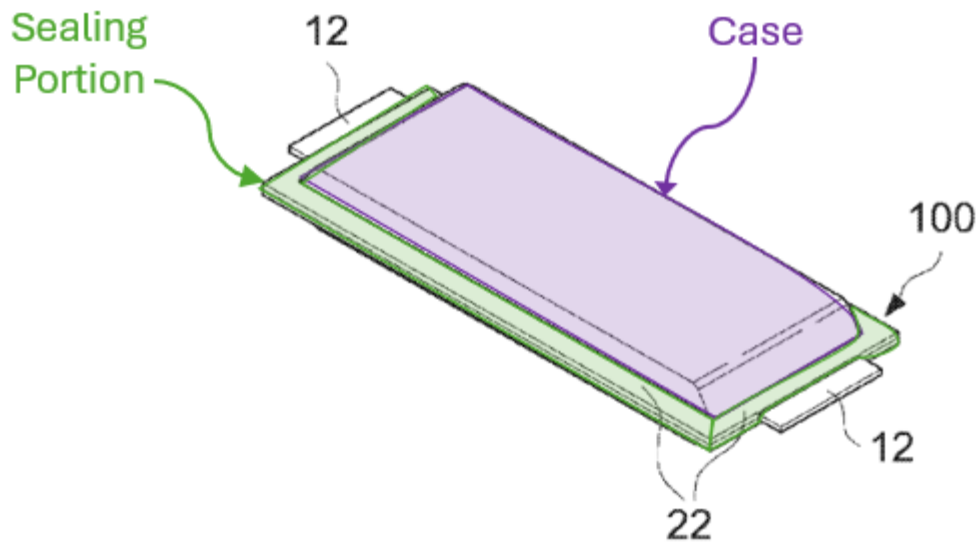
4A can “be folded once more partway as shown in FIG. 2, such that the leading edge of the joined tab portion 4A is interposed between the joined tab portion 4A and the side surface of the encapsulated portion 4B,” to shield leading edge of the joined tab portion 4A from “the intrusion of moisture and air.” EX1006, ¶[0023]; EX1003, ¶[0075].



EX1006, FIG. 2 (annotated).

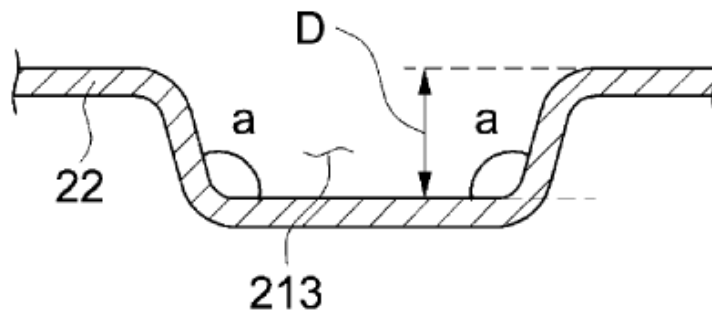
C. Kim-999

Kim-999 discloses a battery like Kim-439, Ueda, and the '808 patent. EX1007, Abstract. EX1006, Abstract; EX1005, Abstract; EX1001, 1:54-58; EX1003, ¶[0194]-[0195]. Kim-999's battery includes case 21 that “house[s] the electrode assembly 11.” EX1007, ¶[0047], [0080] (“the electrode assembly 11 is packaged with the case 21.”)



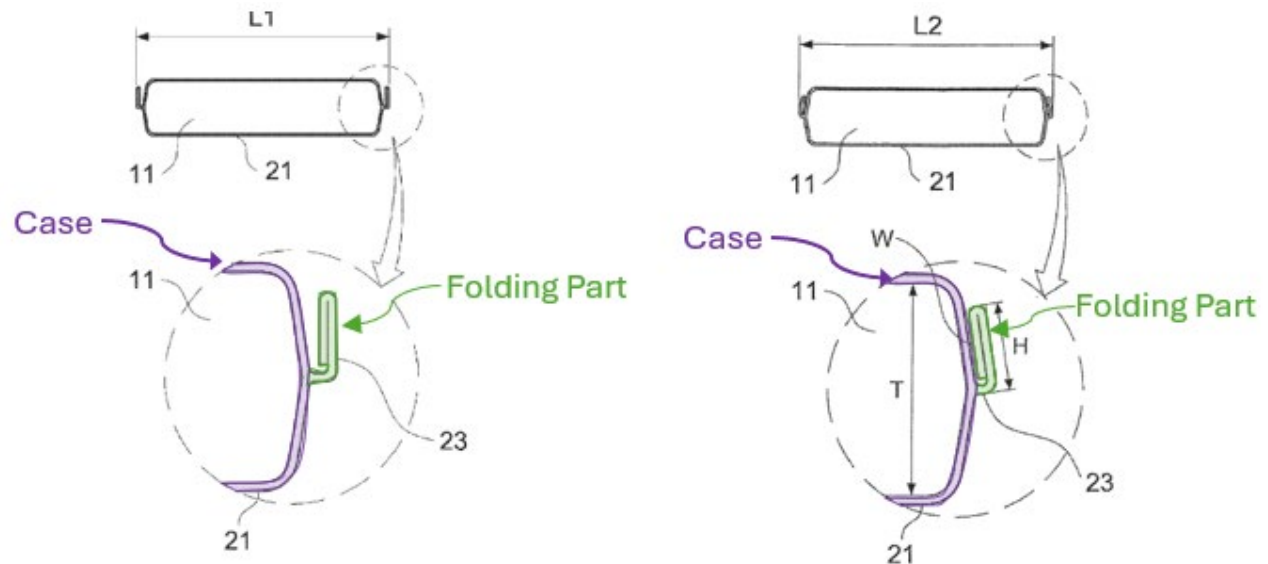
EX1007, FIG. 1 (annotated).

Kim-999's case includes "pouch film 212 and the sealing parts 22 formed on the outer circumferences of the pouch film 212." EX1007, ¶[0080]. As shown in Figure 6B, pouch film 212 is "press[ed] in a recessed shape" to form a "pair of forming parts 213 for housing the electrode assembly 11." EX1007, ¶[0085]. Sealing parts 22 are adhered together "along the outer peripheries of the electrode assembly 11." EX1007, ¶[0048]; EX1003, ¶[0196].



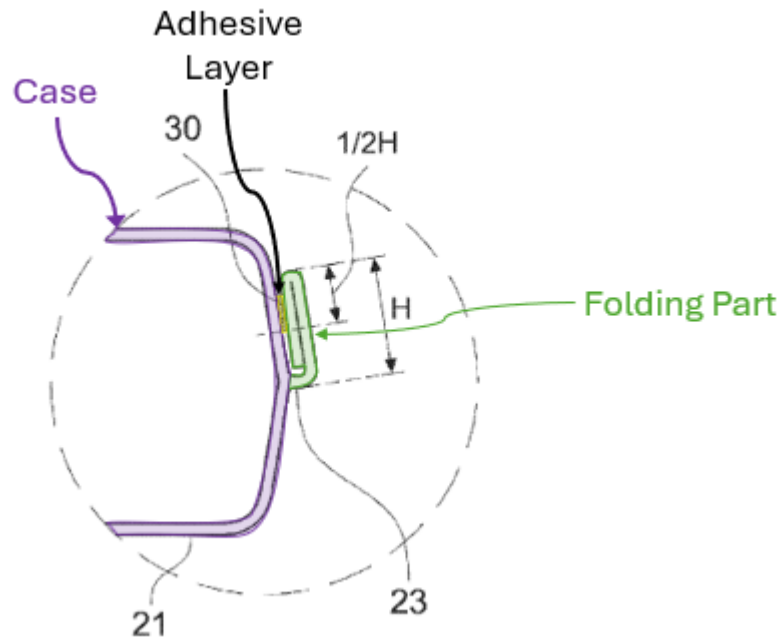
EX1007, FIG. 6B.

Figures 3A-3B show that “sealing parts 22 of the remaining portions are folded to form the folding parts 23, such that the volume of the secondary battery may be reduced.” EX1007, ¶[0049]; EX1003, ¶[0197].



EX1007, FIGS. 3A-3B.

Folding part 23 is “attached to one surface of the case 21 by an adhesive member 30.” EX1007, ¶¶[0057], [0060]. Kim-999 explains the height of adhesive member 30 between the side face of case 21 and folding part 23 can be adjusted to prevent “fluttering, bending, [and] twisting” of folding part 23. EX1007, ¶¶[0063]-[0066]. Kim-999 also explains the “angle between the folded folding part 23 and one surface of the case 21,” may be adjusted to allow “the adhesive member 30 to be injected between the folding part 23 and the case 21,” while preventing the “distance between the folding part 23 and the case 21” from being “too large.” EX1007, ¶[0068]; EX1003, ¶[0198].



EX1007, FIG. 4.

IX. GROUND 1: CLAIMS 1-18, 20, 23, 24, 25, AND 27 WOULD HAVE BEEN OBVIOUS IN VIEW OF KIM-439 AND UEDA.

For clarity, Petitioner provides the following chart identifying selected terms as described or claimed in the '808 patent¹ along with corresponding terms used in the prior art. EX1003, ¶[0089].

¹ The '808 patent claims recite features not included *haec verba* in the specification.

Claim 1	'808 Patent Specification²	Kim-439³	Ueda⁴	Kim-999⁵
Electrode Body	Bare Battery	Electrode Assembly (110, 700)	Battery Element (1)	Electrode Assembly (11)
Package	Battery Body (10)	Pouch casing (120, 200)	Exterior Members (2, 3)	Case (21)
First Part	Side Face, First Plane, Second plane (101, 102, 103)	Upper Surface Lower Surface (122/220, 121/210)	Encapsulated Portion (4B)	Pouch Film (212)

² EX1001, 1:57-58, 1:64-2:8, 2:9-19.

³ EX1005, pp. 4-5.

⁴ EX1006, ¶¶[0014]-[0015], [0018].

⁵ EX1007, ¶¶[0045]-[0049], [0080]-[0085].

Claim 1	'808 Patent Specification²	Kim-439³	Ueda⁴	Kim-999⁵
Second Part	Flange Portion (20)	Bonding Portion (123, 240)	Joined Tab Portion (4A)	Folding Part (23)

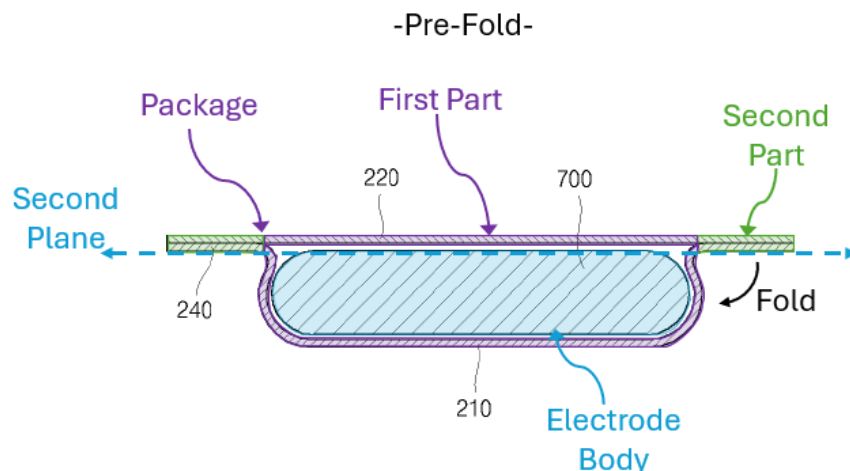
A. Motivation to Combine Kim-439 and Ueda

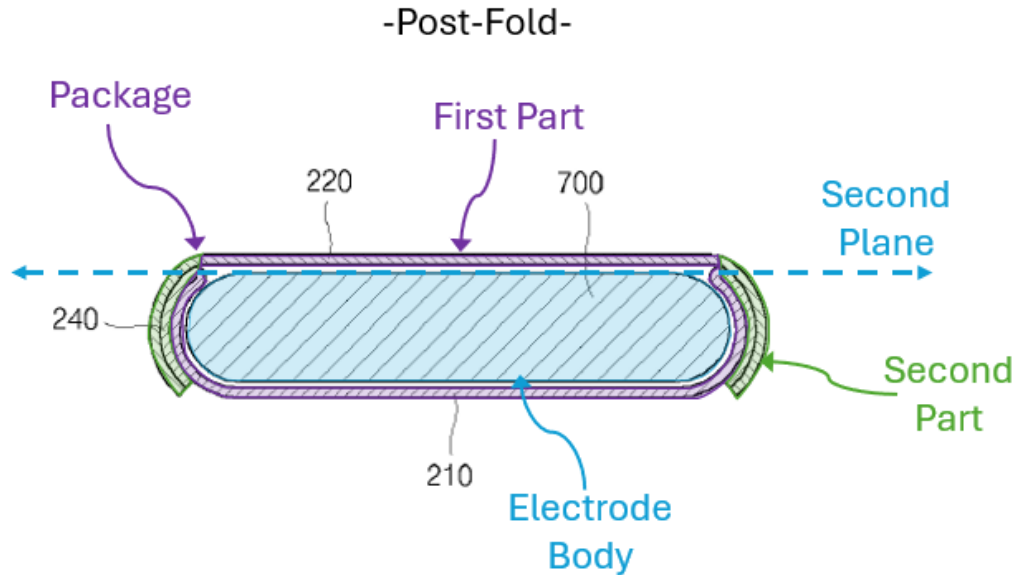
1. Adhering Kim-439's Second Part to the Curved Side Face

A POSA would have been motivated to adhere the second part (bonding portion 240) of Kim-439's package (pouch casing 200) to its curved side face to prevent the second part from separating from the package, thereby preserving compactness of the battery and improving the package's structural integrity, as taught by Ueda. EX1003, ¶¶[0076]-[0081]; EX1006, ¶¶[0006]-[0011], [0029], [0081].

Kim-439, Ueda, and the '808 patent are from the same field of endeavor—pouch-type batteries. EX1003, ¶[0077]; EX1001, 1:54-1:58; EX1005, Abstract, p. 2; EX1006, ¶¶[0001], [0006]. Each discloses a package (e.g., Kim-439's pouch casing, Ueda's exterior members) having (i) a first part (e.g., upper, lower, and side surfaces of Kim-439's pouch casing, Ueda's encapsulated portion) accommodating the battery's electrode body and (ii) a second part (e.g., Kim-439's bonding portion,

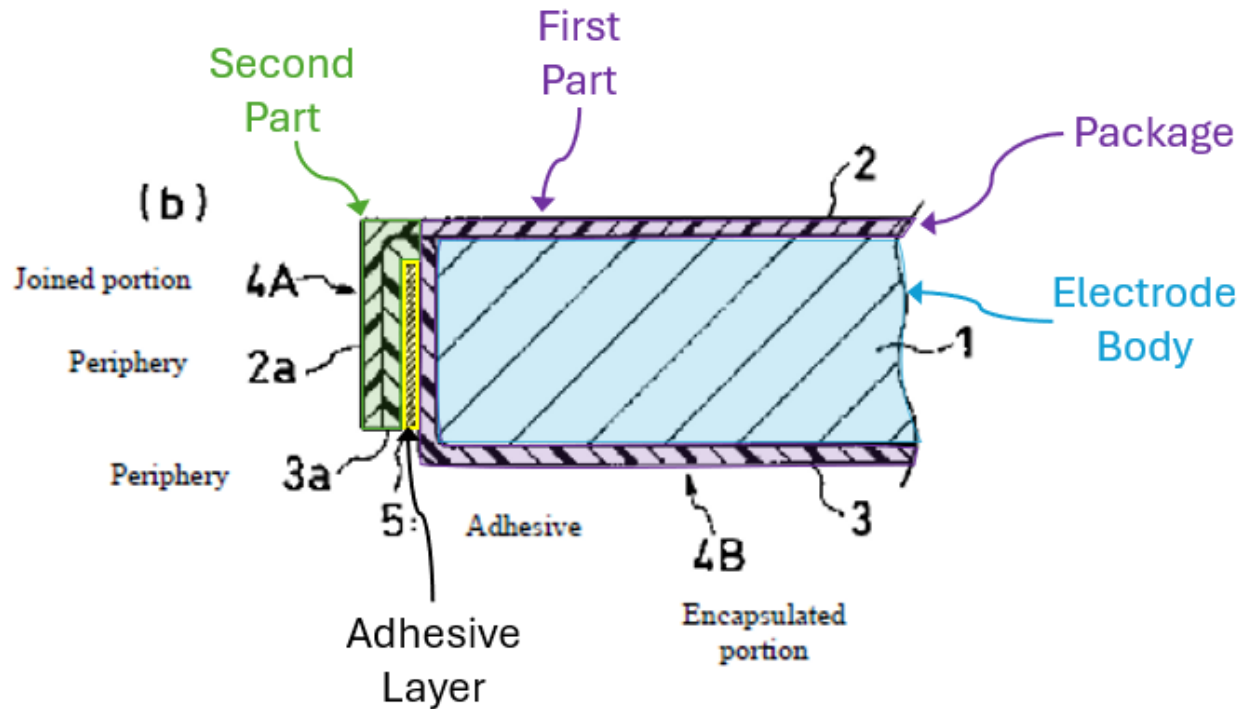
Ueda's tab portion) projecting outward from the first part. Indeed, the second part in both Kim-439's and Ueda's packages is formed by bonding opposing laminate sheets together around the electrode body's periphery to produce an outwardly-projecting flange. EX1005, p. 5; EX1006, ¶[0018]. While Kim-439 folds its second part (e.g., bonding portion 240) over the package's curved side face to achieve a rounded side profile as illustrated in the annotated figures below, Kim-439 does not explicitly disclose using adhesives (beyond the heat-sealing layer) to secure the second part to the curved side face. EX1003, ¶[0077]. But a POSA would have recognized that the interface between the folded second part and the curved side face would have the potential for lift, separation, or reduced contact uniformity, for example, due to elastic recovery of the laminated pouch materials (material springs back for thinner metal sheets) or exposure to impact forces. *Id.*





EX1005, FIGS. 4b, 5b (annotated).

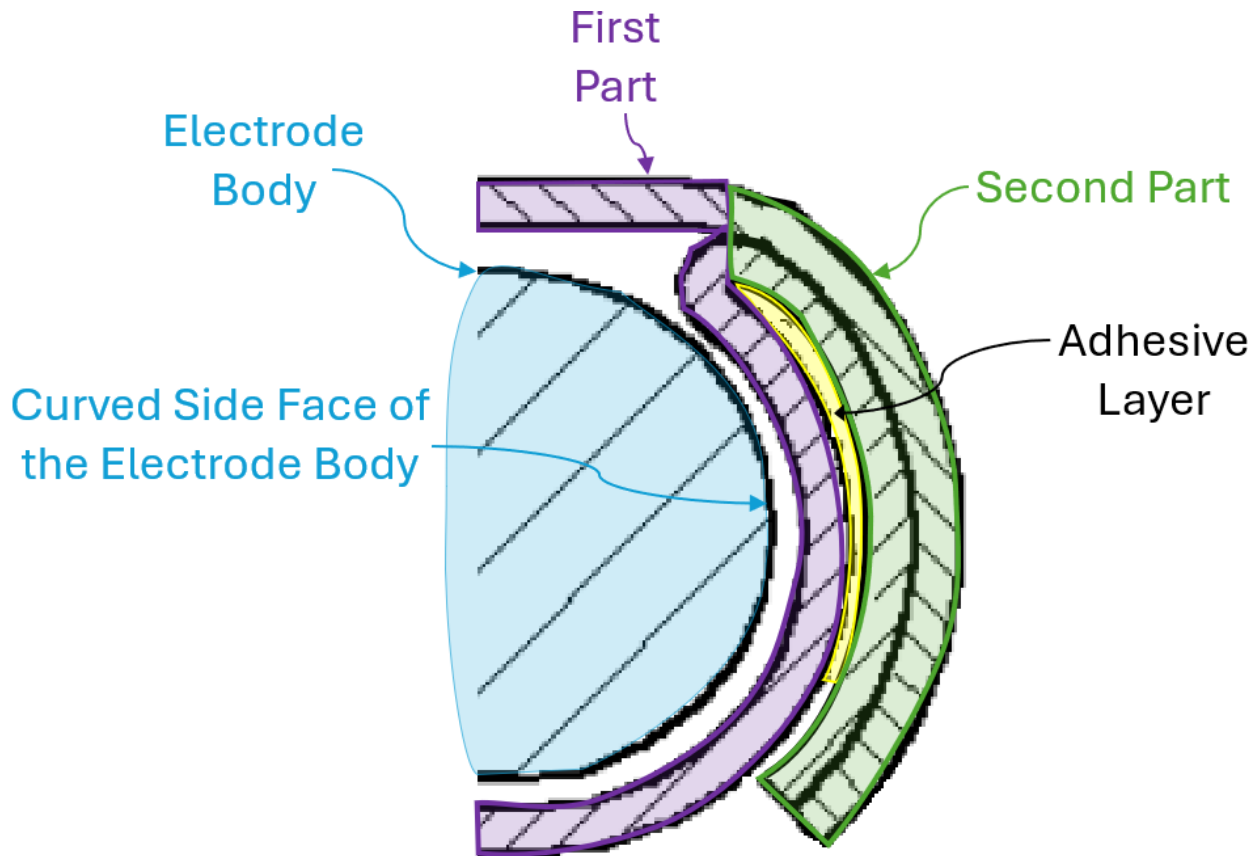
A POSA would have appreciated that Ueda addresses this concern by teaching that the second part (joined tab portion 4A) can: (i) “follow the encapsulated portion” and (ii) bond to the side surface using an adhesive. EX1006, ¶¶[0006]-[0008] (describing a solution to this problem where the adhesive “prevents the folded joined tab portion from separating from the encapsulated portion” and improves “the strength and rigidity of the side surfaces of the battery.”); *see also* EX1006, ¶¶[0015], [0018], [0029]; EX1003, ¶[0078]. Ueda explains the adhesive bonding provides an additional solution by preventing separation of the package’s second part and increasing the strength and rigidity of the package. EX1006, ¶¶[0008], [0081]. Thus, Ueda provides a known solution to the potential for structural instability at the second part-to-side interface of Kim-439’s package without this adhesive. EX1003, ¶[0078].



EX1006, FIG. 1 (annotated).

A POSA would have been motivated to provide an adhesive layer to adhere the second part (bonding portion) of Kim-439's package to its curved side face, as taught by Ueda, to prevent Kim-439's second part from separating from the package's side, while preserving Kim-439's goal of maintaining a compact, rounded battery profile. EX1003, ¶[0079]. Ueda teaches that such adhesive bonding increases the package's side face rigidity, prevents separation of the second part, and maintains a compact structure by holding the second part flush against the side face. EX1006, ¶[0008], [0081]. These benefits would apply equally to Kim-439's structure, particularly given its curved side faces, where maintaining contact between the second part and the package's side face preserves Kim-439's rounded

profile and structural integrity. EX1003, ¶[0079]. Dr. Von Sacken's illustration below shows the resulting structure of this combination.



EX1003, ¶[0079], Kim-439's Modified Battery.

A POSA would have had a reasonable expectation of success in combining Ueda's adhesive layer technique with Kim-439 because this modification would improve the structural integrity of Kim-439's battery without meaningfully increasing its profile. EX1003, ¶[0080]. Indeed, a POSA would have applied Ueda's teachings by simply applying adhesive between the Kim-439's second part and the packaging's curved side face. Each of these applications of Ueda's teachings represents conventional manufacturing variation requiring no undue

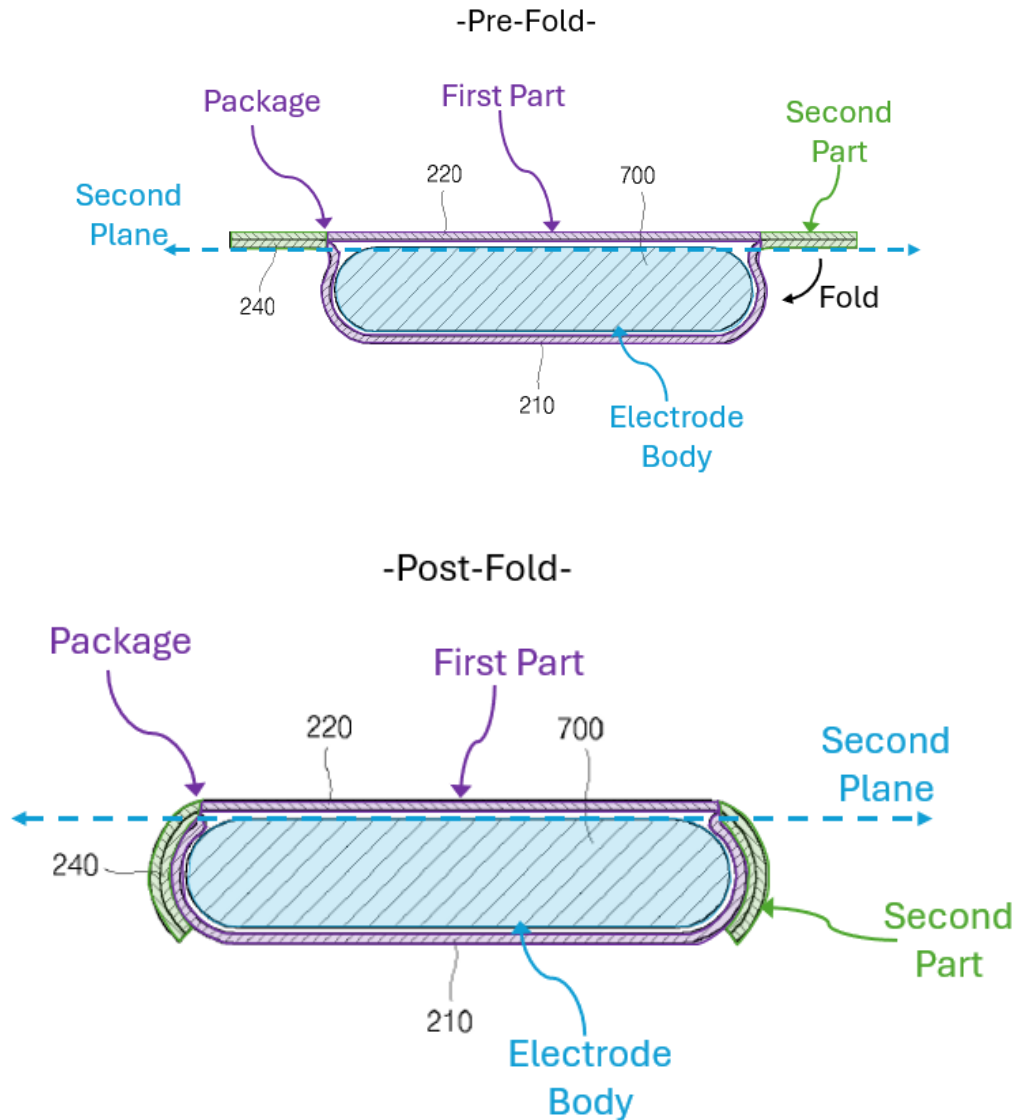
experimentation. EX1003, ¶[0080]. It is the application of a known technique (applying an adhesive layer between the casing's side face and flange) to a known device (Kim-439's battery) to reliably secure the second part to the side face of the package. *KSR Int'l Co. v. Teleflex Inc.*, 550 U.S. 398, 416-417 (2007); EX1003, ¶[0080].

Furthermore, a POSA would have understood *how* to maintain the curved-side profile of Kim-439's battery while applying the adhesive between the package's second part and side face, based on Ueda's disclosure. EX1003, ¶[0081]. Ueda teaches that the "joined tab portion is folded so as to follow the encapsulated portion and is adhered to the encapsulated portion by an adhesive." EX1006, ¶[0006]. Additionally, Ueda's package's exterior members 2, 3 "have shape variability" such that the "shape of the battery can be easily changed by various ways." EX1006, ¶[0069]. With Ueda's teaching to have the folded flange "follow" the package's side, a POSA would have understood that Kim-439's second part (bonding portion 240) would continue to follow the curved side face of the battery even with the addition of the adhesive layer taught by Ueda, preserving the curved profile of Kim-439's battery. EX1003, ¶[0081]. Thus, implementing Ueda's adhesive-layer technique would not require any substantial change to the structure or folding process, but merely the addition of a known adhesive layer at an existing interface as known in the art. *Id.*

2. Folding Kim-439's Second Part Inward

Regarding claims 8-22, a POSA would have been motivated to fold the second part of Kim-439's package inward, as taught by Ueda, to shield the leading edge of the second part from moisture and external forces, preserving the structural integrity of Kim-439's package. EX1003, ¶¶[0082]-[0088]; EX1006, ¶[0001].

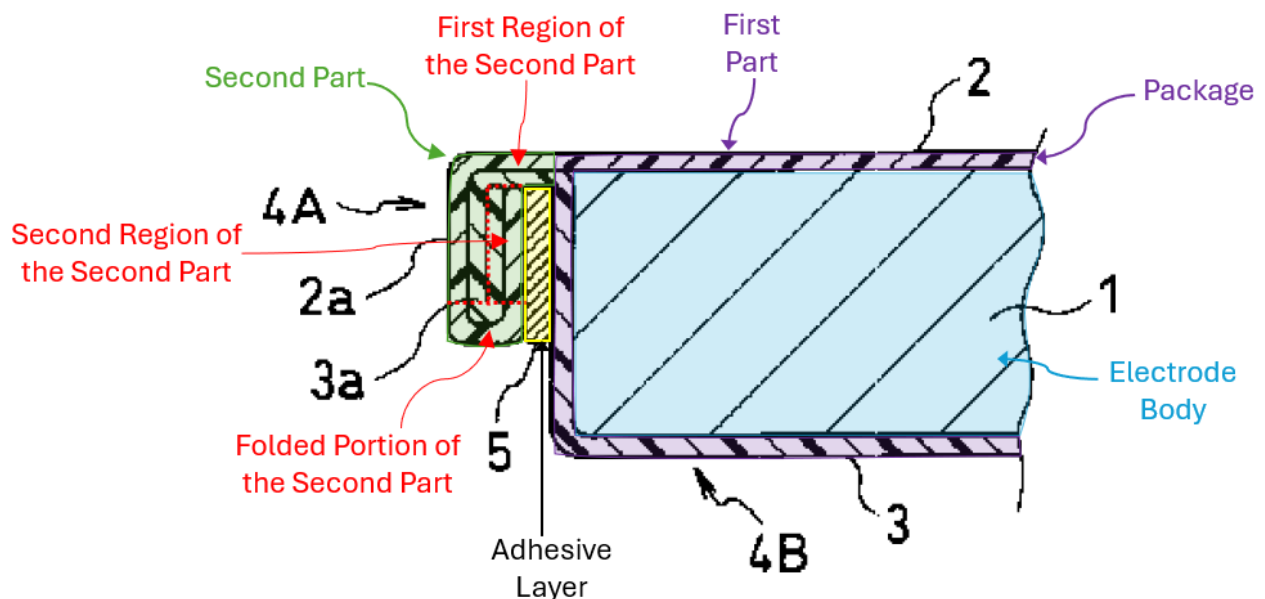
As shown below, Kim-439's bonding portion 240—formed by bonding and folding the upper and lower films of the pouch casing—terminates in a thin, leading edge that is exposed to ambient conditions and risks mechanical damage, deformation, or fraying if left exposed. EX1003, ¶[0083]. This susceptibility comes from the leading edge being subjected to localized bending stresses and tension due to the curvature of the side surface, increasing the likelihood of edge lifting or fatigue over time. EX1003, ¶[0083]. The leading edge of Kim-439's second part is exposed on the exterior of the battery and is thus particularly vulnerable to external mechanical interactions during normal handling, assembly, and use and potential short-circuit. *Id.*, ¶¶[0083]-[0085]. These interactions risk deforming, curling, or fraying the flange's edge. *Id.* Moreover, exposing the second part's leading end to moisture could delaminate the laminate structure of Kim-439's second part, compromising the seal integrity. *Id.*



EX1005, FIGS. 4b, 5b (annotated).

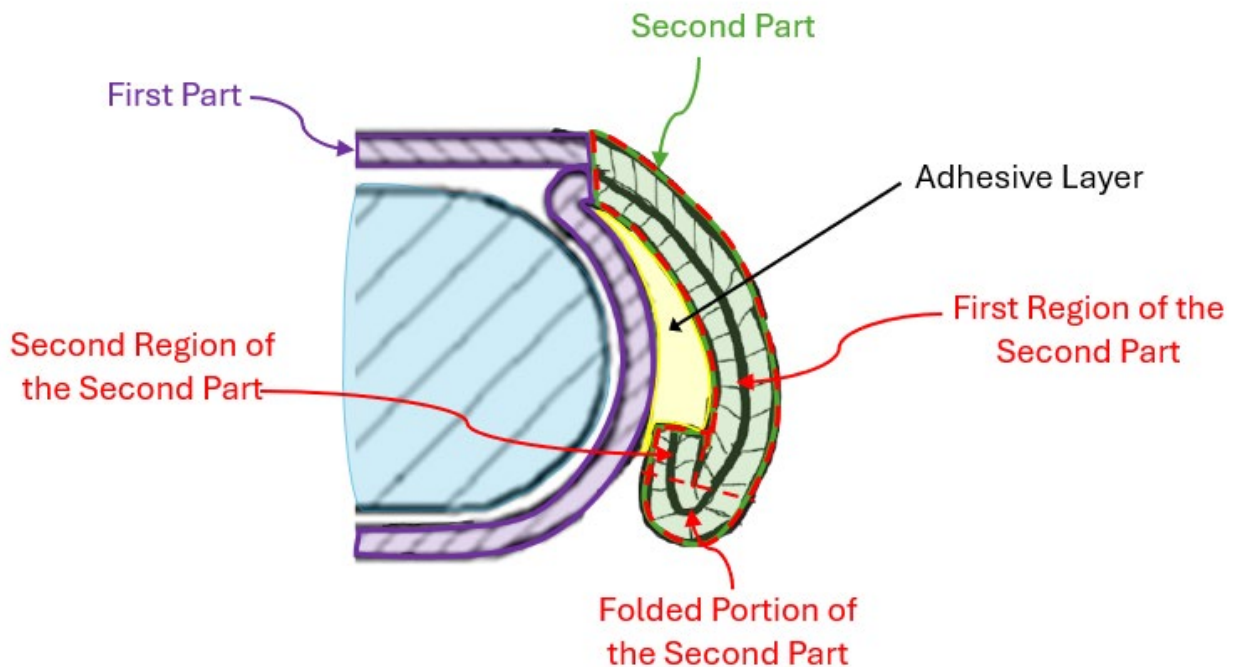
Ueda addresses these concerns by folding the second part (tab portion 4A) inward such that the leading edge of the second part is interposed between the second part's first region and the package's side face, shielding the leading edge from external contact and moisture to preserve the seal at the package's boundary. EX1006, ¶¶[0013] (when "the leading edge of the joined tab portion is interposed between the joined tab portion and the encapsulated portion ... the leading edge of

the joined tab portion is isolated from the outside air, and intrusion of moisture, air or the like through the leading edge.”), [0023] (“the intrusion moisture and air from the joined tab portion can be more effectively prevented”), [0030] (“intrusion of moisture or the like into the bonding interface of the peripheral portions 2a and 3a from the leading edge of the joined tab portion 4A is more reliably prevented”). Ueda’s inward-folding of the second part not only shields the package’s leading edge from external contact, but converts the exposed leading edge into a layered interface where stresses are distributed across overlapping laminated layers rather than concentrated at a single exposed edge. EX1006, ¶¶[0005] (“provide a battery that has a reduced bulk and high strength and rigidity at the side surfaces”), [0008]; EX1003, ¶[0086].



