UTILITY PATENT APPLICATION TRANSMITTAL *(Only for new nonprovisional applications under 37 CFR § 1.53(b))*	Attorney Docket No.	024607-02-5119-US
	First Inventor	Tao TAO, et al.
	Title	LITHIUM-ION BATTERY HAVING DESIRABLE SAFETY PERFORMANCE
	Electronically filed	May 17, 2022

APPLICATION ELEMENTS
See MPEP Chapter 600 concerning utility patent application contents.

Address to: **Commissioner for Patents**
P.O. Box 1450
Alexandria, VA 22313-1450

1. ☐ Fee Transmittal Form *(with duplicate for fee processing)*
2. ☐ Applicant claims Small Entity status, see 37 C.F.R. § 1.27
3. ☒ Specification [Total Pages 23]
4. ☒ Drawing(s) *(35 USC § 113)* [Total Sheets 2]
5. ☒ Oath or Declaration [Total Pages 2]
   a. ☐ Newly executed *(original or copy)*
   b. ☒ Copy from a prior application *(37 CFR § 1.63(d))*
6. ☒ Application Data Sheet, see 37 C.F.R. § 1.76
7. ☐ CD-ROM or CD-R in duplicate, large table or Computer Program *(Appendix)*
   ☐ Landscape Table on CD
8. ☐ Nucleotide and/or Amino Acid Sequence Submission *(if applicable, all necessary)*
   a. ☐ Computer Readable Form (CRF)
   b. ☐ Specification Sequence Listing on
      i. ☐ CD-ROM or CD-R (2 copies); or
      ii. ☐ Paper
   c. ☐ Statement verifying identity of above copies

ACCOMPANYING APPLICATION PARTS

9. ☐ Assignment Papers *(cover sheet & document(s))*
   Name of Assignee:
10. ☒ 37 CFR § 3.73(c) Statement
    a. ☒ Power of Attorney
11. ☐ English Translation Document *(if applicable)*
12. ☐ Information Disclosure Statement and PTO-1449
    a. ☐ Copies of citations attached
13. ☐ Preliminary Amendment
14. ☐ Return Receipt Postcard *(MPEP 503)*
15. ☐ Certified Copy of Priority Document(s) *(if foreign priority is claimed)*
16. ☐ Non-Publication Request under 35 U.S.C. § 122 (b)(2)(B)(i)
17. ☒ Other: Authorization for Internet Communication
    Request for Prioritized Examination (Track 1)

Note: (1) Benefit claims under 37 CFR 1.78 and foreign priority claims under 1.55 **MUST** be included in an Application Data Sheet (ADS).
(2) For applications filed under 35 U.S.C. 111, the application must contain an ADS specifying the applicant if the applicant is an assignee, person to whom the inventor is under an obligation to assign, or person who otherwise shows sufficient proprietary interest in the matter. See 37 CFR 1.46(b).

19. CORRESPONDENCE ADDRESS: Customer Number 24341

Signature	/Yalei Sun/	Date	May 17, 2022
Name (Print/Type)	Yalei Sun	Registration No. (Attorney/Agent)	57,765

UTILITY PATENT APPLICATION FEE TRANSMITTAL *(Only for new nonprovisional applications under 37 CFR § 1.53(b))*	Attorney Docket No.	024607-02-5119-US
	First Inventor	Tao TAO, et al.
	Title	LITHIUM-ION BATTERY HAVING DESIRABLE SAFETY PERFORMANCE
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Alexandria, VA 22313-1450

BASIC FILING, SEARCH AND EXAMINATION FEES

Application Type	Filing Fees	Search Fees	Examination Fees	Fees Paid ($)
Utility	$ 320	$ 700	$ 800	$ 1820

EXCESS CLAIM FEES

Type	No. Filed	Less	Extra	Extra Rate ($)	Type
Total Claims	19	- 20		$ 100 each	0
Independent	2	- 3		$ 480 each	0
			Multiple Dependency Fee If Applicable ($860)		0

APPLICATION SIZE FEE (Specification and Drawings)

Total Sheets	Extra Sheets	No. of each add'l 50 or fraction thereof	Fee ($)
25 x .75- 100	/ 50	(round up to whole no.) x $420	0

Sub Total	$1820
Other: Request for Prioritized Examination	$4200
Processing Fee (Track 1)	$140
TOTAL FILING FEE	**$6160**

Please charge the total filing fee and any other additional fees to Morgan, Lewis & Bockius LLP Deposit Account 50-0310 (order no. 024607-02-5119-US).

Respectfully submitted,

/Yalei Sun/ 57,765

Date: May 17, 2022

Yalei Sun (Reg. No.)
MORGAN, LEWIS & BOCKIUS LLP
1400 Page Mill Road
Palo Alto, CA 94304
(650) 843-4000

Doc Code: TRACK1.REQ
Document Description: TrackOne Request

PTO/AIA/424 (04-14)

CERTIFICATION AND REQUEST FOR PRIORITIZED EXAMINATION UNDER 37 CFR 1.102(e) (Page 1 of 1)

First Named Inventor:	Tao TAO, et al.	Nonprovisional Application Number (if known):	
Title of Invention:	LITHIUM-ION BATTERY HAVING DESIRABLE SAFETY PERFORMANCE		

APPLICANT HEREBY CERTIFIES THE FOLLOWING AND REQUESTS PRIORITIZED EXAMINATION FOR THE ABOVE-IDENTIFIED APPLICATION.

1. The processing fee set forth in 37 CFR 1.17(i)(1) and the prioritized examination fee set forth in 37 CFR 1.17(c) have been filed with the request. The publication fee requirement is met because that fee, set forth in 37 CFR 1.18(d), is currently $0. The basic filing fee, search fee, and examination fee are filed with the request or have been already been paid. I understand that any required excess claims fees or application size fee must be paid for the application.

2. I understand that the application may not contain, or be amended to contain, more than four independent claims, more than thirty total claims, or any multiple dependent claims, and that any request for an extension of time will cause an outstanding Track I request to be dismissed.

3. The applicable box is checked below:

I. ☑ Original Application (Track One) - Prioritized Examination under § 1.102(e)(1)

i. (a) The application is an original nonprovisional utility application filed under 35 U.S.C. 111(a). This certification and request is being filed with the utility application via EFS-Web.

---OR---

(b) The application is an original nonprovisional plant application filed under 35 U.S.C. 111(a). This certification and request is being filed with the plant application in paper.

ii. An executed inventor's oath or declaration under 37 CFR 1.63 or 37 CFR 1.64 for each inventor, **or** the application data sheet meeting the conditions specified in 37 CFR 1.53(f)(3)(i) is filed with the application.

II. ☐ Request for Continued Examination - Prioritized Examination under § 1.102(e)(2)

i. A request for continued examination has been filed with, or prior to, this form.
ii. If the application is a utility application, this certification and request is being filed via EFS-Web.
iii. The application is an original nonprovisional utility application filed under 35 U.S.C. 111(a), or is a national stage entry under 35 U.S.C. 371.
iv. This certification and request is being filed prior to the mailing of a first Office action responsive to the request for continued examination.
v. No prior request for continued examination has been granted prioritized examination status under 37 CFR 1.102(e)(2).

Signature /Yalei Sun/	Date May 17, 2022
Name (Print/Typed) Yalei Sun	Practitioner Registration Number 57,765

Note: *This form must be signed in accordance with 37 CFR 1.33. See 37 CFR 1.4(d) for signature requirements and certifications. Submit multiple forms if more than one signature is required.**

☑ *Total of 1 forms are submitted.

Privacy Act Statement

The **Privacy Act of 1974 (P.L. 93-579)** requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether disclosure of these records is required by the Freedom of Information Act.
2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.
3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.
4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).
5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.
6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).
7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (*i.e.*, GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.
8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspection or an issued patent.
9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

Doc Code: ECOMM.AUTH/ECOMM.WTDW
Doc Description: Internet Communications Authorized/Internet Communications Authorization Withdrawn

PTO/SB/439 (11-15)

AUTHORIZATION FOR INTERNET COMMUNICATIONS IN A PATENT APPLICATION OR REQUEST TO WITHDRAW AUTHORIZATION FOR INTERNET COMMUNICATIONS		
	Application No.	To be assigned
	Filing Date	
	First Named Inventor	Tao TAO, et al.
	Art Unit	To be assigned
	Examiner Name	To be assigned
	Practitioner Docket No.	024607-02-5119-US

To: Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

I. To authorize permission for Internet Communications.

☑ Recognizing that Internet communications are not secure, I hereby authorize the USPTO to communicate with the undersigned and practitioners in accordance with 37 CFR 1.33 and 37 CFR 1.34 concerning any subject matter of this application via video conferencing, instant messaging, or electronic mail. I understand that a copy of these communications will be made of record in the application file. (MPEP 502.03)

II. To withdraw authorization for Internet Communications.

☐ The authorization given on _____, to the USPTO to communicate with the undersigned and any practitioner in accordance with 37 CFR 1.33 and 37 CFR 1.34 concerning any subject matter of this application via Internet communications such as video conferencing, instant messaging, or electronic mail is hereby withdrawn. I understand that the withdrawal is effective when approved rather than when received.

I am the

☐ applicant.

☑ attorney or agent of record. Registration number 57,765.

☐ attorney or agent acting under 37 CFR 1.34. Registration number _____.

/Yalei Sun/ — Signature

May 17, 2022 — Date

Yalei Sun — Typed or printed name

650-843-4000 — Telephone Number

NOTE: This form must be signed in accordance with 37 CFR 1.33. See 37 CFR 1.4 for signature requirements and certifications. Juristic entities must be represented by a patent practitioner (see 37 CFR 1.31, which is applicable to any paper filed on or after September 16, 2012, that is presented on behalf of a juristic entity, regardless of application filing date). Submit multiple forms if more than one signature is required, see below*.

☑ * Total of 1 forms are submitted.

Privacy Act Statement

The **Privacy Act of 1974 (P.L. 93-579)** requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether disclosure of these records is required by the Freedom of Information Act.
2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.
3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.
4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).
5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.
6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).
7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (*i.e.*, GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.
8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspection or an issued patent.
9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

PTO/AIA/14 (11-15)
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Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

Application Data Sheet 37 CFR 1.76	Attorney Docket Number	024607-02-5119-US
	Application Number	
Title of Invention	LITHIUM-ION BATTERY HAVING DESIRABLE SAFETY PERFORMANCE	

The application data sheet is part of the provisional or nonprovisional application for which it is being submitted. The following form contains the bibliographic data arranged in a format specified by the United States Patent and Trademark Office as outlined in 37 CFR 1.76.
This document may be completed electronically and submitted to the Office in electronic format using the Electronic Filing System (EFS) or the document may be printed and included in a paper filed application.

Secrecy Order 37 CFR 5.2:

☐ Portions or all of the application associated with this Application Data Sheet may fall under a Secrecy Order pursuant to 37 CFR 5.2 (Paper filers only. Applications that fall under Secrecy Order may not be filed electronically.)

Inventor Information:

Inventor 1 Remove

Legal Name

Prefix	Given Name	Middle Name	Family Name	Suffix
	Tao		TAO	

Residence Information (Select One) ○ US Residency ◉ Non US Residency ○ Active US Military Service

City	Ningde	Country of Residence	CN

Mailing Address of Inventor:

Address 1	No. 1, Xingang Road		
Address 2	Zhangwan Town, Jiaocheng Zone		
City	Ningde	**State/Province**	FJ
Postal Code	352100	**Country**	CN

Inventor 2 Remove

Legal Name

Prefix	Given Name	Middle Name	Family Name	Suffix
	Ming Liang		MO	

Residence Information (Select One) ○ US Residency ◉ Non US Residency ○ Active US Military Service

City	Ningde	Country of Residence	CN

Mailing Address of Inventor:

Address 1	No. 1, Xingang Road		
Address 2	Zhangwan Town, Jiaocheng Zone		
City	Ningde	**State/Province**	FJ
Postal Code	352100	**Country**	CN

All Inventors Must Be Listed - Additional Inventor Information blocks may be generated within this form by selecting the **Add** button. Add

Correspondence Information:

PTO/AIA/14 (11-15)
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Application Data Sheet 37 CFR 1.76	Attorney Docket Number	024607-02-5119-US
	Application Number	
Title of Invention	LITHIUM-ION BATTERY HAVING DESIRABLE SAFETY PERFORMANCE	

Enter either Customer Number or complete the Correspondence Information section below. For further information see 37 CFR 1.33(a).			
☐ An Address is being provided for the correspondence Information of this application.			
Customer Number	24341		
Email Address		Add Email	Remove Email

Application Information:

Title of the Invention	LITHIUM-ION BATTERY HAVING DESIRABLE SAFETY PERFORMANCE		
Attorney Docket Number	024607-02-5119-US	**Small Entity Status Claimed**	☐
Application Type	Nonprovisional		
Subject Matter	Utility		
Total Number of Drawing Sheets (if any)	2	**Suggested Figure for Publication (if any)**	

Filing By Reference:

Only complete this section when filing an application by reference under 35 U.S.C. 111(c) and 37 CFR 1.57(a). Do not complete this section if application papers including a specification and any drawings are being filed. Any domestic benefit or foreign priority information must be provided in the appropriate section(s) below (i.e., "Domestic Benefit/National Stage Information" and "Foreign Priority Information").

For the purposes of a filing date under 37 CFR 1.53(b), the description and any drawings of the present application are replaced by this reference to the previously filed application, subject to conditions and requirements of 37 CFR 1.57(a).

Application number of the previously filed application	Filing date (YYYY-MM-DD)	Intellectual Property Authority or Country

Publication Information:

☐ Request Early Publication (Fee required at time of Request 37 CFR 1.219)

☐ **Request Not to Publish.** I hereby request that the attached application not be published under 35 U.S.C. 122(b) and certify that the invention disclosed in the attached application **has not and will not** be the subject of an application filed in another country, or under a multilateral international agreement, that requires publication at eighteen months after filing.

Representative Information:

Representative information should be provided for all practitioners having a power of attorney in the application. Providing this information in the Application Data Sheet does not constitute a power of attorney in the application (see 37 CFR 1.32).
Either enter Customer Number or complete the Representative Name section below. If both sections are completed the customer Number will be used for the Representative Information during processing.

Please Select One:	◉ Customer Number	○ US Patent Practitioner	○ Limited Recognition (37 CFR 11.9)
Customer Number	24341		

Application Data Sheet 37 CFR 1.76	Attorney Docket Number	024607-02-5119-US
	Application Number	
Title of Invention	LITHIUM-ION BATTERY HAVING DESIRABLE SAFETY PERFORMANCE	

Domestic Benefit/National Stage Information:

This section allows for the applicant to either claim benefit under 35 U.S.C. 119(e), 120, 121, 365(c), or 386(c) or indicate National Stage entry from a PCT application. Providing benefit claim information in the Application Data Sheet constitutes the specific reference required by 35 U.S.C. 119(e) or 120, and 37 CFR 1.78.
When referring to the current application, please leave the "Application Number" field blank.

Prior Application Status	Pending		Remove
Application Number	Continuity Type	Prior Application Number	Filing or 371(c) Date (YYYY-MM-DD)
	Continuation of	17407081	2021-08-19
Prior Application Status	Abandoned		Remove
Application Number	Continuity Type	Prior Application Number	Filing or 371(c) Date (YYYY-MM-DD)
17407081	Continuation of	16113938	2018-08-27
Prior Application Status	Patented		Remove

Application Number	Continuity Type	Prior Application Number	Filing Date (YYYY-MM-DD)	Patent Number	Issue Date (YYYY-MM-DD)
16113938	Continuation of	14596873	2015-01-14	10541441	2020-01-21

Additional Domestic Benefit/National Stage Data may be generated within this form by selecting the **Add** button.

Foreign Priority Information:

This section allows for the applicant to claim priority to a foreign application. Providing this information in the application data sheet constitutes the claim for priority as required by 35 U.S.C. 119(b) and 37 CFR 1.55. When priority is claimed to a foreign application that is eligible for retrieval under the priority document exchange program (PDX)[i] the information will be used by the Office to automatically attempt retrieval pursuant to 37 CFR 1.55(i)(1) and (2). Under the PDX program, applicant bears the ultimate responsibility for ensuring that a copy of the foreign application is received by the Office from the participating foreign intellectual property office, or a certified copy of the foreign priority application is filed, within the time period specified in 37 CFR 1.55(g)(1).

			Remove
Application Number	Country[i]	Filing Date (YYYY-MM-DD)	Access Code[i] (if applicable)
201420030319.4	CN	2014-01-17	

Additional Foreign Priority Data may be generated within this form by selecting the **Add** button.

Statement under 37 CFR 1.55 or 1.78 for AIA (First Inventor to File) Transition Applications

PTO/AIA/14 (11-15)
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U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

Application Data Sheet 37 CFR 1.76	Attorney Docket Number	024607-02-5119-US
	Application Number	
Title of Invention	LITHIUM-ION BATTERY HAVING DESIRABLE SAFETY PERFORMANCE	

☐ This application (1) claims priority to or the benefit of an application filed before March 16, 2013 and (2) also contains, or contained at any time, a claim to a claimed invention that has an effective filing date on or after March 16, 2013.
NOTE: By providing this statement under 37 CFR 1.55 or 1.78, this application, with a filing date on or after March 16, 2013, will be examined under the first inventor to file provisions of the AIA.

PTO/AIA/14 (11-15)
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Application Data Sheet 37 CFR 1.76	Attorney Docket Number	024607-02-5119-US
	Application Number	
Title of Invention	LITHIUM-ION BATTERY HAVING DESIRABLE SAFETY PERFORMANCE	

Authorization or Opt-Out of Authorization to Permit Access:

When this Application Data Sheet is properly signed and filed with the application, applicant has provided written authority to permit a participating foreign intellectual property (IP) office access to the instant application-as-filed (see paragraph A in subsection 1 below) and the European Patent Office (EPO) access to any search results from the instant application (see paragraph B in subsection 1 below).

Should applicant choose not to provide an authorization identified in subsection 1 below, applicant **must opt-out** of the authorization by checking the corresponding box A or B or both in subsection 2 below.

NOTE: This section of the Application Data Sheet is **ONLY** reviewed and processed with the **INITIAL** filing of an application. After the initial filing of an application, an Application Data Sheet cannot be used to provide or rescind authorization for access by a foreign IP office(s). Instead, Form PTO/SB/39 or PTO/SB/69 must be used as appropriate.

1. Authorization to Permit Access by a Foreign Intellectual Property Office(s)

A. Priority Document Exchange (PDX) - Unless box A in subsection 2 (opt-out of authorization) is checked, the undersigned hereby **grants the USPTO authority** to provide the European Patent Office (EPO), the Japan Patent Office (JPO), the Korean Intellectual Property Office (KIPO), the State Intellectual Property Office of the People's Republic of China (SIPO), the World Intellectual Property Organization (WIPO), and any other foreign intellectual property office participating with the USPTO in a bilateral or multilateral priority document exchange agreement in which a foreign application claiming priority to the instant patent application is filed, access to: (1) the instant patent application-as-filed and its related bibliographic data, (2) any foreign or domestic application to which priority or benefit is claimed by the instant application and its related bibliographic data, and (3) the date of filing of this Authorization. See 37 CFR 1.14(h)(1).

B. Search Results from U.S. Application to EPO - Unless box B in subsection 2 (opt-out of authorization) is checked, the undersigned hereby **grants the USPTO authority** to provide the EPO access to the bibliographic data and search results from the instant patent application when a European patent application claiming priority to the instant patent application is filed. See 37 CFR 1.14(h)(2).

The applicant is reminded that the EPO's Rule 141(1) EPC (European Patent Convention) requires applicants to submit a copy of search results from the instant application without delay in a European patent application that claims priority to the instant application.

2. Opt-Out of Authorizations to Permit Access by a Foreign Intellectual Property Office(s)

☐ A. Applicant **DOES NOT** authorize the USPTO to permit a participating foreign IP office access to the instant application-as-filed. If this box is checked, the USPTO will not be providing a participating foreign IP office with any documents and information identified in subsection 1A above.

☐ B. Applicant **DOES NOT** authorize the USPTO to transmit to the EPO any search results from the instant patent application. If this box is checked, the USPTO will not be providing the EPO with search results from the instant application.

NOTE: Once the application has published or is otherwise publicly available, the USPTO may provide access to the application in accordance with 37 CFR 1.14.

PTO/AIA/14 (11-15)
Approved for use through 04/30/2017. OMB 0651-0032
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
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Application Data Sheet 37 CFR 1.76	Attorney Docket Number	024607-02-5119-US
	Application Number	
Title of Invention	LITHIUM-ION BATTERY HAVING DESIRABLE SAFETY PERFORMANCE	

Applicant Information:

Providing assignment information in this section does not substitute for compliance with any requirement of part 3 of Title 37 of CFR to have an assignment recorded by the Office.

Applicant 1

If the applicant is the inventor (or the remaining joint inventor or inventors under 37 CFR 1.45), this section should not be completed. The information to be provided in this section is the name and address of the legal representative who is the applicant under 37 CFR 1.43; or the name and address of the assignee, person to whom the inventor is under an obligation to assign the invention, or person who otherwise shows sufficient proprietary interest in the matter who is the applicant under 37 CFR 1.46. If the applicant is an applicant under 37 CFR 1.46 (assignee, person to whom the inventor is obligated to assign, or person who otherwise shows sufficient proprietary interest) together with one or more joint inventors, then the joint inventor or inventors who are also the applicant should be identified in this section.

Clear

◉ Assignee	○ Legal Representative under 35 U.S.C. 117	○ Joint Inventor
○ Person to whom the inventor is obligated to assign.	○ Person who shows sufficient proprietary interest	

If applicant is the legal representative, indicate the authority to file the patent application, the inventor is:

Name of the Deceased or Legally Incapacitated Inventor:

If the Applicant is an Organization check here. ☒

Organization Name	NINGDE AMPEREX TECHNOLOGY LIMITED		
Mailing Address Information For Applicant:			
Address 1	No. 1, Xingang Road		
Address 2	Zhangwan Town, Jiaocheng Zone		
City	Ningde	**State/Province**	FJ
Country	CN	Postal Code	352100
Phone Number		Fax Number	
Email Address			

Additional Applicant Data may be generated within this form by selecting the Add button.

Assignee Information including Non-Applicant Assignee Information:

Providing assignment information in this section does not substitute for compliance with any requirement of part 3 of Title 37 of CFR to have an assignment recorded by the Office.

PTO/AIA/14 (11-15)
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Application Data Sheet 37 CFR 1.76	Attorney Docket Number	024607-02-5119-US
	Application Number	
Title of Invention	LITHIUM-ION BATTERY HAVING DESIRABLE SAFETY PERFORMANCE	

Assignee 1

Complete this section if assignee information, including non-applicant assignee information, is desired to be included on the patent application publication. An assignee-applicant identified in the "Applicant Information" section will appear on the patent application publication as an applicant. For an assignee-applicant, complete this section only if identification as an assignee is also desired on the patent application publication.

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Mailing Address Information For Assignee including Non-Applicant Assignee:

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Signature:

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This Application Data Sheet **must** be signed by a patent practitioner if one or more of the applicants is a **juristic entity** (e.g., corporation or association). If the applicant is two or more joint inventors, this form must be signed by a patent practitioner, **all** joint inventors who are the applicant, or one or more joint inventor-applicants who have been given power of attorney (e.g., see USPTO Form PTO/AIA/81) on behalf of **all** joint inventor-applicants.

See 37 CFR 1.4(d) for the manner of making signatures and certifications.

Signature	/Yalei Sun/			Date (YYYY-MM-DD)	2022-05-17
First Name	Yalei	Last Name	Sun	Registration Number	57765

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Application Data Sheet 37 CFR 1.76	Attorney Docket Number	024607-02-5119-US
	Application Number	
Title of Invention	LITHIUM-ION BATTERY HAVING DESIRABLE SAFETY PERFORMANCE	

This collection of information is required by 37 CFR 1.76. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 23 minutes to complete, including gathering, preparing, and submitting the completed application data sheet form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

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The information provided by you in this form will be subject to the following routine uses:

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7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.

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DECLARATION (37 CFR 1.63) FOR UTILITY OR DESIGN APPLICATION USING AN APPLICATION DATA SHEET (37 CFR 1.76)

Title of Invention	LITHIUM ION BATTERY HAVING DESIRABLE SAFETY PERFORMANCE

As the below named inventor, I hereby declare that:

This declaration is directed to:

☐ The attached application, or

☒ United States application or PCT international application number 14/596,873 filed on January 14, 2015.

The above-identified application was made or authorized to be made by me.

I believe that I am the original inventor or an original joint inventor of a claimed invention in the application.

I hereby acknowledge that any willful false statement made in this declaration is punishable under 18 U.S.C. 1001 by fine or imprisonment of not more than five (5) years, or both.

I hereby state that I have reviewed and understand the contents of the above-identified specification, including the claims, as amended by any amendment referred to above.

I acknowledge the duty to disclose information which is material to patentability as defined in 37 CFR 1.56, including for continuation-in-part applications, material information which became available between the filing date of the prior application and the national or PCT international filing date of the continuation-in-part application.

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LEGAL NAME OF INVENTOR

Inventor: **Tao Tao**

Signature: Tao Tao Date (Optional): 2016-4-20

Note: An application data sheet (PTO/SB/14 or equivalent), including naming the entire inventive entity, must accompany this form. Use an additional PTO/AIA/01 form for each additional inventor.

DECLARATION (37 CFR 1.63) FOR UTILITY OR DESIGN APPLICATION USING AN APPLICATION DATA SHEET (37 CFR 1.76)

Title of Invention	LITHIUM ION BATTERY HAVING DESIRABLE SAFETY PERFORMANCE

As the below named inventor, I hereby declare that:

This declaration is directed to:

☐ The attached application, or

☒ United States application or PCT international application number 14/596,873 filed on January 14, 2015.

The above-identified application was made or authorized to be made by me.

I believe that I am the original inventor or an original joint inventor of a claimed invention in the application.

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I hereby state that I have reviewed and understand the contents of the above-identified specification, including the claims, as amended by any amendment referred to above.

I acknowledge the duty to disclose information which is material to patentability as defined in 37 CFR 1.56, including for continuation-in-part applications, material information which became available between the filing date of the prior application and the national or PCT international filing date of the continuation-in-part application.

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LEGAL NAME OF INVENTOR

Inventor: **Ming liang Mo**

Signature: Ming liang Mo Date (Optional): Apr. 20, 2015

Note: An application data sheet (PTO/SB/14 or equivalent), including naming the entire inventive entity, must accompany this form. Use an additional PTO/AIA/03 form for each additional inventor.

Electronically filed May 17, 2022

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Application of:	Tao TAO, et al.	Confirmation No.:	To be assigned
Serial No.:	To be assigned	Art Unit	To be assigned
Filed:	Filed herewith	Examiner:	To be assigned
For:	*LITHIUM ION BATTERY HAVING DESIRABLE SAFETY PERFORMANCE*	Attorney Docket No.:	024607-02-5119-US

STATEMENT UNDER 37 C.F.R. § 3.73(c)

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

Ningde Amperex Technology Limited, a Corporation, states that it is the assignee of the entire right, title and interest in the patent application/patent identified above by virtue of an assignment from the inventor(s) of the parent of the patent application/patent identified above.

The assignment was recorded in the United States Patent and Trademark Office on April 22, 2015 at Reel 035472, Frame 0058, or for which a copy thereof is attached.

The undersigned is authorized to act on behalf of the assignee.

Date: May 17, 2022

/Yalei Sun/ 57,765
Yalei Sun (Reg. No.)

MORGAN, LEWIS & BOCKIUS LLP
1400 Page Mill Road
Palo Alto, CA 94304
(650) 843-4000

POWER OF ATTORNEY TO PROSECUTE APPLICATIONS BEFORE THE UNITED STATES PATENT AND TRADEMARK OFFICE

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

I hereby revoke all previous powers of attorney given in the application identified in the attached statement under 37 CFR 3.73(c).

I hereby appoint the practitioners of Morgan, Lewis & Bockius LLP, Customer Number **24341** as attorneys or agents to represent the undersigned and to transact all business before the United States Patent and Trademark Office (USPTO) in connection with any and all patent applications and patents assigned only to the undersigned according to the USPTO assignment records or assignment documents attached to this form in accordance with 37 C.F.R. § 3.73(c), said appointment to be to the exclusion of the inventor(s) and their attorney(s) in accordance with the provisions of 37 C.F.R. § 3.71, provided that, if any one of these attorneys ceases being affiliated with the law firm of Morgan, Lewis & Bockius LLP as partner, counsel, or employee, then the appointment of that attorney and all powers derived therefrom shall terminate on the date such attorney ceases being so affiliated.

Please change the correspondence address for the application identified in the attached statement under 37 CFR 3.73(c) to the address associated with Customer Number **24341**.

Assignee Name and Address: **NINGDE AMPEREX TECHNOLOGY LIMITED**
No. 1, Xingang Road
Zhangwan Town, Jiaocheng Zone
Ningde City, Fujian Province
P.R. China 352100

SIGNATURE of Assignee of Record

The undersigned whose signature and title is supplied below is authorized to act on behalf of the assignee.

Signature Liangxin Yang

Name Liangxin Yang Date Feb. 24th, 2021

Title IP Manager Telephone

A copy of this form, together with a statement under 37 C.F.R. § 3.73(c) (Form PTO/SB96 or equivalent) is required to be filed in each application in which this form is used. The statement under 37 C.F.R. § 3.73(c) may be completed by one of the practitioners appointed in this form if the appointed practitioner is authorized to act on behalf of the assignee and must identify the application in which this Power of Attorney is to be filed.

DB2/ 40409063.1

LITHIUM-ION BATTERY HAVING DESIRABLE SAFETY PERFORMANCE

CROSS-REFERENCE TO RELATED APPLICATION

[0001] This application is a continuation of U.S. Patent Application No. 17/407,081, entitled "LITHIUM-ION BATTERY HAVING DESIRABLE SAFETY PERFORMANCE", filed on August 19, 2021, which is a continuation application of U.S. Patent Application No. 16/113,938, entitled "LITHIUM-ION BATTERY HAVING DESIRABLE SAFETY PERFORMANCE", filed August 27, 2018, which is a continuation of U.S. Patent Application No. 14/596,873, entitled "LITHIUM-ION BATTERY HAVING DESIRABLE SAFETY PERFORMANCE", filed January 14, 2015, which claims priority to Chinese Patent Application No. 201420030319.4, entitled "LITHIUM-ION BATTERY HAVING DESIRABLE SAFETY PERFORMANCE", filed January 17, 2014, all of which are hereby incorporated by reference in their entirety.

TECHNICAL FIELD

[0002] The present disclosure generally relates to lithium-ion batteries and, more particularly, relates to a lithium-ion battery having desirable safety performance.

BACKGROUND

[0003] At present, lithium-ion batteries are required to be thinner and thinner as well as have higher and higher energy density, which demands a lithium-ion battery has as much energy as possible in a volume as small as possible.

[0004] In conventional design of a lithium-ion battery, a lead is a component soldered on a current collector to conduct current. Arrangement of the lead will increase the thickness of the lithium-ion battery no matter the lithium-ion battery adopts a Jelly-roll structure or a laminated structure. In other words, the area where the lead is soldered to the current collector has a largest thickness in the lithium-ion battery. The increased thickness due to the lead is

about 1~5% of the thickness of an assembled lithium-ion battery. Therefore, increase of thickness of a lithium-ion battery due to the lead has become one of the key actors which limit the energy density of the lithium-ion battery.

[0005] Chinese patent publication numbers CN 202495523U and CN 201087907Y each discloses a lithium-ion battery which defines a recess on a positive plate and/or the negative plate to receive a lead therein. The arrangement of the recess on the positive plate and/or the negative plate can reduce the thickness of the lithium-ion battery. However, when the recess is defined at one end of the positive plate or the negative plate along a length direction thereof, thickness variation around the recess is much larger than the thickness variation of the film afar from the recess. Particularly, the arrangement of the recess may generate a number of corners. The film around the corners is readily peeled off, especially when the negative active material adopts an expansive substance, such as silicon. The structure as previously described may lead to a high internal resistance of the lithium-ion battery and affect the capacity of the lithium-ion battery. In addition, there is no insulating layer provided on the positive area corresponding to the positive recess or the negative recess, internal short circuit and lithium precipitation may potentially occur to the lithium-ion battery, which will inevitably affect the safety performance of the lithium-ion battery.

[0006] In view of the foregoing, what is needed, therefore, is to provide a lithium-ion battery having desirable safety performance.

SUMMARY

[0007] One object of the present disclosure is to provide a battery which has high energy density and desirable safety performance.

[0008] According to an embodiment of the present disclosure, a battery is provided and the battery includes: a first plate, comprising a first film and a first lead; a first insulating glue layer, disposed on a surface of the first lead; a second plate, comprising a second lead; in which a second insulating glue layer is disposed on a surface of the first film corresponding to the

second lead.

[0009] According to an embodiment of the present disclosure, the first plate includes a first current collector, the first film and the first lead, the first film being disposed on the first current collector, the first lead being electrically connected with the first current collector, the first film includes: a first recess configured to receive the first lead; a second plate, comprising a second current collector, a second film and a second lead, the second film being disposed on the second current collector, the second lead being electrically connected with the second current collector, the second film being provided with a second recess configured to receive the second lead.

[0010] Specifically, the first plate is a positive plate, the first current collector is a positive current collector, the first film is a positive film, the first lead is a positive lead; the second plate is a negative plate, the second current collector is a negative current collector, the second film is a negative film, the second lead is a negative lead.

[0011] According to one embodiment of the present disclosure, a lithium-ion battery having desirable safety performance is provided. The lithium-ion battery includes:

a positive plate, including a positive current collector, a positive film formed on the positive current collector and a positive lead coupled to the positive current collector, the positive film being provided with a first recess and the positive lead being soldered in the first recess;

a negative plate, including a negative current collector, a negative film formed on the negative current collector and a negative lead coupled to the negative current collector, and the negative film being provided with a second recess and the negative lead being soldered in the second recess;

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

electrolyte,

wherein upper and lower surfaces of the positive lead each is provided with a first

insulating glue layer, a surface of the positive film corresponding to the second recess is pasted with a second insulating glue layer, and the first insulating glue layer formed on the lower surface of the positive lead entirely covers the blank positive current collector in the first recess.

[0012] According to an embodiment of the present disclosure, the positive lead is entirely seated in the first recess and the negative lead is entirely seated in the second recess. Due to the arrangement of the first recess on the positive plate and the second recess on the negative plate, the positive lead and the negative lead can be received in the first recess and the second recess respectively. Along the thickness direction, the thickness of the positive lead (negative lead) is less than the thickness of the positive plate (negative plate). Therefore, the lead will not induce thickness increase of the positive lead or the negative lead. There will be more space for the active material, and energy density of the lithium-ion battery is improved remarkably.

[0013] According to an embodiment of the present disclosure, the first recess or the second recess is defined via mechanical solvent cleaning or laser cleaning.

[0014] According to an embodiment of the present disclosure, the second insulating glue layer has a width larger than a width of the second recess, and the second insulating glue layer has a length larger than a length of the second recess.

[0015] According to an embodiment of the present disclosure, the first insulating glue layer or the second insulating glue layer is one of a green insulating glue layer, a black insulating glue layer, a white insulating glue layer or a yellow insulating glue layer.

[0016] According to an embodiment of the present disclosure, a distance between a center of the first recess and one end of the positive film is 1/4~3/4 of a length of the positive film, and a distance between a center of the second recess and one end of the negative film is 1/4~3/4 of a length of the negative film.

[0017] According to an embodiment of the present disclosure, the first recess and the second recess are defined in a middle portion of the positive plate and the negative plate respectively. Even though the positive plate and/or the negative plate expand, unstable bonding,

large thickness variation or even abscission of the positive film or the negative film around the recess is avoided. At the same time, the internal resistance of the lithium-ion battery is reduced, and capacity and energy density of the lithium-ion battery are improved remarkably in the premise of unchanged battery cell size.

[0018] According to an embodiment of the present disclosure, a distance between a center of the first recess and one end of the positive film is half of a length of the positive film, and a distance between a center of the second recess and one end of the negative film is half of a length of the negative film.

[0019] According to an embodiment of the present disclosure, the first recess has a length 1~100mm less than a length of the positive lead, the first recess has a width 1~10mm larger than a width of the positive lead, the second recess has a length 1~100mm less than a length of the negative lead, and the second recess has a width 1~10mm larger than a width of the negative lead.

[0020] According to an embodiment of the present disclosure, the first recess has a length 1~100mm less than a width of the positive film, and the second recess has a length 1~100mm less than a width of the negative film.

[0021] According to an embodiment of the present disclosure, the first recess has a depth no larger than a thickness of the positive film, and the second recess has a depth no larger than a thickness of the negative film.

[0022] According to an embodiment of the present disclosure, the first recess has a depth 0.005~0.1mm larger than a thickness of the positive lead, and the second recess has a depth 0.005~0.1mm larger than a depth of the negative lead.

[0023] Compared with the prior art, due to the arrangement of the first insulating glue layer formed on the upper and lower surfaces of the positive lead and the second insulating glue layer pasted on the surface of the positive film corresponding to the second recess, occurrence of internal short circuit and lithium precipitation in the lithium-ion battery is remarkably reduced,

and safety performance of the lithium-ion battery is improved remarkably in the premise of desirable energy density.

[0024] Other advantages and novel features will be drawn from the following detailed description of preferred embodiments with the attached drawings. The accompanying drawings, which are incorporated in and constitute a part of this specification, illustrate embodiments of the present disclosure and, together with a general description of the disclosure given above, and the detailed description of the embodiments given below, serve to explain the principles of the disclosure:

BRIEF DESCRIPTION OF THE DRAWINGS

[0025] FIG. 1 depicts an exemplary front view of a positive plate of a lithium-ion battery according to one embodiment of the present disclosure;

[0026] FIG. 2 depicts an exemplary front view of a negative plate of a lithium-ion battery according to one embodiment of the present disclosure;

[0027] FIG. 3 depicts an exemplary top view of a positive plate of a lithium-ion battery according to one embodiment of the present disclosure;

[0028] FIG. 4 depicts an exemplary top view of a negative plate of a lithium-ion battery according to one embodiment of the present disclosure; and

[0029] FIG. 5 depicts an exemplary cross-sectional view of a lithium-ion battery according to one embodiment of the present disclosure.

DETAILED DESCRIPTION

[0030] Example embodiments of the present disclosure will now be described more fully hereinafter with reference to the accompanying drawings, in which some, but not all embodiments of the disclosure are shown. Indeed, the disclosure may be embodied in many different forms and should not be construed as limited to the embodiments set forth herein;

rather, these embodiments are provided so that this disclosure will satisfy applicable legal requirements. Like reference numerals refer to like elements throughout.

[0031] According to an embodiment of the present disclosure, a battery is provided and the battery includes: a first plate, comprising a first film and a first lead; a first insulating glue layer, disposed on a surface of the first lead; a second plate, comprising a second lead; in which a second insulating glue layer is disposed on a surface of the first film corresponding to the second lead.

[0032] According to an embodiment of the present disclosure, the first plate includes a first current collector, the first film and the first lead, the first film being disposed on the first current collector, the first lead being electrically connected with the first current collector, the first film includes: a first recess configured to receive the first lead; a second plate, comprising a second current collector, a second film and a second lead, the second film being disposed on the second current collector, the second lead being electrically connected with the second current collector, the second film being provided with a second recess configured to receive the second lead.

[0033] Specifically, the first plate is a positive plate, the first current collector is a positive current collector, the first film is a positive film, the first lead is a positive lead; the second plate is a negative plate, the second current collector is a negative current collector, the second film is a negative film, the second lead is a negative lead.

Example 1

[0034] Referring to FIG. 1 to FIG. 5, a lithium-ion battery according to one embodiment of the present disclosure includes a positive plate 1, a negative plate 2, a separator 3 disposed between the positive plate 1 and the negative plate 2, and electrolyte (not shown). The positive plate 1 includes a positive current collector 11, a positive film 12 provided on the positive current collector 11, and a positive lead 13. The negative plate 2 includes a negative current collector 21, a negative film 22 provided on the negative current collector 21, and a negative lead 23. The positive film 12 defines a first recess 14. The positive lead 13 is soldered and

seated in the first recess 14. The negative film 22 defines a second recess 24. The negative lead 23 is soldered and seated in the second recess 24. An upper surface and a lower surface of the positive lead 13 each is formed with a first insulating glue layer 15. A surface of the positive film 12 corresponding to the second recess 24 is pasted with a second insulating glue layer 16.

[0035] The second insulating glue layer 16 has a width larger than a width of the second recess 24. The second insulating glue layer 16 has a length larger than a length of the second recess 24.

[0036] The first insulating glue layer 15 and the second insulating glue layer 16 are green insulating glue layers.

[0037] The distance between the center of the first recess 14 and one end of the positive film 12, i.e. one end of the positive film 12 perpendicular to a length direction of the positive current collector 11 and formed no blank positive current collector 11, is half of a length of the positive film 12. The distance between the center of the second recess 24 and one end of the negative film 22, i.e. one end of the negative film 12 perpendicular to a length direction of the negative current collector 21 and formed no blank negative current collector 21, is half of a length of the negative film 22.

[0038] The first recess 14 has a length 25mm less than a length of the positive lead 13. The first recess 14 has a width 4mm larger than a width of the positive lead 13. The second recess 24 has a length 25mm less than a length of the negative lead 23. The second recess has a width 4mm larger than a width of the negative lead 23.

[0039] The first recess 14 has a length 55mm less than a width of the positive film 13. The second recess 24 has a length 57mm less than a width of the negative film 22.

[0040] The first recess 14 has a depth less than a thickness of the positive film 12. The second recess 24 has a depth less than a thickness of the negative film 22.

[0041] The first recess 14 has a depth 0.02mm larger than a thickness of the positive lead

13. The second recess 24 has a depth 0.02mm larger than a thickness of the negative lead 23.

[0042] A method for manufacturing a lithium-ion battery according to one embodiment of the present disclosure will be described in detail in view of a 303482 square lithium-ion battery (a lithium-ion battery having a thickness of 3.0mm, a width of 34mm and a length of 82mm). The method for manufacturing a lithium-ion battery includes the steps of:

[0043] Preparation of the positive plate:

1) adding 95wt% positive active material $LiCoO_2$, 2wt% binder PVDF and 3wt% conductive agent graphite into solvent NMP, obtaining a positive slurry having a viscosity of 3000-6000pa.s after fully stirring;

2) coating the positive slurry on an aluminum foil having a thickness of 12μm, and obtaining a positive plate 1 having a compacted density of 4.1g/cm^3 and a length of 277mm, a width of 75mm, a thickness of 0.114mm after drying and cold pressing;

3) removing the positive film 12 at a center of the positive plate 1 (at a middle portion along a length direction of the positive plate 1) via laser cleaning to define a first recess 14 having a thickness of 0.1mm, a width of 10mm and a length of 20mm;

4) coupling a positive lead 13 having a thickness of 0.08mm, a width of 6mm and a length of 45mm in the first recess 14 via laser welding, the positive lead 13 extending out of the positive plate 1 of about 15mm;

5) providing green insulating glue layers on upper and lower surfaces of the positive lead 13, and pasting green insulating glue layer on the positive film 12 corresponding to the second recess 24 in winding, ensuring the green insulating glue layer on the lower surface of the positive lead 13 entirely covering the blank positive current collector 11 in the first recess 14.

[0044] Preparation of the negative plate:

1) adding 95wt% negative active material graphite, 2wt% bonding agent SBR, 1wt% thickener

CMC and 2wt% conductive agent graphite in solvent deionized water, and obtaining negative slurry having a viscosity of 1000-3000pa.s after fully stirring;

2) coating the negative slurry on a copper foil having a thickness of 6μm, after drying and cold pressing, obtaining a negative plate having a compaction density of about 1.6g/cm^3 and a length of 285mm, a width of 77mm, a thickness of 0.135mm;

3) removing the negative active material at a center of the negative plate 2 (at a middle portion along a length direction of the negative plate 2) via mechanical cleaning to define a second recess 24, the second recess 24 having a thickness of 0.10mm, a width of 10mm and a length of 20mm;

4) providing a negative lead 23 having a thickness of 0.08mm, a width of 6mm and a length of 45mm, soldering the negative lead 23 in the second recess 24, with the negative lead 23 extending out of the negative plate 2 of 15mm.

[0045] Preparation of the electrolyte: fully mixing a mixture of methyl ethyl carbonate (EMC), diethyl carbonate (DEC), ethylene carbonate (EC) and propylene carbonate (PC) having a weight ratio of 1∶1∶0.5∶0.5; adding $LiPF_6$ as solute and obtaining a base electrolyte containing 1M $LiPF_6$; adding 0.5wt% of two fluorine lithium oxalate borate and 1wt% of adiponitrile in the base electrolyte, and obtaining electrolyte for use in a lithium-ion battery after fully dissolving.

[0046] Preparation of the lithium-ion battery: coiling the positive plate 1 and the negative plate 2 with a separator polyethylene film 3 having a thickness of 0.013mm interposed between the positive plate 1 and the negative plate 2 and obtaining a bared battery cell, with main portion of the bared battery cell having an average thickness of about 2.78mm; obtaining a final lithium-ion battery after drying the bared battery cell, pouring the electrolyte and packaging.

Example 2

[0047] Example 2 is almost the same as Example 1, except that:

[0048] The distance between a center of the first recess 14 and one end of the positive film 12 (one end of the positive film 12 perpendicular to a length direction of the positive current collector 11 and formed no blank positive current collector 11) is about 1/4 of the length of the positive film 12.

[0049] The distance between a center of the second recess 24 and one end of the negative film 22 (one end of the negative film 22 perpendicular to a length direction of the negative current collector 21 and formed no blank negative current collector 21) is about 1/4 of the length of the negative film 12.

[0050] The first recess 14 has a length 75mm less than a length of the positive lead 13. The first recess 14 has a width 2mm larger than a width of the positive lead 13. The second recess 24 has a length 75mm less than a length of the negative lead 23. The second recess 24 has a width 2mm larger than a width of the negative lead 23.

[0051] The first recess 14 has a length 30mm less than a width of the positive film 12. The second recess 24 has a length 33mm less than a width of the negative film 22.

[0052] The first recess 14 has a depth 0.08mm larger than a thickness of the positive lead 13. The second recess 24 has a depth 0.08mm larger than a thickness of the negative lead 23.

[0053] The negative active material is silicon.

[0054] The first insulating glue layer 15 and the second insulating glue layer 16 are black insulating glue layers.

[0055] Other features of Example 2 are the same as have described in Example 1 and will not be detailed further.

Example 3

[0056] Example 3 is almost the same as Example 1, except that:

[0057] The distance between a center of the first recess 14 and one end of the positive film

12 (one end of the positive film 12 perpendicular to a length direction of the positive current collector 11 and formed no blank positive current collector 11) is about 3/4 of the length of the positive film 12.

[0058] The distance between a center of the second recess 24 and one end of the negative film 22 (one end of the negative film 22 perpendicular to a length direction of the negative current collector 21 and formed no blank negative current collector 21) is about 3/4 of the length of the negative film 12.

[0059] The first recess 14 has a length 50mm less than a length of the positive lead 13. The first recess 14 has a width 8mm larger than a width of the positive lead 13. The second recess 24 has a length 50mm less than a length of the negative lead 23. The second recess 24 has a width 8mm larger than a width of the negative lead 23.

[0060] The first recess 14 has a length 70mm less than a width of the positive film 12. The second recess 24 has a length 73mm less than a width of the negative film 22.

[0061] The first recess 14 has a depth 0.05mm larger than a thickness of the positive lead 13. The second recess 24 has a depth 0.05mm larger than a thickness of the negative lead 23.

[0062] The negative active material is silicon.

[0063] The first insulating glue layer 15 and the second insulating glue layer 16 are white insulating glue layers.

[0064] Other features of Example 3 are the same as have described in Example 1 and will not be detailed further.

Example 4

[0065] Example 4 is almost the same as Example 2, except that:

[0066] The distance between a center of the first recess 14 and one end of the positive film 12 (one end of the positive film 12 perpendicular to a length direction of the positive current

collector 11 and formed no blank positive current collector 11) is about 1/6 of the length of the positive film 12.

[0067] The distance between a center of the second recess 24 and one end of the negative film 22 (one end of the negative film 22 perpendicular to a length direction of the negative current collector 21 and formed no blank negative current collector 21) is about 1/6 of the length of the negative film 12.

[0068] The first insulating glue layer 15 and the second insulating glue layer 16 are yellow insulating glue layer.

[0069] Other features of Example 4 are the same as have described in Example 2 and will not be detailed further.

Example 5

[0070] Example 5 is almost the same as Example 3, except that:

[0071] The distance between a center of the first recess 14 and one end of the positive film 12 (one end of the positive film 12 perpendicular to a length direction of the positive current collector 11 and formed no blank positive current collector 11) is about 4/5 of the length of the positive film 12.

[0072] The distance between a center of the second recess 24 and one end of the negative film 22 (one end of the negative film 22 perpendicular to a length direction of the negative current collector 21 and formed no blank negative current collector 21) is about 4/5 of the length of the negative film 12.

[0073] Other features of Example 5 are the same as have described in Example 3 and will not be detailed further.

Comparative Example 1

[0074] The Comparative Example 1 is almost the same as Example 1, except that, upper

and lower surfaces of the positive lead 13 have no first insulating glue layer 15 formed thereon. The surface of the positive film 12 corresponding to the second recess 24 has no second insulating glue layer 16 pasted thereon.

[0075] Other features of Comparative Example 1 are the same as have described in Example 1 and will not be detailed further.

Comparative Example 2

[0076] The Comparative Example 2 is almost the same as Example 1, except that, the positive lead 13 is soldered to the blank positive current collector 11, the positive film 12 does not have a first recess 14, the negative lead 23 is soldered to the blank negative current collector 21, the negative film 22 does not have a second recess 24. Other features of Comparative Example 2 are the same as have described in Example 1 and will not be detailed further.

[0077] 10 lithium-ion batteries are randomly selected from lithium-ion batteries according to Example 1, Example 2, Example 3 and Comparative Example 1 respectively. Each lithium-ion battery is carried out a cycle performance test of 300 cycles. Number of the lithium-ion batteries occurring short circuit is calculated and the testing result is shown in Table 1.

[0078] 10 lithium-ion batteries are randomly selected from lithium-ion batteries according to Example 1, Example 2, Example 3 and Comparative Example 1 respectively. Each lithium-ion battery is carried out a cycle performance test of 100 cycles. Each lithium-ion battery is disassembled to observe lithium precipitation on the negative plate 2. Number of lithium-ion batteries whose negative plate 2 occurs lithium precipitation is calculated and the testing result is shown in Table 2.

Table 1 Short circuit and lithium precipitation on the negative plate occurs to lithium-ion batteries according to Examples 1 to 3 and Comparative Example 1 after cycle test

Group	Number of batteries occurring short circuit after 300 cycles	Number of batteries occurring lithium precipitation on the negative plate after 100 cycles

Example 1	0	0
Example 2	0	1
Example 3	1	0
Comparative Example 1	5	7

[0079] As clearly shown in Table 1, due to the first insulating glue layer 15 formed on the upper and lower surfaces of the positive lead 13 and the second insulating glue layer 16 pasted on the surface of the positive film 12 corresponding to the second recess 24, the safety performance of the lithium-ion battery can be improved remarkably.

[0080] Capacity test, internal resistance test and volumetric energy density test are carried out to the lithium-ion batteries according to Example 1 and Comparative Example 2. The test result is shown in Table 2. The capacity test and internal resistance test are carried out on hang machine at 25℃, the discharge capacity is 0.2C, the internal resistance is impedance under 1000Hz, and the volumetric energy density= minimum capacity x platform voltage/ maximum volume.

Table 2 Capacity, internal resistance and volumetric energy density of lithium-ion batteries according to Example 1 and Comparative Example 2

Group	DC resistance (mΩ)	Average capacity (mAh)	Average thickness (mm)	Average volumetric energy density(Wh/L)
Example 1	55	1180	2.78	563
Comparative Example 2	62	1170	2.84	546

[0081] As clearly shown in Table 2, the structure of the positive plate and negative plate according to the present disclosure can overcome uneven thickness of the battery cell, so as to efficiently utilize the space of the lithium-ion battery, improve the capacity and the volumetric energy density of the lithium-ion battery, and reduce the internal resistance of the lithium-ion battery.

[0082] Charging and discharging cycle tests are carried out to lithium-ion batteries in accordance with Examples 2 to 5, in which for the sake of illustration, the negative active material in Example 1 is substituted by silicon and referenced as Example 6. The lithium-ion batteries are disassembled after 50 cycles. Abscission of active material at the edge of the second recess 24 is shown in Table 3.

Table 3 Abscission of active material at the edge of the second recess after charging and discharging cycle test of lithium-ion batteries according to Examples 2 to 6

	Example 4	Example 2	Example 6	Example 3	Example 5
Abscission of active material at the second recess after 50 cycles	Obvious abscission of active material	No obvious abscission of active material	No abscission of active material	No obvious abscission of active material	Obvious abscission of active material

[0083] As clearly shown in Table 3, if the negative active material for use in the negative plate 2 is apt to serious volume expansion, such as silicon, the first recess 14 in the center of the positive plate 1 and the second recess 24 in the center of the negative plate 2 can effectively

reduce abscission of active material at the edge of the second recess 24. The negative plate 2 adopting silicon as active material undertakes serious volume expansion, which may cause the negative plate 2 defining the second recess at one end thereof, cannot bear the uneven force at the second recess. However, the second recess 24 as describe in Examples 2, 3 and 6 each is located in the center of the negative plate 2. Two ends of the negative plate 2 bear almost the same forces and, therefore, abscission of active material at the edge of the second recess 24 can be improved remarkably.

[0084] Many modifications and other embodiments of the disclosure set forth herein will come to mind to one skilled in the art to which these disclosure pertain having the benefit of the teachings presented in the foregoing descriptions and the associated drawings. Therefore, it is to be understood that the disclosure are not to be limited to the specific embodiments disclosed and that modifications and other embodiments are intended to be included within the scope of the appended claims. Moreover, although the foregoing descriptions and the associated drawings describe example embodiments, it should be appreciated that alternative embodiments without departing from the scope of the appended claims. Although specific terms are employed herein, they are used in a generic and descriptive sense only and not for purposes of limitation.

CLAIMS

What is claimed is:

1. A lithium-ion battery, comprising:

a first plate comprising a first current collector, a first film and a first lead, wherein the first film is disposed on the first current collector and is provided with a first recess configured to receive the first lead, and the first lead is electrically connected to the first current collector;

a first insulating glue layer, disposed on a first location of a surface of the first lead;

a second plate comprising a second current collector, a second film and a second lead, wherein the second film is disposed on the second current collector and is provided with a second recess configured to receive the second lead, and the second lead is electrically connected to the second current collector; and

a separator disposed between the first plate and the second plate;

wherein a length of a portion of the first lead in the first recess is less than a width of a remaining portion of the first film from an edge of the first insulating glue layer covering the first film to an edge of the first film opposite to the first recess; and a second insulating glue layer is disposed on a second location of the surface of the first film corresponding to the second lead in a thickness direction of the first plate and the second plate.

2. The lithium-ion battery of claim 1, wherein,

the first plate is a positive plate, the first current collector is a positive current collector, the first film is a positive film, the first lead is a positive lead; and

the second plate is a negative plate, the second current collector is a negative current collector, the second film is a negative film and the second lead is a negative lead.

3. The lithium-ion battery of claim 2, wherein a distance between a center of the first recess and an end of the positive film is 1/4 - 3/4 of a length of the positive film, and a

distance between a center of the second recess and an end of the negative film is 1/4 - 3/4 of a length of the negative film.

4. The Lithium-ion battery of claim 2, wherein a distance between a center of the first recess and an end of the positive film is half of a length of the positive film, and a distance between a center of the second recess and an end of the negative film is half of a length of the negative film.

5. The lithium-ion battery of claim 2, wherein a length of the first recess is less than a length of the positive lead by 1 - 100mm, a width of the first recess is greater than a width of the positive lead by 1 - 10mm; and

a length of the second recess is less than a length of the negative lead by 1 - 100mm, a width of the second recess is greater than a width of the negative lead by 1 - 10mm.

6. The lithium-ion battery of claim 2, wherein a length of the first recess is less than a width of the positive film by 1 - 100mm, and a length of the second recess is less than a width of the negative film by 1 - 100mm.

7. The lithium-ion battery of claim 2, wherein a depth of the first recess is no larger than a thickness of the positive film, and a depth of the second recess is no larger than a thickness of the negative film.

8. The lithium-ion battery of claim 2, wherein a depth of the first recess is greater than a thickness of the positive lead by 0.005 - 0.1mm, and a depth of the second recess is greater than a thickness of the negative lead by 0.005 - 0.1mm.

9. The lithium-ion battery of claim 1, wherein a width of a portion of the first lead in the first recess is greater than a width of a remaining portion of the first recess not occupied by the first lead located on one side of the first lead.

10. A lithium-ion battery, comprising:

a first plate, comprising a first current collector, a first film and a first lead, wherein the first film is disposed on the first current collector and is provided with a first recess configured to receive the first lead, and the first lead is electrically connected to the first current collector, the first recess having three sides defined by the first film;

a first insulating glue layer, disposed on a first location of a first surface of the first lead and covering the three sides of the first recess defined by the first film;

a second plate, comprising a second current collector, a second film, and a second lead, wherein the second film is disposed on the second current collector and is provided with a second recess configured to receive the second lead, and the second lead is electrically connected to the second current collector; and

a separator disposed between the first plate and the second plate;

wherein a width of a portion of the first lead in the first recess is greater than a width of a remaining portion of the first recess not occupied by the first lead located on one side of the first lead.

11. The lithium-ion battery of claim 10, wherein:

the first plate is a positive plate, the first current collector is a positive current collector, the first film is a positive film, the first lead is a positive lead;

the second plate is a negative plate, the second current collector is a negative current collector, the second film is a negative film and the second lead is a negative lead.

12. The lithium-ion battery of claim 10, wherein a distance between a center of the first recess and an end of the first film is 1/4 - 3/4 of a length of the first film, and a distance

between a center of the second recess and an end of the second film is 1/4 - 3/4 of a length of the second film.

13. The lithium-ion battery of claim 10, wherein a distance between a center of the first recess and an end of the first film is half of a length of the first film, and a distance between a center of the second recess and an end of the second film is half of a length of the second film.

14. The lithium-ion battery of claim 10, wherein a length of the first recess is less than a length of the first lead by 1 - 100mm, a width of the first recess is greater than a width of the first lead by 1 - 10mm; and

a length of the second recess is less than a length of the second lead by 1 - 100mm, a width of the second recess is greater than a width of the second lead by 1 - 10mm.

15. The lithium-ion battery of claim 10, wherein a length of the first recess is less than a width of the first film by 1 - 100mm, and a length of the second recess is less than a width of the second film by 1 - 100mm.

16. The lithium-ion battery of claim 10, wherein a depth of the first recess is no larger than a thickness of the first film, and a depth of the second recess is no larger than a thickness of the second film.

17. The lithium-ion battery of claim 10, wherein a depth of the first recess is greater than a thickness of the first lead by 0.005 - 0.1mm, and a depth of the second recess is greater than a thickness of the second lead by 0.005 - 0.1mm.

18. The lithium-ion battery of claim 10, wherein a pair of second insulating glue layers directly disposed on two opposite surfaces of the first film at a first location and a second location, respectively, wherein the second lead on the second plate is sandwiched between the pair of second insulating glue layers in a thickness direction of the first plate and the second plate.

19. The lithium-ion battery of claim 10, wherein the first insulating glue layer is disposed on an upper surface and below a lower surface of the first lead in a thickness direction of the first plate and the second plate.

ABSTRACT

A lithium-ion battery having desirable safety performance includes a positive plate having a positive film, a negative plate having a negative film, a separator between the positive plate and the negative plate, and electrolyte. The positive film is provided with a first recess and a positive lead is soldered in the first recess. The negative film is provided with a second recess and a negative lead is soldered in the second recess. A first insulating glue layer is formed on an upper surface and below a lower surface of the positive lead. Surface of the positive film corresponding to the second recess is pasted with a second insulating glue layer.