EX1006, FIG. 2 (annotated).

A POSA would have been motivated to apply Ueda's inward-folding technique to Kim-439's second part to improve durability and sealing reliability. EX1003, ¶[0087]. Doing so would shield the interface of Kim-439's laminate materials in the second part (bonding portion 240) from the "intrusion of moisture or the like." EX1006, ¶[0030]; EX1003, ¶[0087]. Moreover, folding the leading edge of Kim-439's second part inward would reinforce the leading edge within a layered configuration, improving robustness of Kim-439's second part. EX1003, ¶[0087]. Dr. Von Sacken's illustration below shows the resulting structure of this combination.



EX1003, ¶[0087], Kim-439's Modified Battery.

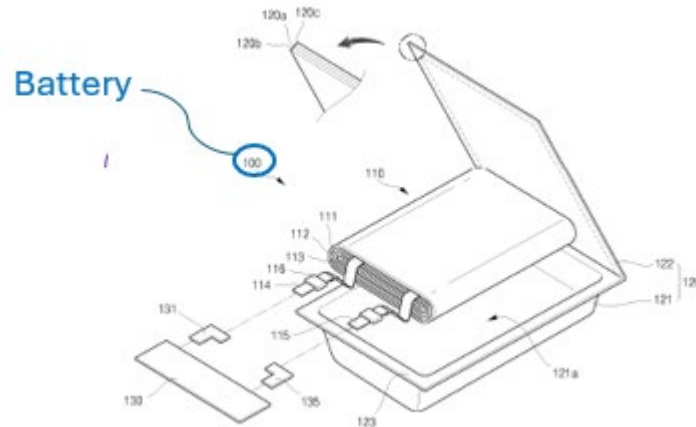
A POSA would have had a reasonable expectation of success applying Ueda's inward-folding technique to Kim-439's second part because both references use

similar package materials—thin, laminated exterior members for non-aqueous (e.g., lithium) secondary batteries—where peripheral portions are joined/sealed and then folded to manage package profile and robustness. EX1003, ¶[0088]; EX1005, pp. 4-5; EX1006, ¶[0018]. Ueda confirms that converting a single-fold configuration to a more protective multi-fold configuration was well within ordinary skill. EX1006, ¶[0023], FIGs. 1b, 2. Indeed, Ueda expressly teaches that the second part (joined tab portion 4a) “may be folded only once ... or ... folded a plurality of times.” EX1006, ¶[0013]. More specifically, Ueda teaches a configuration in which the second part is folded again so that the leading edge is interposed between layers to better prevent moisture/air intrusion. EX1006, ¶¶[0013], [0023], [0030]. Because Ueda presents this as a routine design option (fold once or multiple times) for the same joined peripheral structure (EX1006, ¶¶[0013], [0023]), a POSA would have expected the same approach to translate to Kim-439’s analogous folded bonding portion 240 without undue experimentation. EX1003, ¶[0088]. Accordingly, modifying Kim-439 to implement Ueda’s inward-folding technique represents the application of a known technique (inwardly folding the leading edge) to a known device (Kim-439’s flange), yielding the predictable result of preventing the intrusion of moisture and enhancing structural integrity. *KSR*, 550 U.S. at 417; EX1003, ¶[0088].

B. Independent Claim 1

1. [1.P] “A battery”

Kim-439 discloses a “battery,” in pouch-type lithium secondary battery 100.⁶ EX1005, pp. 3-5, Abstract; EX1003, ¶[0090].



EX1005, FIG. 1 (annotated).

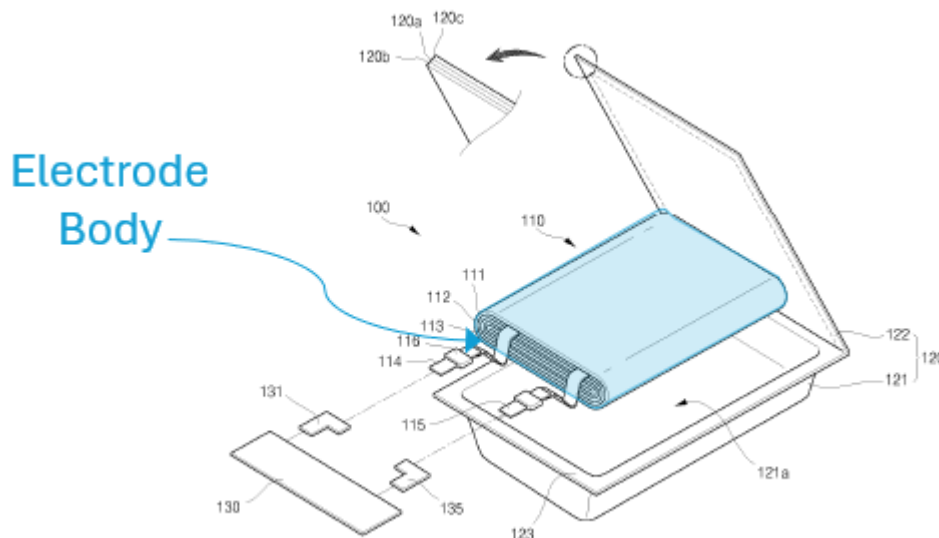
Figures 1a–1b and Figures 2a–5b of Kim-439 disclose the same embodiment of a pouch-type lithium secondary battery and its corresponding manufacturing method. Figures 2a–5b illustrate process views “of manufacturing a pouch-type lithium secondary battery,” while Figures 1a–1b illustrate the resulting battery structure. EX1005, p. 2. The manufacturing process shown in Figures 2a–5b therefore corresponds to the formation of battery 100 shown in Figures 1a–1b. Accordingly, the features illustrated across Figures 1a–5b are not separate or

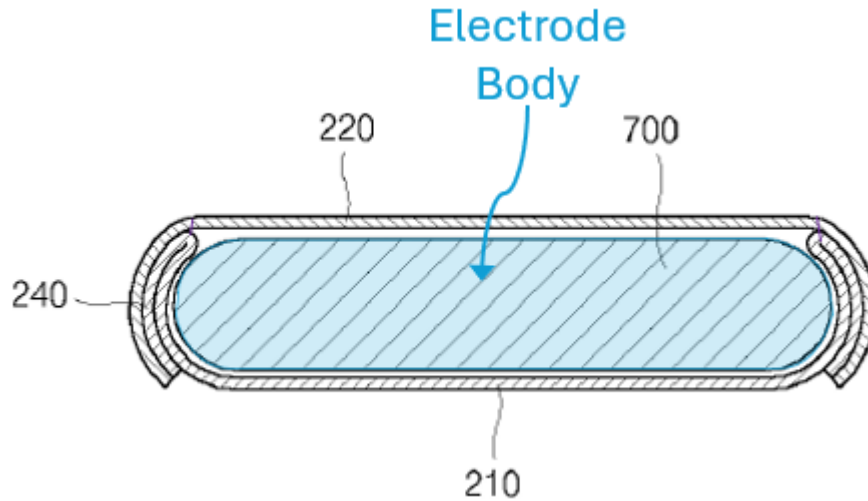
⁶ Whether or not the preamble is limiting, the prior art discloses it.

alternative configurations, but collectively describe a single embodiment of the battery structure and its manufacturing process. EX1003, ¶[0091].

2. [1.A] “an electrode body”

Kim-439 discloses the “electrode body” as electrode assembly 110, 700 that includes electrode plates coated with a positive and negative electrode active material, respectively. EX1005, pp. 4-5 (“electrode assembly (110) comprises a first electrode plate (111) coated with one of a positive electrode active material and ... a second electrode plate (112) coated with ... a negative electrode active material.”), Abstract; EX1003, ¶¶[0092]-[0093].

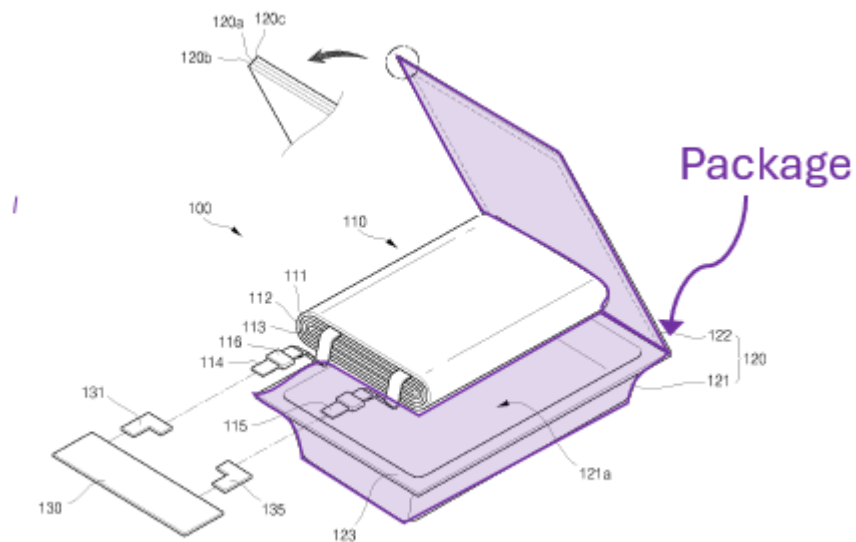


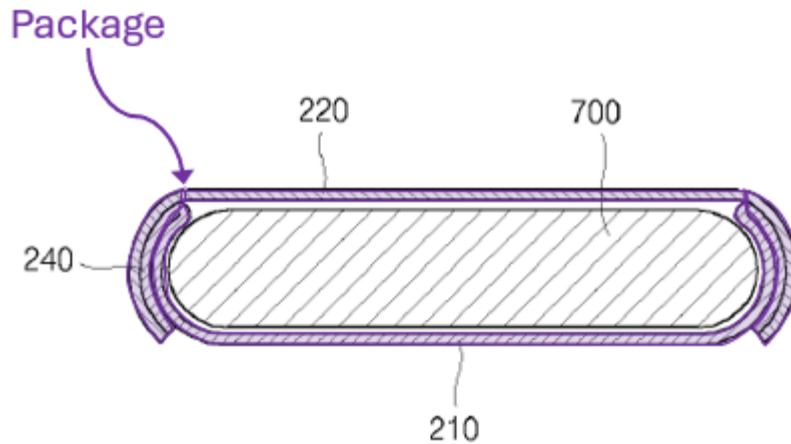


EX1005, FIGS. 1a, 5b (annotated).

3. [1.B] “a package, wherein the package comprises”

Kim-439 discloses the “package” as a pouch-casing 120, 200 that “accommodat[es] the electrode assembly.” EX1005, pp. 4-5 (“a pouch casing (120) accommodating the electrode assembly (110)”); EX1003, ¶¶[0094]-[0095].





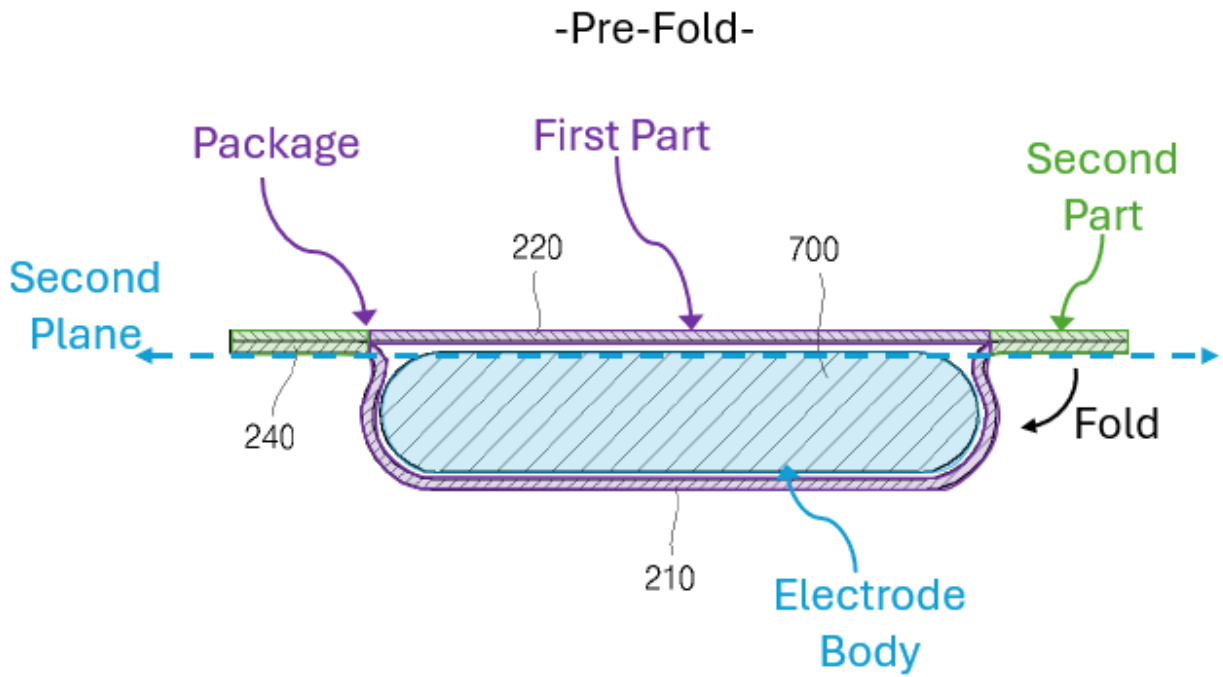
EX1005, FIGS. 1a, 5b (annotated).

4. [1.C] “a first part covering a second plane of the electrode body”

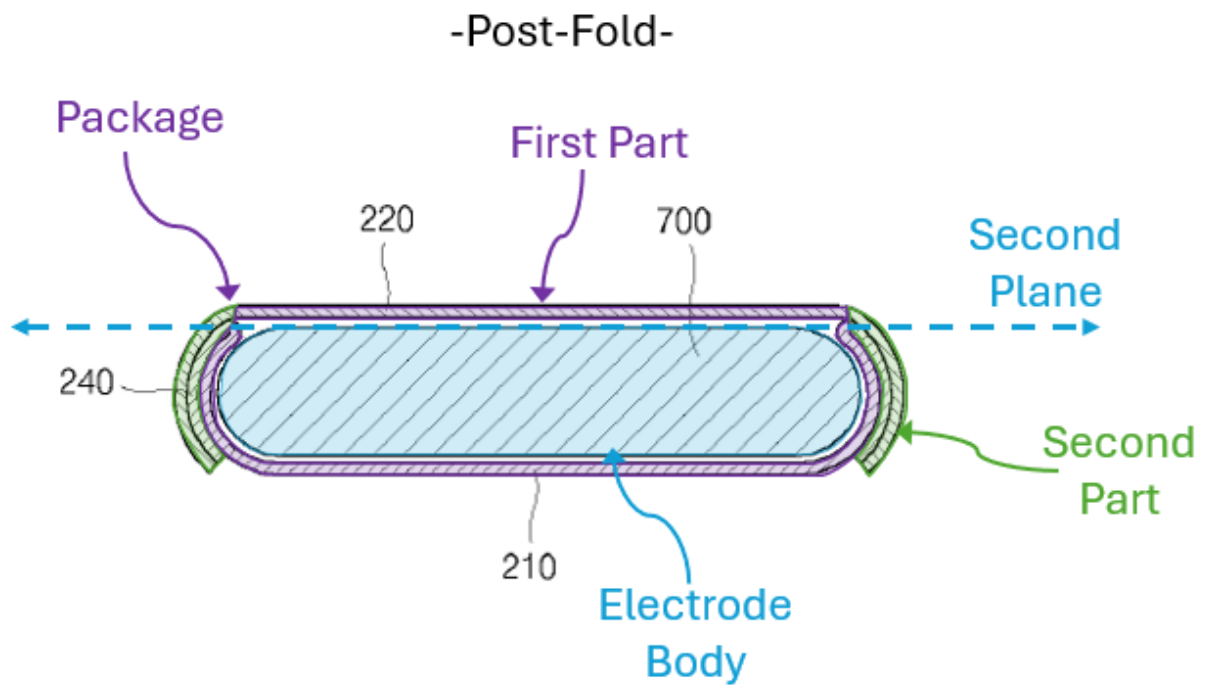
Kim-439’s package includes the “first part” as the portion of the pouch where lower surface 121, 210 and upper surface 122, 220 are not joined together and are spaced apart, defining “a space (211) for accommodating an electrode assembly.”

EX1005, pp. 4-5; EX1003, ¶¶[0096]-[0097]. Annotated Figure 5b shows upper surface 220 of Kim-439’s pouch covers a second plane of electrode assembly 700.

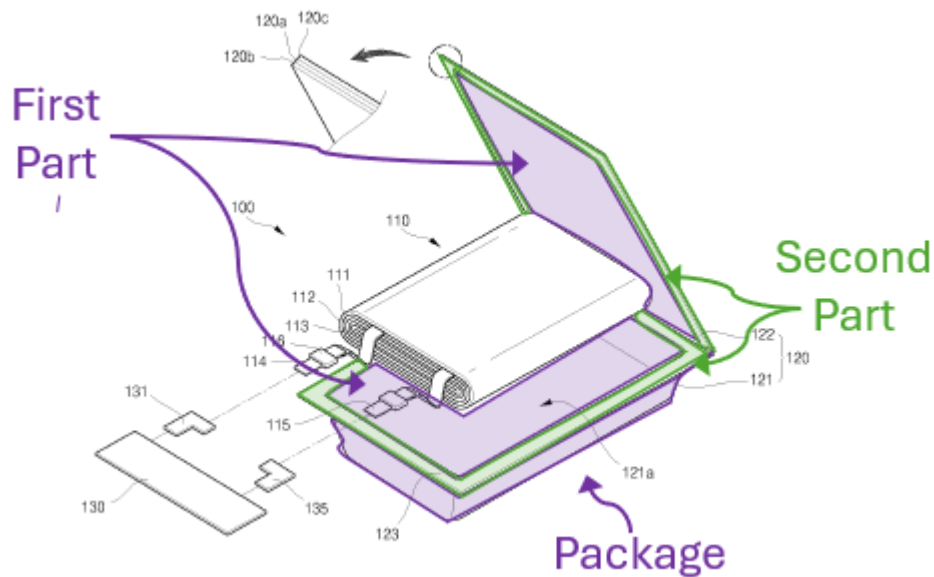
EX1005, pp. 4-5.



EX1005, FIG. 4b (annotated).



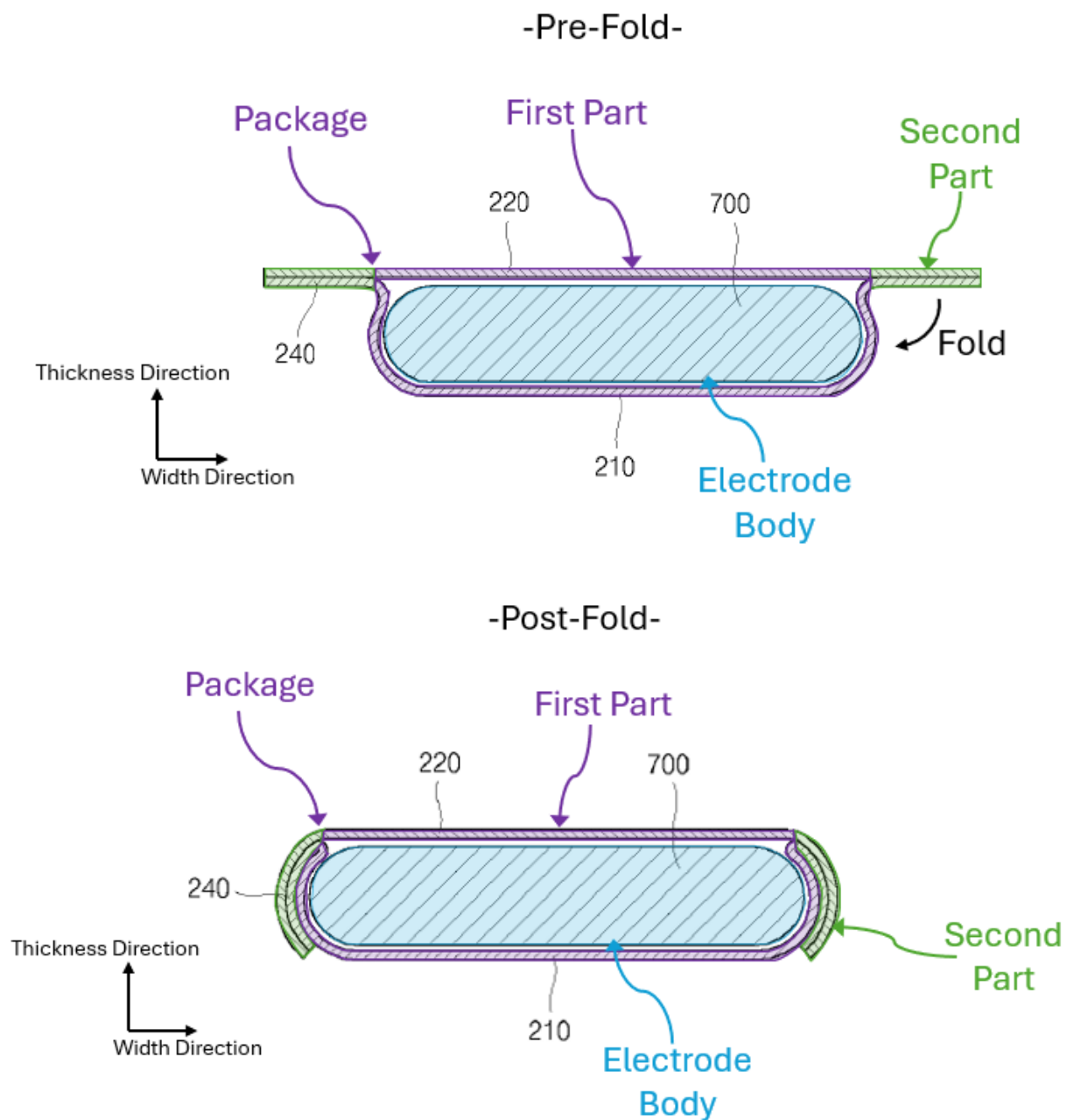
EX1005, FIGs. 5b (annotated).



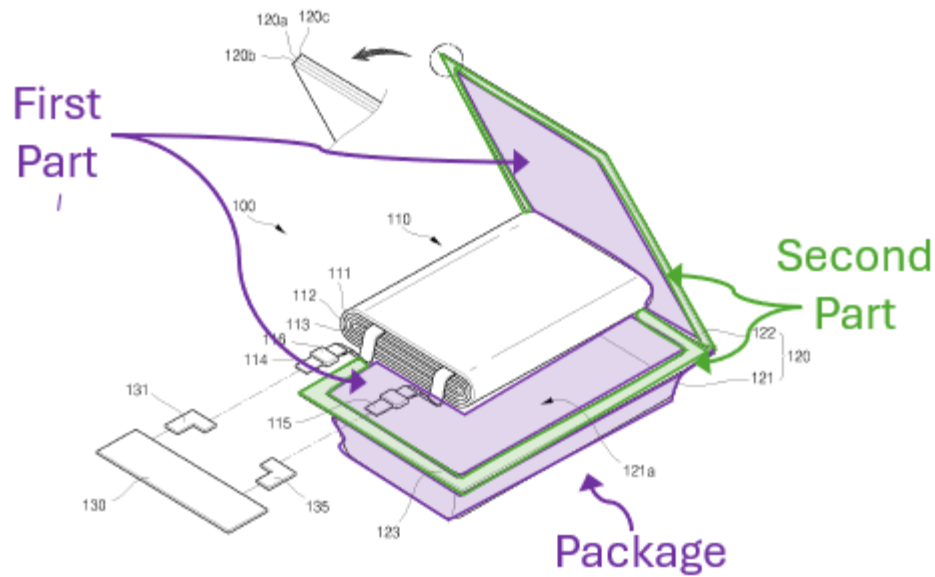
EX1005, FIG. 1A (annotated).

5. [1.D] “a second part protruding from the first part in a width direction of the electrode body”

Kim-439’s package includes the “second part” as bonding portion 123, 240 where lower surface 121, 210 and upper surface 122, 220 of pouch casing 120, 200 form a flange that protrudes in a width direction. EX1005, pp. 4-5 (“[T]he portion where the flange (215) of the lower surface (210) and the upper surface (220) contact each other and are bonded and sealed serves as a bonding portion (240)”; EX1003, ¶¶[0098]-[0099].



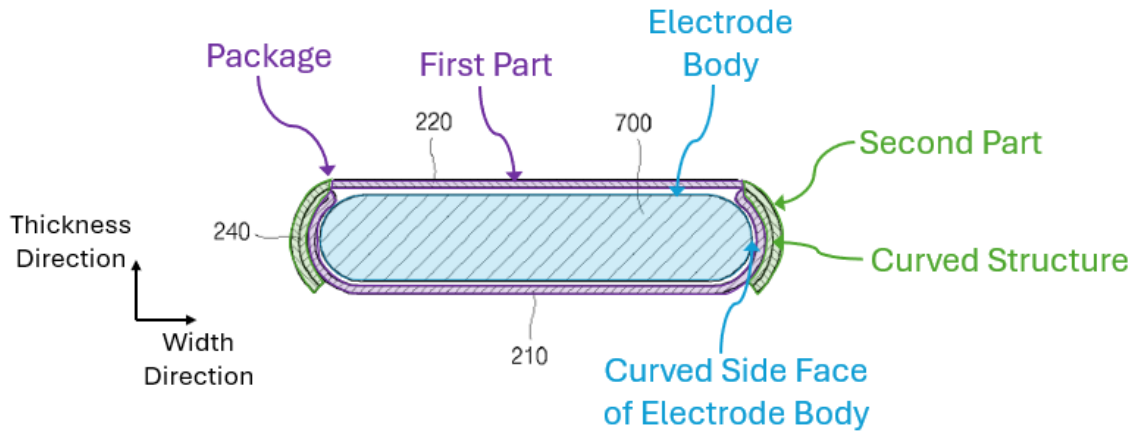
EX1005, FIGs. 4b, 5b (annotated).



EX1005, FIG. 1A (annotated).

6. [1.E] “wherein the second part comprises a curved structure, the curved structure curves around a curved side face of the electrode body in a thickness direction perpendicular to the width direction”

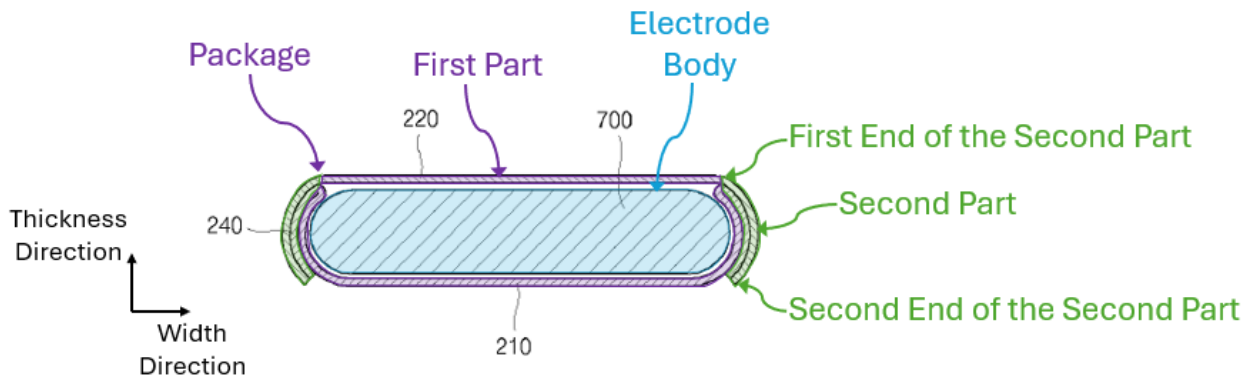
Kim-439’s second part (bonding portion 123, 240) includes a curved structure (annotated) that curves around a curved side face of electrode assembly 700 in a thickness direction perpendicular to the width direction, as annotated below in Figure 5b. EX1005, pp. 4-5 (“[T]he bonding portion (240) is folded along the outwardly rounded sides of the space (211) for accommodating the electrode assembly.”); EX1003, ¶¶[0100]-[0101].



EX1005, FIG. 5b (annotated).

7. [1.F] “the second part including a first end connected to the first part and a second end opposite to the first end in the thickness direction”

Kim-439’s second part (bonding portion 123, 240) includes a first end connected to the first part (non-bonding portions of casing 120, 200) and a second end opposite the first end in the thickness direction, as annotated below in Figure 5b. EX1005, pp. 4-5 (“[T]he portion where the flange (215) of the lower surface (210) and the upper surface (220) contact each other and are bonded and sealed serves as a bonding portion (240)”; EX1003, ¶¶[0102]-[0103].



EX1005, FIG. 5b (annotated).

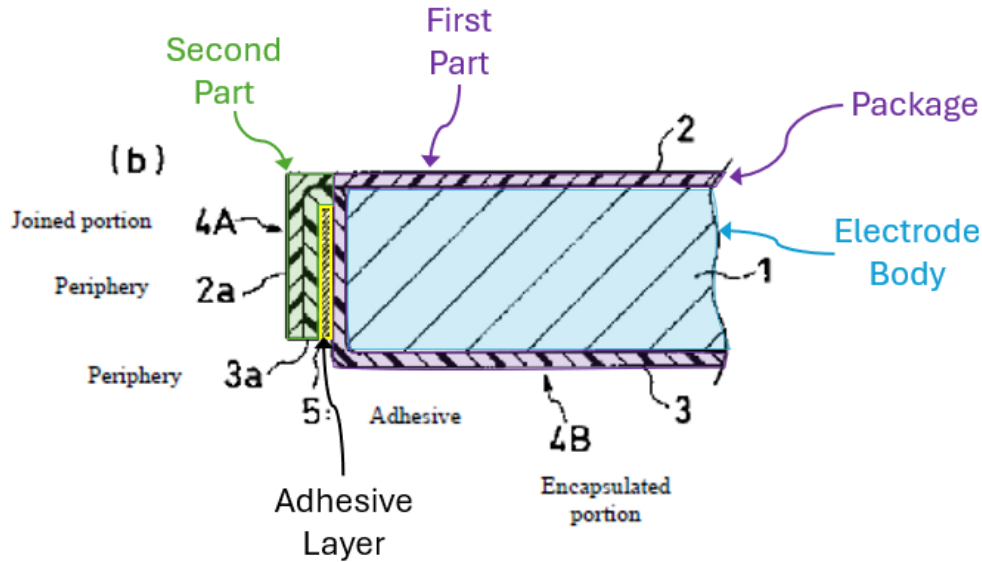
8. [1.G] “the second part is adhered to the curved side face of the electrode body via an adhesive layer”

(a) Kim-439

While Kim-439 describes an adhesive layer as a “heat-sealing layer (120b)” in the laminate sheet of pouch casing 120, Kim-439 does not explicitly disclose that its second part (bonding portion 123, 240) is adhered to the curved side face of the electrode body via an adhesive layer. However, Ueda demonstrates that this would have been obvious. EX1003, ¶[0104].

(b) Ueda

Ueda’s package includes a first part as an “encapsulated portion 4B” that “encapsulates” an electrode body (e.g., battery element 1). EX1006, ¶[0018]. Ueda’s package includes a second part as joined tab portion 4A that “projects outward from [the] encapsulated portion 4b.” EX1006, ¶¶[0015], [0018]. Ueda adheres joined tab portion 4A “to a side surface of an encapsulated portion 4B with an adhesive 5.” EX1006, ¶[0015]; *see also* EX1006, ¶¶[0008]-[0009], [0018], [0029]; EX1003, ¶[0105]. Consistent with the construction provided in Section VII.A, Ueda discloses [1.G] as an adhesive layer between tab portion 4A and a side surface of encapsulated portion 4B enclosing the side face of battery element 1, thereby fixing tab portion 4A (indirectly, as is sufficient to satisfy [1.G]) against the side face of battery element 1. EX1006, ¶[0017]; EX1003, ¶[0105].

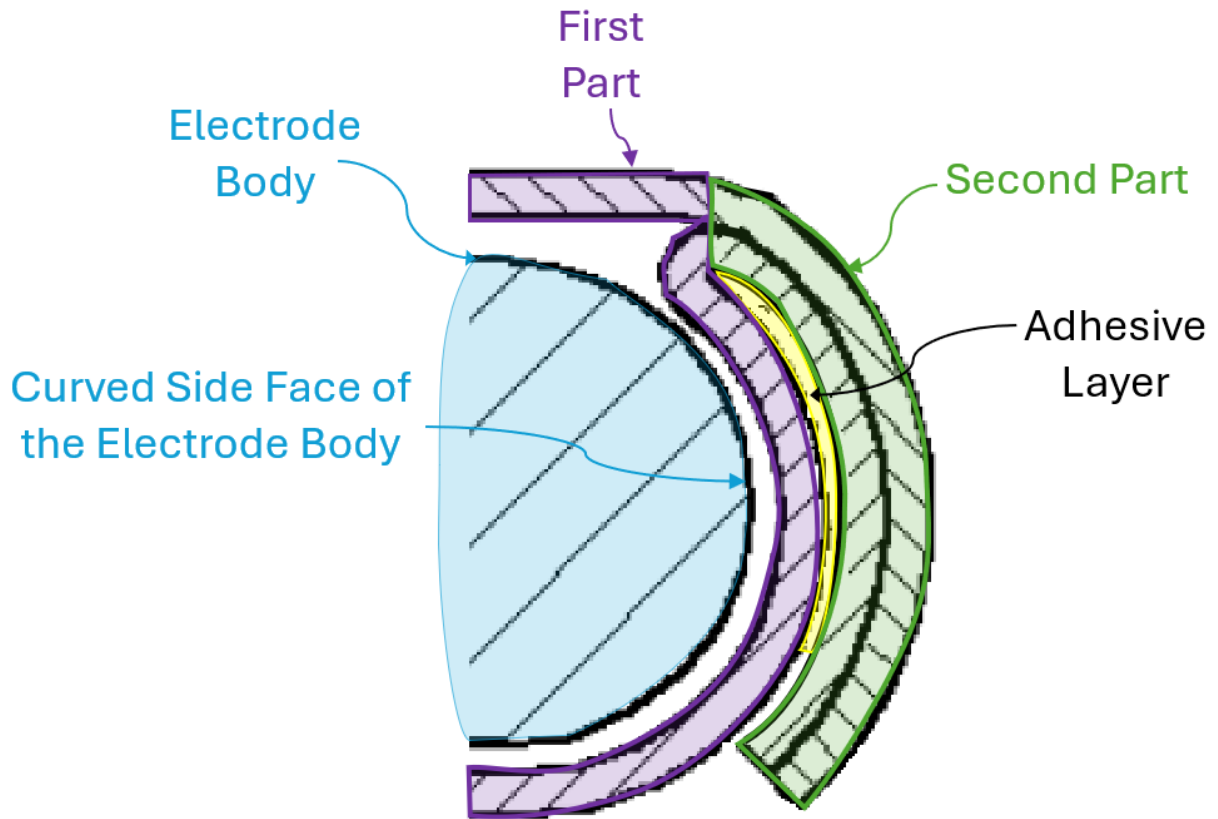


EX1006, FIG. 1 (annotated).