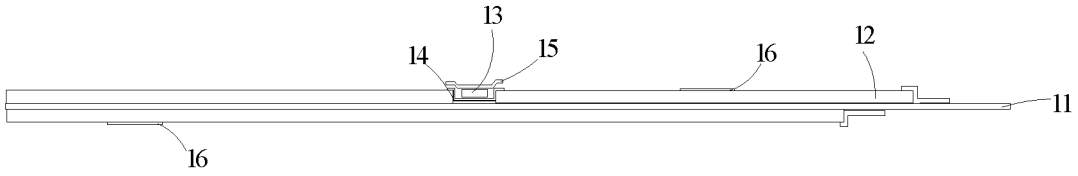


FIG. 1

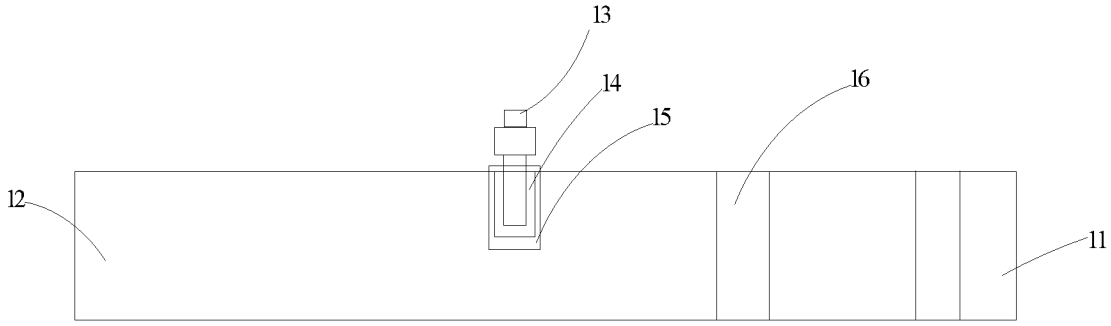


FIG. 2

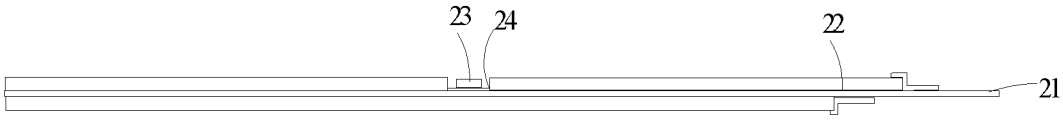


FIG. 3

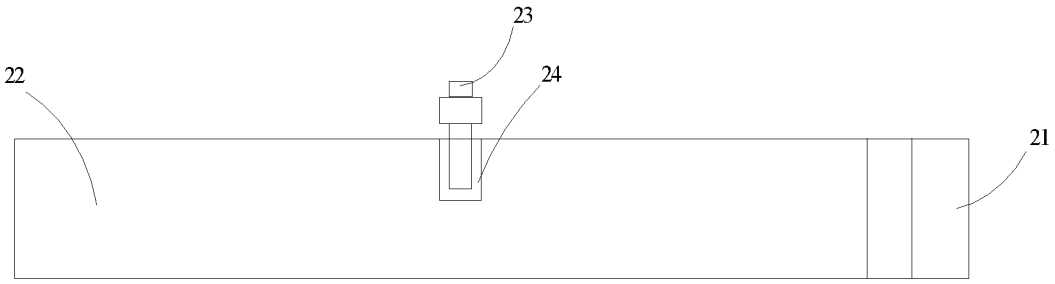


FIG. 4

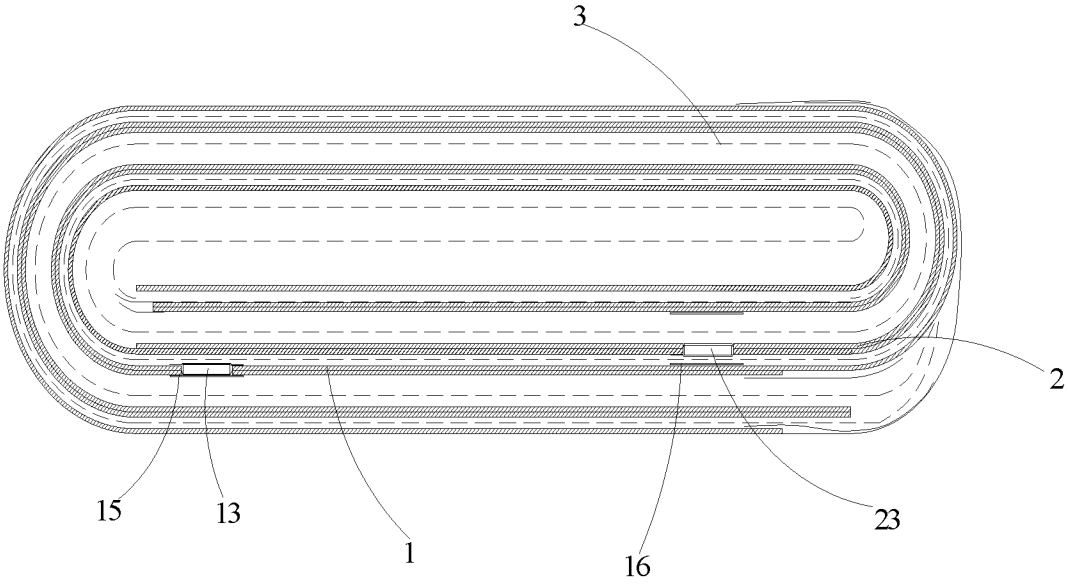


FIG. 5

Electronic Patent Application Fee Transmittal

Application Number:	
Filing Date:	
Title of Invention:	LITHIUM-ION BATTERY HAVING DESIRABLE SAFETY PERFORMANCE
First Named Inventor/Applicant Name:	Tao TAO
Filer:	Yalei Sun/Jacqueline Yu
Attorney Docket Number:	024607-02-5119-US

Filed as Large Entity

Filing Fees for Track I Prioritized Examination - Nonprovisional Application under 35 USC 111(a)

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Basic Filing:				
UTILITY APPLICATION FILING	1011	1	320	320
UTILITY SEARCH FEE	1111	1	700	700
UTILITY EXAMINATION FEE	1311	1	800	800
REQUEST FOR PRIORITIZED EXAMINATION	1817	1	4200	4200
Pages:				
Claims:				
Miscellaneous-Filing:				
PROCESSING FEE, EXCEPT PROV. APPLS.	1830	1	140	140

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
Extension-of-Time:				
Miscellaneous:				
		Total in USD ($)		**6160**

Electronic Acknowledgement Receipt

EFS ID:	45738027
Application Number:	17746755
International Application Number:	
Confirmation Number:	8911
Title of Invention:	LITHIUM-ION BATTERY HAVING DESIRABLE SAFETY PERFORMANCE
First Named Inventor/Applicant Name:	Tao TAO
Customer Number:	24341
Filer:	Yalei Sun
Filer Authorized By:	
Attorney Docket Number:	024607-02-5119-US
Receipt Date:	17-MAY-2022
Filing Date:	
Time Stamp:	18:33:57
Application Type:	Utility under 35 USC 111(a)

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Payment Type	CARD
Payment was successfully received in RAM	$6160
RAM confirmation Number	E20225GI34243427
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The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows:	

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1		024607-02-5119-US_P2014010US5_Application.pdf	2011281 6d598015cca1afcd6c6b249884118578be741ef8	yes	44

Multipart Description/PDF files in .zip description

Document Description	Start	End
Transmittal of New Application	1	1
Fee Worksheet (SB06)	2	2
Track One Request	3	4
Internet Communications Authorization	5	6
Application Data Sheet	7	15
Oath or Declaration filed	16	17
Assignee showing of ownership per 37 CFR 3.73	18	18
Power of Attorney	19	19
Specification	20	36
Claims	37	41
Abstract	42	42
Drawings-only black and white line drawings	43	44

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Information:

2	Fee Worksheet (SB06)	fee-info.pdf	48469 9ff0d29338019caf77a0a6c1d92d22be619474a9	no	2

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If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

PATENT APPLICATION FEE DETERMINATION RECORD

Substitute for Form PTO-875

Application or Docket Number: 17/746,755

APPLICATION AS FILED - PART I

FOR	(Column 1) NUMBER FILED	(Column 2) NUMBER EXTRA	SMALL ENTITY RATE($)	SMALL ENTITY FEE($)	OR	OTHER THAN SMALL ENTITY RATE($)	OTHER THAN SMALL ENTITY FEE($)
BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A	N/A			N/A	320
SEARCH FEE (37 CFR 1.16(k), (i), or (m))	N/A	N/A	N/A			N/A	700
EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A	N/A			N/A	800
TOTAL CLAIMS (37 CFR 1.16(i))	19 minus 20 =	*			OR	x 100 =	0.00
INDEPENDENT CLAIMS (37 CFR 1.16(h))	2 minus 3 =	*				x 480 =	0.00
APPLICATION SIZE FEE (37 CFR 1.16(s))	If the specification and drawings exceed 100 sheets of paper, the application size fee due is $310 ($155 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).						0.00
MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))							0.00
* If the difference in column 1 is less than zero, enter "0" in column 2.			TOTAL			TOTAL	1820

APPLICATION AS AMENDED - PART II

		(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	SMALL ENTITY RATE($)	SMALL ENTITY ADDITIONAL FEE($)	OR	OTHER THAN SMALL ENTITY RATE($)	OTHER THAN SMALL ENTITY ADDITIONAL FEE($)
AMENDMENT A	Total (37 CFR 1.16(i))	*	Minus	**	=	x =		OR	x =	
	Independent (37 CFR 1.16(h))	*	Minus	***	=	x =		OR	x =	
	Application Size Fee (37 CFR 1.16(s))									
	FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							OR		
						TOTAL ADD'L FEE		OR	TOTAL ADD'L FEE	

		(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	SMALL ENTITY RATE($)	SMALL ENTITY ADDITIONAL FEE($)	OR	OTHER THAN SMALL ENTITY RATE($)	OTHER THAN SMALL ENTITY ADDITIONAL FEE($)
AMENDMENT B	Total (37 CFR 1.16(i))	*	Minus	**	=	x =		OR	x =	
	Independent (37 CFR 1.16(h))	*	Minus	***	=	x =		OR	x =	
	Application Size Fee (37 CFR 1.16(s))									
	FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							OR		
						TOTAL ADD'L FEE		OR	TOTAL ADD'L FEE	

* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.

** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".

*** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3".

The "Highest Number Previously Paid For" (Total or Independent) is the highest found in the appropriate box in column 1.

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APPLICATION NUMBER	FILING or 371(c) DATE	GRP ART UNIT	FIL FEE REC'D	ATTY.DOCKET.NO	TOT CLAIMS	IND CLAIMS
17/746,755	05/17/2022	1726	1820	024607-02-5119-US	19	2

CONFIRMATION NO. 8911

24341
Morgan, Lewis & Bockius LLP (PA)
1400 Page Mill Road
Palo Alto, CA 94304-1124

FILING RECEIPT

OC000000134057312

Date Mailed: 05/25/2022

Receipt is acknowledged of this non-provisional utility patent application. The application will be taken up for examination in due course. Applicant will be notified as to the results of the examination. Any correspondence concerning the application must include the following identification information: the U.S. APPLICATION NUMBER, FILING DATE, NAME OF FIRST INVENTOR, and TITLE OF INVENTION. Fees transmitted by check or draft are subject to collection.

Please verify the accuracy of the data presented on this receipt. If an error is noted on this Filing Receipt, please submit a written request for a corrected Filing Receipt, including a properly marked-up ADS showing the changes with strike-through for deletions and underlining for additions. If you received a "Notice to File Missing Parts" or other Notice requiring a response for this application, please submit any request for correction to this Filing Receipt with your reply to the Notice. When the USPTO processes the reply to the Notice, the USPTO will generate another Filing Receipt incorporating the requested corrections provided that the request is grantable.

Inventor(s)

Tao TAO, Residence Not Provided;

Applicant(s)

NINGDE AMPEREX TECHNOLOGY LIMITED, Ningde, CHINA;

Power of Attorney: The patent practitioners associated with Customer Number 24341

Domestic Priority data as claimed by applicant

This application is a CON of 17/407,081 08/19/2021
which is a CON of 16/113,938 08/27/2018 ABN
which is a CON of 14/596,873 01/14/2015 PAT 10541441

Foreign Applications (You may be eligible to benefit from the **Patent Prosecution Highway** program at the USPTO. Please see http://www.uspto.gov for more information.)
CHINA 201420030319.4 01/17/2014 No Access Code Provided

Permission to Access Application via Priority Document Exchange: Yes

Permission to Access Search Results: Yes

Applicant may provide or rescind an authorization for access using Form PTO/SB/39 or Form PTO/SB/69 as appropriate.

If Required, Foreign Filing License Granted: 05/24/2022

The country code and number of your priority application, to be used for filing abroad under the Paris Convention, is **US 17/746,755**

Projected Publication Date: 09/01/2022

Non-Publication Request: No

Early Publication Request: No
Title

LITHIUM-ION BATTERY HAVING DESIRABLE SAFETY PERFORMANCE

Preliminary Class

429

Statement under 37 CFR 1.55 or 1.78 for AIA (First Inventor to File) Transition Applications: No

PROTECTING YOUR INVENTION OUTSIDE THE UNITED STATES

Since the rights granted by a U.S. patent extend only throughout the territory of the United States and have no effect in a foreign country, an inventor who wishes patent protection in another country must apply for a patent in a specific country or in regional patent offices. Applicants may wish to consider the filing of an international application under the Patent Cooperation Treaty (PCT). An international (PCT) application generally has the same effect as a regular national patent application in each PCT-member country. The PCT process **simplifies** the filing of patent applications on the same invention in member countries, but **does not result** in a grant of "an international patent" and does not eliminate the need of applicants to file additional documents and fees in countries where patent protection is desired.

Almost every country has its own patent law, and a person desiring a patent in a particular country must make an application for patent in that country in accordance with its particular laws. Since the laws of many countries differ in various respects from the patent law of the United States, applicants are advised to seek guidance from specific foreign countries to ensure that patent rights are not lost prematurely.

Applicants also are advised that in the case of inventions made in the United States, the Director of the USPTO must issue a license before applicants can apply for a patent in a foreign country. The filing of a U.S. patent application serves as a request for a foreign filing license. The application's filing receipt contains further information and guidance as to the status of applicant's license for foreign filing.

Applicants may wish to consult the USPTO booklet, "General Information Concerning Patents" (specifically, the section entitled "Treaties and Foreign Patents") for more information on timeframes and deadlines for filing foreign patent applications. The guide is available either by contacting the USPTO Contact Center at 800-786-9199, or it can be viewed on the USPTO website at http://www.uspto.gov/web/offices/pac/doc/general/index.html.

For information on preventing theft of your intellectual property (patents, trademarks and copyrights), you may wish to consult the U.S. Government website, http://www.stopfakes.gov. Part of a Department of Commerce initiative, this website includes self-help "toolkits" giving innovators guidance on how to protect intellectual property in specific countries such as China, Korea and Mexico. For questions regarding patent enforcement issues, applicants may call the U.S. Government hotline at 1-866-999-HALT (1-866-999-4258).

LICENSE FOR FOREIGN FILING UNDER

Title 35, United States Code, Section 184

Title 37, Code of Federal Regulations, 5.11 & 5.15

GRANTED

The applicant has been granted a license under 35 U.S.C. 184, if the phrase "IF REQUIRED, FOREIGN FILING LICENSE GRANTED" followed by a date appears on this form. Such licenses are issued in all applications where the conditions for issuance of a license have been met, regardless of whether or not a license may be required as set forth in 37 CFR 5.15. The scope and limitations of this license are set forth in 37 CFR 5.15(a) unless an earlier license has been issued under 37 CFR 5.15(b). The license is subject to revocation upon written notification. The date indicated is the effective date of the license, unless an earlier license of similar scope has been granted under 37 CFR 5.13 or 5.14.

This license is to be retained by the licensee and may be used at any time on or after the effective date thereof unless it is revoked. This license is automatically transferred to any related applications(s) filed under 37 CFR 1.53(d). This license is not retroactive.

The grant of a license does not in any way lessen the responsibility of a licensee for the security of the subject matter as imposed by any Government contract or the provisions of existing laws relating to espionage and the national security or the export of technical data. Licensees should apprise themselves of current regulations especially with respect to certain countries, of other agencies, particularly the Office of Defense Trade Controls, Department of State (with respect to Arms, Munitions and Implements of War (22 CFR 121-128)); the Bureau of Industry and Security, Department of Commerce (15 CFR parts 730-774); the Office of Foreign AssetsControl, Department of Treasury (31 CFR Parts 500+) and the Department of Energy.

NOT GRANTED

No license under 35 U.S.C. 184 has been granted at this time, if the phrase "IF REQUIRED, FOREIGN FILING LICENSE GRANTED" DOES NOT appear on this form. Applicant may still petition for a license under 37 CFR 5.12, if a license is desired before the expiration of 6 months from the filing date of the application. If 6 months has lapsed from the filing date of this application and the licensee has not received any indication of a secrecy order under 35 U.S.C. 181, the licensee may foreign file the application pursuant to 37 CFR 5.15(b).

SelectUSA

The United States represents the largest, most dynamic marketplace in the world and is an unparalleled location for business investment, innovation, and commercialization of new technologies. The U.S. offers tremendous resources and advantages for those who invest and manufacture goods here. Through SelectUSA, our nation works to promote and facilitate business investment. SelectUSA provides information assistance to the international investor community; serves as an ombudsman for existing and potential investors; advocates on behalf of U.S. cities, states, and regions competing for global investment; and counsels U.S. economic development organizations on investment attraction best practices. To learn more about why the United States is the best country in the world to develop technology, manufacture products, deliver services, and grow your business, visit http://www.SelectUSA.gov or call +1-202-482-6800.

Electronically filed June 2, 2022

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Application of:	Tao TAO, et al.	Confirmation No.:	8911
Serial No.:	17/746,755	Art Unit:	1726
Filed:	May 17, 2022	Examiner:	To be assigned
For:	LITHIUM-ION BATTERY HAVING DESIRABLE SAFETY PERFORMANCE	Attorney Docket No.:	024607-02-5119-US

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

REQUEST FOR CORRECTED FILING RECEIPT

Attached is a copy of the Filing Receipt received from the U.S. Patent Office in the above-referenced application for which issuance of a **corrected** Filing Receipt is respectfully requested.

The correction is with respect to a USPTO error in which the Inventor(s) residence is listed as "Residence Not Provided". The Inventor(s) residence should be "Ningde, CHINA" which is indicated on the attached marked up Filing Receipt.

Also, the second inventor, Ming Liang MO is missing from the Filing Receipt and has been provided on the marked-up version.

Please note that the correct information was included in the as-filed Application Data Sheet (ADS) submitted on May 17, 2022. A corrected Filing Receipt is hereby requested.

The Commissioner is hereby authorized to charge any additional fees which may be required by this submission, including fees due under 37 C.F.R. §§ 1.16 and 1.17, or credit any overpayment to Deposit Account 50-0310. A corrected Filing Receipt is hereby requested.

Respectfully submitted,

Date: June 2, 2022

/Yalei Sun/ 57,765

Yalei Sun (Reg. No.)
MORGAN, LEWIS & BOCKIUS LLP
1400 Page Mill Road
Palo Alto, CA 94304
Phone: (650) 843-4000

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Inventor(s)

Tao TAO, ~~Residence Not Provided;~~ Nindge, CHINA

Applicant(s) Ming Liang MO, Nindge, CHINA
NINGDE AMPEREX TECHNOLOGY LIMITED, Ningde, CHINA;

Power of Attorney: The patent practitioners associated with Customer Number 24341.

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Early Publication Request: No
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PTO/AIA/14 (11-15)
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U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

Application Data Sheet 37 CFR 1.76	Attorney Docket Number	024607-02-5119-US
	Application Number	
Title of Invention	LITHIUM-ION BATTERY HAVING DESIRABLE SAFETY PERFORMANCE	

The application data sheet is part of the provisional or nonprovisional application for which it is being submitted. The following form contains the bibliographic data arranged in a format specified by the United States Patent and Trademark Office as outlined in 37 CFR 1.76.
This document may be completed electronically and submitted to the Office in electronic format using the Electronic Filing System (EFS) or the document may be printed and included in a paper filed application.

Secrecy Order 37 CFR 5.2:

☐ Portions or all of the application associated with this Application Data Sheet may fall under a Secrecy Order pursuant to 37 CFR 5.2 (Paper filers only. Applications that fall under Secrecy Order may not be filed electronically.)

Inventor Information:

Inventor 1 Remove

Legal Name

Prefix	Given Name	Middle Name	Family Name	Suffix
	Tao		TAO	

Residence Information (Select One) ○ US Residency ◉ Non US Residency ○ Active US Military Service

City	Ningde	Country of Residence [i]	CN

Mailing Address of Inventor:

Address 1	No. 1, Xingang Road		
Address 2	Zhangwan Town, Jiaocheng Zone		
City	Ningde	**State/Province**	FJ
Postal Code	352100	**Country** [i]	CN

Inventor 2 Remove

Legal Name

Prefix	Given Name	Middle Name	Family Name	Suffix
	Ming Liang		MO	

Residence Information (Select One) ○ US Residency ◉ Non US Residency ○ Active US Military Service

City	Ningde	Country of Residence [i]	CN

Mailing Address of Inventor:

Address 1	No. 1, Xingang Road		
Address 2	Zhangwan Town, Jiaocheng Zone		
City	Ningde	**State/Province**	FJ
Postal Code	352100	**Country** [i]	CN

All Inventors Must Be Listed - Additional Inventor Information blocks may be generated within this form by selecting the **Add** button. Add

Correspondence Information:

PTO/AIA/14 (11-15)
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U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
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Application Data Sheet 37 CFR 1.76	Attorney Docket Number	024607-02-5119-US
	Application Number	
Title of Invention	LITHIUM-ION BATTERY HAVING DESIRABLE SAFETY PERFORMANCE	

Enter either Customer Number or complete the Correspondence Information section below.
For further information see 37 CFR 1.33(a).

☐ **An Address is being provided for the correspondence Information of this application.**

Customer Number	24341		
Email Address		Add Email	Remove Email

Application Information:

Title of the Invention	LITHIUM-ION BATTERY HAVING DESIRABLE SAFETY PERFORMANCE		
Attorney Docket Number	024607-02-5119-US	**Small Entity Status Claimed**	☐
Application Type	Nonprovisional		
Subject Matter	Utility		
Total Number of Drawing Sheets (if any)	2	**Suggested Figure for Publication (if any)**	

Filing By Reference:

Only complete this section when filing an application by reference under 35 U.S.C. 111(c) and 37 CFR 1.57(a). Do not complete this section if application papers including a specification and any drawings are being filed. Any domestic benefit or foreign priority information must be provided in the appropriate section(s) below (i.e., "Domestic Benefit/National Stage Information" and "Foreign Priority Information").

For the purposes of a filing date under 37 CFR 1.53(b), the description and any drawings of the present application are replaced by this reference to the previously filed application, subject to conditions and requirements of 37 CFR 1.57(a).

Application number of the previously filed application	Filing date (YYYY-MM-DD)	Intellectual Property Authority or Country

Publication Information:

☐ Request Early Publication (Fee required at time of Request 37 CFR 1.219)

☐ **Request Not to Publish.** I hereby request that the attached application not be published under 35 U.S.C. 122(b) and certify that the invention disclosed in the attached application **has not and will not** be the subject of an application filed in another country, or under a multilateral international agreement, that requires publication at eighteen months after filing.

Representative Information:

Representative information should be provided for all practitioners having a power of attorney in the application. Providing this information in the Application Data Sheet does not constitute a power of attorney in the application (see 37 CFR 1.32).
Either enter Customer Number or complete the Representative Name section below. If both sections are completed the customer Number will be used for the Representative Information during processing.

Please Select One:	◉ Customer Number	○ US Patent Practitioner	○ Limited Recognition (37 CFR 11.9)
Customer Number	24341		

PTO/AIA/14 (11-15)
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Application Data Sheet 37 CFR 1.76	Attorney Docket Number	024607-02-5119-US
	Application Number	
Title of Invention	LITHIUM-ION BATTERY HAVING DESIRABLE SAFETY PERFORMANCE	

Domestic Benefit/National Stage Information:

This section allows for the applicant to either claim benefit under 35 U.S.C. 119(e), 120, 121, 365(c), or 386(c) or indicate National Stage entry from a PCT application. Providing benefit claim information in the Application Data Sheet constitutes the specific reference required by 35 U.S.C. 119(e) or 120, and 37 CFR 1.78.
When referring to the current application, please leave the "Application Number" field blank.

Prior Application Status	Pending		Remove
Application Number	Continuity Type	Prior Application Number	Filing or 371(c) Date (YYYY-MM-DD)
	Continuation of	17407081	2021-08-19
Prior Application Status	Abandoned		Remove
Application Number	Continuity Type	Prior Application Number	Filing or 371(c) Date (YYYY-MM-DD)
17407081	Continuation of	16113938	2018-08-27
Prior Application Status	Patented		Remove

Application Number	Continuity Type	Prior Application Number	Filing Date (YYYY-MM-DD)	Patent Number	Issue Date (YYYY-MM-DD)
16113938	Continuation of	14596873	2015-01-14	10541441	2020-01-21

Additional Domestic Benefit/National Stage Data may be generated within this form by selecting the **Add** button.

Foreign Priority Information:

This section allows for the applicant to claim priority to a foreign application. Providing this information in the application data sheet constitutes the claim for priority as required by 35 U.S.C. 119(b) and 37 CFR 1.55. When priority is claimed to a foreign application that is eligible for retrieval under the priority document exchange program (PDX)[i] the information will be used by the Office to automatically attempt retrieval pursuant to 37 CFR 1.55(i)(1) and (2). Under the PDX program, applicant bears the ultimate responsibility for ensuring that a copy of the foreign application is received by the Office from the participating foreign intellectual property office, or a certified copy of the foreign priority application is filed, within the time period specified in 37 CFR 1.55(g)(1).

Remove

Application Number	Country[i]	Filing Date (YYYY-MM-DD)	Access Code[i] (if applicable)
201420030319.4	CN	2014-01-17	

Additional Foreign Priority Data may be generated within this form by selecting the **Add** button.

Statement under 37 CFR 1.55 or 1.78 for AIA (First Inventor to File) Transition Applications

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☐ This application (1) claims priority to or the benefit of an application filed before March 16, 2013 and (2) also contains, or contained at any time, a claim to a claimed invention that has an effective filing date on or after March 16, 2013.
NOTE: By providing this statement under 37 CFR 1.55 or 1.78, this application, with a filing date on or after March 16, 2013, will be examined under the first inventor to file provisions of the AIA.

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Authorization or Opt-Out of Authorization to Permit Access:

When this Application Data Sheet is properly signed and filed with the application, applicant has provided written authority to permit a participating foreign intellectual property (IP) office access to the instant application-as-filed (see paragraph A in subsection 1 below) and the European Patent Office (EPO) access to any search results from the instant application (see paragraph B in subsection 1 below).

Should applicant choose not to provide an authorization identified in subsection 1 below, applicant **must opt-out** of the authorization by checking the corresponding box A or B or both in subsection 2 below.

NOTE: This section of the Application Data Sheet is **ONLY** reviewed and processed with the **INITIAL** filing of an application. After the initial filing of an application, an Application Data Sheet cannot be used to provide or rescind authorization for access by a foreign IP office(s). Instead, Form PTO/SB/39 or PTO/SB/69 must be used as appropriate.

1. Authorization to Permit Access by a Foreign Intellectual Property Office(s)

A. Priority Document Exchange (PDX) - Unless box A in subsection 2 (opt-out of authorization) is checked, the undersigned hereby **grants the USPTO authority** to provide the European Patent Office (EPO), the Japan Patent Office (JPO), the Korean Intellectual Property Office (KIPO), the State Intellectual Property Office of the People's Republic of China (SIPO), the World Intellectual Property Organization (WIPO), and any other foreign intellectual property office participating with the USPTO in a bilateral or multilateral priority document exchange agreement in which a foreign application claiming priority to the instant patent application is filed, access to: (1) the instant patent application-as-filed and its related bibliographic data, (2) any foreign or domestic application to which priority or benefit is claimed by the instant application and its related bibliographic data, and (3) the date of filing of this Authorization. See 37 CFR 1.14(h)(1).

B. Search Results from U.S. Application to EPO - Unless box B in subsection 2 (opt-out of authorization) is checked, the undersigned hereby **grants the USPTO authority** to provide the EPO access to the bibliographic data and search results from the instant patent application when a European patent application claiming priority to the instant patent application is filed. See 37 CFR 1.14(h)(2).

The applicant is reminded that the EPO's Rule 141(1) EPC (European Patent Convention) requires applicants to submit a copy of search results from the instant application without delay in a European patent application that claims priority to the instant application.

2. Opt-Out of Authorizations to Permit Access by a Foreign Intellectual Property Office(s)

☐ A. Applicant **DOES NOT** authorize the USPTO to permit a participating foreign IP office access to the instant application-as-filed. If this box is checked, the USPTO will not be providing a participating foreign IP office with any documents and information identified in subsection 1A above.

☐ B. Applicant **DOES NOT** authorize the USPTO to transmit to the EPO any search results from the instant patent application. If this box is checked, the USPTO will not be providing the EPO with search results from the instant application.

NOTE: Once the application has published or is otherwise publicly available, the USPTO may provide access to the application in accordance with 37 CFR 1.14.

PTO/AIA/14 (11-15)
Approved for use through 04/30/2017. OMB 0651-0032
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

Application Data Sheet 37 CFR 1.76	Attorney Docket Number	024607-02-5119-US
	Application Number	
Title of Invention	LITHIUM-ION BATTERY HAVING DESIRABLE SAFETY PERFORMANCE	

Applicant Information:

Providing assignment information in this section does not substitute for compliance with any requirement of part 3 of Title 37 of CFR to have an assignment recorded by the Office.

Applicant 1

If the applicant is the inventor (or the remaining joint inventor or inventors under 37 CFR 1.45), this section should not be completed. The information to be provided in this section is the name and address of the legal representative who is the applicant under 37 CFR 1.43; or the name and address of the assignee, person to whom the inventor is under an obligation to assign the invention, or person who otherwise shows sufficient proprietary interest in the matter who is the applicant under 37 CFR 1.46. If the applicant is an applicant under 37 CFR 1.46 (assignee, person to whom the inventor is obligated to assign, or person who otherwise shows sufficient proprietary interest) together with one or more joint inventors, then the joint inventor or inventors who are also the applicant should be identified in this section.

Clear

◉ Assignee	○ Legal Representative under 35 U.S.C. 117	○ Joint Inventor
○ Person to whom the inventor is obligated to assign.	○ Person who shows sufficient proprietary interest	

If applicant is the legal representative, indicate the authority to file the patent application, the inventor is:

Name of the Deceased or Legally Incapacitated Inventor:

If the Applicant is an Organization check here. ☒

Organization Name	NINGDE AMPEREX TECHNOLOGY LIMITED		
Mailing Address Information For Applicant:			
Address 1	No. 1, Xingang Road		
Address 2	Zhangwan Town, Jiaocheng Zone		
City	Ningde	**State/Province**	FJ
Country	CN	Postal Code	352100
Phone Number		Fax Number	
Email Address			

Additional Applicant Data may be generated within this form by selecting the Add button.

Assignee Information including Non-Applicant Assignee Information:

Providing assignment information in this section does not substitute for compliance with any requirement of part 3 of Title 37 of CFR to have an assignment recorded by the Office.

PTO/AIA/14 (11-15)
Approved for use through 04/30/2017. OMB 0651-0032
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
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Application Data Sheet 37 CFR 1.76	Attorney Docket Number	024607-02-5119-US
	Application Number	
Title of Invention	LITHIUM-ION BATTERY HAVING DESIRABLE SAFETY PERFORMANCE	

Assignee 1

Complete this section if assignee information, including non-applicant assignee information, is desired to be included on the patent application publication. An assignee-applicant identified in the "Applicant Information" section will appear on the patent application publication as an applicant. For an assignee-applicant, complete this section only if identification as an assignee is also desired on the patent application publication.

If the Assignee or Non-Applicant Assignee is an Organization check here. ☐

Prefix	**Given Name**	Middle Name	**Family Name**	Suffix

Mailing Address Information For Assignee including Non-Applicant Assignee:

Address 1			
Address 2			
City		**State/Province**	
Country i		Postal Code	
Phone Number		Fax Number	
Email Address			

Additional Assignee or Non-Applicant Assignee Data may be generated within this form by selecting the Add button.

Signature:

NOTE: This Application Data Sheet must be signed in accordance with 37 CFR 1.33(b). **However, if this Application Data Sheet is submitted with the INITIAL filing of the application and either box A or B is not checked in subsection 2 of the "Authorization or Opt-Out of Authorization to Permit Access" section, then this form must also be signed in accordance with 37 CFR 1.14(c).**

This Application Data Sheet **must** be signed by a patent practitioner if one or more of the applicants is a **juristic entity** (e.g., corporation or association). If the applicant is two or more joint inventors, this form must be signed by a patent practitioner, **all** joint inventors who are the applicant, or one or more joint inventor-applicants who have been given power of attorney (e.g., see USPTO Form PTO/AIA/81) on behalf of **all** joint inventor-applicants.

See 37 CFR 1.4(d) for the manner of making signatures and certifications.

Signature	/Yalei Sun/			Date (YYYY-MM-DD)	2022-05-17
First Name	Yalei	Last Name	Sun	Registration Number	57765

Additional Signature may be generated within this form by selecting the Add button.

PTO/AIA/14 (11-15)
Approved for use through 04/30/2017. OMB 0651-0032
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

Application Data Sheet 37 CFR 1.76	Attorney Docket Number	024607-02-5119-US
	Application Number	
Title of Invention	LITHIUM-ION BATTERY HAVING DESIRABLE SAFETY PERFORMANCE	

This collection of information is required by 37 CFR 1.76. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 23 minutes to complete, including gathering, preparing, and submitting the completed application data sheet form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

Privacy Act Statement

The Privacy Act of 1974 (P.L. 93-579) requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C. 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether the Freedom of Information Act requires disclosure of these records.

2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.

3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.

4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).

5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent CooperationTreaty.

6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).

7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.

8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspections or an issued patent.

9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

Electronic Acknowledgement Receipt

EFS ID:	45863446
Application Number:	17746755
International Application Number:	
Confirmation Number:	8911
Title of Invention:	LITHIUM-ION BATTERY HAVING DESIRABLE SAFETY PERFORMANCE
First Named Inventor/Applicant Name:	Tao TAO
Customer Number:	24341
Filer:	Yalei Sun
Filer Authorized By:	
Attorney Docket Number:	024607-02-5119-US
Receipt Date:	02-JUN-2022
Filing Date:	17-MAY-2022
Time Stamp:	20:11:12
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Request for Corrected Filing Receipt	024607-02-5119-US_Request_for_Corrected_Filing_Receiptv2.pdf	4923891 2da7d96526f6a9b3798c2c297bcedd803ee534a3	no	13

Warnings:

Information:	
Total Files Size (in bytes):	4923891

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NUMBER	FILING or 371(c) DATE	GRP ART UNIT	FIL FEE REC'D	ATTY.DOCKET.NO	TOT CLAIMS	IND CLAIMS
17/746,755	05/17/2022	1726	1820	024607-02-5119-US	19	2

CONFIRMATION NO. 8911

CORRECTED FILING RECEIPT

24341
Morgan, Lewis & Bockius LLP (PA)
1400 Page Mill Road
Palo Alto, CA 94304-1124

OC000000134294514

Date Mailed: 06/06/2022

Receipt is acknowledged of this non-provisional utility patent application. The application will be taken up for examination in due course. Applicant will be notified as to the results of the examination. Any correspondence concerning the application must include the following identification information: the U.S. APPLICATION NUMBER, FILING DATE, NAME OF FIRST INVENTOR, and TITLE OF INVENTION. Fees transmitted by check or draft are subject to collection.

Please verify the accuracy of the data presented on this receipt. If an error is noted on this Filing Receipt, please submit a written request for a corrected Filing Receipt, including a properly marked-up ADS showing the changes with strike-through for deletions and underlining for additions. If you received a "Notice to File Missing Parts" or other Notice requiring a response for this application, please submit any request for correction to this Filing Receipt with your reply to the Notice. When the USPTO processes the reply to the Notice, the USPTO will generate another Filing Receipt incorporating the requested corrections provided that the request is grantable.

Inventor(s)

Tao TAO, Ningde, CHINA;
Ming Liang MO, Ningde, CHINA;

Applicant(s)

NINGDE AMPEREX TECHNOLOGY LIMITED, Ningde, CHINA;

Power of Attorney: The patent practitioners associated with Customer Number 24341

Domestic Priority data as claimed by applicant

This application is a CON of 17/407,081 08/19/2021
which is a CON of 16/113,938 08/27/2018 ABN
which is a CON of 14/596,873 01/14/2015 PAT 10541441

Foreign Applications (You may be eligible to benefit from the **Patent Prosecution Highway** program at the USPTO. Please see http://www.uspto.gov for more information.)
CHINA 201420030319.4 01/17/2014 No Access Code Provided

Permission to Access Application via Priority Document Exchange: Yes

Permission to Access Search Results: Yes

Applicant may provide or rescind an authorization for access using Form PTO/SB/39 or Form PTO/SB/69 as appropriate.

If Required, Foreign Filing License Granted: 05/24/2022

The country code and number of your priority application, to be used for filing abroad under the Paris Convention, is **US 17/746,755**

Projected Publication Date: 09/01/2022

Non-Publication Request: No

Early Publication Request: No

Title

LITHIUM-ION BATTERY HAVING DESIRABLE SAFETY PERFORMANCE

Preliminary Class

429

Statement under 37 CFR 1.55 or 1.78 for AIA (First Inventor to File) Transition Applications: No

PROTECTING YOUR INVENTION OUTSIDE THE UNITED STATES

Since the rights granted by a U.S. patent extend only throughout the territory of the United States and have no effect in a foreign country, an inventor who wishes patent protection in another country must apply for a patent in a specific country or in regional patent offices. Applicants may wish to consider the filing of an international application under the Patent Cooperation Treaty (PCT). An international (PCT) application generally has the same effect as a regular national patent application in each PCT-member country. The PCT process **simplifies** the filing of patent applications on the same invention in member countries, but **does not result** in a grant of "an international patent" and does not eliminate the need of applicants to file additional documents and fees in countries where patent protection is desired.

Almost every country has its own patent law, and a person desiring a patent in a particular country must make an application for patent in that country in accordance with its particular laws. Since the laws of many countries differ in various respects from the patent law of the United States, applicants are advised to seek guidance from specific foreign countries to ensure that patent rights are not lost prematurely.

Applicants also are advised that in the case of inventions made in the United States, the Director of the USPTO must issue a license before applicants can apply for a patent in a foreign country. The filing of a U.S. patent application serves as a request for a foreign filing license. The application's filing receipt contains further information and guidance as to the status of applicant's license for foreign filing.

Applicants may wish to consult the USPTO booklet, "General Information Concerning Patents" (specifically, the section entitled "Treaties and Foreign Patents") for more information on timeframes and deadlines for filing foreign patent applications. The guide is available either by contacting the USPTO Contact Center at 800-786-9199, or it can be viewed on the USPTO website at http://www.uspto.gov/web/offices/pac/doc/general/index.html.

For information on preventing theft of your intellectual property (patents, trademarks and copyrights), you may wish to consult the U.S. Government website, http://www.stopfakes.gov. Part of a Department of Commerce initiative, this website includes self-help "toolkits" giving innovators guidance on how to protect intellectual property in specific countries such as China, Korea and Mexico. For questions regarding patent enforcement issues, applicants may call the U.S. Government hotline at 1-866-999-HALT (1-866-999-4258).

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Title 35, United States Code, Section 184

Title 37, Code of Federal Regulations, 5.11 & 5.15

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This license is to be retained by the licensee and may be used at any time on or after the effective date thereof unless it is revoked. This license is automatically transferred to any related applications(s) filed under 37 CFR 1.53(d). This license is not retroactive.

The grant of a license does not in any way lessen the responsibility of a licensee for the security of the subject matter as imposed by any Government contract or the provisions of existing laws relating to espionage and the national security or the export of technical data. Licensees should apprise themselves of current regulations especially with respect to certain countries, of other agencies, particularly the Office of Defense Trade Controls, Department of State (with respect to Arms, Munitions and Implements of War (22 CFR 121-128)); the Bureau of Industry and Security, Department of Commerce (15 CFR parts 730-774); the Office of Foreign AssetsControl, Department of Treasury (31 CFR Parts 500+) and the Department of Energy.

NOT GRANTED

No license under 35 U.S.C. 184 has been granted at this time, if the phrase "IF REQUIRED, FOREIGN FILING LICENSE GRANTED" DOES NOT appear on this form. Applicant may still petition for a license under 37 CFR 5.12, if a license is desired before the expiration of 6 months from the filing date of the application. If 6 months has lapsed from the filing date of this application and the licensee has not received any indication of a secrecy order under 35 U.S.C. 181, the licensee may foreign file the application pursuant to 37 CFR 5.15(b).

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United States Patent and Trademark Office
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www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
17/746,755	05/17/2022	Tao TAO	024607-02-5119-US	8911

24341 7590 06/23/2022

Morgan, Lewis & Bockius LLP (PA)
1400 Page Mill Road
Palo Alto, CA 94304-1124

EXAMINER	
CENTRAL, DOCKET	

ART UNIT	PAPER NUMBER
1726	

NOTIFICATION DATE	DELIVERY MODE
06/23/2022	ELECTRONIC

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

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

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

padocketingdepartment@morganlewis.com
vskliba@morganlewis.com

Decision Granting Request for Prioritized Examination (Track I)	**Application No.** 17/746,755	**Applicant(s)** TAO et al.	
	Examiner FIKIRTE A GEREMEW	**Art Unit** OMBL	**AIA (FITF) Status** Yes

1. THE REQUEST FILED 17 May 2022 IS **GRANTED** .

   The above-identified application has met the requirements for prioritized examination
   - A. ☑ for an original nonprovisional application (Track I).
   - B. ☐ for an application undergoing continued examination (RCE).

2. **The above-identified application will undergo prioritized examination**. The application will be accorded special status throughout its entire course of prosecution until one of the following occurs:
   - A. filing a **petition for extension of time** to extend the time period for filing a reply;
   - B. filing an **amendment to amend the application to contain more than four independent claims, more than thirty total claims** , or a multiple dependent claim;
   - C. filing a **request for continued examination** ;
   - D. filing a notice of appeal;
   - E. filing a request for suspension of action;
   - F. mailing of a notice of allowance;
   - G. mailing of a final Office action;
   - H. completion of examination as defined in 37 CFR 41.102; or
   - I. abandonment of the application.

Telephone inquiries with regard to this decision should be directed to FIKIRTE GEREMEW at (703) 756-1930. In his/her absence, calls may be directed to Petition Help Desk at (571) 272-3282.

/FIKIRTE A GEREMEW/ PROGRAM SUPPORT ASSISTANT, OMBL	

INFORMATION DISCLOSURE STATEMENT BY APPLICANT Substitute for Form 1449-PTO				*Electronically filed July 26, 2022*	
				Application Number	*17/746,755*
				Filing Date	*May 17, 2022*
				First Named Inventor	*Tao TAO*
				Art Unit	*1721*
				Examiner Name	*Barton, Jason Aaron*
Sheet	1	of	2	Attorney Docket Number	*024607-02-5119-US*

U.S. PATENT DOCUMENTS					
Examiner Initials	Cite No.	Document Number Number - Kind Code	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
		5,017,442 A	05-21-1991	Watanabe et al.	
		5,478,668 A	12-26-1995	Gozdz et al.	
		6,551,143 B2	04-22-2003	Tanaka et al.	
		6,100,114	08-08-2000	Milkovich et al.	
		2001/0036574 A1	11-01-2001	Fukuda et al.	
		2007/0122714 A1	05-31-2007	Suzuki et al.	
		2009/0035638 A1	02-05-2009	Tsai et al.	

FOREIGN PATENT DOCUMENTS						
Examiner Initials	Cite No.	Foreign Patent Document Country Code – Number - Kind Code *(if known)*	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear	T
		CN101939873A	01-05-2011	SK ENERGY CO LTD		
		CN103066239A	04-24-2013	RESEARCH IN MOTION LTD		
		CN1221054C	09-28-2005	NANFU BATTERY CO LTD NANPING C [CN]		
		CN1350350A	05-22-2002	TEISHINA ELECTRONICS AMP CO LT [JP]		
		CN201087907Y	07-16-2008	Ke et al.		
		CN202495523U	10-17-2012	Shufa et al.		
		JPH0513064A	01-22-1993	SANYO ELECTRIC CO		
		JP1999317218A - JPH11317218A	11-16-1999	TOYOTA CENTRAL RES & DEV		
		JP1993013064A - JPH0713064A	01-17-1995	OLYMPUS OPTICAL CO		
		JP2000-277155A	10-06-2000	HITACHI LTD		
		JP2003132875A	05-09-2003	MATSUSHITA ELECTRIC IND CO LTD		

NON PATENT LITERATURE DOCUMENTS

Examiner Signature		Date Considered	

INFORMATION DISCLOSURE STATEMENT BY APPLICANT Substitute for Form 1449-PTO				***Electronically filed July 26, 2022***	
				Application Number	***17/746,755***
				Filing Date	***May 17, 2022***
				First Named Inventor	***Tao TAO***
				Art Unit	***1721***
				Examiner Name	***Barton, Jason Aaron***
Sheet	2	of	2	Attorney Docket Number	***024607-02-5119-US***

Examiner Initials	Cite No.	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published
		Evaluation Report of Utility Model Patent, ZL2014200303194, 24DEC2019, 5 pgs.
		Tao, Office Action, US14/596,873, 04APR2017, 14 pgs.
		Tao, Final Office Action, US14/596,873, 22NOV2017, 13 pgs.
		Tao, Office Action, US14/596,873, 19APR2018, 13 pgs.
		Tao, Final Office Action, US14/596,873, 05DEC2018, 13 pgs.
		Tao, Office Action, US14/596,873, 22MAR2019, 14 pgs.
		Tao, Notice of Allowance, US14/596,873, 25NOV2019, 7 pgs.
		Tao, Office Action, US16/113,938, 16AUG2019, 15 pgs.
		Tao, Office Action, US16/113,938, 13FEB2020, 23 pgs.
		Tao, Office Action, US16/113,938, 02NOV2020, 14 pgs.
		Tao, Final Office Action, US16/113,938, 20MAY2021, 18 pgs.
		Tao, Advisory Action, US16/113,938, 02AUG2021, 3 pgs.
		Machine English translation of CN202495523U (Year: 2012)

Examiner Signature		Date Considered	

Electronic Acknowledgement Receipt

EFS ID:	46278713
Application Number:	17746755
International Application Number:	
Confirmation Number:	8911
Title of Invention:	LITHIUM-ION BATTERY HAVING DESIRABLE SAFETY PERFORMANCE
First Named Inventor/Applicant Name:	Tao TAO
Customer Number:	24341
Filer:	Yalei Sun/Edith Fuentes
Filer Authorized By:	Yalei Sun
Attorney Docket Number:	024607-02-5119-US
Receipt Date:	26-JUL-2022
Filing Date:	17-MAY-2022
Time Stamp:	23:44:14
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1		024607-02-5119-US_IDS.pdf	388568 4557ac6e660d7481f3974d4540b6a7d3bbe8c994	yes	6

	Multipart Description/PDF files in .zip description		
	Document Description	**Start**	**End**
	Transmittal Letter	1	4
	Information Disclosure Statement (IDS) Form (SB08)	5	6
Warnings:			
Information:			
	Total Files Size (in bytes):	388568	

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111
If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.
National Stage of an International Application under 35 U.S.C. 371
If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.
New International Application Filed with the USPTO as a Receiving Office
If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

Electronically filed July 26, 2022

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Application of:	Tao TAO et al.	Confirmation No.:	8911
Serial No.:	17/746,755	Art Unit:	1721
Filed:	May 17, 2022	Examiner:	Barton, Jason Aaron
For:	Lithium-Ion Battery Having Desirable Safety Performance	Attorney Docket No.:	024607-02-5119-US

INFORMATION DISCLOSURE STATEMENT

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

In accordance with the duty of disclosure provisions of 37 C.F.R. §1.56, there is hereby provided certain information which the Examiner may consider material to the examination of the subject U.S. patent application. It is requested that the Examiner make this information of record if it is deemed material to the examination of the application.

1. Enclosures accompanying this Information Disclosure Statement are:

1a. ☒ A list of all patents, publications, applications, or other information submitted for consideration by the office.

1b. A legible copy of:

☐ Each foreign patent;

☐ Each publication or that portion which caused it to be listed on the PTO-1449;

☐ For each cited pending U.S. application, the application specification including the claims, and any drawing of the application, or portion of the application which caused it to be listed on the PTO-1449 including any claims directed to that portion;

☐ all other information or portion which caused it to be listed on the PTO-1449.

1c. ☐ An English language copy of search report(s) from a counterpart foreign application or PCT International Search Report.

1d. ☐ Explanations of relevancy (ATTACHMENT hereto) or English language abstracts of the non-English language publications.

2. ☒ This Information Disclosure Statement is filed under 37 C.F.R. §1.97(b):

☒ Within three months of the filing date of a national application other than a continued prosecution application under §1.53(d);

☐ Within three months of the date of entry of the national stage as set forth in §1.491 in an international application;

☐ Before the mailing of the first Office action on the merits;

☐ Before the mailing of a first Office action after the filing of a request for continued examination under §1.114.

3. ☐ This Information Disclosure Statement is filed under 37 C.F.R. §1.97(c) after the period specified in 37 C.F.R. §1.97(b), but before the mailing date of any of a final action under 37 C.F.R. §1.113, a notice of allowance under 37 C.F.R. §1.311 or an action that otherwise closes prosecution in the application.

(Check either Item 3a, 3b, 3c or 3d)

3a. ☐ The Certification Statement in Item 5 below is applicable. Accordingly, no fee is required.

3b. ☐ The $260 (large entity) fee set forth in 37 C.F.R. §1.17(p) in accordance with 37 C.F.R. §1.97(c) is to be charged to Morgan, Lewis & Bockius LLP Deposit Account No. 50-0310 (order no.).

3c. ☐ The $130 (small entity) fee set forth in 37 C.F.R. §1.17(p) in accordance with 37 C.F.R. §1.97(c) is to be charged to Morgan, Lewis & Bockius LLP Deposit Account No. 50-0310 (order no.).

3d. ☐ The $65 (micro entity) fee set forth in 37 C.F.R. §1.17(p) in accordance with 37 C.F.R. §1.97(c) is to be charged to Morgan, Lewis & Bockius LLP Deposit Account No. 50-0310 (order no.).

(Items 3b or 3c to be checked if any reference known for more than 3 months)

4. ☐ This Information Disclosure Statement is filed under 37 C.F.R. §1.97(d) after the period specified in 37 C.F.R. §1.97(c), but on or before the date of payment of the issue fee.

(Check Item 4a, and 4b, 4c or 4d)

4a. ☐ The Certification Statement in Item 5 below is applicable.

4b. ☐ The $260 (large entity) fee set forth in 37 C.F.R. §1.17(p) in accordance with 37 C.F.R. §1.97(c) is to be charged to Morgan, Lewis & Bockius LLP Deposit Account No. 50-0310 (order no.).

4c. ☐ The $130 (small entity) fee set forth in 37 C.F.R. §1.17(p) in accordance with 37 C.F.R. §1.97(c) is to be charged to Morgan, Lewis & Bockius LLP Deposit Account No. 50-0310 (order no.).

4d. ☐ The $65 (micro entity) fee set forth in 37 C.F.R. §1.17(p) in accordance with 37 C.F.R. §1.97(c) is to be charged to Morgan, Lewis & Bockius LLP Deposit Account No. 50-0310 (order no.).

5. ☐ Certification Statement (applicable if Item 3a or Item 4a is checked)

(Check either Item 5a, 5b, 5c or 5d)

5a. ☐ In accordance with 37 C.F.R. §1.97(e)(1), it is certified that each item of information contained in this information disclosure statement was first cited in a communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of this Information Disclosure Statement.

5b. ☐ In accordance with 37 C.F.R. §1.97(e)(2), it is certified that no item of information contained in the information disclosure statement was cited in a communication from a foreign patent office in a counterpart foreign application, and, to the knowledge of the person signing the certification after making reasonable inquiry, no item of information contained in the information disclosure statement was known to any individual designated in 37 C.F.R. §1.56(c) more than three months prior to the filing of this information disclosure statement.

5c. ☐ Each item of information contained in this information disclosure statement was cited in a communication from a foreign patent office in a counterpart application, and the communication was not **received** by any individual designated in 37 C.F.R. §1.56(c) more than thirty days prior to the filing of this information disclosure statement.

5d. ☐ Pursuant to 37 C.F.R. §1.704(d), each item of information contained in this information disclosure statement was cited in a communication from a foreign patent office in a counterpart application, and the communication was not **received** by any individual designated in 37 C.F.R. §1.56(c) more than thirty days prior to the filing of this information disclosure statement.

6. ☒ Copies of each cited U.S. patent and each U.S. patent application publication are not enclosed pursuant to the USPTO OG Notice dated 05 August 2003 waiving the requirement under 37 C.F.R. 1.98(a)(2)(i) for U.S. patent applications filed after June 30, 2003.

7. ☒ This application is a continuation application under 37 C.F.R. §1.53(b) or (d).

(Check appropriate Items 7a, 7b and/or 7c)

7a. ☐ A Petition to Withdraw from issue under 37 C.F.R. §1.313(b)(5) is concurrently filed herewith.

7b. ☒ Copies of publications listed on Form PTO-1449 from prior application Serial No. **17/407,081**, filed on **August 19, 2021**, **16/.113,938**, filed on **August 27, 2018** and **14/596,873**, filed on **January 14, 2015**, of which this application claims priority under 35 U.S.C. §120, are not being submitted pursuant to 37 C.F.R. §1.98(d).

7c. ☐ Copies of the publications listed on the attached Form PTO-1449 that were not previously cited in prior application Serial No. , filed on , are provided

herewith.

8. ☐ This is a Supplemental Information Disclosure Statement. (Check Item 8a)

8a. ☐ This Supplemental Information Disclosure Statement under 37 C.F.R. §1.97(f) supplements the Information Disclosure Statement filed on . A bona fide attempt was made to comply with 37 C.F.R. §1.98, but inadvertent omissions were made. These omissions have been corrected herein. Accordingly, additional time is requested so that this Supplemental Information Disclosure Statement can be considered as if properly filed on .

9. ☐ In accordance with 37 C.F.R. §1.98, a concise explanation of what is presently understood to be the relevance of each non-English language publication is:

(Check Item 9a, 9b, or 9c)

9a. ☐ satisfied because all non-English language publications were cited on the enclosed English language copy of the PCT International Search Report or the search report from a counterpart foreign application indicating the degree of relevance found by the foreign office.

9b. ☐ set forth in the application.

9c. ☐ enclosed as an attachment hereto.

10. ☒ The Commissioner is authorized to charge any additional fee required or credit any overpayment for this Information Disclosure Statement and/or Petition to Morgan, Lewis & Bockius LLP Deposit Account No. 50-0310 (order no. 024607-02-5119-US).

11. ☒ No admission is made that the information cited in this Statement is, or is considered to be, material to patentability nor a representation that a search has been made (other than a search report of a foreign counterpart application or PCT International Search Report if submitted herewith). 37 C.F.R. §§1.97(g) and (h).

Respectfully submitted,

Date: July 26, 2022

/Yalei Sun/ 57,765

Yalei Sun (Reg. No.)
MORGAN, LEWIS & BOCKIUS LLP
1400 Page Mill Road
Palo Alto, CA 94304
(650) 843-4000

UNITED STATES PATENT AND TRADEMARK OFFICE

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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
17/746,755	05/17/2022	Tao TAO	024607-02-5119-US	8911

24341 7590 07/28/2022

Morgan, Lewis & Bockius LLP (PA)
1400 Page Mill Road
Palo Alto, CA 94304-1124

EXAMINER	
BARTON, JASON AARON	

ART UNIT	PAPER NUMBER
1721	

NOTIFICATION DATE	DELIVERY MODE
07/28/2022	ELECTRONIC

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

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

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

padocketingdepartment@morganlewis.com
vskliba@morganlewis.com

Office Action Summary	Application No. 17/746,755	Applicant(s) TAO et al.	
	Examiner JASON A BARTON	Art Unit 1721	AIA (FITF) Status Yes

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTHS FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☑ Responsive to communication(s) filed on 05/17/2022.

☐ A declaration(s)/affidavit(s) under **37 CFR 1.130(b)** was/were filed on _____.

2a)☐ This action is **FINAL.** 2b) ☑ This action is non-final.

3)☐ An election was made by the applicant in response to a restriction requirement set forth during the interview on _____; the restriction requirement and election have been incorporated into this action.

4)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims*

5) ☑ Claim(s) 1-19 is/are pending in the application.

5a) Of the above claim(s) _____ is/are withdrawn from consideration.

6) ☐ Claim(s) _____ is/are allowed.

7) ☑ Claim(s) 1-19 is/are rejected.

8) ☐ Claim(s) _____ is/are objected to.

9) ☐ Claim(s) _____ are subject to restriction and/or election requirement

* If any claims have been determined allowable, you may be eligible to benefit from the **Patent Prosecution Highway** program at a participating intellectual property office for the corresponding application. For more information, please see http://www.uspto.gov/patents/init_events/pph/index.jsp or send an inquiry to **PPHfeedback@uspto.gov.**

Application Papers

10)☐ The specification is objected to by the Examiner.

11)☑ The drawing(s) filed on 05/17/2022 is/are: a)☑ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

Priority under 35 U.S.C. § 119

12)☑ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

Certified copies:

a)☑ All b)☐ Some** c)☐ None of the:

1.☐ Certified copies of the priority documents have been received.

2.☑ Certified copies of the priority documents have been received in Application No. 16/113,938.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

** See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☑ Notice of References Cited (PTO-892)

2) ☐ Information Disclosure Statement(s) (PTO/SB/08a and/or PTO/SB/08b) Paper No(s)/Mail Date _____.

3) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date _____.

4) ☐ Other: _____.

DETAILED ACTION

Notice of Pre-AIA or AIA Status

1. The present application, filed on or after March 16, 2013, is being examined under the first inventor to file provisions of the AIA.

Information Disclosure Statement

2. An IDS was not filed in the present application. However, an IDS was filed in the parent application (17/407,081).

3. Applicant is reminded that when an IDS has not been considered in the parent application, the information submitted via IDS in the parent application must be resubmitted in the continuation application. See MPEP 609.02 §B.2. In the future, Applicant should submit information material to patentability that has not been considered in the parent application in compliance with the rules (37 C.F.R. §§1.97 and 1.98).

4. In this case, the parent application is being examined simultaneously with the present application, and the IDS placed in the parent application's folder has been considered in relation to this application.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103 which forms the basis for all obviousness rejections set forth in this Office action:

> A patent for a claimed invention may not be obtained, notwithstanding that the claimed invention is not identically disclosed as set forth in section 102, if the differences between the claimed invention and the prior art are such that the claimed invention as a whole would have been obvious before the effective filing date of the claimed invention to a person having ordinary skill in the art to which the claimed invention pertains. Patentability shall not be negated by the manner in which the invention was made.

6. The factual inquiries for establishing a background for determining obviousness under 35 U.S.C. 103 are summarized as follows:

1. Determining the scope and contents of the prior art.

2. Ascertaining the differences between the prior art and the claims at issue.

3. Resolving the level of ordinary skill in the pertinent art.

4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

7. This application currently names joint inventors. In considering patentability of the claims the examiner presumes that the subject matter of the various claims was commonly owned as of the effective filing date of the claimed invention(s) absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and effective filing dates of each claim that was not commonly owned as of the effective filing date of the later invention in order for the examiner to consider the applicability of 35 U.S.C. 102(b)(2)(C) for any potential 35 U.S.C. 102(a)(2) prior art against the later invention.

8. Claims 1-9 are rejected under 35 U.S.C. 103 as being unpatentable over Sugita (WO2013038677A1) in view of Matsushita (US20140120417A1; Matsushita is 102(a)(2) art) and Kwak (US20060051662A1).