(c) Kim-439/Ueda Combination

As discussed in Section IX.A.1, it would have been obvious to adhere Kim-439's second part (bonding portion 240) to a curved side face of its electrode assembly by providing an adhesive layer between Kim-439's second part (bonding portion 240) and a side of its package in view of Ueda's disclosure. EX1003, ¶[0106]. Ueda teaches that such adhesive increases the package's side face rigidity, prevents separation of the second part, and maintains a compact structure by holding the second part flush against the side face. EX1006, ¶¶[0008], [0081]. Thus, this modification would ensure that Kim-439's second part (bonding portion 240) remains secured to the side of the package to maintain a compact structure while increasing the casing's rigidity. EX1003, ¶[0106]. This modification would have simply been applying a known technique (Ueda's adhesive) to a known device

(Kim-439's battery) to improve Kim-439's battery's structural integrity. Section IX.A.1; EX1003, ¶¶[0106]-[0107].



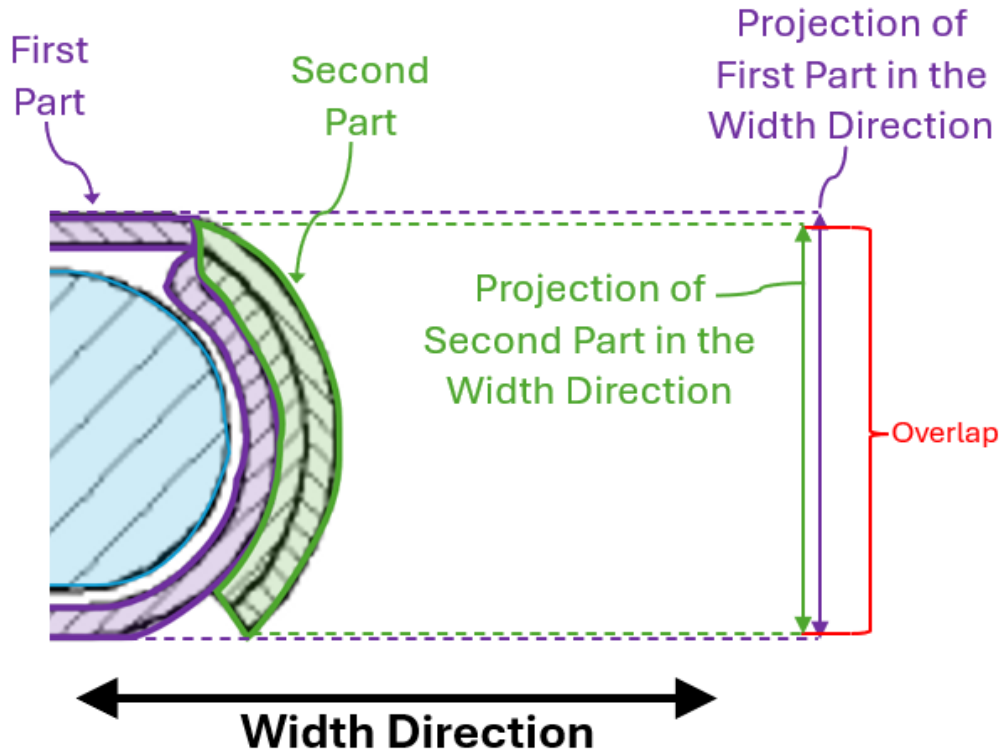
EX1003, ¶[0106], Kim-439's Modified Battery.

C. Dependent Claim 2

A projection of Kim-439's first part (upper and lower surfaces 210, 220) in the width direction overlaps with a projection of its second part (bonding portion 240) in the width direction, as annotated below in Figure 5b. EX1005, pp. 4-5; EX1003, ¶¶[0108]-[0109]. When viewed along the width axis, the height of the projection of Kim-439's second part does not extend beyond the height of the

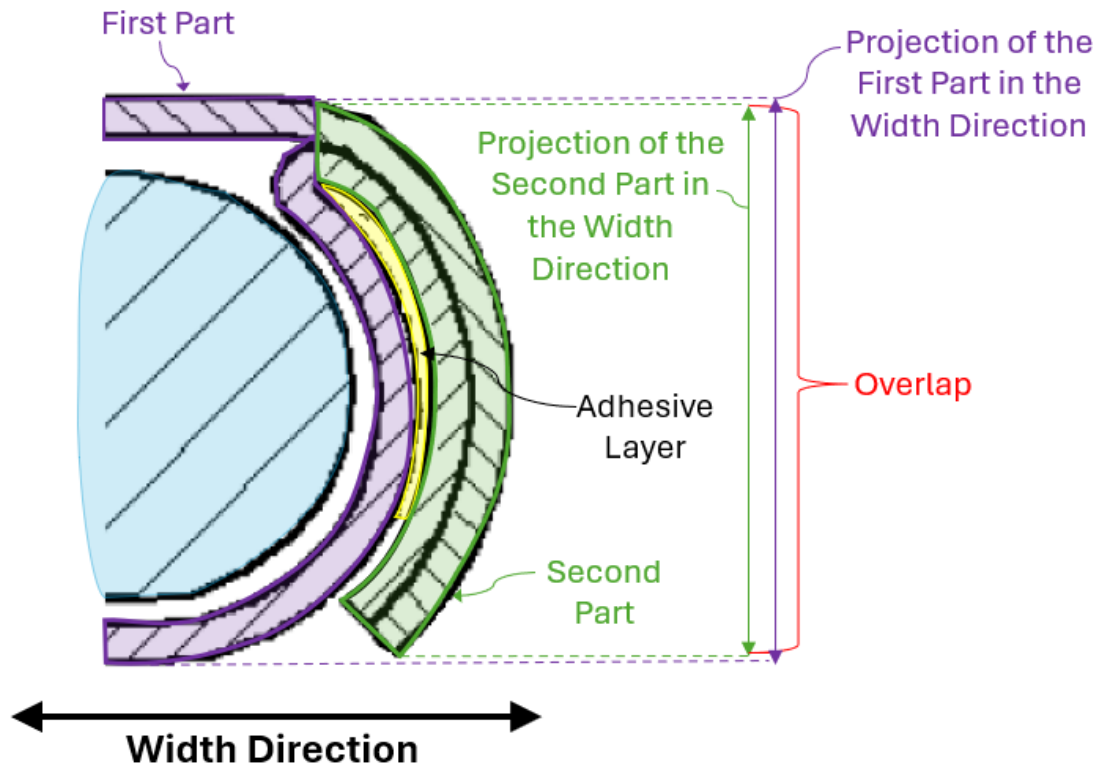
projection of Kim-439's first part, thereby overlapping in the width direction.

EX1003, ¶[0109].



EX1005, FIG. 5b (enlarged partial, annotated).

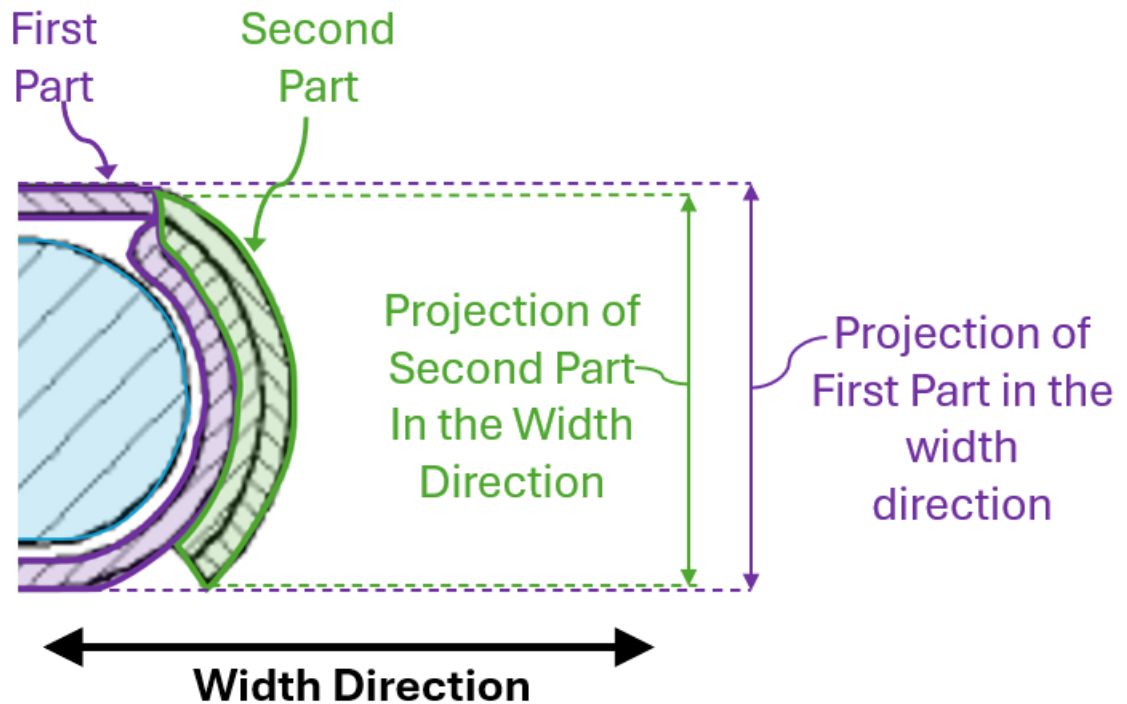
The projection of Kim-439's second part overlaps the projection of Kim-439's first part in the width direction similarly as the second part (flange portion 20) disclosed by Figure 1 of the '808 patent:



EX1003, ¶[0111], Kim-439's Modified Battery.

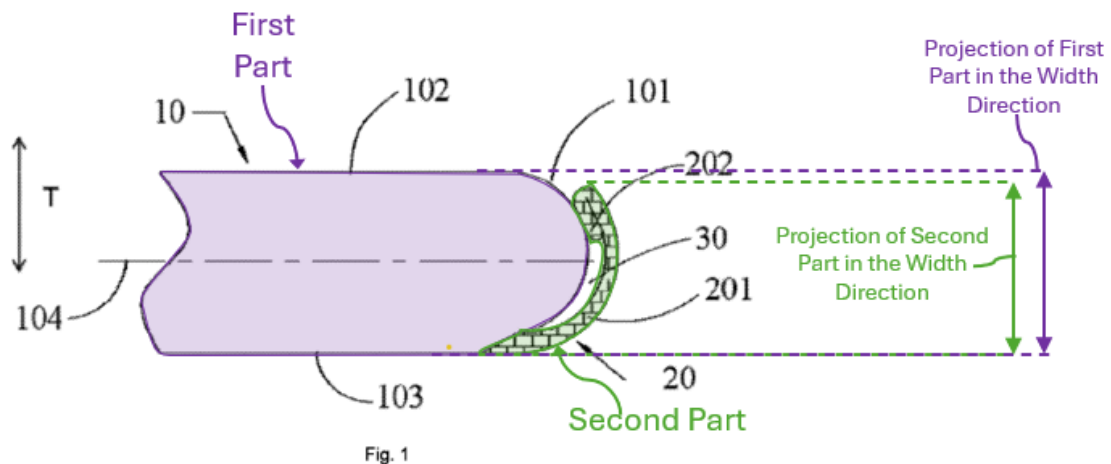
D. Dependent Claim 3

A projection of Kim-439's second part (bonding portion 240) in the width direction is located within the projection of its first part (upper and lower surfaces 210, 220) in the width direction, as annotated below in Figure 5b. EX1005, pp. 4-5; EX1003, ¶¶[0112]-[0113]. When viewed along the width axis, the height of the projection of Kim-439's second part does not extend beyond the height of the projection of Kim-439's first part. *Id.*



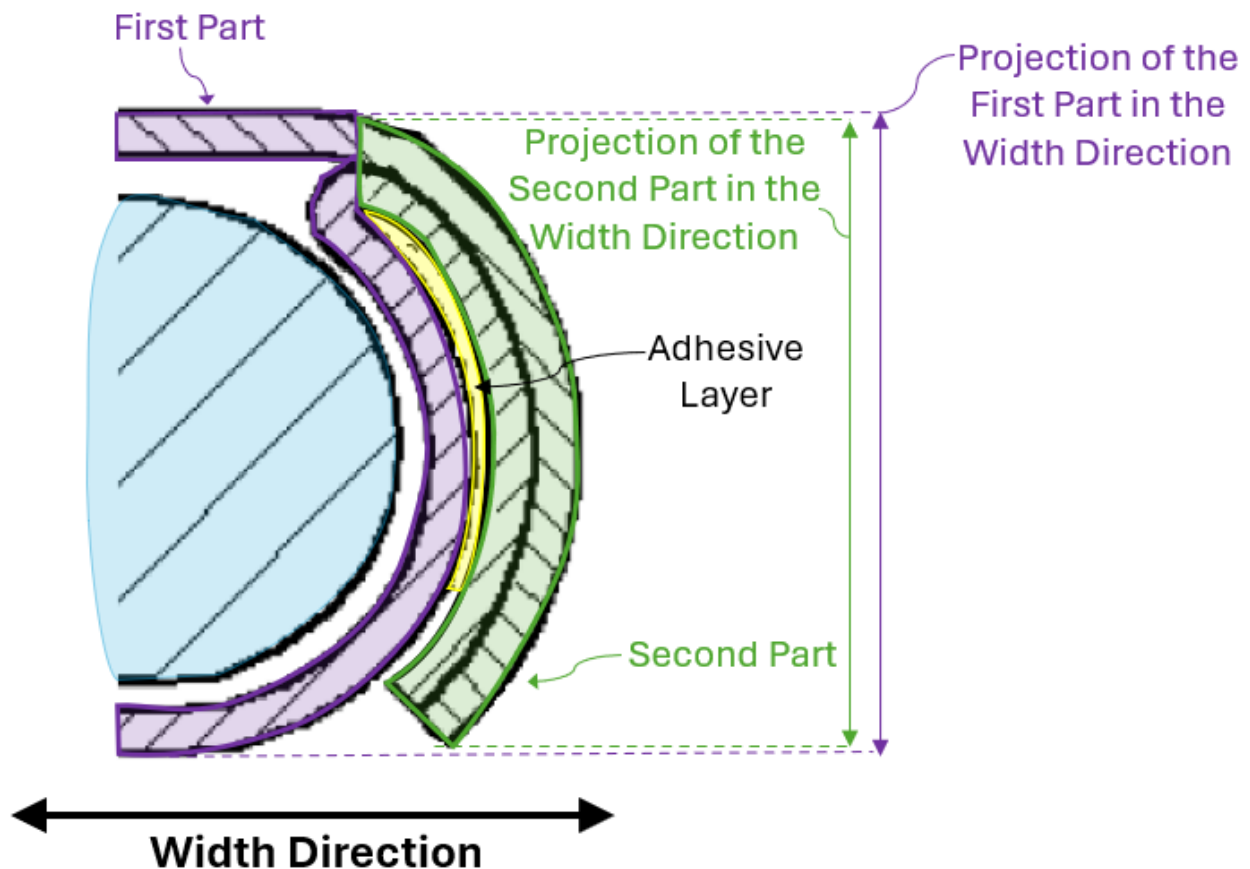
Kim-439, FIG. 5b (enlarged partial, annotated).

The projection of Kim-439's second part is located within the projection of Kim-439's first part in the width direction in the same manner as the second part (flange portion 20) disclosed by Figure 1 of the '808 patent:



EX1001, FIG. 1 (annotated).

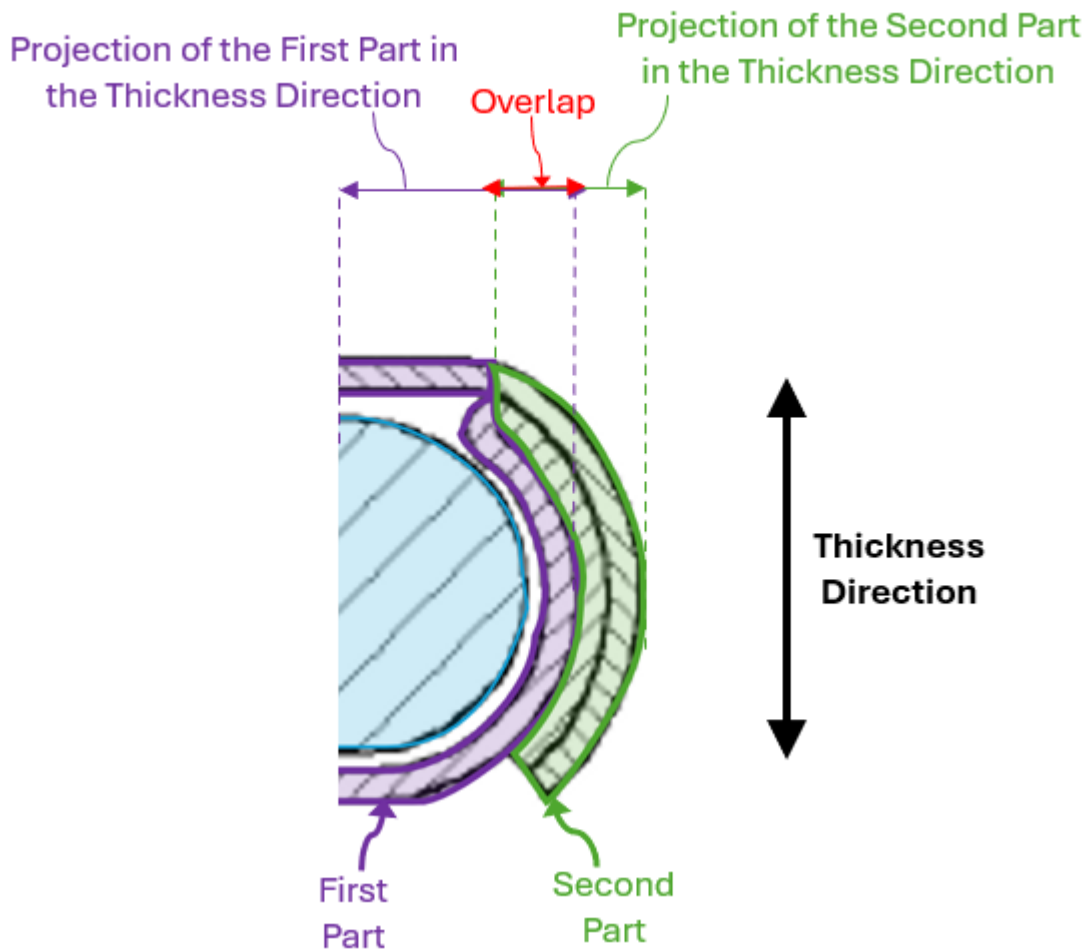
Furthermore, it would have been obvious to a POSA that Kim-439's second part's projection in the width direction would remain within the first part's projection in the width direction in the Kim-439/Ueda combination even with the presence of an adhesive, as annotated below. EX1003, ¶¶[0114]-[0115]. Doing so would be consistent with Ueda teaching that joined tab portion 4a does not extend beyond encapsulated portion 4b "to provide a battery that is compact in size." EX1006, Abstract.



EX1003, ¶[0115], Kim-439's Modified Battery.

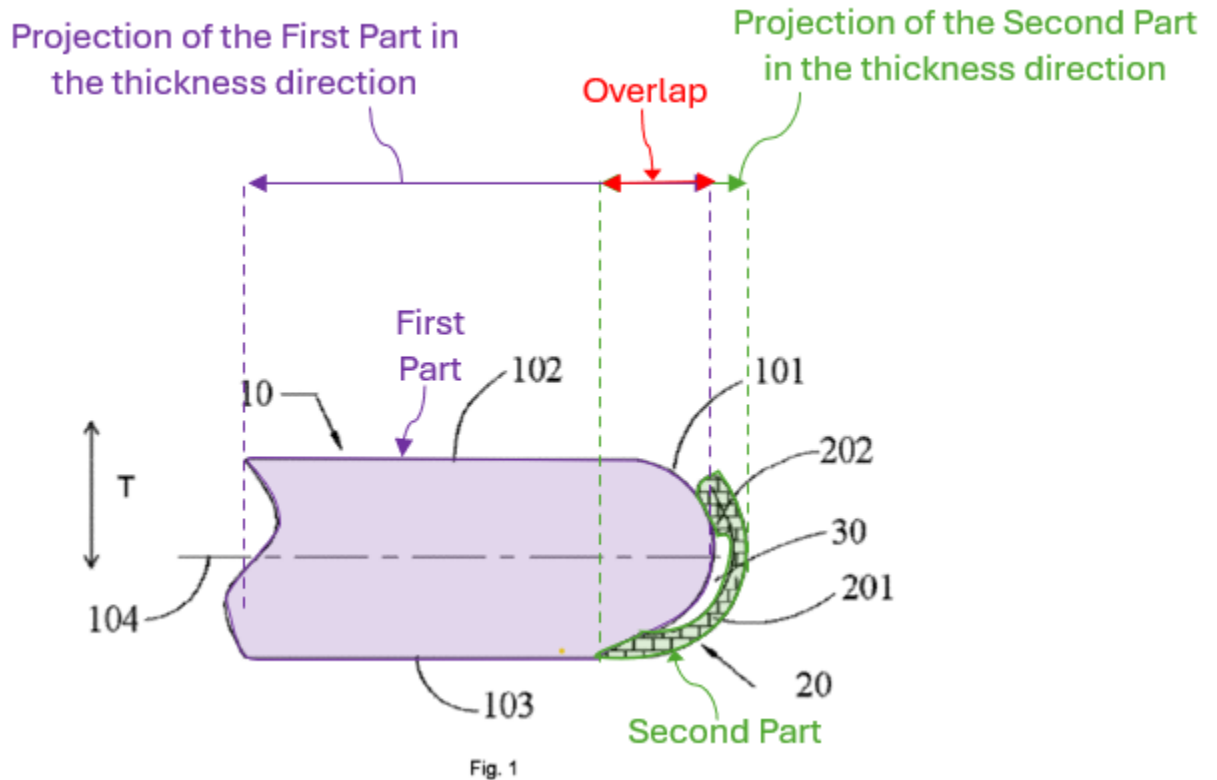
E. Dependent Claim 4

A projection of Kim-439's first part (upper and lower surfaces 210, 220) in the thickness direction overlaps with a projection of its second part (bonding portion 240) in the thickness direction, as annotated below. EX1005, pp. 4-5; EX1003, ¶¶[0116]-[0117]. When viewed along the thickness axis, the projection of Kim-439's second part overlaps a portion of the projection of Kim-439's first part, rather than being entirely offset from it. *Id.*



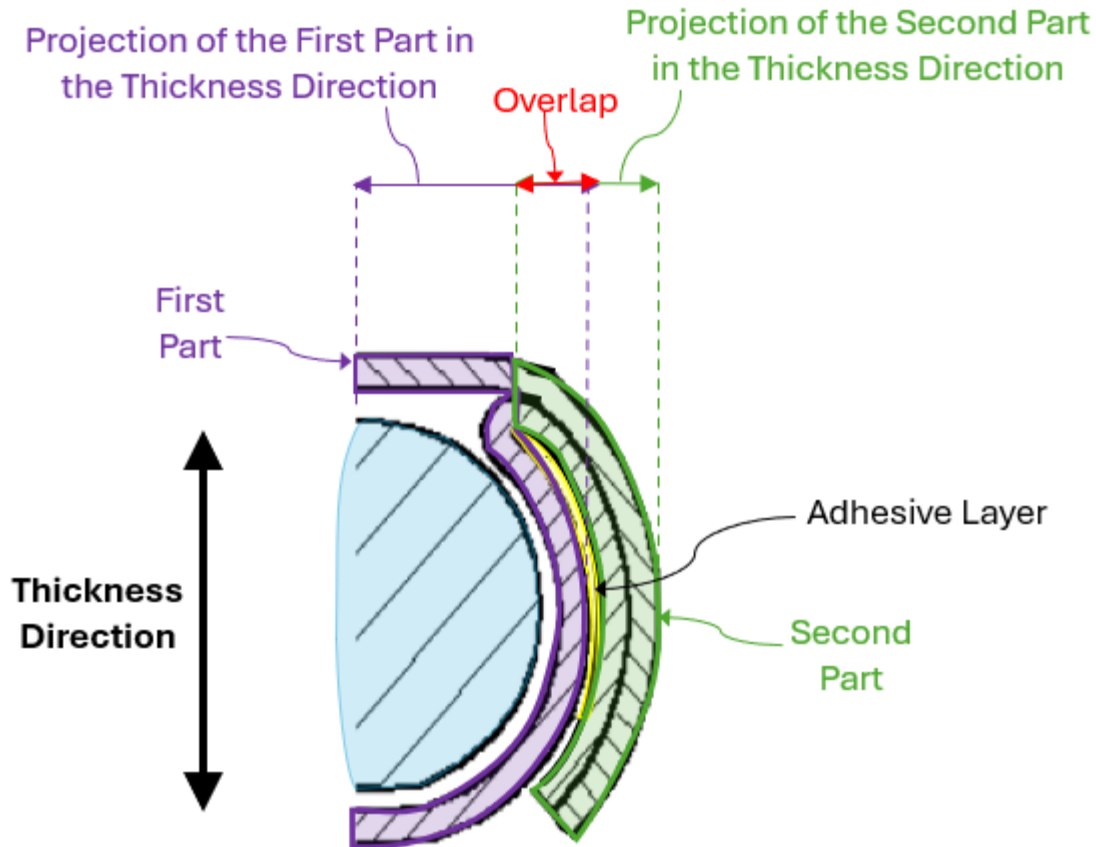
EX1005, FIG. 5b (enlarged partial, annotated)

The projection of Kim-439's second part overlaps the projection of Kim-439's first part in the thickness direction in the same manner as the second part (flange portion 20) disclosed in Figure 1 of the '808 patent:



'808 Patent, FIG. 1 (annotated)

Furthermore, it would have been obvious to a POSA that the projections would remain overlapped in the thickness direction of Kim-439 as modified, because Kim-439's second part (bonding portion 240) would continue to bend around the side face of the casing, as taught by Ueda. EX1003, ¶¶[0118]-[0119]; EX1006, ¶[0006].

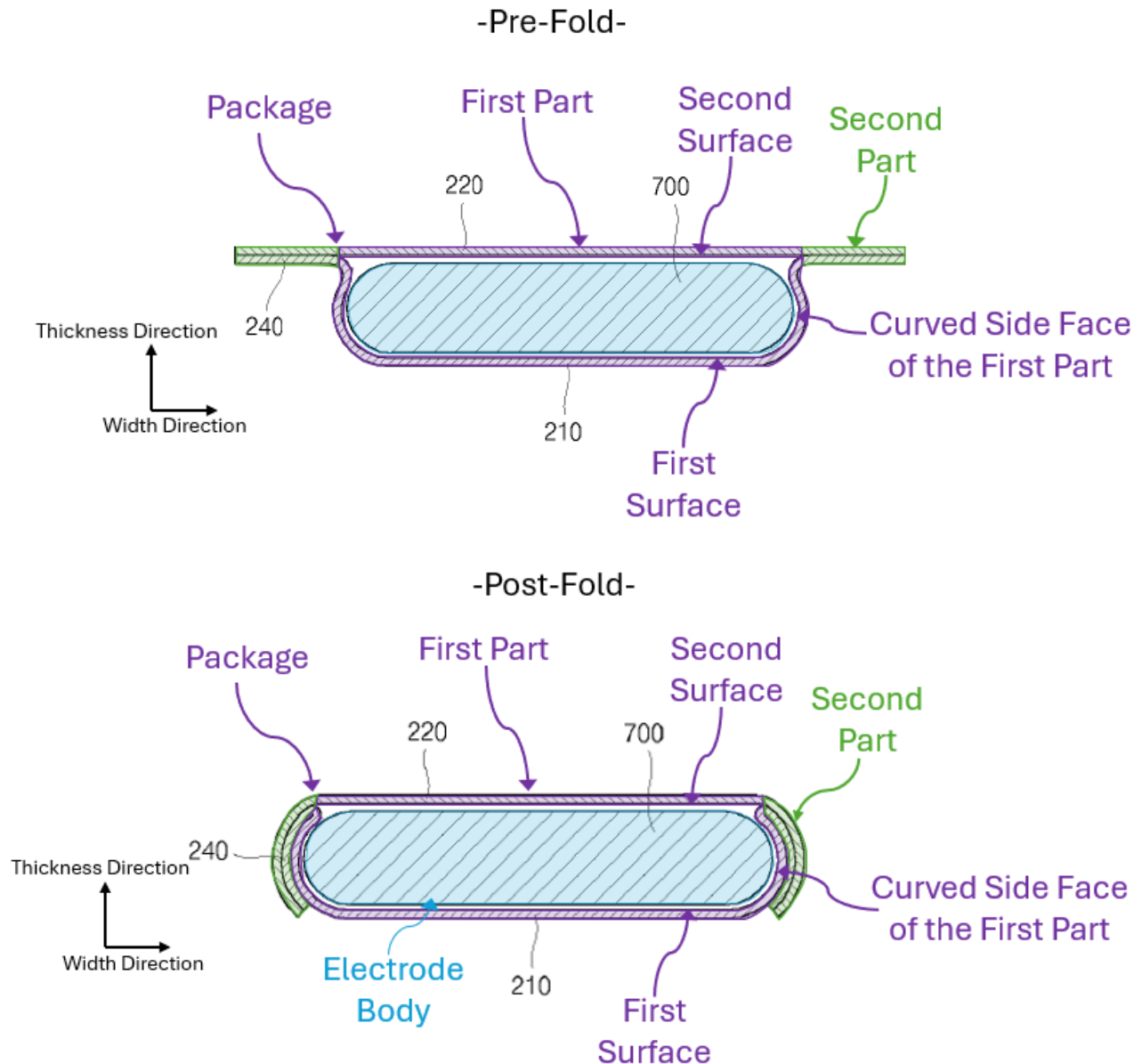


EX1003, ¶[0119], Kim-439's Modified Battery.

F. Dependent Claim 5

1. “wherein the first part comprises: a first surface extending in the width direction; a second surface extending in the width direction, wherein the second surface is opposite to the first surface in the thickness direction.”

As shown below in Figures 4b-5b, Kim-439's first part includes a “first surface extending in the width direction,” as the interior side of Kim-439's upper surface 220, and a “second surface extending in the width direction,” as the interior side of Kim-439's lower surface 210. EX1005, pp. 4-5; EX1003, ¶¶[0120]-[0121]. The second surface is opposite to the first surface in the thickness direction. *Id.*



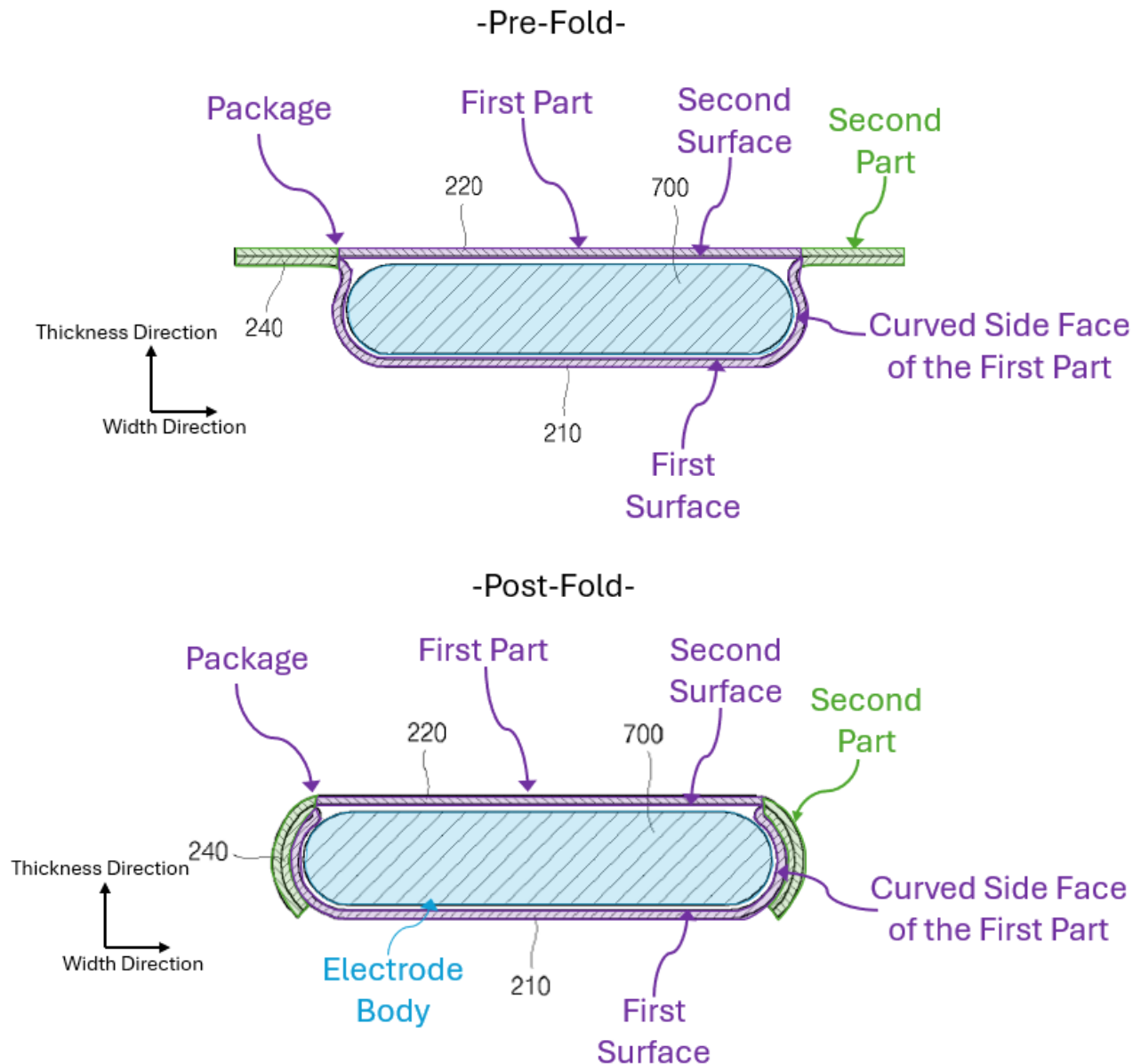
Kim-439, FIG. 4b, 5b (annotated).