9. **Regarding claim 1**, Sugita teaches a lithium-ion battery ([001]-[002]), comprising:

a first plate (positive electrode plate 1a, FIG. 2a; [029]) comprising a first current collector (see [027]), a first film (the term is understood to mean "active material"; the active material is coated on the current collector, see [027]; FIG. 2a shows the "film" as the dark portion (no reference sign is provided)) and a first lead (collector tab 12, FIG. 2A; [029]),

wherein the first film is disposed on the first current collector (see [027]) and is provided with a first recess (exposed portion 22, FIG. 2A; [027]) configured to receive the first lead (see FIG. 2a), and the first lead is electrically connected to the first current collector (see FIG. 2a; the structure is inherently present since a "collector tab" is necessarily electrically connected to the current collector);

a second plate (negative electrode plate 2a, FIG. 13; [030], [056]) comprising a second current collector (see [027]), a second film (the active material is coated on the collector, see [027]) and a second lead (negative electrode lead 6, FIG. 2b; [027]),

wherein the second film is disposed on the second current collector and is provided with a second recess (exposed portion 31, FIG. 2b) configured to receive the second lead (see FIG. 2b), and the second lead is electrically connected to the second current collector (the structure is inherently present since a "collector tab" is necessarily electrically connected to the current collector); and

a separator (separator 3, FIG. 1; [069]) disposed between the first plate and the second plate (see FIG. 1);

wherein a length of a portion of the first lead in the first recess is less than a width of a remaining portion of the first film from an edge of the first insulating glue layer covering the first film to an edge of the first film opposite to the first recess (see FIG. 2a; since the length of the alleged first lead covers ~1/4 of the width of the current collecting plate (top-to-bottom), the limitation is held to be met).

Sugita does not teach (limitation 1) a first insulating glue layer, disposed on a first location of a surface of the first lead or (limitation 2) a second insulating glue layer is disposed on a second

location of the surface of the first film corresponding to the second lead in a thickness direction of the first plate and the second plate.

However, Matsushita teaches the deficient limitation 1. Matsushita relates to electrodes having exposed portions with a lead bonded thereto (abstract) and is thus analogous art.

Matsushita teaches an electrode (any of embodiments of Figs 4-7, see, e.g., Fig. 4a) having a recessed portion (non-coated portion 21b) with an electrode lead (lead 25) disposed in the recessed portion. The electrode lead (lead 25) is covered with an insulating glue (e.g., resin tape of protective tape 27, see [0052]). Thus Matsushita teaches a first insulating glue layer, disposed on a first location of a surface of the first lead.

Furthermore, Kwak teaches deficient limitation 2. Kwak relates to a wound electrode assembly (FIG. 6) that prevents short circuiting (abstract) and is thus analogous art. Kwak teaches a second insulating glue layer (insulation tape 160a, FIG. 6, [0044]) corresponding to the second lead (second electrode tab 136) in a thickness direction of the first plate and the second plate (see FIGS. 4 and 6). See FIG. 6 in particular, which shows that the second insulating glue layer 160a is disposed (indirectly) on the first film.

10. Thus, it would have been obvious before the effective filing date of the claimed invention to incorporated the insulating glue (protective tape 27) of Matsushita and the insulation tape (160a) of Kwak to Sugita to arrive at the claimed invention. In modifying Sugita with Matsushita, the person having ordinary skill in the art ("skilled person") would have arrived at the claimed invention wherein the lithium-ion battery comprises a first insulating glue layer, disposed on a first location of a surface of the first lead. The skilled person would have been motivated to do so in order to insulate the electrode lead and prevent thermal runaway of the battery when, for example, the separator or the like is split in an abnormal case (Matsushita, [0052]). In modifying

Sugita with Kwak, the skilled person would have arrived at the claimed invention wherein a second insulating glue layer is disposed on a second location of the surface of the first film corresponding to the second lead in a thickness direction of the first plate and the second plate. The skilled person would have been motivated to prevent short-circuiting between the first electrode plate 140 and the second electrode plate 130 (Kwak, [0056]).**Regarding claim 2**, Sugita in view of Matsushita and Kwak teach the lithium-ion battery of claim 1 as described above. Sugita also teaches wherein, the first plate is a positive plate, the first current collector is a positive current collector, the first film is a positive film, the first lead is a positive lead; and the second plate is a negative plate, the second current collector is a negative current collector, the second film is a negative film and the second lead is a negative lead. See claim mapping above.

11. **Regarding claim 3**, Sugita in view of Matsushita and Kwak teach the lithium-ion battery of claim 2 as described above. Sugita also teaches wherein a distance between a center of the first recess and an end of the positive film is 1/4 - 3/4 of a length of the positive film (see FIG. 2a and claim mapping above), and a distance between a center of the second recess and an end of the negative film is 1/4 - 3/4 of a length of the negative film (see FIG. 13 and claim mapping above).

12. **Regarding claim 4**, Sugita in view of Matsushita and Kwak teach the lithium-ion battery of claim 2 as described above. Sugita also teaches wherein a distance between a center of the first recess and an end of the positive film is half of a length of the positive film, and a distance between a center of the second recess and an end of the negative film is half of a length of the negative film (see claim mapping above and FIGS. 2a and 13).

13. **Regarding claims 5, 6 and 8**, Sugita in view of Matsushita and Kwak teach the lithium-ion battery of claim 2 as described above.

None of Sugita, Matsushita, and Kwak teach wherein a length of the first recess is less than a length of the positive lead by 1 - 100mm, a width of the first recess is greater than a width of the positive lead by 1 - 10mm; and a length of the second recess is less than a length of the negative lead by 1 - 100mm, a width of the second recess is greater than a width of the negative lead by 1 - 10mm **(claim 5)**.

None of Sugita, Matsushita, and Kwak teach wherein a length of the first recess is less than a width of the positive film by 1 - 100mm, and a length of the second recess is less than a width of the negative film by 1 - 100mm **(claim 6)**.

Lastly, none of Sugita, Matsushita, and Kwak teach wherein a depth of the first recess is greater than a thickness of the positive lead by 0.005 - 0.1mm, and a depth of the second recess is greater than a thickness of the negative lead by 0.005 - 0.1mm **(claim 8)**.

However, it has been held that changes in size (dimension) are generally recognized as being within the level of ordinary skill in the art. *In re Rose*, 220 F.2d 459, 105 USPQ 237 (CCPA 1955). Where the only difference between the prior art and the claims is a recitation of relative dimensions of the claimed device, and the device having the claimed dimensions would not perform differently than the prior art device, the claimed device is not patentably distinct from the prior art device. *Gardner v. TEC Syst., Inc.*, 725 F.2d 1338, 220 USPQ 777 (Fed. Cir. 1984), *cert. denied*, 469 U.S. 830, 225 USPQ 232 (1984).

In the instant case, it appears that the prior art device (i.e., the combination of Sugita and Matsushita) have the same claimed features and that any relative difference in size, dimensions, or proportions would not lead to device that performs differently from the claimed device. Moreover, the present claims cover very broad ranges (three orders of magnitude) and there is no indication in the specification that such broad ranges establish the criticality of the ranges. Thus, the claimed

device of claims 5, 6 and 8 is not patentably distinct from Sugita in view of Matsushita and Kwak. Accordingly, it would have been obvious before the effective filing date of the claimed invention to have arrived at the claimed invention of claims 5, 6 and 8 because changes in proportion (size) are within ordinary skill in the art.

14. **Regarding claim 7**, Sugita in view of Matsushita and Kwak teach the lithium-ion battery of claim 2 as described above. Sugita also necessarily teaches wherein a depth of the first recess is no larger than a thickness of the positive film, and a depth of the second recess is no larger than a thickness of the negative film. The recess portion are taught by Sugita as "exposed portions" (reference numeral 22, 31 or 32; it is noted the reference sign is not provided in FIG. 13 but is apparent from comparison of the other figures) and the undersigned understands this to be a non-coated portion (see [029]), meaning the depth of the recesses are approximately equal to the thickness of the positive/negative films. Thus, the limitation is inherently met.

15. **Regarding claim 9,** Sugita in view of Matsushita and Kwak teach the lithium-ion battery of claim 1 as described above.

Neither Sugita nor Matsushita teach wherein a width of a portion of the first lead in the first recess is greater than a width of a remaining portion of the first recess not occupied by the first lead located on one side of the first lead.

However, it has been held that changes in dimension are generally recognized as being within the level of ordinary skill in the art. *In re Rose,* 220 F.2d 459, 105 USPQ 237 (CCPA 1955). Where the only difference between the prior art and the claims is a recitation of relative dimensions of the claimed device, and the device having the claimed dimensions would not perform differently than the prior art device, the claimed device is not patentably distinct from the prior art device.

Gardner v. TEC Syst., Inc., 725 F.2d 1338, 220 USPQ 777 (Fed. Cir. 1984), *cert. denied*, 469 U.S. 830, 225 USPQ 232 (1984).

In the instant case, it does not appear that there would be any difference between the claimed device and the prior art device of Sugita in view of Matsushita. For at least these reasons, it would have been obvious before the effective filing date of the claimed invention to have arrived at the claimed invention of claim 9 because changes in proportion are within ordinary skill in the art.

16. Claims 10-17 and 19 are rejected under 35 U.S.C. 103 as being unpatentable over Sugita (WO2013038677A1) in view of Matsushita (US20140120417A1).

17. **Regarding claim 10**, Sugita teaches a lithium-ion battery ([001]-[002]), comprising:

a first plate (positive electrode plate 1a, FIG. 2a; [029]) comprising a first current collector (see [027]), a first film (the term is understood to mean "active material"; the active material is coated on the current collector, see [027]; FIG. 2a shows the "film" as the dark portion (no reference sign is provided)) and a first lead (collector tab 12, FIG. 2A; [029]),

wherein the first film is disposed on the first current collector (see [027]) and is provided with a first recess (exposed portion 22, FIG. 2A; [027]) configured to receive the first lead (see FIG. 2a), and the first lead is electrically connected to the first current collector (see FIG. 2a; the structure is inherently present since a "collector tab" is necessarily electrically connected to the current collector), the first recess having three sides defined by the first film (see FIG. 2a, the first recess has three sides defined by the alleged first film);

a second plate (negative electrode plate 2a, FIG. 13; [030], [056]) comprising a second current collector (see [027]), a second film (the active material is coated on the collector, see [027]) and a second lead (negative electrode lead 6, FIG. 2b; [027]),

wherein the second film is disposed on the second current collector and is provided with a second recess (exposed portion 31, FIG. 2b) configured to receive the second lead (see FIG. 2b), and the second lead is electrically connected to the second current collector (the structure is inherently present since a "collector tab" is necessarily electrically connected to the current collector);

wherein a width of a portion of the first lead in the first recess is greater than a width of a remaining portion of the first recess not occupied by the first lead located on one side of the first lead (see FIG. 2a and discussion below); and

a separator (separator 3, FIG. 1; [069]) disposed between the first plate and the second plate (see FIG. 1).

Sugita does not teach (1) a first insulating glue layer, disposed on a first location of a first surface of the first lead and covering the three sides of the first recess defined by the first film.

However, Matsushita teaches the deficient limitation. Matsushita relates to electrodes having exposed portions with a lead bonded thereto (abstract) and is thus analogous art.

Matsushita teaches an electrode (any of embodiments of Figs 4-7, see, e.g., Fig. 4a) having a recessed portion (non-coated portion 21b) with an electrode lead (lead 25) disposed in the recessed portion. The electrode lead (lead 25) is covered with an insulating glue (e.g., resin tape of protective tape 27, see [0052]). The recessed portion has 4 sides and the insulating glue (protective tape 27) covers all four sides and covers the entirety of the portion of the electrode disposed in the recessed portion. Thus, Matsushita teaches a first insulating glue layer, disposed

on a first location of a first surface of the first lead and covering the three sides of the first recess defined by the first film.

It would have been obvious before the effective filing date of the claimed invention to incorporated the insulating glue (protective tape 27) of Matsushita to the electrode leads of Sugita to arrive at the claimed invention wherein the lithium-ion battery comprises a first insulating glue layer, disposed on a first location of a first surface of the first lead and covering the three sides of the first recess defined by the first film. The skilled person would have been motivated to do so in order to insulate the electrode lead and prevent thermal runaway of the battery when, for example, the separator or the like is split in an abnormal case ([0052]).

It is also believed that Sugita teaches, "wherein a width of a portion of the first lead in the first recess is greater than a width of a remaining portion of the first recess not occupied by the first lead located on one side of the first lead." While the claim language is verbose, it is believed that the intent of the was to claim that the recess is wider than the lead. The claim is interpreted in this manner and in this interpretation, the claim limitation is clearly met (see FIG. 2a of Sugita), and the lead would not fit into the recess if this were not true.

18. **Regarding claim 11**, Sugita in view of Matsushita teach the lithium-ion battery of claim 10 as described above. Sugita also teaches wherein, the first plate is a positive plate, the first current collector is a positive current collector, the first film is a positive film, the first lead is a positive lead; and the second plate is a negative plate, the second current collector is a negative current collector, the second film is a negative film and the second lead is a negative lead. See claim mapping above.

19. **Regarding claim 12,** Sugita in view of Matsushita teach the lithium-ion battery of claim 10 as described above. Sugita also teaches wherein a distance between a center of the first recess

and an end of the positive film is 1/4 - 3/4 of a length of the positive film (see FIG. 2a and claim mapping above), and a distance between a center of the second recess and an end of the negative film is 1/4 - 3/4 of a length of the negative film (see FIG. 13 and claim mapping above).

20. **Regarding claim 13,** Sugita in view of Matsushita teach the lithium-ion battery of claim 10 as described above. Sugita also teaches wherein a distance between a center of the first recess and an end of the positive film is half of a length of the positive film, and a distance between a center of the second recess and an end of the negative film is half of a length of the negative film (see claim mapping above and FIGS. 2a and 13).

21. **Regarding claims 14, 15 and 17,** Sugita in view of Matsushita teach the lithium-ion battery of claim 10 as described above.

Neither Sugita nor Matsushita teach wherein a length of the first recess is less than a length of the first lead by 1 – 100 mm, a width of the first recess is greater than a width of the first lead by 1 - 10mm, and a length of the second recess is less than a length of the second lead by 1 - 100mm, a width of the second recess is greater than a width of the second lead by 1 – 10 mm **(claim 14)**.

Neither Sugita nor Matsushita teach wherein a length of the first recess is less than a width of the first film by 1 - 100mm, and a length of the second recess is less than a width of the second film by 1 - 100mm **(claim 15)**.

Lastly, neither Sugita nor Matsushita teach wherein a depth of the first recess is greater than a thickness of the first lead by 0.005 - 0.1mm, and a depth of the second recess is greater than a thickness of the second lead by 0.005 - 0.1mm **(claim 17)**.

However, it has been held that changes in size (dimension) are generally recognized as being within the level of ordinary skill in the art. *In re Rose,* 220 F.2d 459, 105 USPQ 237 (CCPA

1955). Where the only difference between the prior art and the claims is a recitation of relative dimensions of the claimed device, and the device having the claimed dimensions would not perform differently than the prior art device, the claimed device is not patentably distinct from the prior art device. *Gardner v. TEC Syst., Inc.*, 725 F.2d 1338, 220 USPQ 777 (Fed. Cir. 1984), *cert. denied*, 469 U.S. 830, 225 USPQ 232 (1984).

In the instant case, it appears that the prior art device (i.e., the combination of Sugita and Matsushita) have the same claimed features and that any relative difference in size, dimensions, or proportions would not lead to device that performs differently from the claimed device. Moreover, the present claims cover very broad ranges (three orders of magnitude) and there is no indication in the specification that such broad ranges establish the criticality of the ranges. Thus, the claimed device of claims 14, 15 and 17 is not patentably distinct from Sugita in view of Matsushita. Accordingly, it would have been obvious before the effective filing date of the claimed invention to have arrived at the claimed invention of claims 14, 15 and 17 because changes in proportion (size) are within ordinary skill in the art.

22. **Regarding claim 16**, Sugita in view of Matsushita teach the lithium-ion battery of claim 10 as described above. Sugita also necessarily teaches wherein a depth of the first recess is no larger than a thickness of the positive film, and a depth of the second recess is no larger than a thickness of the negative film. The recess portion are taught by Sugita as "exposed portions" (reference numeral 22, 31 or 32; it is noted the reference sign is not provided in FIG. 13 but is apparent from comparison of the other figures) and the undersigned understands this to be a non-coated portion (see [029]), meaning the depth of the recesses are approximately equal to the thickness of the positive/negative films. Thus, the limitation is inherently met.

23. **Regarding claim 19,** Sugita in view of Matsushita teach the lithium-ion battery of claim 10 as described above. Sugita in view of Matsushita also necessarily teaches wherein the first insulating glue layer is disposed on an upper surface and below a lower surface of the first lead in a thickness direction of the first plate and the second plate ("[a] protective tape 27 covers, on the one main surface side of the positive electrode current collector 21A, the positive electrode current collector exposed surface 21a, the lead 25, and the protective layer 28, and, on the other main surface side of the positive electrode current collector 21A, the positive electrode current collector exposed surface 21" (Matsushita, [0052])).

24. Claim 18 is rejected under 35 U.S.C. 103 as being unpatentable over Sugita (WO2013038677A1) in view of Matsushita (US20140120417A1), and further in view of Lee (US20110027636A1).

25. **Regarding claim 18,** Sugita in view of Matsushita teach the lithium-ion battery of claim 10 as described above.

Sugita does not teach wherein a pair of second insulating glues are disposed on two opposing sides of the first film at a first location and a second location, respectively, wherein the second lead on the second plate is sandwiched between the pair of second insulating glue layers in a thickness direction of the first plate and the second plate.

However, Lee teaches the deficient limitations. Lee relates to a wound battery having an active material coating onto the current collectors (abstract) and is thus analogous art.

Lee teaches using a plurality of insulators (90a, 90b, 90c and 90d, see FIG. 1 and [0011]), of which the pairs of 90a + 90d and 90c + 90b satisfy the limitation of, "disposed on two opposing sides of the first film at a first location and a second location." Where a pair of insulators, or all of 90a-90d of the insulators of Lee are used with Sugita and Matsushita as described above, the

limitation of, "wherein the second lead on the second plate is sandwiched between the pair of second insulating glue layers in a thickness direction of the first plate and the second plate" would necessarily be met because the insulators are provided at opposing ends and on opposing surfaces.

Thus, it would have been obvious before the effective filing date of the claimed invention to have modified the lithium-ion battery of claim 10 as taught by Sugita and Matsushita with that of Lee to arrive at the claimed invention. The skilled person would have been motivated to prevent short circuit between the positive and negative electrodes ([0011]).

Conclusion

26. Any inquiry concerning this communication or earlier communications from the examiner should be directed to JASON AARON BARTON whose telephone number is (571)270-3551. The examiner can normally be reached 9:00 AM to 5:00 PM.

Examiner interviews are available via telephone, in-person, and video conferencing using a USPTO supplied web-based collaboration tool. To schedule an interview, applicant is encouraged to use the USPTO Automated Interview Request (AIR) at http://www.uspto.gov/interviewpractice.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Allison Bourke can be reached on (303)297-4684. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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/JASON BARTON/
Examiner, Art Unit 1721

/WILLIAM E MCCLAIN/
Primary Examiner, Art Unit 1721

Notice of References Cited	Application/Control No. 17/746,755	Applicant(s)/Patent Under Reexamination TAO et al.	
	Examiner JASON A BARTON	Art Unit 1721	Page 1 of 1

U.S. PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Name	CPC Classification	US Classification
*	A	US-20140120417-A1	05-2014	Matsushita; Tadashi	H01M50/534	429/211
*	B	US-20110027636-A1	02-2011	Lee; Jin Soo	H01M10/0431	429/94
*	C	US-20060051662-A1	03-2006	Kwak; Yoon Tai	H01M10/0431	429/130
	D					
	E					
	F					
	G					
	H					
	I					
	J					
	K					
	L					
	M					

FOREIGN PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Country	Name	CPC Classification
	N	WO-2013038677-A1	03-2013	WO	ENDO K	H01M10/0587
	O					
	P					
	Q					
	R					
	S					
	T					

NON-PATENT DOCUMENTS

*		Include as applicable: Author, Title Date, Publisher, Edition or Volume, Pertinent Pages)
	U	Machine translation of WO2013038677A1 (Year: 2013)
	V	
	W	
	X	

*A copy of this reference is not being furnished with this Office action. (See MPEP § 707.05(a).)
Dates in MM-YYYY format are publication dates. Classifications may be US or foreign.

Search Notes	Application/Control No.	Applicant(s)/Patent Under Reexamination
	17/746,755	TAO et al.
	Examiner	Art Unit
	JASON A BARTON	1721

CPC - Searched*		
Symbol	**Date**	**Examiner**
H01M10/0431	07/14/2022	JB
H01M10/0587	07/14/2022	JB
H01M50/531, 533, 538	07/14/2022	JB
H01M50/5$	07/14/2022	JB
H01M.cpcl.	07/14/2022	JB

CPC Combination Sets - Searched*		
Symbol	**Date**	**Examiner**

US Classification - Searched*			
Class	**Subclass**	**Date**	**Examiner**

* See search history printout included with this form or the SEARCH NOTES box below to determine the scope of the search.

Search Notes		
Search Notes	**Date**	**Examiner**
Global dossier search	07/14/2022	JB
Applicant and inventor search in SEARCH	07/14/2022	JB
CPC and CPC-limited text search in SEARCH	07/14/2022	JB
“More like this” searching in SEARCH and IP.COM	07/14/2022	JB

/JASON BARTON/ Examiner, Art Unit 1721	

Search Notes	Application/Control No.	Applicant(s)/Patent Under Reexamination
	17/746,755	TAO et al.
	Examiner	Art Unit
	JASON A BARTON	1721

Interference Search			
US Class/CPC Symbol	US Subclass/CPC Group	Date	Examiner

/JASON BARTON/ Examiner, Art Unit 1721	

17746755

Report Run Date: 2022-07-15 UTC
Searches: 15
Markers: 1

Search #	Timestamp	Results	Page
1	2022-07-12 23:31 UTC	~27,652,907	4
2	2022-07-12 23:33 UTC	~27,652,907	4
3	2022-07-12 23:33 UTC	~27,652,907	4
4	2022-07-12 23:36 UTC	~2,345,469	4
5	2022-07-12 23:36 UTC	~239,658	4
6	2022-07-12 23:37 UTC	~35,161	5
7	2022-07-12 23:37 UTC	~13,875	5
8	2022-07-12 23:38 UTC	~8835	5
9	2022-07-13 15:43 UTC	~26,331	5
10	2022-07-13 15:43 UTC	~26,326	5
11	2022-07-13 17:26 UTC	~255	6
12	2022-07-13 17:29 UTC	13	6
13	2022-07-15 15:47 UTC	13	6
14	2022-07-15 15:47 UTC	~408	6
15	2022-07-15 19:38 UTC	~231	7

Content: Patents + NPL (190)

US Patents | US Designs | US Applications | EPO Patents | EPO Applications | China Patents | China Applications | Japan Patents | Japan Applications | Korea Patents | Korea Applications | WIPO Applications | Argentina Patents | Argentina Applications | Brazil Patents | Brazil Applications | Canada Patents | Canada Applications | Chile Patents | Chile Applications | Colombia Applications | Costa Rica Applications | Cuba Patents | Cuba Applications | Dominican Republic Applications | Ecuador Patents | Ecuador Applications | El Salvador Applications | Guatemala Applications | Honduras Applications | Mexico Patents | Mexico Applications | Nicaragua Patents | Panama Applications | Peru Applications | Trinidad & Tobago Patents | Uruguay Applications | Austria Patents | Austria Applications | Belarus Patents | Belgium Patents | Belgium Applications | Bosnia & Herzegovina Patents | Bosnia & Herzegovina Applications | Bulgaria Patents | Bulgaria Applications | Croatia Patents | Croatia Applications | Czech Republic Patents | Czech Republic Applications | Czechoslovakia Patents | Czechoslovakia Applications | Denmark Patents | Denmark Applications | Estonia Patents | Estonia Applications | EUIPO Patents | Finland Patents | Finland Applications | France Patents | France Applications | Germany Patents | Germany Applications | Great Britain Patents | Great Britain Applications | Greece Patents | Greece Applications | Hungary Patents | Hungary Applications | Iceland Patents | Iceland Applications | Ireland Patents | Ireland Applications | Italy Patents | Italy Applications | Latvia Patents | Latvia Applications | Lithuania Patents | Lithuania Applications | Luxembourg Patents | Malta Patents | Monaco Patents | Montenegro Patents | Montenegro Applications | Netherlands Patents | Netherlands Applications | Norway Patents | Norway Applications | Poland Patents | Poland Applications | Portugal Patents | Portugal Applications | Republic of Moldova Patents | Republic of Moldova Applications | Romania Patents | Romania Applications | San Marino Patents | San Marino Applications | Serbia Patents | Serbia Applications | Slovakia Patents | Slovakia Applications | Slovenia Patents | Spain Patents | Spain Applications | Sweden Patents | Sweden Applications | Switzerland Patents | Switzerland Applications | Ukraine Patents | Yugoslavia/Serbia and Montenegro Patents | Yugoslavia/Serbia and Montenegro Applications | Armenia Patents | Australia Patents | Australia Applications | Cyprus Patents | Gulf Cooperation Council Patents | Hong Kong Patents | India Patents | India Applications | Indonesia Patents | Indonesia Applications | Israel Applications | Jordan Patents | Jordan Applications | Kyrgyzstan Patents | Macao Applications | Malaysia Patents | Mongolia Patents | New Zealand Patents | Philippines Patents | Philippines Applications | Saudi Arabia Patents | Saudi Arabia Applications | Singapore Patents | Singapore Applications | Taiwan Patents | Taiwan Applications | Tajikistan Patents | Tajikistan Applications | Thailand Patents | Thailand Applications | Uzbekistan Patents | Vietnam Patents | Algeria Patents | ARIPO Patents | ARIPO Applications | Egypt Patents | Kenya Patents | Malawi Patents | Morocco Patents | Morocco Applications | OAPI Patents | South Africa Patents | Tunisia Applications | Zambia Patents | Zimbabwe Patents | EAPO Patents | EAPO Applications | Georgia Patents | Georgia Applications | Kazakhstan Patents | Kazakhstan Applications | Russia Patents | Russia Applications | Turkey Patents | Turkey Applications | IEEE Xplore Publications: IEEE Periodicals | IEEE Xplore Publications: IEEE Conferences | IEEE Xplore Publications: IEEE Standards | IEEE Xplore Publications: IEEE Early Access | IEEE Xplore Publications: SMPTE Periodicals | IEEE Xplore Publications: SMPTE Conferences | IEEE Xplore Publications: SMPTE Standards | IEEE Xplore Publications: MIT Press eBooks | IEEE Xplore Publications: Wiley-IEEE eBooks | IEEE Xplore Publications: IBM Periodicals | IEEE Xplore Publications: URSI Periodicals | IEEE Xplore Publications: VDE Conferences | IEEE Xplore Publications: Periodicals from China | IP.com Prior Art Database: The IP.com Journal | IP.com Prior Art Database: Internet Society RFC | IP.com Prior Art Database: IBM TDB Archive | IP.com Prior Art Database: Legacy Journals | IP.com Prior Art Database: Software Patent Institute | OnePetro.org: Periodicals at OnePetro.org | OnePetro.org: Conferences at OnePetro.org | Other Literature: IBM Redbooks | Other Literature: PubMed Central | Other Literature: arXiv.org

0104

1 **2022-07-12 23:31 UTC | ~27,652,907 results from**

De-Dup: Extended Family Numbers (PAT only) | **Cut-off:** None | **Sort:** Relevance

Main Concept: Document
US20150207111 Lithium ion battery having desirable safety performance (view)

Concept Modifiers: None

Filters: None

2 **2022-07-12 23:33 UTC | ~27,652,907 results from**

De-Dup: Extended Family Numbers (PAT only) | **Cut-off:** None | **Sort:** Relevance

Main Concept: Same as Search 1

Concept Modifiers (1):
1. More Like Document: US20150207111 Lithium ion battery having desirable safety performance (view)

Filters: None

3 **2022-07-12 23:33 UTC | ~27,652,907 results from**

De-Dup: Extended Family Numbers (PAT only) | **Cut-off:** None | **Sort:** Relevance

Main Concept: Same as Search 1

Concept Modifiers: Same as Search 2

Filters: None

4 **2022-07-12 23:36 UTC | ~2,345,469 results from**

De-Dup: Extended Family Numbers (PAT only) | **Cut-off:** None | **Sort:** Relevance

Main Concept: Text
recess and electrode lead or tab

Concept Modifiers: Same as Search 2

Filters: None

5 **2022-07-12 23:36 UTC | ~239,658 results from**

De-Dup: Extended Family Numbers (PAT only) | **Cut-off:** None | **Sort:** Relevance

Main Concept: Same as Search 4

Concept Modifiers (2):
2. More Like Text: insulating glue or tape or adhesive
1. More Like Document: US20150207111 Lithium ion battery having desirable safety performance (view)

Filters: None

6 **2022-07-12 23:37 UTC | ~35,161 results from**

De-Dup: Extended Family Numbers (PAT only) | **Cut-off:** None | **Sort:** Relevance

Main Concept: Same as Search 4

Concept Modifiers (3):
3. More Like Text: wound battery or strip-shaped
2. More Like Text: insulating glue or tape or adhesive
1. More Like Document: US20150207111 Lithium ion battery having desirable safety performance (view)

Filters: None

7 **2022-07-12 23:37 UTC | ~13,875 results from**

De-Dup: Extended Family Numbers (PAT only) | **Cut-off:** None | **Sort:** Relevance

Main Concept: Same as Search 4

Concept Modifiers: Same as Search 6

Filters (1):
Publication Date: To 2014-01-17

8 **2022-07-12 23:38 UTC | ~8835 results from**

De-Dup: Extended Family Numbers (PAT only) | **Cut-off:** None | **Sort:** Relevance

Main Concept: Same as Search 4

Concept Modifiers (3):
3. More Like Text: wound or strip-shaped or cylindrical
2. More Like Text: insulating glue or tape or adhesive
1. More Like Document: US20150207111 Lithium ion battery having desirable safety performance (view)

Filters: Same as Search 7

9 **2022-07-13 15:43 UTC | ~26,331 results from**

De-Dup: Extended Family Numbers (PAT only) | **Cut-off:** None | **Sort:** Relevance

Main Concept: Document
US20140349179 Secondary battery (view)

Concept Modifiers: Same as Search 8

Filters: Same as Search 7

10 **2022-07-13 15:43 UTC | ~26,326 results from**

De-Dup: Extended Family Numbers (PAT only) | **Cut-off:** None | **Sort:** Relevance

Main Concept: Same as Search 9

Concept Modifiers (4):
4. More Like Document: US20140349179 Secondary battery (view)
3. More Like Text: wound or strip-shaped or cylindrical
2. More Like Text: insulating glue or tape or adhesive
1. More Like Document: US20150207111 Lithium ion battery having desirable safety performance (view)

Filters: Same as Search 7

11 **2022-07-13 17:26 UTC | ~255 results from**

De-Dup: Extended Family Numbers (PAT only) | **Cut-off:** None | **Sort:** Relevance

Main Concept: Text
recessed portion

Concept Modifiers: Same as Search 10

Filters: Same as Search 7

12 **2022-07-13 17:29 UTC | 13 results from**

De-Dup: Extended Family Numbers (PAT only) | **Cut-off:** None | **Sort:** Relevance

Main Concept: Same as Search 11

Concept Modifiers (5):
5. More Like Text: energy density
4. More Like Document: US20140349179 Secondary battery (view)
3. More Like Text: wound or strip-shaped or cylindrical
2. More Like Text: insulating glue or tape or adhesive
1. More Like Document: US20150207111 Lithium ion battery having desirable safety performance (view)

Filters: Same as Search 7

13 **2022-07-15 15:47 UTC | 13 results from**

De-Dup: Extended Family Numbers (PAT only) | **Cut-off:** None | **Sort:** Relevance

Main Concept: Same as Search 11

Concept Modifiers: Same as Search 12

Filters: Same as Search 7

14 **2022-07-15 15:47 UTC | ~408 results from**

De-Dup: Extended Family Numbers (PAT only) | **Cut-off:** None | **Sort:** Relevance

Main Concept: Text
insulating polymer for electrode lead

Concept Modifiers: Same as Search 12

Filters: Same as Search 7

15 **2022-07-15 19:38 UTC | ~231 results from**

De-Dup: Extended Family Numbers (PAT only) | **Cut-off:** None | **Sort:** Relevance

Main Concept: Text
pair of adhesive tape

Concept Modifiers: Same as Search 12

Filters: Same as Search 7

Bibliographic Data

Application No: 17/746,755

Foreign Priority claimed: (•) Yes ( ) No

35 USC 119 (a-d) conditions met: [✓] Yes [ ] No [ ] Met After Allowance

Verified and Acknowledged: /JASON BARTON/ Examiner's Signature [ ] Initials

Title: LITHIUM-ION BATTERY HAVING DESIRABLE SAFETY PERFORMANCE

FILING or 371(c) DATE	CLASS	GROUP ART UNIT	ATTORNEY DOCKET NO.
05/17/2022	429	1721	024607-02-5119-US
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APPLICANTS

NINGDE AMPEREX TECHNOLOGY LIMITED, Ningde, CHINA

INVENTORS

Tao TAO, Ningde, CHINA

Ming Liang MO, Ningde, CHINA

CONTINUING DATA

This application is a CON of 17407081 08/19/2021

17407081 is a CON of 16113938 08/27/2018ABN

16113938 is a CON of 14596873 01/14/2015 PAT 10541441

FOREIGN APPLICATIONS

CHINA CN201420030319.4 01/17/2014

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05/24/2022

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CHINA

ADDRESS

Morgan, Lewis & Bockius LLP (PA)
1400 Page Mill Road
Palo Alto, CA 94304-1124
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国際事務局

(43) 国際公開日
2013 年 3 月 21 日 (21.03.2013)

WIPO PCT

(10) 国際公開番号
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(22) 国際出願日： 2012 年 9 月 13 日 (13.09.2012)

(25) 国際出願の言語： 日本語

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(30) 優先権データ：
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(71) 出願人 (米国を除く全ての指定国について)：パナソニック株式会社 (PANASONIC CORPORATION) [JP/JP]; 〒5718501 大阪府門真市大字門真 1006 番地 Osaka (JP).

(72) 発明者；および

(75) 発明者/出願人 (米国についてのみ)：杉田 康成 (SUGITA, Yasunari). 遠藤 一樹 (ENDO, Kazuki). 藤川 万郷 (FUJIKAWA, Masato). 西野 肇 (NISHINO, Hajime).

(74) 代理人：特許業務法人前田特許事務所 (MAEDA & PARTNERS); 〒5410053 大阪府大阪市中央区本町 2 丁目 5 番 7 号 大阪丸紅ビル 5 階 Osaka (JP).

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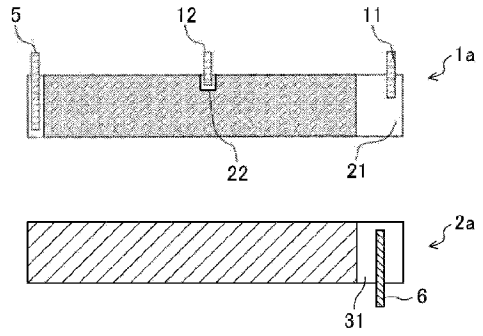
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添付公開書類：
- 国際調査報告 (条約第 21 条 (3))

(54) Title: NONAQUEOUS ELECTROLYTE SECONDARY CELL

(54) 発明の名称：非水電解質二次電池

[図2]



(57) Abstract: In a nonaqueous electrolyte secondary cell of the present invemion, an electrode group (4) on which are wound a positive electrode plate (1) and a negative electrode plate (2), obtained by coating a collector with an active substance layer, with a separator (3) therebetween, is housed in a cell casing (7). Of the positive electrode plate and the negative pole plate, the pole plate that is of the opposite polarity of the cell casing has at the outermost circumference of the electrode group a first collector exposed part (21) in which a collector of at least once winding is exposed, and a second collector exposed part (22) formed at a portion separated from the first collector exposed part. A first collector tab (11) is disposed in the first collector exposed part, and a second collector tab (12) is provided to the second collector exposed part. The first and second collector tabs are connected outside the electrode group.

(57) 要約：

[続葉有]

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非水電解質二次電池は、集電体上に活物質層が塗着された正極板１及び負極板２が、セパレータ３を介して捲回された電極群４が電池缶７に収容され、正極板及び負極板のうち、電池缶と異極性の極板は、電極群の最外周側で、１周以上の集電体が露出した第１の集電体露出部２１と、第１の集電体露出部と離れた部位に形成された第２の集電体露出部２２とを有し、第１の集電体露出部に第１の集電タブ１１が設けられ、第２の集電体露出部に第２の集電タブ１２が設けられ、第１の集電タブ及び第２の集電タブは、電極群外で接続されている。

明　細　書

発明の名称　：非水電解質二次電池

技術分野

[0001] 本発明は、非水電解質二次電池の極板構造に関する。

背景技術

[0002] 近年、ノート型パーソナルコンピュータ、携帯電話等のポータブル機器の普及により、その電源である電池の需要が高まっている。特に、小型かつ軽量で、エネルギー密度が高く、繰り返し充放電が可能な二次電池の需要が高まっている。また、最近では、電動工具、ハイブリッドカー、電気自動車などの駆動用電源としての新しい需要が増加しつつある。

[0003] このような需要に対して、リチウムイオン二次電池に代表される非水電解質二次電池の研究開発が活発に行われている。非水電解質二次電池は、機器の高性能化及び高出力化に伴って、より大きなエネルギーを保有するようになっている。そのため、異常時に発生する熱量も大きなものとなっている。

[0004] 電池の異常な発熱とは、例えば、電池の内部短絡または過充電時の発熱である。特に、釘刺し等の外部異物によって電池缶及び電極群が変形して、内部短絡が生じた場合、正極活物質に短絡電流が流れることによって発生する熱量が大きくなるため、電池の安全性が問題になる。

[0005] このような内部短絡に対して、特許文献１または２には、捲回された電極群が電池缶に収容された非水電解質二次電池において、正極の集電体露出部、及びそれに対向して配置された負極の集電体露出部を、捲回方向に１周以上の長さにわたって形成することが記載されている。特に、当該集電体露出部を、電極群の最外周側に形成することによって、釘刺し等による内部短絡が発生しても、最外周側に設けられた正極及び負極の集電体露出部同士の短絡の方が、内周側の活物質同士の短絡よりも抵抗が小さいため、集電体露出部同士の短絡箇所に、集中的に短絡電流が流れる。その結果、電池の急激な温度上昇を抑制することができる。

先行技術文献

特許文献

[0006] 特許文献1 :特開平０８—１５３５４２号公報

特許文献2 :特開平０９—１８０７６１号公報

発明の概要

発明が解決しようとする課題

[0007] 電極群の外周側で集電体露出部同士の短絡が生じた場合でも、電極群の内周側の活物質は電位、即ち電気エネルギーを有しているため、正極及び負極の集電体を通じて、内周側から、外周側の短絡箇所に向かう方向に短絡電流が生じる。そのとき、電極群の内周側で生じた活物質同士の短絡箇所にも、集電体を通じて流れる短絡電流が流れ込むため、内周側でも、局所的な熱が生じる。特に、非水電解質二次電池の高容量化、高出力化が進むと、短絡電流も増大するため、従来の対策のみでは、十分に電池の安全性を確保することが難しい。

[0008] 本発明は、かかる課題に鑑みなされたもので、その主な目的は、異常時に電池内で内部短絡が生じた場合でも、安全性の高い非水電解質二次電池を提供することにある。

課題を解決するための手段

[0009] 上記の課題を解決するために、本発明は、捲回された電極群を備えた非水電解質二次電池において、電極群の最外周側に１周以上の集電体露出部を設けるとともに、それとは別の部位に、他の集電体露出部を設け、この２つの集電体露出部を、各集電体露出部にそれぞれ接続された２つの集電タブを介して電気的に接続した構成を採用する。

[001 0] すなわち、本発明に係る発明は、正極集電体上に正極活物質層が塗着された正極板と、負極集電体上に負極活物質層が塗着された負極板と、正極板及び負極板がセパレータを介して捲回された電極群と、電極群が収容された電池缶とを備えた非水電解質二次電池であって、正極板及び負極板のうち、電

池缶と異極性の極板は、電極群の最外周側で、捲回方向に1周以上の長さにわたって集電体が露出した第1の集電体露出部と、第1の集電体露出部と離れた部位に形成された第2の集電体露出部とを有し、第1の集電体露出部に第1の集電タブが設けられ、第2の集電体露出部に第2の集電タブが設けられ、かつ、第1の集電タブ及び第2の集電タブは、電極群外で接続されていることを特徴とする。

[001 1] このような構成により、釘等の外部異物によって電池缶に応力が加わって、電極群に内部短絡が生じても、最外周側の第1の集電体露出部で、抵抗の小さな内部短絡を発生させるとともに、内周側で発生した短絡電流を、第2の集電体露出部から、第1及び第2の集電タブを介して、第1の集電体露出部に分流することができる。これにより、異常時に電池内で内部短絡が生じた場合でも、安全性の高い非水電解質二次電池を提供することができる。

発明の効果

[001 2] 本発明によれば、異常時に電池内で内部短絡が生じた場合でも、安全性の高い非水電解質二次電池を提供することができる。

図面の簡単な説明

[001 3] [図1]本発明の一実施形態における円筒型リチウムイオン電池の構成を模式的に示した断面図である。

[図2]本発明の一実施形態における極板の構成を模式的に示した平面図で、図2（a）は正極板の平面図、図2（b）は負極板の平面図である。

[図3]本発明の他の実施形態における正極板の構成を模式的に示した平面図である。

[図4]本発明の他の実施形態における正極板の構成を模式的に示した平面図である。

[図5]本発明の他の実施形態における正極板の構成を模式的に示した平面図である。

[図6]本発明の他の実施形態における正極板の構成を模式的に示した平面図である。

[図7]本発明の他の実施形態における正極板の構成を模式的に示した平面図である。

[図8]本発明の他の実施形態における正極板の構成を模式的に示した平面図である。

[図9]本発明の他の実施形態における正極板の構成を模式的に示した平面図である。

[図10]本発明の他の実施形態における正極板の構成を模式的に示した平面図である。

[図11]本発明の他の実施形態における正極板の構成を模式的に示した平面図である。

[図12]本発明の他の実施形態における負極板の構成を模式的に示した平面図である。

[図13]本発明の他の実施形態における負極板の構成を模式的に示した平面図である。

発明を実施するための形態

[0014] 本発明は、正極集電体上に正極活物質層が塗着された正極板と、負極集電体上に負極活物質層が塗着された負極板と、正極板及び負極板がセパレータを介して捲回された電極群と、電極群が収容された電池缶とを備えた非水電解質二次電池に関する。正極板及び負極板のうち、電池缶と異極性の極板は、電極群の最外周側で、捲回方向に1周以上の長さにわたって集電体が露出した第1の集電体露出部と、第1の集電体露出部と離れた部位に形成された第2の集電体露出部とを有し、第1の集電体露出部に第1の集電タブが設けられ、第2の集電体露出部に第2の集電タブが設けられ、かつ、第1の集電タブ及び第2の集電タブは、電極群外で接続されている。

[001 5] 釘等の外部異物によって、電池缶に応力が加わって、電極群に内部短絡が生じたとき、電極群の最外周側に設けられた第1の集電体露出部と、それに対向する極板との間で、抵抗の小さい内部短絡が発生する。このとき、第1の集電体露出部と第2の集電体露出部とは、第1の集電タブと第2の集電タ

プとによって、電極群外で接続されているため、電極群の内周側で発生した集電体を流れる短絡電流を、第２の集電体露出部から、第１の集電タプ及び第２の集電タプを介して、第１の集電体露出部に分流することができる。これにより、電極群の内周側で活物質層同士の内部短絡が発生しても、当該短絡箇所に、集電体を通じて流れ込む短絡電流を抑制することができる。その結果、活物質層を流れる短絡電流による異常発熱を抑制することが可能となる。

[001 6] 一方、上記のような分流経路が設けられていないと、内周側から集電体を通じて第１の集電体露出部の短絡箇所に流れる短絡電流が、内周側で発生した活物質層同士の短絡箇所に流れ込むのを回避することができない。その結果、内周側で発生した短絡箇所において、局所的な異常発熱の発生を抑制することが困難になる。

[001 7] 本発明において、第２の集電体露出部は、極板の活物質層が塗着された内周側端部と外周側端部との距離をＬとしたとき、内周側端部から3／４Ｌ以下の範囲に形成されていることが好ましい。これにより、集電体を流れる短絡電流を、第２の集電体露出部から第１の集電体露出部に分流する効果をより高めることがでる。

[001 8] 本発明において、極板に電池外部へ出力するためのリ一ドを設け、第２の集電体露出部を第１の集電体露出部とリ一ドとの間に形成することが好ましし。また、リ一ドは、電極群の最内周側に設けられていることが好ましい。これにより、集電体を流れる短絡電流を、第２の集電体露出部から第１の集電体露出部に分流する効果をより高めることができる。

[001 9] 本発明において、第２の集電体露出部は、捲回方向に１周以上の長さにわたって集電体が露出しているのが好ましい。また、第２の集電体露出部は、集電体の両面が露出していてもよい。これにより、最外周側の第１の集電体露出部で発生した抵抗の低い内部短絡に加えて、内周側の第２の集電体露出部に、抵抗の低い内部短絡箇所を分散して設けることができる。

[0020] 本発明において、第１の集電体露出部は、集電体の両面が露出していても

よい。これにより、最外周側の集電体露出部で生じる短絡抵抗をより小さくすることができる。

[0021] 本発明において、極板は、第1の集電体露出部と第2の集電体露出部との間に、第3の集電体露出部が形成され、第3の集電体露出部は、捲回方向に1周以上の長さにわたって集電体が露出していることが好ましい。これにより、最外周側の第1の集電体露出部で発生した抵抗の低い内部短絡に加えて、内周側の第3の集電体露出部に、抵抗の低い内部短絡箇所を分散して設けることができる。

[0022] 本発明において、正極板及び負極板のうち、電池缶と同極性の極板は、第1の集電体露出部と対向する部位に、集電体が露出した集電体露出部が形成されていることが好ましい。また、電池缶と同極性の極板は、第2の集電体露出部、または／及び第3の集電体露出部と対向する部位に、集電体が露出した集電体露出部が形成されていることが好ましい。これにより、最外周側及び内周側の集電体露出部で生じる短絡抵抗をより小さくすることができる。

[0023] 本発明において、正極板及び負極板のうち、電池缶と同極性の極板は、電極群の最外周側で、捲回方向に1周以上の長さにわたって集電体が露出した集電体露出部と、該集電体露出部と離れた部位に形成された他の集電体露出部とを有し、最外周側の集電体露出部にリードが設けられ、他の集電体露出部に集電タブが設けられ、かつ、リード及び集電タブは、電池缶に接続されていることが好ましい。これにより、集電体を流れる短絡電流を、集電体露出部から、集電タブ及び電池缶を介して、最外周側の集電体露出部に分流することができる。

[0024] 本発明において、電池缶が、例えばラミネートフイルムのような絶縁材料から構成され、正極板及び負極板のどちらとも、電池缶に電気的に接続されていない非水電解質二次電池の場合でも、本発明の技術的思想を用いることで、釘刺しなどの外部異物に起因した内部短絡による異常発熱を抑制し、安全性の高い電池を提供することができる。

[0025] 以下、本発明の実施形態を図面に基づいて詳細に説明する。なお、本発明は、以下の実施形態に限定されるものではない。また、本発明の効果を奏する範囲を逸脱しない範囲で、適宜変更は可能である。さらに、他の実施形態との組み合わせも可能である。

[0026] 図１は、本発明の一実施形態における円筒型リチウムイオン電池の構成を模式的に示した断面図である。

[0027] 図１において、円筒型リチウムイオン電池は、アルミニウム箔からなる正極集電体に、正極活物質層が塗着された正極板１と、銅箔からなる負極集電体に、負極活物質層が塗着された負極板２と、正極板１と負極板２との間に、厚み１６μｍのセパレータ３を配置して捲回された電極群４を備えている。正極集電体には、正極リード５が抵抗溶接され、負極集電体には、負極リード６が抵抗溶接されている。電極群４は、電解液とともに、電池缶７に収納されている。電極群４の上部及び下部には、上部絶縁板１０ａ及び下部絶縁板１０ｂが配置されている。負極リード６の一端は、電池缶７の底部と抵抗溶接されている。正極リード５の一端は、金属製フィルター９にレーザ溶接されている。電池缶７の開口端は、ガスケット１０ｃを介して、封口板８で封口されている。

[0028] 図２は、本発明の一実施形態における極板の構成を模式的に示した図で、図２（ａ）は正極板１ａの平面図、図２（ｂ）は負極板２ａの平面図である。

[0029] 図２（ａ）に示すように、正極板１ａには、電極群４の最内周側に位置する箇所に正極リード５が設けられている。なお、正極リード５は、正極集電体上の正極活物質層が塗着されていない集電体露出部に形成される。また、電極群４の最外周端部には、捲回方向に１周以上の長さにわたって正極集電体が露出した第１の集電体露出部２１が設けられ、第１の集電体露出部２１には、第１の集電タブ１１が形成されている。さらに、正極板１ａには、第１の集電体露出部２１と離れた部位に、第２の集電体露出部２２が設けられ、第２の集電体露出部２２には、第２の集電タブ１２が形成されている。第

１の集電タブ１１と第２の集電タブ１２は、電極群４外で接続されている。第１の集電タブ１１と第２の集電タブ１２との接続方法は、特に制限されないが、例えば、図１に示すように、第１の集電タブ１１及び第２の集電タブ１２の一端を、それぞれ、金属製フィルター９にレーザ溶接することによつて、金属製フィルター９を介して接続することができる。また、第１の集電タブ１１と第２の集電タブ１２とを、直接、溶接してもよい。

[0030] 図２（ｂ）に示すように、負極板２ａには、電極群４の最外周側に位置する箇所に負極リード6が設けられている。

[0031] 本実施形態において、第１の集電体露出部２１と第２の集電体露出部２２とは、それらの間に存在する正極集電体やその上に塗着された正極活物質層とは別に、第１の集電タブ１１及び第２の集電タブ１２を介して、電気的に接続されている。

[0032] 電極群４の最外周側にある第１の集電体露出部２１で内部短絡が生じた場合、電極群４の内周側で生じる短絡電流は、第１の集電タブ１１と第２の集電タブ１２がないと、正極集電体とその上に塗着された正極活物質層を流れる。そのため、電極群４の内周側の活物質層同士でも内部短絡が生じると、その短絡箇所に短絡電流が流れて発熱が生じる。

[0033] これに対して、第１の集電体露出部２１と第２の集電体露出部２２とが、第１の集電タブ１１及び第２の集電タブ１２を介して、電気的に接続されていると、電極群４の内周側で生じた短絡電流を、正極集電体とその上に塗着された正極活物質層に流れるのとは別に、第１の集電タブ１１と第２の集電タブ１２を介して、第２の集電体露出部２２から第１の集電体露出部２１へ分流することができる。そのため、釘等の外部異物により電極群４の外周側から内周側へ、短絡箇所が進行する場合でも、第１の集電体露出部２１への短絡電流の分流により、内周側で発生した短絡箇所に、正極集電体を通じて流れ込む短絡電流を抑制することができる。その結果、正極活物質層を流れる短絡電流による異常発熱を抑制することが可能となる。

[0034] 本発明において、第２の集電体露出部２２、第２の集電タブ１２、及び正

極リード5の配置場所や形状等は、特に制限されない。以下、本発明における他の実施形態を、図面を参照しながら説明する。

[0035] 図3は、本発明の他の実施形態における正極板1bの構成を模式的に示した平面図である。

[0036] 図3に示すように、本実施形態では、第2の集電体露出部22は、捲回方向に1周以上の長さにわたって集電体が露出している。これにより、最外周側の第1の集電体露出部21で発生した抵抗の低い内部短絡に加えて、内周側の第2の集電体露出部22に、抵抗の低い内部短絡箇所を分散して設けることができる。

[0037] 図4は、本発明の他の実施形態における正極板1cの構成を模式的に示した平面図である。

[0038] 図4に示すように、本実施形態では、第1の集電体露出部21と第2の集電体露出部22との間に、第3の集電体露出部23が形成され、第3の集電体露出部23は、捲回方向に1周以上の長さにわたって集電体が露出している。これにより、最外周側の第1の集電体露出部で発生した抵抗の低い内部短絡に加えて、内周側の第3の集電体露出部に、抵抗の低い内部短絡箇所を分散して設けることができる。

[0039] 図2～図4に示した正極板1a、1b、1cでは、正極リード5が、電極群4の最内周側、すなわち、第1の集電体露出部21と反対側の部位に形成されているが、これに限定されず、正極板のいずれの部位に形成されていてもよい。

[0040] 図5は、本発明の他の実施形態における正極板1dの構成を模式的に示した平面図である。

[0041] 図5に示すように、本実施形態では、正極リード5は、正極板1dの内周側 (中央部) に形成されている。また、第2の集電体露出部22は、第1の集電体露出部21と正極リード5との間に形成されている。正極リード5を、正極板1dの内周側に形成した場合、正極集電体の集電抵抗が低減されるため、電池の高出力化が図られる。このような高出力を図った電池に対して

も、異常時に電池内で内部短絡が生じた場合、電池の安全性を確保することができる。

[0042] 本発明では、第１及び第２の集電タブ１１、１２を互いに接続することによって、内周側で発生した短絡電流を、第２の集電体露出部２２から第１の集電体露出部に分流する経路を設けているが、第２の集電タブ１２を、正極リード5と兼用してもよい。この場合、正極リード5及び第１の集電タブ１１は、電極群４外で直接接続しても、あるいは、金属製フィルター９を介して接続してもよい。

[0043] 図６～図９は、本発明の他の実施形態における正極板１ｅ～１ｈの構成を模式的に示した平面図である。

[0044] 図６に示した正極板１ｅでは、第２の集電タブ１２を兼ねる正極リード5が、電極群４の最内周側に設けられており、図７に示した正極板１ｆでは、第２の集電タブ１２を兼ねる正極リード5が、電極群４の内周側に設けられている。また、図８に示した正極板１ｇでは、電極群４の内周側に設けらた第２の集電体露出部２２と、最外周側に設けられた第１の集電体露出部２１との間に、第３の集電体露出部２３を設けている。また、図９に示した正極板１ｈでは、電極群４の内周側に設けらた第２の集電体露出部２２は、捲回方向に１周以上の長さにわたって集電体が露出している。このような構成により、部品点数やプロセス工数を減らすことができる。

[0045] 上記実施形態では、第１の集電タブ１１及び第２の集電タブ１２を、電池の封口板８側で接続したが、電池缶７の底部側で接続してもよい。前者の場合には、第１及び第２の集電タブ１１、１２は、正極リード5と、捲回軸に対して同じ方向に形成され、後者の場合には、第１及び第２の集電タブ１１、１２は、正極リード5と、捲回軸に対して反対方向に形成される。なお、後者の場合、互いに接続された第１及び第２の集電タブが、負極リード6と電気的に干渉しないよう、絶縁を施すとよい。

[0046] 図１０、図１１は、本発明の他の実施形態における正極板１ｉ、１ｊの構成を模式的に示した平面図である。

[0047] 図１０に示した正極板１ｉでは、正極リード5が、電極群４の最内周側に設けられ、第２の集電タブ１２が、電極群４の内周側に設けられている。また、図１１に示した正極板１ｊでは、正極リード5が、電極群４の内周側に設けられ、第２の集電タブ１２が、正極リード5に対して、第１の集電タブ１１と反対側に設けられている。

[0048] 本発明において、第２の集電体露出部２２は、正極板１の正極活物質層が塗着された内周側端部と外周側端部との距離をＬとしたとき、内周側端部から3/ ４Ｌ以下の範囲に形成されていることが好ましい。これにより、正極集電体を流れる短絡電流を、第２の集電体露出部２２から第１の集電体露出部２１に分流する効果をより高めることがでる。

[0049] 本発明において、電池缶７と同極性の負極板２は、第１の集電体露出部２１と対向する部位に、負極集電体が露出した集電体露出部が形成されていることが好ましい。また、負極板２は、第２の集電体露出部２２、または/ 及び第３の集電体露出部２３と対向する部位に、負極集電体が露出した集電体露出部が形成されていることが好ましい。これにより、最外周側及び内周側の集電体露出部で生じる短絡抵抗をより小さくすることができる。

[0050] 上記実施形態では、電池缶７と異極性の正極板１について、第１及び第２の集電タブ１１、１２を電極群４外で接続することによって、電極群４の内周側で発生し、正極集電体を流れる短絡電流を、第２の集電体露出部から第１の集電体露出部に分流する経路を設け、これにより、内周側で発生した短絡箇所での局所的な異常発熱の発生を抑制する効果を得た。これと同様の効果は、電池缶７と同極性の負極板２についても実現することができる。

[0051] 図１２は、本発明の他の実施形態における負極板２ｂの構成を模式的に示した平面図である。

[0052] 図１２に示すように、本実施形態における負極板２ｂは、電極群４の最外周側で、捲回方向に１周以上の長さにわたって負極集電体が露出した集電体露出部３１と、電極群４の最内周側で、負極集電体が露出した集電体露出部３２とを有している。最外周側の集電体露出部３１に負極リード6が設けら

れ、最内周側の集電体露出部３２に集電タブ１６が設けられている。そして、負極リード6及び集電タブ１６は、電池缶７に接続されている。

[0053] 釘等の外部異物により、電極群４の最外周側で内部短絡が生じた場合、最内周側の集電体露出部３２は、集電タブ１６、電池缶７、釘等の外部異物を介して、負極板２の最外周側の集電体部露出部３１と電気的に接続した状態となる。したがって、電極群４の内周側の負極板２で生じた短絡電流は、負極集電体と最外周側の短絡点との間で流れる経路とは別に、電池缶７と接続された集電タブ１６と電池缶７を通じて最外周側の短絡点に分流する経路を設けることができる。電極群４の内周側で内部短絡が生じた場合、負極集電体を流れる短絡電流を分流すると同時に、最外周側の抵抗の低い短絡点に短絡電流を分流することができるため、電極群４の内周側で短絡が生じた場合でも、異常な発熱を抑制することができる。

[0054] 本実施形態において、負極リード6が負極板２の最外周側に設けられると同時に、内周側のいずれかの箇所に集電タブ１６が設けられていることが好ましい。釘等の外部異物による電気的な接続がなくても、第２の集電タブ１６と電池缶７と負極リード6との電気的な接続が形成されるため、短絡電流の分流を効果的に発現することができる。

[0055] 図１３は、本発明の他の実施形態における負極板２ｃの構成を模式的に示した平面図である。

[0056] 図１３に示した負極板２ｃでは、集電タブ１６を兼用する負極リード6が、負極板２の長手方向の中央部に設けられている。ここで、中央部とは、正極合剤層１４が設けられている正極５の領域において、内周側端部と外周側端部との間の距離をＬとしたとき、内周側端部から外周側端部に向かって距離が（2Ｚ３）Ｌ以下であり、外周側端部から内周側端部に向かって距離が（2/３）Ｌ以下であって、両方の距離関係がオーバーラップしている範囲をいう。

[0057] この場合、釘等の外部異物により、電極群４の最外周側で内部短絡が生じた場合、負極板２の最外周側の集電体部露出部は、釘を介して電池缶７と電

気的に接続された状態となる。したがって、電極群4の内周側の負極板2で生じた短絡電流は、負極集電体と最外周側の短絡点との間で流れる経路とは別に、電池缶7と接続された集電タブ16を兼用する負極リード6を介して、最外周側の短絡点に分流する経路を設けることができる。電極群4の内周側で内部短絡が生じた場合、負極集電体を流れる短絡電流を分流すると同時に、最外周側の抵抗の低い短絡点に短絡電流を分流することができる。

[0058] 次に、本発明の非水電解質二次電池の各構成要素について、さらに具体的に説明する。

[0059] 正極板1は、正極集電体と正極活物質層とを含む。

[0060] 正極活物質には、リチウム含有遷移金属複合酸化物、具体的には、コバルト酸リチウム、ニッケル酸リチウム、マンガン酸リチウムや、それらの変性体などを用いることができる。導電剤には、天然黒鉛や人造黒鉛のグラファイト類、アセチレンブラック、ケッチェンブラックなどのカーボンブラック類などを用いることができる。結着剤には、ポリフッ化ビニリデン（PVDF）、ポリテトラフルオロエチレン（PTFE）などを用いることができる。