2. “wherein the first part comprises: ... the curved side face connects the first surface and the second surface.”

Consistent with the construction in Section VII.B, Kim-439 discloses the “curved side face,” as the “rounded” side of Kim-439’s casing because the rounded side of Kim-439’s pouch casing 200 connects the interior side of the pouch casing’s

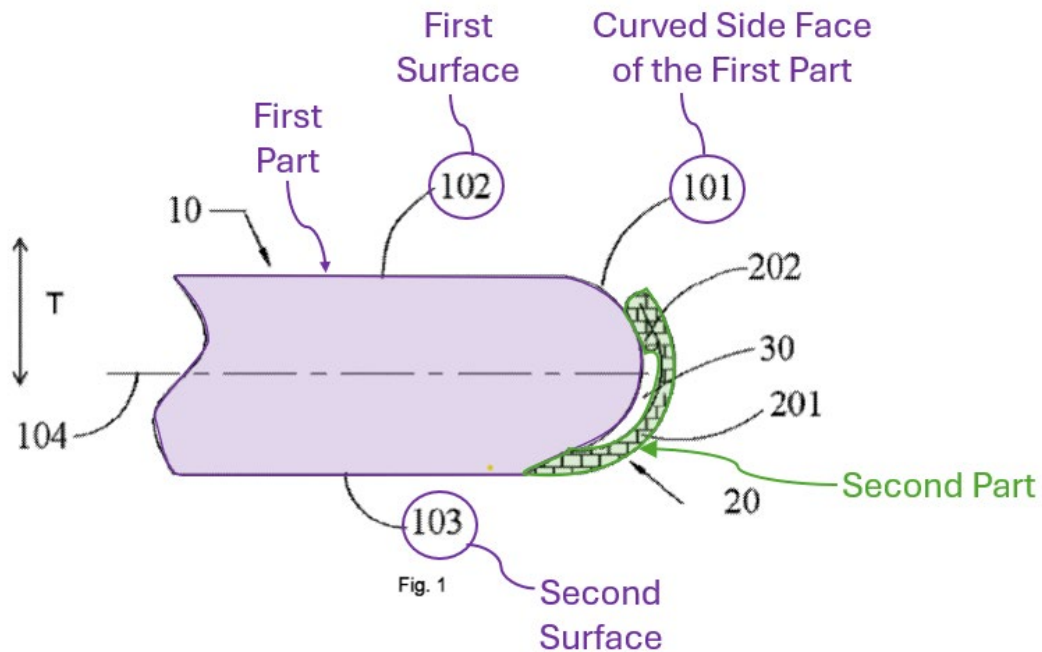
upper surface 220 to the interior side of the pouch casing's lower surface 210.

EX1005, p. 5; EX1003, ¶[0122]. The interior side of both Kim-439's upper surface 220 and lower surface 210 extend in a width direction and are located opposite each other to define a space 211 for accommodating the electrode body. *Id.*



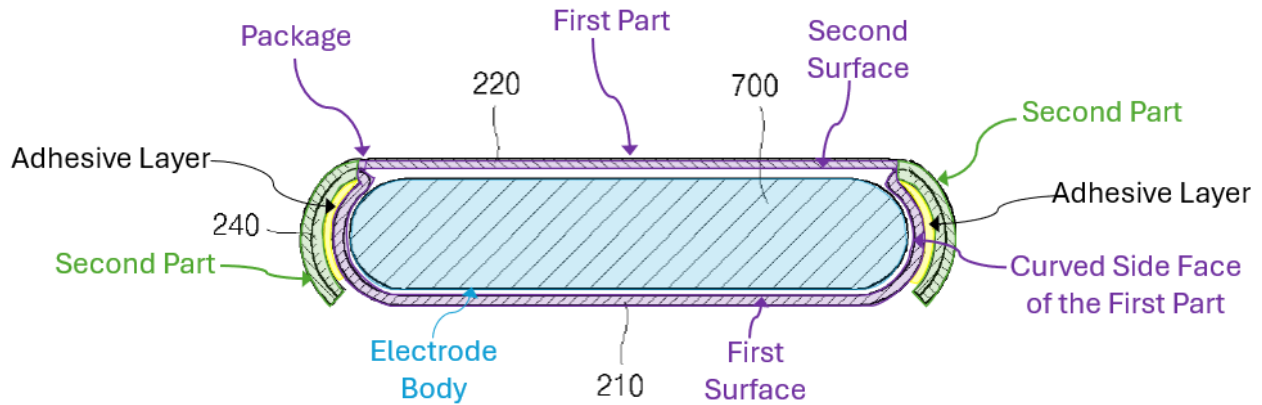
Kim-439, FIG. 4b, 5b (annotated).

Kim-439's rounded side surface connects upper surface 220 and lower surface 210 of pouch casing 200 in the same manner as the '808 patent's side face 101, shown below. EX1001, 1:51-2:8; EX1003, ¶[0123].



EX1001, FIG. 1 (annotated).

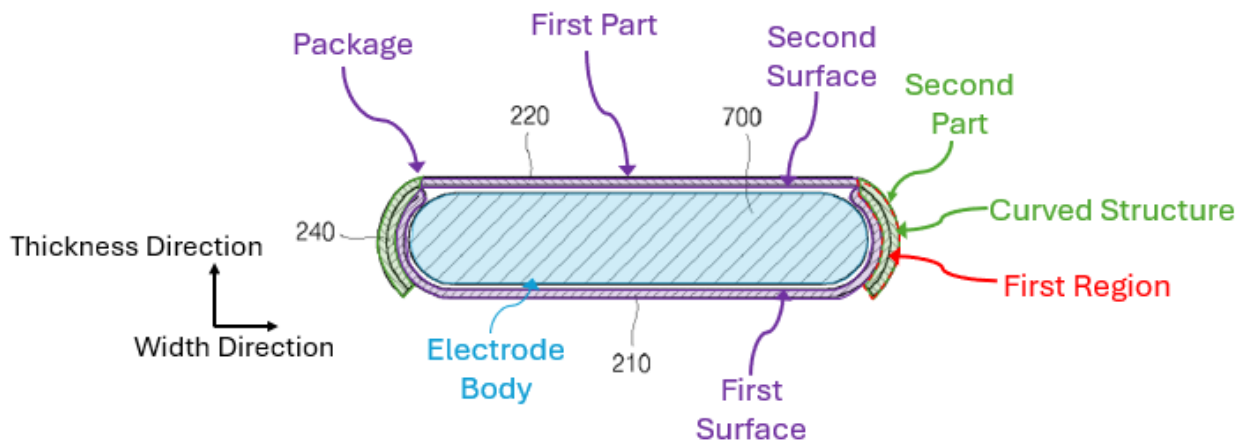
Furthermore, it would have been obvious to a POSA that Kim-439's first surface, second surface, and curved side surface would have the same spatial arrangement in the Kim-439/Ueda combination, annotated below, because applying adhesive between Kim-439's second part and the side of package would not alter the structural arrangement of Kim-439's lower surface 210, upper surface 220, and the rounded side of the package. EX1003, ¶[0124].



EX1003, ¶[0124], Kim-439's Modified Battery.

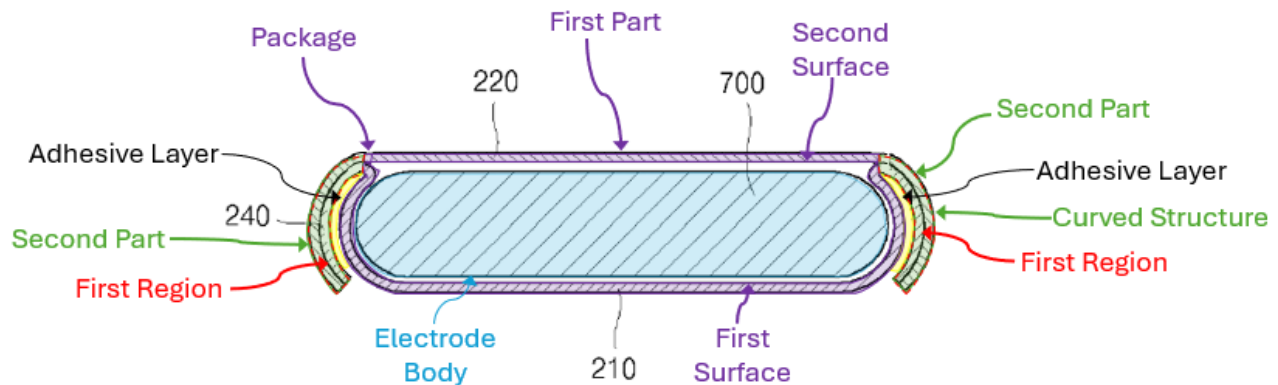
G. Dependent Claim 6

Kim-439's second part (bonding portion 240) comprises a first region comprising a curved structure, annotated below. EX1005, p. 5. Kim-439's bonding portion 240 (including the curved structure) is connected to the first part (upper and lower surfaces 210, 220), as bonding portion 240 is integrally formed with the unbonded portion of upper and lower surfaces 210, 220. EX1003, ¶¶[0125]-[0126].



EX1005, FIG. 5b (annotated).

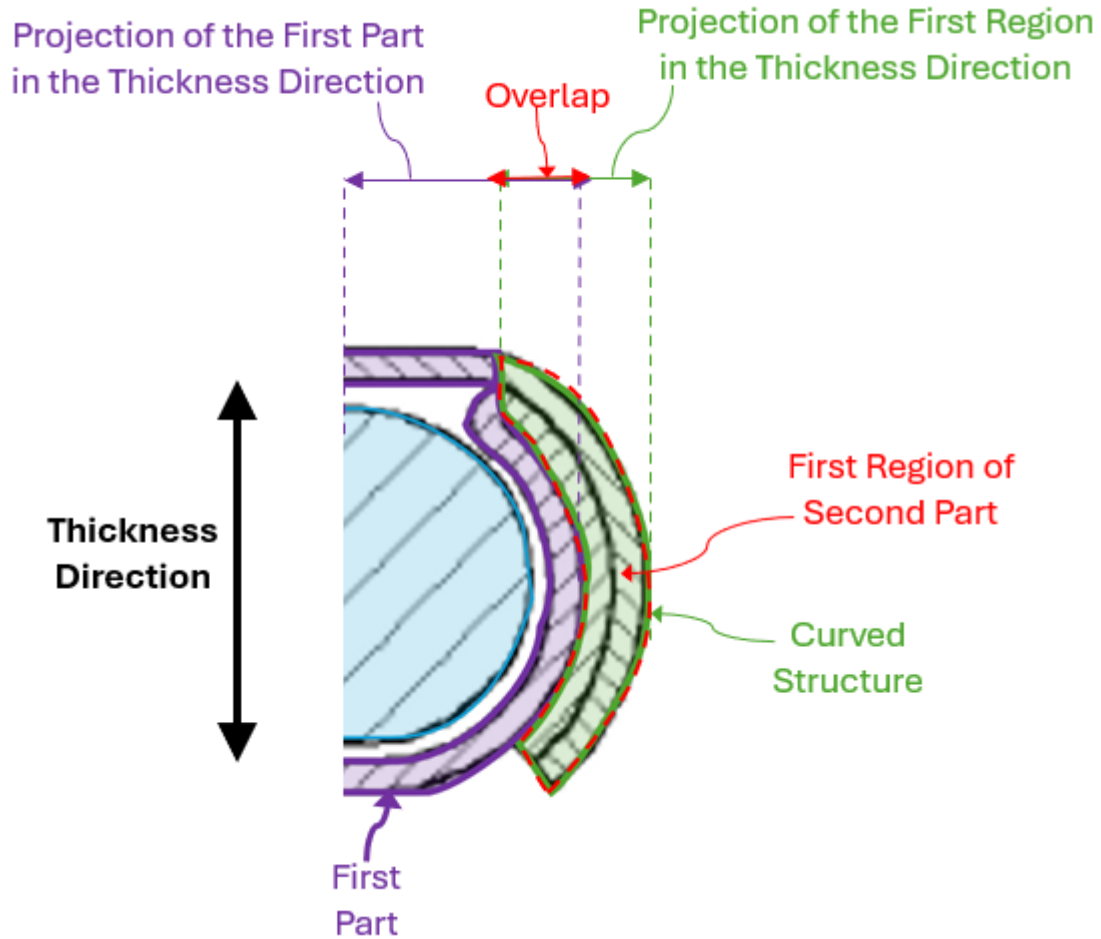
Furthermore, it would have been obvious to a POSA that Kim-439's second part would have had a curved structure in the Kim-439/Ueda combination, as annotated below, because Kim-439's second part (bonding portion 240) would continue to bend around the side face of the package, consistent with Ueda's teaching. EX1003, ¶[0127]; EX1006, ¶[0006].



EX1003, ¶[0127], Kim-439's Modified Battery.

H. Dependent Claim 7

A projection of the first region of Kim-439's second part (bonding portion 240) in the thickness direction overlaps with a projection of its first part (upper surface 220, lower surface 210, and side) in the thickness direction, as annotated below. EX1005, pp. 4-5; EX1003, ¶¶[0128]-[0129]. When viewed along the thickness axis, the projection of Kim-439's first region overlaps a portion of the projection of Kim-439's first part, rather than being entirely offset from it. *Id.*



Kim-439, FIG. 5b (enlarged partial, annotated).

The projection of Kim-439's first region overlaps the projection of Kim-439's first part in the thickness direction in the same manner as the '808 patent's first part (segment 201):

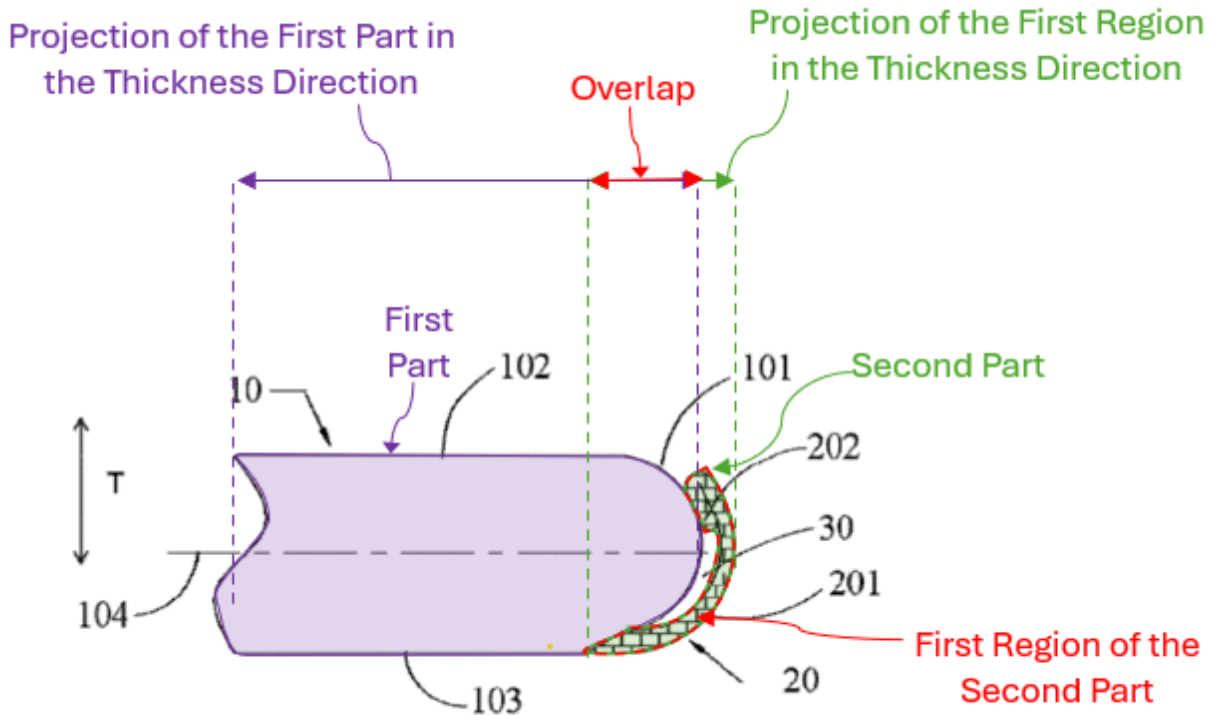
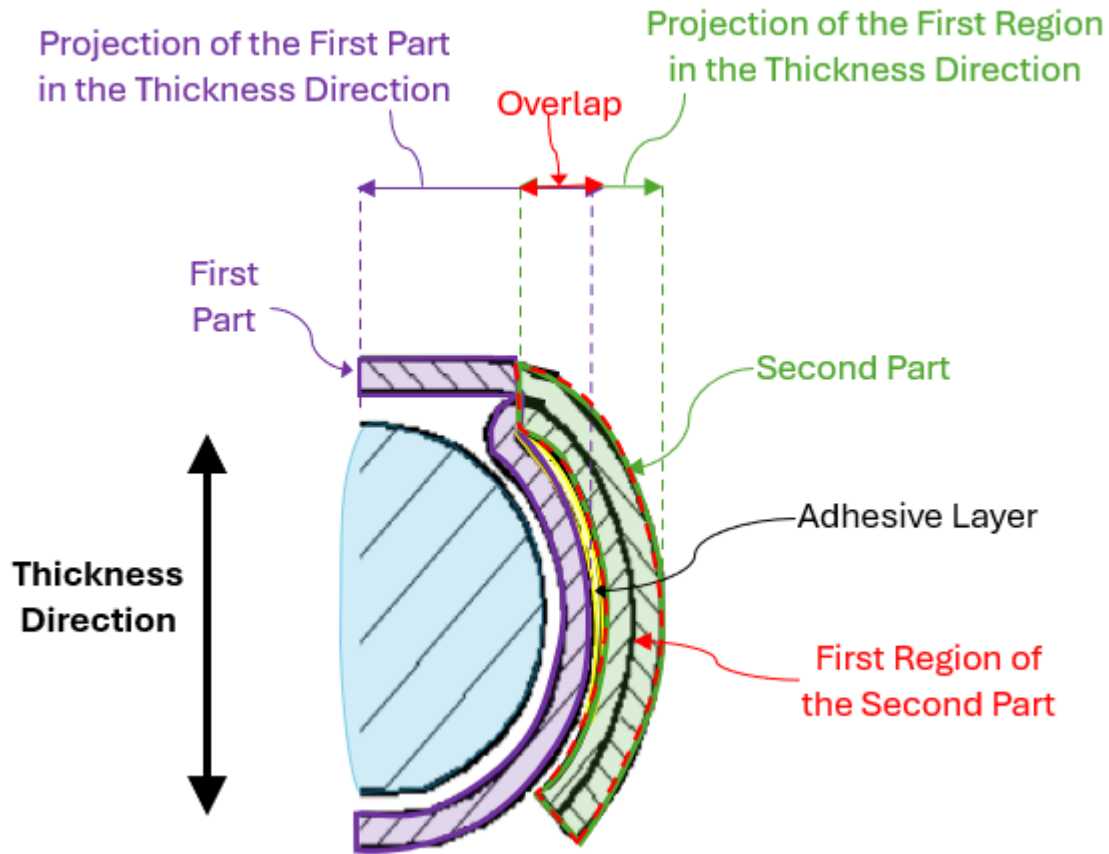


Fig. 1

EX1001, FIG. 1 (annotated).

Furthermore, it would have been obvious to a POSA that the projections would remain overlapped in the thickness direction in the Kim-439/Ueda combination, as annotated below, because Kim-439's second part (bonding portion 240) would continue to bend around the side face of the package, consistent with Ueda's teaching. EX1003, ¶¶[0130]-[0131]; EX1006, ¶[0006].



EX1003, ¶[0131], Kim-439's Modified Battery.

I. Dependent Claim 8

1. Kim-439

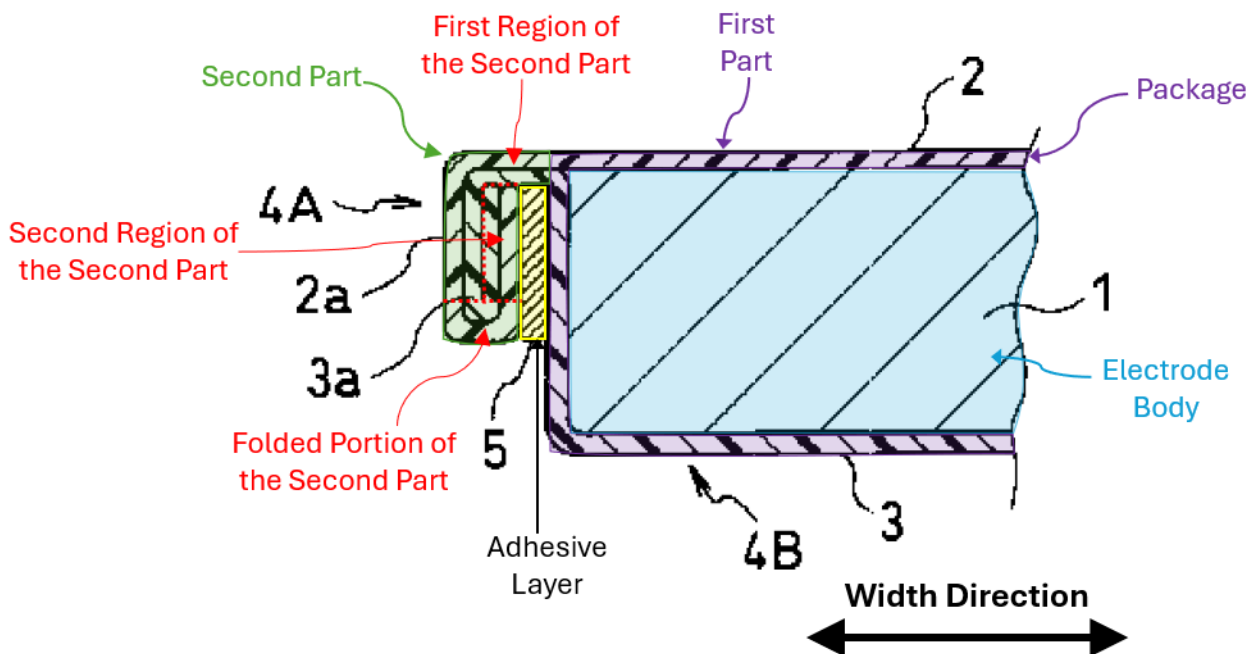
Kim-439 does not explicitly disclose that the second part comprises a second region and a folded portion connecting the first region and the second region.

EX1003, ¶¶[0132]-[0133]. However, it was well known to fold the second part (flange) of a battery package inward such that the second part includes a first region, a second region, and a folding portion connecting the first and second regions, as evidenced by Ueda. *Id.*

2. Ueda

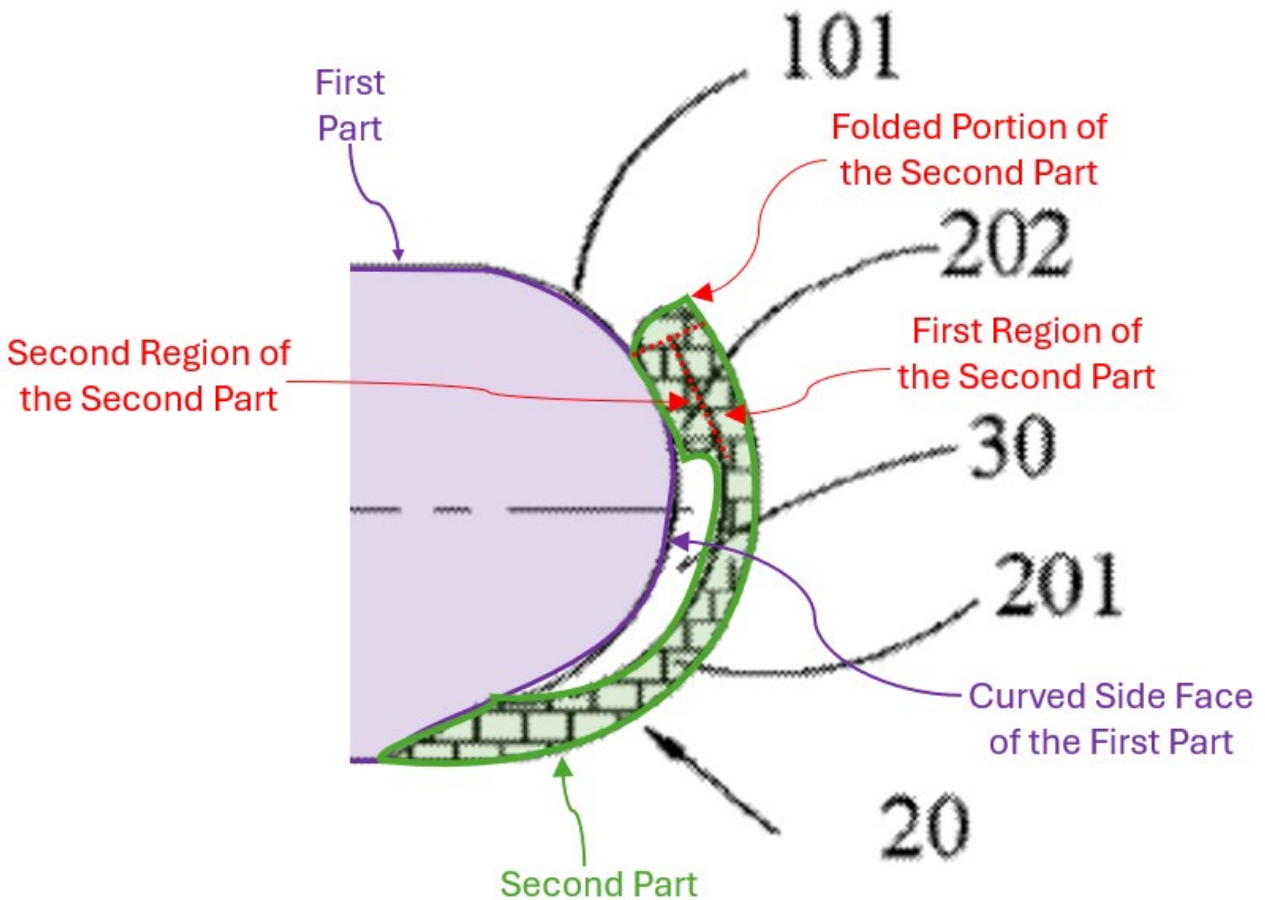
Ueda's "joined tab portion 4A may be folded once more partway as shown in FIG. 2, such that the leading edge of the joined tab portion 4A is interposed between the joined tab portion 4A and the side surface of the encapsulated portion 4B."

EX1006, ¶[0023]. Thus, Ueda's joined tab portion 4A includes a first region connected to the first part, a second region, and a folded portion connecting the first and second regions, as annotated below. EX1006, FIG. 2. Ueda discloses the recited "folded portion" as a second bend in the second part (joined tab portion 4A) that interposes the second region between the first region and the package's side face in the width direction. EX1003, ¶[0134].



EX1006, FIG. 2 (annotated).

Ueda's inward folding technique interposes the second region between the second part's first region and the package's side face in the same manner as the '808 patent, shown below. EX1001, 1:51-2:8; EX1003, ¶[0135].

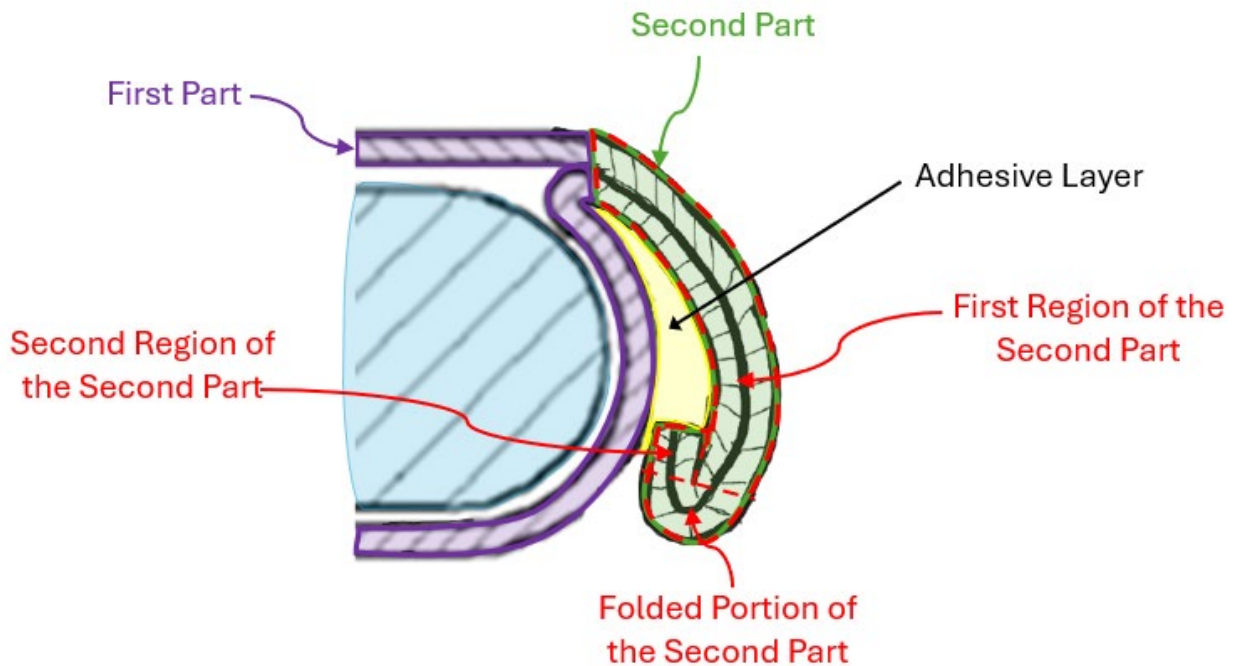


EX1001, FIG. 1 (annotated).

3. Kim-439/Ueda Combination

As in Section IX.A.2, it would have been obvious to fold Kim-439's second part (bonding portion 240) inward, as taught by Ueda, thus interposing the leading edge of bonding portion 240 between the second part's first region and the package's side face, thereby shielding the leading edge from moisture and handling.

EX1006, ¶¶[0013], [0023], [0030]; EX1003, ¶[0136]. Furthermore, it would have been obvious to a POSA to form a second bend in Kim-439's second part, as identified by the dashed-line shown below, redirecting the second part's second region toward the second surface of Kim-439's first part. EX1003, ¶[0136].



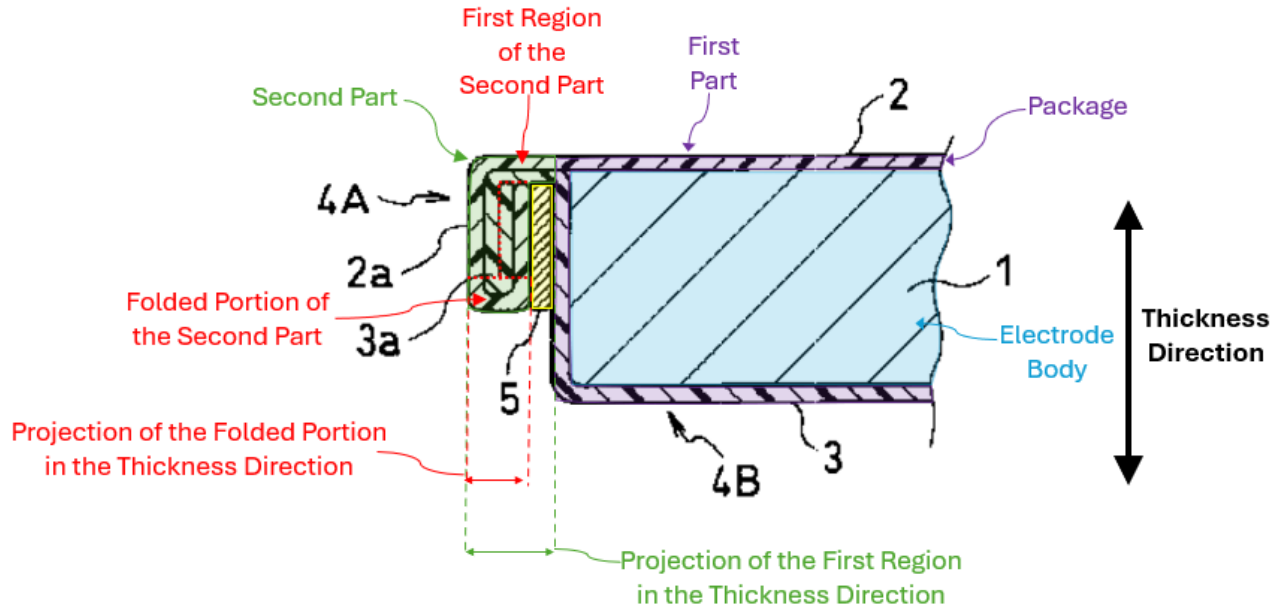
EX1003, ¶[0136], Kim-439's Modified Battery.

A POSA would have had a reasonable expectation of success in applying Ueda's inward folding technique to Kim-439's second part because this modification would improve Kim-439's package's structural integrity without extending the second part beyond the package's upper and lower surfaces. EX1003, ¶[0137]. This modification would have simply been applying a known technique (Ueda's inward folding) to a known device (Kim-439's battery) to shield the package's seal. *Id.*

Furthermore, a POSA would have understood from basic background knowledge that the second region's height relative to the first region of Ueda's second part is not limited to Figure 2's depiction. EX1003, ¶[0138]. Although Ueda's Figure 2 shows the second part's leading edge engaging the second part's first region, a POSA would have recognized this is merely one implementation of Ueda's inward folding technique. *Id.* In other implementations, the leading edge of the second part may remain spatially separated from its first region while still achieving Ueda's intended objectives—improving structural integrity and protecting the package seal. *Id.*; *see e.g.*, EX1007, FIG. 4, ¶¶[0052]-[0056]. Accordingly, a POSA would have understood, when applying Ueda's inwardly folding technique with Kim-439, the second part can likewise be folded such that its leading edge remains spatially separated from the first region while still achieving the desired structural and sealing benefits. EX1003, ¶[0138].

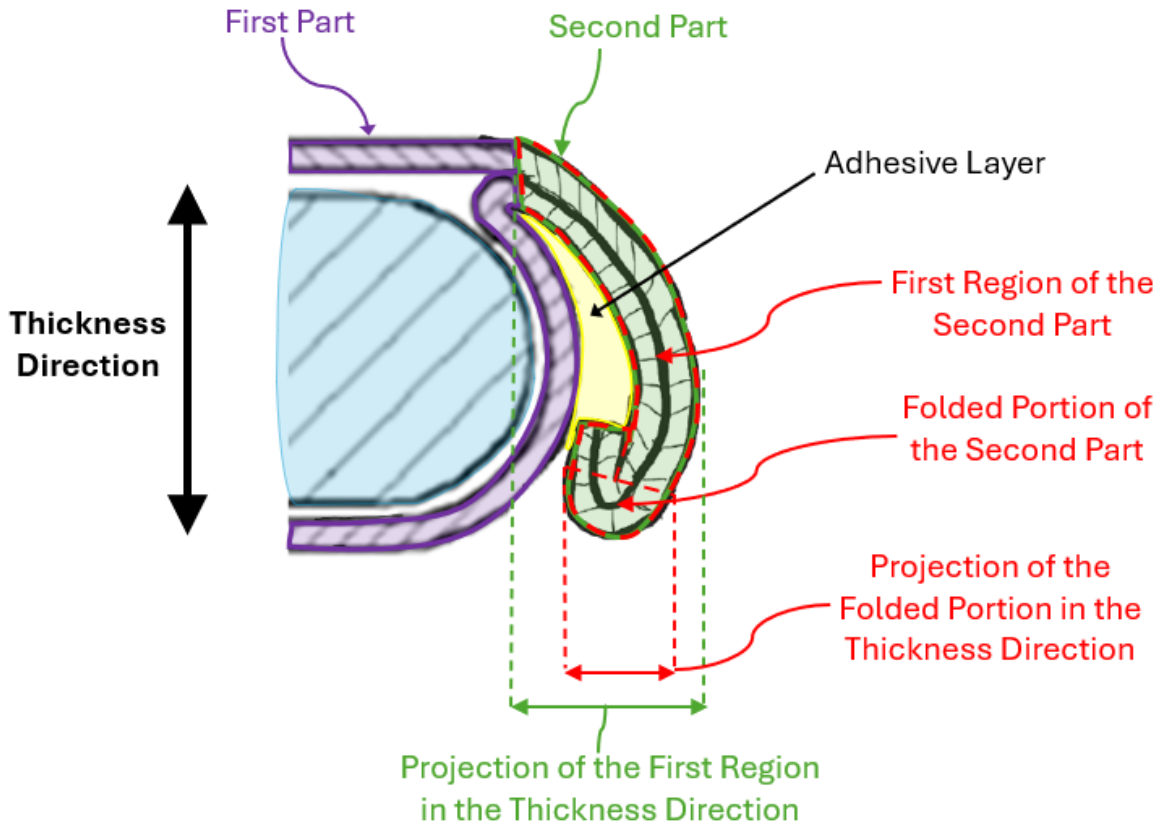
J. Dependent Claim 9

A projection of Ueda's second part's folded portion (second fold of tab portion 4a) in the thickness direction is located within a projection of the first region (first fold of tab portion 4a) in the thickness direction, as annotated below. EX1006, ¶¶[0013], [0023], [0030]; EX1003, ¶¶[0139]-[0140].



EX1006, FIG. 2 (annotated).

Accordingly, it would have been obvious to a POSA that, when combining Ueda's inward folding technique with Kim-439's second part (bonding portion 240), a similar structural arrangement would be made to minimize the battery's footprint, as shown below. EX1003, ¶[0141].



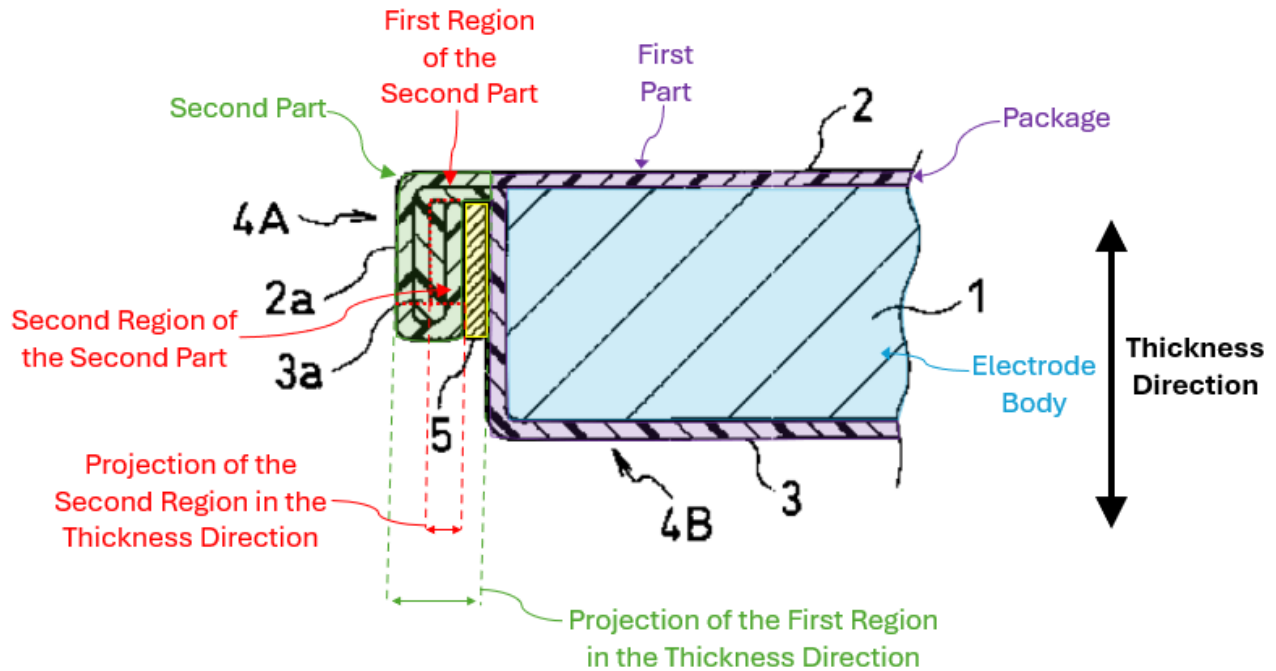
EX1003, ¶[0141], Kim-439's Modified Battery.

Furthermore, a POSA would have understood from basic background knowledge that the position and extent of the second part's folded portion relative to the first region can be varied as a result-effective variable. EX1003, ¶[0142]; EX1007, ¶¶[0054]-[0056], [0068]; *Pfizer Inc. v. Sanofi Pasteur Inc.*, 94 F.4th 1341, 1347 (Fed. Cir. 2024) (explaining that when the prior art discloses the general conditions of a claim, routine optimization of a result-effective variable does not confer patentability). For example, Kim-999 teaches that the height of the second part (folding part 23) can be adjusted so long as the height is smaller than the thickness of the electrode assembly 11 and that the folding angle can be adjusted to

maintain adhesion and control spacing relative to the case. EX1007, ¶¶[0054]-[0056], [0068]. These parameters directly affect the spatial relationship between the folded portion and the first region, including its extension in the width direction. EX1003, ¶[0142]. Accordingly, when combining Ueda's inward folding technique with Kim-439, a POSA would have been motivated to modify the height and folding angle of Kim-439's second part such that the folded portion remains within a projection of the second part's first region in the thickness direction. EX1007, ¶¶[0054]-[0056], [0068]; EX1003, ¶[0142]. Doing so would have been the application of a known technique (adjusting the second part's height and folding angle) to a known device (Kim-439's battery) to achieve a compact profile and improved adhesive retention. EX1003, ¶[0142].

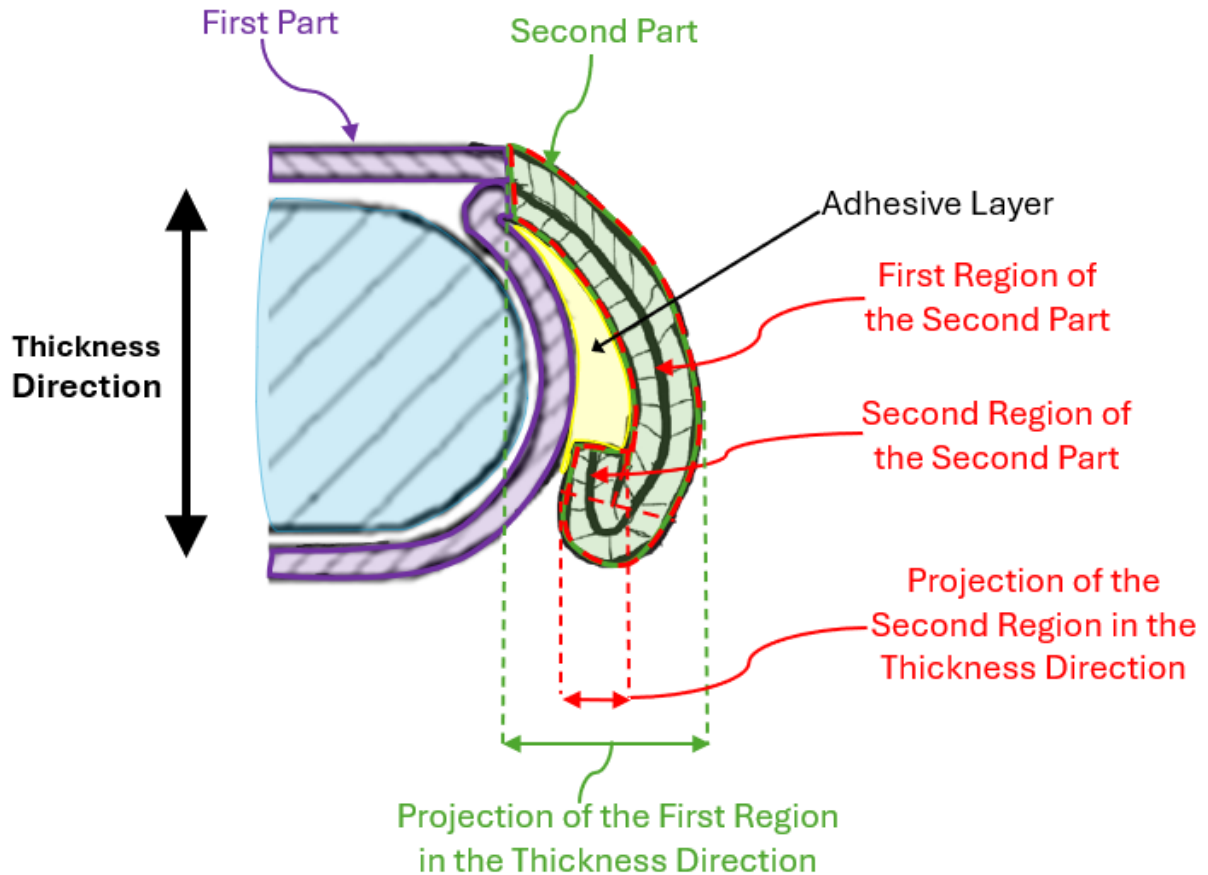
K. Dependent Claim 10

A projection of Ueda's second region (leading edge of tab portion 4a) in the thickness direction is located within a projection of the first region (first fold of tab portion 4a) in the thickness direction, as annotated below. EX1006, ¶¶[0013], [0023], [0030]; EX1003, ¶¶[0143]-[0144].



Ueda, FIG. 2 (annotated).

Accordingly, it would have been obvious to a POSA that, when combining Ueda's inward folding technique with Kim-439's bonding portion 240, a similar structural arrangement would be made to minimize the battery's footprint. EX1003, ¶[0145].



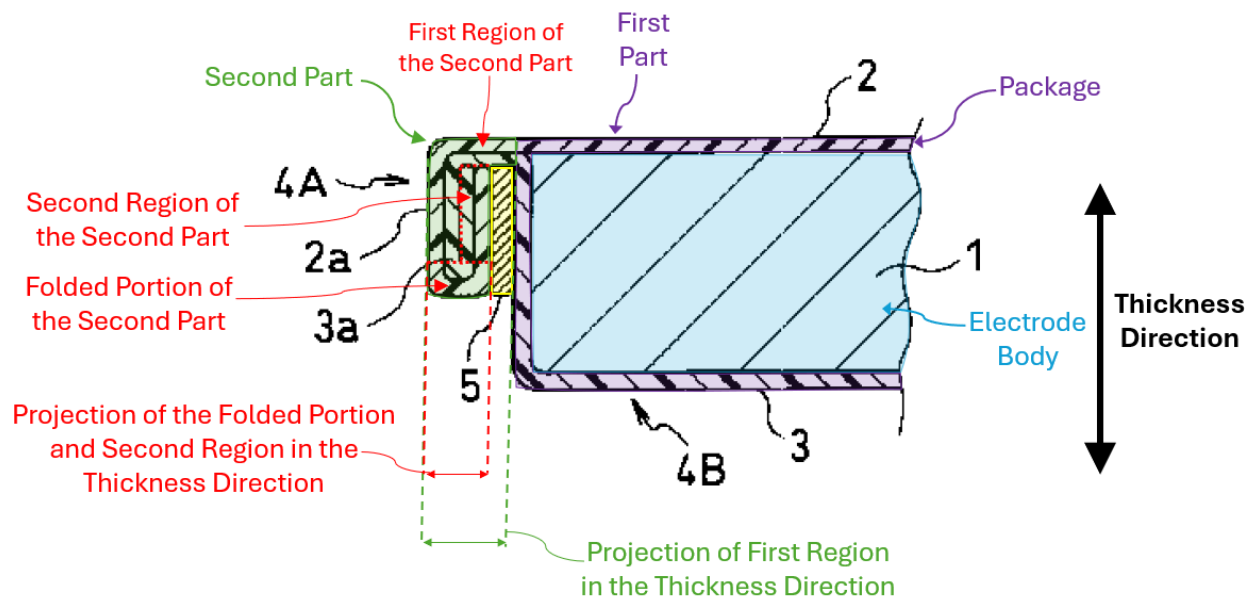
EX1003, ¶[0145], Kim-439's Modified Battery.

As discussed for claim 9, a POSA would have understood from basic background knowledge that the spatial arrangement of the second part's second region relative to the first region can be varied as a result-effective variable. *See* EX1007, ¶[0068]; EX1003, ¶[0146]. A POSA would have been motivated to adjust the height and folding angle of Kim-439's second part to prevent the second part's second region from extending beyond the projection of the second part's first region in the thickness direction to retain adhesive and minimize footprint. EX1003, ¶[0146]. Doing so would have been the application of a known technique (adjusting

the second part's height and folding angle) to a known device (Kim-439's battery) to achieve a compact profile and improved adhesive retention. *Id.*

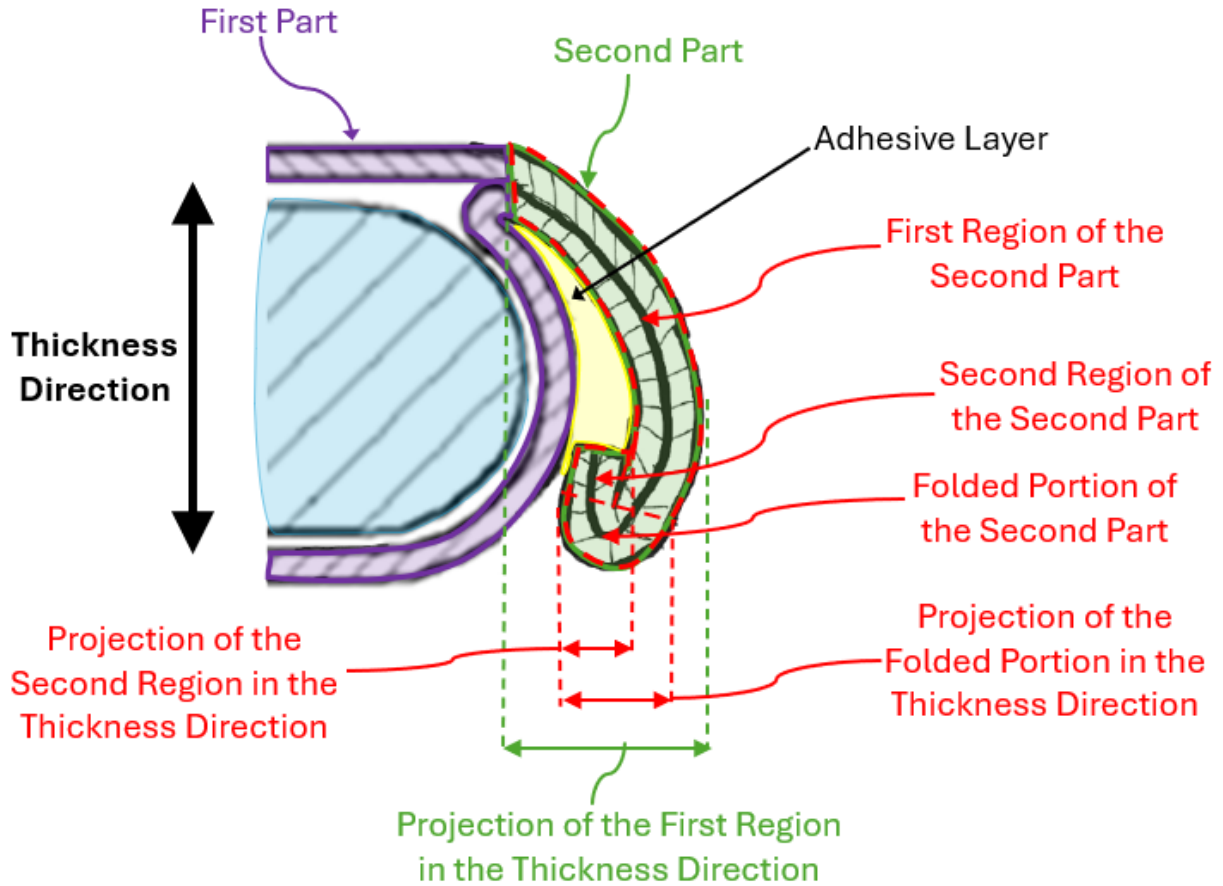
L. Dependent Claim 11

A projection of Ueda's folded portion (second fold of tab portion 4a) and a projection of the second region (leading edge of tab portion 4a) in the thickness direction are located within the projection of the first region (first fold of tab portion 4a) in the thickness direction, as annotated below. EX1006, ¶¶[0013], [0023], [0030]; EX1003, ¶¶[0147]-[0148].



EX1006, FIG. 2 (annotated).

Accordingly, it would have been obvious to a POSA that, when combining Ueda's inward folding technique with Kim-439's bonding portion 240, a similar structural arrangement would be made to minimize the battery's footprint. EX1003, ¶[0149].



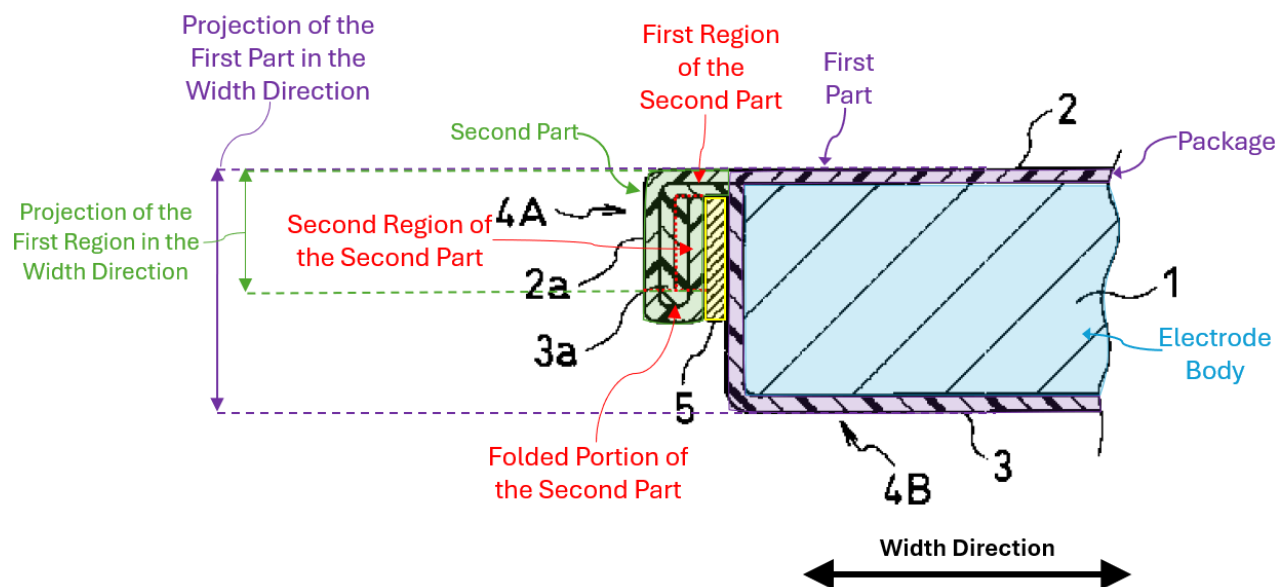
EX1003, ¶[0149], Kim-439's Modified Battery.

As discussed for claims 9-10, a POSA would have understood from basic background knowledge that the spatial arrangement of the second part's folded portion and second region relative to the first region can be varied as a result-effective variable. *See* EX1007, ¶[0068]; EX1003, ¶[0150]. A POSA would have been motivated to adjust the height and folding angle of Kim-439's second part to prevent the second part's folded portion and second region from extending beyond the projection of the second part's first region in the thickness direction to retain adhesive and minimize footprint. EX1003, ¶[0150]. Doing so would have been the

application of a known technique (adjusting the second part's height and folding angle) to a known device (Kim-439's battery) to achieve a compact profile and improved adhesive retention. *Id.*

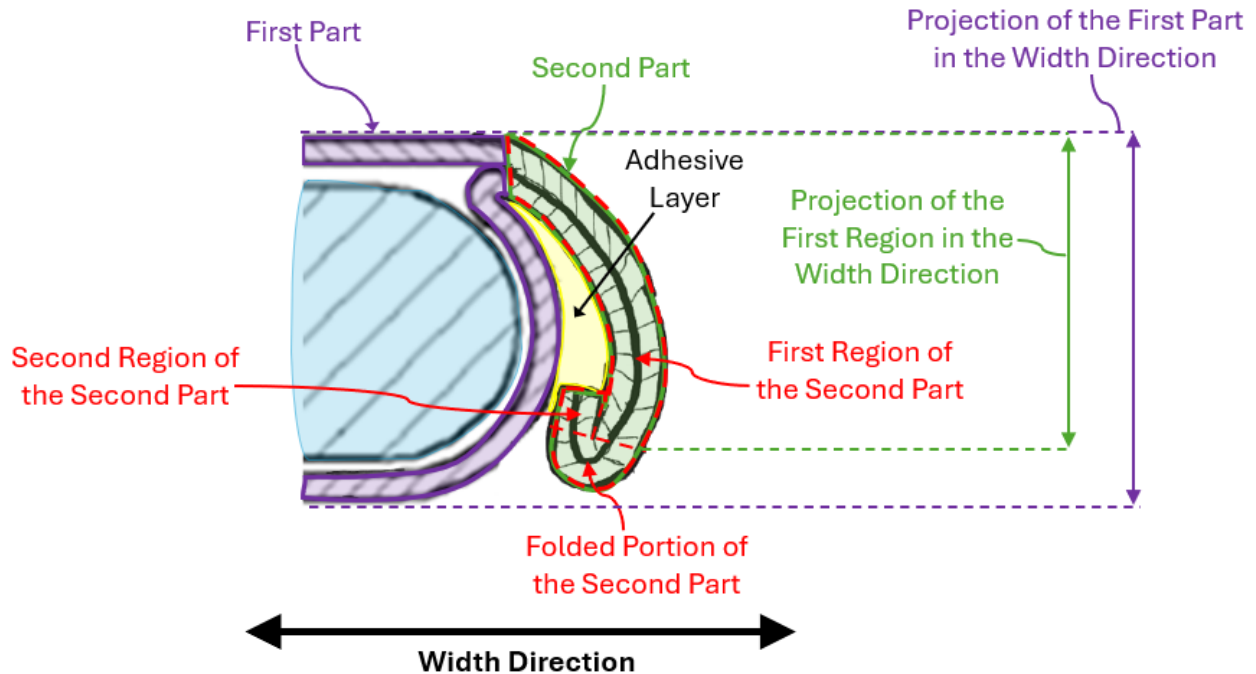
M. Dependent Claim 12

A projection of Ueda's first region (first fold of tab portion 4a) in the width direction is located within a projection of the first part (encapsulated portion 4b) in the width direction, as annotated below. EX1006, ¶¶[0013], [0023], [0030]; EX1003, ¶¶[0151]-[0152].



EX1006, FIG. 2 (annotated).

Accordingly, it would have been obvious to a POSA that, when combining Ueda's inward folding technique with Kim-439's second part, a similar structural arrangement would be made to minimize the battery's footprint. EX1003, ¶[0153].



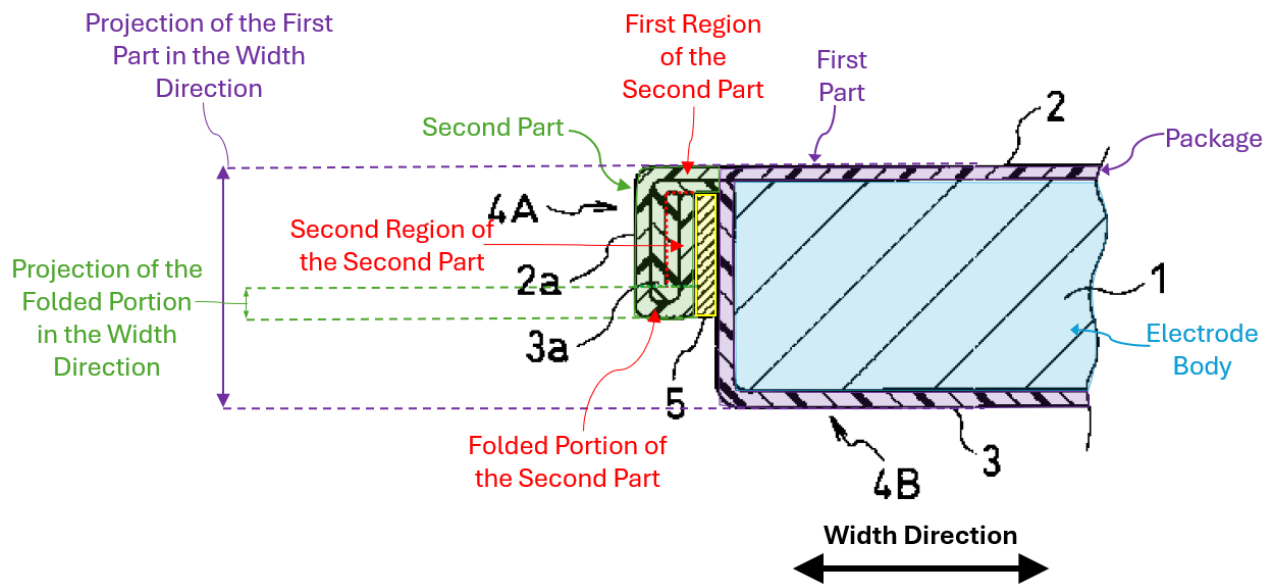
EX1003, ¶[0153], Kim-439's Modified Battery.

Furthermore, a POSA would have understood from basic background knowledge that the height of Kim-439's second part (bonding portion 240) relative to Kim-439's first part (upper surface 220, lower surface 210, and side) can be varied as a result-effective variable. *See* EX1007, ¶¶[0052]-[0056]; EX1003, ¶[0154]. For example, Kim-999 teaches that the height of the second part (folding part 23) can be adjusted so long as it remains shorter than the thickness of the electrode assembly 11, thereby preventing the package's second part from protruding beyond the first part's top and bottom surfaces. *Id.* Accordingly, when combining Ueda's inward folding technique with Kim-439, a POSA would have been motivated to adjust the height of Kim-439's second part to prevent the second part's regions from extending beyond the projection of the first part in the width

direction. *Id.* Doing so would have been the application of a known technique (adjusting the second part's height) to a known device (Kim-439's battery) to achieve a compact profile and improved structural integrity. *Id.*

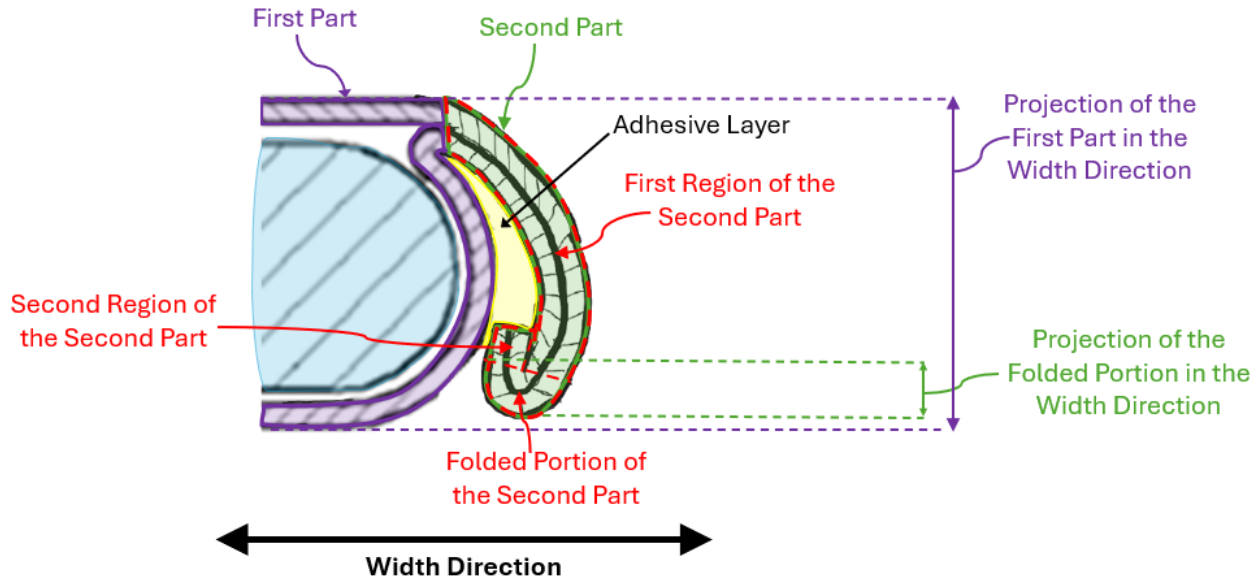
N. Dependent Claim 13

A projection of Ueda's folded portion (second fold of tab portion 4a) in the width direction is located within a projection of the first part (first fold of tab portion 4a) in the width direction, as annotated below. EX1006, ¶¶[0013], [0023], [0030]; EX1003, ¶¶[0155]-[0156].



EX1006, FIG. 2 (annotated).

Accordingly, it would have been obvious to a POSA that, when combining Ueda's inward folding technique with Kim-439's second part, a similar structural arrangement would be made to minimize the battery's footprint. EX1003, ¶[0157].

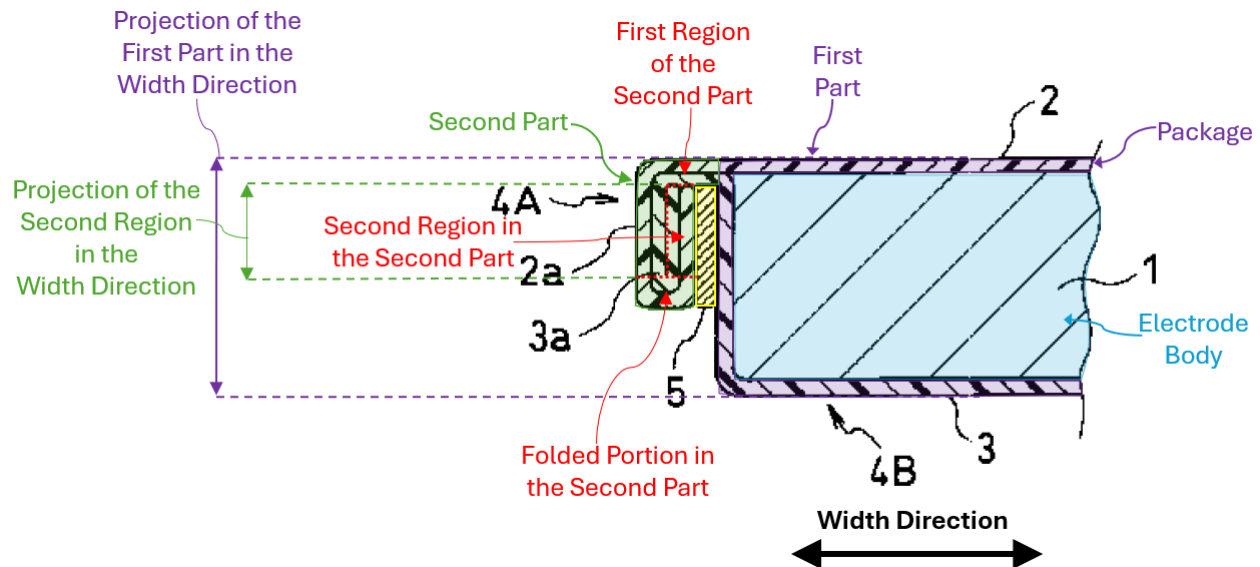


EX1003, ¶[0157], Kim-439's Modified Battery.

As discussed for claim 12, a POSA would have understood from basic background knowledge that the height of the package's second part relative to the package's first part can be varied as a result-effective variable to optimize battery footprint and structural integrity. EX1003, ¶[0158]; EX1007, ¶¶[0052]-[0056]. Because reducing the second part's height limits its extent in the thickness direction, a POSA would have been motivated to adjust the height of Kim-439's second part to prevent the folded portion from protruding beyond the first part's projection in the width direction. EX1003, ¶[0158]. Doing so would have been the application of a known technique (adjusting the second part's height) to a known device (Kim-439's battery) to achieve a compact profile and improved structural integrity. *Id.*

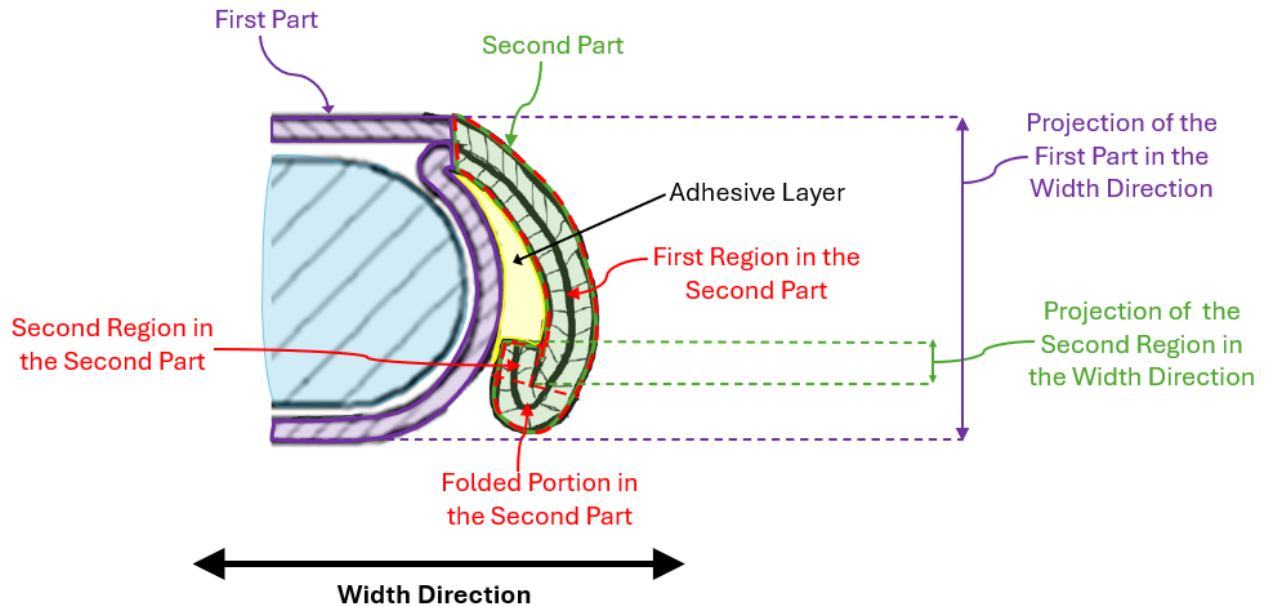
O. Dependent Claim 14

A projection of Ueda's second region (leading edge of tab portion 4a) in the width direction is located within a projection of the first part (first fold of tab portion 4a) in the width direction, as annotated below. EX1006, ¶¶[0013], [0023], [0030]; EX1003, ¶¶[0159]-[0160].