[0061] 正極集電体には、アルミニウム、アルミニウム合金、ステンレス鋼、チタンなどを含有する金属箔、穿孔体などを用いることができる。

[0062] 正極活物質層は、例えば、正極合剤スラリーを正極集電体表面に塗布し、乾燥し、圧延することにより塗着できる。正極合剤スラリーは、たとえば、正極活物質、結着剤、導電剤などを有機溶媒または水に溶解または分散させることにより調製できる。有機溶媒には、N—メチル_2_ピロリドンなどを使用できる。正極活物質層は、正極集電体の両面、もしくは片面に塗着される。

[0063] 正極集電体の所望の箇所に未塗着部（集電体露出部）を設け、正極リード5及び第1の集電タブ11、第2の集電タブ12を溶接することにより正極板1が作製される。正極リード5及び第1の集電タブ11、第2の集電タブ12は、アルミニウムなどから形成される。

[0064] 負極板２は、負極集電体と負極活物質層とを含む。

[0065] 負極活物質には、炭素材料、リチウムと合金化可能な元素、珪素化合物、錫化合物、リチウム金属、合金などを用いることができる。炭素材料には、天然黒鉛、人造黒鉛、ハ－ドカ－ボンなどがある。リチウムと合金化可能な元素には、Ａし Ｓｉ、Ｚｎ、Ｇｅ、Ｃｄ、Ｓｎ、Ｔｉ、Ｐｂなどがある。結着剤には、ポリフッ化ビニリデン、アクリル酸モノマーを含むスチレンブタジエンゴム (ＢＭ—５００Ｂ) などを用いることができる。導電剤には、正極活物質層に含まれる導電剤と同じものを用いることができる。増粘剤には、カルボキシメチルセルロース、ポリエチレンオキシドなどを用いることができる。

[0066] 負極集電体には、ステンレス鋼、ニッケル、銅などの金属箔、穿孔体などを用いることができる。

[0067] 負極活物質層は、たとえば、負極合剤スラリーを負極集電体表面に塗布し、乾燥し、圧延することにより形成できる。負極合剤スラリーは、たとえば、負極活物質、結着剤、導電剤、増粘剤などを有機溶媒または水に溶解または分散させることにより調製できる。有機溶媒には、ＮＭＰなどを使用できる。

[0068] 負極集電体の所望の箇所に未塗着部 (集電体露出部) を設け、負極リード６及び集電タブ１６を溶接することにより負極板２が作製される。負極リード6及び集電タブ１６は、ニッケル、ニッケル合金、銅、ニッケルで被覆した銅などを用いることができる。

[0069] 正極板１及び負極板２を、セパレータ3を介して正極リード5と負極リード6が、互いに反対方向から取り出されるように捲回することにより、電極群４が構成される。電池缶７に電極群４を挿入し、負極リード6と集電タブ１６を電池缶７の有底部に溶接する。

[0070] セパレータ3には、微多孔薄膜、織布、不織布などが用いられる。セパレータの材質としては、ポリプロピレン、ポリエチレンなどのポリオレフインが用いられる。

[0071] 非水電解液は、非水溶媒に電解質 (例えば、リチウム塩) を溶解させることにより得られる。非水溶媒には、環状炭酸エステル、鎖状炭酸エステル、環状カルボン酸エステルなどが用いられる。電解質には、$LiClO_4$、$LiBF_4$、$LiPF_6$などが用いられる。

[0072] 電池缶7の開口部より取り出した正極リード5は、封口板8の金属製フィルター9に溶接される。第1の集電タブ11及び第2の集電タブ12が、正極リード5と捲回軸に対して同方向に取り出されている場合は、第1の集電タブ11と第2の集電タブ12を直接、もしくは金属製フィルター9に溶接する。第1の集電タブ11と第2の集電タブ12が正極リード5と捲回方向に対して異対向に取り出されている場合は、電極群4を電池缶7に挿入する前に、第1の集電タブ11と第2の集電タブ12を溶接して電気的に接続しておく。電池缶7の開放部から非水電解液を注入した後、電池缶7の開口部を、ガスケット10cを介して封口することにより、非水電解質二次電池が作製される。

実施例

[0073] 以下、本発明の実施例を詳細に説明するが、本発明はこれらの実施例に限定されない。

[0074] 本発明の非水電解質二次電池の安全性を評価するため、以下の手順で、円筒型非水電解質二次電池を作製した。

[0075] (実施例1)

(1) 正極板の作製

正極活物質として、100質量部のコバルト酸リチウム粉末、導電剤として、3質量部のアセチレンブラック、及び、N—メチルピロリドン (NMP) の溶剤に結着剤として4質量部のポリフッ化ビニリデン (PVDF) を溶解した溶液を混合し、正極合剤を含むペーストを得た。このペーストを、厚さ15μmのアルミニウム箔集電体の両面に塗布し、乾燥後、圧延して厚みを172μmとした。

[0076] 電極群の最外周側の両面に、捲回方向に1周分の長さでアルミニウム箔が

露出するように、第１の集電体露出部２１を形成した。また、電極群の最内周側と最外周側を結ぶ中央部の両面にアルミニウム箔が露出した第２の集電体露出部２２を形成した。これを、幅５８ｍｍ、長さ６３０ｍｍの寸法に裁断し、正極板を作製した。

[0077] 正極板の第１の集電体露出部２１と第２の集電体露出部２２のそれぞれの箇所に、アルミニウムからなる第１の集電タブ１１と第２の集電タブ１２の一端を接続した。電極群４の最内周側にアルミニウム箔が露出する箇所を設け、その箇所にアルミニウム製の正極リード5の一端を接続して、図２（ａ）に示すような正極板１ａを得た。

[0078] （２）負極板の作製

負極合剤として、１００質量部の人造黒鉛粉末、１質量部のスチレン－ブタジエンゴム粒子の４０質量％水性分散液、１質量部のカルボキシメチルセルロース、及び適量の水とを混合攪拌してスラリー状の負極合剤を調整した。この負極合剤スラリーを、厚み８μｍの銅箔集電体の両面に、塗布、乾燥した後、圧延して厚みを１７４μｍとした。

[0079] 電極群の最外周側の両面に、アルミニウム箔集電体の第１の集電体露出部２１と対向する長さ以上で、銅箔集電体が露出した集電体露出部３１を形成する。これを幅５９ｍｍ、長さ６８５ｍｍの寸法に裁断し、負極板２を作製した。

[0080] 負極板２の最外周側に形成された集電体露出部３１に、ニッケル製の負極リード6の一端を接続して負極板２ａを得た。

[0081] （３）非水電解液の調整

非水溶媒として、エチレンカーボネートとエチルメチルカーボネートとジメチルカーボネートを体積比１：１：１の混合溶媒９９質量部に１質量部のビニレンカーボネートを添加し、１．０ｍｏｌ／Ｌの濃度で六フッ化リン酸リチウム（$LiPF_6$）を溶解し、非水電解液を得た。

[0082] （４）非水電解質二次電池の作製

正極板１と負極板２の間に厚み１６μｍのポリエチレン製微多孔質フィル

ムからなるセパレータを配置して捲回し、円筒状の電極群４を作製した。この電極群４の上下に、上部絶縁板１０ａ及び下部絶縁板１０ｂを装着した後、負極リード6を電池缶７に溶接して挿入した。第１の集電タブ１１と第２の集電タブ１２を抵抗溶接して接続した。正極リード5を封口板８の金属製フィルター９に溶接した。その後、電池缶７の内部に非水電解液５ｇを注入した。最後に、電池缶７の開口部をガスケット１０ｃを介して封口板８で封口して、電池Ａを完成させた。得られた円筒型電池は、直径１８．２ｍｍ、高さ６５ｍｍであり、電池容量は２８６０ｍＡｈであった。

[0083] (実施例２)

第２の集電体露出部２２を捲回方向に１周の長さになるように形成して、図３に示すような正極板１ｂを得たこと以外、電池Ａと同様にして電池Ｂを作製した。電池Ｂの電池容量は２７５０ｍＡｈであった。

[0084] (実施例３)

第２の集電タブ１２を兼ねる正極リード5を、電極群４の内周側に形成して、図７に示すような正極板１ｆを得たこと以外、電池Ａと同様にして電池Ｃを作製した。電池Ｃの電池容量は２８６０ｍＡｈであった。

[0085] (実施例４)

第１の集電体露出部２１と第２の集電体露出部２２との間に、捲回方向に１周の長さになるようにアルミニウム箔集電体が片側露出した第３の集電体露出部２３を形成して、図８に示すような正極板１ｇを得たこと以外、電池Ｃと同様にして電池Ｄを作製した。電池Ｄの電池容量は２７４０ｍＡｈであった。

[0086] (実施例５)

負極板の電極群４の最内周側に銅箔集電体が露出する集電体露出部３２を形成し、その箇所にニッケル製の集電タブ１６を接続して、図１２に示すような負極板２ｂを作製し、集電タブ１６を電池缶７に接続すること以外、電池Ｃと同様にして電池Ｅを作製した。電池Ｅの電池容量は２８６０ｍＡｈであった。

[0087] (実施例６)

第２の集電体露出部２２を捲回方向に１周の長さになるように形成して、図９に示すような正極板１ｈを作製し、第２の集電体露出部２２に対向する負極板に、銅箔集電体の露出部を形成して負極板２を得たこと以外、電池Ｅと同様にして同様にして電池Ｆを作製した。電池Ｆの電池容量は２６４０ｍＡｈであった。

[0088] (比較例１)

第２の集電体露出部２２、第１の集電タブ１１、第２の集電タブ１２を形成しないこと以外、電池Ａと同様にして電池Ｘを作製した。電池Ｘの電池容量は２８６０ｍＡｈであった。

[0089] (比較例２)

第１の集電体露出部２１に第１の集電タブ１１を形成しないこと以外、電池Ｃと同様にして電池Ｙを作製した。電池Ｙの電池容量は２８６０ｍＡｈであった。

[0090] (評価試験)

実施例１～６及び比較例１～２で得られた非水電解質二次電池を用いて、次に示す釘刺し試験を行い、安全性について評価した。

[0091] [釘刺し試験]

各電池に対して、以下の条件で充電を行った。そして、６０℃環境下で、充電状態の電池の側面から、直径３ｍｍの鉄釘を１０ｍｍ/秒の速度で２０ｍｍの深さまで突き刺し貫通して、内部短絡を発生させた。同じ試験を各５セルずつ行い、異常過熱に至るかどうか確認した。表１は、その結果を示した表である。

[0092] 定電流充電 :電流値０．５Ｃ/充電終止電圧４．３Ｖ

定電圧充電 :電圧値４．３Ｖ/充電終止電流１００ｍＡ

[0093]

[表1]

	異常過熱した電池数 （過熱数／試験数）
実施例１	１／５
実施例２	０／５
実施例３	１／５
実施例４	０／５
実施例５	０／５
実施例６	０／５
比較例１	４／５
比較例２	４／５

[0094] 表１から明らかなように、実施例２、４～６では、釘刺し時の異常過熱もなく、電池容量も高い電池が得られた。実施例１及び３は、釘刺し時の異常過熱が５セル中１セル発生した。実施例１及び３は、正極板の中央部と外周箔とを集電タブで接続しているが、正極板の中央部は出力が高く、電極群内部での発熱が大きくなったと考えられる。正極板の内周側に第２の集電体露出部２２を設けた実施例２、４、６では、その箇所での低抵抗短絡により安全性が向上したと考えられる。実施例５、６では、負極板に設けた集電タブ１６と負極リード6とを接続したことで、さらに安全性が向上した。

[0095] 比較例１及び２は、異常過熱が多く発生した。比較例１は、外周側での集電体間短絡は発生するものの、外周側への短絡電流の分流効果が生じないため安全性が低かった。

[0096] 以上より、本発明の実施例１～６の非水電解質二次電池Ａ～Ｆは、比較例１～２の非水電解質二次電池Ｘ～Ｙに比べて、釘刺し等による外部異物による内部短絡に対する安全性が高いことが分かった。

[0097] 以上、本発明を好適な実施形態により説明してきたが、こうした記述は限

定事項ではなく、勿論、種々の改変が可能である。例えば、上記の実施形態では、捲回された電極群を含む円筒型の非水電解質二次電池について説明したが、これに限定されず、本発明の非水電解質二次電池は、各種形態の二次電池を包含する。例えば、捲回された電極群を含む角型電池、捲回された扁平状電極群を含む角型電池、積層された電極群をラミネートフィルムに収容したラミネートフィルム電池、積層された電極群を含む角型電池などがある。

産業上の利用可能性

[0098] 本発明に係る非水電解質二次電池は、携帯用電子機器の電源や、電動工具、電気自動車などの駆動用電源等に有用である。

符号の説明

[0099]

1 正極板
2 負極板
3 セパレータ
4 電極群
5 正極リード
6 負極リード
7 電池缶
8 封口板
9 金属製フィルター
10a 上部絶縁板
10b 下部絶縁板
10c ガスケット
11 第1の集電タブ
12 第2の集電タブ
16 集電タブ
21 第1の集電体露出部
22 第2の集電体露出部

２３　第３の集電体露出部

請求の範囲

[請求項1] 正極集電体上に正極活物質層が塗着された正極板と、

負極集電体上に負極活物質層が塗着された負極板と、

前記正極板及び前記負極板がセパレータを介して捲回された電極群と、

前記電極群が収容された電池缶と

を備えた非水電解質二次電池であつて、

前記正極板及び前記負極板のうち、前記電池缶と異極性の極板は、

前記電極群の最外周側で、捲回方向に1周以上の長さにわたって集電体が露出した第1の集電体露出部と、

前記第1の集電体露出部と離れた部位に形成された第2の集電体露出部と、

を有し、

前記第1の集電体露出部に第1の集電タブが設けられ、前記第2の集電体露出部に第2の集電タブが設けられ、かつ、前記第1の集電タブ及び前記第2の集電タブは、前記電極群外で接続されている、非水電解質二次電池。

[請求項2] 前記第2の集電体露出部は、前記極板の活物質層が塗着された内周側端部と外周側端部との距離をLとしたとき、内周側端部から3Z4L以下の範囲に形成されている、請求項1に記載の非水電解質二次電池。

[請求項3] 前記極板に、電池外部へ出力するためのリードが設けられており、

前記第2の集電体露出部は、前記第1の集電体露出部と前記リードとの間に形成されている、請求項1または2に記載の非水電解質二次電池。

[請求項4] 前記リードは、前記電極群の最内周側に設けられている、請求項3に記載の非水電解質二次電池。

[請求項5] 前記リードは、前記第2の集電タブを兼ねている、請求項3または

4に記載の非水電解質二次電池。

[請求項6] 前記第2の集電体露出部は、捲回方向に1周以上の長さにわたって集電体が露出している、請求項1に記載の非水電解質二次電池。

[請求項7] 前記第2の集電体露出部は、該集電体の両面が露出している、請求項1に記載の非水電解質二次電池。

[請求項8] 前記第1の集電体露出部は、該集電体の両面が露出している、請求項1に記載の非水電解質二次電池。

[請求項9] 前記極板は、前記第1の集電体露出部と前記第2の集電体露出部との間に、第3の集電体露出部が形成されており、

前記第3の集電体露出部は、捲回方向に1周以上の長さにわたって集電体が露出している、請求項1に記載の非水電解質二次電池。

[請求項10] 前記正極板及び前記負極板のうち、前記電池缶と同極性の極板は、前記第1の集電体露出部と対向する部位に、集電体が露出した集電体露出部が形成されている、請求項1に記載の非水電解質二次電池。

[請求項11] 前記正極板及び前記負極板のうち、前記電池缶と同極性の極板は、前記第2の集電体露出部と対向する部位に、集電体が露出した集電体露出部が形成されている、請求項6に記載の非水電解質二次電池。

[請求項12] 前記正極板及び前記負極板のうち、前記電池缶と同極性の極板は、前記第3の集電体露出部と対向する部位に、集電体が露出した集電体露出部が形成されている、請求項9に記載の非水電解質二次電池。

[請求項13] 前記正極板及び前記負極板のうち、前記電池缶と同極性の極板は、

前記電極群の最外周側で、捲回方向に1周以上の長さにわたって集電体が露出した集電体露出部と、

前記集電体露出部と離れた部位に形成された他の集電体露出部と、

を有し、

前記最外周側の集電体露出部にリードが設けられ、前記他の集電体露出部に集電タブが設けられ、かつ、前記リード及び前記集電タブは

、前記電池缶に接続されている、請求項１～１２の何れか１項に記載の非水電解質二次電池。

[請求項14] 前記正極板及び前記負極板のうち、前記電池缶と同極性の極板は、

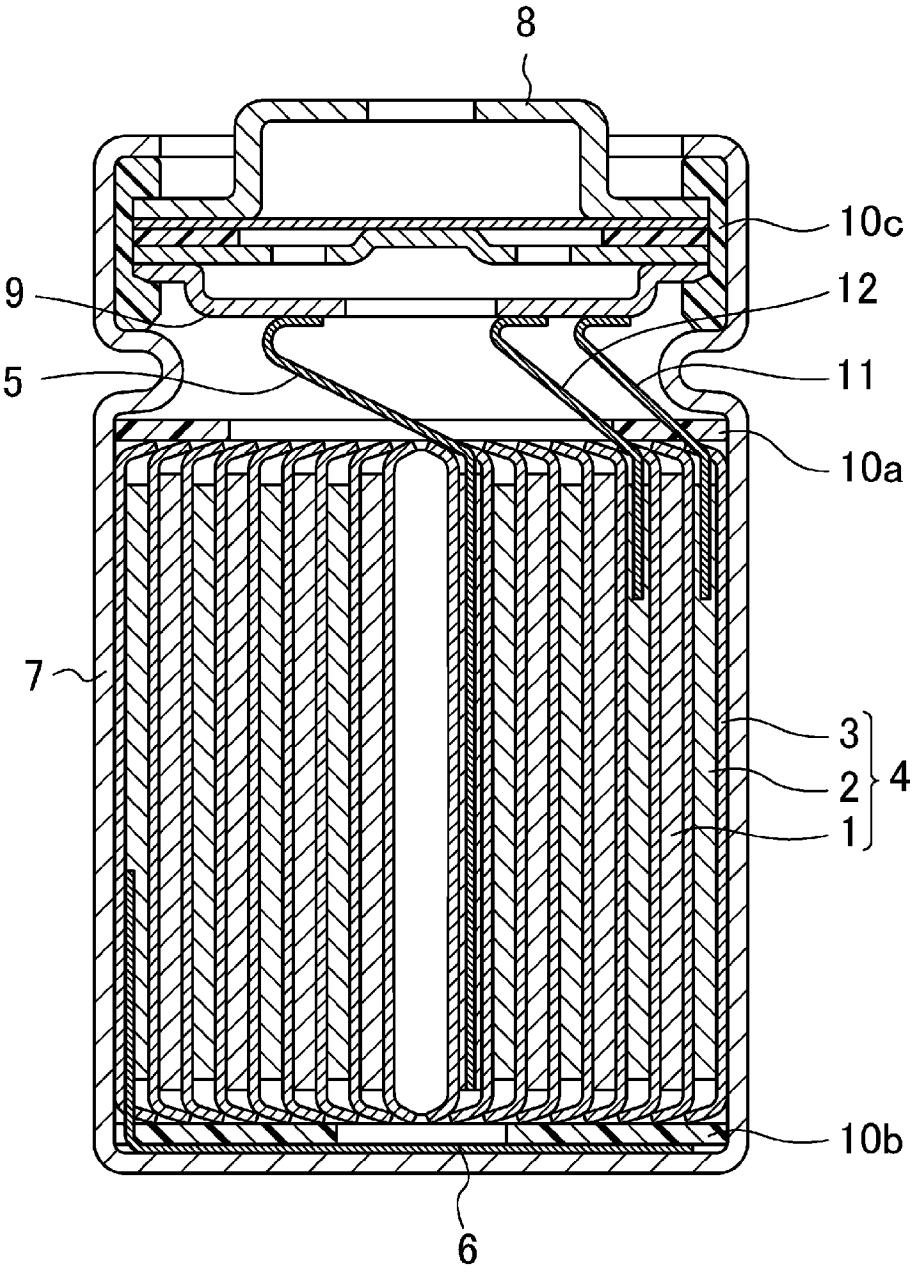
前記電極群の最外周側で、捲回方向に１周以上の長さにわたって集電体が露出した集電体露出部と、

前記極板の長手方向の中央部で、捲回方向に１周以上の長さにわたって集電体が露出した他の集電体露出部と

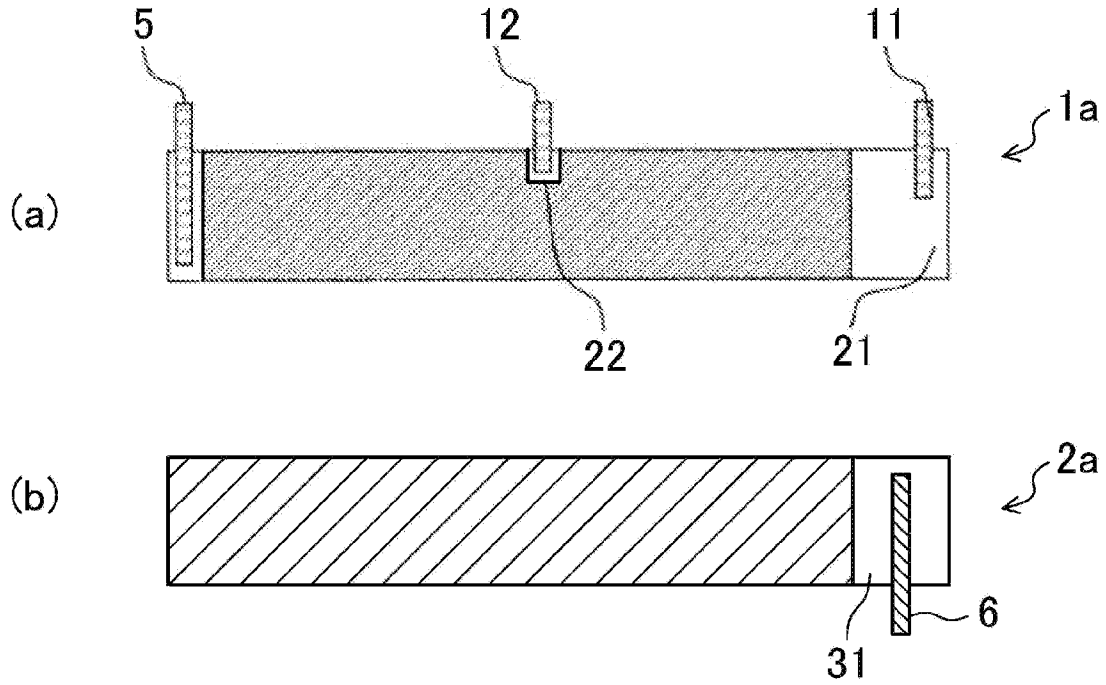
を有し、

前記中央部の他の集電体露出部に、リードが設けられ、かつ、該リードは、前記電池缶に接続されている、請求項１～１２の何れか１項に記載の非水電解質二次電池。

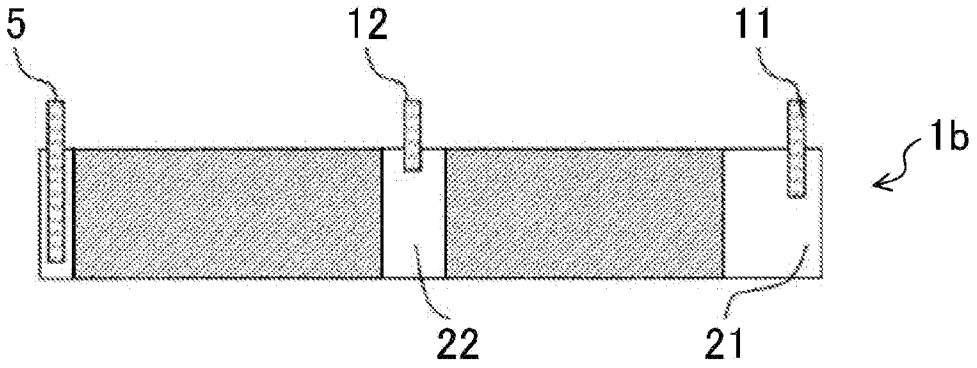
[図1]



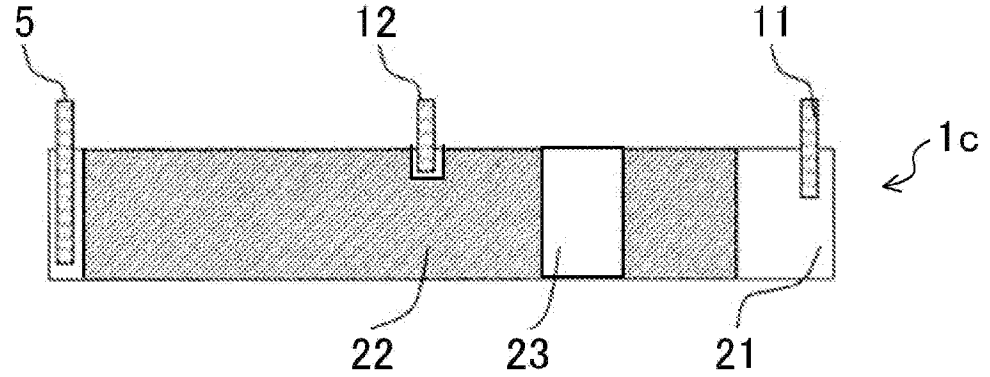
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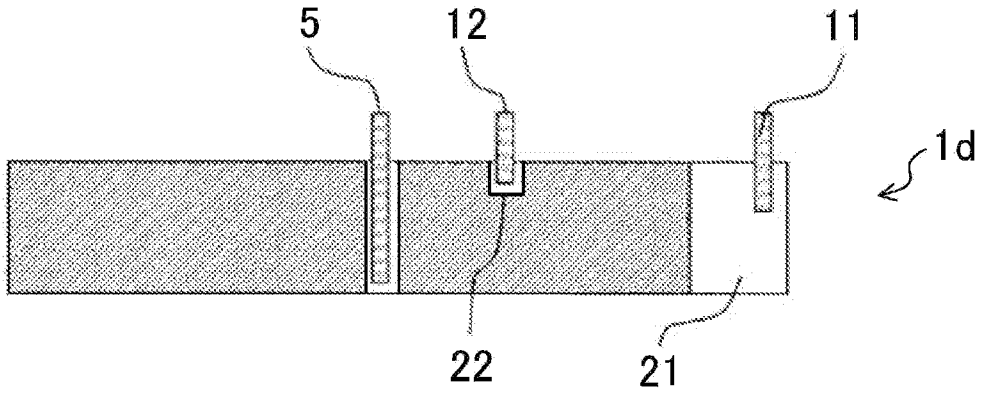
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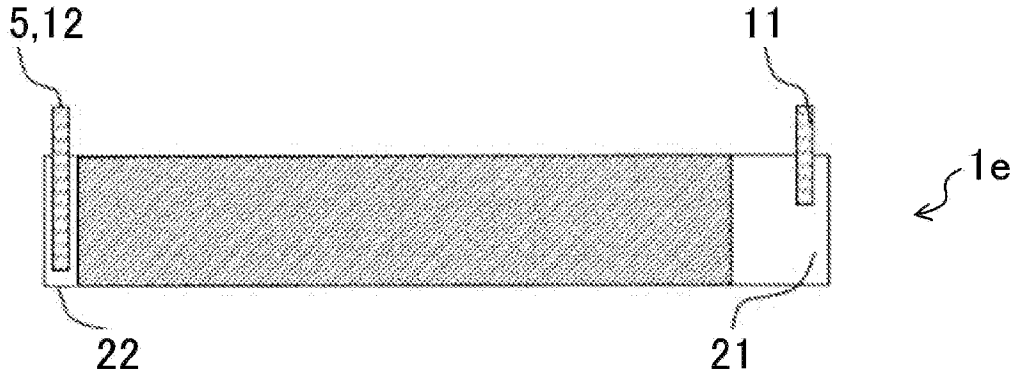
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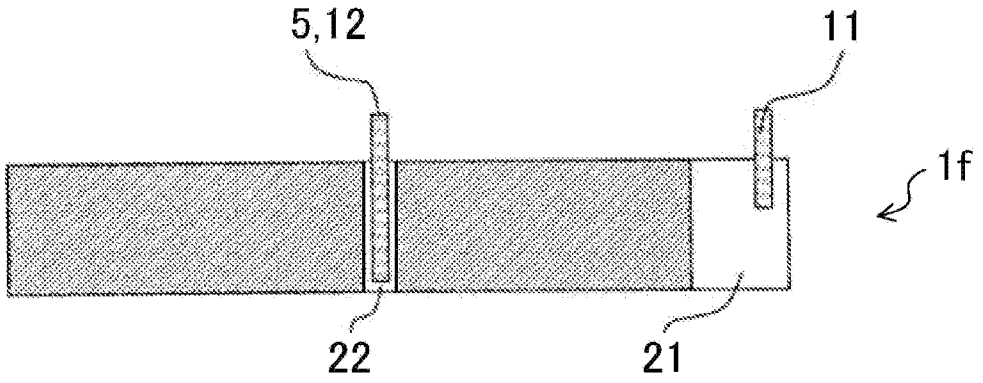
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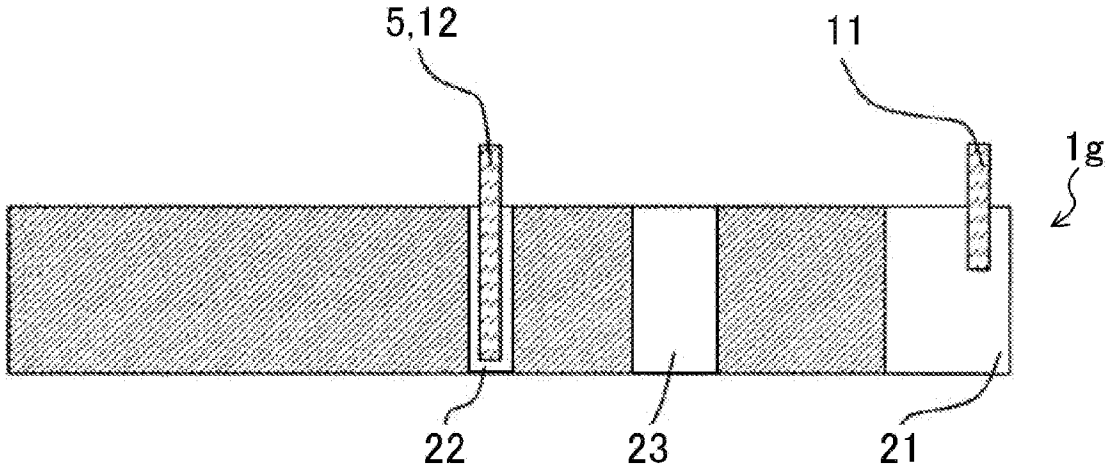
[図6]



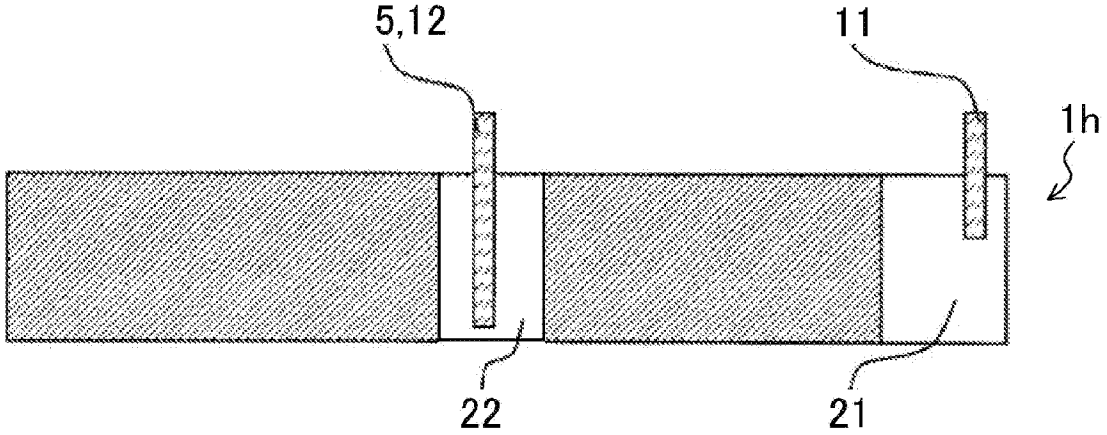
[図7]



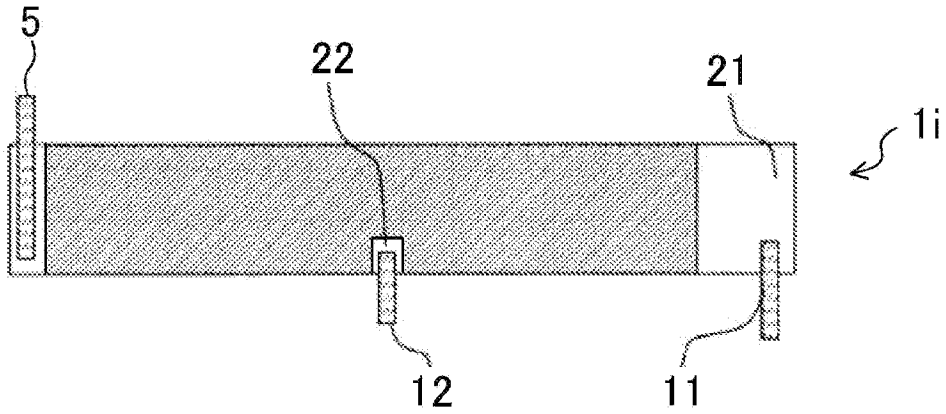
[図8]



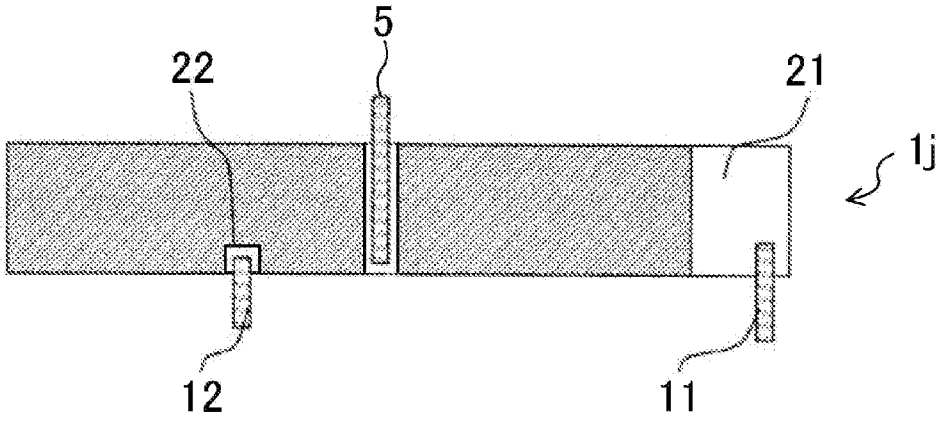
[図9]



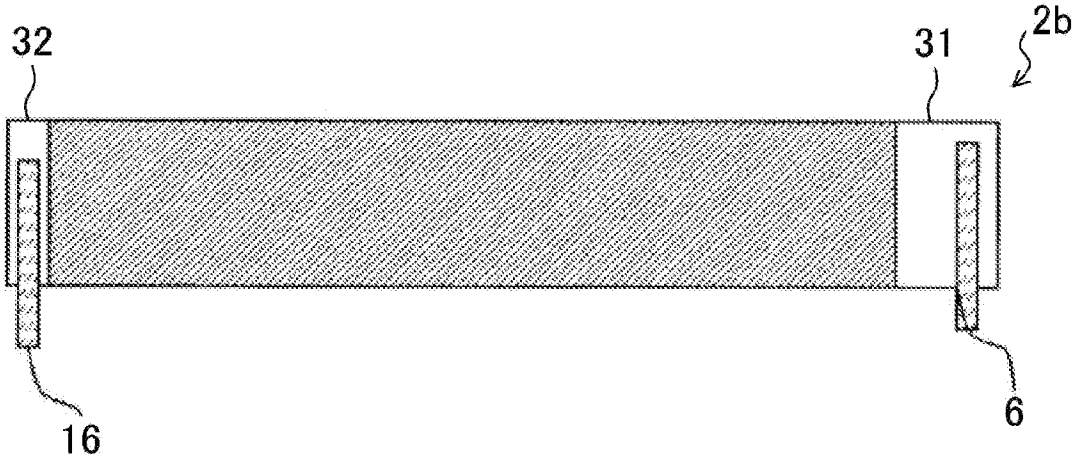
[図10]



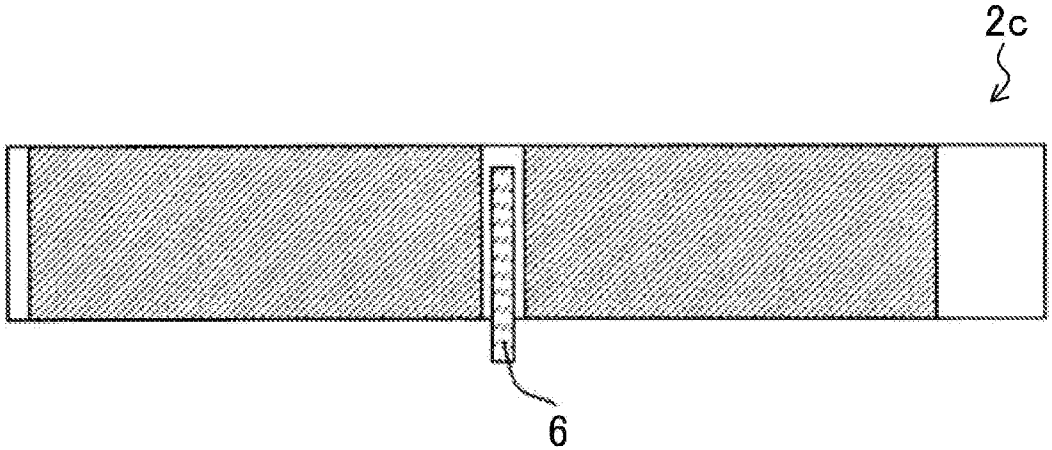
[図11]



[図12]



[図13]



INTERNATIONAL SEARCH REPORT

International application No.
PCT / JP2 012/ 005846

A. CLASSIFICATION OF SUBJECT MATTER
H01M2/2 6 (2006.01)i, H01M1 0/05 87 (2010.01)i

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
H01M2/26, H01M1 0/0587

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Jitsuyo Shinan Koho 1922-1996 Jitsuyo Shinan Toroku Koho 1996-2012
Kokai Jitsuyo Shinan Koho 1971-2012 Toroku Jitsuyo Shinan Koho 1994-2012

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y A	JP 2007-220321 A (Matsushita Electric Industrial Co., Ltd.), 30 August 2007 (30.08.2007), claims; paragraphs [0011], [0041] to [0047]; fig. 1 to 2 & US 2007/0190407 A1 & US 2010/0178541 A1	1-5, 7-8 12, 9-14
Y A	JP 2008-311011 A (Panasonic Corp.), 25 December 2008 (25.12.2008), claims; paragraph [0012]; fig. 1 (Family: none)	1-5, 7-8 12, 9-14

☐ Further documents are listed in the continuation of Box C. ☐ See patent family annex.

* Special categories of cited documents:
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"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
29 October, 2012 (29.10.12)	06 November, 2012 (06.11.12)
Name and mailing address of the ISA/ Japanese Patent Office	Authorized officer
Facsimile No.	Telephone No.

Form PCT/ISA/210 (second sheet) (July 2009)

国際調査報告

国際出願番号 PCT/JP2012/005846

A. 発明の属する分野の分類（国際特許分類（IPC））

Int.Cl. H01M2/26 (2006.01)i, H01M10/0587 (2010.01)i

B. 調査を行った分野

調査を行った最小限資料（国際特許分類（IPC））

Int.Cl. H01M2/26, H01M10/0587

最小限資料以外の資料で調査を行った分野に含まれるもの

日本国実用新案公報	1922-19
日本国公開実用新案公報	1971-20
日本国実用新案登録公報	1996-20
日本国登録実用新案公報	1994-20

国際調査で使用した電子データベース（データベースの名称、調査に使用した用語）

C. 関連すると認められる文献

引用文献のカテゴリー*	引用文献名 及び一部の箇所が関連するときは、その関連する箇所の表示	関連する請求項の番号
Y A	JP 2007-22032 1A (松下電器産業株式会社) 2007.08.30, 【特許請求の範囲】、【0011】、【0041】－【0047】、図1－図2】 & US 2007/0190407 A1 & US 2010/0178541 A1	1, 3-5, 7-8 2, 6, 9-14
Y A	JP 2008-31101 1A (パナソニック株式会社) 2008.12.25, 【特許請求の範囲】、【0012】、図1】 (ファミリーなし)	1, 3-5, 7-8 2, 6, 9-14

「C」 C欄の続きにも文献が列挙されている。

☐ パテントファミリーに関する別紙を参照。

* 引用文献のカテゴリー

「A」特に関連のある文献ではなく、一般的技術水準を示すもの

「E」国際出願日前の出願または特許であるが、国際出願日以後に公表されたもの

「L」優先権主張に疑義を提起する文献又は他の文献の発行日若しくは他の特別な理由を確立するために引用する文献（理由を付す）

「O」口頭による開示、使用、展示等に言及する文献

「P」国際出願日前で、かつ優先権の主張の基礎となる出願の日の後に公表された文献

「T」国際出願日又は優先日後に公表された文献であって出願と矛盾するものではなく、発明の原理又は理論の理解のために引用するもの

「X」特に関連のある文献であって、当該文献のみで発明の新規性又は進歩性がないと考えられるもの

「Y」特に関連のある文献であって、当該文献と他の1以上の文献との、当業者にとって自明である組合せによって進歩性がないと考えられるもの

「&」同一パテントファミリー文献

国際調査を完了した日 29.10.2012	国際調査報告の発送日 06.11.2012
国際調査機関の名称及びあて先 日本国特許庁（ISA／JP） 郵便番号100－8915 東京都千代田区霞が関三丁目4番3号	特許庁審査官（権限のある職員） 4X 2930 前田 寛之 電話番号 03-3581-1101 内線 3477

様式PCT／ISA／210（第2ページ）（2009年7月）

PE2E SEARCH - Search History (Prior Art)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	British Equivalents	Time Stamp
L1	24	(US-41406506-$ | US-5017442-$ | US-5478668-$ | US-6100114-$ | US-6551143-$).DID. (AL-20010036574-$ | AL-20070122714-$ | AL-20090035638-$ | CN-101939873-$ | CN-103066239-$ | CN-1221054-$ | CN-1350350-$ | CN-201087907-$ | CN-202495523-$ | DB-241406506-$ | JP-1993013064-$ | JP-1999317218-$ | JP-2000277155-$ | JP-2003132875-$).DID.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO); FPRS; EPO; JPO)	OR	ON	ON	2022/07/12 07:49 PM
L2	3	(US-20010036574-$ | US-20070122714-$ | US-20090035638-$).did.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO); FPRS; EPO; JPO)	OR	ON	ON	2022/07/12 07:56 PM
L3	0	(JP-0513064-$).did.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO); FPRS; EPO; JPO)	OR	ON	ON	2022/07/12 07:58 PM
L4	0	(JPH-0513064-$).did.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO); FPRS; EPO; JPO)	OR	ON	ON	2022/07/12 07:58 PM
L5	0	(JP-00513064-$).did.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY,	OR	ON	ON	2022/07/12 07:58 PM

			CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO); FPRS; EPO; JPO)				
L6	4	(JP-3161778-$).did.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO); FPRS; EPO; JPO)	OR	ON	ON	2022/07/12 07:58 PM
L7	91	(US-10135097-$ | US-10868290-$ | US-11024868-$ | US-11108118-$ | US-20100055560-$ | US-20100285370-$ | US-20170092925-$ | US-20180190963-$ | US-20180366775-$ | US-5017442-$ | US-5478668-$ | US-6100114-$ | US-6551143-$ | US-7195844-$ | US-9741988-$).DID. (CN-103367700-$ | CN-105576191-$ | CN-105990612-$ | CN-106169540-$ | CN-107534127-$ | CN-108376759-$ | CN-109888162-$ | CN-112272877-$ | CN-112582583-$ | CN-113826240-$ | CN-201087907-$ | CN-202495523-$ | CN-205355186-$ | GB-2548361-$ | JP-2005222744-$ | JP-2007294198-$ | JP-2010086754-$ | JP-2011103249-$ | JP-2013137943-$ | JP-2014241267-$ | JP-2018166080-$ | JP-4850996-$ | JP-5284933-$ | JP-5623073-$ | JP-5821913-$ | JP-	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO); FPRS; EPO; JPO)	OR	ON	ON	2022/07/13 11:34 AM

		6237187-$ | JP-6288015-$ | JP-6926991-$ | KR-101489993-$ | KR-101515672-$ | KR-101980974-$ | KR-200364044-$ | KR-20060009411-$ | KR-20120022773-$ | WO-2017149977-$).DID.					
L8	4	("20020197535" | "20040191634" | "20140030607" | "20150207111").pn. OR ("11108118").urpn. AND (PGPB | USPT | USOC).dbnm.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2022/07/13 11:36 AM
L9	3	("20090305120" | "20140349179" | "20150207111").pn. OR ("11024868").urpn. AND (PGPB | USPT | USOC).dbnm.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2022/07/13 11:36 AM
L10	1	US-20060051662-$.did.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO); FPRS; EPO; JPO)	OR	ON	ON	2022/07/13 11:50 AM
L11	30	(US-10014495-$ | US-10038212-$ | US-10193125-$ | US-10312497-$ | US-10396336-$ | US-11024868-$ | US-11043700-$ | US-20060127774-$ | US-20080274410-$ | US-20110159344-$ | US-20110183191-$ | US-20130252053-$ | US-20130266845-$ | US-20130316207-$ | US-20140349179-$ | US-20160126511-$ | US-20160260954-$ | US-20180315991-$ | US-8877371-$ | US-8974944-$ | US-9159963-$ | US-9203074-$ | US-9224989-$ | US-9293744-$ | US-	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO); FPRS; EPO; JPO)	OR	ON	ON	2022/07/13 11:53 AM

		9397329-$ | US-9490468-$ | US-9564626-$ | US-9595699-$ | US-9627677-$ | US-9960404-$).DID.					
L12	7	("20060111625" | "20080233474" | "20090111011" | "20130045405" | "20140120417" | "20140349179" | "20140377593").pn. OR ("11043700").urpn. AND (PGPB | USPT | USOC).dbnm.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2022/07/13 11:53 AM
L13	22	((JP-2003132875-A OR CN-202495523-U OR CN-103066239-A OR CN-101939873-A OR CN-201087907-Y OR CN-1221054-C OR CN-1350350-A OR CN-1221054-A).did. AND FTDB.dbnm.) OR ((US-20140349179-A1 OR US-20140120417-A1 OR US-20090111011-A1 OR US-20080233474-A1 OR US-20130045405-A1 OR US-20040191634-A1 OR US-20060051662-A1 OR US-20090035638-A1 OR US-20070122714-A1).did. AND PGPB.dbnm.) OR ((JP-2000277155-A).did. AND JPAB.dbnm.) OR ((US-6100114-A OR US-5478668-A OR US-5017442-A).did. AND USPT.dbnm.) OR ((CN-1221054-A).did. AND FPRS.dbnm.)	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/07/13 12:01 PM
L14	76440	(H01M10/0431 OR H01M10/0587 OR H01M50/531 OR H01M50/533 OR H01M50/538).cpc.	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/07/13 12:03 PM

L15	5171174	(recess$7 OR pocket OR (non-coat$7 ADJ (portion OR part)) OR cavity OR hole OR gap) NEAR10 (tab$5 OR tap$5 OR lead$5)	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO); FPRS; EPO; JPO)	OR	ON	ON	2022/07/13 12:06 PM
L16	10212	L14 AND L15	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO); FPRS; EPO; JPO)	OR	ON	ON	2022/07/13 12:06 PM
L17	953	L14 AND L15 AND @fd<"20140117"	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2022/07/13 12:06 PM
L18	1	US-8795879-$.did.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO); FPRS; EPO; JPO)	OR	ON	ON	2022/07/13 12:22 PM
L19	1	("20090296318").pn. OR ("8795879").urpn. AND (PGPB | USPT | USOC).dbnm.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2022/07/13 12:22 PM
L20	76	(US-20040126654-$ | US-20040207974-$ | US-20090296318-$ | US-20150332857-$ | US-8014127-$ | US-8218293-$ | US-8795879-$ | US-8837115-$ | US-9070511-$).DID. (CN-104137303-$ | CN-108713233-$ | CN-110706928-$ | CN-201156473-$ | EP-1580774-$ | JP-2001023866-$ | JP-2001284190-$ | JP-2006286959-$ | JP-2008147541-$ | JP-2009010070-$ | JP-2009152514-$ | JP-	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO); FPRS; EPO; JPO)	OR	ON	ON	2022/07/13 12:23 PM

		2009212117-$ | JP-2009212283-$ | JP-2010074083-$ | JP-2010074089-$ | JP-2012019061-$ | JP-2012064601-$ | JP-2018157012-$ | JP-3587333-$ | JP-4413003-$ | JP-6893123-$ | JP-6953724-$ | KR-101404532-$ | KR-101434923-$ | KR-101475367-$ | KR-102079677-$ | KR-20130116836-$ | WO-2010116656-$ | WO-2021172440-$).DID.					
L21	293	L14 AND L15 AND (length NEAR10(tab$5 OR tap$5 OR lead$5)) AND @fd<"20140117"	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2022/07/13 12:29 PM
L22	17297	((recess$7 OR pocket OR (non-coat$7 ADJ (portion OR part)) OR cavity OR hole OR gap) NEAR10 (energ$6 NEAR5 densit$7))	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO); FPRS; EPO; JPO)	OR	ON	ON	2022/07/13 12:35 PM
L23	1	L14 AND L15 AND (length NEAR10(tab$5 OR tap$5 OR lead$5)) AND L22 AND @fd<"20140117"	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2022/07/13 12:35 PM
L24	13	L14 AND L15 AND (length NEAR10(tab$5 OR tap$5 OR lead$5)) AND L22 AND @fd<"20140117"	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO))	OR	ON	ON	2022/07/13 12:37 PM
L25	5	L14 AND L15 AND (length NEAR10(tab$5 OR tap$5 OR lead$5)) AND L22 AND @pd<"20140117"	(FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO); FPRS; EPO; JPO)	OR	ON	ON	2022/07/13 12:37 PM
L26	6494	(H01M10/0431 AND	(US-PGPUB; USPAT;	OR	ON	ON	2022/07/13

		H01M50/538).cpc.	USOCR; FIT (AP, AT, AU, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)				12:55 PM
L27	127	L26 AND L15 AND @fd<"20140117"	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2022/07/13 12:55 PM
L28	2	(US-20100124694-$ OR US-2006022937-$ OR US-20090166192-$).did.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO); FPRS; EPO; JPO)	OR	ON	ON	2022/07/13 01:18 PM
L29	0	(US-2006022937-$).did.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO); FPRS; EPO; JPO)	OR	ON	ON	2022/07/13 01:19 PM
L30	1	(US-20060022937-$).did.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO); FPRS; EPO; JPO)	OR	ON	ON	2022/07/13 01:19 PM
L31	1	(US-20060222937-$).did.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO); FPRS; EPO; JPO)	OR	ON	ON	2022/07/13 01:20 PM
L32	1	(US-6828059-$).did.	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, BE, BG, BR, BY, CA, CH, CN, CS, CU,	OR	ON	ON	2022/07/13 01:24 PM

			CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO); FPRS; EPO; JPO)				
L33	1	(US-20100124694-$).did.	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO); FPRS; EPO; JPO)	OR	ON	ON	2022/07/13 01:25 PM
L34	1	(jp-09017410-$).did.	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO); FPRS; EPO; JPO)	OR	ON	ON	2022/07/13 01:25 PM
L35	1	(jp-09161837$).did.	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO); FPRS; EPO; JPO)	OR	ON	ON	2022/07/13 01:25 PM
L36	1	US-20070122714-$.did.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO); FPRS; EPO; JPO)	OR	ON	ON	2022/07/13 01:29 PM
L37	37	((JP-2003132875-A OR CN-202495523-U OR CN-103066239-A OR CN-101939873-A OR CN-201087907-Y OR CN-1221054-C OR CN-1350350-A OR CN-1221054-A).did. AND FTDB.dbnm.) OR ((US-20140349179-A1 OR	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO); FPRS; EPO; JPO;	OR	ON	ON	2022/07/13 01:30 PM

		US-20140120417-A1 OR US-20090111011-A1 OR US-20110104539-A1 OR US-20110151295-A1 OR US-20010033962-A1 OR US-20090166192-A1 OR US-20080233474-A1 OR US-20130045406-A1 OR US-20120214049-A1 OR US-20110027636-A1 OR US-20060222937-A1 OR US-20130045405-A1 OR US-20130316207-A1 OR US-20130316209-A1 OR US-20130101891-A1 OR US-20120321942-A1 OR US-20040191634-A1 OR US-20060051662-A1 OR US-20090035638-A1 OR US-20070122714-A1).did. AND PGPB.dbnm.) OR ((US-9142840-B2 OR US-8837115-B2 OR US-6100114-A OR US-5478668-A OR US-5017442-A).did. AND USPT.dbnm.) OR ((KR-101475367-B1 OR CN-1221054-A).did. AND FPRS.dbnm.) OR ((JP-2000277155-A).did. AND JPAB.dbnm.)	DERWENT; IBM_TDB)				
L38	145716	(non-coat$6 OR (non ADJ coat$6) OR un-coat$6 OR (un ADJ coat$6) OR non-application$9 OR (non ADJ application$9))	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO); FPRS; EPO; JPO)	OR	ON	ON	2022/07/13 01:36 PM
L39	4877	L14 AND L38	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV,	OR	ON	ON	2022/07/13 01:36 PM

			MA, OA, RU, SU, WO); FPRS; EPO; JPO)				
L40	249	L14 AND L38 AND (L38 NEAR15 (width OR length OR size OR area)) AND (L38 SAME3 (energ$7 NEAR5 dens$6))	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO); FPRS; EPO; JPO)	OR	ON	ON	2022/07/13 01:37 PM
L41	23	L14 AND L38 AND (L38 NEAR15 (width OR length OR size OR area)) AND (L38 SAME3 (energ$7 NEAR5 dens$6)) AND @fd<"20140117"	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2022/07/13 01:37 PM
L42	428	(H01M50/538).cpc. AND (recess$6 near15 (tab OR lead OR tap))	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO); FPRS; EPO; JPO)	OR	ON	ON	2022/07/13 02:18 PM
L43	41	(H01M50/538).cpc. AND (recess$6 near15 (tab OR lead OR tap)) AND @fd<"20140117"	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2022/07/13 02:18 PM
L44	507	(H01M50/5$).cpc. AND (recess$6 near15 (tab OR lead OR tap)) AND @fd<"20140117"	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2022/07/13 02:22 PM
L45	114	(H01M50/538).cpc. AND (recess$6 near15 (tab OR lead OR tap)) AND @pd<"20140117"	(FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO); FPRS; EPO; JPO)	OR	ON	ON	2022/07/13 02:23 PM
L46	13	("20100216001" OR "20110274953" OR "20140017565" OR "20150295270" OR "6139986" OR "20050287428" OR "20090148766" OR "20090297941" OR "20110076547" OR "20160197379" OR	(US-PGPUB; USPAT)	OR	ON	ON	2022/07/13 04:06 PM

		"7923139" OR "7955736" OR "8450006").pn.					
L47	1	US-10320024-$.did.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO); FPRS; EPO; JPO)	OR	ON	ON	2022/07/13 04:08 PM
L48	9	("20110104539" | "20110129708" | "20110151295" | "20120009450" | "20120321924" | "20130260203" | "20130316207" | "20140072877" | "20140302366").pn. OR ("10320024").urpn. AND (PGPB | USPT | USOC).dbnm.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2022/07/13 04:08 PM
L49	0	(KR-1038115-$ OR KR-1615712-$ OR KR-20110035566-$ OR KR-20160085063-$).DID.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2022/07/13 04:12 PM
L50	4	(KR-1038115-$ OR KR-1615712-$ OR KR-20110035566-$ OR KR-20160085063-$).DID.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO); FPRS; EPO; JPO)	OR	ON	ON	2022/07/13 04:12 PM
L51	4	(KR-101038115-$ OR KR-101615712-$).DID.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO); FPRS; EPO; JPO)	OR	ON	ON	2022/07/13 04:13 PM
L52	45	(Artificial Intelligence) More Like: US-20140302366-A1 Text: (US-9520588-B2 OR WO-2013038701-A1	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB,	OR	ON	ON	2022/07/13 04:14 PM

		OR JP-WO2013038701-A1 OR JP-5849234-B2 OR WO-2013038677-A1 OR JP-2014225326-A OR JP-2007109612-A OR JP-6208239-B2 OR JP-6439839-B2 OR CN-103733418-B OR CN-107431250-B OR JP-H09180761-A OR JP-2003288941-A OR KR-20030078019-A OR KR-100990800-B1 OR JP-4097443-B2 OR JP-6652125-B2 OR JP-2013073680-A OR JP-2016081881-A OR CN-103733418-A).did.	HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA, VN); FPRS; EPO; JPO; DERWENT; IBM_TDB)				
L53	49	(Artificial Intelligence) More Like: WO-2013038677-A1 Text: (WO-2013038701-A1 OR JP-5849234-B2 OR JP-WO2013038701-A1 OR WO-2013038676-A1 OR JP-2014225326-A OR US-9520588-B2 OR US-20140302366-A1 OR WO-2016079943-A1 OR JP-2007109612-A OR JP-2010061893-A OR JP-2008311011-A OR WO-2018061381-A1 OR JP-2018018646-A OR JP-WO2018061381-A1 OR JP-2016122628-A OR JP-6567821-B2 OR WO-2019065871-A1 OR US-8530072-B2 OR JP-H09306471-A OR JP-2010086812-A).did.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA, VN); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/07/13 04:19 PM
L54	47	((JP-2003132875-A OR WO-2013038677-A1 OR WO-2013038676-A1 OR CN-202495523-U OR JP-6652125-B2 OR CN-103066239-A OR CN-101939873-A OR CN-201087907-Y OR CN-1221054-C OR CN-1350350-A OR CN-1221054-A).did. AND FTDB.dbnm.) OR ((US-20140349179-A1 OR	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA,	OR	ON	ON	2022/07/13 04:43 PM

		US-20140120417-A1 OR US-20090111011-A1 OR US-20110104539-A1 OR US-20110151295-A1 OR US-20010033962-A1 OR US-20090166192-A1 OR US-20140302366-A1 OR US-20130316207-A1 OR US-20080233474-A1 OR US-20130045406-A1 OR US-20120214049-A1 OR US-20110027636-A1 OR US-20060222937-A1 OR US-20130045405-A1 OR US-20130316209-A1 OR US-20130101891-A1 OR US-20120321942-A1 OR US-20100086858-A1 OR US-20150295270-A1 OR US-20120009450-A1 OR US-20040191634-A1 OR US-20060051662-A1 OR US-20090081530-A1 OR US-20090035638-A1 OR US-20070122714-A1).did. AND PGPB.dbnm.) OR ((US-9142840-B2 OR US-8837115-B2 OR US-6100114-A OR US-5478668-A OR US-5017442-A).did. AND USPT.dbnm.) OR ((JP-2014225326-A OR JP-2001015096-A OR JP-2000277155-A).did. AND JPAB.dbnm.) OR ((KR-101475367-B1 OR CN-1221054-A).did. AND FPRS.dbnm.)	VN); FPRS; EPO; JPO; DERWENT; IBM_TDB)				
L55	134	((("NINGDE") near3 ("AMPEREX") near3 ("TECHNOLOGY") near3 ("LIMITED"))).AS,AANM.	(USPAT)	OR	ON	ON	2022/07/13 09:28 PM
L56	137	((("NINGDE") near3 ("AMPEREX"))).AS,AANM.	(USPAT)	OR	ON	ON	2022/07/13 09:30 PM

L57	527	((("NINGDE") near3 ("AMPEREX"))).AS,AANM.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2022/07/13 09:30 PM
L58	1129	L57 AND L14	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO); FPRS; EPO; JPO)	OR	ON	ON	2022/07/13 09:31 PM
L59	10	L57 AND L14 AND @pd<"20140117"	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO); FPRS; EPO; JPO)	OR	ON	ON	2022/07/13 09:31 PM
L60	308	((("TAO") near3 ("Tao")) OR (("MO") near3 ("Ming") near3 ("Liang"))).INV.	(US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT)	OR	ON	ON	2022/07/14 10:56 AM
L61	2	L60 AND L14 AND @pd<"20140117"	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO); FPRS; EPO; JPO)	OR	ON	ON	2022/07/14 10:57 AM
L62	130343969	L60AND @pd<"20140117"	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO); FPRS; EPO; JPO)	OR	ON	ON	2022/07/14 10:57 AM
L63	2325	L60 AND @pd<"20140117"	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO);	OR	ON	ON	2022/07/14 10:57 AM

			FPRS; EPO; JPO)				
L65	0	L60 AND H01M50/5$.cpc. AND @pd<"20140117"	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO); FPRS; EPO; JPO)	OR	ON	ON	2022/07/14 10:58 AM
L66	46	L60 AND H01M.cpcl. AND @pd<"20140117"	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO); FPRS; EPO; JPO)	OR	ON	ON	2022/07/14 10:59 AM
L67	47	((JP-2003132875-A OR WO-2013038677-A1 OR WO-2013038676-A1 OR CN-202495523-U OR JP-6652125-B2 OR CN-103066239-A OR CN-101939873-A OR CN-201087907-Y OR CN-1221054-C OR CN-1350350-A OR CN-1221054-A).did. AND FTDB.dbnm.) OR ((US-20140349179-A1 OR US-20140120417-A1 OR US-20090111011-A1 OR US-20110104539-A1 OR US-20110151295-A1 OR US-20010033962-A1 OR US-20090166192-A1 OR US-20140302366-A1 OR US-20130316207-A1 OR US-20080233474-A1 OR US-20130045406-A1 OR US-20120214049-A1 OR US-20110027636-A1 OR US-20060222937-A1 OR US-20130045405-A1 OR US-20130316209-A1 OR US-20130101891-A1 OR US-20120321942-A1 OR US-	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/07/14 11:11 AM

		20100086858-A1 OR US-20150295270-A1 OR US-20120009450-A1 OR US-20040191634-A1 OR US-20060051662-A1 OR US-20090081530-A1 OR US-20090035638-A1 OR US-20070122714-A1).did. AND PGPB.dbnm.) OR ((US-9142840-B2 OR US-8837115-B2 OR US-6100114-A OR US-5478668-A OR US-5017442-A).did. AND USPT.dbnm.) OR ((JP-2014225326-A OR JP-2001015096-A OR JP-2000277155-A).did. AND JPAB.dbnm.) OR ((KR-101475367-B1 OR CN-1221054-A).did. AND FPRS.dbnm.)					
L68	12	(US-20050250052-$ OR US-20110003211-$).did. OR (CN-1489229-$ OR CN-101939869-$ OR CN-103262310-$ OR JP-2005283643-$).did.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO); FPRS; EPO; JPO)	OR	ON	ON	2022/07/14 12:00 PM
L69	53	((JP-2003132875-A OR WO-2013038677-A1 OR WO-2013038676-A1 OR CN-202495523-U OR JP-6652125-B2 OR CN-103066239-A OR CN-101939873-A OR CN-201087907-Y OR CN-1221054-C OR CN-1350350-A OR CN-1221054-A OR CN-103262310-A OR CN-101939869-A OR JP-2005283643-A OR CN-1489229-A).did. AND FTDB.dbnm.) OR ((US-20140349179-A1 OR US-20140120417-A1 OR US-20090111011-A1 OR US-20110104539-A1 OR US-20110151295-A1	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/07/14 12:12 PM

		OR US-20010033962-A1 OR US-20090166192-A1 OR US-20140302366-A1 OR US-20130316207-A1 OR US-20080233474-A1 OR US-20130045406-A1 OR US-20120214049-A1 OR US-20110027636-A1 OR US-20060222937-A1 OR US-20130045405-A1 OR US-20130316209-A1 OR US-20130101891-A1 OR US-20120321942-A1 OR US-20100086858-A1 OR US-20150295270-A1 OR US-20120009450-A1 OR US-20040191634-A1 OR US-20060051662-A1 OR US-20090081530-A1 OR US-20090035638-A1 OR US-20070122714-A1 OR US-20110003211-A1 OR US-20050250052-A1).did. AND PGPB.dbnm.) OR ((US-9142840-B2 OR US-8837115-B2 OR US-6100114-A OR US-5478668-A OR US-5017442-A).did. AND USPT.dbnm.) OR ((JP-2014225326-A OR JP-2001015096-A OR JP-2000277155-A).did. AND JPAB.dbnm.) OR ((KR-101475367-B1 OR CN-1221054-A).did. AND FPRS.dbnm.)					
L70	53	((JP-2003132875-A OR WO-2013038677-A1 OR WO-2013038676-A1 OR CN-202495523-U OR JP-6652125-B2 OR CN-103066239-A OR CN-101939873-A OR CN-201087907-Y OR CN-1221054-C OR CN-1350350-A OR CN-1221054-A OR CN-103262310-A OR CN-101939869-A OR JP-	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/07/15 11:48 AM

		2005283643-A OR CN-1489229-A).did. AND FTDB.dbnm.) OR ((US-20140349179-A1 OR US-20140120417-A1 OR US-20090111011-A1 OR US-20110104539-A1 OR US-20110151295-A1 OR US-20010033962-A1 OR US-20090166192-A1 OR US-20140302366-A1 OR US-20130316207-A1 OR US-20080233474-A1 OR US-20130045406-A1 OR US-20120214049-A1 OR US-20110027636-A1 OR US-20060222937-A1 OR US-20130045405-A1 OR US-20130316209-A1 OR US-20130101891-A1 OR US-20120321942-A1 OR US-20100086858-A1 OR US-20150295270-A1 OR US-20120009450-A1 OR US-20040191634-A1 OR US-20060051662-A1 OR US-20090081530-A1 OR US-20090035638-A1 OR US-20070122714-A1 OR US-20110003211-A1 OR US-20050250052-A1).did. AND PGPB.dbnm.) OR ((US-9142840-B2 OR US-8837115-B2 OR US-6100114-A OR US-5478668-A OR US-5017442-A).did. AND USPT.dbnm.) OR ((JP-2014225326-A OR JP-2001015096-A OR JP-2000277155-A).did. AND JPAB.dbnm.) OR ((KR-101475367-B1 OR CN-1221054-A).did. AND FPRS.dbnm.)					
L71	4105191	(tape OR adhesive OR insulat$7) NEAR25 (electrode OR lead OR tab)	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU,	OR	ON	ON	2022/07/15 11:49 AM

			CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO); FPRS; EPO; JPO)				
L72	34	L70 AND L71	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO); FPRS; EPO; JPO)	OR	ON	ON	2022/07/15 11:49 AM
L73	25	L70 AND L71 AND @fd<"20140117"	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2022/07/15 11:50 AM
L74	275044	(pair OR couple) NEAR10 (adhesiv$6 OR tape)	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO); FPRS; EPO; JPO)	OR	ON	ON	2022/07/15 03:31 PM
L75	578	L14 AND L74	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO); FPRS; EPO; JPO)	OR	ON	ON	2022/07/15 03:32 PM
L76	214	L14 AND L74 AND @fd<"20140117"	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO))	OR	ON	ON	2022/07/15 03:32 PM
L77	50	L14 AND L74 AND @fd<"20140117"	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2022/07/15 03:32 PM
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			MA, OA, RU, SU, WO); FPRS; EPO; JPO)				
L79	987872	(insulat$7 ADJ4 (tape OR adhesive OR resin))	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO); FPRS; EPO; JPO)	OR	ON	ON	2022/07/15 03:43 PM
L80	8568	L79 AND L14	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO); FPRS; EPO; JPO)	OR	ON	ON	2022/07/15 03:44 PM
L81	6063	(insulat$7 ADJ4 (tape OR adhesive OR resin)) NEAR25 (((first AND second) OR oppos$8) ADJ surfac$7)	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO); FPRS; EPO; JPO)	OR	ON	ON	2022/07/15 03:44 PM
L82	175	L14 AND L81	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO); FPRS; EPO; JPO)	OR	ON	ON	2022/07/15 03:44 PM
L83	14	L14 AND L81 AND @fd<"20140117"	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2022/07/15 03:45 PM
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			ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO); FPRS; EPO; JPO)				
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		OR US-20120009450-A1 OR US-20040191634-A1 OR US-20060051662-A1 OR US-20090081530-A1 OR US-20090035638-A1 OR US-20070122714-A1 OR US-20110003211-A1 OR US-20050250052-A1).did. AND PGPB.dbnm.) OR ((US-9142840-B2 OR US-8837115-B2 OR US-6100114-A OR US-5478668-A OR US-5017442-A).did. AND USPT.dbnm.) OR ((JP-2014225326-A OR JP-2001015096-A OR JP-2000277155-A).did. AND JPAB.dbnm.) OR ((KR-101475367-B1 OR CN-1221054-A).did. AND FPRS.dbnm.)					
L88	184982	((insulat$7 OR adhesiv$6 OR tape OR glue OR resin) NEAR10 (oppos$10 OR paired OR pair$5 OR face-to-face OR corresponding)) SAME ((short ADJ circuit) OR short-circuit OR short$7)	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO); FPRS; EPO; JPO)	OR	ON	ON	2022/07/20 11:07 AM
L89	1468	L14 AND L88	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO); FPRS; EPO; JPO)	OR	ON	ON	2022/07/20 11:07 AM
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		A1 OR US-20050250052-A1).did. AND PGPB.dbnm.) OR ((US-9142840-B2 OR US-8837115-B2 OR US-6100114-A OR US-5478668-A OR US-5017442-A).did. AND USPT.dbnm.) OR ((JP-2014225326-A OR JP-2001015096-A OR JP-2000277155-A).did. AND JPAB.dbnm.) OR ((KR-101475367-B1 OR CN-1221054-A).did. AND FPRS.dbnm.)					

PE2E SEARCH - Search History (Interference)

There are no Interference searches to show.

Electronically filed August 8, 2022

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Application of:	Tao Tao et al.	Confirmation No.:	8911
Serial No.:	17/746,755	Art Unit:	1721
Filed:	May 17, 2022	Examiner:	Barton, Jason Aaron
For:	*Lithium-Ion Battery Having Desirable Safety Performance*	Attorney Docket No.:	024607-02-5119-US

AMENDMENT AND RESPONSE TO **TRACK 1** NON-FINAL OFFICE ACTION

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450
Sir:

The enclosed Amendment is in response to the **Track 1** Office Action dated July 28, 2022 for the above identified patent application.

The Commissioner is hereby authorized to charge any required fee(s) to Morgan, Lewis & Bockius LLP Deposit Account No. 50-0310 (order no. 024607-02-5119-US).

Amendments to the Claims

The following listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1-19. (Canceled)

20. (New) A lithium-ion battery, comprising:

a positive electrode comprising a positive current collector and a positive electrode active material layer containing $LiCoO_2$, wherein the positive electrode active material layer is formed on the positive current collector, the positive electrode active material layer being provided with a first recess accommodating a positive lead being coupled with the positive current collector;

a negative electrode comprising a negative current collector and a negative electrode active material layer containing graphite or silicon, wherein the negative electrode active material layer is formed on the negative current collector, the negative electrode active material layer being provided with a second recess accommodating a negative lead being coupled with the negative current collector;

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

an electrolyte,

wherein, a top surface of the positive lead is provided with a first insulating glue layer, a surface of the positive electrode active material layer corresponding to the second recess is pasted with a second insulating glue layer, the second insulating glue layer has a width larger than a width of the second recess, and the second insulating glue layer has a length larger than a length of the second recess.

21. (New) The lithium-ion battery of claim 20, wherein a distance between a center of the first recess and one end of the positive electrode active material layer is 1/4-3/4 of a length of the positive electrode active material layer; and a distance between a center of the second recess and one end of the negative electrode active material layer is 1/4-3/4 of a length of the negative electrode active material layer.

22. (New) The lithium-ion battery of claim 21, wherein, the distance between the center of the first recess and the one end of the positive electrode active material layer is half of the length of the positive electrode active material layer; and the distance between the center of the second recess and the one end of the negative electrode active material layer is half of the length of the negative electrode active material layer.

23. (New) The lithium-ion battery of claim 22, wherein the first recess has a length of 1-100 mm less than a length of the positive lead, the first recess has a width of 1-10 mm larger than a width of the positive lead, the second recess has a length of 1-100 mm less than a length of the negative lead, and the second recess has a width of 1-10 mm larger than a width of the negative lead.

24. (New) The lithium-ion battery of claim 20, wherein the first recess has a length of 1-100 mm less than a width of the positive electrode active material layer, and the second recess has a length of 1-100 mm less than a width of the negative electrode active material layer.

25. (New) The lithium-ion battery of claim 20, wherein the first recess has a depth of 0.005-0.1 mm larger than a thickness of the positive lead, and the second recess has a depth of 0.005-0.1 mm larger than a thickness of the negative lead.

26. (New) The lithium-ion battery of claim 20, wherein a length of a portion of the positive lead in the first recess is less than a width of a remaining portion of the positive electrode active material layer from an edge of the first insulating glue layer covering the positive electrode active material layer to an edge of the positive electrode active material layer opposite to the first recess.

27. (New) The lithium-ion battery of claim 20, wherein a width of a portion of the positive lead in the first recess is greater than a width of a remaining portion of the first recess not occupied by the positive lead located on one side of the positive lead.

28. (New) The lithium-ion battery of claim 20, wherein a surface of the positive current collector corresponding to the positive lead is covered with another first insulating glue layer.

29. (New) A lithium-ion battery, comprising:

a positive electrode, comprising a positive current collector and a positive electrode active material layer being formed on the positive current collector, the positive electrode active material layer being provided with a first recess accommodating a positive lead being coupled with the positive current collector;

a negative electrode, comprising a negative current collector and a negative electrode active material layer being formed on the negative current collector, the negative electrode active material layer being provided with a second recess accommodating a negative lead being coupled with the negative current collector;

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

an electrolyte,

wherein, a first location of a top surface of the positive lead is provided with a first insulating glue layer; a second location of a surface of the positive electrode active material layer corresponding to the second recess is pasted with a second insulating glue layer; a third location of a surface of the positive current collector corresponding to the positive lead is covered with another first insulating glue layer; the second insulating glue layer has a width larger than a width of the second recess, and the second insulating glue layer has a length larger than a length of the second recess.

30. (New) The lithium-ion battery of claim 29, wherein a distance between a center of the first recess and one end of the positive electrode active material layer is 1/4-3/4 of a length of the positive electrode active material layer, and a distance between a center of the second recess and one end of the negative electrode active material layer is 1/4-3/4 of a length of the negative electrode active material layer.

31. (New) The lithium-ion battery of claim 29, wherein a distance between a center of the first recess and one end of the positive electrode active material layer is half of a length of the positive electrode active material layer, and a distance between a center of the second recess and one end of the negative electrode active material layer is half of a length of the negative electrode active material layer.

32. (New) The lithium-ion battery of claim 29, wherein the first recess has a length of 1-100mm less than a length of the positive lead, the first recess has a width of 1-10mm larger than a width of the positive lead, the second recess has a length of 1-100mm less than a

length of the negative lead, and the second recess has a width of 1-10mm larger than a width of the negative lead.

33. (New) The lithium-ion battery of claim 29, wherein the first recess has a length of 1-100mm less than a width of the positive electrode active material layer, and the second recess has a length of 1-100mm less than a width of the negative electrode active material layer.

34. (New) The lithium-ion battery of claim 29, wherein the first recess has a depth of 0.005-0.1mm larger than a thickness of the positive lead, and the second recess has a depth of 0.005-0.1mm larger than a thickness of the negative lead.

35. (New) The lithium-ion battery of claim 29, wherein a length of a portion of the positive lead in the first recess is less than a width of a remaining portion of the positive electrode active material layer from an edge of the first insulating glue layer covering the positive electrode active material layer to an edge of the positive electrode active material layer opposite to the first recess.

36. (New) The lithium-ion battery of claim 29, wherein a width of a portion of the positive lead in the first recess is greater than a width of a remaining portion of the first recess not occupied by the positive lead located on one side of the positive lead.

37. (New) A lithium-ion battery, comprising:

a positive electrode, comprising a positive current collector and a positive electrode active material layer being formed on the positive current collector, the positive electrode active material layer being provided with a first recess accommodating a positive lead being coupled with the positive current collector;

a negative electrode, comprising a negative current collector and a negative electrode active material layer being formed on the negative current collector, the negative electrode active material layer being provided with a second recess accommodating a negative lead being coupled with the negative current collector;

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

an electrolyte,

wherein, a first location of a top surface of the positive lead is provided with a first insulating glue layer; a second location of a surface of the positive electrode active material layer corresponding to the second recess is pasted with a second insulating glue layer; the

second insulating glue layer has a width larger than a width of the second recess, and the second insulating glue layer has a length larger than a length of the second recess.

38. (New) The lithium-ion battery of claim 37, wherein a length of a portion of the first lead in the first recess is less than a width of a remaining portion of the first film from an edge of the first insulating glue layer covering the first film to an edge of the first film opposite to the first recess.

39. (New) The lithium-ion battery of claim 37, wherein a width of a portion of the first lead in the first recess is greater than a width of a remaining portion of the first recess not occupied by the first lead located on one side of the first lead.

REMARKS

This amendment responds to the **Track 1** office action mailed July 28, 2022. In the **Track 1** office action, the Examiner:

- rejected claims 1-9 under 35 U.S.C. 103 as being unpatentable over Sugita (WO 2013/038677), in view of Matsushita et al. (U.S. Patent Publication No. 2014/0120417; Matsushita is 102(a)(2) art) and Kwak et al. (U.S. Patent Publication No. 2006/0051662);
- rejected claims 10-17 and 19 under 35 U.S.C. 103 as being unpatentable over Sugita, in view of Matsushita; and
- rejected claim 18 under 35 U.S.C. 103 as being unpatentable over Sugita, in view of Matsushita, and further in view of Lee et al. (U.S. Patent Publication No. 2011/0027636).

INTERVIEW SUMMARY

Applicant's attorneys thank Examiner Barton for the opportunity to discuss the application during a telephone interview on August 5, 2022 with Yalei Sun. In the interview, the Applicant's attorney explained that the original claims 1-19 were filed by mistake because they are identical to the claims 1-19 of the co-pending application 17/407,081. The Examiner suggested that the Applicant file a new set of claims to replace the original claims 1-19. The Examiner also agreed that the double patenting rejection in the office action against the co-pending application 17/407,081 is moot.

REMARKS CONCERNING CLAIMS

Claims 1-19 have been canceled and new claims 20-39 have been added.

Support for the new claims can be found in at least paragraphs [0034] and [0041], and Figures 1-5 of the application as filed. No new matter has been added.

With respect to all amendments, Applicant has not dedicated or abandoned any unclaimed subject matter. Moreover, Applicant has not acquiesced to any characterizations of the invention, nor any rejections or objections of the claims, made by the Examiner. Moreover, the Applicant hereby rescinds any prior disclaimer of claim scope, to the extent they exist, made during the prosecution of this application or made during the prosecution of

any patent or other related patents/applications, and advises the Examiner that any such previous disclaimers and the cited references that they were made to avoid may need to be revisited.

After entry of this amendment, the pending claims are: claims 20-39.

REMARKS CONCERNING REJECTIONS UNDER 35 U.S.C. 103

I. **REJECTION OF CLAIMS 1-9 UNDER 35 U.S.C. 103 AS BEING UNPATENTABLE OVER SUGITA, IN VIEW OF MATSUSHITA**

II. **REJECTION OF CLAIMS 10-17 AND 19 UNDER 35 U.S.C. 103 AS BEING UNPATENTABLE OVER SUGITA, IN VIEW OF MATSUSHITA**

III. **REJECTION OF CLAIM 18 UNDER 35 U.S.C. 103 AS BEING UNPATENTABLE OVER SUGITA, IN VIEW OF MATSUSHITA, AND FURTHER IN VIEW OF LEE**

As noted above, claims 1-19 have been canceled and therefore the rejections above are moot.

Moreover, independent claim 20 recites, among others, that:

> ...
>
> wherein, a top surface of the positive lead is provided with a first insulating glue layer, a surface of the positive electrode active material layer corresponding to the second recess is pasted with a second insulating glue layer, the second insulating glue layer has a width larger than a width of the second recess, and the second insulating glue layer has a length larger than a length of the second recess.

Independent claim 29 recites, among others, that:

> ...
>
> wherein, a first location of a top surface of the positive lead is provided with a first insulating glue layer; a second location of a surface of the positive electrode active material layer corresponding to the second recess is pasted with a second insulating glue layer; a third location of a surface of the positive current collector corresponding to the positive lead is covered with another first insulating glue layer; the second insulating glue layer has a width larger than a width of the second recess, and the second insulating glue layer has a length larger than a length of the second recess.

Independent claim 37 recites, among others, that:

> ...
>
> wherein, a first location of a top surface of the positive lead is provided with a first insulating glue layer; a second location of a surface of the positive electrode active material layer corresponding

to the second recess is pasted with a second insulating glue layer; the second insulating glue layer has a width larger than a width of the second recess, and the second insulating glue layer has a length larger than a length of the second recess.

The Applicant respectfully submits that none of the cited references teach or suggest the claim features above. Therefore, the Applicant respectfully submits that claims 20-39 are patentable over the cited references.

CONCLUDING REMARKS

By responding in the foregoing remarks only to particular positions asserted by the examiner, the Applicant does not necessarily acquiesce in other positions that have not been explicitly addressed. In addition, the Applicant's arguments for the patentability of a claim should not be understood as implying that no other reasons for the patentability of that claim exist.

In light of the above amendments and remarks, the Applicant respectfully requests that the Examiner reconsider this application with a view towards allowance. The Examiner is invited to call the undersigned attorney at (650) 843-7558, if a telephone call could help resolve any remaining items.

Respectfully submitted,

Date: August 8, 2022

/Yalei Sun/ 57,765

Yalei Sun (Reg. No.)
MORGAN, LEWIS & BOCKIUS LLP
1400 Page Mill Road
Palo Alto, CA 94304
Phone: (650) 843-7558
E-mail: yalei.sun@morganlewis.com

Electronic Acknowledgement Receipt

EFS ID:	46365464
Application Number:	17746755
International Application Number:	
Confirmation Number:	8911
Title of Invention:	LITHIUM-ION BATTERY HAVING DESIRABLE SAFETY PERFORMANCE
First Named Inventor/Applicant Name:	Tao TAO
Customer Number:	24341
Filer:	Yalei Sun
Filer Authorized By:	
Attorney Docket Number:	024607-02-5119-US
Receipt Date:	08-AUG-2022
Filing Date:	17-MAY-2022
Time Stamp:	19:19:37
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1		024607-02-5119-US_P2014010US5_RNFOA.pdf	214553 9f4e15639ab5948d9da67dec0d3fe74831c5acfa	yes	9

	Multipart Description/PDF files in .zip description		
	Document Description	**Start**	**End**
	Amendment/Request for Reconsideration-After Non-Final Rejection	1	1
	Claims	2	6
	Applicant Arguments/Remarks Made in an Amendment	7	9
Warnings:			
Information:			
	Total Files Size (in bytes):	214553	

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

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APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
17/746,755	05/17/2022	Tao TAO	024607-02-5119-US

CONFIRMATION NO. 8911

24341
Morgan, Lewis & Bockius LLP (PA)
1400 Page Mill Road
Palo Alto, CA 94304-1124

PUBLICATION NOTICE

OC00000136175778

Title:LITHIUM-ION BATTERY HAVING DESIRABLE SAFETY PERFORMANCE

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Morgan, Lewis & Bockius LLP (PA)
1400 Page Mill Road
Palo Alto, CA 94304-1124

EXAMINER	
BARTON, JASON AARON	

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

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

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

padocketingdepartment@morganlewis.com
vskliba@morganlewis.com

Office Action Summary	Application No. 17/746,755	Applicant(s) TAO et al.	
	Examiner JASON A BARTON	Art Unit 1721	AIA (FITF) Status Yes

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTHS FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☑ Responsive to communication(s) filed on 08/08/2022.

☐ A declaration(s)/affidavit(s) under **37 CFR 1.130(b)** was/were filed on _____.

2a)☑ This action is **FINAL.** 2b) ☐ This action is non-final.

3)☐ An election was made by the applicant in response to a restriction requirement set forth during the interview on _____; the restriction requirement and election have been incorporated into this action.

4)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims*

5) ☑ Claim(s) 20-39 is/are pending in the application.

5a) Of the above claim(s) _____ is/are withdrawn from consideration.

6) ☐ Claim(s) _____ is/are allowed.

7) ☑ Claim(s) 20-39 is/are rejected.

8) ☐ Claim(s) _____ is/are objected to.

9) ☐ Claim(s) _____ are subject to restriction and/or election requirement

* If any claims have been determined allowable, you may be eligible to benefit from the **Patent Prosecution Highway** program at a participating intellectual property office for the corresponding application. For more information, please see http://www.uspto.gov/patents/init_events/pph/index.jsp or send an inquiry to **PPHfeedback@uspto.gov.**

Application Papers

10)☐ The specification is objected to by the Examiner.

11)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

Certified copies:

a)☐ All b)☐ Some** c)☐ None of the:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

** See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☑ Notice of References Cited (PTO-892)

2) ☑ Information Disclosure Statement(s) (PTO/SB/08a and/or PTO/SB/08b) Paper No(s)/Mail Date _____.

3) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date _____.

4) ☐ Other: _____.

DETAILED ACTION

Notice of Pre-AIA or AIA Status

1. The present application, filed on or after March 16, 2013, is being examined under the first inventor to file provisions of the AIA.

Response to Arguments

2. Applicant's arguments filed 08/08/2022, with respect to new independent claims 20, 29 and 37 have been considered but are not persuasive. Applicant argues that the previously cited art do not teach the limitations of the independent claims relating to the insulating glue layers. The examiner disagrees that the previously cited art does not teach the claimed limitations. New claims 20-39 stand rejected over Sugita, Matsushita and Kwak. See rejections below.

Information Disclosure Statement

3. The information disclosure statement filed 07/26/2022 fails to comply with 37 CFR 1.98(a)(2), which requires a legible copy of each cited foreign patent document; each non-patent literature publication or that portion which caused it to be listed; and all other information or that portion which caused it to be listed. It has been placed in the application file, but the information referred to therein has not been considered.

An IDS was filed 07/26/2022. No copies were provided for any of the foreign references or non-patent literature documents. Those references not considered are crossed out on the IDS accompanying this Action.

Claim Rejections - 35 USC § 112

4. The following is a quotation of 35 U.S.C. 112(b):

(b) CONCLUSION.—The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the inventor or a joint inventor regards as the invention.

The following is a quotation of 35 U.S.C. 112 (pre-AIA), second paragraph:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

5. Claims 28 and 29-36 are rejected under 35 U.S.C. 112(b) or 35 U.S.C. 112 (pre-AIA), second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which the inventor or a joint inventor (or for applications subject to pre-AIA 35 U.S.C. 112, the applicant), regards as the invention.

6. **Claim 28 recites**, "...wherein a surface of the positive current collector **corresponding to** the positive lead is covered with another first insulating glue layer" (emphasis added). It is unclear what structure is imparted by the term, "corresponding to." For instance, it is unclear how the location of the another first insulating glue layer on the surface of the positive current collector "corresponds" to the positive lead in a structural sense. In this regard, claim 1 already requires a first insulating glue layer provided on a top surface of the positive lead. If the another first insulating glue layer corresponds to the positive lead, is the positive lead covered with two insulating glue layers? Alternatively, if the positive lead itself is not covered, it's unclear at what location or locations the another insulating glue layer would meet the limitation of, "corresponding to." For at least these reasons, the claim is indefinite.

The claim is broadly interpreted as meaning, "wherein a surface of the positive current collector is covered with another first insulating glue layer."

To overcome the rejection, it is suggested that Applicant amend the claim to more distinctly define the location of the another first insulating glue layer. Moreover, it is noted that in presenting the amendment that annotated figures from the specification can be helpful in aiding the understanding of the claimed subject matter.

7. **Claim 29** is similarly indefinite for same reasons identified in claim 28. That is, the claim recitation of, "a third location of a surface of the positive current collector corresponding to the positive lead is covered with another first insulating glue layer." By virtue of their dependency on claim 29, claims 30-36 are similarly rejected.

Claim Rejections - 35 USC § 103

8. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

9. This application currently names joint inventors. In considering patentability of the claims the examiner presumes that the subject matter of the various claims was commonly owned as of the effective filing date of the claimed invention(s) absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and effective filing dates of each claim that was not commonly owned as of the effective filing date of the later invention in order for the examiner to consider the applicability of 35 U.S.C. 102(b)(2)(C) for any potential 35 U.S.C. 102(a)(2) prior art against the later invention.

10. Claims 20-39 are rejected under 35 U.S.C. 103 as being unpatentable over Sugita (WO2013038677A1) in view of Matsushita (US20140120417A1) and Kwak (US20060051662A1).

11. **Regarding claim 20**, Sugita teaches a lithium-ion battery ([001]-[002]), comprising:

a positive electrode (positive electrode plate 1a, 1c, 1d, 1f, FIGs. 2a, 4, 5, 7; [029]; while numerous embodiments are cited, reference is made specifically to plate 1a of FIG. 2a below for brevity) comprising a positive current collector (see [027]) and a positive electrode active material layer (the active material is coated on the current collector, see [027]; e.g., FIG. 2a shows the "film" as the dark portion (no reference sign is provided)) containing LiCoO2 (lithium cobalt oxide, [060]),

wherein the positive electrode active material layer is formed on the positive current collector (see [027]), the positive electrode active material layer being provided with a first recess (exposed portion 22, FIG. 2A; [027]) accommodating a positive lead being coupled with the positive current collector (see FIG. 2a);

a negative electrode (negative electrode plate 2c, FIG. 13; [030], [056]) comprising a negative current collector (see [027]) and a negative electrode active material layer (the active material is coated on the collector, see [027]) containing graphite or silicon ([065], graphite and silicon are both disclosed),

wherein the negative electrode active material layer is formed on the negative current collector (see [027]), the negative electrode active material layer being provided with a second recess (exposed portion 31, FIG. 2b) accommodating a negative lead being coupled with the negative current collector (see FIG. 2b);

a separator (separator 3, FIG. 1; [069]) disposed between the positive electrode and the negative electrode (see FIG. 1); and

an electrolyte ([071]).

Sugita does not teach wherein, a top surface of the positive lead is provided with a first insulating glue layer, a surface of the positive electrode active material layer corresponding to the second

recess is pasted with a second insulating glue layer, the second insulating glue layer has a width larger than a width of the second recess, and the second insulating glue layer has a length larger than a length of the second recess. However, Sugita does advise to provide insulation between current collecting tabs ([045]). Accordingly, the skilled person would have been motivated to provide insulation to the battery of Sugita.

However, Matsushita and Kwak teach the deficient limitations. Matsushita relates to electrodes having exposed portions with a lead bonded thereto (abstract) and is thus analogous art. Kwak relates to a wound electrode assembly (FIG. 6) that prevents short circuiting (abstract) and is thus analogous art.

Matsushita teaches a top surface of the positive lead (lead 25, see any of embodiments of Figs 4-7; in particular, see Fig. 4a) is provided with a first insulating glue layer (resin tape of protective tape 27, see [0052]).

Kwak teaches a surface of the positive electrode active material layer (second electrode plate 130, FIG. 6; [0036]) corresponding to the second recess (see FIG. 6, the insulation tape 160a corresponds to the second electrode tab 136; see FIG. 4, the recess is formed by the absence of active material) is pasted with a second insulating glue layer (insulation tape 160a, FIG. 6, [0044]), the second insulating glue layer has a width larger than a width of the second recess (see FIG. 4, the insulation tape 160 is noticeably wider than the electrode tab 136), and the second insulating glue layer has a length larger than a length of the second recess (see FIG. 3, the insulating tape 160a has a length that protrudes beyond the length of separator, see also claim 14).

Thus, it would have been obvious before the effective filing date of the claimed invention to incorporated the insulating glue (protective tape 27) of Matsushita and the insulation tape (160a) of Kwak to Sugita to arrive at the claimed invention. The skilled person would have been motivated

to modify Sugita with Matsushita to insulate the electrode lead and prevent thermal runaway of the battery when, for example, the separator or the like is split in an abnormal case (Matsushita, [0052]). Further, the skilled person would have been motivated to modify Sugita with Kwak to prevent short-circuiting between the first electrode plate 140 and the second electrode plate 130 (Kwak, [0056]).

12. **Regarding claim 21,** Sugita in view of Matsushita and Kwak teach the lithium-ion battery of claim 20 as described above.

Sugita also teaches wherein a distance between a center of the first recess and one end of the positive electrode active material layer is 1/4-3/4 of a length of the positive electrode active material layer (see FIG. 2a; since the length of the alleged first lead covers ~1/4 of the width of the current collecting plate (top-to-bottom), the limitation is held to be met); and a distance between a center of the second recess and one end of the negative electrode active material layer is 1/4-3/4 of a length of the negative electrode active material layer (see FIG. 13 and claim mapping above).

13. **Regarding claims 22, 23, 24 and 25**, Sugita in view of Matsushita and Kwak teach the lithium-ion battery of claims 20 and 21 as described above.

None of Sugita, Matsushita or Kwak teach the limitations of claim 22, 23, 24 and 25.

Claim 23 requires wherein the first recess has a length of 1- 100 mm less than a length of the positive lead, the first recess has a width of 1-10 mm larger than a width of the positive lead, the second recess has a length of 1-100 mm less than a length of the negative lead, and the second recess has a width of 1-10 mm larger than a width of the negative lead.

Claim 24 requires wherein the first recess has a length of 1- 100 mm less than a width of the positive electrode active material layer, and the second recess has a length of 1-100 mm less than a width of the negative electrode active material layer.

Claim 25 requires wherein the first recess has a depth of 0.005-0.1 mm larger than a thickness of the positive lead, and the second recess has a depth of 0.005-0.1 mm larger than a thickness of the negative lead.

However, it has been held that changes in size (dimension) are generally recognized as being within the level of ordinary skill in the art. *In re Rose*, 220 F.2d 459, 105 USPQ 237 (CCPA 1955). Where the only difference between the prior art and the claims is a recitation of relative dimensions of the claimed device, and the device having the claimed dimensions would not perform differently than the prior art device, the claimed device is not patentably distinct from the prior art device. *Gardner v. TEC Syst., Inc.*, 725 F.2d 1338, 220 USPQ 777 (Fed. Cir. 1984), *cert. denied*, 469 U.S. 830, 225 USPQ 232 (1984).

In the instant case, it appears that the prior art device (i.e., the combination of Sugita with Matsushita and Kwak) have the same claimed features and any relative difference in size, dimensions, or proportions would not lead to a device that performs differently from the claimed device. Moreover, the present claims cover very broad ranges (two or three orders of magnitude) and there is no indication in the specification that such broad ranges establish the criticality of the ranges. Thus, the claimed device of claims 22, 23, 24 and 25 are not patentably distinct from Sugita in view of Matsushita and Kwak. Accordingly, it would have been obvious before the effective filing date of the claimed invention to have arrived at the claimed invention of claims 22, 23, 24 and 25 because changes in proportion (size) are within ordinary skill in the art.

14. **Regarding claim 26**, Sugita in view of Matsushita and Kwak teach the lithium-ion battery of claim 20 as described above.

Sugita also teaches wherein a length of a portion of the positive lead in the first recess is less than a width of a remaining portion of the positive electrode active material layer from an edge of the first insulating glue layer covering the positive electrode active material layer to an edge of the positive electrode active material layer opposite to the first recess (see FIG. 2a; since the length of the alleged first lead covers ~1/4 of the width of the current collecting plate (top-to-bottom), the limitation is held to be met).

15. **Regarding claim 27**, Sugita in view of Matsushita and Kwak teach the lithium-ion battery of claim 20 as described above.

None of Sugita, Matsushita or Kwak teach wherein a width of a portion of the positive lead in the first recess is greater than a width of a remaining portion of the first recess not occupied by the positive lead located on one side of the positive lead.

However, it has been held that changes in dimension are generally recognized as being within the level of ordinary skill in the art. *In re Rose,* 220 F.2d 459, 105 USPQ 237 (CCPA 1955). Where the only difference between the prior art and the claims is a recitation of relative dimensions of the claimed device, and the device having the claimed dimensions would not perform differently than the prior art device, the claimed device is not patentably distinct from the prior art device. *Gardner v. TEC Syst., Inc.,* 725 F.2d 1338, 220 USPQ 777 (Fed. Cir. 1984), *cert. denied,* 469 U.S. 830, 225 USPQ 232 (1984).

In the instant case, it does not appear that there would be any difference between the claimed device and the prior art device of Sugita in view of Matsushita. For at least these reasons, it would have been obvious before the effective filing date of the claimed invention to have arrived

at the claimed invention of claim 27 because changes in proportion are within ordinary skill in the art.

16. **Regarding claim 28**, Sugita in view of Matsushita and Kwak teach the lithium-ion battery of claim 20 as described above.

Sugita does not teach wherein a surface of the positive current collector is covered with another first insulating glue layer (the claim is interpreted in this manner due to the claim being indefinite, see §112(b) rejections above).

As noted above, Sugita advises to provide insulation between current collecting tabs ([045]), but does not explicitly state how to insulate the current collecting tabs.

Nonetheless, Kwak teaches wherein a surface of the positive current collector is covered with another first insulating glue layer (see [040], the separator 150 has insulation tape 160 that when the battery is assembled faces the positive or negative electrode plate 130/140 after being wound; FIG. 6). While it's unclear what the term, "corresponding to" in the claim means (see §112(b) rejection above), Kwak at least appears to suggest this limitation: "the insulation tape 160 may be coupled with the separator in a position facing the first electrode plate uncoated portion corresponding to the position of the first electrode tab." ([0041]).

Thus, the skilled person would have been motivated to modify the lithium-ion battery of claim 20 as taught by Sugita, Matsushita and Kwak additionally with Kwak to arrive at the claimed invention. The skilled person would have been motivated to do so in order to prevent short-circuiting between the first electrode plate 140 and the second electrode plate 130 (Kwak, [0060]).

17. **Regarding claim 29**, Sugita teaches a lithium-ion battery ([001]-[002]), comprising:

a positive electrode (positive electrode plate 1a, FIG. 2a; [029]) comprising a positive current collector (see [027]) and a positive electrode active material layer (the active material is

coated on the current collector, see [027]; FIG. 2a shows the "film" as the dark portion (no reference sign is provided)) being formed on the positive current collector (see [027]), the positive electrode active material layer being provided with a first recess (exposed portion 22, FIG. 2A; [027]) accommodating a positive lead being coupled with the positive current collector (see FIG. 2a);

a negative electrode (negative electrode plate 2a, FIG. 13; [030], [056]) comprising a negative current collector (see [027]) and a negative electrode active material layer (the active material is coated on the collector, see [027]) being formed on the negative current collector (see [027]), the negative electrode active material layer being provided with a second recess (exposed portion 31, FIG. 2b) accommodating a negative lead being coupled with the negative current collector (see FIG. 2b);

a separator (separator 3, FIG. 1; [069]) disposed between the positive electrode and the negative electrode (see FIG. 1); and

an electrolyte ([071]).

Sugita does not teach wherein (**limitation 1**) a first location of a top surface of the positive lead is provided with a first insulating glue layer, (**limitation 2**) a second location of a surface of the positive electrode active material layer corresponding to the second recess is pasted with a second insulating glue layer, the second insulating glue layer has a width larger than a width of the second recess, and the second insulating glue layer has a length larger than a length of the second recess; and (**limitation 3**) a third location of a surface of the positive current collector corresponding to the positive lead is covered with another first insulating glue layer.

However, Sugita does advise to provide insulation between current collecting tabs ([045]). Accordingly, the skilled person would have been motivated to provide insulation to the battery of Sugita, which relates to deficient limitations 1-3.

However, Matsushita and Kwak teach the deficient limitations. Matsushita relates to electrodes having exposed portions with a lead bonded thereto (abstract) and is thus analogous art. Kwak relates to a wound electrode assembly (FIG. 6) that prevents short circuiting (abstract) and is thus analogous art.

Matsushita teaches (**limitation 1**) a first location of a top surface of the positive lead (lead 25, see any of embodiments of Figs 4-7; in particular, see Fig. 4a) is provided with a first insulating glue layer (resin tape of protective tape 27, see [0052]).

Kwak teaches (**limitation 2**) a surface of the positive electrode active material layer (second electrode plate 130, FIG. 6; [0036]) corresponding to the second recess (see FIG. 6, the insulation tape 160a corresponds to the second electrode tab 136; see FIG. 4, the recess is formed by the absence of active material) is pasted with a second insulating glue layer (insulation tape 160a, FIG. 6, [0044]), the second insulating glue layer has a width larger than a width of the second recess (see FIG. 4, the insulation tape 160 is noticeably wider than the electrode tab 136), and the second insulating glue layer has a length larger than a length of the second recess (see FIG. 3, the insulating tape 160a has a length that protrudes beyond the length of separator, see also claim 14).

Kwak teaches (**limitation 3**) wherein a third location of a surface of the positive current collector is covered with another first insulating glue layer (see [040], the separator 150 has insulation tape 160 that when the battery is assembled faces the positive or negative electrode plate 130/140 after being wound; FIG. 6). While it's unclear what the term, "corresponding to" in the claim means (see §112(b) rejection above), Kwak at least appears to suggest this limitation: "the

insulation tape 160 may be coupled with the separator in a position facing the first electrode plate uncoated portion corresponding to the position of the first electrode tab." ([0041]).

Thus, it would have been obvious before the effective filing date of the claimed invention to incorporated the insulating glue (protective tape 27) of Matsushita and the insulation tapes (160, 160a) of Kwak to Sugita to arrive at the claimed invention. The skilled person would have been motivated to modify Sugita with Matsushita to insulate the electrode lead and prevent thermal runaway of the battery when, for example, the separator or the like is split in an abnormal case (Matsushita, [0052]). Further, the skilled person would have been motivated to modify Sugita with Kwak to prevent short-circuiting between the first electrode plate 140 and the second electrode plate 130 (Kwak, [0056] corresponding to insulating tape 160a and [0060] corresponding to insulating tape 160).

18. **Regarding claim 30,** Sugita in view of Matsushita and Kwak teach the lithium-ion battery of claim 29 as described above.

Sugita also teaches wherein a distance between a center of the first recess and one end of the positive electrode active material layer is 1/4-3/4 of a length of the positive electrode active material layer (see FIG. 2a; since the length of the alleged first lead covers ~1/4 of the width of the current collecting plate (top-to-bottom), the limitation is held to be met); and a distance between a center of the second recess and one end of the negative electrode active material layer is 1/4-3/4 of a length of the negative electrode active material layer (see FIG. 13 and claim mapping above).

19. **Regarding claim 31,** Sugita in view of Matsushita and Kwak teach the lithium-ion battery of claim 29 as described above.

Sugita also teaches wherein a distance between a center of the first recess and one end of the positive electrode active material layer is half of a length of the positive electrode active material layer, and a distance between a center of the second recess and one end of the negative electrode active material layer is half of a length of the negative electrode active material layer. See FIGS. 2a and 13, the first recess 22 (FIG. 2a) is located in the center and the second recess (see FIG. 13, the recess is not denoted by a reference numeral but is below tab 6) is also located in the center of the active material layer.

20. **Regarding claims 32, 33, and 34**, Sugita in view of Matsushita and Kwak teach the lithium-ion battery of claim 29 as described above.

None of Sugita, Matsushita or Kwak teach the limitations of claim 32, 33 and 34.

Claim 32 requires wherein the first recess has a length of 1- 100mm less than a length of the positive lead, the first recess has a width of 1-10mm larger than a width of the positive lead, the second recess has a length of 1-100mm less than a length of the negative lead, and the second recess has a width of 1-10mm larger than a width of the negative lead.

Claim 33 requires wherein the first recess has a length of 1- 100mm less than a width of the positive electrode active material layer, and the second recess has a length of 1-100mm less than a width of the negative electrode active material layer.

Claim 34 requires wherein the first recess has a depth of 0.005-0.1mm larger than a thickness of the positive lead, and the second recess has a depth of 0.005-0. 1mm larger than a thickness of the negative lead.

However, it has been held that changes in size (dimension) are generally recognized as being within the level of ordinary skill in the art. *In re Rose*, 220 F.2d 459, 105 USPQ 237 (CCPA 1955). Where the only difference between the prior art and the claims is a recitation of relative

dimensions of the claimed device, and the device having the claimed dimensions would not perform differently than the prior art device, the claimed device is not patentably distinct from the prior art device. *Gardner v. TEC Syst., Inc.*, 725 F.2d 1338, 220 USPQ 777 (Fed. Cir. 1984), *cert. denied*, 469 U.S. 830, 225 USPQ 232 (1984).

In the instant case, it appears that the prior art device (i.e., the combination of Sugita with Matsushita and Kwak) have the same claimed features and any relative difference in size, dimensions, or proportions would not lead to a device that performs differently from the claimed device. Moreover, the present claims cover very broad ranges (two or three orders of magnitude) and there is no indication in the specification that such broad ranges establish the criticality of the ranges. Thus, the claimed device of claims 32, 33 and 34 are not patentably distinct from Sugita in view of Matsushita and Kwak. Accordingly, it would have been obvious before the effective filing date of the claimed invention to have arrived at the claimed invention of claims 32, 33 and 34 because changes in proportion (size) are within ordinary skill in the art.

21. **Regarding claim 35**, Sugita in view of Matsushita and Kwak teach the lithium-ion battery of claim 29 as described above.

Sugita also teaches wherein a length of a portion of the positive lead in the first recess is less than a width of a remaining portion of the positive electrode active material layer from an edge of the first insulating glue layer covering the positive electrode active material layer to an edge of the positive electrode active material layer opposite to the first recess (see FIG. 2a; since the length of the alleged first lead covers ~1/4 of the width of the current collecting plate (top-to-bottom), the limitation is held to be met).

22. **Regarding claim 36**, Sugita in view of Matsushita and Kwak teach the lithium-ion battery of claim 29 as described above.

None of Sugita, Matsushita or Kwak teach wherein a width of a portion of the positive lead in the first recess is greater than a width of a remaining portion of the first recess not occupied by the positive lead located on one side of the positive lead.

However, it has been held that changes in dimension are generally recognized as being within the level of ordinary skill in the art. *In re Rose,* 220 F.2d 459, 105 USPQ 237 (CCPA 1955). Where the only difference between the prior art and the claims is a recitation of relative dimensions of the claimed device, and the device having the claimed dimensions would not perform differently than the prior art device, the claimed device is not patentably distinct from the prior art device. *Gardner v. TEC Syst., Inc.,* 725 F.2d 1338, 220 USPQ 777 (Fed. Cir. 1984), *cert. denied,* 469 U.S. 830, 225 USPQ 232 (1984).

In the instant case, it does not appear that there would be any difference between the claimed device and the prior art device of Sugita in view of Matsushita. For at least these reasons, it would have been obvious before the effective filing date of the claimed invention to have arrived at the claimed invention of claim 36 because changes in proportion are within ordinary skill in the art.

23. **Regarding claim 37**, Sugita teaches a lithium-ion battery ([001]-[002]), comprising:

a positive electrode (positive electrode plate 1a, FIG. 2a; [029]) comprising a positive current collector (see [027]) and a positive electrode active material layer (the active material is coated on the current collector, see [027]; FIG. 2a shows the "film" as the dark portion (no reference sign is provided)) being formed on the positive current collector (see [027]), the positive electrode active material layer being provided with a first recess (exposed portion 22, FIG. 2A; [027]) accommodating a positive lead being coupled with the positive current collector (see FIG. 2a);

a negative electrode (negative electrode plate 2a, FIG. 13; [030], [056]) comprising a negative current collector (see [027]) and a negative electrode active material layer (the active material is coated on the collector, see [027]) being formed on the negative current collector (see [027]), the negative electrode active material layer being provided with a second recess (exposed portion 31, FIG. 2b) accommodating a negative lead being coupled with the negative current collector (see FIG. 2b);

a separator (separator 3, FIG. 1; [069]) disposed between the positive electrode and the negative electrode (see FIG. 1); and

an electrolyte ([071]).

Sugita does not teach wherein (**limitation 1**) a first location of a top surface of the positive lead is provided with a first insulating glue layer, (**limitation 2**) a second location of a surface of the positive electrode active material layer corresponding to the second recess is pasted with a second insulating glue layer, the second insulating glue layer has a width larger than a width of the second recess, and the second insulating glue layer has a length larger than a length of the second recess.

However, Sugita does advise to provide insulation between current collecting tabs ([045]). Accordingly, the skilled person would have been motivated to provide insulation to the battery of Sugita, which relates to deficient limitations 1 and 2.

However, Matsushita and Kwak teach the deficient limitations. Matsushita relates to electrodes having exposed portions with a lead bonded thereto (abstract) and is thus analogous art. Kwak relates to a wound electrode assembly (FIG. 6) that prevents short circuiting (abstract) and is thus analogous art.

Matsushita teaches (**limitation 1**) a first location of a top surface of the positive lead (lead 25, see any of embodiments of Figs 4-7; in particular, see Fig. 4a) is provided with a first insulating glue layer (resin tape of protective tape 27, see [0052]).

Kwak teaches (**limitation 2**) a surface of the positive electrode active material layer (second electrode plate 130, FIG. 6; [0036]) corresponding to the second recess (see FIG. 6, the insulation tape 160a corresponds to the second electrode tab 136; see FIG. 4, the recess is formed by the absence of active material) is pasted with a second insulating glue layer (insulation tape 160a, FIG. 6, [0044]), the second insulating glue layer has a width larger than a width of the second recess (see FIG. 4, the insulation tape 160 is noticeably wider than the electrode tab 136), and the second insulating glue layer has a length larger than a length of the second recess (see FIG. 3, the insulating tape 160a has a length that protrudes beyond the length of separator, see also claim 14).

Thus, it would have been obvious before the effective filing date of the claimed invention to incorporated the insulating glue (protective tape 27) of Matsushita and the insulation tape (160a) of Kwak to Sugita to arrive at the claimed invention. The skilled person would have been motivated to modify Sugita with Matsushita to insulate the electrode lead and prevent thermal runaway of the battery when, for example, the separator or the like is split in an abnormal case (Matsushita, [0052]). Further, the skilled person would have been motivated to modify Sugita with Kwak to prevent short-circuiting between the first electrode plate 140 and the second electrode plate 130 (Kwak, [0060]).

24. **Regarding claim 38**, Sugita in view of Matsushita and Kwak teach the lithium-ion battery of claim 37 as described above.

Sugita also teaches wherein a length of a portion of the positive lead in the first recess is less than a width of a remaining portion of the positive electrode active material layer from an edge

of the first insulating glue layer covering the positive electrode active material layer to an edge of the positive electrode active material layer opposite to the first recess (see FIG. 2a; since the length of the alleged first lead covers ~1/4 of the width of the current collecting plate (top-to-bottom), the limitation is held to be met).

25. **Regarding claim 39**, Sugita in view of Matsushita and Kwak teach the lithium-ion battery of claim 37 as described above.

None of Sugita, Matsushita or Kwak teach wherein a width of a portion of the positive lead in the first recess is greater than a width of a remaining portion of the first recess not occupied by the positive lead located on one side of the positive lead.

However, it has been held that changes in dimension are generally recognized as being within the level of ordinary skill in the art. *In re Rose,* 220 F.2d 459, 105 USPQ 237 (CCPA 1955). Where the only difference between the prior art and the claims is a recitation of relative dimensions of the claimed device, and the device having the claimed dimensions would not perform differently than the prior art device, the claimed device is not patentably distinct from the prior art device. *Gardner v. TEC Syst., Inc.*, 725 F.2d 1338, 220 USPQ 777 (Fed. Cir. 1984), *cert. denied,* 469 U.S. 830, 225 USPQ 232 (1984).

In the instant case, it does not appear that there would be any difference between the claimed device and the prior art device of Sugita in view of Matsushita. For at least these reasons, it would have been obvious before the effective filing date of the claimed invention to have arrived at the claimed invention of claim 39 because changes in proportion are within ordinary skill in the art.

Citation of Pertinent Art

26. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

- JP2007165224A: JP'224 discloses a nonaqueous electrolyte battery (abstract) having an insulating portion 8 (FIG. 3). The insulating portion is disposed cooperatively with the electrode lead 7 and across a separator 4 to prevent short-circuiting (see FIG. 3 and pg. 2 of machine translation).
- US20070172736A1: US'736 discloses a lithium secondary battery (abstract). The battery includes a heat resistant layer (30) disposed opposite a current collecting lead 14 to prevent short-circuiting ([0026]).

Conclusion

27. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

28. Any inquiry concerning this communication or earlier communications from the examiner should be directed to JASON AARON BARTON whose telephone number is (571)270-3551. The examiner can normally be reached 9:00 AM to 5:00 PM.

Examiner interviews are available via telephone, in-person, and video conferencing using a USPTO supplied web-based collaboration tool. To schedule an interview, applicant is encouraged to use the USPTO Automated Interview Request (AIR) at http://www.uspto.gov/interviewpractice.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Allison Bourke can be reached on (303)297-4684. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of published or unpublished applications may be obtained from Patent Center. Unpublished application information in Patent Center is available to registered users. To file and manage patent submissions in Patent Center, visit: https://patentcenter.uspto.gov. Visit https://www.uspto.gov/patents/apply/patent-center for more information about Patent Center and https://www.uspto.gov/patents/docx for information about filing in DOCX format. For additional questions, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/JASON BARTON/
Examiner, Art Unit 1721

/WILLIAM E MCCLAIN/
Primary Examiner, Art Unit 1721

Notice of References Cited	Application/Control No. 17/746,755	Applicant(s)/Patent Under Reexamination TAO	
	Examiner JASON A BARTON	Art Unit 1721	Page 1 of 1

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*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Name	CPC Classification	US Classification
*	A	US-20070172736-A1	07-2007	Fujikawa; Masato	H01M50/474	429/246
	B					
	C					
	D					
	E					
	F					
	G					
	H					
	I					
	J					
	K					
	L					
	M					

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	P					
	Q					
	R					
	S					
	T					

NON-PATENT DOCUMENTS

*		Include as applicable: Author, Title Date, Publisher, Edition or Volume, Pertinent Pages)
	U	Machine translation of JP-2007165224-A (Year: 2007)
	V	
	W	
	X	

*A copy of this reference is not being furnished with this Office action. (See MPEP § 707.05(a).)
Dates in MM-YYYY format are publication dates. Classifications may be US or foreign.

Search Notes	Application/Control No.	Applicant(s)/Patent Under Reexamination
	17/746,755	TAO et al.
	Examiner	Art Unit
	JASON A BARTON	1721

CPC - Searched*		
Symbol	**Date**	**Examiner**
H01M10/0431	07/14/2022	JB
H01M10/0587	07/14/2022	JB
H01M50/531, 533, 538	07/14/2022	JB
H01M50/5$	07/14/2022	JB
H01M.cpcl.	07/14/2022	JB
H01M10/0431	09/08/2022	JB
H01M10/0587	09/08/2022	JB
H01M50/531, 533, 538	09/08/2022	JB
H01M50/5$	09/08/2022	JB
H01M.cpcl.	09/08/2022	JB

CPC Combination Sets - Searched*		
Symbol	**Date**	**Examiner**

US Classification - Searched*			
Class	**Subclass**	**Date**	**Examiner**

* See search history printout included with this form or the SEARCH NOTES box below to determine the scope of the search.