EX1006, FIG. 2 (annotated).

Accordingly, it would have been obvious to a POSA that, when combining Ueda's inward folding technique with Kim-439's second part, a similar structural arrangement would be made to minimize the battery's footprint. EX1003, ¶[0161].

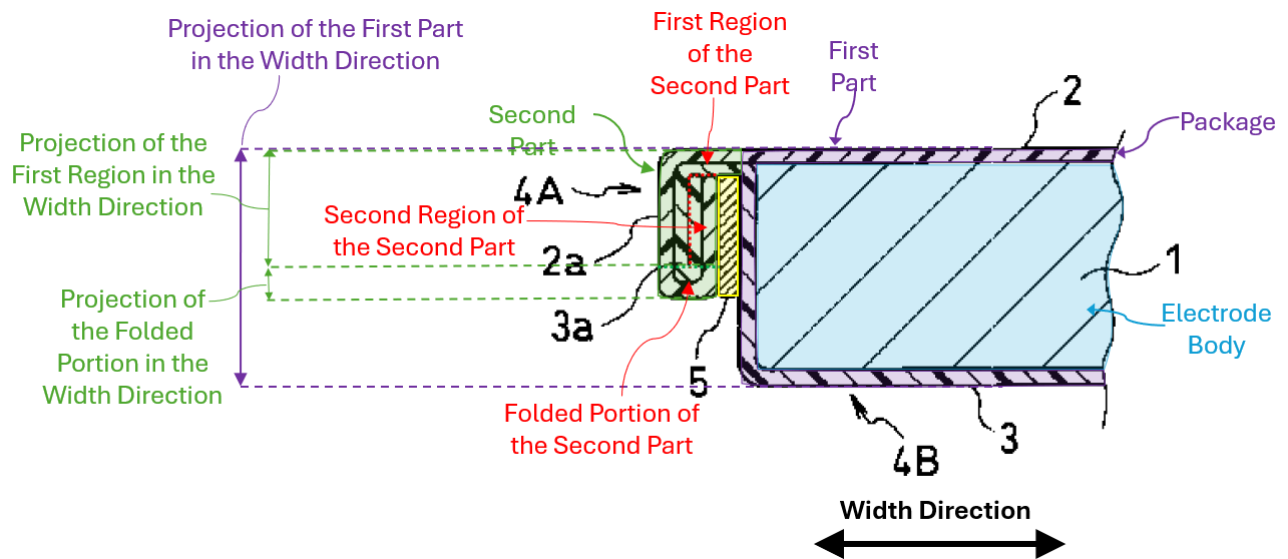


EX1003, ¶[0161], Kim-439's Modified Battery.

As discussed for claims 12-13, a POSA would have understood from basic background knowledge that the height of the package's second part can be varied as a result-effective variable to optimize the battery footprint and structural integrity. EX1003, ¶[0162]; EX1007, ¶[0052]-[0056]. Because reducing the second part's height limits its extent in the thickness direction, a POSA would have been motivated to adjust the height of Kim-439's second part to prevent the second region from protruding beyond the first part's projection in the width direction. EX1003, ¶[0162]. Doing so would have been the application of a known technique (adjusting the second part's height) to a known device (Kim-439's battery) to achieve a compact profile and improved structural integrity. *Id.*

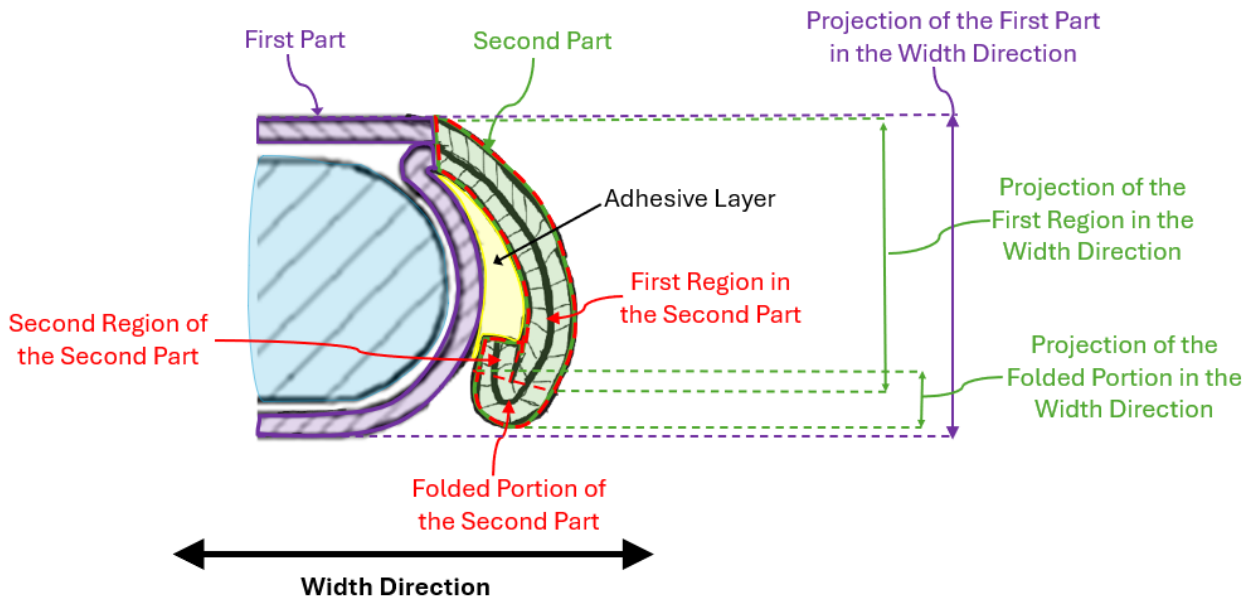
P. Dependent Claim 15

A projection of Ueda's first region in the width direction and a projection of the folded portion in the width direction are located within a projection of the first part in the width direction. EX1006, ¶¶[0013], [0023], [0030]; EX1003, ¶¶[0163]-[0164].



EX1006, FIG. 2 (annotated).

Accordingly, it would have been obvious to a POSA that, when combining Ueda's inward folding technique with Kim-439's second part, a similar structural arrangement would be made to minimize the battery's volume footprint. EX1003, ¶[0165].

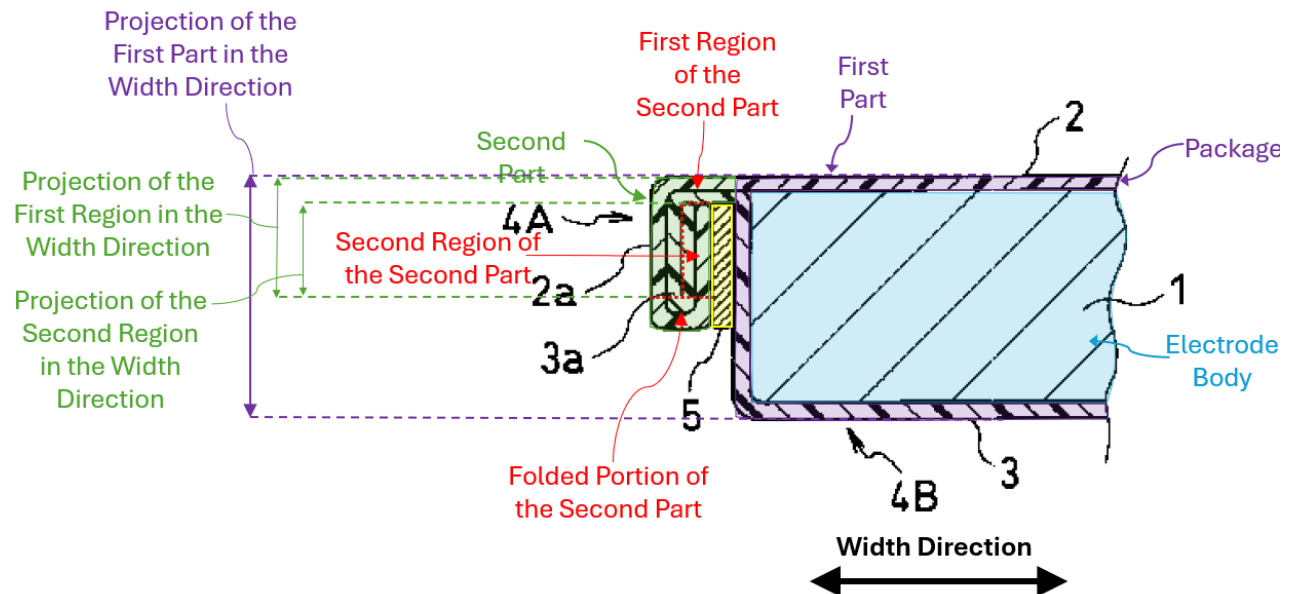


EX1003, ¶[0165], Kim-439's Modified Battery.

As discussed for claims 12-14, a POSA would have understood from basic background knowledge that the height of the package's second part can be varied as a result-effective variable to optimize the battery footprint and structural integrity. EX1003, ¶[0166]; EX1007, ¶¶[0052]-[0056]. Because reducing the second part's height limits its extent in the thickness direction, a POSA would have been motivated to adjust the height of Kim-439's second part to prevent the first region and folded portion from protruding beyond the first part's projection in the width direction. EX1003, ¶[0166]. Doing so would have been the application of a known technique (adjusting the second part's height) to a known device (Kim-439's battery) to achieve a compact profile and improved structural integrity. *Id.*

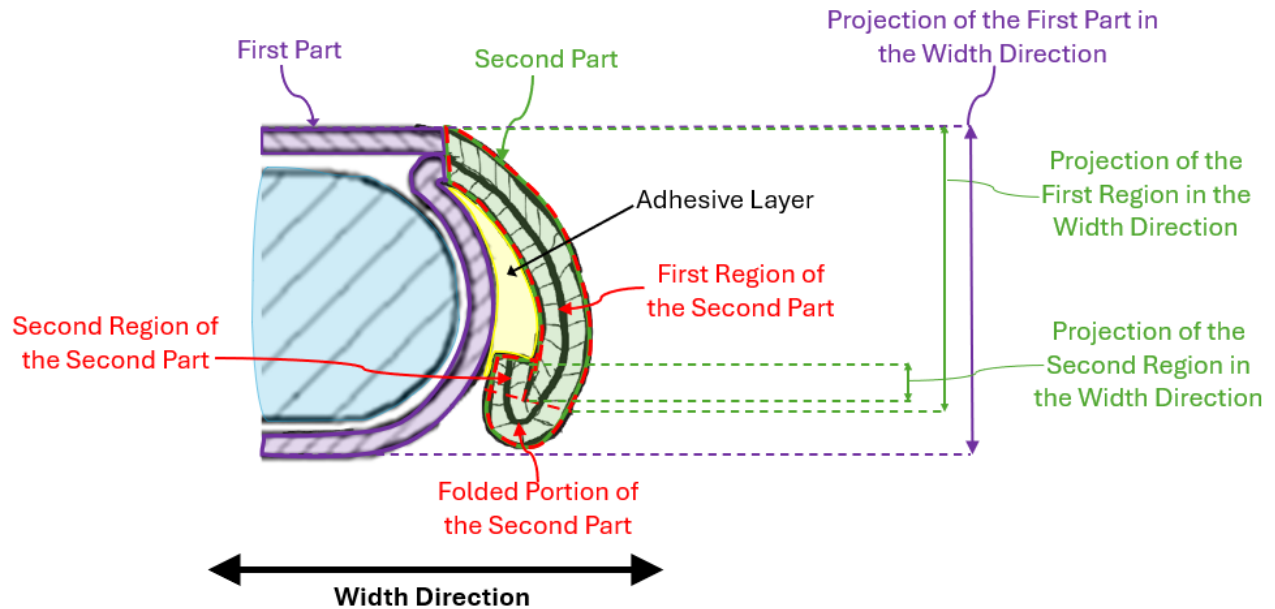
Q. Dependent Claim 16

A projection of Ueda's first region in the width direction and a projection of the second region in the width direction are located within a projection of the first part in the width direction. EX1006, ¶¶[0013], [0023], [0030]; EX1003, ¶¶[0167]-[0168].



EX1006, FIG. 2 (annotated).

Accordingly, it would have been obvious to a POSA that, when combining Ueda's inward folding technique with Kim-439's second part, a similar structural arrangement would be made to minimize the battery's footprint. EX1003, ¶[0169].



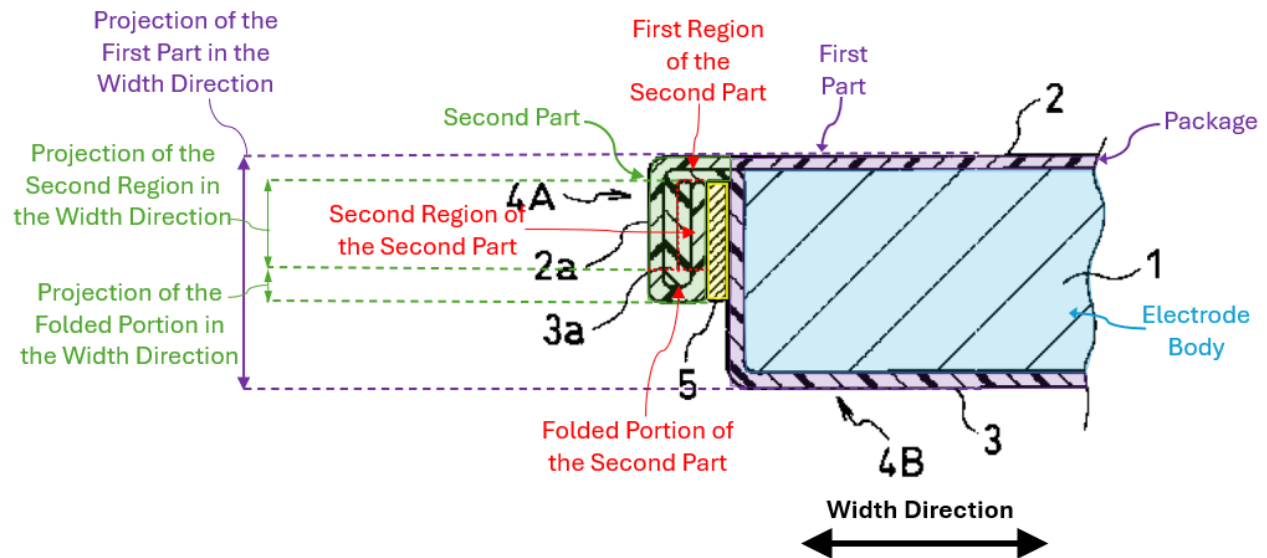
EX1003, ¶[0169]: Kim-439's Modified Battery.

As discussed for claims 12-15, a POSA would have understood from basic background knowledge that the height of the package's second part can be varied as a result-effective variable to optimize battery footprint and structural integrity.

EX1003, ¶[0170]; EX1007, ¶¶[0052]-[0056]. Because reducing the second part's height limits its extent in the thickness direction, a POSA would have been motivated to adjust the height of Kim-439's second part to prevent the first and second regions from protruding beyond the first part's projection in the width direction. EX1003, ¶[0170]. Doing so would have been the application of a known technique (adjusting the second part's height) to a known device (Kim-439's battery) to achieve a compact profile and improved structural integrity. *Id.*

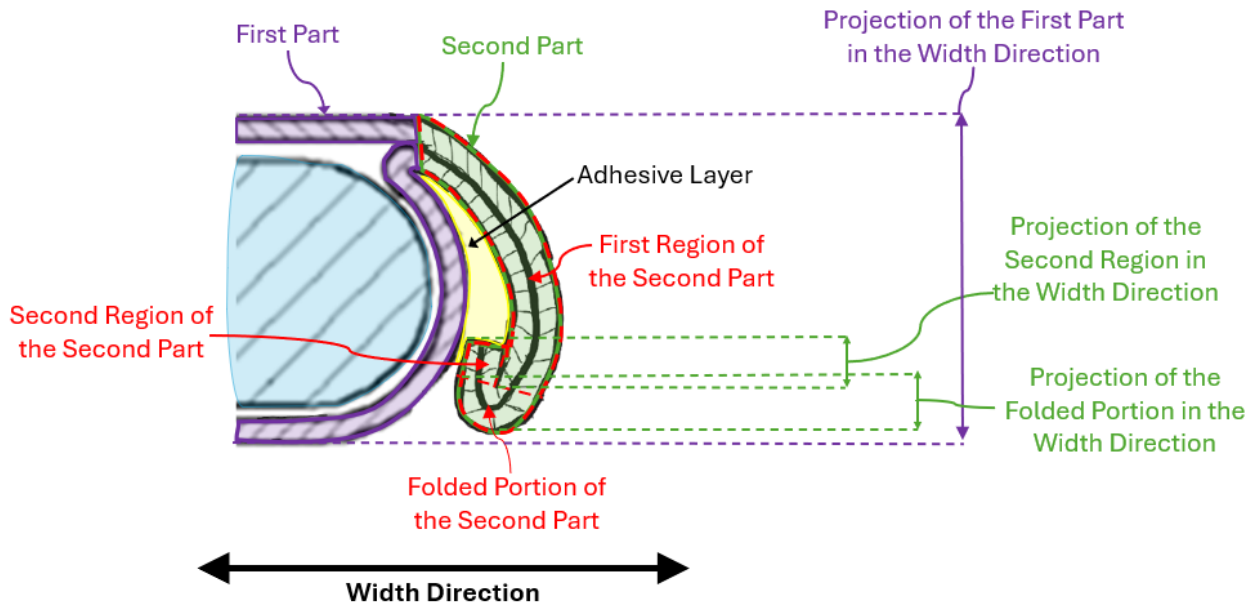
R. Dependent Claim 17

A projection of Ueda's folded portion in the width direction and a projection of the second region in the width direction are located within a projection of the first part in the width direction. EX1006, ¶¶[0013], [0023], [0030]; EX1003, ¶¶[0171]-[0172].



EX1006, FIG. 2 (annotated).

Accordingly, it would have been obvious to a POSA that, when combining Ueda's inward folding technique with Kim-439's second part, a similar structural arrangement would be made to minimize the battery's footprint. EX1003, ¶[0173].



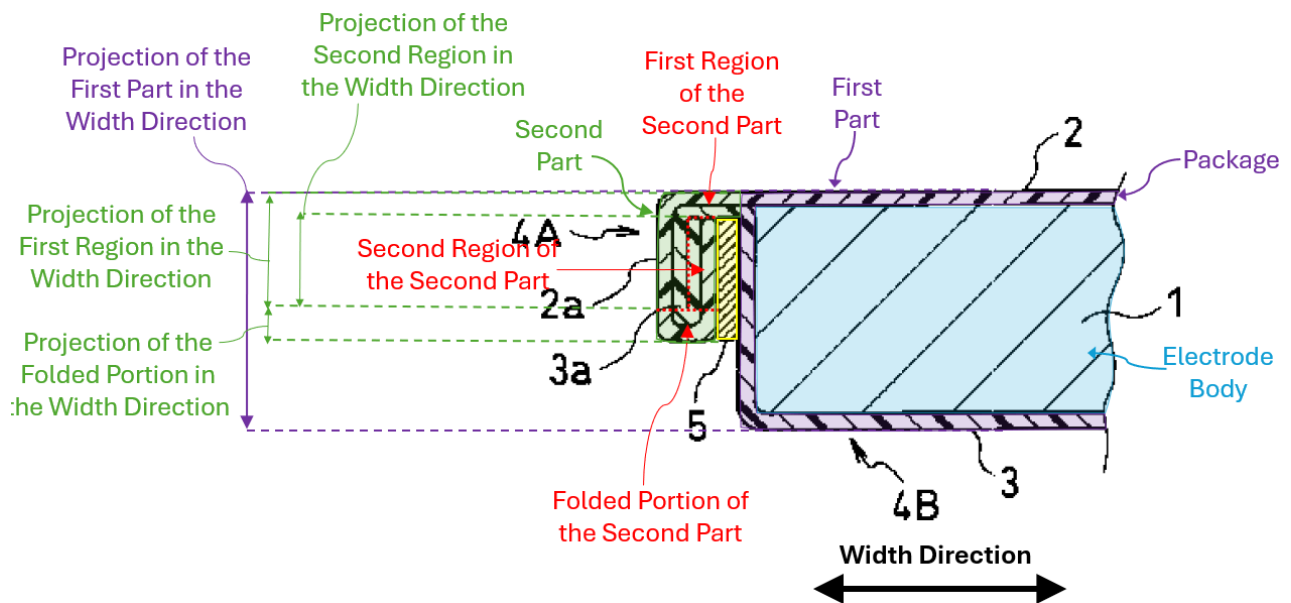
EX1003, ¶[0173], Kim-439's Modified Battery.

As discussed for claims 12-16, a POSA would have understood from basic background knowledge that the height of the package's second part can be varied as a result-effective variable to optimize battery footprint and structural integrity. EX1003, ¶[0174]; EX1007, ¶[0052]-[0056]. Because reducing the second part's height limits its extent in the thickness direction, a POSA would have been motivated to adjust the height of Kim-439's second part to prevent the second region and folding portion from protruding beyond the first part's projection in the width direction. EX1003, ¶[0174]. Doing so would have been the application of a known technique (adjusting the second part's height) to a known device (Kim-439's battery) to achieve a compact profile and improved structural integrity. *Id.*

S. Dependent Claim 18

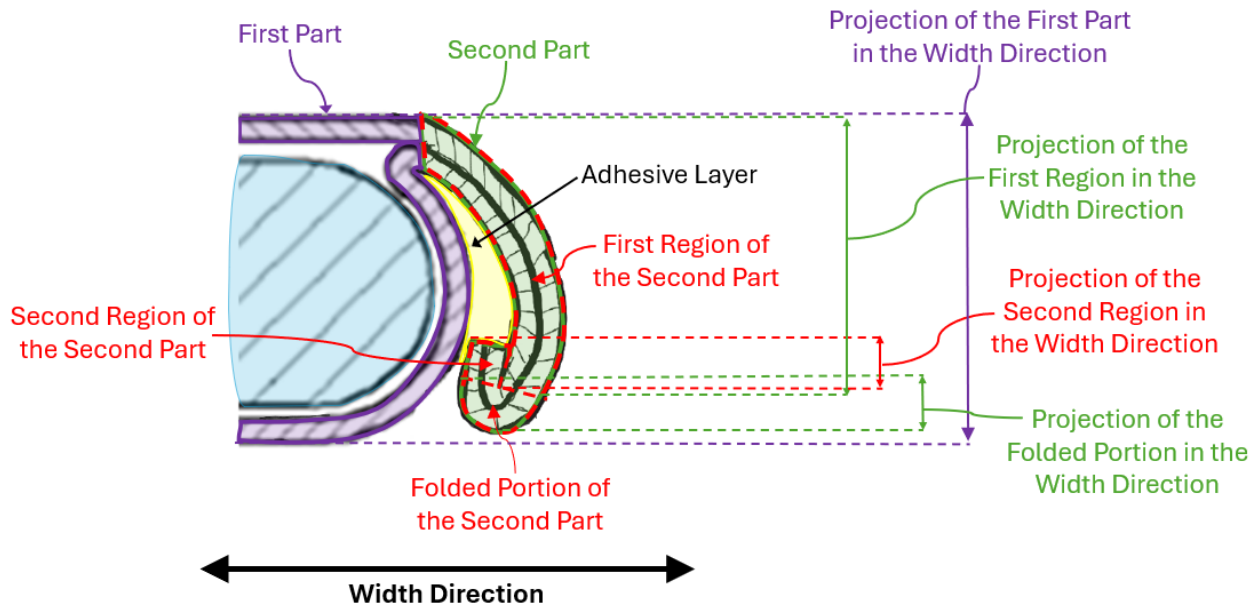
A projection of Ueda's first region in the width direction, a projection of the folded portion in the width direction, and a projection of the second region in the width direction are located within a projection of the first part in the width direction.

EX1006, ¶[0023], FIG. 2; EX1003, ¶¶[0175]-[0176].



EX1006, FIG. 2 (annotated).

Accordingly, it would have been obvious to a POSA that, when combining Ueda's inward folding technique with Kim-439's second part, a similar structural arrangement would be made to minimize the battery's footprint. EX1003, ¶[0177].

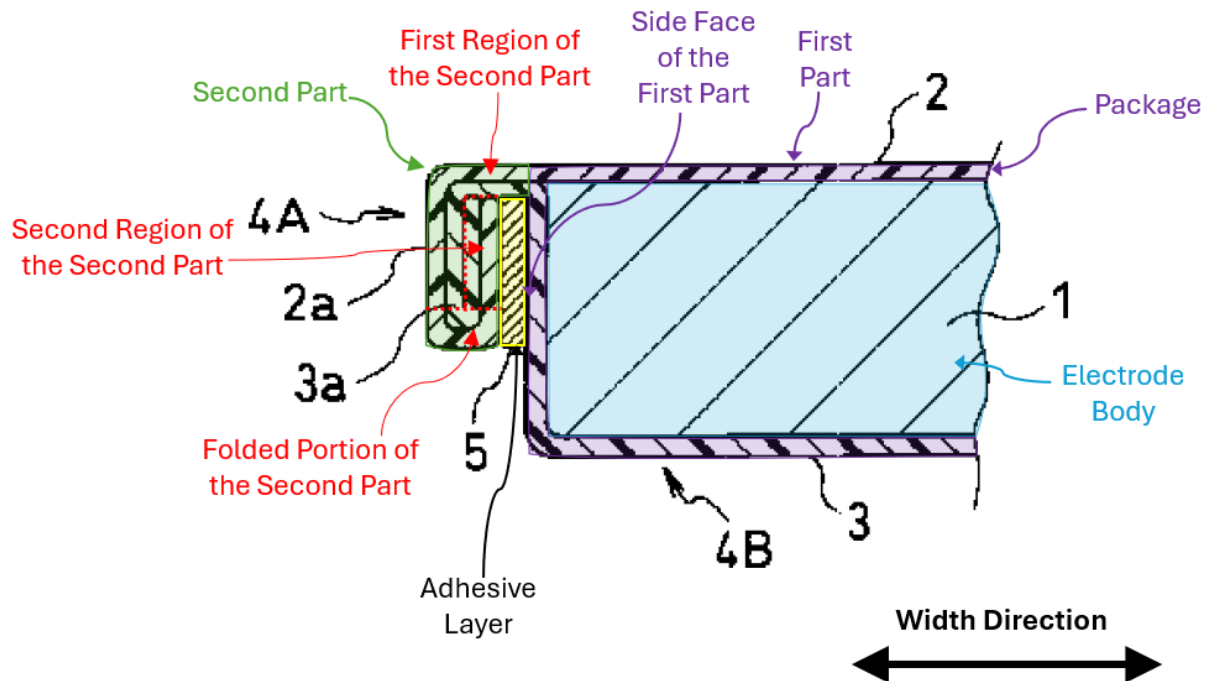


EX1003, ¶[0177], Kim-439's Modified Battery.

As discussed for claims 12-17, a POSA would have understood from basic background knowledge that the height of the package's second part can be varied as a result-effective variable to optimize battery footprint and structural integrity. EX1003, ¶[0178]; EX1007, ¶¶[0052]-[0056]. Because reducing the second part's height limits its extent in the thickness direction, a POSA would have been motivated to adjust the height of Kim-439's second part to prevent its regions and folded portion from protruding beyond the first part's projection in the width direction. EX1003, ¶[0178]. Doing so would have been the application of a known technique (adjusting the second part's height) to a known device (Kim-439's battery) to achieve a compact profile and improved structural integrity. *Id.*

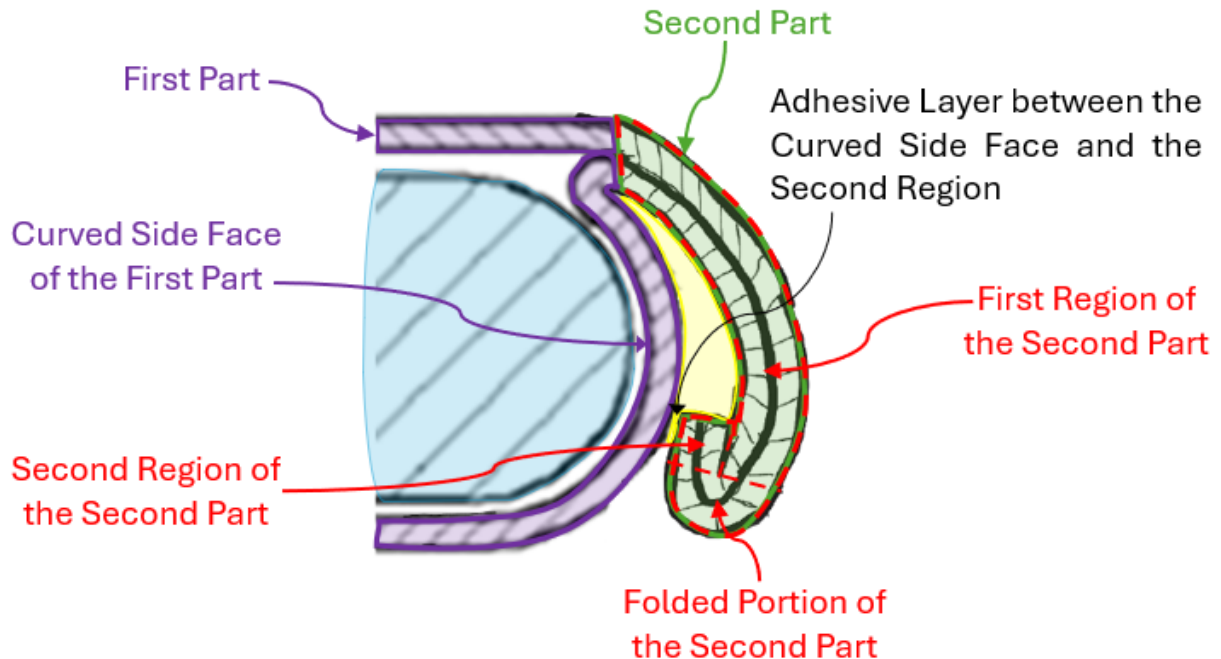
T. Dependent Claim 20

Ueda's adhesive layer (adhesive 5) is provided between the side face (annotated) and the second region (leading edge of tab portion 4a) in the width direction. EX1006, ¶¶[0013], [0023], [0030]; EX1003, ¶¶[0179]-[0180].



EX1006, FIG. 2 (annotated).

Accordingly, it would have been obvious to a POSA that when applying Ueda's adhesive between Kim-439's second part and the curved side face, the adhesive layer would be provided between Kim-439's curved side face and second region in the width direction. EX1003, ¶[0181].



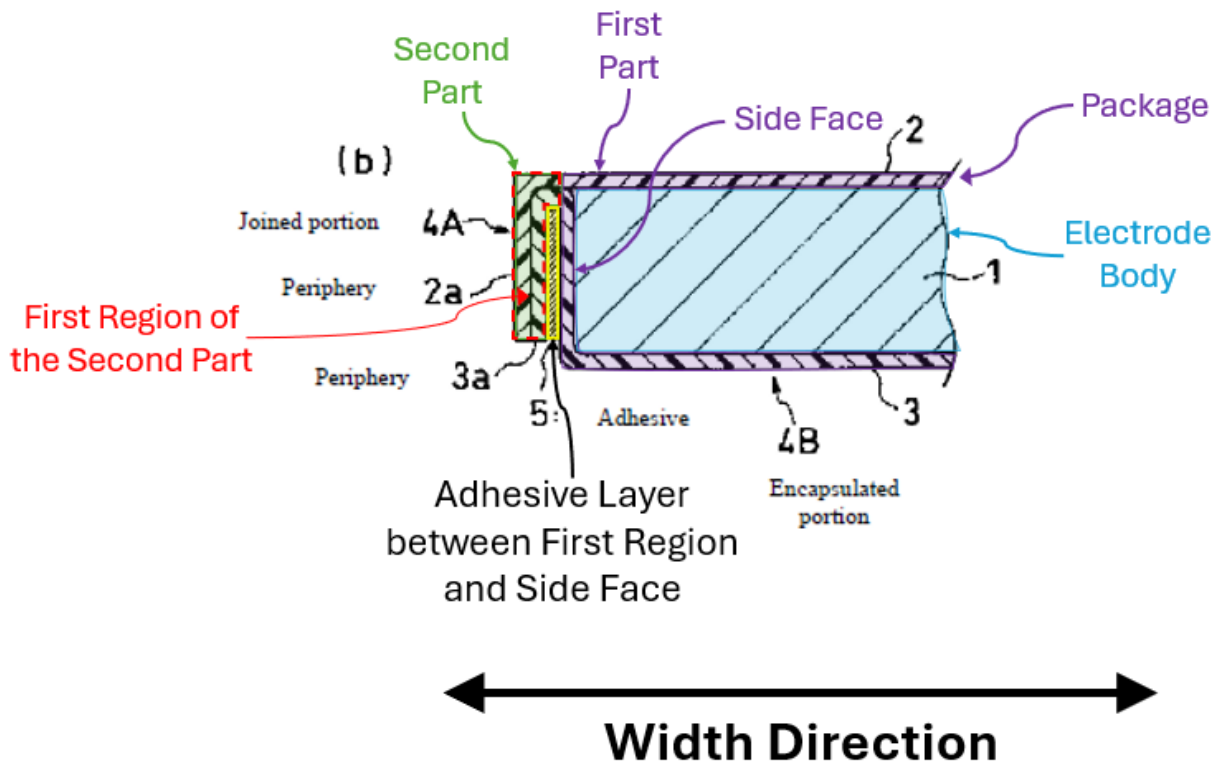
EX1003, ¶[0181], Kim-439's Modified Battery.

Furthermore, a POSA would have understood from basic background knowledge that the placement of adhesive between the curved side face and the second part can be varied as a result-effective variable. *See* EX1007, ¶¶[0063]-[0065]; EX1003, ¶[0182]. For example, Kim-999 expressly teaches that the extent of adhesive applied between the package's side face and second part may be adjusted to ensure sufficient bonding while avoiding unnecessary spacing or excess material. EX1007, ¶¶[0063]-[0065]; EX1003, ¶[0182]. Accordingly, a POSA would have been motivated to modify the volume and location of adhesive applied between Kim-439's curved side face and second part to include adhesive between the second part's second region and the first part's curved side face. *Id.* Doing so would have been the application of a known technique (controlling the amount of applied

adhesive) to a known device (Kim-439's battery) to secure the second part to the first part without excess adhesive and maintain a compact profile. *Id.*

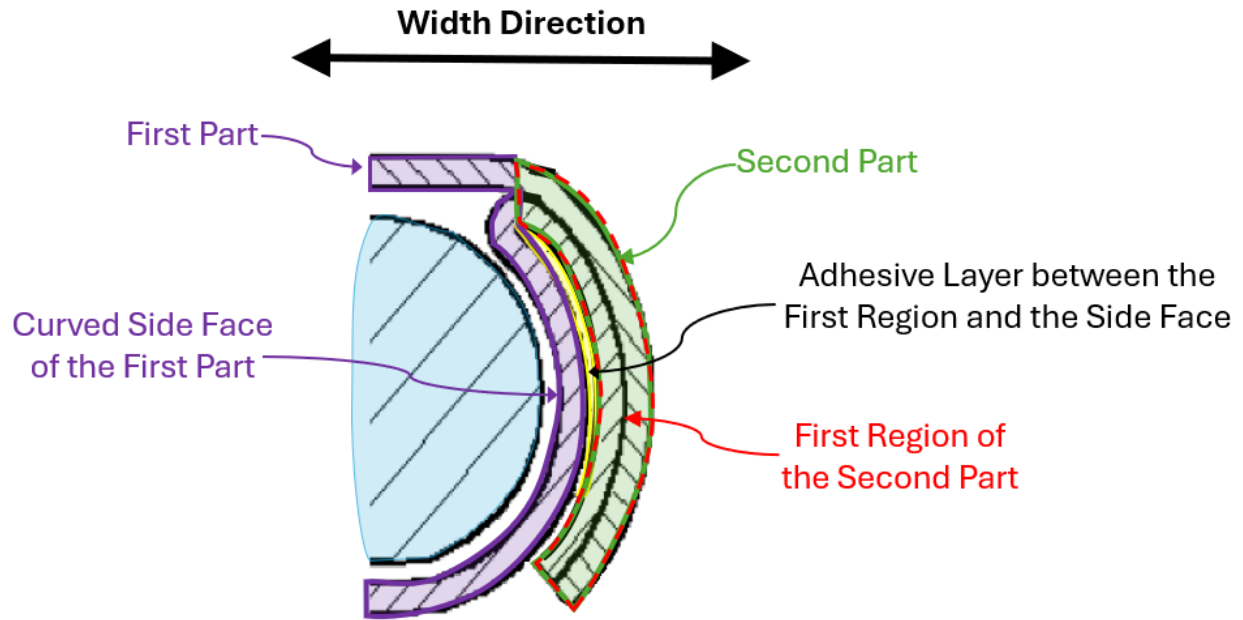
U. Dependent Claim 23

Ueda's adhesive layer (adhesive 5) is provided between the side face (annotated) and the first region in the width direction. EX1006, FIG. 1b, ¶¶[0013], [0023], [0030]; EX1003, ¶¶[0183]-[0184].



EX1006, FIG. 1b (annotated).

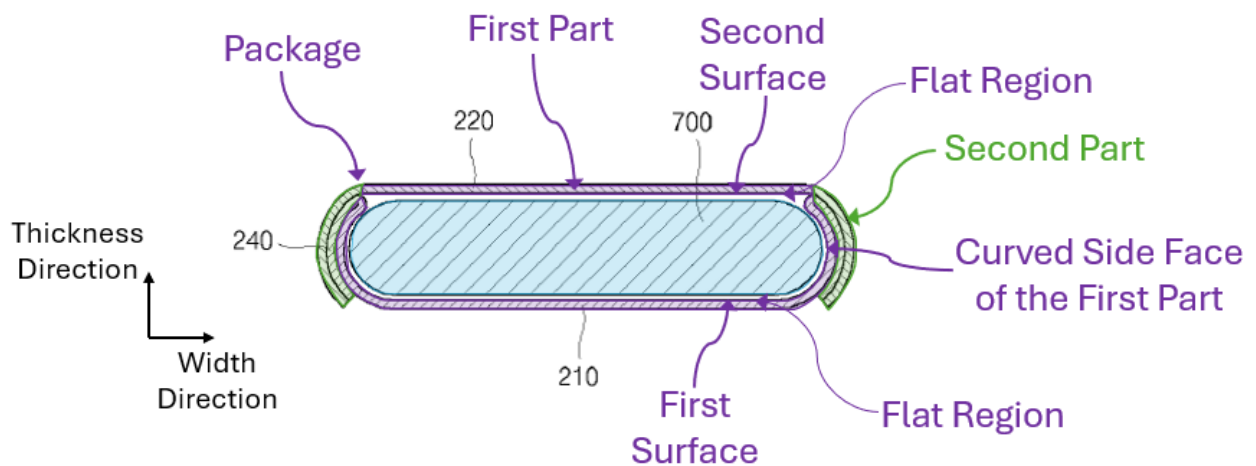
Accordingly, it would have been obvious to a POSA that, when applying Ueda's adhesive between Kim-439's second part and the curved side face, the adhesive layer would likewise be provided between Kim-439's curved side face and first region in the width direction. EX1003, ¶[0185].



EX1003, ¶[0185], Kim-439's Modified Battery.

V. Dependent Claim 24

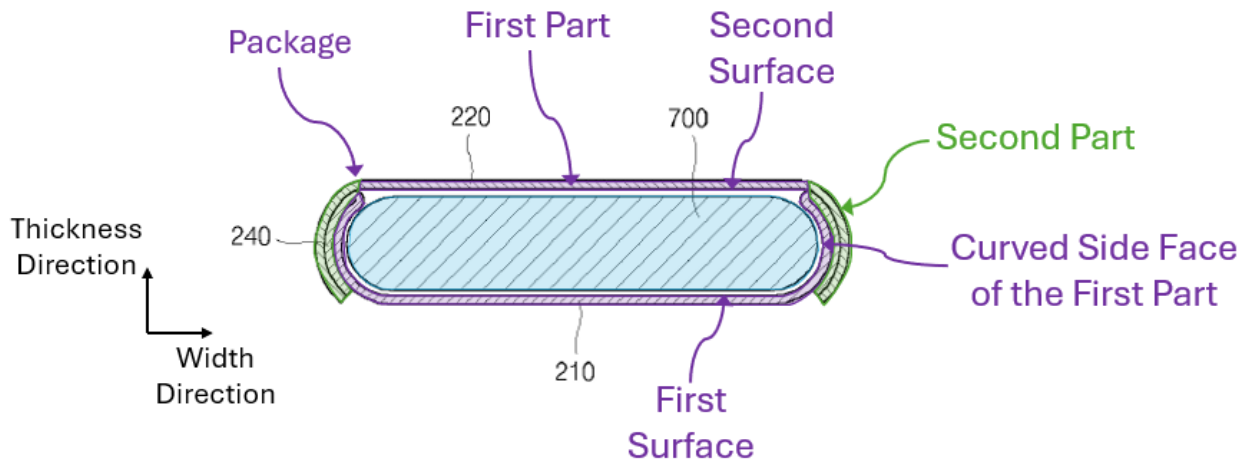
At least one of Kim-439's first and second surfaces (in fact, both) of the first part have a flat region in the width direction. EX1005, pp. 3-5; EX1003, ¶¶[0186]-[0187].



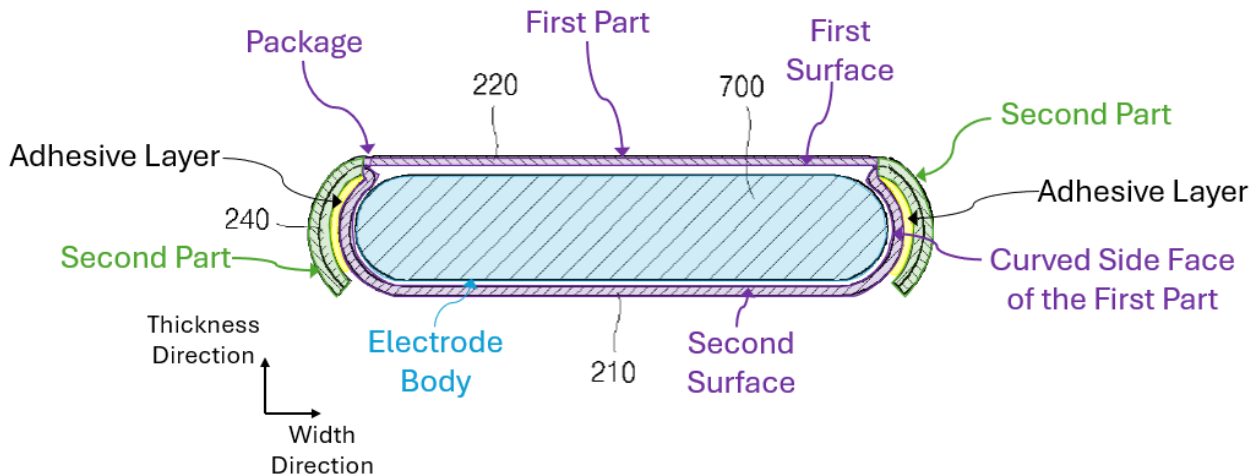
Kim-439, FIG. 5b (annotated).

W. Dependent Claim 25

The curved side face of Kim-439's first part faces the second part in the width direction. EX1005, pp. 3-5; EX1003, ¶¶[0188]-[0189].



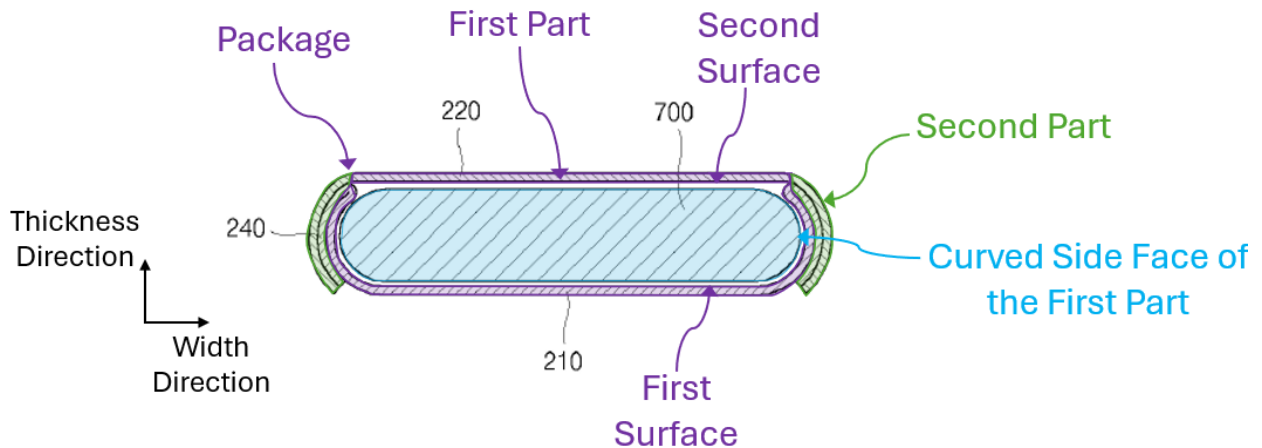
Kim-439, FIG. 5b (annotated).



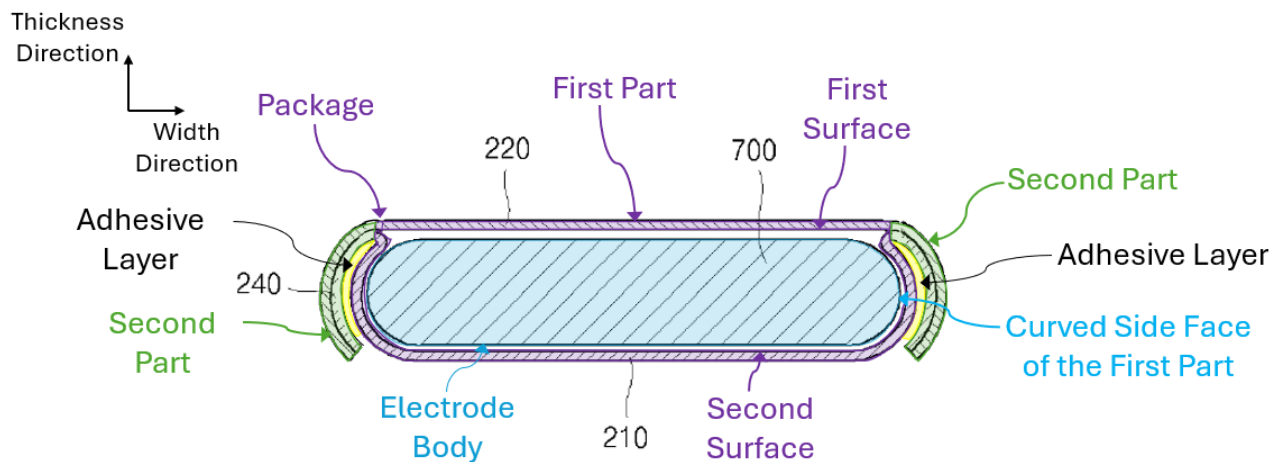
EX1003, ¶[0189], Kim-439's Modified Battery.

X. Dependent Claim 27

The curved side face of Kim-439's electrode body protrudes toward the second part in the width direction. EX1005, pp. 3-5; EX1003, ¶¶[0190]-[0191].



Kim-439, FIG. 5b (annotated).



EX1003, ¶[0191], Kim-439's Modified Battery.

X. GROUND 2: CLAIMS 19, 21-22, AND 26 WOULD HAVE BEEN OBVIOUS IN VIEW OF KIM-439, UEDA, AND KIM-999.

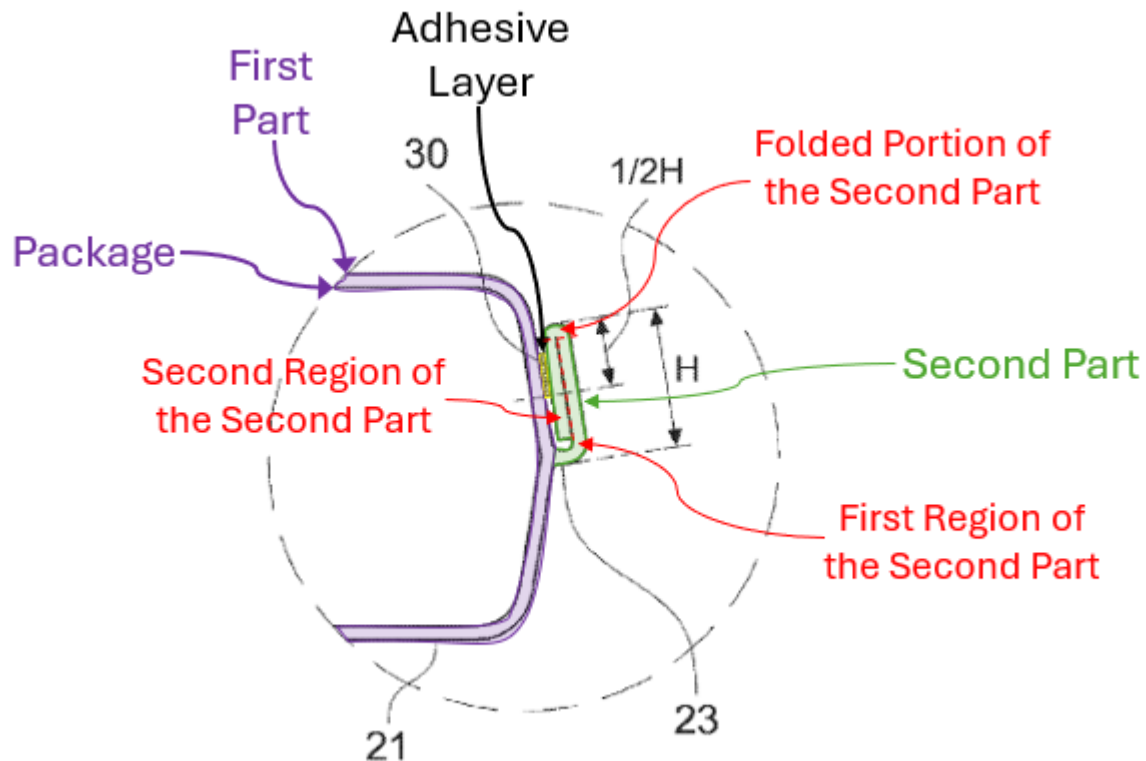
A. Motivation to Combine Kim-999 with Kim-439/Ueda.

Kim-439, Ueda, Kim-999, and the '808 patent are from the same field of endeavor—pouch-type, soft-pack batteries. EX1003, ¶[0199]; EX1001, 1:54-58; EX1005, Abstract, p. 2. EX1006, Abstract; EX1007, Abstract.

Kim-999 discloses parameters for adjusting the spatial arrangement of the package's second part (Kim-999's folding part 23) relative to the package's first part (Kim-999's case 21) to balance structural rigidity and adhesive bonding with the package's footprint. EX1007, ¶¶[0054]-[0068]; EX1003, ¶[0200]. For example, Kim-999 discloses that the height of the second part (Kim-999's folding part 23) can be adjusted so long as the height is smaller than the thickness of the electrode assembly 11 to prevent the folding part 23 from protruding beyond the boundaries of battery case 21. EX1007, ¶¶[0054]-[0056]. Kim-999 further discloses that the “angle between the folded folding part 23 and one surface of the case 21 may be 5 degrees or more and 25 degrees or less” to allow “the adhesive member 30 to be injected between the folding part 23 and the case 21,” while preventing the “the distance between the folding part 23 and the case 21” from being “too large.” EX1007, ¶[0068].

Moreover, Kim-999's adhesive 30 “may be injected between the entire height of the folding part 23 and $\frac{1}{2}$ or more of the entire height of the folding part 23.” EX1007, ¶[0065]. Kim-999 further explains that when the adhesive layer is “less than $\frac{1}{2}$ of the entire height of the folding part 23, fluttering, bending, twisting, and the like may occur in the detached portion of the folding part 23.” EX1007, ¶[0066]. Accordingly, a POSA would have understood in view of Kim-999 that the folding

part's height, the fold angle, and the height of glue are variables that can be jointly adjusted to optimize adhesive spacing and bonding performance. EX1003, ¶[0201].



EX1007, FIG. 4 (annotated).

1. Locating the Second End Portion Between the First Part's Central Plane and First Surface in the Width Direction

Should Patent Owner argue the Kim-439/Ueda combination does not disclose locating the projection of the second end portion in the width direction between the projections of the first part's central plane and first surface in the width direction, it would have been obvious to do so according to the parameters taught by Kim-999 to maintain the structural integrity of the package while keeping the package compact. EX1003, ¶[0202]. Kim-999 teaches that it was known to adjust the height of the

package's second part (folding part 23), which directly correlates to the location of the second end portion (leading end) of the second part, in "relationship with the thickness of the electrode assembly." EX1007, ¶[0054]. Specifically, Kim-999 teaches setting the folding part 23 "in a height smaller than the thickness of the electrode assembly 11" so that the second fold of folding part 23 does not protrude above the first surface of package. EX1007, ¶[0055]-[0056]. Doing so "prevent[s] an unnecessary space from being formed between the adjacent secondary batteries by the folding part 23 when assembling the secondary battery module." EX1007, ¶[0056].

A POSA would have recognized that modifying Kim-439's bonding portion 240's height—such as the second part's first and second regions of Kim-439's battery as modified by Ueda—represents a predictable use of known sealing techniques to secure folded structural elements without expanding the package's footprint. EX1003, ¶[0203]. The combination amounts to nothing more than applying a known technique (Kim-999's folding part height-adjustment technique) to a known device (Kim-439's battery, as modified by Ueda) to achieve the same benefits of improved sealing and preserved compactness. *KSR*, 550 U.S. at 417; EX1003, ¶[0203].

A POSA would also have had a reasonable expectation of success in combining Kim-999's folding part height-adjustment technique with Kim-439/Ueda

because the references employ compatible structures (folded flange or tab portions adjacent a casing) and solve similar problems (securing folded portions to a battery body while controlling thickness and volume). EX1003, ¶[0204]. All references address the same interface—the connection between a second part (flange/folded edge portion) and the first part (casing) of the battery’s package—with the same design goals: structural integrity, compactness, and adhesion reliability. *Id.* Thus, modifying the location of the second end portion of Kim-439’s bonding portion, as modified by Ueda and Kim-999, would have been a design refinement well within the level of ordinary skill, not a structural overhaul. *Id.*

2. Providing Adhesive Between First and Second Regions of the Package’s Second Part

Should Patent Owner argue the Kim-439/Ueda combination does not explicitly disclose providing an adhesive layer between the first region and the second region of the second part in the width direction, it would have been obvious to do so according to the parameters taught by Kim-999 to maintain the structural integrity of the package while keeping the package compact. EX1003, ¶[0205]. Specifically, Kim-999 teaches that adhesive placement between the folding part and the case is enabled and controlled by adjusting spacing, angular orientation, and adhesive height, which directly govern adhesive distribution and curing efficiency. EX1007, ¶[0068]. A POSA would have recognized that providing an adhesive layer between adjoining regions of a folded portion—such as the first and second regions

of Kim-439 as modified by Ueda—represents a predictable use of known adhesive techniques to secure folded structural elements while preventing deformation (e.g., fluttering or separation). EX1003, ¶[0205]. The combination therefore amounts to nothing more than applying a known technique (Kim-999’s expressly taught adhesive-spacing optimization principles) to a known device (Kim-439’s battery, as modified by Ueda) to achieve the same benefits of improved bonding and preserved compactness. *KSR*, 550 U.S. at 417; EX1003, ¶[0205].

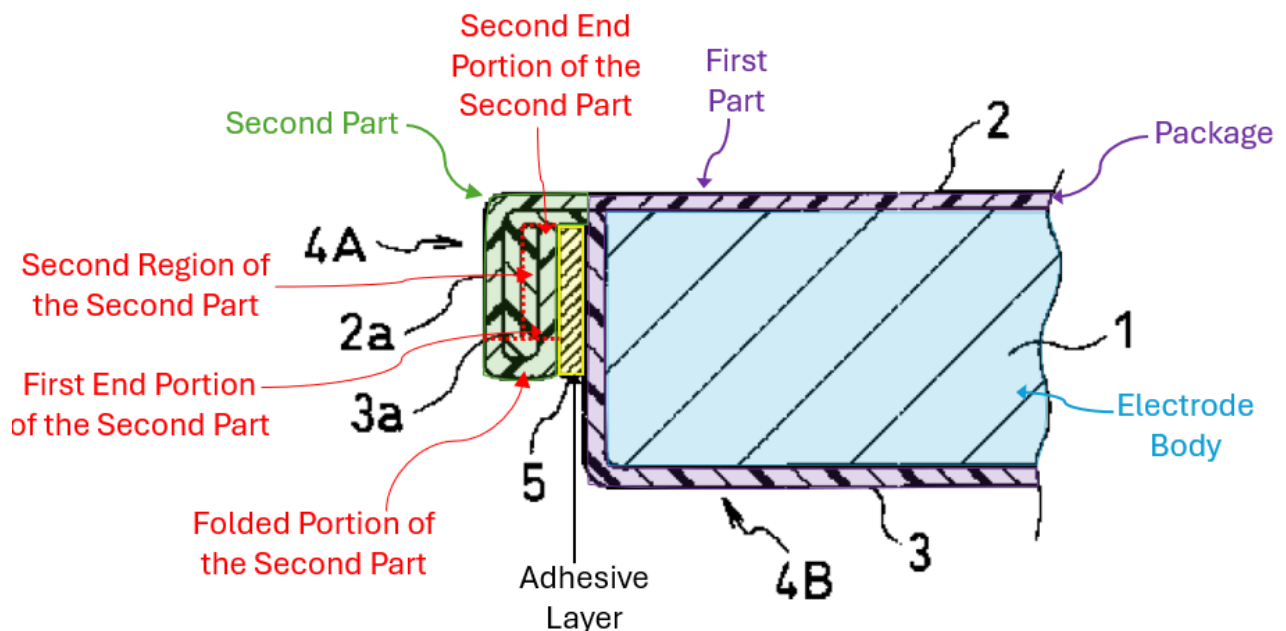
A POSA would also have had a reasonable expectation of success in combining Kim-999’s teachings with Kim-439/Ueda because the references employ compatible structures (folded flange or tab portions adjacent a casing) and solve similar problems (securing folded portions to a battery body while controlling thickness and volume). EX1003, ¶[0206]. Thus, Kim-999’s parameter-driven approach to adhesive spacing, adhesive height, and folding geometry would have been directly applicable to the Kim-439/Ueda structure without requiring undue experimentation. *Id.* Kim-999 explicitly links geometric parameters (e.g., folding angle, height, and spacing) with adhesive performance outcomes, providing concrete design guidance for a POSA to readily implement in analogous folded configurations. EX1003, ¶[0206]; EX1007, ¶¶[0054]-[0056], [0068]. Furthermore, Ueda confirms that adhering folded portions of a pouch battery structure to the battery body was a known and reliable technique for improving rigidity and

preventing deformation. EX1006, ¶¶[0018], [0081]. In view of these complementary teachings, a POSA would have reasonably expected that applying Kim-999's spacing and angle optimization to the Kim-439/Ueda's battery would successfully yield improved adhesive bonding and structural integrity without compromising volume efficiency. EX1003, ¶[0206].

B. Dependent Claim 19

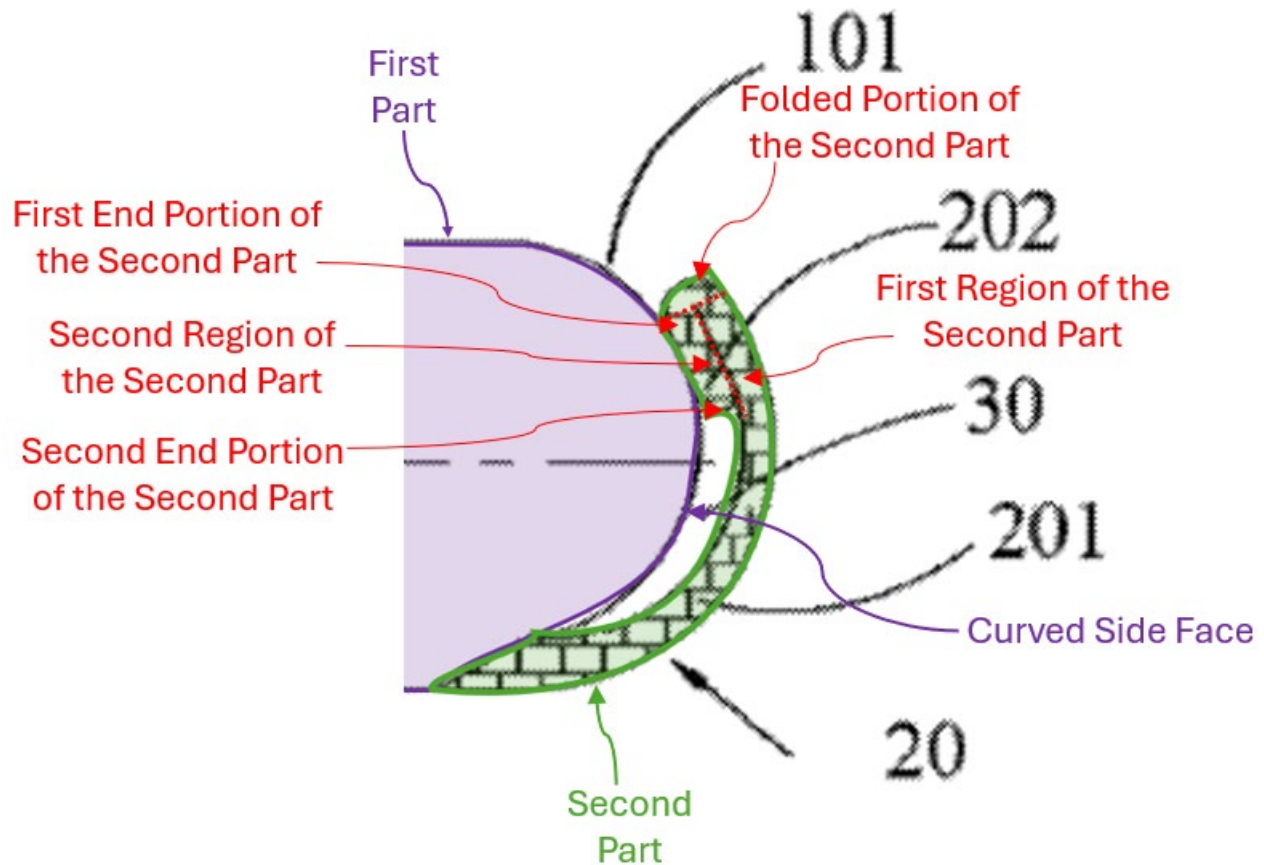
1. [19.A] “wherein the second region comprises a first end portion connected to the folded portion, and a second end portion opposite to the first end portion”

Ueda's second region (leading edge of tab portion 4a) has a first end portion (annotated) connected to the folded portion (second fold of tab portion 4a) and a second end portion (annotated) opposite to the first end portion. EX1003, ¶¶[0207]-[0208].



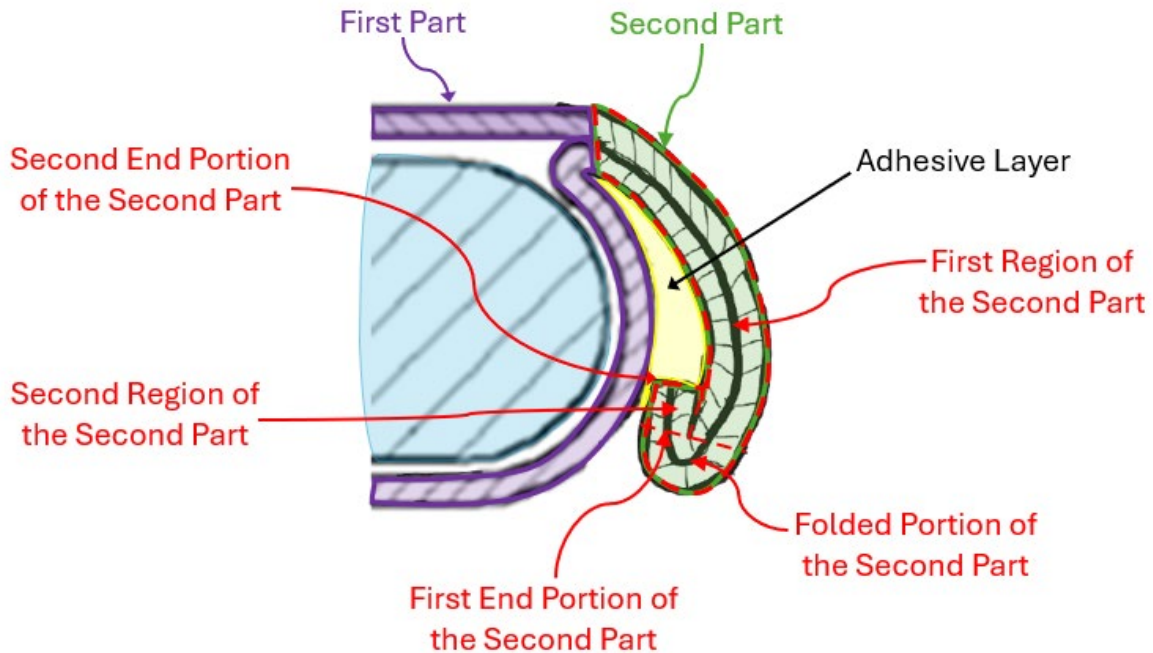
EX1006, FIG. 2 (annotated).

Ueda's inward folding technique of the second part (joined tab portion 4A) provides the second region with a first end portion and a second end portion in the same manner as the '808 patent. EX1001, 1:51-2:8; EX1003, ¶[0209].



EX1001, FIG. 1 (annotated).

Accordingly, a POSA would have understood that, when combining Ueda's inward folding technique with Kim-439's second part, a similar structural arrangement would be made to minimize the battery's footprint. EX1003, ¶[0210].



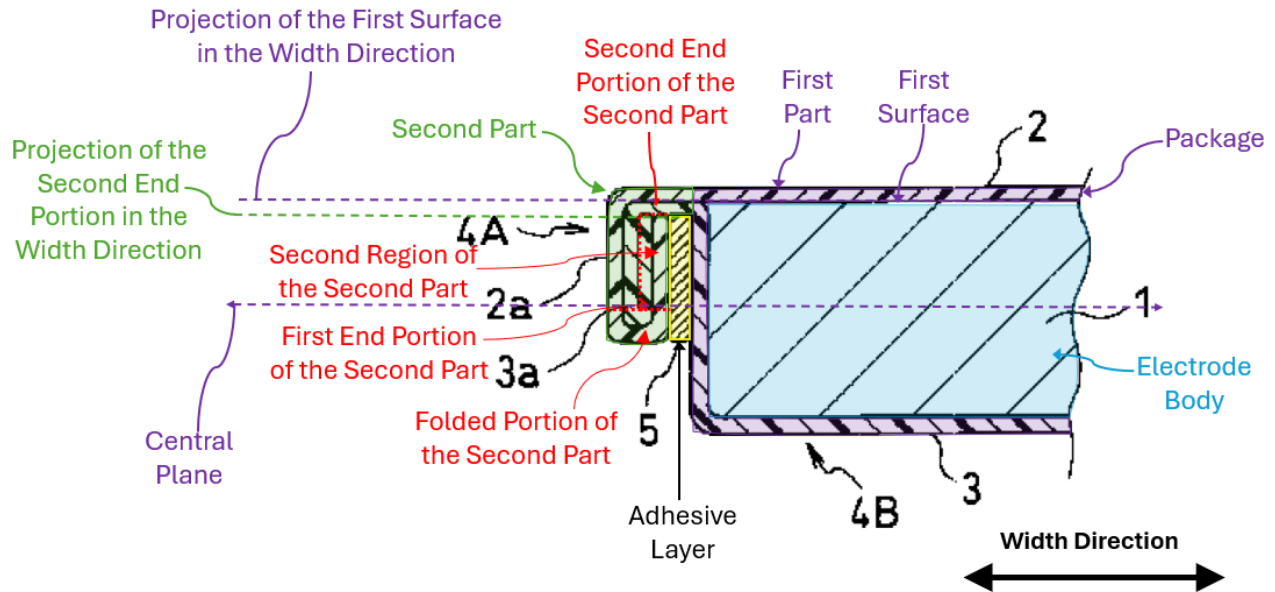
EX1003, ¶[0210], Kim-439's Modified Battery.