/JASON BARTON/ Examiner, Art Unit 1721	

Search Notes	Application/Control No.	Applicant(s)/Patent Under Reexamination
	17/746,755	TAO et al.
	Examiner	Art Unit
	JASON A BARTON	1721

Search Notes		
Search Notes	**Date**	**Examiner**
Global dossier search	07/14/2022	JB
Applicant and inventor search in SEARCH	07/14/2022	JB
CPC and CPC-limited text search in SEARCH	07/14/2022	JB
“More like this” searching in SEARCH and IP.COM	07/14/2022	JB
Additional search (refresh)	09/08/2022	JB

Interference Search			
US Class/CPC Symbol	**US Subclass/CPC Group**	**Date**	**Examiner**

/JASON BARTON/ Examiner, Art Unit 1721	

INFORMATION DISCLOSURE STATEMENT BY APPLICANT Substitute for Form 1449-PTO				*Electronically filed July 26, 2022*	
				Application Number	*17/746,755*
				Filing Date	*May 17, 2022*
				First Named Inventor	*Tao TAO*
				Art Unit	*1721*
				Examiner Name	*Barton, Jason Aaron*
Sheet	1	of	2	Attorney Docket Number	*024607-02-5119-US*

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		JPH11317218A	11-16-1999	RES & DEV		
		~~JP19930130644 -~~		~~OLYMPUS OPTICAL~~		
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		JP2003132875A	05-09-2003	MATSUSHITA ELECTRIC IND CO LTD		

NON PATENT LITERATURE DOCUMENTS

Examiner Signature	/JASON BARTON/	Date Considered	09/09/2022

DB2/ 43704314.1

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /J.B./

INFORMATION DISCLOSURE STATEMENT BY APPLICANT Substitute for Form 1449-PTO				*Electronically filed July 26, 2022*	
				Application Number	*17/746,755*
				Filing Date	*May 17, 2022*
				First Named Inventor	*Tao TAO*
				Art Unit	*1721*
				Examiner Name	*Barton, Jason Aaron*
Sheet	2	of	2	Attorney Docket Number	*024607-02-5119-US*

Examiner Initials	Cite No.	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published
		~~Evaluation Report of Utility Model Patent, ZL201420030319 4, 24DEC2019, 5 pgs.~~
		~~Tao, Office Action, US14/596,873, 04APR2017, 14 pgs.~~
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		~~Machine English translation of CN202495523U (Year: 2012)~~

Examiner Signature	/JASON BARTON/	Date Considered	09/09/2022

DB2/ 43704314.1

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PE2E SEARCH - Search History (Prior Art)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	British Equivalents	Time Stamp
L1	24	(US-41406506-$ | US-5017442-$ | US-5478668-$ | US-6100114-$ | US-6551143-$).DID. (AL-20010036574-$ | AL-20070122714-$ | AL-20090035638-$ | CN-101939873-$ | CN-103066239-$ | CN-1221054-$ | CN-1350350-$ | CN-201087907-$ | CN-202495523-$ | DB-241406506-$ | JP-1993013064-$ | JP-1999317218-$ | JP-2000277155-$ | JP-2003132875-$).DID.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO); FPRS; EPO; JPO)	OR	ON	ON	2022/07/12 07:49 PM
L2	3	(US-20010036574-$ | US-20070122714-$ | US-20090035638-$).did.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO); FPRS; EPO; JPO)	OR	ON	ON	2022/07/12 07:56 PM
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		6237187-$ | JP-6288015-$ | JP-6926991-$ | KR-101489993-$ | KR-101515672-$ | KR-101980974-$ | KR-200364044-$ | KR-20060009411-$ | KR-20120022773-$ | WO-2017149977-$).DID.					
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		9397329-$ | US-9490468-$ | US-9564626-$ | US-9595699-$ | US-9627677-$ | US-9960404-$).DID.					
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L15	5171174	(recess$7 OR pocket OR (non-coat$7 ADJ (portion OR part)) OR cavity OR hole OR gap) NEAR10 (tab$5 OR tap$5 OR lead$5)	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO); FPRS; EPO; JPO)	OR	ON	ON	2022/07/13 12:06 PM
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L18	1	US-8795879-$.did.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO); FPRS; EPO; JPO)	OR	ON	ON	2022/07/13 12:22 PM
L19	1	("20090296318").pn. OR ("8795879").urpn. AND (PGPB | USPT | USOC).dbnm.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2022/07/13 12:22 PM
L20	76	(US-20040126654-$ | US-20040207974-$ | US-20090296318-$ | US-20150332857-$ | US-8014127-$ | US-8218293-$ | US-8795879-$ | US-8837115-$ | US-9070511-$).DID. (CN-104137303-$ | CN-108713233-$ | CN-110706928-$ | CN-201156473-$ | EP-1580774-$ | JP-2001023866-$ | JP-2001284190-$ | JP-2006286959-$ | JP-2008147541-$ | JP-2009010070-$ | JP-2009152514-$ | JP-	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO); FPRS; EPO; JPO)	OR	ON	ON	2022/07/13 12:23 PM

		2009212117-$ | JP-2009212283-$ | JP-2010074083-$ | JP-2010074089-$ | JP-2012019061-$ | JP-2012064601-$ | JP-2018157012-$ | JP-3587333-$ | JP-4413003-$ | JP-6893123-$ | JP-6953724-$ | KR-101404532-$ | KR-101434923-$ | KR-101475367-$ | KR-102079677-$ | KR-20130116836-$ | WO-2010116656-$ | WO-2021172440-$).DID.					
L21	293	L14 AND L15 AND (length NEAR10(tab$5 OR tap$5 OR lead$5)) AND @fd<"20140117"	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2022/07/13 12:29 PM
L22	17297	((recess$7 OR pocket OR (non-coat$7 ADJ (portion OR part)) OR cavity OR hole OR gap) NEAR10 (energ$6 NEAR5 densit$7))	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO); FPRS; EPO; JPO)	OR	ON	ON	2022/07/13 12:35 PM
L23	1	L14 AND L15 AND (length NEAR10(tab$5 OR tap$5 OR lead$5)) AND L22 AND @fd<"20140117"	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2022/07/13 12:35 PM
L24	13	L14 AND L15 AND (length NEAR10(tab$5 OR tap$5 OR lead$5)) AND L22 AND @fd<"20140117"	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO))	OR	ON	ON	2022/07/13 12:37 PM
L25	5	L14 AND L15 AND (length NEAR10(tab$5 OR tap$5 OR lead$5)) AND L22 AND @pd<"20140117"	(FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO); FPRS; EPO; JPO)	OR	ON	ON	2022/07/13 12:37 PM
L26	6494	(H01M10/0431 AND	(US-PGPUB; USPAT;	OR	ON	ON	2022/07/13

		H01M50/538).cpc.	USOCR; FIT (AP, AT, AU, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)				12:55 PM
L27	127	L26 AND L15 AND @fd<"20140117"	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2022/07/13 12:55 PM
L28	2	(US-20100124694-$ OR US-2006022937-$ OR US-20090166192-$).did.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO); FPRS; EPO; JPO)	OR	ON	ON	2022/07/13 01:18 PM
L29	0	(US-2006022937-$).did.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO); FPRS; EPO; JPO)	OR	ON	ON	2022/07/13 01:19 PM
L30	1	(US-20060022937-$).did.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO); FPRS; EPO; JPO)	OR	ON	ON	2022/07/13 01:19 PM
L31	1	(US-20060222937-$).did.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO); FPRS; EPO; JPO)	OR	ON	ON	2022/07/13 01:20 PM
L32	1	(US-6828059-$).did.	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, BE, BG, BR, BY, CA, CH, CN, CS, CU,	OR	ON	ON	2022/07/13 01:24 PM

			CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO); FPRS; EPO; JPO)				
L33	1	(US-20100124694-$).did.	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO); FPRS; EPO; JPO)	OR	ON	ON	2022/07/13 01:25 PM
L34	1	(jp-09017410-$).did.	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO); FPRS; EPO; JPO)	OR	ON	ON	2022/07/13 01:25 PM
L35	1	(jp-09161837$).did.	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO); FPRS; EPO; JPO)	OR	ON	ON	2022/07/13 01:25 PM
L36	1	US-20070122714-$.did.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO); FPRS; EPO; JPO)	OR	ON	ON	2022/07/13 01:29 PM
L37	37	((JP-2003132875-A OR CN-202495523-U OR CN-103066239-A OR CN-101939873-A OR CN-201087907-Y OR CN-1221054-C OR CN-1350350-A OR CN-1221054-A).did. AND FTDB.dbnm.) OR ((US-20140349179-A1 OR	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO); FPRS; EPO; JPO;	OR	ON	ON	2022/07/13 01:30 PM

		US-20140120417-A1 OR US-20090111011-A1 OR US-20110104539-A1 OR US-20110151295-A1 OR US-20010033962-A1 OR US-20090166192-A1 OR US-20080233474-A1 OR US-20130045406-A1 OR US-20120214049-A1 OR US-20110027636-A1 OR US-20060222937-A1 OR US-20130045405-A1 OR US-20130316207-A1 OR US-20130316209-A1 OR US-20130101891-A1 OR US-20120321942-A1 OR US-20040191634-A1 OR US-20060051662-A1 OR US-20090035638-A1 OR US-20070122714-A1).did. AND PGPB.dbnm.) OR ((US-9142840-B2 OR US-8837115-B2 OR US-6100114-A OR US-5478668-A OR US-5017442-A).did. AND USPT.dbnm.) OR ((KR-101475367-B1 OR CN-1221054-A).did. AND FPRS.dbnm.) OR ((JP-2000277155-A).did. AND JPAB.dbnm.)	DERWENT; IBM_TDB)				
L38	145716	(non-coat$6 OR (non ADJ coat$6) OR un-coat$6 OR (un ADJ coat$6) OR non-application$9 OR (non ADJ application$9))	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO); FPRS; EPO; JPO)	OR	ON	ON	2022/07/13 01:36 PM
L39	4877	L14 AND L38	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV,	OR	ON	ON	2022/07/13 01:36 PM

			MA, OA, RU, SU, WO); FPRS; EPO; JPO)				
L40	249	L14 AND L38 AND (L38 NEAR15 (width OR length OR size OR area)) AND (L38 SAME3 (energ$7 NEAR5 dens$6))	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO); FPRS; EPO; JPO)	OR	ON	ON	2022/07/13 01:37 PM
L41	23	L14 AND L38 AND (L38 NEAR15 (width OR length OR size OR area)) AND (L38 SAME3 (energ$7 NEAR5 dens$6)) AND @fd<"20140117"	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2022/07/13 01:37 PM
L42	428	(H01M50/538).cpc. AND (recess$6 near15 (tab OR lead OR tap))	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO); FPRS; EPO; JPO)	OR	ON	ON	2022/07/13 02:18 PM
L43	41	(H01M50/538).cpc. AND (recess$6 near15 (tab OR lead OR tap)) AND @fd<"20140117"	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2022/07/13 02:18 PM
L44	507	(H01M50/5$).cpc. AND (recess$6 near15 (tab OR lead OR tap)) AND @fd<"20140117"	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2022/07/13 02:22 PM
L45	114	(H01M50/538).cpc. AND (recess$6 near15 (tab OR lead OR tap)) AND @pd<"20140117"	(FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO); FPRS; EPO; JPO)	OR	ON	ON	2022/07/13 02:23 PM
L46	13	("20100216001" OR "20110274953" OR "20140017565" OR "20150295270" OR "6139986" OR "20050287428" OR "20090148766" OR "20090297941" OR "20110076547" OR "20160197379" OR	(US-PGPUB; USPAT)	OR	ON	ON	2022/07/13 04:06 PM

		"7923139" OR "7955736" OR "8450006").pn.					
L47	1	US-10320024-$.did.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO); FPRS; EPO; JPO)	OR	ON	ON	2022/07/13 04:08 PM
L48	9	("20110104539" | "20110129708" | "20110151295" | "20120009450" | "20120321924" | "20130260203" | "20130316207" | "20140072877" | "20140302366").pn. OR ("10320024").urpn. AND (PGPB | USPT | USOC).dbnm.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2022/07/13 04:08 PM
L49	0	(KR-1038115-$ OR KR-1615712-$ OR KR-20110035566-$ OR KR-20160085063-$).DID.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2022/07/13 04:12 PM
L50	4	(KR-1038115-$ OR KR-1615712-$ OR KR-20110035566-$ OR KR-20160085063-$).DID.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO); FPRS; EPO; JPO)	OR	ON	ON	2022/07/13 04:12 PM
L51	4	(KR-101038115-$ OR KR-101615712-$).DID.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO); FPRS; EPO; JPO)	OR	ON	ON	2022/07/13 04:13 PM
L52	45	(Artificial Intelligence) More like doc: US-20140302366-A1 Text: (US-9520588-B2 OR WO-2013038701-A1	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB,	OR	ON	ON	2022/07/13 04:14 PM

		OR JP-WO2013038701-A1 OR JP-5849234-B2 OR WO-2013038677-A1 OR JP-2014225326-A OR JP-2007109612-A OR JP-6208239-B2 OR JP-6439839-B2 OR CN-103733418-B OR CN-107431250-B OR JP-H09180761-A OR JP-2003288941-A OR KR-20030078019-A OR KR-100990800-B1 OR JP-4097443-B2 OR JP-6652125-B2 OR JP-2013073680-A OR JP-2016081881-A OR CN-103733418-A).did.	HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA, VN); FPRS; EPO; JPO; DERWENT; IBM_TDB)				
L53	49	(Artificial Intelligence) More like doc: WO-2013038677-A1 Text: (WO-2013038701-A1 OR JP-5849234-B2 OR JP-WO2013038701-A1 OR WO-2013038676-A1 OR JP-2014225326-A OR US-9520588-B2 OR US-20140302366-A1 OR WO-2016079943-A1 OR JP-2007109612-A OR JP-2010061893-A OR JP-2008311011-A OR WO-2018061381-A1 OR JP-2018018646-A OR JP-WO2018061381-A1 OR JP-2016122628-A OR JP-6567821-B2 OR WO-2019065871-A1 OR US-8530072-B2 OR JP-H09306471-A OR JP-2010086812-A).did.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA, VN); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/07/13 04:19 PM
L54	47	((JP-2003132875-A OR WO-2013038677-A1 OR WO-2013038676-A1 OR CN-202495523-U OR JP-6652125-B2 OR CN-103066239-A OR CN-101939873-A OR CN-201087907-Y OR CN-1221054-C OR CN-1350350-A OR CN-1221054-A).did. AND FTDB.dbnm.) OR ((US-20140349179-A1 OR	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA,	OR	ON	ON	2022/07/13 04:43 PM

		US-20140120417-A1 OR US-20090111011-A1 OR US-20110104539-A1 OR US-20110151295-A1 OR US-20010033962-A1 OR US-20090166192-A1 OR US-20140302366-A1 OR US-20130316207-A1 OR US-20080233474-A1 OR US-20130045406-A1 OR US-20120214049-A1 OR US-20110027636-A1 OR US-20060222937-A1 OR US-20130045405-A1 OR US-20130316209-A1 OR US-20130101891-A1 OR US-20120321942-A1 OR US-20100086858-A1 OR US-20150295270-A1 OR US-20120009450-A1 OR US-20040191634-A1 OR US-20060051662-A1 OR US-20090081530-A1 OR US-20090035638-A1 OR US-20070122714-A1).did. AND PGPB.dbnm.) OR ((US-9142840-B2 OR US-8837115-B2 OR US-6100114-A OR US-5478668-A OR US-5017442-A).did. AND USPT.dbnm.) OR ((JP-2014225326-A OR JP-2001015096-A OR JP-2000277155-A).did. AND JPAB.dbnm.) OR ((KR-101475367-B1 OR CN-1221054-A).did. AND FPRS.dbnm.)	VN); FPRS; EPO; JPO; DERWENT; IBM_TDB)				
L55	134	((("NINGDE") near3 ("AMPEREX") near3 ("TECHNOLOGY") near3 ("LIMITED"))).AS,AANM.	(USPAT)	OR	ON	ON	2022/07/13 09:28 PM
L56	137	((("NINGDE") near3 ("AMPEREX"))).AS,AANM.	(USPAT)	OR	ON	ON	2022/07/13 09:30 PM

L57	527	((("NINGDE") near3 ("AMPEREX"))).AS,AANM.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2022/07/13 09:30 PM
L58	1129	L57 AND L14	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO); FPRS; EPO; JPO)	OR	ON	ON	2022/07/13 09:31 PM
L59	10	L57 AND L14 AND @pd<"20140117"	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO); FPRS; EPO; JPO)	OR	ON	ON	2022/07/13 09:31 PM
L60	308	((("TAO") near3 ("Tao")) OR (("MO") near3 ("Ming") near3 ("Liang"))).INV.	(US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT)	OR	ON	ON	2022/07/14 10:56 AM
L61	2	L60 AND L14 AND @pd<"20140117"	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO); FPRS; EPO; JPO)	OR	ON	ON	2022/07/14 10:57 AM
L62	130343969	L60AND @pd<"20140117"	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO); FPRS; EPO; JPO)	OR	ON	ON	2022/07/14 10:57 AM
L63	2325	L60 AND @pd<"20140117"	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO);	OR	ON	ON	2022/07/14 10:57 AM

			FPRS; EPO; JPO)				
L64	130343999	L60 AND H01M50/5$.cpc. @pd<"20140117"	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO); FPRS; EPO; JPO)	OR	ON	ON	2022/07/14 10:58 AM
L65	0	L60 AND H01M50/5$.cpc. AND @pd<"20140117"	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO); FPRS; EPO; JPO)	OR	ON	ON	2022/07/14 10:58 AM
L66	46	L60 AND H01M.cpcl. AND @pd<"20140117"	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO); FPRS; EPO; JPO)	OR	ON	ON	2022/07/14 10:59 AM
L67	47	((JP-2003132875-A OR WO-2013038677-A1 OR WO-2013038676-A1 OR CN-202495523-U OR JP-6652125-B2 OR CN-103066239-A OR CN-101939873-A OR CN-201087907-Y OR CN-1221054-C OR CN-1350350-A OR CN-1221054-A).did. AND FTDB.dbnm.) OR ((US-20140349179-A1 OR US-20140120417-A1 OR US-20090111011-A1 OR US-20110104539-A1 OR US-20110151295-A1 OR US-20010033962-A1 OR US-20090166192-A1 OR US-20140302366-A1 OR US-20130316207-A1 OR US-20080233474-A1 OR US-20130045406-A1	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/07/14 11:11 AM

		OR US-20120214049-A1 OR US-20110027636-A1 OR US-20060222937-A1 OR US-20130045405-A1 OR US-20130316209-A1 OR US-20130101891-A1 OR US-20120321942-A1 OR US-20100086858-A1 OR US-20150295270-A1 OR US-20120009450-A1 OR US-20040191634-A1 OR US-20060051662-A1 OR US-20090081530-A1 OR US-20090035638-A1 OR US-20070122714-A1).did. AND PGPB.dbnm.) OR ((US-9142840-B2 OR US-8837115-B2 OR US-6100114-A OR US-5478668-A OR US-5017442-A).did. AND USPT.dbnm.) OR ((JP-2014225326-A OR JP-2001015096-A OR JP-2000277155-A).did. AND JPAB.dbnm.) OR ((KR-101475367-B1 OR CN-1221054-A).did. AND FPRS.dbnm.)					
L68	12	(US-20050250052-$ OR US-20110003211-$).did. OR (CN-1489229-$ OR CN-101939869-$ OR CN-103262310-$ OR JP-2005283643-$).did.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO); FPRS; EPO; JPO)	OR	ON	ON	2022/07/14 12:00 PM
L69	53	((JP-2003132875-A OR WO-2013038677-A1 OR WO-2013038676-A1 OR CN-202495523-U OR JP-6652125-B2 OR CN-103066239-A OR CN-101939873-A OR CN-201087907-Y OR CN-1221054-C OR CN-1350350-A OR CN-1221054-A OR CN-103262310-A OR CN-	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/07/14 12:12 PM

		101939869-A OR JP-2005283643-A OR CN-1489229-A).did. AND FTDB.dbnm.) OR ((US-20140349179-A1 OR US-20140120417-A1 OR US-20090111011-A1 OR US-20110104539-A1 OR US-20110151295-A1 OR US-20010033962-A1 OR US-20090166192-A1 OR US-20140302366-A1 OR US-20130316207-A1 OR US-20080233474-A1 OR US-20130045406-A1 OR US-20120214049-A1 OR US-20110027636-A1 OR US-20060222937-A1 OR US-20130045405-A1 OR US-20130316209-A1 OR US-20130101891-A1 OR US-20120321942-A1 OR US-20100086858-A1 OR US-20150295270-A1 OR US-20120009450-A1 OR US-20040191634-A1 OR US-20060051662-A1 OR US-20090081530-A1 OR US-20090035638-A1 OR US-20070122714-A1 OR US-20110003211-A1 OR US-20050250052-A1).did. AND PGPB.dbnm.) OR ((US-9142840-B2 OR US-8837115-B2 OR US-6100114-A OR US-5478668-A OR US-5017442-A).did. AND USPT.dbnm.) OR ((JP-2014225326-A OR JP-2001015096-A OR JP-2000277155-A).did. AND JPAB.dbnm.) OR ((KR-101475367-B1 OR CN-1221054-A).did. AND FPRS.dbnm.)					
L70	53	((JP-2003132875-A OR WO-2013038677-A1 OR WO-2013038676-	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY,	OR	ON	ON	2022/07/15 11:48 AM

		A1 OR CN-202495523-U OR JP-6652125-B2 OR CN-103066239-A OR CN-101939873-A OR CN-201087907-Y OR CN-1221054-C OR CN-1350350-A OR CN-1221054-A OR CN-103262310-A OR CN-101939869-A OR JP-2005283643-A OR CN-1489229-A).did. AND FTDB.dbnm.) OR ((US-20140349179-A1 OR US-20140120417-A1 OR US-20090111011-A1 OR US-20110104539-A1 OR US-20110151295-A1 OR US-20010033962-A1 OR US-20090166192-A1 OR US-20140302366-A1 OR US-20130316207-A1 OR US-20080233474-A1 OR US-20130045406-A1 OR US-20120214049-A1 OR US-20110027636-A1 OR US-20060222937-A1 OR US-20130045405-A1 OR US-20130316209-A1 OR US-20130101891-A1 OR US-20120321942-A1 OR US-20100086858-A1 OR US-20150295270-A1 OR US-20120009450-A1 OR US-20040191634-A1 OR US-20060051662-A1 OR US-20090081530-A1 OR US-20090035638-A1 OR US-20070122714-A1 OR US-20110003211-A1 OR US-20050250052-A1).did. AND PGPB.dbnm.) OR ((US-9142840-B2 OR US-8837115-B2 OR US-6100114-A OR US-5478668-A OR US-5017442-A).did. AND USPT.dbnm.) OR ((JP-2014225326-A OR JP-	CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)				

		2001015096-A OR JP-2000277155-A).did. AND JPAB.dbnm.) OR ((KR-101475367-B1 OR CN-1221054-A).did. AND FPRS.dbnm.)					
L71	4105191	(tape OR adhesive OR insulat$7) NEAR25 (electrode OR lead OR tab)	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO); FPRS; EPO; JPO)	OR	ON	ON	2022/07/15 11:49 AM
L72	34	L70 AND L71	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO); FPRS; EPO; JPO)	OR	ON	ON	2022/07/15 11:49 AM
L73	25	L70 AND L71 AND @fd<"20140117"	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2022/07/15 11:50 AM
L74	275044	(pair OR couple) NEAR10 (adhesiv$6 OR tape)	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO); FPRS; EPO; JPO)	OR	ON	ON	2022/07/15 03:31 PM
L75	578	L14 AND L74	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO); FPRS; EPO; JPO)	OR	ON	ON	2022/07/15 03:32 PM
L76	214	L14 AND L74 AND @fd<"20140117"	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV,	OR	ON	ON	2022/07/15 03:32 PM

			MA, OA, RU, SU, WO))				
L77	50	L14 AND L74 AND @fd<"20140117"	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2022/07/15 03:32 PM
L78	139	L14 AND L74 AND @pd<"20140117"	(FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO); FPRS; EPO; JPO)	OR	ON	ON	2022/07/15 03:35 PM
L79	987872	(insulat$7 ADJ4 (tape OR adhesive OR resin))	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO); FPRS; EPO; JPO)	OR	ON	ON	2022/07/15 03:43 PM
L80	8568	L79 AND L14	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO); FPRS; EPO; JPO)	OR	ON	ON	2022/07/15 03:44 PM
L81	6063	(insulat$7 ADJ4 (tape OR adhesive OR resin)) NEAR25 (((first AND second) OR oppos$8) ADJ surfac$7)	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO); FPRS; EPO; JPO)	OR	ON	ON	2022/07/15 03:44 PM
L82	175	L14 AND L81	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO); FPRS; EPO; JPO)	OR	ON	ON	2022/07/15 03:44 PM
L83	14	L14 AND L81 AND @fd<"20140117"	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2022/07/15 03:45 PM
L84	53	L14 AND L81 AND	(FIT (AU, AP, AT, BE,	OR	ON	ON	2022/07/15

		@fd<"20140117"	BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO))				03:48 PM
L85	52	L14 AND L81 AND @pd<"20140117"	(FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO); FPRS; EPO; JPO)	OR	ON	ON	2022/07/15 03:48 PM
L86	1	US-20110027636-$.did.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO); FPRS; EPO; JPO)	OR	ON	ON	2022/07/15 03:51 PM
L87	53	((JP-2003132875-A OR WO-2013038677-A1 OR WO-2013038676-A1 OR CN-202495523-U OR JP-6652125-B2 OR CN-103066239-A OR CN-101939873-A OR CN-201087907-Y OR CN-1221054-C OR CN-1350350-A OR CN-1221054-A OR CN-103262310-A OR CN-101939869-A OR JP-2005283643-A OR CN-1489229-A).did. AND FTDB.dbnm.) OR ((US-20140349179-A1 OR US-20140120417-A1 OR US-20090111011-A1 OR US-20110104539-A1 OR US-20110151295-A1 OR US-20010033962-A1 OR US-20090166192-A1 OR US-20140302366-A1 OR US-20130316207-A1 OR US-20110027636-A1 OR US-20080233474-A1 OR US-20130045406-	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/07/15 05:32 PM

		A1 OR US-20120214049-A1 OR US-20060222937-A1 OR US-20130045405-A1 OR US-20130316209-A1 OR US-20130101891-A1 OR US-20120321942-A1 OR US-20100086858-A1 OR US-20150295270-A1 OR US-20120009450-A1 OR US-20040191634-A1 OR US-20060051662-A1 OR US-20090081530-A1 OR US-20090035638-A1 OR US-20070122714-A1 OR US-20110003211-A1 OR US-20050250052-A1).did. AND PGPB.dbnm.) OR ((US-9142840-B2 OR US-8837115-B2 OR US-6100114-A OR US-5478668-A OR US-5017442-A).did. AND USPT.dbnm.) OR ((JP-2014225326-A OR JP-2001015096-A OR JP-2000277155-A).did. AND JPAB.dbnm.) OR ((KR-101475367-B1 OR CN-1221054-A).did. AND FPRS.dbnm.)					
L88	184982	((insulat$7 OR adhesiv$6 OR tape OR glue OR resin) NEAR10 (oppos$10 OR paired OR pair$5 OR face-to-face OR corresponding)) SAME ((short ADJ circuit) OR short-circuit OR short$7)	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO); FPRS; EPO; JPO)	OR	ON	ON	2022/07/20 11:07 AM
L89	1468	L14 AND L88	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO); FPRS; EPO; JPO)	OR	ON	ON	2022/07/20 11:07 AM
L90	137	L14 AND L88 AND	(US-PGPUB; USPAT;	OR	ON	ON	2022/07/20

		@fd<"20140117"	USOCR)				11:07 AM
L91	387	L14 AND L88 AND @pd<"20140117"	(FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO); FPRS; EPO; JPO)	OR	ON	ON	2022/07/20 02:15 PM
L92	58	((JP-2003132875-A OR WO-2013038677-A1 OR WO-2013038676-A1 OR KR-20090027314-A OR CN-202495523-U OR WO-2013080966-A1 OR JP-6652125-B2 OR CN-103066239-A OR CN-101939873-A OR CN-201087907-Y OR CN-1221054-C OR CN-1350350-A OR CN-1221054-A OR CN-103262310-A OR CN-101939869-A OR JP-2005283643-A OR CN-1489229-A).did. AND FTDB.dbnm.) OR ((US-20140349179-A1 OR US-20140120417-A1 OR US-20110104539-A1 OR US-20110151295-A1 OR US-20010033962-A1 OR US-20140302366-A1 OR US-20130316207-A1 OR US-20110027636-A1 OR US-20110014509-A1 OR US-20100285342-A1 OR US-20060051662-A1 OR US-20090111011-A1 OR US-20080233474-A1 OR US-20130045406-A1 OR US-20120214049-A1 OR US-20090166192-A1 OR US-20060222937-A1 OR US-20130045405-A1 OR US-20130316209-A1 OR US-20130101891-A1 OR US-20120321942-A1 OR US-	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/07/20 03:01 PM

		20100086858-A1 OR US-20150295270-A1 OR US-20120009450-A1 OR US-20040191634-A1 OR US-20090081530-A1 OR US-20130230749-A1 OR US-20090035638-A1 OR US-20070122714-A1 OR US-20110003211-A1 OR US-20050250052-A1).did. AND PGPB.dbnm.) OR ((US-9142840-B2 OR US-8837115-B2 OR US-6100114-A OR US-5478668-A OR US-5017442-A).did. AND USPT.dbnm.) OR ((JP-2014225326-A OR JP-2001015096-A OR JP-2000277155-A).did. AND JPAB.dbnm.) OR ((KR-101475367-B1 OR CN-1221054-A).did. AND FPRS.dbnm.)					
L93	59	((JP-2003132875-A OR WO-2013038677-A1 OR WO-2013038676-A1 OR KR-20090027314-A OR CN-202495523-U OR WO-2013080966-A1 OR KR-20060027266-A OR JP-6652125-B2 OR CN-103066239-A OR CN-101939873-A OR CN-201087907-Y OR CN-1221054-C OR CN-1350350-A OR CN-1221054-A OR CN-103262310-A OR CN-101939869-A OR JP-2005283643-A OR CN-1489229-A).did. AND FTDB.dbnm.) OR ((US-20140349179-A1 OR US-20140120417-A1 OR US-20110104539-A1 OR US-20110151295-A1 OR US-20010033962-A1 OR US-20140302366-A1 OR US-20130316207-A1 OR US-20110027636-A1 OR US-20110014509-	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/09/08 04:47 PM

		A1 OR US-20100285342-A1 OR US-20060051662-A1 OR US-20090111011-A1 OR US-20080233474-A1 OR US-20130045406-A1 OR US-20120214049-A1 OR US-20090166192-A1 OR US-20060222937-A1 OR US-20130045405-A1 OR US-20130316209-A1 OR US-20130101891-A1 OR US-20120321942-A1 OR US-20100086858-A1 OR US-20150295270-A1 OR US-20120009450-A1 OR US-20040191634-A1 OR US-20090081530-A1 OR US-20130230749-A1 OR US-20090035638-A1 OR US-20070122714-A1 OR US-20110003211-A1 OR US-20050250052-A1).did. AND PGPB.dbnm.) OR ((US-9142840-B2 OR US-8837115-B2 OR US-6100114-A OR US-5478668-A OR US-5017442-A).did. AND USPT.dbnm.) OR ((JP-2014225326-A OR JP-2001015096-A OR JP-2000277155-A).did. AND JPAB.dbnm.) OR ((KR-101475367-B1 OR CN-1221054-A).did. AND FPRS.dbnm.)					
L94	24	(US-41406506-$ | US-5017442-$ | US-5478668-$ | US-6100114-$ | US-6551143-$).DID. (AL-20010036574-$ | AL-20070122714-$ | AL-20090035638-$ | CN-101939873-$ | CN-103066239-$ | CN-1221054-$ | CN-1350350-$ | CN-201087907-$ | CN-202495523-$ | DB-	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO); FPRS; EPO; JPO)	OR	ON	ON	2022/09/08 06:55 PM

		241406506-$ | JP-1993013064-$ | JP-1999317218-$ | JP-2000277155-$ | JP-2003132875-$).DID.					
L95	3	(US-20010036574-$ | US-20070122714-$ | US-20090035638-$).did.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO); FPRS; EPO; JPO)	OR	ON	ON	2022/09/08 06:55 PM
L96	0	(JP-0513064-$).did.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO); FPRS; EPO; JPO)	OR	ON	ON	2022/09/08 06:55 PM
L97	0	(JPH-0513064-$).did.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO); FPRS; EPO; JPO)	OR	ON	ON	2022/09/08 06:55 PM
L98	0	(JP-00513064-$).did.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO); FPRS; EPO; JPO)	OR	ON	ON	2022/09/08 06:55 PM
L99	4	(JP-3161778-$).did.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO); FPRS; EPO; JPO)	OR	ON	ON	2022/09/08 06:55 PM
L100	92	(US-10135097-$ | US-	(US-PGPUB; USPAT;	OR	ON	ON	2022/09/08

		10868290-$ | US-11024868-$ | US-11108118-$ | US-20100055560-$ | US-20100285370-$ | US-20170092925-$ | US-20180190963-$ | US-20180366775-$ | US-5017442-$ | US-5478668-$ | US-6100114-$ | US-6551143-$ | US-7195844-$ | US-9741988-$).DID. (CN-103367700-$ | CN-105576191-$ | CN-105990612-$ | CN-106169540-$ | CN-107534127-$ | CN-108376759-$ | CN-109888162-$ | CN-112272877-$ | CN-112582583-$ | CN-113826240-$ | CN-201087907-$ | CN-202495523-$ | CN-205355186-$ | GB-2548361-$ | JP-2005222744-$ | JP-2007294198-$ | JP-2010086754-$ | JP-2011103249-$ | JP-2013137943-$ | JP-2014241267-$ | JP-2018166080-$ | JP-4850996-$ | JP-5284933-$ | JP-5623073-$ | JP-5821913-$ | JP-6237187-$ | JP-6288015-$ | JP-6926991-$ | KR-101489993-$ | KR-101515672-$ | KR-101980974-$ | KR-200364044-$ | KR-20060009411-$ | KR-20120022773-$ | WO-2017149977-$).DID.	USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO); FPRS; EPO; JPO)				06:55 PM
L101	4	("20020197535" | "20040191634" | "20140030607" | "20150207111").pn. OR ("11108118").urpn. AND (PGPB | USPT | USOC).dbnm.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2022/09/08 06:55 PM
L102	3	("20090305120" |	(US-PGPUB; USPAT;	OR	ON	ON	2022/09/08

		"20140349179" | "20150207111").pn. OR ("11024868").urpn. AND (PGPB | USPT | USOC).dbnm.	USOCR)				06:55 PM
L103	1	US-20060051662-$.did.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO); FPRS; EPO; JPO)	OR	ON	ON	2022/09/08 06:55 PM
L104	30	(US-10014495-$ | US-10038212-$ | US-10193125-$ | US-10312497-$ | US-10396336-$ | US-11024868-$ | US-11043700-$ | US-20060127774-$ | US-20080274410-$ | US-20110159344-$ | US-20110183191-$ | US-20130252053-$ | US-20130266845-$ | US-20130316207-$ | US-20140349179-$ | US-20160126511-$ | US-20160260954-$ | US-20180315991-$ | US-8877371-$ | US-8974944-$ | US-9159963-$ | US-9203074-$ | US-9224989-$ | US-9293744-$ | US-9397329-$ | US-9490468-$ | US-9564626-$ | US-9595699-$ | US-9627677-$ | US-9960404-$).DID.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO); FPRS; EPO; JPO)	OR	ON	ON	2022/09/08 06:55 PM
L105	7	("20060111625" | "20080233474" | "20090111011" | "20130045405" | "20140120417" | "20140349179" | "20140377593").pn. OR ("11043700").urpn. AND (PGPB | USPT | USOC).dbnm.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2022/09/08 06:55 PM
L106	22	((JP-2003132875-A OR CN-202495523-U OR	(US-PGPUB; USPAT; USOCR; FIT (AU, AP,	OR	ON	ON	2022/09/08 06:55 PM

		CN-103066239-A OR CN-101939873-A OR CN-201087907-Y OR CN-1221054-C OR CN-1350350-A OR CN-1221054-A).did. AND FTDB.dbnm.) OR ((US-20140349179-A1 OR US-20140120417-A1 OR US-20090111011-A1 OR US-20080233474-A1 OR US-20130045405-A1 OR US-20040191634-A1 OR US-20060051662-A1 OR US-20090035638-A1 OR US-20070122714-A1).did. AND PGPB.dbnm.) OR ((JP-2000277155-A).did. AND JPAB.dbnm.) OR ((US-6100114-A OR US-5478668-A OR US-5017442-A).did. AND USPT.dbnm.) OR ((CN-1221054-A).did. AND FPRS.dbnm.)	AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)				
L107	79516	(H01M10/0431 OR H01M10/0587 OR H01M50/531 OR H01M50/533 OR H01M50/538).cpc.	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/09/08 06:55 PM
L108	5257187	(recess$7 OR pocket OR (non-coat$7 ADJ (portion OR part)) OR cavity OR hole OR gap) NEAR10 (tab$5 OR tap$5 OR lead$5)	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO); FPRS; EPO; JPO)	OR	ON	ON	2022/09/08 06:55 PM
L109	10494	L14 AND L15	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV,	OR	ON	ON	2022/09/08 06:55 PM

			MA, OA, RU, SU, WO); FPRS; EPO; JPO)				
L110	955	L14 AND L15 AND @fd<"20140117"	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2022/09/08 06:55 PM
L111	1	US-8795879-$.did.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO); FPRS; EPO; JPO)	OR	ON	ON	2022/09/08 06:55 PM
L112	1	("20090296318").pn. OR ("8795879").urpn. AND (PGPB | USPT | USOC).dbnm.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2022/09/08 06:55 PM
L113	77	(US-20040126654-$ | US-20040207974-$ | US-20090296318-$ | US-20150332857-$ | US-8014127-$ | US-8218293-$ | US-8795879-$ | US-8837115-$ | US-9070511-$).DID. (CN-104137303-$ | CN-108713233-$ | CN-110706928-$ | CN-201156473-$ | EP-1580774-$ | JP-2001023866-$ | JP-2001284190-$ | JP-2006286959-$ | JP-2008147541-$ | JP-2009010070-$ | JP-2009152514-$ | JP-2009212117-$ | JP-2009212283-$ | JP-2010074083-$ | JP-2010074089-$ | JP-2012019061-$ | JP-2012064601-$ | JP-2018157012-$ | JP-3587333-$ | JP-4413003-$ | JP-6893123-$ | JP-6953724-$ | KR-101404532-$ | KR-101434923-$ | KR-101475367-$ | KR-102079677-$ | KR-20130116836-$ | WO-2010116656-$ | WO-2021172440-$).DID.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO); FPRS; EPO; JPO)	OR	ON	ON	2022/09/08 06:55 PM

L114	293	L14 AND L15 AND (length NEAR10(tab$5 OR tap$5 OR lead$5)) AND @fd<"20140117"	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2022/09/08 06:55 PM
L115	17601	((recess$7 OR pocket OR (non-coat$7 ADJ (portion OR part)) OR cavity OR hole OR gap) NEAR10 (energ$6 NEAR5 densit$7))	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO); FPRS; EPO; JPO)	OR	ON	ON	2022/09/08 06:55 PM
L116	1	L14 AND L15 AND (length NEAR10(tab$5 OR tap$5 OR lead$5)) AND L22 AND @fd<"20140117"	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2022/09/08 06:55 PM
L117	18	L14 AND L15 AND (length NEAR10(tab$5 OR tap$5 OR lead$5)) AND L22 AND @fd<"20140117"	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO))	OR	ON	ON	2022/09/08 06:55 PM
L118	8	L14 AND L15 AND (length NEAR10(tab$5 OR tap$5 OR lead$5)) AND L22 AND @pd<"20140117"	(FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO); FPRS; EPO; JPO)	OR	ON	ON	2022/09/08 06:55 PM
L119	6698	(H01M10/0431 AND H01M50/538).cpc.	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/09/08 06:55 PM
L120	127	L26 AND L15 AND @fd<"20140117"	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2022/09/08 06:55 PM
L121	2	(US-20100124694-$ OR US-2006022937-$ OR US-20090166192-$).did.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB,	OR	ON	ON	2022/09/08 06:55 PM

			HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO); FPRS; EPO; JPO)				
L122	0	(US-2006022937-$).did.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO); FPRS; EPO; JPO)	OR	ON	ON	2022/09/08 06:55 PM
L123	1	(US-20060022937-$).did.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO); FPRS; EPO; JPO)	OR	ON	ON	2022/09/08 06:55 PM
L124	1	(US-20060222937-$).did.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO); FPRS; EPO; JPO)	OR	ON	ON	2022/09/08 06:55 PM
L125	1	(US-6828059-$).did.	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO); FPRS; EPO; JPO)	OR	ON	ON	2022/09/08 06:55 PM
L126	1	(US-20100124694-$).did.	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO); FPRS; EPO; JPO)	OR	ON	ON	2022/09/08 06:55 PM
L127	1	(jp-09017410-$).did.	(US-PGPUB; USPAT; USOCR; FIT (AP, AT,	OR	ON	ON	2022/09/08 06:55 PM

			AU, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO); FPRS; EPO; JPO)				
L128	1	(jp-09161837$).did.	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO); FPRS; EPO; JPO)	OR	ON	ON	2022/09/08 06:55 PM
L129	1	US-20070122714-$.did.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO); FPRS; EPO; JPO)	OR	ON	ON	2022/09/08 06:55 PM
L130	37	((JP-2003132875-A OR CN-202495523-U OR CN-103066239-A OR CN-101939873-A OR CN-201087907-Y OR CN-1221054-C OR CN-1350350-A OR CN-1221054-A).did. AND FTDB.dbnm.) OR ((US-20140349179-A1 OR US-20140120417-A1 OR US-20090111011-A1 OR US-20110104539-A1 OR US-20110151295-A1 OR US-20010033962-A1 OR US-20090166192-A1 OR US-20080233474-A1 OR US-20130045406-A1 OR US-20120214049-A1 OR US-20110027636-A1 OR US-20060222937-A1 OR US-20130045405-A1 OR US-20130316207-A1 OR US-20130316209-A1 OR US-	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/09/08 06:55 PM

		20130101891-A1 OR US-20120321942-A1 OR US-20040191634-A1 OR US-20060051662-A1 OR US-20090035638-A1 OR US-20070122714-A1).did. AND PGPB.dbnm.) OR ((US-9142840-B2 OR US-8837115-B2 OR US-6100114-A OR US-5478668-A OR US-5017442-A).did. AND USPT.dbnm.) OR ((KR-101475367-B1 OR CN-1221054-A).did. AND FPRS.dbnm.) OR ((JP-2000277155-A).did. AND JPAB.dbnm.)					
L131	147477	(non-coat$6 OR (non ADJ coat$6) OR un-coat$6 OR (un ADJ coat$6) OR non-application$9 OR (non ADJ application$9))	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO); FPRS; EPO; JPO)	OR	ON	ON	2022/09/08 06:55 PM
L132	4977	L14 AND L38	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO); FPRS; EPO; JPO)	OR	ON	ON	2022/09/08 06:55 PM
L133	257	L14 AND L38 AND (L38 NEAR15 (width OR length OR size OR area)) AND (L38 SAME3 (energ$7 NEAR5 dens$6))	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO); FPRS; EPO; JPO)	OR	ON	ON	2022/09/08 06:55 PM
L134	23	L14 AND L38 AND (L38 NEAR15 (width OR length OR size OR area)) AND (L38 SAME3 (energ$7 NEAR5 dens$6)) AND @fd<"20140117"	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2022/09/08 06:55 PM

L135	438	(H01M50/538).cpc. AND (recess$6 near15 (tab OR lead OR tap))	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO); FPRS; EPO; JPO)	OR	ON	ON	2022/09/08 06:55 PM
L136	41	(H01M50/538).cpc. AND (recess$6 near15 (tab OR lead OR tap)) AND @fd<"20140117"	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2022/09/08 06:55 PM
L137	509	(H01M50/5$).cpc. AND (recess$6 near15 (tab OR lead OR tap)) AND @fd<"20140117"	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2022/09/08 06:55 PM
L138	112	(H01M50/538).cpc. AND (recess$6 near15 (tab OR lead OR tap)) AND @pd<"20140117"	(FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO); FPRS; EPO; JPO)	OR	ON	ON	2022/09/08 06:55 PM
L139	13	("20100216001" OR "20110274953" OR "20140017565" OR "20150295270" OR "6139986" OR "20050287428" OR "20090148766" OR "20090297941" OR "20110076547" OR "20160197379" OR "7923139" OR "7955736" OR "8450006").pn.	(US-PGPUB; USPAT)	OR	ON	ON	2022/09/08 06:55 PM
L140	1	US-10320024-$.did.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO); FPRS; EPO; JPO)	OR	ON	ON	2022/09/08 06:55 PM
L141	9	("20110104539" | "20110129708" | "20110151295" | "20120009450" | "20120321924" | "20130260203" |	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2022/09/08 06:55 PM

		"20130316207" | "20140072877" | "20140302366").pn. OR ("10320024").urpn. AND (PGPB | USPT | USOC).dbnm.					
L142	0	(KR-1038115-$ OR KR-1615712-$ OR KR-20110035566-$ OR KR-20160085063-$).DID.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2022/09/08 06:55 PM
L143	4	(KR-1038115-$ OR KR-1615712-$ OR KR-20110035566-$ OR KR-20160085063-$).DID.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO); FPRS; EPO; JPO)	OR	ON	ON	2022/09/08 06:55 PM
L144	4	(KR-101038115-$ OR KR-101615712-$).DID.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO); FPRS; EPO; JPO)	OR	ON	ON	2022/09/08 06:55 PM
L145	44	(Artificial Intelligence) More like doc: US-20140302366-A1 Text: (US-9520588-B2 OR WO-2013038701-A1 OR JP-WO2013038701-A1 OR JP-5849234-B2 OR WO-2013038677-A1 OR JP-2014225326-A OR JP-2007109612-A OR JP-6208239-B2 OR JP-6439839-B2 OR CN-103733418-B OR JP-H09180761-A OR JP-2003288941-A OR KR-20030078019-A OR CN-110178250-B OR KR-100990800-B1 OR JP-WO2017149977-A1 OR JP-4097443-B2 OR JP-2013073680-A OR JP-2016081881-A OR CN-103733418-A).did.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA, VN); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/09/08 06:55 PM

L146	49	(Artificial Intelligence) More like doc: WO-2013038677-A1 Text: (WO-2013038701-A1 OR JP-5849234-B2 OR JP-WO2013038701-A1 OR WO-2013038676-A1 OR JP-2014225326-A OR US-9520588-B2 OR US-20140302366-A1 OR WO-2016079943-A1 OR JP-2007109612-A OR JP-2010061893-A OR JP-2008311011-A OR WO-2018061381-A1 OR JP-2018018646-A OR JP-WO2018061381-A1 OR JP-2016122628-A OR JP-6567821-B2 OR WO-2019065871-A1 OR US-8530072-B2 OR JP-H09306471-A OR JP-2010086812-A).did.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA, VN); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/09/08 06:55 PM
L147	47	((JP-2003132875-A OR WO-2013038677-A1 OR WO-2013038676-A1 OR CN-202495523-U OR JP-6652125-B2 OR CN-103066239-A OR CN-101939873-A OR CN-201087907-Y OR CN-1221054-C OR CN-1350350-A OR CN-1221054-A).did. AND FTDB.dbnm.) OR ((US-20140349179-A1 OR US-20140120417-A1 OR US-20090111011-A1 OR US-20110104539-A1 OR US-20110151295-A1 OR US-20010033962-A1 OR US-20090166192-A1 OR US-20140302366-A1 OR US-20130316207-A1 OR US-20080233474-A1 OR US-20130045406-A1 OR US-20120214049-A1 OR US-20110027636-A1 OR US-20060222937-A1 OR US-20130045405-A1 OR US-	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA, VN); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/09/08 06:55 PM

		20130316209-A1 OR US-20130101891-A1 OR US-20120321942-A1 OR US-20100086858-A1 OR US-20150295270-A1 OR US-20120009450-A1 OR US-20040191634-A1 OR US-20060051662-A1 OR US-20090081530-A1 OR US-20090035638-A1 OR US-20070122714-A1).did. AND PGPB.dbnm.) OR ((US-9142840-B2 OR US-8837115-B2 OR US-6100114-A OR US-5478668-A OR US-5017442-A).did. AND USPT.dbnm.) OR ((JP-2014225326-A OR JP-2001015096-A OR JP-2000277155-A).did. AND JPAB.dbnm.) OR ((KR-101475367-B1 OR CN-1221054-A).did. AND FPRS.dbnm.)					
L148	135	((("NINGDE") near3 ("AMPEREX") near3 ("TECHNOLOGY") near3 ("LIMITED"))).AS,AANM.	(USPAT)	OR	ON	ON	2022/09/08 06:55 PM
L149	139	((("NINGDE") near3 ("AMPEREX"))).AS,AANM.	(USPAT)	OR	ON	ON	2022/09/08 06:55 PM
L150	575	((("NINGDE") near3 ("AMPEREX"))).AS,AANM.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2022/09/08 06:55 PM
L151	1286	L57 AND L14	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO); FPRS; EPO; JPO)	OR	ON	ON	2022/09/08 06:55 PM
L152	10	L57 AND L14 AND @pd<"20140117"	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA,	OR	ON	ON	2022/09/08 06:55 PM

			EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO); FPRS; EPO; JPO)				
L153	316	((("TAO") near3 ("Tao")) OR (("MO") near3 ("Ming") near3 ("Liang"))).INV.	(US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT)	OR	ON	ON	2022/09/08 06:55 PM
L154	2	L60 AND L14 AND @pd<"20140117"	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO); FPRS; EPO; JPO)	OR	ON	ON	2022/09/08 06:55 PM
L155	130423336	L60AND @pd<"20140117"	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO); FPRS; EPO; JPO)	OR	ON	ON	2022/09/08 06:55 PM
L156	2325	L60 AND @pd<"20140117"	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO); FPRS; EPO; JPO)	OR	ON	ON	2022/09/08 06:55 PM
L157	0	L60 AND H01M50/5$.cpc. AND @pd<"20140117"	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO); FPRS; EPO; JPO)	OR	ON	ON	2022/09/08 06:55 PM
L158	46	L60 AND H01M.cpcl. AND @pd<"20140117"	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS,	OR	ON	ON	2022/09/08 06:55 PM

			IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO); FPRS; EPO; JPO)				
L159	47	((JP-2003132875-A OR WO-2013038677-A1 OR WO-2013038676-A1 OR CN-202495523-U OR JP-6652125-B2 OR CN-103066239-A OR CN-101939873-A OR CN-201087907-Y OR CN-1221054-C OR CN-1350350-A OR CN-1221054-A).did. AND FTDB.dbnm.) OR ((US-20140349179-A1 OR US-20140120417-A1 OR US-20090111011-A1 OR US-20110104539-A1 OR US-20110151295-A1 OR US-20010033962-A1 OR US-20090166192-A1 OR US-20140302366-A1 OR US-20130316207-A1 OR US-20080233474-A1 OR US-20130045406-A1 OR US-20120214049-A1 OR US-20110027636-A1 OR US-20060222937-A1 OR US-20130045405-A1 OR US-20130316209-A1 OR US-20130101891-A1 OR US-20120321942-A1 OR US-20100086858-A1 OR US-20150295270-A1 OR US-20120009450-A1 OR US-20040191634-A1 OR US-20060051662-A1 OR US-20090081530-A1 OR US-20090035638-A1 OR US-20070122714-A1).did. AND PGPB.dbnm.) OR ((US-9142840-B2 OR US-8837115-B2 OR US-6100114-A OR US-5478668-A OR US-5017442-A).did. AND USPT.dbnm.) OR ((JP-2014225326-A OR JP-	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/09/08 06:55 PM

		2001015096-A OR JP-2000277155-A).did. AND JPAB.dbnm.) OR ((KR-101475367-B1 OR CN-1221054-A).did. AND FPRS.dbnm.)					
L160	12	(US-20050250052-$ OR US-20110003211-$).did. OR (CN-1489229-$ OR CN-101939869-$ OR CN-103262310-$ OR JP-2005283643-$).did.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO); FPRS; EPO; JPO)	OR	ON	ON	2022/09/08 06:55 PM
L161	53	((JP-2003132875-A OR WO-2013038677-A1 OR WO-2013038676-A1 OR CN-202495523-U OR JP-6652125-B2 OR CN-103066239-A OR CN-101939873-A OR CN-201087907-Y OR CN-1221054-C OR CN-1350350-A OR CN-1221054-A OR CN-103262310-A OR CN-101939869-A OR JP-2005283643-A OR CN-1489229-A).did. AND FTDB.dbnm.) OR ((US-20140349179-A1 OR US-20140120417-A1 OR US-20090111011-A1 OR US-20110104539-A1 OR US-20110151295-A1 OR US-20010033962-A1 OR US-20090166192-A1 OR US-20140302366-A1 OR US-20130316207-A1 OR US-20080233474-A1 OR US-20130045406-A1 OR US-20120214049-A1 OR US-20110027636-A1 OR US-20060222937-A1 OR US-20130045405-A1 OR US-20130316209-A1 OR US-20130101891-A1 OR US-20120321942-A1 OR US-20100086858-A1 OR	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/09/08 06:55 PM

		US-20150295270-A1 OR US-20120009450-A1 OR US-20040191634-A1 OR US-20060051662-A1 OR US-20090081530-A1 OR US-20090035638-A1 OR US-20070122714-A1 OR US-20110003211-A1 OR US-20050250052-A1).did. AND PGPB.dbnm.) OR ((US-9142840-B2 OR US-8837115-B2 OR US-6100114-A OR US-5478668-A OR US-5017442-A).did. AND USPT.dbnm.) OR ((JP-2014225326-A OR JP-2001015096-A OR JP-2000277155-A).did. AND JPAB.dbnm.) OR ((KR-101475367-B1 OR CN-1221054-A).did. AND FPRS.dbnm.)					
L162	53	((JP-2003132875-A OR WO-2013038677-A1 OR WO-2013038676-A1 OR CN-202495523-U OR JP-6652125-B2 OR CN-103066239-A OR CN-101939873-A OR CN-201087907-Y OR CN-1221054-C OR CN-1350350-A OR CN-1221054-A OR CN-103262310-A OR CN-101939869-A OR JP-2005283643-A OR CN-1489229-A).did. AND FTDB.dbnm.) OR ((US-20140349179-A1 OR US-20140120417-A1 OR US-20090111011-A1 OR US-20110104539-A1 OR US-20110151295-A1 OR US-20010033962-A1 OR US-20090166192-A1 OR US-20140302366-A1 OR US-20130316207-A1 OR US-20080233474-A1 OR US-20130045406-A1 OR US-20120214049-A1 OR US-	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/09/08 06:55 PM

		20110027636-A1 OR US-20060222937-A1 OR US-20130045405-A1 OR US-20130316209-A1 OR US-20130101891-A1 OR US-20120321942-A1 OR US-20100086858-A1 OR US-20150295270-A1 OR US-20120009450-A1 OR US-20040191634-A1 OR US-20060051662-A1 OR US-20090081530-A1 OR US-20090035638-A1 OR US-20070122714-A1 OR US-20110003211-A1 OR US-20050250052-A1).did. AND PGPB.dbnm.) OR ((US-9142840-B2 OR US-8837115-B2 OR US-6100114-A OR US-5478668-A OR US-5017442-A).did. AND USPT.dbnm.) OR ((JP-2014225326-A OR JP-2001015096-A OR JP-2000277155-A).did. AND JPAB.dbnm.) OR ((KR-101475367-B1 OR CN-1221054-A).did. AND FPRS.dbnm.)					
L163	4151033	(tape OR adhesive OR insulat$7) NEAR25 (electrode OR lead OR tab)	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO); FPRS; EPO; JPO)	OR	ON	ON	2022/09/08 06:55 PM
L164	34	L70 AND L71	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO); FPRS; EPO; JPO)	OR	ON	ON	2022/09/08 06:55 PM
L165	25	L70 AND L71 AND @fd<"20140117"	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2022/09/08 06:55 PM

L166	277493	(pair OR couple) NEAR10 (adhesiv$6 OR tape)	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO); FPRS; EPO; JPO)	OR	ON	ON	2022/09/08 06:55 PM
L167	581	L14 AND L74	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO); FPRS; EPO; JPO)	OR	ON	ON	2022/09/08 06:55 PM
L168	214	L14 AND L74 AND @fd<"20140117"	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO))	OR	ON	ON	2022/09/08 06:55 PM
L169	50	L14 AND L74 AND @fd<"20140117"	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2022/09/08 06:55 PM
L170	139	L14 AND L74 AND @pd<"20140117"	(FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO); FPRS; EPO; JPO)	OR	ON	ON	2022/09/08 06:55 PM
L171	997639	(insulat$7 ADJ4 (tape OR adhesive OR resin))	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO); FPRS; EPO; JPO)	OR	ON	ON	2022/09/08 06:55 PM
L172	8710	L79 AND L14	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB,	OR	ON	ON	2022/09/08 06:55 PM

			HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO); FPRS; EPO; JPO)				
L173	6138	(insulat$7 ADJ4 (tape OR adhesive OR resin)) NEAR25 (((first AND second) OR oppos$8) ADJ surfac$7)	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO); FPRS; EPO; JPO)	OR	ON	ON	2022/09/08 06:55 PM
L174	174	L14 AND L81	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO); FPRS; EPO; JPO)	OR	ON	ON	2022/09/08 06:55 PM
L175	14	L14 AND L81 AND @fd<"20140117"	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2022/09/08 06:55 PM
L176	53	L14 AND L81 AND @fd<"20140117"	(FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO))	OR	ON	ON	2022/09/08 06:55 PM
L177	52	L14 AND L81 AND @pd<"20140117"	(FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO); FPRS; EPO; JPO)	OR	ON	ON	2022/09/08 06:55 PM
L178	1	US-20110027636-$.did.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO); FPRS; EPO; JPO)	OR	ON	ON	2022/09/08 06:55 PM
L179	53	((JP-2003132875-A OR WO-2013038677-A1 OR WO-2013038676-	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY,	OR	ON	ON	2022/09/08 06:55 PM

		A1 OR CN-202495523-U OR JP-6652125-B2 OR CN-103066239-A OR CN-101939873-A OR CN-201087907-Y OR CN-1221054-C OR CN-1350350-A OR CN-1221054-A OR CN-103262310-A OR CN-101939869-A OR JP-2005283643-A OR CN-1489229-A).did. AND FTDB.dbnm.) OR ((US-20140349179-A1 OR US-20140120417-A1 OR US-20090111011-A1 OR US-20110104539-A1 OR US-20110151295-A1 OR US-20010033962-A1 OR US-20090166192-A1 OR US-20140302366-A1 OR US-20130316207-A1 OR US-20110027636-A1 OR US-20080233474-A1 OR US-20130045406-A1 OR US-20120214049-A1 OR US-20060222937-A1 OR US-20130045405-A1 OR US-20130316209-A1 OR US-20130101891-A1 OR US-20120321942-A1 OR US-20100086858-A1 OR US-20150295270-A1 OR US-20120009450-A1 OR US-20040191634-A1 OR US-20060051662-A1 OR US-20090081530-A1 OR US-20090035638-A1 OR US-20070122714-A1 OR US-20110003211-A1 OR US-20050250052-A1).did. AND PGPB.dbnm.) OR ((US-9142840-B2 OR US-8837115-B2 OR US-6100114-A OR US-5478668-A OR US-5017442-A).did. AND USPT.dbnm.) OR ((JP-2014225326-A OR JP-	CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)				

		2001015096-A OR JP-2000277155-A).did. AND JPAB.dbnm.) OR ((KR-101475367-B1 OR CN-1221054-A).did. AND FPRS.dbnm.)					
L180	185922	((insulat$7 OR adhesiv$6 OR tape OR glue OR resin) NEAR10 (oppos$10 OR paired OR pair$5 OR face-to-face OR corresponding)) SAME ((short ADJ circuit) OR short-circuit OR short$7)	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO); FPRS; EPO; JPO)	OR	ON	ON	2022/09/08 06:55 PM
L181	1494	L14 AND L88	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO); FPRS; EPO; JPO)	OR	ON	ON	2022/09/08 06:55 PM
L182	137	L14 AND L88 AND @fd<"20140117"	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2022/09/08 06:55 PM
L183	387	L14 AND L88 AND @pd<"20140117"	(FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO); FPRS; EPO; JPO)	OR	ON	ON	2022/09/08 06:55 PM
L184	58	((JP-2003132875-A OR WO-2013038677-A1 OR WO-2013038676-A1 OR KR-20090027314-A OR CN-202495523-U OR WO-2013080966-A1 OR JP-6652125-B2 OR CN-103066239-A OR CN-101939873-A OR CN-201087907-Y OR CN-1221054-C OR CN-1350350-A OR CN-1221054-A OR CN-103262310-A OR CN-101939869-A OR JP-2005283643-A OR CN-1489229-A).did. AND FTDB.dbnm.) OR ((US-	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/09/08 06:55 PM

		20140349179-A1 OR US-20140120417-A1 OR US-20110104539-A1 OR US-20110151295-A1 OR US-20010033962-A1 OR US-20140302366-A1 OR US-20130316207-A1 OR US-20110027636-A1 OR US-20110014509-A1 OR US-20100285342-A1 OR US-20060051662-A1 OR US-20090111011-A1 OR US-20080233474-A1 OR US-20130045406-A1 OR US-20120214049-A1 OR US-20090166192-A1 OR US-20060222937-A1 OR US-20130045405-A1 OR US-20130316209-A1 OR US-20130101891-A1 OR US-20120321942-A1 OR US-20100086858-A1 OR US-20150295270-A1 OR US-20120009450-A1 OR US-20040191634-A1 OR US-20090081530-A1 OR US-20130230749-A1 OR US-20090035638-A1 OR US-20070122714-A1 OR US-20110003211-A1 OR US-20050250052-A1).did. AND PGPB.dbnm.) OR ((US-9142840-B2 OR US-8837115-B2 OR US-6100114-A OR US-5478668-A OR US-5017442-A).did. AND USPT.dbnm.) OR ((JP-2014225326-A OR JP-2001015096-A OR JP-2000277155-A).did. AND JPAB.dbnm.) OR ((KR-101475367-B1 OR CN-1221054-A).did. AND FPRS.dbnm.)					
L185	59	((JP-2003132875-A OR WO-2013038677-A1 OR WO-2013038676-	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY,	OR	ON	ON	2022/09/08 06:55 PM

		A1 OR KR-20090027314-A OR CN-202495523-U OR WO-2013080966-A1 OR KR-20060027266-A OR JP-6652125-B2 OR CN-103066239-A OR CN-101939873-A OR CN-201087907-Y OR CN-1221054-C OR CN-1350350-A OR CN-1221054-A OR CN-103262310-A OR CN-101939869-A OR JP-2005283643-A OR CN-1489229-A).did. AND FTDB.dbnm.) OR ((US-20140349179-A1 OR US-20140120417-A1 OR US-20110104539-A1 OR US-20110151295-A1 OR US-20010033962-A1 OR US-20140302366-A1 OR US-20130316207-A1 OR US-20110027636-A1 OR US-20110014509-A1 OR US-20100285342-A1 OR US-20060051662-A1 OR US-20090111011-A1 OR US-20080233474-A1 OR US-20130045406-A1 OR US-20120214049-A1 OR US-20090166192-A1 OR US-20060222937-A1 OR US-20130045405-A1 OR US-20130316209-A1 OR US-20130101891-A1 OR US-20120321942-A1 OR US-20100086858-A1 OR US-20150295270-A1 OR US-20120009450-A1 OR US-20040191634-A1 OR US-20090081530-A1 OR US-20130230749-A1 OR US-20090035638-A1 OR US-20070122714-A1 OR US-20110003211-A1 OR US-20050250052-A1).did.	CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)				

		AND PGPB.dbnm.) OR ((US-9142840-B2 OR US-8837115-B2 OR US-6100114-A OR US-5478668-A OR US-5017442-A).did. AND USPT.dbnm.) OR ((JP-2014225326-A OR JP-2001015096-A OR JP-2000277155-A).did. AND JPAB.dbnm.) OR ((KR-101475367-B1 OR CN-1221054-A).did. AND FPRS.dbnm.)					
L186	7	("20010036574" OR "20070122714" OR "20090035638" OR "5017442" OR "5478668" OR "6100114" OR "6551143").pn.	(US-PGPUB; USPAT)	OR	ON	ON	2022/09/09 11:47 AM
L187	0	"19993172"	(US-PGPUB; USPAT)	OR	ON	ON	2022/09/09 11:51 AM
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PE2E SEARCH - Search History (Interference)

There are no Interference searches to show.