2. [19.B] “wherein a projection of the second end portion in the width direction is located between a central plane of the first part and a projection of the first surface in the width direction”

(a) Kim-439/Ueda

As discussed for claims 12-18, a POSA would have understood from basic background knowledge that spatial arrangement of the second end to the package's side is a result-effective variable to optimize the volume and structural integrity of the package. *See* EX1007, ¶¶[0052]-[0056]; EX1003, ¶[0211]. Accordingly, it would have been obvious to a POSA to configure Kim-439's second part (bonding portion) such that the projection of the second end portion in the width direction is located between a central plane of Kim-439's first part (upper surface 220, lower surface 210, and side) and a projection of the first surface (interior side of upper

surface 220) in the width direction to avoid unnecessary protrusion while maintaining mechanical stability. *Id.*



EX1006, FIG. 2 (annotated).

Should Patent Owner argue that the Kim-439/Ueda combination does not disclose the recited arrangement of the projection of the second end portion in the width direction relative to the central plane and first surface of the first part in the width direction, Kim-999 shows that it was known to modify the location of the second end portion of the second region relative to the central plane and first surface of the first part by adjusting the height of the second part. EX1003, ¶[0212].

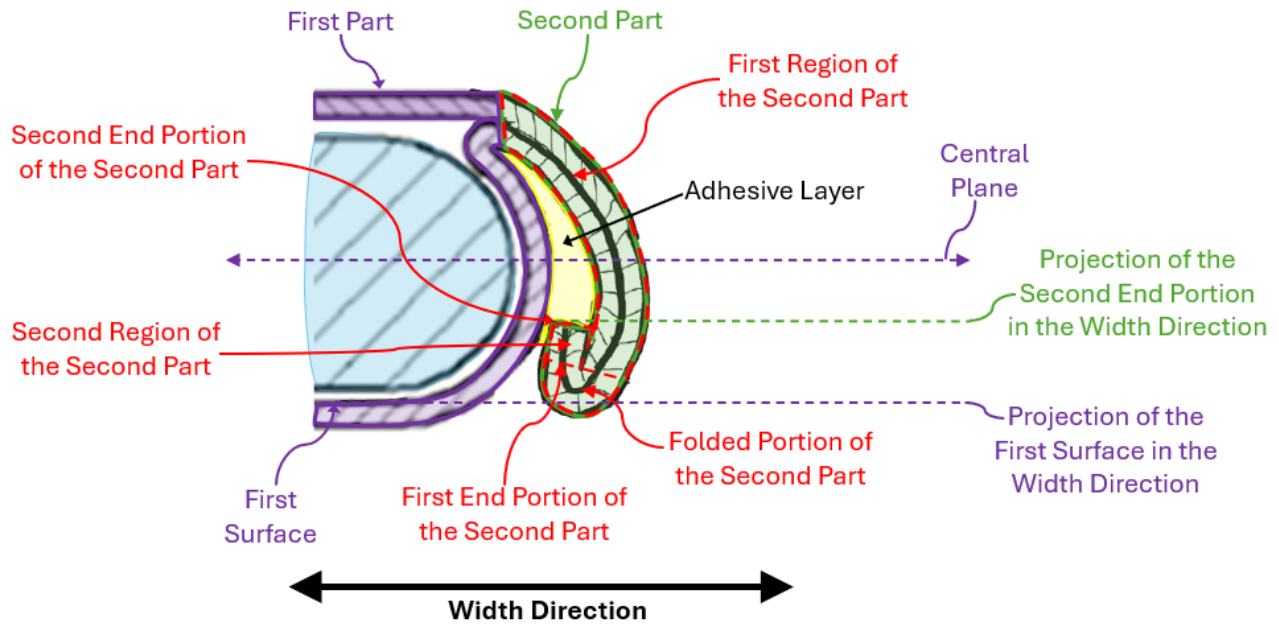
(b) Kim-999

Kim-999 teaches adjusting the height of the package's second part (folding part 23) was well-known. EX1007, ¶[0054]; EX1003, ¶[0213]. Adjusting the height of the package's second part directly correlates to the location of the second end

portion (leading end) of the second part, i.e. in “relationship with the thickness of the electrode assembly.” EX1007, ¶[0054]. Specifically, Kim-999 teaches setting folding part 23 “in a height smaller than the thickness of the electrode assembly 11” so the second fold of folding part 23 does not protrude above the first surface of package. EX1007, ¶[0055]-[0056]. This “prevent[s] an unnecessary space from being formed between the adjacent secondary batteries by the folding part 23 when assembling the secondary battery module.” EX1007, ¶[0056]. Accordingly, in view of known design considerations to reduce package size, a POSA would have been motivated to position the second end portion of the second region of the package’s second part to be located between the first surface and central plane of the package’s first part so that the second part has a height less than the electrode body. EX1003, ¶[0213].

(c) Kim-439/Ueda/Kim-999 Combination

As discussed in Section X.A, a POSA would have been motivated to modify the height of Kim-439’s second part such that a projection of the second part’s second end portion in the width direction is located between a central plane of Kim-439’s first part and a projection of Kim-439’s first surface in the width direction, as taught by Kim-999, to minimize the battery’s footprint. EX1003, ¶¶[0214]-[0216].



EX1003, ¶[0214], Kim-439's Modified Battery.

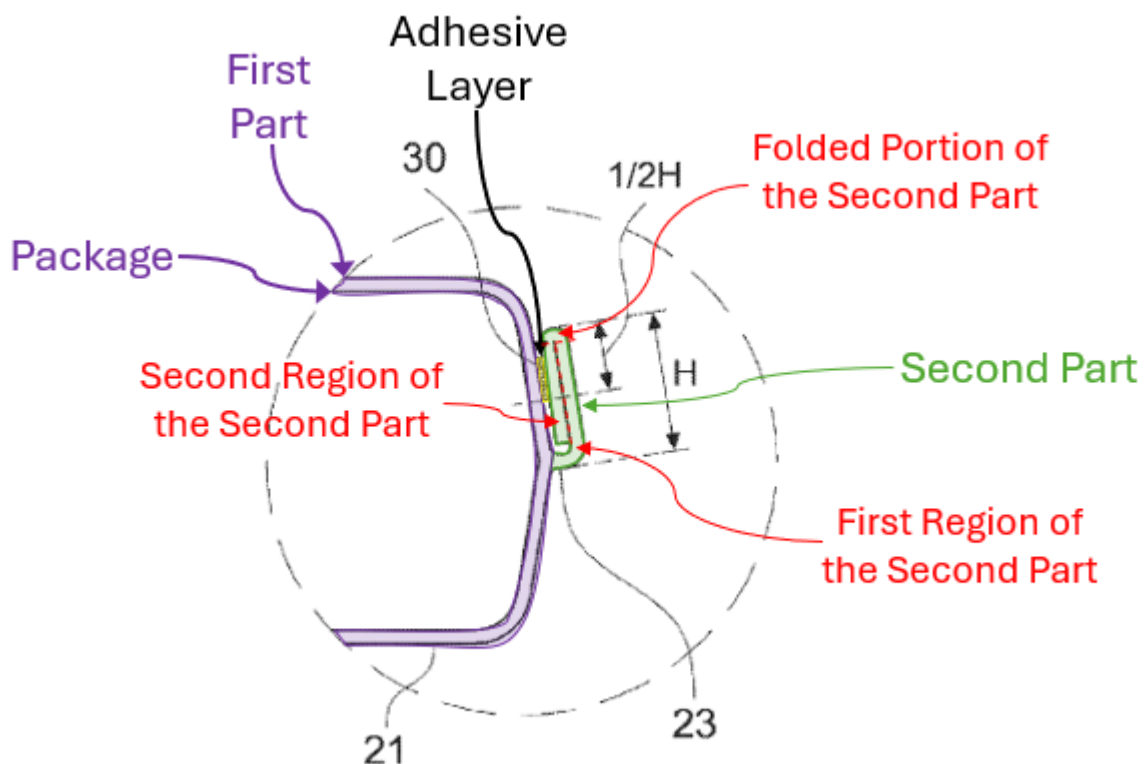
C. Dependent Claim 21

1. Kim-439/Ueda

The Kim-439/Ueda combination renders obvious applying an adhesive layer between the first region and the second region in the width direction. As in Section IX.I, a POSA would have understood that the height of Kim-439's second part (bonding portion) and the application of adhesive can be varied as a result effective variable to control bonding strength and footprint. EX1003, ¶¶[0217]-[0218]. Should Patent Owner argue that the Kim-439/Ueda combination does not disclose the recited placement of adhesive, Kim-999 shows that modifying placement of adhesive relative to the location of the second part was well known. EX1003, ¶[0218].

2. Kim-999

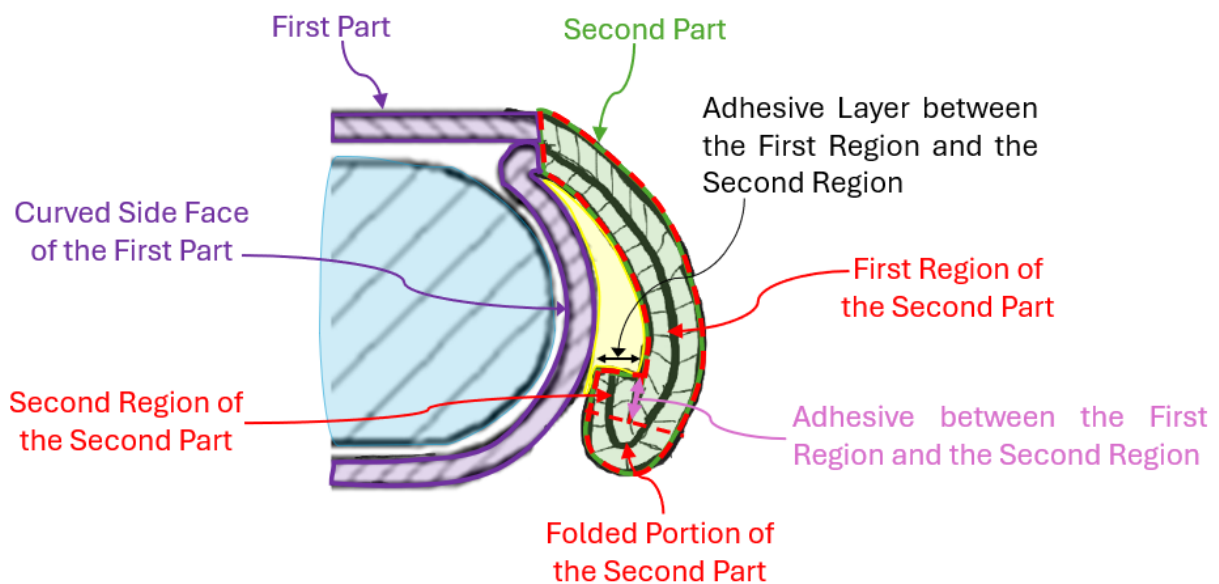
The end of the second region in Kim-999's folding part 23 is spatially separated from the folding part's first region. EX1007, FIG. 4. Kim-999 teaches that adhesive 30 "may be injected between the entire height of the folding part 23 and $\frac{1}{2}$ or more of the entire height of the folding part 23." Kim-999, ¶[0065]. A POSA would have understood that Kim-999's disclosed range of adhesive extension includes applying adhesive between the first region and the second region in the width direction. EX1003, ¶[0219].



EX1007, FIG. 4 (annotated).

3. Kim-439/Ueda/Kim-999 Combination

As discussed in Section X.A, it would have been obvious to modify the height of Kim-439's second part (bonding portion 240) and the height of adhesive in Kim-439/Ueda's battery such that adhesive is applied between Kim-439's first region and second region in the width direction to improve bonding, reduce material usage, and preserve compactness. EX1003, ¶[0220]. Injecting adhesive along the thickness between Kim-439's first and second parts would also force adhesive to intrude into the interface between the first and second regions of the second part, as shown below. *Id.* And a POSA would have had a reasonable expectation of success doing so because Kim-999's parameter-driven approach to adhesive application would have been directly applicable to Kim-439/Ueda's battery. *Id.*



EX1003, ¶[0220], Kim-439's Modified Battery.

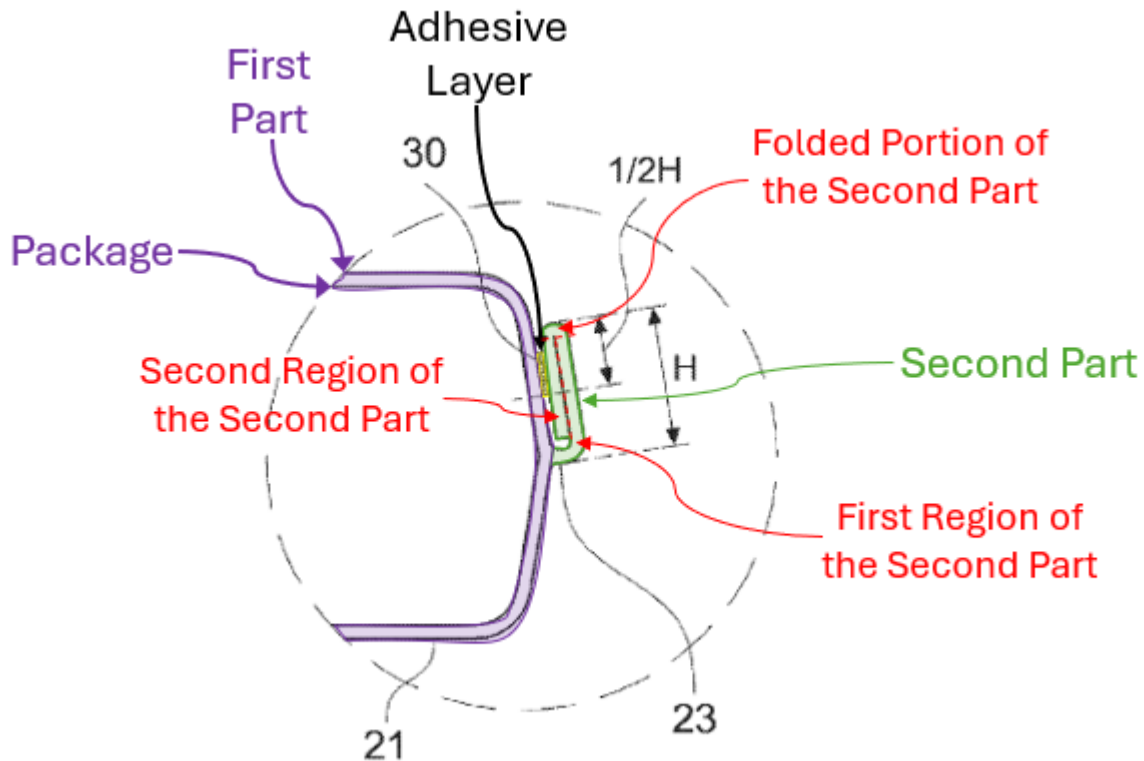
D. Dependent Claim 22

1. Kim-439/Ueda

As in Section IX.U, the Kim-439/Ueda combination renders obvious applying the adhesive layer between the curved side face, the first region, and the second region in the width direction because a POSA would have understood that the height of Kim-439's second part and the application of adhesive can be varied as a result effective variable to control bonding strength and footprint. EX1003, ¶¶[0221]-[0222]. Should Patent Owner argue that the Kim-439/Ueda combination does not disclose the recited placement of adhesive, Kim-999 shows that modifying placement of adhesive relative to the location of the second part was well known. *Id.*

2. Kim-999

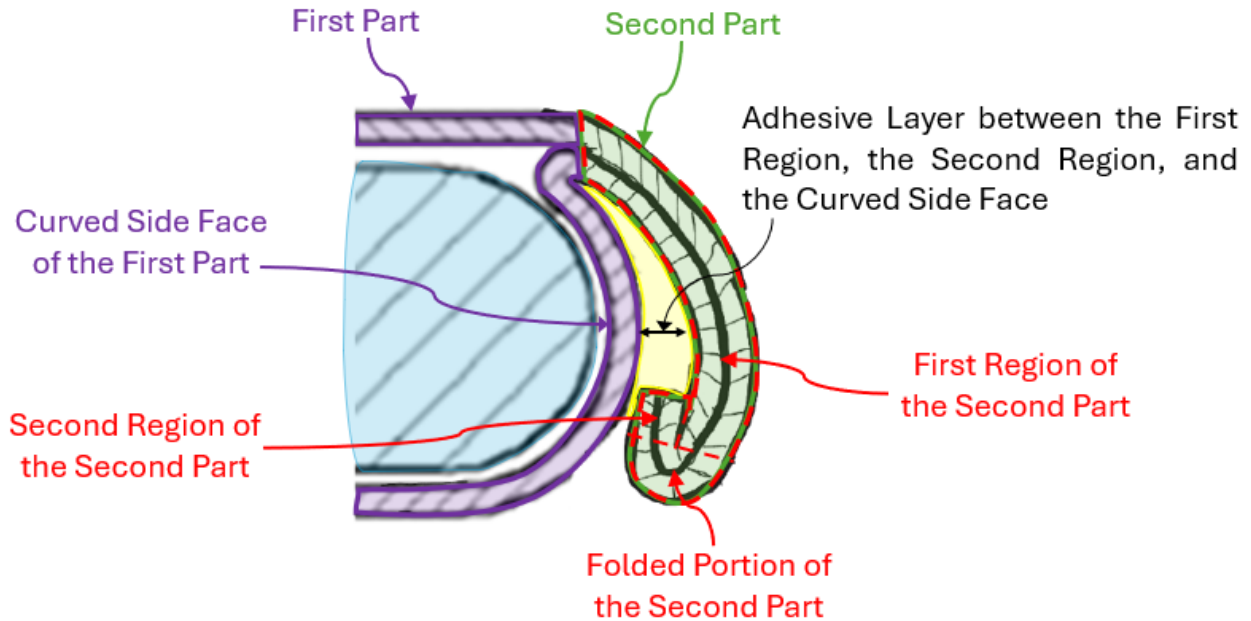
The end of the second region in Kim-999's folding part 23 is spatially separated from the folding part's first region. EX1007, FIG. 4. Kim-999's adhesive 30 "may be injected between the entire height of the folding part 23 and ½ or more of the entire height of the folding part 23." Kim-999, ¶[0065]. A POSA would have understood that Kim-999's disclosed range of adhesive extension includes applying adhesive between the curved side face, the first region, and the second region in the width direction. EX1003, ¶[0223].



EX1007, FIG. 4 (annotated).

3. Kim-439/Ueda/Kim-999 Combination

As in Section X.A, it would have been obvious to modify the height of Kim-439's second part (bonding portion 240) and the height of adhesive in Kim-439/Ueda's battery such that adhesive is applied between Kim-439's curved side face, first region, and second region in the width direction to improve bonding, reduce material usage, preserve compactness, and seal against air and moisture. EX1003, ¶[0224]. And a POSA would have had a reasonable expectation of doing so because Kim-999's parameter-driven approach to adhesive application would have been directly applicable to Kim-439/Ueda's battery. *Id.*



EX1003, ¶[0224], Kim-439's Modified Battery.

E. Dependent Claim 26

1. Kim-439/Ueda

The Kim-439/Ueda combination does not explicitly disclose wherein a unit mass of the adhesive layer is 0.1 to 0.25 mg/mm in the thickness direction.

However, Kim-999 shows that modifying of the amount of adhesive at the interface between the second part and the side face of the package was well known, and the prosecution history supports this conclusion. EX1003, ¶¶[0225]-[0226].

2. Kim-999

A POSA would have understood, in view of Kim-999, that the amount of adhesive applied per unit length (adhesive mass per mm) can be varied as a result-effective variable because Kim-999 expressly teaches adjusting both the placement and extent of adhesive to achieve adequate bonding while avoiding

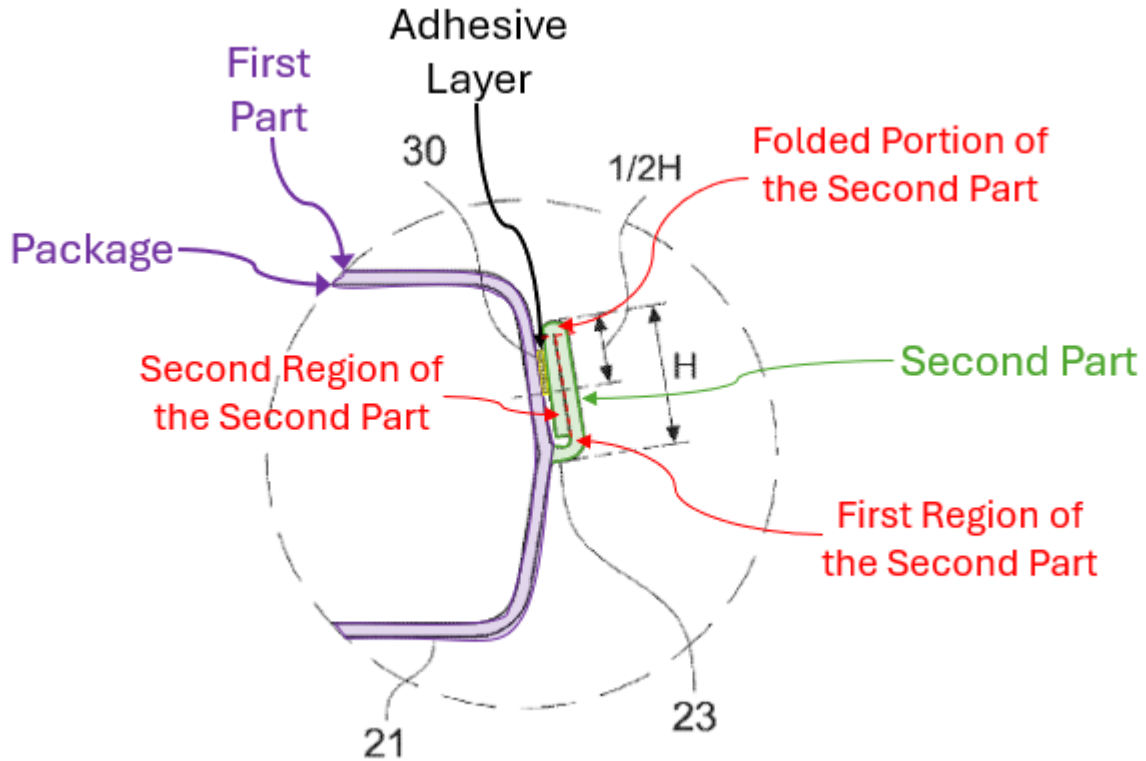
unnecessary bulk or separation between the folded portion and the case. EX1007, ¶[0065]; EX1003, ¶[0227].

For example, Kim-999 teaches adhesive 30 “may be injected between the entire height of the folding part 23 and ½ or more of the entire height of the folding part 23,” thereby identifying a controllable range for how much adhesive is applied and where it is positioned. EX1007, ¶[0065]. This teaching signals to a POSA that adhesive amount is selected to ensure sufficient adhesion while minimizing excess material. EX1003, ¶[0228].

Kim-999 further emphasizes that adhesive amount is controlled to protect against “fluttering, bending, [and] twisting,” but not so much as to increase spacing or impair package compactness. EX1007, ¶[0066]; EX1003, ¶[0229]. Accordingly, a POSA would have understood that optimizing adhesive mass per unit length balances structural integrity against dimensional constraints. EX1003, ¶[0229]. Thus, selecting an appropriate unit mass would have been a matter of routine optimization based on known engineering tradeoffs. *Id.*

Furthermore, a POSA would have understood that the “adhesive amount per unit length” corresponds to the product of (i) adhesive density, (ii) gap thickness, and (iii) the effective bonding height. EX1003, ¶¶[0229]-[0232]. Because Kim-999 expressly teaches varying the height and extent of adhesive, the resulting adhesive mass-per-unit-length is a predictable function of these result-effective variables and

would have been routinely optimized to achieve sufficient bonding while minimizing excess thickness. *Id.*

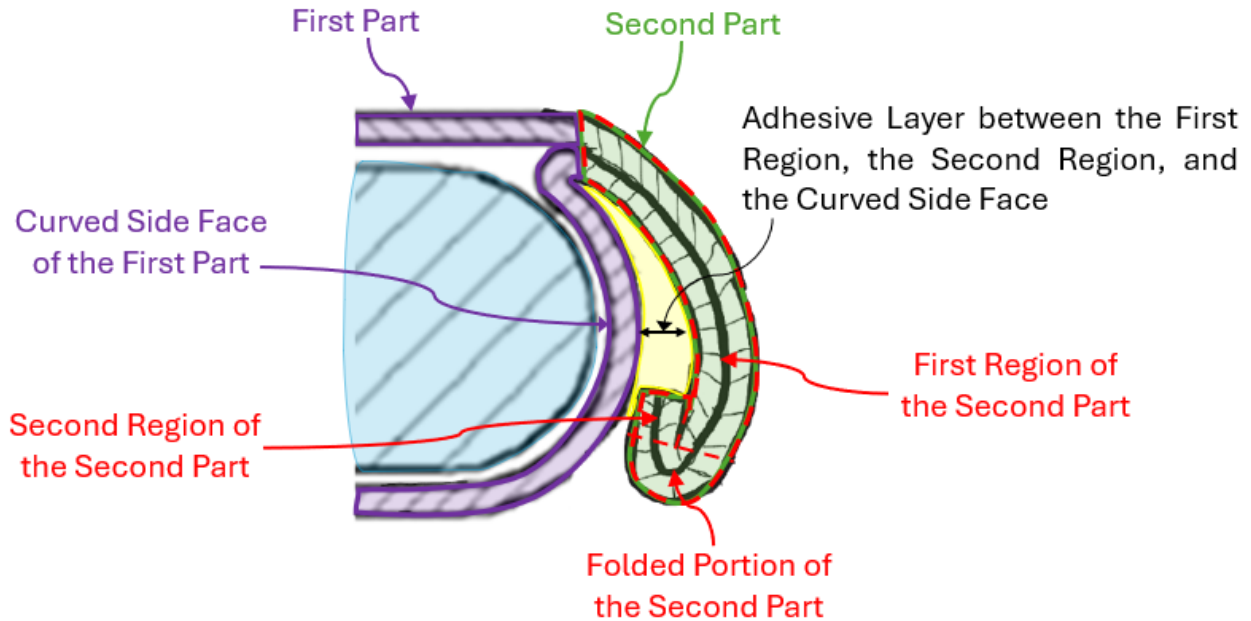


EX1007, FIG. 4 (annotated).

3. Kim-439/Ueda/Kim-999 Combination

As in Section X.A, it would have been obvious in view of Kim-999 for the adhesive in Kim-439/Ueda's battery to have (or optimized to have) a unit mass of the adhesive layer in a range from 0.1 to 0.25 mg/mm in the thickness direction, thereby achieving adequate bonding strength and avoiding unnecessary bulk.

EX1003, ¶[0233]. And a POSA would have had a reasonable expectation of success in doing so because Kim-999's parameter-driven approach to adhesive application would have been directly applicable to Kim-439/Ueda's battery. *Id.*



EX1003, ¶[0233], Kim-439's Modified Battery.

XI. NO SECONDARY CONSIDERATIONS

Petitioner is not aware of any evidence of alleged secondary considerations of non-obviousness having nexus to the challenged claims, but reserves the right to address any evidence Patent Owner presents. EX1003, ¶¶[0234]-[0235].

XII. MANDATORY NOTICES (37 C.F.R. § 42.8(A)(1))

Real Party-in-Interest (37 C.F.R. § 42.8(b)(1)): The real party-in-interest is Zhuhai CosMX Battery Co., Ltd.; Chongqing CosMX Battery Co., Ltd.; Zhuhai CosMX Power Jinwan Subsidiary Co., Ltd.; Zhuhai CosMX Power Battery Co., Ltd.; Zhuhai CosMX Power Supply Co., Ltd.; Zhejiang CosMX Battery Co., Ltd.; Zhejiang CosMX Power Supply Co., Ltd.; and Chongqing CosMX Battery Co., Ltd.

Related Matters (37 C.F.R. § 42.8(b)(2)):

The '808 patent was asserted in the litigation *Ningde Amperex Technology Limited v. Zhuhai CosMX Battery Co., Ltd.*, Case No. 2:26-cv-00139 (E.D. Tex.), filed February 18, 2026, dismissed June 16, 2026.

Petitioner has previously filed petitions for *inter partes* review of Patent Owner's U.S. Patent Nos. 12,374,686 (IPR2026-00399; filed July 21, 2026), 10,916,769 (IPR2026-00398; filed July 21, 2026), and 12,294,082 (IPR2026-00401; filed July 22, 2026).

Petitioner is concurrently filing a petition for *inter partes* review of Patent Owner's U.S. Patent No. 12,278,330 (IPR2026-00409).

Lead and Back-up Counsel (37 C.F.R. § 42.8(b)(3)):

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Service Information (37 C.F.R. § 42.8(b)(4)): Please direct all correspondence regarding this Petition to counsel at the above addresses and to PTAB@sternekessler.com and COSMXPTAB@leehayes.com. Petitioner consents to service by email at the addresses above.

XIII. PROCEDURAL STATEMENTS

This Petition is filed in accordance with 37 C.F.R. § 42.106(a). Concurrently filed herewith are a Power of Attorney and Exhibit List under 37 C.F.R. §§ 42.10(b) and 42.63(e), respectively. The required fee is paid through Deposit Acct. No. 19-0036 (Customer ID No. 45324). The Office is authorized to charge any fee deficiency, or credit any overpayment, to Deposit Acct. No. 19-0036 (Customer ID No. 45324).

XIV. CONCLUSION

The Board should institute review of claims 1-27 and find them unpatentable.

Respectfully submitted,

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XV. APPENDIX A: LIST OF ALL CHALLENGED CLAIMS

1. 1. A battery, comprising:

an electrode body, and

a package, wherein the package comprises:

a first part covering a second plane of the electrode body;

and

a second part protruding from the first part in a width
direction of the electrode body, wherein the second part comprises
a curved structure, the curved structure curves around a curved
side face of the electrode body in a thickness direction
perpendicular to the width direction, the second part including a
first end connected to the first part and a second end opposite to
the first end in the thickness direction, and the second part is
adhered to the curved side face of the electrode body via an
adhesive layer.
2. The battery according to claim 1, wherein a projection of the first part
in the width direction overlaps with a projection of the second part in the
width direction.

3. The battery according to claim 2, wherein the projection of the second part in the width direction is located within the projection of the first part in the width direction.

4. The battery according to claim 2, wherein a projection of the first part in the thickness direction overlaps with a projection of the second part in the thickness direction.

5. The battery according to claim 1, wherein the first part comprises:
a first surface extending in the width direction;
a second surface extending in the width direction, wherein the second surface is opposite to the first surface in the thickness direction; and
the curved side face connects the first surface and the second surface.

6. The battery according to claim 5, wherein the second part comprises a first region comprising the curved structure, wherein the first region is connected to the first part.

7. The battery according to claim 6, wherein a projection of the first region in the thickness direction overlaps with a projection of the first part in the thickness direction.

8. The battery according to claim 6, wherein the second part further comprises a second region, and a folded portion connecting the first region and the second region.

9. The battery according to claim 8, wherein a projection of the folded portion in the thickness direction is located within a projection of the first region in the thickness direction.

10. The battery according to claim 8, wherein projection of the second region in the thickness direction is located within a projection of the first region in the thickness direction.

11. The battery according to claim 8, wherein a projection of the folded portion in the thickness direction and a projection of the second region in the thickness direction are located within projection of the first region in the thickness direction.

12. The battery according to claim 8, wherein a projection of the first region in the width direction is located within a projection of the first part in the width direction.

13. The battery according to claim 8, wherein a projection of the folded portion in the width direction is located within a projection of the first part in the width direction.

14. The battery according to claim 8, wherein a projection of the second region in the width direction is located within a projection of the first part in the width direction.

15. The battery according to claim 8, wherein a projection of the first region in the width direction and a projection of the folded portion in the width direction are located within a projection of the first part in the width direction.

16. The battery according to claim 8, wherein a projection of the first region in the width direction and a projection of the second region in the

width direction are located within a projection of the first part in the width direction.

17. The battery according to claim 8, wherein a projection of the folded portion in the width direction and a projection of the second region in the width direction are located within a projection of the first part in the width direction.

18. The battery according to claim 8, wherein a projection of the first region in the width direction, a projection of the folded portion in the width direction, and a projection of the second region in the width direction are located within a projection of the first part in the width direction.

19. The battery according to claim 8,
wherein the second region comprises a first end portion connected to the folded portion, and a second end portion opposite to the first end portion,
and

wherein a projection of the second end portion in the width direction is located between a central plane of the first part and a projection of the first surface in the width direction.

20. The battery according to claim 8, wherein the adhesive layer is provided between the curved side face and the second region in the width direction.

21. The battery according to claim 8, wherein the adhesive layer is provided between the first region and the second region in the width direction.

22. The battery according to claim 8, wherein the adhesive layer is provided between the curved side face, the first region and the second region in the width direction.

23. The battery according to claim 6, wherein the adhesive layer is provided between the curved side face and the first region in the width direction.

24. The battery according to claim 5, wherein at least one of the first surface or the second surface has a flat region in the width direction.

25. The battery according to claim 5, wherein the curved side face faces to the second part in the width direction.

26. The battery according to claim 1, wherein a unit mass of the adhesive layer is 0.1 to 0.25 mg/mm in the thickness direction.

27. The battery according to claim 1, wherein the curved side face protrudes toward the second part in the width direction.

**CERTIFICATE OF COMPLIANCE WITH TYPE-VOLUME LIMITATION,
TYPEFACE REQUIREMENTS, AND TYPE STYLE REQUIREMENTS**

1. This Petition complies with the type-volume limitation of 14,000 words, comprising 13,524 words, excluding the parts exempted by 37 C.F.R. § 42.24(a).

2. This Petition complies with the general format requirements of 37 C.F.R. § 42.6(a) and has been prepared using Microsoft® Word in 14-point Times New Roman.

Respectfully submitted,

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CERTIFICATION OF SERVICE (37 C.F.R. §§ 42.6(e), 42.105(a))

The undersigned hereby certifies that on July 28, 2026, true and correct copies of the foregoing **PETITION FOR *INTER PARTES* REVIEW OF U.S. PATENT NO. 11,699,808** and all associated exhibits were served in their entireties on the following party via FedEx Express®:

MORGAN, LEWIS & BOCKIUS LLP
1400 Page Mill Road
Palo Alto, CA 94304

Patent Owner's Correspondence Address of Record for U.S. Patent No. 11,699,808

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