INFORMATION DISCLOSURE STATEMENT BY APPLICANT Substitute for Form 1449-PTO				***Electronically filed December 8, 2022***	
				Application Number	***17/746,755***
				Filing Date	***May 17, 2022***
				First Named Inventor	***Tao TAO***
				Art Unit	***1721***
				Examiner Name	***Barton, Jason Aaron***
Sheet	1	of	1	Attorney Docket Number	***024607-02-5119-US***

U.S. PATENT DOCUMENTS					
Examiner Initials	Cite No.	Document Number Number - Kind Code	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear

FOREIGN PATENT DOCUMENTS						
Examiner Initials	Cite No.	Foreign Patent Document Country Code – Number - Kind Code *(if known)*	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear	T
		JP1999317218A - JPH11317218A	11-16-1999	TOYOTA CENTRAL RES & DEV		
		JP1993013064A - JPH0713064A	01-17-1995	OLYMPUS OPTICAL CO		

NON PATENT LITERATURE DOCUMENTS		
Examiner Initials	Cite No.	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published
		Evaluation Report of Utility Model Patent, ZL2014200303194, 24DEC2019, 5 pgs.
		Tao, Office Action, US14/596,873, 04APR2017, 13 pgs.
		Tao, Final Office Action, US14/596,873, 22NOV2017, 13 pgs.
		Tao, Office Action, US14/596,873, 19APR2018, 12 pgs.
		Tao, Final Office Action, US14/596,873, 05DEC2018, 13 pgs.
		Tao, Office Action, US14/596,873, 22MAR2019, 14 pgs.
		Tao, Notice of Allowance, US14/596,873, 25NOV2019, 7 pgs.
		Tao, Office Action, US16/113,938, 16AUG2019, 17 pgs.
		Tao, Office Action, US16/113,938, 13FEB2020, 22 pgs.
		Tao, Office Action, US16/113,938, 02NOV2020, 14 pgs.
		Tao, Final Office Action, US16/113,938, 20MAY2021, 22 pgs.
		Tao, Advisory Action, US16/113,938, 02AUG2021, 3 pgs.
		Machine English translation of CN202495523U (Year: 2012), 6 pgs.

Examiner Signature		Date Considered	

Electronic Acknowledgement Receipt

EFS ID:	47174292
Application Number:	17746755
International Application Number:	
Confirmation Number:	8911
Title of Invention:	LITHIUM-ION BATTERY HAVING DESIRABLE SAFETY PERFORMANCE
First Named Inventor/Applicant Name:	Tao TAO
Customer Number:	24341
Filer:	Yalei Sun/Edith Fuentes
Filer Authorized By:	Yalei Sun
Attorney Docket Number:	024607-02-5119-US
Receipt Date:	08-DEC-2022
Filing Date:	17-MAY-2022
Time Stamp:	22:13:30
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Non Patent Literature	Evaluation-Report-on-of-Utility-Model-Patent_24DEC2019.pdf	5293278 2c7307384bff6d47deb366236f8802f16283 2058	no	5

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2	Non Patent Literature	Tao_Office-Action-US14596873_04APR2017.pdf	467527 39d368d88e91e62bdfed1e49e2c8e80c3b67d79e	no	13
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Information:					
3	Non Patent Literature	Tao_Final-Office-Action-US14596873_22NOV2017.pdf	379644 8563da1755e9ead9d31d4aa25b22f14cdc9eefd8	no	13
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4	Non Patent Literature	Tao_Office-Action-US14596873_19APR2018.pdf	475498 92b41ad4162ff27e492b1980311cfba8923bda41	no	12
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Information:					
5	Non Patent Literature	Tao_Final-Office-Action-US14596873_05DEC2018.pdf	506116 0a1911560fbd339c2783c93f3e56713d19bcbb87	no	13
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6	Non Patent Literature	Tao_Office-Action-US14596873_22MAR2019.pdf	556480 ab84fdabe0fad43b4b7184b0fa46c59823b8558a	no	14
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7	Non Patent Literature	Tao_Notice-of-Allowance-US14596873_25NOV2019.pdf	415744 880445142d2134e157022401f892d8dcb865735b	no	7
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Information:					
8	Non Patent Literature	Tao_Office-Action-US16113938_16AUG2019.PDF	200922 4b6e6630aeff4eccbe6d71d2b6ebca95dcf775b2	no	17
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Information:					

9	Non Patent Literature	Tao_Office-Action-US16113938_02NOV2020.PDF	572321 420a10dcd7e97bf79cdc03128f588eefca9dcac1	no	14
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Information:					
10	Non Patent Literature	Tao_Advisory-Action-US16113938_02AUG2021.pdf	152730 967ad775699d91e5c5f267f76c9329c582b12dbb	no	3
Warnings:					
Information:					
11	Non Patent Literature	Machine-English-translation-of-CN202495523U_Year-2012.pdf	470817 284e57dc00ea381de7d6407cb643ebc9b97dc4f4	no	6
Warnings:					
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12	Non Patent Literature	Tao_Final-Office-Action-US16113938_13FEB2020.pdf	902368 5c95dfb2293762c867c77a01e030bd6c0759683c	no	22
Warnings:					
Information:					
13	Non Patent Literature	Tao_Final-Office-Action-US16113938_20MAY2021.pdf	876897 ce54dd843df8c971a36c3663c90c20f357dc2181	no	22
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Information:					
14	Foreign Reference	JP1999317218A-JPH11-317218.pdf	564953 54cd8e4dcd5f01b2dd9e428c3d1052c1dcd3f8f1	no	7
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15	Foreign Reference	JP1993013064A-JPH5-13064.pdf	549586 e6080f49cce315ee84aa79bb25a09cc5306ffa8c8	no	9
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Information:					

16		024607-02-5119-US_Supplemental-IDS.pdf	378861 8c498428788b53c879317d2ed7d951353e89d2aa	yes	5

	Multipart Description/PDF files in .zip description		
	Document Description	**Start**	**End**
	Transmittal Letter	1	4
	Information Disclosure Statement (IDS) Form (SB08)	5	5

Warnings:	
Information:	
Total Files Size (in bytes):	12763742

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

Electronically filed December 8, 2022

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Application of:	Tao TAO et al.	Confirmation No.:	8911
Serial No.:	17/746,755	Art Unit:	1721
Filed:	May 17, 2022	Examiner:	Barton, Jason Aaron
For:	Lithium-Ion Battery Having Desirable Safety Performance	Attorney Docket No.:	024607-02-5119-US

SUPPLEMENTAL INFORMATION DISCLOSURE STATEMENT

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

In accordance with the duty of disclosure provisions of 37 C.F.R. §1.56, there is hereby provided certain information which the Examiner may consider material to the examination of the subject U.S. patent application. It is requested that the Examiner make this information of record if it is deemed material to the examination of the application.

1. Enclosures accompanying this Information Disclosure Statement are:

1a. ☒ A list of all patents, publications, applications, or other information submitted for consideration by the office.

1b. A legible copy of:

☒ Each foreign patent;

☐ Each publication or that portion which caused it to be listed on the PTO-1449;

☐ For each cited pending U.S. application, the application specification including the claims, and any drawing of the application, or portion of the application which caused it to be listed on the PTO-1449 including any claims directed to that portion;

☒ all other information or portion which caused it to be listed on the PTO-1449.

1c. ☐ An English language copy of search report(s) from a counterpart foreign application or PCT International Search Report.

1d. ☐ Explanations of relevancy (ATTACHMENT hereto) or English language abstracts of the non-English language publications.

2. ☐ This Information Disclosure Statement is filed under 37 C.F.R. §1.97(b):

☐ Within three months of the filing date of a national application other than a continued prosecution application under §1.53(d);

☐ Within three months of the date of entry of the national stage as set forth in §1.491 in an international application;

☐ Before the mailing of the first Office action on the merits;

☐ Before the mailing of a first Office action after the filing of a request for continued examination under §1.114.

3. ☐ This Information Disclosure Statement is filed under 37 C.F.R. §1.97(c) after the period specified in 37 C.F.R. §1.97(b), but before the mailing date of any of a final action under 37 C.F.R. §1.113, a notice of allowance under 37 C.F.R. §1.311 or an action that otherwise closes prosecution in the application.

(Check either Item 3a, 3b, 3c or 3d)

3a. ☐ The Certification Statement in Item 5 below is applicable. Accordingly, no fee is required.

3b. ☐ The $260 (large entity) fee set forth in 37 C.F.R. §1.17(p) in accordance with 37 C.F.R. §1.97(c) is to be charged to Morgan, Lewis & Bockius LLP Deposit Account No. 50-0310 (order no.).

3c. ☐ The $130 (small entity) fee set forth in 37 C.F.R. §1.17(p) in accordance with 37 C.F.R. §1.97(c) is to be charged to Morgan, Lewis & Bockius LLP Deposit Account No. 50-0310 (order no.).

3d. ☐ The $65 (micro entity) fee set forth in 37 C.F.R. §1.17(p) in accordance with 37 C.F.R. §1.97(c) is to be charged to Morgan, Lewis & Bockius LLP Deposit Account No. 50-0310 (order no.).

(Items 3b or 3c to be checked if any reference known for more than 3 months)

4. ☐ This Information Disclosure Statement is filed under 37 C.F.R. §1.97(d) after the period specified in 37 C.F.R. §1.97(c), but on or before the date of payment of the issue fee.

(Check Item 4a, and 4b, 4c or 4d)

4a. ☐ The Certification Statement in Item 5 below is applicable.

4b. ☐ The $260 (large entity) fee set forth in 37 C.F.R. §1.17(p) in accordance with 37 C.F.R. §1.97(c) is to be charged to Morgan, Lewis & Bockius LLP Deposit Account No. 50-0310 (order no.).

4c. ☐ The $130 (small entity) fee set forth in 37 C.F.R. §1.17(p) in accordance with 37 C.F.R. §1.97(c) is to be charged to Morgan, Lewis & Bockius LLP Deposit Account No. 50-0310 (order no.).

4d. ☐ The $65 (micro entity) fee set forth in 37 C.F.R. §1.17(p) in accordance with 37 C.F.R. §1.97(c) is to be charged to Morgan, Lewis & Bockius LLP Deposit Account No. 50-0310 (order no.).

5. ☐ Certification Statement (applicable if Item 3a or Item 4a is checked)

(Check either Item 5a, 5b, 5c or 5d)

5a. ☐ In accordance with 37 C.F.R. §1.97(e)(1), it is certified that each item of information contained in this information disclosure statement was first cited in a communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of this Information Disclosure Statement.

5b. ☐ In accordance with 37 C.F.R. §1.97(e)(2), it is certified that no item of information contained in the information disclosure statement was cited in a communication from a foreign patent office in a counterpart foreign application, and, to the knowledge of the person signing the certification after making reasonable inquiry, no item of information contained in the information disclosure statement was known to any individual designated in 37 C.F.R. §1.56(c) more than three months prior to the filing of this information disclosure statement.

5c. ☐ Each item of information contained in this information disclosure statement was cited in a communication from a foreign patent office in a counterpart application, and the communication was not **received** by any individual designated in 37 C.F.R. §1.56(c) more than thirty days prior to the filing of this information disclosure statement.

5d. ☐ Pursuant to 37 C.F.R. §1.704(d), each item of information contained in this information disclosure statement was cited in a communication from a foreign patent office in a counterpart application, and the communication was not **received** by any individual designated in 37 C.F.R. §1.56(c) more than thirty days prior to the filing of this information disclosure statement.

6. ☐ Copies of each cited U.S. patent and each U.S. patent application publication are not enclosed pursuant to the USPTO OG Notice dated 05 August 2003 waiving the requirement under 37 C.F.R. 1.98(a)(2)(i) for U.S. patent applications filed after June 30, 2003.

7. ☐ This application is a continuation application under 37 C.F.R. §1.53(b) or (d).

(Check appropriate Items 7a, 7b and/or 7c)

7a. ☐ A Petition to Withdraw from issue under 37 C.F.R. §1.313(b)(5) is concurrently filed herewith.

7b. ☐ Copies of publications listed on Form PTO-1449 from prior application Serial No. , filed on , of which this application claims priority under 35 U.S.C. §120, are not being submitted pursuant to 37 C.F.R. §1.98(d).

7c. ☐ Copies of the publications listed on the attached Form PTO-1449 that were not previously cited in prior application Serial No. , filed on , are provided herewith.

8. ☒ This is a Supplemental Information Disclosure Statement. (Check Item 8a)

8a. ☒ This Supplemental Information Disclosure Statement under 37 C.F.R. §1.97(f) supplements the Information Disclosure Statement filed on **July 26, 2022**. A bona fide attempt was made to comply with 37 C.F.R. §1.98, but inadvertent omissions were made. These omissions have been corrected herein. Accordingly, additional time is requested so that this Supplemental Information Disclosure Statement can be considered as if properly filed on **July 26, 2022**.

9. ☐ In accordance with 37 C.F.R. §1.98, a concise explanation of what is presently understood to be the relevance of each non-English language publication is:

(Check Item 9a, 9b, or 9c)

9a. ☐ satisfied because all non-English language publications were cited on the enclosed English language copy of the PCT International Search Report or the search report from a counterpart foreign application indicating the degree of relevance found by the foreign office.

9b. ☐ set forth in the application.

9c. ☐ enclosed as an attachment hereto.

10. ☒ The Commissioner is authorized to charge any additional fee required or credit any overpayment for this Information Disclosure Statement and/or Petition to Morgan, Lewis & Bockius LLP Deposit Account No. 50-0310 (order no. 024607-02-5119-US).

11. ☒ No admission is made that the information cited in this Statement is, or is considered to be, material to patentability nor a representation that a search has been made (other than a search report of a foreign counterpart application or PCT International Search Report if submitted herewith). 37 C.F.R. §§1.97(g) and (h).

Respectfully submitted,

Date: December 8, 2022

/Yalei Sun/ 57,765
Yalei Sun (Reg. No.)
MORGAN, LEWIS & BOCKIUS LLP
1400 Page Mill Road
Palo Alto, CA 94304
(650) 843-4000

REQUEST FOR CONTINUED EXAMINATION (RCE) TRANSMITTAL

Address to:
Mail Stop RCE
Commissioner of Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Electronically filed	January 24, 2023
Application Number	17/746,755
Confirmation Number	8911
Filing Date	May 17, 2022
First Named Inventor	Tao Tao, et al.
Art Unit	1721
Examiner Name	Barton, Jason Aaron
Attorney Docket No.	024607-02-5119-US

This is a Request for Continued Examination (RCE) under 37 C.F.R. § 1.114 of the above-identified application. Request for Continued Examination (RCE) practice under 37 CFR 1.114 does not apply to any utility or plant application filed prior to June 8, 1995, or to any design application.

1. Submission required under 37 C.F.R. § 1.114

NOTE: If the RCE is proper, any previously filed unentered amendments and amendments enclosed with the RCE will be entered in the order in which they were filed unless applicant instructs otherwise. If applicant does not wish to have any previously filed unentered amendment(s) entered, applicant must request non-entry of such amendment(s).

a. ☐ Previously submitted. If a final Office Action is outstanding, any amendments filed after the final Office Action may be considered as a submission.
   i. ☐ Consider the arguments in the Appeal Brief or Reply Brief previously filed _____
   ii. ☐ Other _____

b. ☒ Enclosed
   i. ☒ Amendment/Reply
   ii. ☐ Affidavit(s)/Declaration(s)
   iii. ☐ Information Disclosure Statement (IDS)
   iv. ☐ Other _____

2. Miscellaneous

a. ☐ Suspension of action on the above-identified application is requested under 37 C.F.R. § 1.103(c) for a period of _____ months. (Period of suspension shall not exceed 3 months; Fee under 37 C.F.R. § 1.17(i) required)

b. ☐ Other _____

3. Fees — The RCE fee under 37 C.F.R. § 1.17(e) is required by 37 C.F.R. § 1.114 when the RCE is filed.

a. ☒ Payment has been made via Financial Manager, however, the Director is hereby authorized to charge any required fees to Morgan, Lewis & Bockius LLP Deposit Account No. 50-0310 (order no. 024607-02-5119-US).
   i. ☒ (1st request) RCE fee required under 37 C.F.R. § 1.17(e)(1), ☐ $1360 (large entity); ☐ $680 (small entity)
   ii. ☐ (2nd or subsequent request) RCE fee required under 37 C.F.R. § 1.17(e)(2), ☐ $2000 (large entity); ☐ $1000 (small entity)
   iii. ☐ Extension of time fee required under 37 C.F.R. §§ 1.136 and 1.17, to be $ for a month(s) extension, the request for which is being made herewith
   iv. ☐ Other _____

SIGNATURE OF APPLICANT, ATTORNEY, OR AGENT REQUIRED

Name (Print/Type)	Yalei Sun	*Registration No. (Attorney/Agent)*	57,765
Signature	/Yalei Sun/	*Date*	January 24, 2023

CERTIFICATE OF MAILING OR TRANSMISSION

I hereby certify that this correspondence is being deposited with the United States Postal Service as first class mail in an envelope addressed to: Mail Stop RCE, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450, or by facsimile transmitted to fax no. 1-703- to the U.S. Patent and Trademark Office on the date indicated below.

Name (Print/Type)		*Registration No. (Attorney/Agent)*	
Signature		*Date*	

Electronically filed January 24, 2023

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Application of:	Tao Tao et al.	Confirmation No.:	8911
Serial No.:	17/746,755	Art Unit:	1721
Filed:	May 17, 2022	Examiner:	Barton, Jason Aaron
For:	*Lithium-Ion Battery Having Desirable Safety Performance*	Attorney Docket No.:	024607-02-5119-US

AMENDMENT AND RESPONSE TO FINAL OFFICE ACTION FILED WITH REQUEST FOR CONTINUED EXAMINATION (RCE)

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

The enclosed Amendment is in response to the Final Office Action dated October 24, 2022 for the above-identified patent application.

The Commissioner is hereby authorized to charge any required fee(s) to Morgan, Lewis & Bockius LLP Deposit Account No. 50-0310 (order no. 024607-02-5119-US).

Electronic Patent Application Fee Transmittal

Application Number:	17746755
Filing Date:	17-May-2022
Title of Invention:	LITHIUM-ION BATTERY HAVING DESIRABLE SAFETY PERFORMANCE
First Named Inventor/Applicant Name:	Tao TAO
Filer:	Yalei Sun/Cheryl Rogers
Attorney Docket Number:	024607-02-5119-US

Filed as Large Entity

Filing Fees for Utility under 35 USC 111(a)

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Basic Filing:				
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
Extension-of-Time:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Miscellaneous:				
RCE- 1ST REQUEST	1801	1	1360	1360
		Total in USD ($)		**1360**

Electronic Acknowledgement Receipt

EFS ID:	47417770
Application Number:	17746755
International Application Number:	
Confirmation Number:	8911
Title of Invention:	LITHIUM-ION BATTERY HAVING DESIRABLE SAFETY PERFORMANCE
First Named Inventor/Applicant Name:	Tao TAO
Customer Number:	24341
Filer:	Yalei Sun
Filer Authorized By:	
Attorney Docket Number:	024607-02-5119-US
Receipt Date:	24-JAN-2023
Filing Date:	17-MAY-2022
Time Stamp:	18:04:19
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1		024607-02-5119-US_RCE_Amendmentv2.pdf	865217 61f003a37b9b9adfc68dae77788cc9fbad3fed47	yes	15

	Multipart Description/PDF files in .zip description		
	Document Description	**Start**	**End**
	Request for Continued Examination (RCE)	1	1
	Response After Final Action	2	2
	Claims	3	8
	Applicant Arguments/Remarks Made in an Amendment	9	15

Warnings:					
Information:					
2	Fee Worksheet (SB06)	fee-info.pdf	37958 6ef27fb78e0cca6245e26ca46487d616288095a4	no	2
Warnings:					
Information:					
		Total Files Size (in bytes):	903175		

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

Amendments to the Claims

The following listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1-19. (Canceled)

20. (Currently Amended) A lithium-ion battery, comprising:

a positive electrode comprising a positive current collector and a positive electrode active material layer containing $LiCoO_2$, wherein the positive electrode active material layer is formed on the positive current collector, the positive electrode active material layer being provided with a first recess accommodating a positive lead being coupled with the positive current collector;

a negative electrode comprising a negative current collector and a negative electrode active material layer containing graphite or silicon, wherein the negative electrode active material layer is formed on the negative current collector, the negative electrode active material layer being provided with a second recess accommodating a negative lead being coupled with the negative current collector;

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

an electrolyte,

wherein, a top surface of the positive lead is provided with a first insulating glue layer, a surface of the positive electrode active material layer ~~corresponding~~ opposite to the second recess across the separator in a thickness direction of the positive plate and the negative plate is pasted with a second insulating glue layer, the second insulating glue layer has a width larger than a width of the second recess, and the second insulating glue layer has a length larger than a length of the second recess.

21. (Previously Presented) The lithium-ion battery of claim 20, wherein a distance between a center of the first recess and one end of the positive electrode active material layer is 1/4-3/4 of a length of the positive electrode active material layer; and a distance between a center of the second recess and one end of the negative electrode active material layer is 1/4-3/4 of a length of the negative electrode active material layer.

22. (Previously Presented) The lithium-ion battery of claim 21, wherein, the distance between the center of the first recess and the one end of the positive electrode active material layer is half of the length of the positive electrode active material layer; and the distance between the center of the second recess and the one end of the negative electrode active material layer is half of the length of the negative electrode active material layer.

23. (Previously Presented) The lithium-ion battery of claim 22, wherein the first recess has a length of 1-100 mm less than a length of the positive lead, the first recess has a width of 1-10 mm larger than a width of the positive lead, the second recess has a length of 1-100 mm less than a length of the negative lead, and the second recess has a width of 1-10 mm larger than a width of the negative lead.

24. (Previously Presented) The lithium-ion battery of claim 20, wherein the first recess has a length of 1-100 mm less than a width of the positive electrode active material layer, and the second recess has a length of 1-100 mm less than a width of the negative electrode active material layer.

25. (Previously Presented) The lithium-ion battery of claim 20, wherein the first recess has a depth of 0.005-0.1 mm larger than a thickness of the positive lead, and the second recess has a depth of 0.005-0.1 mm larger than a thickness of the negative lead.

26. (Previously Presented) The lithium-ion battery of claim 20, wherein a length of a portion of the positive lead in the first recess is less than a width of a remaining portion of the positive electrode active material layer from an edge of the first insulating glue layer covering the positive electrode active material layer to an edge of the positive electrode active material layer opposite to the first recess.

27. (Previously Presented) The lithium-ion battery of claim 20, wherein a width of a portion of the positive lead in the first recess is greater than a width of a remaining portion of the first recess not occupied by the positive lead located on one side of the positive lead.

28. (Canceled)

29. (Currently Amended) A lithium-ion battery, comprising:

a positive electrode, comprising a positive current collector and a positive electrode active material layer being formed on the positive current collector, the positive electrode

active material layer being provided with a first recess accommodating a positive lead being coupled with the positive current collector;

a negative electrode, comprising a negative current collector and a negative electrode active material layer being formed on the negative current collector, the negative electrode active material layer being provided with a second recess accommodating a negative lead being coupled with the negative current collector;

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

an electrolyte,

wherein, a first location of a top surface of the positive lead is provided with a first insulating glue layer; a second location of a surface of the positive electrode active material layer ~~corresponding~~ opposite to the second recess across the separator in a thickness direction of the positive plate and the negative plate is pasted with a second insulating glue layer; a third location of a surface of the positive current collector opposite to the surface of the positive current collector where the positive lead coupled ~~corresponding to the positive lead~~ is covered with another first insulating glue layer; the second insulating glue layer has a width larger than a width of the second recess, and the second insulating glue layer has a length larger than a length of the second recess.

30. (Previously Presented) The lithium-ion battery of claim 29, wherein a distance between a center of the first recess and one end of the positive electrode active material layer is 1/4-3/4 of a length of the positive electrode active material layer, and a distance between a center of the second recess and one end of the negative electrode active material layer is 1/4-3/4 of a length of the negative electrode active material layer.

31. (Previously Presented) The lithium-ion battery of claim 29, wherein a distance between a center of the first recess and one end of the positive electrode active material layer is half of a length of the positive electrode active material layer, and a distance between a center of the second recess and one end of the negative electrode active material layer is half of a length of the negative electrode active material layer.

32. (Previously Presented) The lithium-ion battery of claim 29, wherein the first recess has a length of 1-100mm less than a length of the positive lead, the first recess has a width of 1-10mm larger than a width of the positive lead, the second recess has a length of 1-100mm

less than a length of the negative lead, and the second recess has a width of 1-10mm larger than a width of the negative lead.

33. (Previously Presented) The lithium-ion battery of claim 29, wherein the first recess has a length of 1-100mm less than a width of the positive electrode active material layer, and the second recess has a length of 1-100mm less than a width of the negative electrode active material layer.

34. (Previously Presented) The lithium-ion battery of claim 29, wherein the first recess has a depth of 0.005-0.1mm larger than a thickness of the positive lead, and the second recess has a depth of 0.005-0.1mm larger than a thickness of the negative lead.

35. (Previously Presented) The lithium-ion battery of claim 29, wherein a length of a portion of the positive lead in the first recess is less than a width of a remaining portion of the positive electrode active material layer from an edge of the first insulating glue layer covering the positive electrode active material layer to an edge of the positive electrode active material layer opposite to the first recess.

36. (Previously Presented) The lithium-ion battery of claim 29, wherein a width of a portion of the positive lead in the first recess is greater than a width of a remaining portion of the first recess not occupied by the positive lead located on one side of the positive lead.

37. (Currently Amended) A lithium-ion battery, comprising:

a positive electrode, comprising a positive current collector and a positive electrode active material layer being formed on the positive current collector, the positive electrode active material layer being provided with a first recess accommodating a positive lead being coupled with the positive current collector;

a negative electrode, comprising a negative current collector and a negative electrode active material layer being formed on the negative current collector, the negative electrode active material layer being provided with a second recess accommodating a negative lead being coupled with the negative current collector;

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

an electrolyte,

wherein, a first location of a top surface of the positive lead is provided with a first insulating glue layer; a second location of a surface of the positive electrode active material layer ~~corresponding~~ opposite to the second recess across the separator in a thickness direction of the positive plate and the negative plate is pasted with a second insulating glue layer; the second insulating glue layer has a width larger than a width of the second recess, and the second insulating glue layer has a length larger than a length of the second recess.

38. (Previously Presented) The lithium-ion battery of claim 37, wherein a length of a portion of the first lead in the first recess is less than a width of a remaining portion of the first film from an edge of the first insulating glue layer covering the first film to an edge of the first film opposite to the first recess.

39. (Previously Presented) The lithium-ion battery of claim 37, wherein a width of a portion of the first lead in the first recess is greater than a width of a remaining portion of the first recess not occupied by the first lead located on one side of the first lead.

REMARKS

This amendment responds to the final office action mailed October 24, 2022. In the final office action, the Examiner:

- commented under "*Information Disclosure Statement*" filed on July 26, 2022;
- rejected claims 28 and 29-36 as being indefinite under 35 U.S.C. § 112(b) for failing to particularly point out and distinctly claim the subject matter; and
- rejected claims 20-39 under 35 U.S.C. 103 as being unpatentable over Sugita (WO 2013/038677), in view of Matsushita et al. (U.S. Patent Publication No. 2014/0120417), and Kwak et al. (U.S. Patent Publication No. 2006/0051662).

INTERVIEW SUMMARY

Applicant's attorneys thank Examiner Barton and his supervisor for the opportunity to discuss the application during a telephone interview on December 19, 2022 with Yalei Sun. In the interview, Mr. Sun discussed the distinction between the pending claims and JP2007165224 (which has not been cited by but was considered by the Examiner in connection with examining US Patent Application No. 17/407,081). No specific agreement has been reached.

REMARKS CONCERNING CLAIMS

Claims 20, 29 and 37 have been amended. Claim 28 has been canceled.

Support for the amendments can be found in at least paragraphs [0023] and [0079], and Figures 1-5 of the application as filed. No new matter has been added.

With respect to all amendments, Applicant has not dedicated or abandoned any unclaimed subject matter. Moreover, Applicant has not acquiesced to any characterizations of the invention, nor any rejections or objections of the claims, made by the Examiner. Moreover, the Applicant hereby rescinds any prior disclaimer of claim scope, to the extent they exist, made during the prosecution of this application or made during the prosecution of any patent or other related patents/applications, and advises the Examiner that any such previous disclaimers and the cited references that they were made to avoid may need to be revisited.

After entry of this amendment, the pending claims are: claims 20-27 and 29-39.

REMARKS CONCERNING INFORMATION DISCLOSURE STATEMENT

I. COMMENTS REGARDING INFORMATION DISCLOSURE STATEMENT FILED ON JULY 26, 2022

The pending application is a continuation of the following US patent applications:

- US Patent Application No. 14/596,873 (issued as US Patent No. 10,541,441);
- US Patent Application No. 16/113,938; and
- US Patent Application No. 17/407,081.

It is the Applicant's belief that the references cited in the IDS filed on July 26, 2022 have already been filed with at least one of the parent applications. According to 37 CFR Sec 1.98(d), the Applicant does not need to submit references already submitted in the parent cases. However, the Applicant agrees to file a supplemental IDS to include a legible copy of all the foreign references and NPLs to expedite the prosecution of the pending application.

REMARKS CONCERNING REJECTIONS UNDER 35 U.S.C. 112

II. REJECTION OF CLAIMS 28 AND 29-36 AS BEING INDEFINITE UNDER 35 U.S.C. 112(B) FOR FAILING TO PARTICULARLY POINT OUT AND DISTINCTLY CLAIM THE SUBJECT MATTER

Claim 29 has been amended to recite the location of the "another first insulating glue layer". Support for the amendments can be found in in FIG. 5 and [0023] of the present application. Claim 28 has been canceled.

In light of the above, the Applicant respectfully submits that the rejection of claims 28 and 29-36 should be withdrawn.

REMARKS CONCERNING REJECTIONS UNDER 35 U.S.C. 103

III. REJECTION OF CLAIMS 20-39 UNDER 35 U.S.C. 103 AS BEING UNPATENTABLE OVER SUGITA, IN VIEW OF MATSUSHITA AND KWAK

Claim 20 as amended recites, among others that:

> ...
>
> wherein, a top surface of the positive lead is provided with a first insulating glue layer, **a surface of the positive electrode active material layer opposite to the second recess across the separator in a thickness direction of the positive plate and the negative plate is pasted with a second insulating glue layer**, the second insulating glue layer has a width larger than a width of the second recess, and the second insulating glue layer has a length larger than a length of the second recess.

Emphasis Added.

For reference, FIG. 5 of the present application (reproduced below with color annotations) depicts an exemplary cross-sectional view of a lithium-ion battery, in which the second lead 23 is separated from the second insulating glue layer 16 disposed on the surface of the first film opposite to the second lead **across the separator 3** (represented by the dashed line) in a thickness direction of the battery.

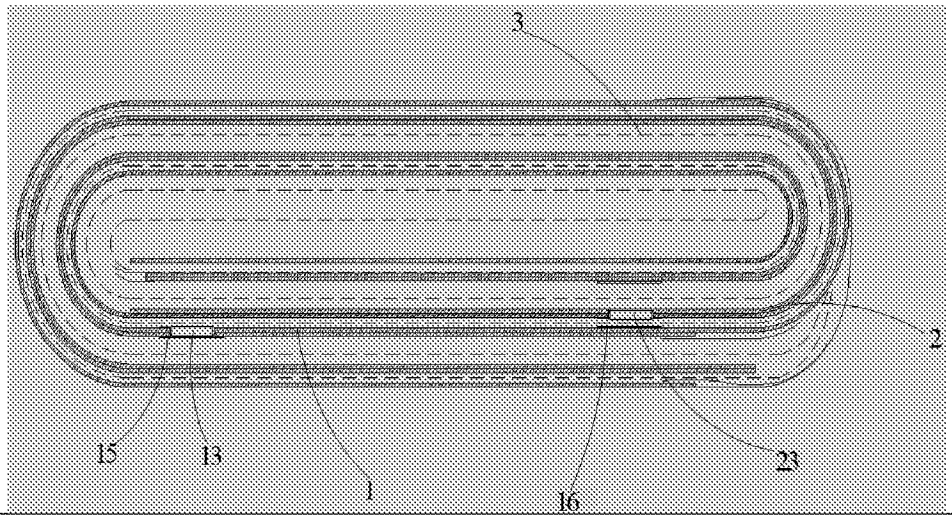


FIG. 5 of the present application

Without the second insulating glue layer 16, the charge and discharge of the lithium-ion battery may result in lithium precipitation near the second lead 23 on the negative electrode due to receiving the lithium ions escaping from the surface of the first film on the positive electrode because the negative film 22 on the second current collector 21 has been removed to form the second recess for housing the second lead 23. This would cause the penetration of the separator 3 and therefore result in a short circuit between the positive electrode and the negative electrode.

But as depicted in FIG. 5 above, the deployment of the second insulating glue layer 16 on the surface of the first film near the location of the second lead across the separator 3 prevents lithium precipitation on the surface of the second film. Thus,

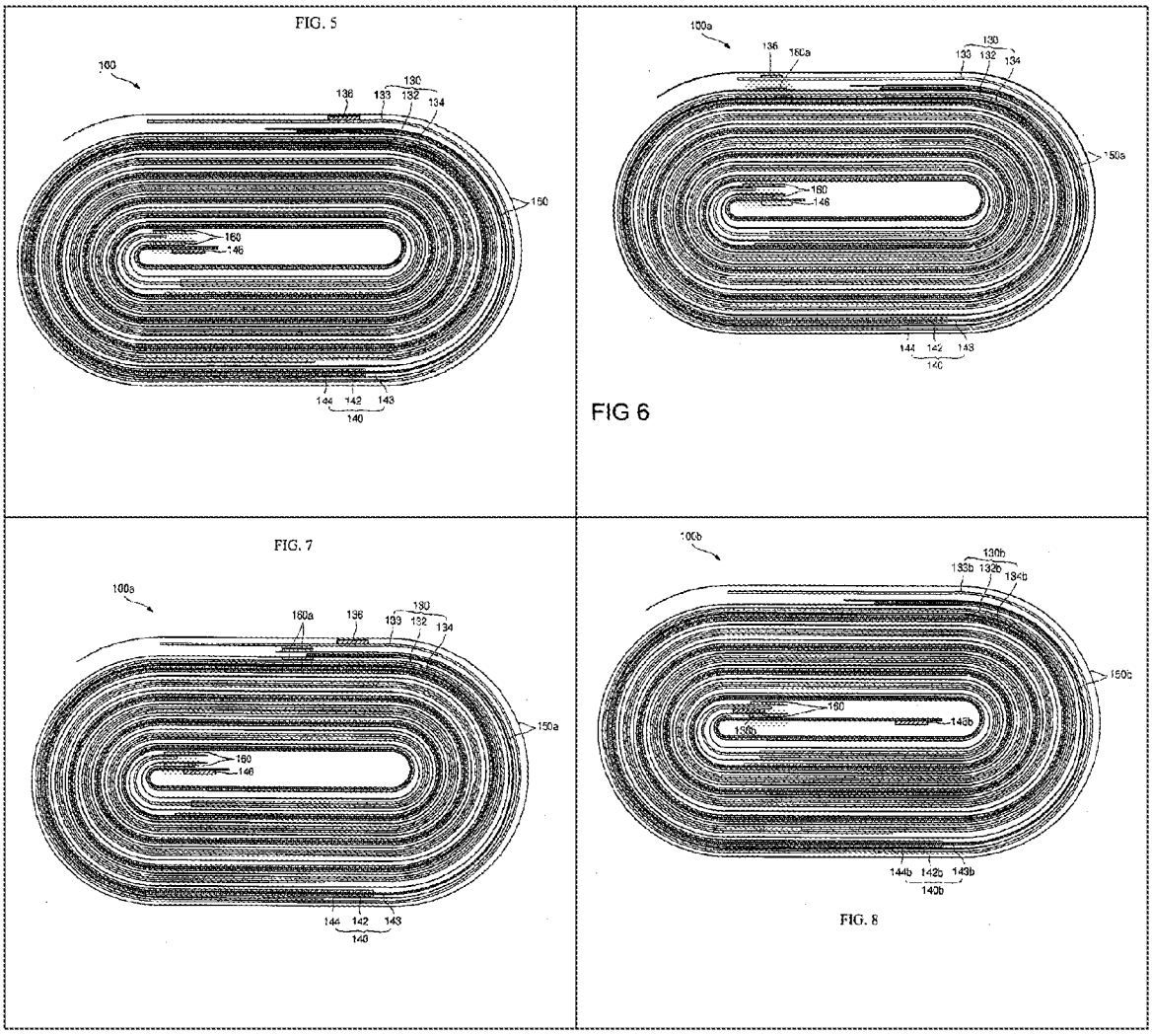
> **[0023]** Compared with the prior art, due to the arrangement of the first insulating glue layer formed on the upper and lower surfaces of the positive lead and *the second insulating glue layer pasted on the surface of the positive film corresponding to the second recess, occurrence of internal short circuit and lithium precipitation in the lithium-ion battery is remarkably reduced*, and safety performance of the lithium-ion battery is improved remarkably in the premise of desirable energy density.

In other words, the short circuit that the present application tries to prevent is the lithium precipitation-induced short circuit.

In contrast, the short circuit between the positive electrode and the negative electrode described by Kwak is caused by the contracting of the separator "due to heat that is generated near the electrode tab during overcharging, over-discharging", not by the lithium precipitation near the location of the negative lead on the negative electrode. See, e.g.,

> **[0041]** The insulation tape 160 prevents the heat that is generated from the first electrode tab 146 portion from being directly transferred to the separator 150. In particular, **the insulation tape 160 effectively prevents the separator 150 from contracting in a position corresponding to the position of the first electrode tab 146**, in spite of the heat generation at the first electrode tab 146. For that reason, the insulation tape 160 may be coupled with the separator in a position facing the first electrode plate uncoated **portion corresponding to the position of the first electrode tab.**
> **[0042]** The insulation tape 160 has a predetermined width and the same height as the second electrode 130 or first electrode plate 140 and is attached to a surface of the separator 150 that does not contact the second electrode plate 130. The insulation tape 160 is sufficiently wide to be attached to the separator 150 in a position corresponding to the second electrode uncoated portion 133 of the second electrode plate 130. **The insulation tape 160 is attached to a predetermined portion of the separator 150 and holds the separator 150 in place even when it is subjected to heat which prevents it from contracting.**

For further reference, FIGS. 5-8 of Kwak are reproduced below with the insulation tapes 160 and 160a being highlighted in each figure. As can be seen in the figures below, there is an insulation tape 160 or 160a with one side disposed on the separator (150, 150a, or 150b) and the other side disposed on the electrode collector (132 or 142) such that the separator is attached to the electrode collector at least at one end of the electrode plate to prevent the contraction of the separator along the winding direction of the battery cell.



In sum, because Kwak attempts to solve a different type of short circuit problem from the present application, one skilled in the art would not have been motivated to combine the teachings of the three cited references to arrive at the claimed invention. Thus claim 20 and its dependent claims 21-27 are patentable over the three cited references.

Because claims 29 and 37 have been amended in a substantially similar manner, claims 29 and 37 as well as their respective dependent claims 30-36 and 38-39 are also patentable over the three cited references for at least the same reasons above.

REMARKS CONCERNING JP2007165224

During the phone interview, the Examiner suggests that the Japanese reference JP2007165224 might be relevant to the pending claims.

For reference, FIG. 4 of the Japanese reference and FIG. 5 of the present application are reproduced below.

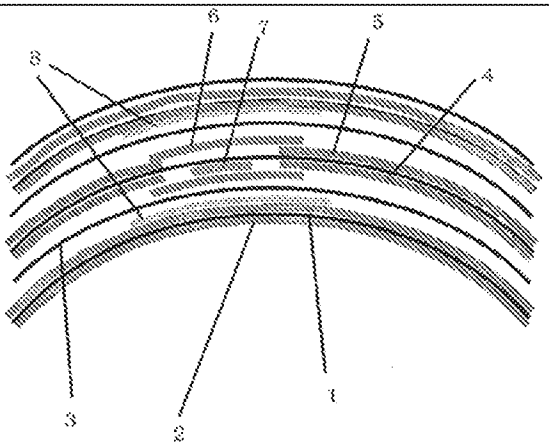


FIG. 4 of the Japanese reference

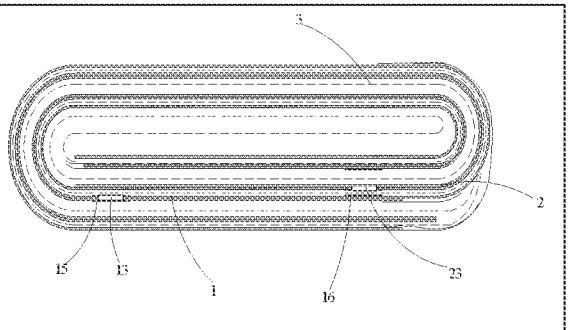


FIG. 5 of the present application

As shown above, the numeral 4 refers to the **positive current collector** and the heat-resistant film 8 is located on the **negative active material 2** that is disposed on the **negative current collector 1**.

In contrast, the pending claim 20 requires that "a surface of the **positive electrode active material layer** corresponding to the second recess across the separator in a thickness direction of the positive plate and the negative plate is pasted with a **second insulating glue layer**". In other words, the arrangement of the second insulating glue layer of the present application is exactly **opposite** to the teaching of the JP reference. As shown in FIG. 5 of the present application, the **second insulating glue layer 16** is disposed on the surface of the **positive electrode active material layer 1**.

The difference between the teaching of the Japanese reference and the pending application lies in the fact that they are attempting to address two different problems.

According to the Japanese reference, the purpose of having the heat-resistant protective film 8 on the negative active material 2 is to protect the battery by suppressing the high heat caused by a short circuit between the positive electrode and the negative electrode. Please refer to the abstract and other relevant of the Japanese reference[1] as follows:

> PROBLEM TO BE SOLVED: To solve a problem in a nonaqueous electrolyte secondary battery that a large current flows

[1] The English translation of the Japanese reference can be found at https://patents.google.com/patent/JP2007165224A/en?oq=JP2007165224.

> and an open circuit voltage is decreased and **a heating may be caused, in case an internal short circuit occurs between an uncoated part of a cathode collector and an anode plate coated by an anode active substance**.
>
> By doing so, the heat-resistant protective film can be formed densely with good adhesion, and the **highest risk of heat generation between the uncoated portion of the positive electrode current collector and the negative electrode plate coated with the negative electrode active material heat generation at the time of internal short circuit that occurred can be suppressed**.

Emphasis Added.

In other words, the Japanese reference does **not** prevent short circuit but it tries to mitigate the heat buildup near the lead **after the short circuit has occurred**.

In contrast, as described above, by covering the surface of the positive film (including a large amount of lithium-ion) near the location of the second lead across the separator 3 with the deployment of the second insulating glue layer 16, it is more difficult for the lithium-ion to move across the separator 3 to arrive at the second lead on the negative current collector, which would have resulted into a lithium precipitation on the surface of the second film near the second lead and the "occurrence of **internal short circuit** ··· in the lithium-ion battery" .

In other words, the technical problem of the present application is how to prevent the lithium-ion battery from having a short circuit on the first place than how to suppress heat after the short circuit has occurred. Thus, it would not be apparent for one of ordinary skill in the art to modify the battery design of the Japanese reference to address a technical problem that has never been contemplated in the Japanese reference.

In view of the above, the Applicant respectfully submits that the pending claims are patentable over the Japanese reference as well.

CONCLUDING REMARKS

By responding in the foregoing remarks only to particular positions asserted by the examiner, the Applicant does not necessarily acquiesce in other positions that have not been explicitly addressed. In addition, the Applicant's arguments for the patentability of a claim should not be understood as implying that no other reasons for the patentability of that claim exist.

In light of the above amendments and remarks, the Applicant respectfully requests that the Examiner reconsider this application with a view towards allowance. The Examiner is invited to call the undersigned attorney at (650) 843-7558, if a telephone call could help resolve any remaining items.

Respectfully submitted,

Date: January 24, 2023

/Yalei Sun/ 57,765

Yalei Sun (Reg. No.)
MORGAN, LEWIS & BOCKIUS LLP
1400 Page Mill Road
Palo Alto, CA 94304
Phone: (650) 843-7558
E-mail: yalei.sun@morganlewis.com

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Sale Item Reference Number	Effective Date
17746755	01/24/2023

Document Number	Fee Code	Fee Code Description	Amount Paid	Payment Method
I20231PD53201963	1801	RCE- 1ST REQUEST	$1,360.00	Deposit Account

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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
17/746,755	05/17/2022	Tao TAO	024607-02-5119-US	8911

24341 7590 01/30/2023

Morgan, Lewis & Bockius LLP (PA)
1400 Page Mill Road
Palo Alto, CA 94304-1124

EXAMINER	
BARTON, JASON AARON	

ART UNIT	PAPER NUMBER
1721	

NOTIFICATION DATE	DELIVERY MODE
01/30/2023	ELECTRONIC

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

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

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

donald.mixon@morganlewis.com
padocketingdepartment@morganlewis.com

Applicant-Initiated Interview Summary	Application No. 17/746,755	Applicant(s) TAO et al.		
	Examiner JASON A BARTON	Art Unit 1721	AIA (First Inventor to File) Status Yes	Page 1 of 2

All Participants (applicant, applicants representative, PTO personnel)	Title	Type
JASON A BARTON	Examiner	Telephonic
WILLIAM MCCLAIN	Primary Examiner	
YALEI SUN	Attorney of Record	

Date of Interview: 11 January 2023

Issues Discussed:

35 U.S.C. 103

Examiner convened with Applicant's counsel on 12/19/2022 to discuss an interview agenda (see attachment). Applicant proposed amending the independent claim to recite, "...a surface of the positive electrode active material layer corresponding to the second recess across the separator in a thickness direction of the positive plate and the negative plate." A similar limitation was discussed in the related parent case (17/407,081). Examiner indicated that Jp2007165224, which was cited in the pertinent prior art, would most likely be cited against the claims.

Applicant's counsel suggested sending proposed amendments in the 12/19/2022 interview. Examiner agreed.

In a subsequent email on 01/06/2023, Applicant's counsel proposed arguments (see attachment) for preemptively addressing the Jp'224 reference. Examiner indicated 1/11/2023 that the proposed arguments would most likely be insufficient for overcoming the Jp'224 reference upon formal filing.

☑ Attachment

/JASON BARTON/ Examiner, Art Unit 1721	/WILLIAM E MCCLAIN/ Primary Examiner, Art Unit 1721

Applicant is reminded that a complete written statement as to the substance of the interview must be made of record in the application file. It is the applicants responsibility to provide the written statement, unless the interview was initiated by the Examiner and the Examiner has indicated that a written summary will be provided. See MPEP 713.04
Please further see:
MPEP 713.04
Title 37 Code of Federal Regulations (CFR) § 1.133 Interviews, paragraph (b)
37 CFR § 1.2 Business to be transacted in writing

Applicant recordation instructions: The formal written reply to the last Office action must include the substance of the interview. (See MPEP section 713.04). If a reply to the last Office action has already been filed, applicant is given a non-extendable period of the longer of one month or thirty days from this interview date, or the mailing date of this interview summary form, whichever is later, to file a statement of the substance of the interview.

Applicant-Initiated Interview Summary	**Application No.** 17/746,755	**Applicant(s)** TAO et al.		
	Examiner JASON A BARTON	**Art Unit** 1721	**AIA (First Inventor to File) Status** Yes	**Page** **2 of 2**

Examiner recordation instructions: Examiners must summarize the substance of any interview of record. A complete and proper recordation of the substance of an interview should include the items listed in MPEP 713.04 for complete and proper recordation including the identification of the general thrust of each argument or issue discussed, a general indication of any other pertinent matters discussed regarding patentability and the general results or outcome of the interview, to include an indication as to whether or not agreement was reached on the issues raised.

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Application of:	Tao Tao et al.	Confirmation No.:	8911
Serial No.:	17/746,755	Art Unit:	1721
Filed:	May 17, 2022	Examiner:	Barton, Jason Aaron
For:	*Lithium-Ion Battery Having Desirable Safety Performance*	Attorney Docket No.:	024607-02-5119-US

PHONE INTERVIEW AGENDA

Listing of Claims:

1-19. (Canceled)

20. (Currently Amended) A lithium-ion battery, comprising:

a positive electrode comprising a positive current collector and a positive electrode active material layer containing $LiCoO_2$, wherein the positive electrode active material layer is formed on the positive current collector, the positive electrode active material layer being provided with a first recess accommodating a positive lead being coupled with the positive current collector;

a negative electrode comprising a negative current collector and a negative electrode active material layer containing graphite or silicon, wherein the negative electrode active material layer is formed on the negative current collector, the negative electrode active material layer being provided with a second recess accommodating a negative lead being coupled with the negative current collector;

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

an electrolyte,

wherein, a top surface of the positive lead is provided with a first insulating glue layer, a surface of the positive electrode active material layer corresponding to the second recess across the separator in a thickness direction of the positive plate and the negative plate is pasted with a second insulating glue layer, the second insulating glue layer has a width

larger than a width of the second recess, and the second insulating glue layer has a length larger than a length of the second recess.

Comments about JP2007165224:

First:

The problem to be addressed by this patent is described in the following paragraph:

By doing so, **the heat-resistant protective film can be formed densely with good adhesion, and the highest risk of heat generation between the uncoated portion of the positive electrode current collector and the negative electrode plate coated with the negative electrode active material Heat generation at the time of internal short circuit that occurred can be suppressed.**

In other words, this JP patent does not try to prevent the short-circuit. Actually, it tries to deal with the over-heating issue after the short circuit occurs.

Second:

The JP patent does not teach the following claim feature because it does not teach the recess in the negative electrode.

the second insulating glue layer has a length larger than a length of the second recess.

Barton, Jason

From: Barton, Jason
Sent: Wednesday, January 11, 2023 9:11 AM
To: Sun, Yalei
Cc: McClain, William E.
Subject: RE: 024607-02-5119-US (P2014010US5) Phone Interview Agenda.DOCX

Hi Mr. Sun,

I think my preliminary opinion on the positive/negative current collector distinction you have made is that the heat-resistant film 8 is applicable in either case, i.e., as applied in the disclosed positive/negative and in the non-disclosed opposite manner. Similar to point #2 which we discussed during the interview, I don't think there is a patentable distinction as it follows from common sense that the limitation would be met (i.e., the alleged insulating glue layer needs to be at least as large in both width/length directions to cover the electrode inside the recess), even if it is not expressly shown in the figures or discussed in the specification of the JP reference.

Having addressed these items, please proceed to formal file your response.

Best regards,

Jason Barton
Junior Patent Examiner | AU 1721
Email: jason.barton@uspto.gov
Ph.: (571)-270-3551

From: Sun, Yalei <yalei.sun@morganlewis.com>
Sent: Friday, January 6, 2023 12:46 PM
To: Barton, Jason <Jason.Barton@uspto.gov>
Cc: McClain, William E. <william.mcclain@USPTO.GOV>
Subject: RE: 024607-02-5119-US (P2014010US5) Phone Interview Agenda.DOCX

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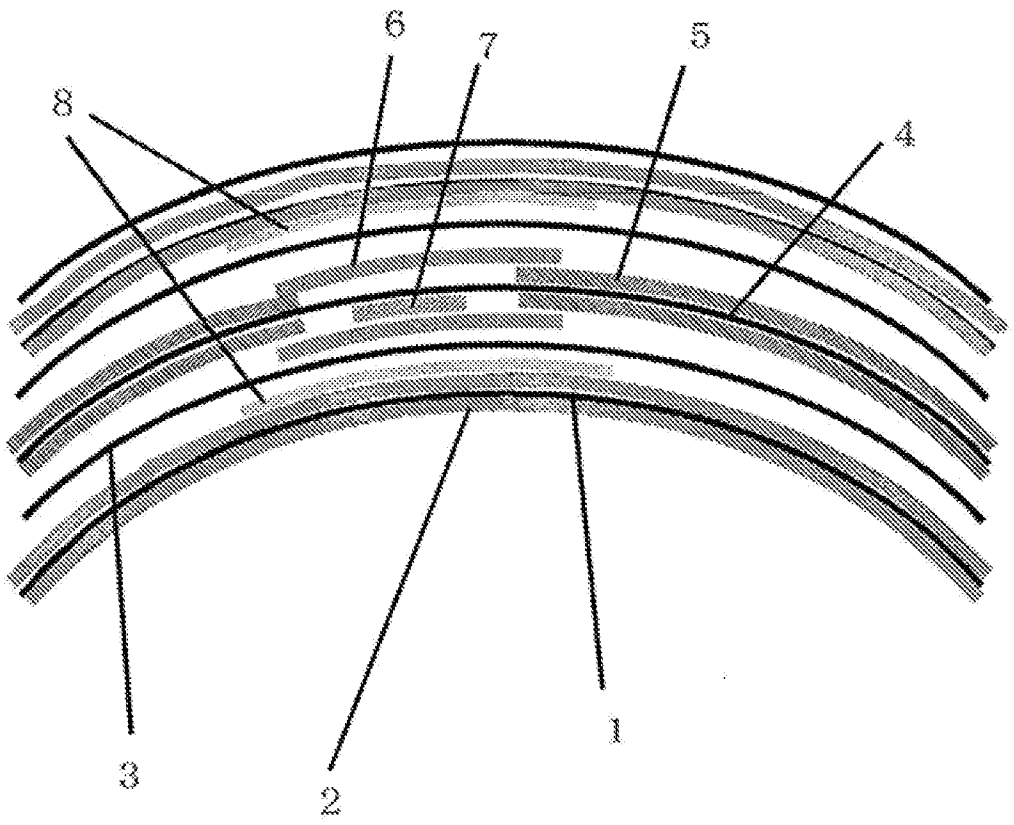
Examiner Barton,

Thanks for your email below.

We will wait for the final OA of the parent case before requesting the interview.

As for the child case, I would like to further explain the differences between the JP reference and the pending claims.

As you can see from the figure 4 of the JP reference, the numeral 4 refers to the positive current collector and the heat-resistant film 8 is located on the negative active material 2 that is disposed on the negative current collector 1.



In contrast, the pending claim 20 requires that "a surface of the positive electrode active material layer corresponding to the second recess across the separator in a thickness direction of the positive plate and the negative plate is pasted with a second insulating glue layer". In other words, the arrangement of the second insulating glue layer of the present application is exactly opposite to the teaching of the JP reference. See the Fig. 5 of the present application below. Note that the second insulating glue layer highlighted in the figure is disposed on the surface of the positive electrode active material layer.

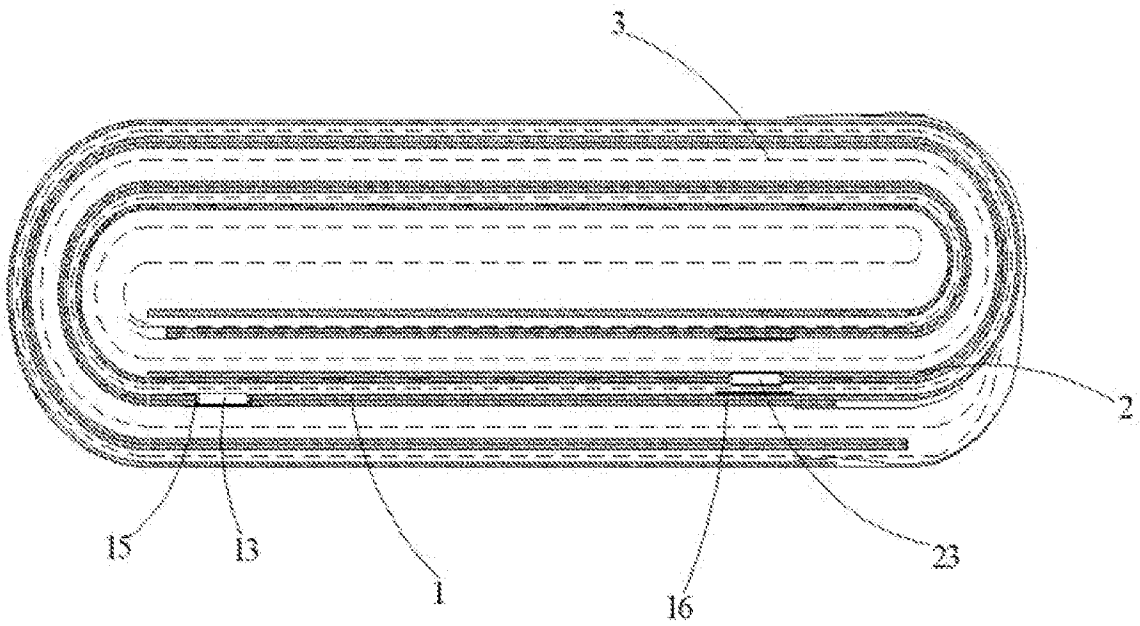


FIG. 5

Please feel free to call me if you think that it is helpful.

Thanks,

Yalei Sun | 孙亚雷
Morgan, Lewis & Bockius LLP
1400 Page Mill Road | Palo Alto,CA 94304
Direct: +1.650.843.7558 | Main:+1.650.843.4000 | Fax: +1.650.843.4001
yalei.sun@morganlewis.com| www.morganlewis.com
Assistant: Cheryl A. Rogers |+1.650.843.7839 | cheryl.rogers@morganlewis.com

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From: Barton, Jason <Jason.Barton@uspto.gov>
Sent: Wednesday, January 4, 2023 12:15 PM
To: Sun, Yalei <yalei.sun@morganlewis.com>
Cc: McClain, William E. <william.mcclain@USPTO.GOV>
Subject: RE: 024607-02-5119-US (P2014010US5) Phone Interview Agenda.DOCX

[EXTERNAL EMAIL]
Hi Mr. Sun,

I just received your voicemail a moment ago. In your voicemail you requested to discuss the parent to this case. Since I have already started drafting the final rejection in that case I am going to decline your interview request. However, please consider requesting an interview after you receive the final office action in that case if you would like to.

With respect to the case we discussed on Dec. 19th, my understanding was that you were going to send me proposed claim limitations to consider prior to submitting a response. I have not received such proposed claim

limitations. In the next few days I will submit my interview summary to make our discussion of record, with or without having received the proposed claim limitations.

Best regards,

Jason Barton
Junior Patent Examiner | AU 1721
Email: jason.barton@uspto.gov
Ph.: (571)-270-3551

From: Barton, Jason
Sent: Wednesday, December 14, 2022 12:43 PM
To: Sun, Yalei <yalei.sun@morganlewis.com>
Subject: RE: 024607-02-5119-US (P2014010US5) Phone Interview Agenda.DOCX

Mr. Sun,

I have you scheduled for 4 PM ET on 12/19. Please give me a call at the below number at that time. Thanks.

Best regards,

Jason Barton
Junior Patent Examiner | AU 1721
Email: jason.barton@uspto.gov
Ph.: (571)-270-3551

From: Sun, Yalei <yalei.sun@morganlewis.com>
Sent: Wednesday, December 14, 2022 12:27 PM
To: Barton, Jason <Jason.Barton@uspto.gov>
Subject: RE: 024607-02-5119-US (P2014010US5) Phone Interview Agenda.DOCX

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Thanks Examiner Barton.

How about 4 PM ET and 1 PM PT on Monday December 19?

Yalei Sun | 孙亚雷
Morgan, Lewis & Bockius LLP
1400 Page Mill Road | Palo Alto,CA 94304
Direct: +1.650.843.7558 | Main:+1.650.843.4000 | Fax: +1.650.843.4001
yalei.sun@morganlewis.com| www.morganlewis.com
Assistant: Cheryl A. Rogers |+1.650.843.7839 | cheryl.rogers@morganlewis.com

---

From: Barton, Jason <Jason.Barton@uspto.gov>
Sent: Wednesday, December 14, 2022 10:35 AM

To: Sun, Yalei <yalei.sun@morganlewis.com>
Subject: RE: 024607-02-5119-US (P2014010US5) Phone Interview Agenda.DOCX

[EXTERNAL EMAIL]
Hello Mr. Sun,

Thank you for confirming during our phone call that you filed an email communication authorization in this case.

Per our phone conversation a moment ago, please take a look at JP2007165224A and let me know if you would still like to proceed with the proposed amendment. A copy and machine translation of this reference accompanied the final rejection issued in this case (17746755).

Per our discussion, we will be responding to response in the parent case (17407081) in the approximately the next 30 days.

Regarding availability, Will McClain and I are available for a 30 minute discussion during the following times:

- Monday, December 19, 2022: 1:00 PM to 5:00 PM ET; and
- Tuesday, December 20, 2022: 1:30 PM to 5:00 PM ET.

If you do not have availability during those times, please give me a call and we can discuss arranging an interview for Wednesday or a day later in the week.

Best regards,

Jason Barton
Junior Patent Examiner | AU 1721
Email: jason.barton@uspto.gov
Ph.: (571)-270-3551

From: Sun, Yalei <yalei.sun@morganlewis.com>
Sent: Monday, December 12, 2022 5:14 PM
To: Barton, Jason <Jason.Barton@uspto.gov>
Subject: 024607-02-5119-US (P2014010US5) Phone Interview Agenda.DOCX

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Examiner Barton,

I am wondering if you are available for having a quick interview for this case.

FYI. The case is a CON of US Application No. 17/407,081 for which we had a phone interview on 9/14/2022.

This claim amendment is consistent with the one we made to 17/407,081.

Thanks,

Yalei Sun | 孙亚雷
Morgan, Lewis & Bockius LLP
1400 Page Mill Road | Palo Alto,CA 94304
Direct: +1.650.843.7558 | Main:+1.650.843.4000 | Fax: +1.650.843.4001
yalei.sun@morganlewis.com| www.morganlewis.com
Assistant: Cheryl A. Rogers |+1.650.843.7839 | cheryl.rogers@morganlewis.com

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Sale Item Reference Number	Effective Date
17746755	12/08/2022

Document Number	Fee Code	Fee Code Description	Amount Paid	Payment Method
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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
17/746,755	05/17/2022	Tao TAO	024607-02-5119-US	8911

24341 7590 03/31/2023

Morgan, Lewis & Bockius LLP (PA)
1400 Page Mill Road
Palo Alto, CA 94304-1124

EXAMINER	
BARTON, JASON AARON	

ART UNIT	PAPER NUMBER
1721	

NOTIFICATION DATE	DELIVERY MODE
03/31/2023	ELECTRONIC

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

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

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

donald.mixon@morganlewis.com
padocketingdepartment@morganlewis.com

Office Action Summary	Application No. 17/746,755	Applicant(s) TAO et al.	
	Examiner JASON A BARTON	Art Unit 1721	AIA (FITF) Status Yes

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTHS FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☑ Responsive to communication(s) filed on 01/24/2023.

☐ A declaration(s)/affidavit(s) under **37 CFR 1.130(b)** was/were filed on _____.

2a)☐ This action is **FINAL.** 2b) ☑ This action is non-final.

3)☐ An election was made by the applicant in response to a restriction requirement set forth during the interview on _____; the restriction requirement and election have been incorporated into this action.

4)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims*

5) ☑ Claim(s) 20-27 and 29-39 is/are pending in the application.

5a) Of the above claim(s) _____ is/are withdrawn from consideration.

6) ☐ Claim(s) _____ is/are allowed.

7) ☑ Claim(s) 20-27 and 29-39 is/are rejected.

8) ☐ Claim(s) _____ is/are objected to.

9) ☐ Claim(s) _____ are subject to restriction and/or election requirement

* If any claims have been determined allowable, you may be eligible to benefit from the **Patent Prosecution Highway** program at a participating intellectual property office for the corresponding application. For more information, please see http://www.uspto.gov/patents/init_events/pph/index.jsp or send an inquiry to **PPHfeedback@uspto.gov.**

Application Papers

10)☐ The specification is objected to by the Examiner.

11)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

Certified copies:

a)☐ All b)☐ Some** c)☐ None of the:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

** See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☑ Notice of References Cited (PTO-892)

2) ☑ Information Disclosure Statement(s) (PTO/SB/08a and/or PTO/SB/08b) Paper No(s)/Mail Date _____.

3) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date _____.

4) ☐ Other: _____.

DETAILED ACTION

Notice of Pre-AIA or AIA Status

1. The present application, filed on or after March 16, 2013, is being examined under the first inventor to file provisions of the AIA.

Continued Examination Under 37 CFR 1.114

2. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission in the response filed 01/24/2023 (hereafter, "the response") has been entered.

Response to Arguments

3. Applicant's arguments filed in the response have been fully considered but they are not persuasive.

First, the new grounds of rejection apply Atsuo (JP2007165224A), rendering Applicant's arguments moot. Applicant did address Atsuo (prior to Atsuo being applied in any rejection in the present application). The arguments relating to Atsuo are not persuasive for the reasons given below.

Applicant's sole argument, which is applied to the various references, is that the present invention solves the problem of lithium precipitation causing short-circuiting, thereby improving the safety properties of the resulting battery (see pgs. 8-10 of the response). In particular, Applicant

argues that Kwak solves a different problem (pg. 11 of the response), and that the newly applied reference Atsuo solves a different problem (pgs. 12-13 of the response).

The arguments are not found persuasive because there is no requirement that the prior art references necessarily solve the same problem, or are applied according to the same rationale as that of Applicant. The reason or motivation to modify the reference may often suggest what the inventor has done, but for a different purpose or to solve a different problem. It is not necessary that the prior art suggest the combination to achieve the same advantage or result discovered by applicant. See, e.g., *In re Kahn,* 441 F.3d 977, 987, 78 USPQ2d 1329, 1336 (Fed. Cir. 2006). See MPEP 2144 §IV.

Applicant is invited to discuss the present rejections in an examiner's interview to advance prosecution.

Claim Rejections - 35 USC § 112

4. The following is a quotation of 35 U.S.C. 112(b):

> (b) CONCLUSION.—The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the inventor or a joint inventor regards as the invention.

The following is a quotation of 35 U.S.C. 112 (pre-AIA), second paragraph:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

5. Claim 38 is rejected under 35 U.S.C. 112(b) or 35 U.S.C. 112 (pre-AIA), second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which the inventor or a joint inventor (or for applications subject to pre-AIA 35 U.S.C. 112, the applicant), regards as the invention.

6. There is insufficient antecedent basis for the term, "the first film" in claim 38. The claim is interpreted as reciting, "a first film."

Claim Rejections - 35 USC § 103

7. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

8. This application currently names joint inventors. In considering patentability of the claims the examiner presumes that the subject matter of the various claims was commonly owned as of the effective filing date of the claimed invention(s) absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and effective filing dates of each claim that was not commonly owned as of the effective filing date of the later invention in order for the examiner to consider the applicability of 35 U.S.C. 102(b)(2)(C) for any potential 35 U.S.C. 102(a)(2) prior art against the later invention.

9. Claims 20-27 and 37-39 are rejected under 35 U.S.C. 103 as being unpatentable over Sugita (WO2013038677A1) in view of Matsushita (US20140120417A1) and Atsuo (JP2007165224A).

10. **Regarding claim 20**, Sugita teaches a lithium-ion battery ([001]-[002]), comprising:

a positive electrode (positive electrode plate 1a, 1c, 1d, 1f, FIGs. 2a, 4, 5, 7; [029]; while numerous embodiments are cited, reference is made specifically to plate 1a of FIG. 2a below for brevity) comprising a positive current collector (see [027]) and a positive electrode active material layer (the active material is coated on the current collector, see [027]; e.g., FIG. 2a shows the "film" as the dark portion (no reference sign is provided)) containing $LiCoO_2$ (lithium cobalt oxide, [060]),

wherein the positive electrode active material layer is formed on the positive current collector (see [027]), the positive electrode active material layer being provided with a first recess

(exposed portion 22, FIG. 2A; [027]) accommodating a positive lead being coupled with the positive current collector (see FIG. 2a);

a negative electrode (negative electrode plate 2c, FIG. 13; [030], [056]) comprising a negative current collector (see [027]) and a negative electrode active material layer (the active material is coated on the collector, see [027]) containing graphite or silicon ([065], graphite and silicon are both disclosed),

wherein the negative electrode active material layer is formed on the negative current collector (see [027]), the negative electrode active material layer being provided with a second recess (exposed portion 31, FIG. 2b) accommodating a negative lead being coupled with the negative current collector (see FIG. 2b);

a separator (separator 3, FIG. 1; [069]) disposed between the positive electrode and the negative electrode (see FIG. 1); and

an electrolyte ([071]).

Sugita does not teach wherein, (**limitation 1**) a top surface of the positive lead is provided with a first insulating glue layer, (**limitation 2**) a surface of the positive electrode active material layer opposite to the second recess across the separator in a thickness direction of the positive plate and the negative plate is pasted with a second insulating glue layer, the second insulating glue layer has a width larger than a width of the second recess, and the second insulating glue layer has a length larger than a length of the second recess. However, Sugita does advise to provide insulation between current collecting tabs ([045]). Accordingly, the skilled person would have been motivated to provide insulation to the battery of Sugita.

However, Matsushita and Atsuo teach the deficient limitations. Matsushita relates to electrodes having exposed portions with a lead bonded thereto (abstract) and is thus analogous art.

Atsuo relates to secondary batteries having tape and heat-resisting protective membranes to prevent short circuiting and is thus analogous art (abstract and pg. 2, ¶1).

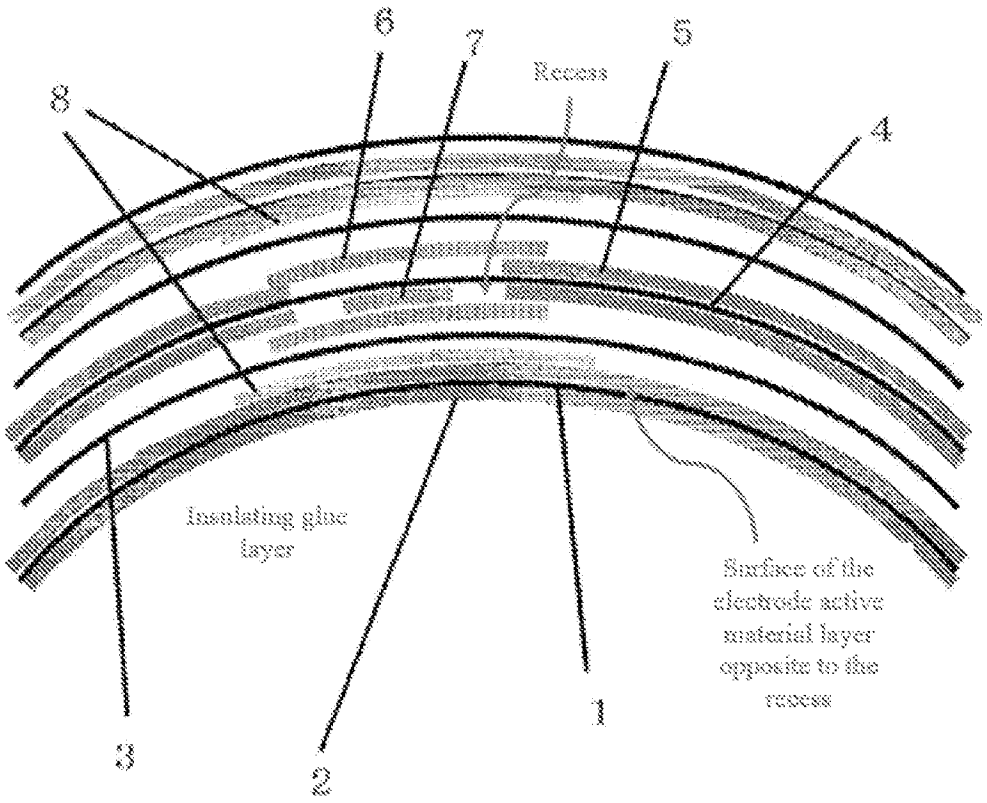
Limitation 1

Matsushita teaches a top surface of the positive lead (lead 25, see any of embodiments of Figs 4-7; in particular, see Fig. 4a) is provided with a first insulating glue layer (resin tape of protective tape 27, see [0052]).

Thus, it would have been obvious before the effective filing date of the claimed invention to incorporated the insulating glue (protective tape 27) of Matsushita to Sugita to arrive at the claimed invention wherein a top surface of the positive lead is provided with a first insulating glue layer. The skilled person would have been motivated to modify Sugita with Matsushita to insulate the electrode lead and prevent thermal runaway of the battery when, for example, the separator or the like is split in an abnormal case (Matsushita, [0052]).

Limitation 2

Atsuo teaches a surface of the electrode active material layer opposite to the recess across the separator in a thickness direction of the positive plate and the negative plate is pasted with a second insulating glue layer (see annotated FIG. 1 below).



ANNOTATED FIG. 1
(FIG. 4 of Atsuo, annotated)

The disclosure of Atsuo does not explicitly teach the verbose limitation of a second insulating glue layer has a width larger than a width of the second recess, and the second insulating glue layer has a length larger than a length of the second recess. However, Atsuo teaches that, "[a] heat resistant protective film is formed on the surface of the negative electrode plate facing the uncoated portion. By doing so, it is possible to suppress heat generation at the time of an internal short circuit occurring between the uncoated portion of the positive electrode current collector and the negative electrode plate coated with the negative electrode active material," (pg. 3, ¶¶2-3). This disclosure is held to teach the limitation because without appropriately sizing the insulating layer, it is common sense that the protective film would not be capable of performing the intended function of preventing short circuiting.

Atsuo does not specifically teach a surface of the positive electrode active material layer opposite to the second recess across the separator in a thickness direction of the positive plate in the negative plate. Rather, the opposite configuration is used as claimed by Applicant. However, Atsuo does not specifically teach that the prevention of short-circuiting is limited to when the negative electrode plate is covered with the alleged second insulating layer. Accordingly, the skilled person would have modified Sugita with Atsuo to include either (1) the second insulating layer on the positive electrode active material or, and perhaps more likely, (2) the second insulating layer on both of the positive electrode active material and the negative electrode active material (i.e., both electrode leads are protected by inclusion of the alleged second insulating layer).

Thus, it would have been obvious before the effective filing date of the claimed invention to incorporated the second insulating glue layer (porous insulating film 8) of Atsuo with Sugita to arrive at the claimed invention. In modifying Sugita with Atsuo, the skilled person would have arrived at the claimed invention wherein a surface of the positive electrode active material layer opposite to the second recess across the separator in a thickness direction of the positive plate and the negative plate is pasted with a second insulating glue layer, the second insulating glue layer has a width larger than a width of the second recess, and the second insulating glue layer has a length larger than a length of the second recess. The skilled person would have been motivated to combine Sugita with Atsuo to prevent short-circuiting (Atsuo, pg. 7, ¶9).

11. **Regarding claim 21,** Sugita in view of Matsushita and Atsuo teach the lithium-ion battery of claim 20 as described above.

Sugita also teaches wherein a distance between a center of the first recess and one end of the positive electrode active material layer is 1/4-3/4 of a length of the positive electrode active material layer (see FIG. 2a; since the length of the alleged first lead covers ~1/4 of the width of

the current collecting plate (top-to-bottom), the limitation is held to be met); and a distance between a center of the second recess and one end of the negative electrode active material layer is 1/4-3/4 of a length of the negative electrode active material layer (see FIG. 13 and claim mapping above).

12. **Regarding claims 22, 23, 24 and 25**, Sugita in view of Matsushita and Kwak teach the lithium-ion battery of claims 20 and 21 as described above.

None of Sugita, Matsushita or Atsuo teach the limitations of claim 22, 23, 24 and 25.

Claim 23 requires wherein the first recess has a length of 1- 100 mm less than a length of the positive lead, the first recess has a width of 1-10 mm larger than a width of the positive lead, the second recess has a length of 1-100 mm less than a length of the negative lead, and the second recess has a width of 1-10 mm larger than a width of the negative lead.

Claim 24 requires wherein the first recess has a length of 1- 100 mm less than a width of the positive electrode active material layer, and the second recess has a length of 1-100 mm less than a width of the negative electrode active material layer.

Claim 25 requires wherein the first recess has a depth of 0.005-0.1 mm larger than a thickness of the positive lead, and the second recess has a depth of 0.005-0.1 mm larger than a thickness of the negative lead.

However, it has been held that changes in size (dimension) are generally recognized as being within the level of ordinary skill in the art. *In re Rose*, 220 F.2d 459, 105 USPQ 237 (CCPA 1955). Where the only difference between the prior art and the claims is a recitation of relative dimensions of the claimed device, and the device having the claimed dimensions would not perform differently than the prior art device, the claimed device is not patentably distinct from the

prior art device. *Gardner v. TEC Syst., Inc.*, 725 F.2d 1338, 220 USPQ 777 (Fed. Cir. 1984), *cert. denied*, 469 U.S. 830, 225 USPQ 232 (1984).

In the instant case, it appears that the prior art device (i.e., the combination of Sugita with Matsushita and Atsuo) have the same claimed features and any relative difference in size, dimensions, or proportions would not lead to a device that performs differently from the claimed device. Moreover, the present claims cover very broad ranges (two or three orders of magnitude) and there is no indication in the specification that such broad ranges establish the criticality of the ranges. Thus, the claimed device of claims 22, 23, 24 and 25 are not patentably distinct from Sugita in view of Matsushita and Kwak. Accordingly, it would have been obvious before the effective filing date of the claimed invention to have arrived at the claimed invention of claims 22, 23, 24 and 25 because changes in proportion (size) are within ordinary skill in the art.

13. **Regarding claim 26**, Sugita in view of Matsushita and Atsuo teach the lithium-ion battery of claim 20 as described above.

Sugita also teaches wherein a length of a portion of the positive lead in the first recess is less than a width of a remaining portion of the positive electrode active material layer from an edge of the first insulating glue layer covering the positive electrode active material layer to an edge of the positive electrode active material layer opposite to the first recess (see FIG. 2a; since the length of the alleged first lead covers ~1/4 of the width of the current collecting plate (top-to-bottom), the limitation is held to be met).

14. **Regarding claim 27**, Sugita in view of Matsushita and Atsuo teach the lithium-ion battery of claim 20 as described above.

None of Sugita, Matsushita or Atsuo teach wherein a width of a portion of the positive lead in the first recess is greater than a width of a remaining portion of the first recess not occupied by the positive lead located on one side of the positive lead.

However, it has been held that changes in dimension are generally recognized as being within the level of ordinary skill in the art. *In re Rose,* 220 F.2d 459, 105 USPQ 237 (CCPA 1955). Where the only difference between the prior art and the claims is a recitation of relative dimensions of the claimed device, and the device having the claimed dimensions would not perform differently than the prior art device, the claimed device is not patentably distinct from the prior art device. *Gardner v. TEC Syst., Inc.,* 725 F.2d 1338, 220 USPQ 777 (Fed. Cir. 1984), *cert. denied,* 469 U.S. 830, 225 USPQ 232 (1984).

In the instant case, it does not appear that there would be any difference between the claimed device and the prior art device of Sugita in view of Matsushita and Atsuo. For at least these reasons, it would have been obvious before the effective filing date of the claimed invention to have arrived at the claimed invention of claim 27 because changes in proportion are within ordinary skill in the art.

15. **Regarding claim 37**, Sugita teaches a lithium-ion battery ([001]-[002]), comprising:

a positive electrode (positive electrode plate 1a, FIG. 2a; [029]) comprising a positive current collector (see [027]) and a positive electrode active material layer (the active material is coated on the current collector, see [027]; FIG. 2a shows the "film" as the dark portion (no reference sign is provided)) being formed on the positive current collector (see [027]), the positive electrode active material layer being provided with a first recess (exposed portion 22, FIG. 2A; [027]) accommodating a positive lead being coupled with the positive current collector (see FIG. 2a);

a negative electrode (negative electrode plate 2a, FIG. 13; [030], [056]) comprising a negative current collector (see [027]) and a negative electrode active material layer (the active material is coated on the collector, see [027]) being formed on the negative current collector (see [027]), the negative electrode active material layer being provided with a second recess (exposed portion 31, FIG. 2b) accommodating a negative lead being coupled with the negative current collector (see FIG. 2b);

a separator (separator 3, FIG. 1; [069]) disposed between the positive electrode and the negative electrode (see FIG. 1); and

an electrolyte ([071]).

Sugita does not teach wherein, (**limitation 1**) a top surface of the positive lead is provided with a first insulating glue layer, (**limitation 2**) a surface of the positive electrode active material layer opposite to the second recess across the separator in a thickness direction of the positive plate and the negative plate is pasted with a second insulating glue layer, the second insulating glue layer has a width larger than a width of the second recess, and the second insulating glue layer has a length larger than a length of the second recess. However, Sugita does advise to provide insulation between current collecting tabs ([045]). Accordingly, the skilled person would have been motivated to provide insulation to the battery of Sugita.

However, Matsushita and Atsuo teach the deficient limitations. Matsushita relates to electrodes having exposed portions with a lead bonded thereto (abstract) and is thus analogous art. Atsuo relates to secondary batteries having tape and heat-resisting protective membranes to prevent short circuiting and is thus analogous art (abstract and pg. 2, ¶1).

Limitation 1

Matsushita teaches a top surface of the positive lead (lead 25, see any of embodiments of Figs 4-7; in particular, see Fig. 4a) is provided with a first insulating glue layer (resin tape of protective tape 27, see [0052]).

Thus, it would have been obvious before the effective filing date of the claimed invention to incorporated the insulating glue (protective tape 27) of Matsushita to Sugita to arrive at the claimed invention wherein a top surface of the positive lead is provided with a first insulating glue layer. The skilled person would have been motivated to modify Sugita with Matsushita to insulate the electrode lead and prevent thermal runaway of the battery when, for example, the separator or the like is split in an abnormal case (Matsushita, [0052]).

Limitation 2

Atsuo teaches a surface of the electrode active material layer opposite to the recess across the separator in a thickness direction of the positive plate and the negative plate is pasted with a second insulating glue layer (see annotated FIG. 1 given above in relation to claim 20)

The disclosure of Atsuo does not explicitly teach the verbose limitation of a second insulating glue layer has a width larger than a width of the second recess, and the second insulating glue layer has a length larger than a length of the second recess. However, Atsuo teaches that, "[a] heat resistant protective film is formed on the surface of the negative electrode plate facing the uncoated portion. By doing so, it is possible to suppress heat generation at the time of an internal short circuit occurring between the uncoated portion of the positive electrode current collector and the negative electrode plate coated with the negative electrode active material," (pg. 3, ¶¶2-3). This disclosure is held to teach the limitation because without appropriately sizing the insulating layer, it is common sense that the protective film would not be capable of performing the intended function of preventing short circuiting.

Atsuo does not specifically teach a surface of the positive electrode active material layer opposite to the second recess across the separator in a thickness direction of the positive plate in the negative plate. Rather, the opposite configuration is used as claimed by Applicant. However, Atsuo does not specifically teach that the prevention of short-circuiting is limited to when the negative electrode plate is covered with the alleged second insulating layer. Accordingly, the skilled person would have modified Sugita with Atsuo to include either (1) the second insulating layer on the positive electrode active material or, and perhaps more likely, (2) the second insulating layer on both of the positive electrode active material and the negative electrode active material (i.e., both electrode leads are protected by inclusion of the alleged second insulating layer).

Thus, it would have been obvious before the effective filing date of the claimed invention to incorporated the second insulating glue layer (porous insulating film 8) of Atsuo with Sugita to arrive at the claimed invention. In modifying Sugita with Atsuo, the skilled person would have arrived at the claimed invention wherein a surface of the positive electrode active material layer opposite to the second recess across the separator in a thickness direction of the positive plate and the negative plate is pasted with a second insulating glue layer, the second insulating glue layer has a width larger than a width of the second recess, and the second insulating glue layer has a length larger than a length of the second recess. The skilled person would have been motivated to combine Sugita with Atsuo to prevent short-circuiting (Atsuo, pg. 7, ¶9).

16. **Regarding claim 38**, Sugita in view of Matsushita and Atsuo teach the lithium-ion battery of claim 37 as described above.

Sugita also teaches wherein a length of a portion of the positive lead in the first recess is less than a width of a remaining portion of the positive electrode active material layer from an edge of the first insulating glue layer covering the positive electrode active material layer to an edge of

the positive electrode active material layer opposite to the first recess (see FIG. 2a; since the length of the alleged first lead covers ~1/4 of the width of the current collecting plate (top-to-bottom), the limitation is held to be met).

17. **Regarding claim 39**, Sugita in view of Matsushita and Atsuo teach the lithium-ion battery of claim 37 as described above.

None of Sugita, Matsushita or Atsuo teach wherein a width of a portion of the positive lead in the first recess is greater than a width of a remaining portion of the first recess not occupied by the positive lead located on one side of the positive lead.

However, it has been held that changes in dimension are generally recognized as being within the level of ordinary skill in the art. *In re Rose*, 220 F.2d 459, 105 USPQ 237 (CCPA 1955). Where the only difference between the prior art and the claims is a recitation of relative dimensions of the claimed device, and the device having the claimed dimensions would not perform differently than the prior art device, the claimed device is not patentably distinct from the prior art device. *Gardner v. TEC Syst., Inc.*, 725 F.2d 1338, 220 USPQ 777 (Fed. Cir. 1984), *cert. denied*, 469 U.S. 830, 225 USPQ 232 (1984).

In the instant case, it does not appear that there would be any difference between the claimed device and the prior art device of Sugita in view of Matsushita and Atsuo. For at least these reasons, it would have been obvious before the effective filing date of the claimed invention to have arrived at the claimed invention of claim 39 because changes in proportion are within ordinary skill in the art.

18. Claims 29-36 are rejected under 35 U.S.C. 103 as being unpatentable over Sugita (WO2013038677A1) in view of Matsushita (US20140120417A1), Atsuo (JP2007165224A) and Kwak (US20060051662A1).

19. **Regarding claim 29**, Sugita teaches a lithium-ion battery ([001]-[002]), comprising:

a positive electrode (positive electrode plate 1a, FIG. 2a; [029]) comprising a positive current collector (see [027]) and a positive electrode active material layer (the active material is coated on the current collector, see [027]; FIG. 2a shows the "film" as the dark portion (no reference sign is provided)) being formed on the positive current collector (see [027]), the positive electrode active material layer being provided with a first recess (exposed portion 22, FIG. 2A; [027]) accommodating a positive lead being coupled with the positive current collector (see FIG. 2a);

a negative electrode (negative electrode plate 2a, FIG. 13; [030], [056]) comprising a negative current collector (see [027]) and a negative electrode active material layer (the active material is coated on the collector, see [027]) being formed on the negative current collector (see [027]), the negative electrode active material layer being provided with a second recess (exposed portion 31, FIG. 2b) accommodating a negative lead being coupled with the negative current collector (see FIG. 2b);

a separator (separator 3, FIG. 1; [069]) disposed between the positive electrode and the negative electrode (see FIG. 1); and

an electrolyte ([071]).

Sugita does not teach wherein (**limitation 1**) a first location of a top surface of the positive lead is provided with a first insulating glue layer, (**limitation 2**) a second location of a surface of the positive electrode active material layer opposite to the second recess across the separator in a thickness direction of the positive plate and the negative plate is pasted with a second insulating glue layer, the second insulating glue layer has a width larger than a width of the second recess, and the second insulating glue layer has a length larger than a length of the second recess; and

(**limitation 3**) a third location of a surface of the positive current collector opposite to the surface of the positive current collector where the positive lead is coupled is covered with another first insulating glue layer.

However, Sugita does advise to provide insulation between current collecting tabs ([045]). Accordingly, the skilled person would have been motivated to provide insulation to the battery of Sugita, which relates to deficient limitations 1-3.

However, Matsushita, Atsuo and Kwak teach the deficient limitations. Matsushita relates to electrodes having exposed portions with a lead bonded thereto (abstract) and is thus analogous art. Atsuo relates to secondary batteries having tape and heat-resisting protective membranes to prevent short circuiting and is thus analogous art (abstract and pg. 2, ¶1). Kwak relates to a wound electrode assembly (FIG. 6) that prevents short circuiting (abstract) and is thus analogous art.

Limitation 1

Matsushita teaches (**limitation 1**) a first location of a top surface of the positive lead (lead 25, see any of embodiments of Figs 4-7; in particular, see Fig. 4a) is provided with a first insulating glue layer (resin tape of protective tape 27, see [0052]).

Thus, it would have been obvious before the effective filing date of the claimed invention to incorporated the insulating glue (protective tape 27) of Matsushita to Sugita to arrive at the claimed invention. The skilled person would have been motivated to modify Sugita with Matsushita to insulate the electrode lead and prevent thermal runaway of the battery when, for example, the separator or the like is split in an abnormal case (Matsushita, [0052]).

Limitation 2

Atsuo teaches a surface of the electrode active material layer opposite to the recess across the separator in a thickness direction of the positive plate and the negative plate is pasted with a

second insulating glue layer (see annotated FIG. 1 above provided in relation to independent claim 20).

The disclosure of Atsuo does not explicitly teach the verbose limitation of a second insulating glue layer has a width larger than a width of the second recess, and the second insulating glue layer has a length larger than a length of the second recess. However, Atsuo teaches that, "[a] heat resistant protective film is formed on the surface of the negative electrode plate facing the uncoated portion. By doing so, it is possible to suppress heat generation at the time of an internal short circuit occurring between the uncoated portion of the positive electrode current collector and the negative electrode plate coated with the negative electrode active material," (pg. 3, ¶¶2-3). This disclosure is held to teach the limitation because without appropriately sizing the insulating layer, it is common sense that the protective film would not be capable of performing the intended function of preventing short circuiting.

Atsuo does not specifically teach a surface of the positive electrode active material layer opposite to the second recess across the separator in a thickness direction of the positive plate in the negative plate. Rather, the opposite configuration is used as claimed by Applicant. However, Atsuo does not specifically teach that the prevention of short-circuiting is limited to when the negative electrode plate is covered with the alleged second insulating layer. Accordingly, the skilled person would have modified Sugita with Atsuo to include either (1) the second insulating layer on the positive electrode active material or, and perhaps more likely, (2) the second insulating layer on both of the positive electrode active material and the negative electrode active material (i.e., both electrode leads are protected by inclusion of the alleged second insulating layer).

Thus, it would have been obvious before the effective filing date of the claimed invention to incorporated the second insulating glue layer (porous insulating film 8) of Atsuo with Sugita to

arrive at the claimed invention. In modifying Sugita with Atsuo, the skilled person would have arrived at the claimed invention wherein a surface of the positive electrode active material layer opposite to the second recess across the separator in a thickness direction of the positive plate and the negative plate is pasted with a second insulating glue layer, the second insulating glue layer has a width larger than a width of the second recess, and the second insulating glue layer has a length larger than a length of the second recess. The skilled person would have been motivated to combine Sugita with Atsuo to prevent short-circuiting (Atsuo, pg. 7, ¶9).

Limitation 3

Kwak teaches (**limitation 3**) wherein a third location of a surface of the positive current collector where the positive lead is coupled is covered with another first insulating glue layer (see [040], the separator 150 has insulation tape 160 that when the battery is assembled faces the positive or negative electrode plate 130/140 after being wound; FIG. 6; "the insulation tape 160 may be coupled with the separator in a position facing the first electrode plate uncoated portion corresponding to the position of the first electrode tab." ([0041])).

Thus, it would have been obvious before the effective filing date of the claimed invention to incorporated the insulation tape (160) of Kwak to Sugita to arrive at the claimed invention. The skilled person would have been motivated to modify Sugita with Kwak to prevent short-circuiting between the first electrode plate 140 and the second electrode plate 130 (Kwak, [0060]) and to prevent heat that is generated from the electrode tab from being transferred to the separator ([0041]).

20. **Regarding claim 30,** Sugita in view of Matsushita, Atsuo and Kwak teach the lithium-ion battery of claim 29 as described above.

Sugita also teaches wherein a distance between a center of the first recess and one end of the positive electrode active material layer is 1/4-3/4 of a length of the positive electrode active material layer (see FIG. 2a; since the length of the alleged first lead covers ~1/4 of the width of the current collecting plate (top-to-bottom), the limitation is held to be met); and a distance between a center of the second recess and one end of the negative electrode active material layer is 1/4-3/4 of a length of the negative electrode active material layer (see FIG. 13 and claim mapping above).

21. **Regarding claim 31,** Sugita in view of Matsushita, Atsuo and Kwak teach the lithium-ion battery of claim 29 as described above.

Sugita also teaches wherein a distance between a center of the first recess and one end of the positive electrode active material layer is half of a length of the positive electrode active material layer, and a distance between a center of the second recess and one end of the negative electrode active material layer is half of a length of the negative electrode active material layer. See FIGS. 2a and 13, the first recess 22 (FIG. 2a) is located in the center and the second recess (see FIG. 13, the recess is not denoted by a reference numeral but is below tab 6) is also located in the center of the active material layer.

22. **Regarding claims 32, 33, and 34**, Sugita in view of Matsushita, Atsuo and Kwak teach the lithium-ion battery of claim 29 as described above.

None of Sugita, Matsushita, Atsuo or Kwak teach the limitations of claim 32, 33 and 34.

Claim 32 requires wherein the first recess has a length of 1- 100mm less than a length of the positive lead, the first recess has a width of 1-10mm larger than a width of the positive lead, the second recess has a length of 1-100mm less than a length of the negative lead, and the second recess has a width of 1-10mm larger than a width of the negative lead.

Claim 33 requires wherein the first recess has a length of 1- 100mm less than a width of the positive electrode active material layer, and the second recess has a length of 1-100mm less than a width of the negative electrode active material layer.

Claim 34 requires wherein the first recess has a depth of 0.005-0.1mm larger than a thickness of the positive lead, and the second recess has a depth of 0.005-0. 1mm larger than a thickness of the negative lead.

However, it has been held that changes in size (dimension) are generally recognized as being within the level of ordinary skill in the art. *In re Rose*, 220 F.2d 459, 105 USPQ 237 (CCPA 1955). Where the only difference between the prior art and the claims is a recitation of relative dimensions of the claimed device, and the device having the claimed dimensions would not perform differently than the prior art device, the claimed device is not patentably distinct from the prior art device. *Gardner v. TEC Syst., Inc.*, 725 F.2d 1338, 220 USPQ 777 (Fed. Cir. 1984), *cert. denied*, 469 U.S. 830, 225 USPQ 232 (1984).

In the instant case, it appears that the prior art device (i.e., the combination of Sugita with Matsushita, Atsuo and Kwak) have the same claimed features and any relative difference in size, dimensions, or proportions would not lead to a device that performs differently from the claimed device. Moreover, the present claims cover very broad ranges (two or three orders of magnitude) and there is no indication in the specification that such broad ranges establish the criticality of the ranges. Thus, the claimed device of claims 32, 33 and 34 are not patentably distinct from Sugita in view of Matsushita, Atsuo and Kwak. Accordingly, it would have been obvious before the effective filing date of the claimed invention to have arrived at the claimed invention of claims 32, 33 and 34 because changes in proportion (size) are within ordinary skill in the art.

23. **Regarding claim 35**, Sugita in view of Matsushita, Atsuo and Kwak teach the lithium-ion battery of claim 29 as described above.

Sugita also teaches wherein a length of a portion of the positive lead in the first recess is less than a width of a remaining portion of the positive electrode active material layer from an edge of the first insulating glue layer covering the positive electrode active material layer to an edge of the positive electrode active material layer opposite to the first recess (see FIG. 2a; since the length of the alleged first lead covers ~1/4 of the width of the current collecting plate (top-to-bottom), the limitation is held to be met).

24. **Regarding claim 36**, Sugita in view of Matsushita, Atsuo and Kwak teach the lithium-ion battery of claim 29 as described above.

None of Sugita, Matsushita, Atsuo or Kwak teach wherein a width of a portion of the positive lead in the first recess is greater than a width of a remaining portion of the first recess not occupied by the positive lead located on one side of the positive lead.

However, it has been held that changes in dimension are generally recognized as being within the level of ordinary skill in the art. *In re Rose,* 220 F.2d 459, 105 USPQ 237 (CCPA 1955). Where the only difference between the prior art and the claims is a recitation of relative dimensions of the claimed device, and the device having the claimed dimensions would not perform differently than the prior art device, the claimed device is not patentably distinct from the prior art device. *Gardner v. TEC Syst., Inc.,* 725 F.2d 1338, 220 USPQ 777 (Fed. Cir. 1984), *cert. denied,* 469 U.S. 830, 225 USPQ 232 (1984).

In the instant case, it does not appear that there would be any difference between the claimed device and the prior art device of Sugita in view of Matsushita, Atsuo and Kwak. For at least these reasons, it would have been obvious before the effective filing date of the claimed

invention to have arrived at the claimed invention of claim 36 because changes in proportion are within ordinary skill in the art.

Conclusion

25. Any inquiry concerning this communication or earlier communications from the examiner should be directed to JASON AARON BARTON whose telephone number is (571)270-3551 and email is jason.barton@uspto.gov. The examiner can normally be reached 9:00 AM to 5:00 PM.

Examiner interviews are available via telephone, in-person, and video conferencing using a USPTO supplied web-based collaboration tool. To schedule an interview, applicant is encouraged to use the USPTO Automated Interview Request (AIR) at http://www.uspto.gov/interviewpractice.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Allison Bourke can be reached on (303)297-4684. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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/JASON BARTON/
Examiner, Art Unit 1721

/WILLIAM E MCCLAIN/
Primary Examiner, Art Unit 1721

Notice of References Cited	Application/Control No. 17/746,755	Applicant(s)/Patent Under Reexamination TAO et al.	
	Examiner JASON A BARTON	Art Unit 1721	Page 1 of 1

U.S. PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Name	CPC Classification	US Classification
	A					
	B					
	C					
	D					
	E					
	F					
	G					
	H					
	I					
	J					
	K					
	L					
	M					

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*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Country	Name	CPC Classification
	N	JP-2007165224-A	06-2007	JP	NAGASAKI A	Y02P70/50
	O					
	P					
	Q					
	R					
	S					
	T					

NON-PATENT DOCUMENTS

*		Include as applicable: Author, Title Date, Publisher, Edition or Volume, Pertinent Pages)
	U	Machine translation of JP 2007165224 A (Year: 2007)
	V	
	W	
	X	

*A copy of this reference is not being furnished with this Office action. (See MPEP § 707.05(a).)
Dates in MM-YYYY format are publication dates. Classifications may be US or foreign.

Search Notes	Application/Control No.	Applicant(s)/Patent Under Reexamination
	17/746,755	TAO et al.
	Examiner	Art Unit
	JASON A BARTON	1721

CPC - Searched*		
Symbol	**Date**	**Examiner**
H01M10/0431	07/14/2022	JB
H01M10/0587	07/14/2022	JB
H01M50/531, 533, 538	07/14/2022	JB
H01M50/5$	07/14/2022	JB
H01M.cpcl.	07/14/2022	JB
H01M10/0431	09/08/2022	JB
H01M10/0587	09/08/2022	JB
H01M50/531, 533, 538	09/08/2022	JB
H01M50/5$	09/08/2022	JB
H01M.cpcl.	09/08/2022	JB
H01M.cpcl.	03/24/2023	JB

CPC Combination Sets - Searched*		
Symbol	**Date**	**Examiner**

US Classification - Searched*			
Class	**Subclass**	**Date**	**Examiner**

* See search history printout included with this form or the SEARCH NOTES box below to determine the scope of the search.

/JASON BARTON/ Examiner, Art Unit 1721	

Search Notes	Application/Control No.	Applicant(s)/Patent Under Reexamination
	17/746,755	TAO et al.
	Examiner	Art Unit
	JASON A BARTON	1721

Search Notes		
Search Notes	**Date**	**Examiner**
Global dossier search	07/14/2022	JB
Applicant and inventor search in SEARCH	07/14/2022	JB
CPC and CPC-limited text search in SEARCH	07/14/2022	JB
“More like this” searching in SEARCH and IP.COM	07/14/2022	JB
Additional search (refresh)	09/08/2022	JB
Discussion with Will McClain regarding strategy and search	03/23/2023	JB
Additional searching in SEARCH	03/24/2023	JB

Interference Search			
US Class/CPC Symbol	**US Subclass/CPC Group**	**Date**	**Examiner**

/JASON BARTON/ Examiner, Art Unit 1721	

INFORMATION DISCLOSURE STATEMENT BY APPLICANT Substitute for Form 1449-PTO				*Electronically filed December 8, 2022*	
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				Filing Date	*May 17, 2022*
				First Named Inventor	*Tao TAO*
				Art Unit	*1721*
				Examiner Name	*Barton, Jason Aaron*
Sheet	1	of	1	Attorney Docket Number	*024607-02-5119-US*

U.S. PATENT DOCUMENTS					
Examiner Initials	Cite No.	Document Number Number - Kind Code	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear

FOREIGN PATENT DOCUMENTS						
Examiner Initials	Cite No.	Foreign Patent Document Country Code – Number - Kind Code *(if known)*	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear	T
		JP1999317218A - JPH11317218A	11-16-1999	TOYOTA CENTRAL RES & DEV		
		JP1993013064A - JPH0713064A	01-17-1995	OLYMPUS OPTICAL CO		

NON PATENT LITERATURE DOCUMENTS		
Examiner Initials	Cite No.	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published
		Evaluation Report of Utility Model Patent, ZL2014200303194, 24DEC2019, 5 pgs.
		Tao, Office Action, US14/596,873, 04APR2017, 13 pgs.
		Tao, Final Office Action, US14/596,873, 22NOV2017, 13 pgs.
		Tao, Office Action, US14/596,873, 19APR2018, 12 pgs.
		Tao, Final Office Action, US14/596,873, 05DEC2018, 13 pgs.
		Tao, Office Action, US14/596,873, 22MAR2019, 14 pgs.
		Tao, Notice of Allowance, US14/596,873, 25NOV2019, 7 pgs.
		Tao, Office Action, US16/113,938, 16AUG2019, 17 pgs.
		Tao, Office Action, US16/113,938, 13FEB2020, 22 pgs.
		Tao, Office Action, US16/113,938, 02NOV2020, 14 pgs.
		Tao, Final Office Action, US16/113,938, 20MAY2021, 22 pgs.
		Tao, Advisory Action, US16/113,938, 02AUG2021, 3 pgs.
		Machine English translation of CN202495523U (Year: 2012), 6 pgs.

Examiner Signature	/JASON BARTON/	Date Considered	03/24/2023

DB2/ 44550180.1

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /J.B./

PE2E SEARCH - Search History (Prior Art)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	British Equivalents	Time Stamp
L1	24	(US-41406506-$ | US-5017442-$ | US-5478668-$ | US-6100114-$ | US-6551143-$).DID. (AL-20010036574-$ | AL-20070122714-$ | AL-20090035638-$ | CN-101939873-$ | CN-103066239-$ | CN-1221054-$ | CN-1350350-$ | CN-201087907-$ | CN-202495523-$ | DB-241406506-$ | JP-1993013064-$ | JP-1999317218-$ | JP-2000277155-$ | JP-2003132875-$).DID.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO); FPRS; EPO; JPO)	OR	ON	ON	2022/07/12 07:49 PM
L2	3	(US-20010036574-$ | US-20070122714-$ | US-20090035638-$).did.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO); FPRS; EPO; JPO)	OR	ON	ON	2022/07/12 07:56 PM
L3	0	(JP-0513064-$).did.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO); FPRS; EPO; JPO)	OR	ON	ON	2022/07/12 07:58 PM
L4	0	(JPH-0513064-$).did.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO); FPRS; EPO; JPO)	OR	ON	ON	2022/07/12 07:58 PM
L5	0	(JP-00513064-$).did.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY,	OR	ON	ON	2022/07/12 07:58 PM

			CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO); FPRS; EPO; JPO)				
L6	4	(JP-3161778-$).did.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO); FPRS; EPO; JPO)	OR	ON	ON	2022/07/12 07:58 PM
L7	91	(US-10135097-$ | US-10868290-$ | US-11024868-$ | US-11108118-$ | US-20100055560-$ | US-20100285370-$ | US-20170092925-$ | US-20180190963-$ | US-20180366775-$ | US-5017442-$ | US-5478668-$ | US-6100114-$ | US-6551143-$ | US-7195844-$ | US-9741988-$).DID. (CN-103367700-$ | CN-105576191-$ | CN-105990612-$ | CN-106169540-$ | CN-107534127-$ | CN-108376759-$ | CN-109888162-$ | CN-112272877-$ | CN-112582583-$ | CN-113826240-$ | CN-201087907-$ | CN-202495523-$ | CN-205355186-$ | GB-2548361-$ | JP-2005222744-$ | JP-2007294198-$ | JP-2010086754-$ | JP-2011103249-$ | JP-2013137943-$ | JP-2014241267-$ | JP-2018166080-$ | JP-4850996-$ | JP-5284933-$ | JP-5623073-$ | JP-5821913-$ | JP-	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO); FPRS; EPO; JPO)	OR	ON	ON	2022/07/13 11:34 AM

		6237187-$ | JP-6288015-$ | JP-6926991-$ | KR-101489993-$ | KR-101515672-$ | KR-101980974-$ | KR-200364044-$ | KR-20060009411-$ | KR-20120022773-$ | WO-2017149977-$).DID.					
L8	4	("20020197535" | "20040191634" | "20140030607" | "20150207111").pn. OR ("11108118").urpn. AND (PGPB | USPT | USOC).dbnm.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2022/07/13 11:36 AM
L9	3	("20090305120" | "20140349179" | "20150207111").pn. OR ("11024868").urpn. AND (PGPB | USPT | USOC).dbnm.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2022/07/13 11:36 AM
L10	1	US-20060051662-$.did.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO); FPRS; EPO; JPO)	OR	ON	ON	2022/07/13 11:50 AM
L11	30	(US-10014495-$ | US-10038212-$ | US-10193125-$ | US-10312497-$ | US-10396336-$ | US-11024868-$ | US-11043700-$ | US-20060127774-$ | US-20080274410-$ | US-20110159344-$ | US-20110183191-$ | US-20130252053-$ | US-20130266845-$ | US-20130316207-$ | US-20140349179-$ | US-20160126511-$ | US-20160260954-$ | US-20180315991-$ | US-8877371-$ | US-8974944-$ | US-9159963-$ | US-9203074-$ | US-9224989-$ | US-9293744-$ | US-	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO); FPRS; EPO; JPO)	OR	ON	ON	2022/07/13 11:53 AM

		9397329-$ | US-9490468-$ | US-9564626-$ | US-9595699-$ | US-9627677-$ | US-9960404-$).DID.					
L12	7	("20060111625" | "20080233474" | "20090111011" | "20130045405" | "20140120417" | "20140349179" | "20140377593").pn. OR ("11043700").urpn. AND (PGPB | USPT | USOC).dbnm.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2022/07/13 11:53 AM
L13	22	((JP-2003132875-A OR CN-202495523-U OR CN-103066239-A OR CN-101939873-A OR CN-201087907-Y OR CN-1221054-C OR CN-1350350-A OR CN-1221054-A).did. AND FTDB.dbnm.) OR ((US-20140349179-A1 OR US-20140120417-A1 OR US-20090111011-A1 OR US-20080233474-A1 OR US-20130045405-A1 OR US-20040191634-A1 OR US-20060051662-A1 OR US-20090035638-A1 OR US-20070122714-A1).did. AND PGPB.dbnm.) OR ((JP-2000277155-A).did. AND JPAB.dbnm.) OR ((US-6100114-A OR US-5478668-A OR US-5017442-A).did. AND USPT.dbnm.) OR ((CN-1221054-A).did. AND FPRS.dbnm.)	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/07/13 12:01 PM
L14	76440	(H01M10/0431 OR H01M10/0587 OR H01M50/531 OR H01M50/533 OR H01M50/538).cpc.	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/07/13 12:03 PM

L15	5171174	(recess$7 OR pocket OR (non-coat$7 ADJ (portion OR part)) OR cavity OR hole OR gap) NEAR10 (tab$5 OR tap$5 OR lead$5)	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO); FPRS; EPO; JPO)	OR	ON	ON	2022/07/13 12:06 PM
L16	10212	L14 AND L15	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO); FPRS; EPO; JPO)	OR	ON	ON	2022/07/13 12:06 PM
L17	953	L14 AND L15 AND @fd<"20140117"	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2022/07/13 12:06 PM
L18	1	US-8795879-$.did.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO); FPRS; EPO; JPO)	OR	ON	ON	2022/07/13 12:22 PM
L19	1	("20090296318").pn. OR ("8795879").urpn. AND (PGPB | USPT | USOC).dbnm.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2022/07/13 12:22 PM
L20	76	(US-20040126654-$ | US-20040207974-$ | US-20090296318-$ | US-20150332857-$ | US-8014127-$ | US-8218293-$ | US-8795879-$ | US-8837115-$ | US-9070511-$).DID. (CN-104137303-$ | CN-108713233-$ | CN-110706928-$ | CN-201156473-$ | EP-1580774-$ | JP-2001023866-$ | JP-2001284190-$ | JP-2006286959-$ | JP-2008147541-$ | JP-2009010070-$ | JP-2009152514-$ | JP-	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO); FPRS; EPO; JPO)	OR	ON	ON	2022/07/13 12:23 PM

		2009212117-$ | JP-2009212283-$ | JP-2010074083-$ | JP-2010074089-$ | JP-2012019061-$ | JP-2012064601-$ | JP-2018157012-$ | JP-3587333-$ | JP-4413003-$ | JP-6893123-$ | JP-6953724-$ | KR-101404532-$ | KR-101434923-$ | KR-101475367-$ | KR-102079677-$ | KR-20130116836-$ | WO-2010116656-$ | WO-2021172440-$).DID.					
L21	293	L14 AND L15 AND (length NEAR10(tab$5 OR tap$5 OR lead$5)) AND @fd<"20140117"	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2022/07/13 12:29 PM
L22	17297	((recess$7 OR pocket OR (non-coat$7 ADJ (portion OR part)) OR cavity OR hole OR gap) NEAR10 (energ$6 NEAR5 densit$7))	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO); FPRS; EPO; JPO)	OR	ON	ON	2022/07/13 12:35 PM
L23	1	L14 AND L15 AND (length NEAR10(tab$5 OR tap$5 OR lead$5)) AND L22 AND @fd<"20140117"	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2022/07/13 12:35 PM
L24	13	L14 AND L15 AND (length NEAR10(tab$5 OR tap$5 OR lead$5)) AND L22 AND @fd<"20140117"	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO))	OR	ON	ON	2022/07/13 12:37 PM
L25	5	L14 AND L15 AND (length NEAR10(tab$5 OR tap$5 OR lead$5)) AND L22 AND @pd<"20140117"	(FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO); FPRS; EPO; JPO)	OR	ON	ON	2022/07/13 12:37 PM
L26	6494	(H01M10/0431 AND	(US-PGPUB; USPAT;	OR	ON	ON	2022/07/13

		H01M50/538).cpc.	USOCR; FIT (AP, AT, AU, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)				12:55 PM
L27	127	L26 AND L15 AND @fd<"20140117"	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2022/07/13 12:55 PM
L28	2	(US-20100124694-$ OR US-2006022937-$ OR US-20090166192-$).did.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO); FPRS; EPO; JPO)	OR	ON	ON	2022/07/13 01:18 PM
L29	0	(US-2006022937-$).did.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO); FPRS; EPO; JPO)	OR	ON	ON	2022/07/13 01:19 PM
L30	1	(US-20060022937-$).did.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO); FPRS; EPO; JPO)	OR	ON	ON	2022/07/13 01:19 PM
L31	1	(US-20060222937-$).did.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO); FPRS; EPO; JPO)	OR	ON	ON	2022/07/13 01:20 PM
L32	1	(US-6828059-$).did.	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, BE, BG, BR, BY, CA, CH, CN, CS, CU,	OR	ON	ON	2022/07/13 01:24 PM

			CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO); FPRS; EPO; JPO)				
L33	1	(US-20100124694-$).did.	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO); FPRS; EPO; JPO)	OR	ON	ON	2022/07/13 01:25 PM
L34	1	(jp-09017410-$).did.	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO); FPRS; EPO; JPO)	OR	ON	ON	2022/07/13 01:25 PM
L35	1	(jp-09161837$).did.	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO); FPRS; EPO; JPO)	OR	ON	ON	2022/07/13 01:25 PM
L36	1	US-20070122714-$.did.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO); FPRS; EPO; JPO)	OR	ON	ON	2022/07/13 01:29 PM
L37	37	((JP-2003132875-A OR CN-202495523-U OR CN-103066239-A OR CN-101939873-A OR CN-201087907-Y OR CN-1221054-C OR CN-1350350-A OR CN-1221054-A).did. AND FTDB.dbnm.) OR ((US-20140349179-A1 OR	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO); FPRS; EPO; JPO;	OR	ON	ON	2022/07/13 01:30 PM

		US-20140120417-A1 OR US-20090111011-A1 OR US-20110104539-A1 OR US-20110151295-A1 OR US-20010033962-A1 OR US-20090166192-A1 OR US-20080233474-A1 OR US-20130045406-A1 OR US-20120214049-A1 OR US-20110027636-A1 OR US-20060222937-A1 OR US-20130045405-A1 OR US-20130316207-A1 OR US-20130316209-A1 OR US-20130101891-A1 OR US-20120321942-A1 OR US-20040191634-A1 OR US-20060051662-A1 OR US-20090035638-A1 OR US-20070122714-A1).did. AND PGPB.dbnm.) OR ((US-9142840-B2 OR US-8837115-B2 OR US-6100114-A OR US-5478668-A OR US-5017442-A).did. AND USPT.dbnm.) OR ((KR-101475367-B1 OR CN-1221054-A).did. AND FPRS.dbnm.) OR ((JP-2000277155-A).did. AND JPAB.dbnm.)	DERWENT; IBM_TDB)				
L38	145716	(non-coat$6 OR (non ADJ coat$6) OR un-coat$6 OR (un ADJ coat$6) OR non-application$9 OR (non ADJ application$9))	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO); FPRS; EPO; JPO)	OR	ON	ON	2022/07/13 01:36 PM
L39	4877	L14 AND L38	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV,	OR	ON	ON	2022/07/13 01:36 PM

			MA, OA, RU, SU, WO); FPRS; EPO; JPO)				
L40	249	L14 AND L38 AND (L38 NEAR15 (width OR length OR size OR area)) AND (L38 SAME3 (energ$7 NEAR5 dens$6))	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO); FPRS; EPO; JPO)	OR	ON	ON	2022/07/13 01:37 PM
L41	23	L14 AND L38 AND (L38 NEAR15 (width OR length OR size OR area)) AND (L38 SAME3 (energ$7 NEAR5 dens$6)) AND @fd<"20140117"	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2022/07/13 01:37 PM
L42	428	(H01M50/538).cpc. AND (recess$6 near15 (tab OR lead OR tap))	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO); FPRS; EPO; JPO)	OR	ON	ON	2022/07/13 02:18 PM
L43	41	(H01M50/538).cpc. AND (recess$6 near15 (tab OR lead OR tap)) AND @fd<"20140117"	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2022/07/13 02:18 PM
L44	507	(H01M50/5$).cpc. AND (recess$6 near15 (tab OR lead OR tap)) AND @fd<"20140117"	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2022/07/13 02:22 PM
L45	114	(H01M50/538).cpc. AND (recess$6 near15 (tab OR lead OR tap)) AND @pd<"20140117"	(FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO); FPRS; EPO; JPO)	OR	ON	ON	2022/07/13 02:23 PM
L46	13	("20100216001" OR "20110274953" OR "20140017565" OR "20150295270" OR "6139986" OR "20050287428" OR "20090148766" OR "20090297941" OR "20110076547" OR "20160197379" OR	(US-PGPUB; USPAT)	OR	ON	ON	2022/07/13 04:06 PM

		"7923139" OR "7955736" OR "8450006").pn.					
L47	1	US-10320024-$.did.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO); FPRS; EPO; JPO)	OR	ON	ON	2022/07/13 04:08 PM
L48	9	("20110104539" | "20110129708" | "20110151295" | "20120009450" | "20120321924" | "20130260203" | "20130316207" | "20140072877" | "20140302366").pn. OR ("10320024").urpn. AND (PGPB | USPT | USOC).dbnm.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2022/07/13 04:08 PM
L49	0	(KR-1038115-$ OR KR-1615712-$ OR KR-20110035566-$ OR KR-20160085063-$).DID.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2022/07/13 04:12 PM
L50	4	(KR-1038115-$ OR KR-1615712-$ OR KR-20110035566-$ OR KR-20160085063-$).DID.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO); FPRS; EPO; JPO)	OR	ON	ON	2022/07/13 04:12 PM
L51	4	(KR-101038115-$ OR KR-101615712-$).DID.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO); FPRS; EPO; JPO)	OR	ON	ON	2022/07/13 04:13 PM
L52	45	(Artificial Intelligence) More like doc: US-20140302366-A1 Text: (US-9520588-B2 OR WO-2013038701-A1	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB,	OR	ON	ON	2022/07/13 04:14 PM

		OR JP-WO2013038701-A1 OR JP-5849234-B2 OR WO-2013038677-A1 OR JP-2014225326-A OR JP-2007109612-A OR JP-6208239-B2 OR JP-6439839-B2 OR CN-103733418-B OR CN-107431250-B OR JP-H09180761-A OR JP-2003288941-A OR KR-20030078019-A OR KR-100990800-B1 OR JP-4097443-B2 OR JP-6652125-B2 OR JP-2013073680-A OR JP-2016081881-A OR CN-103733418-A).did.	HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA, VN); FPRS; EPO; JPO; DERWENT; IBM_TDB)				
L53	49	(Artificial Intelligence) More like doc: WO-2013038677-A1 Text: (WO-2013038701-A1 OR JP-5849234-B2 OR JP-WO2013038701-A1 OR WO-2013038676-A1 OR JP-2014225326-A OR US-9520588-B2 OR US-20140302366-A1 OR WO-2016079943-A1 OR JP-2007109612-A OR JP-2010061893-A OR JP-2008311011-A OR WO-2018061381-A1 OR JP-2018018646-A OR JP-WO2018061381-A1 OR JP-2016122628-A OR JP-6567821-B2 OR WO-2019065871-A1 OR US-8530072-B2 OR JP-H09306471-A OR JP-2010086812-A).did.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA, VN); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/07/13 04:19 PM
L54	47	((JP-2003132875-A OR WO-2013038677-A1 OR WO-2013038676-A1 OR CN-202495523-U OR JP-6652125-B2 OR CN-103066239-A OR CN-101939873-A OR CN-201087907-Y OR CN-1221054-C OR CN-1350350-A OR CN-1221054-A).did. AND FTDB.dbnm.) OR ((US-20140349179-A1 OR	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA,	OR	ON	ON	2022/07/13 04:43 PM

		US-20140120417-A1 OR US-20090111011-A1 OR US-20110104539-A1 OR US-20110151295-A1 OR US-20010033962-A1 OR US-20090166192-A1 OR US-20140302366-A1 OR US-20130316207-A1 OR US-20080233474-A1 OR US-20130045406-A1 OR US-20120214049-A1 OR US-20110027636-A1 OR US-20060222937-A1 OR US-20130045405-A1 OR US-20130316209-A1 OR US-20130101891-A1 OR US-20120321942-A1 OR US-20100086858-A1 OR US-20150295270-A1 OR US-20120009450-A1 OR US-20040191634-A1 OR US-20060051662-A1 OR US-20090081530-A1 OR US-20090035638-A1 OR US-20070122714-A1).did. AND PGPB.dbnm.) OR ((US-9142840-B2 OR US-8837115-B2 OR US-6100114-A OR US-5478668-A OR US-5017442-A).did. AND USPT.dbnm.) OR ((JP-2014225326-A OR JP-2001015096-A OR JP-2000277155-A).did. AND JPAB.dbnm.) OR ((KR-101475367-B1 OR CN-1221054-A).did. AND FPRS.dbnm.)	VN); FPRS; EPO; JPO; DERWENT; IBM_TDB)				
L55	134	((("NINGDE") near3 ("AMPEREX") near3 ("TECHNOLOGY") near3 ("LIMITED"))).AS,AANM.	(USPAT)	OR	ON	ON	2022/07/13 09:28 PM
L56	137	((("NINGDE") near3 ("AMPEREX"))).AS,AANM.	(USPAT)	OR	ON	ON	2022/07/13 09:30 PM

L57	527	((("NINGDE") near3 ("AMPEREX"))).AS,AANM.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2022/07/13 09:30 PM
L58	1129	L57 AND L14	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO); FPRS; EPO; JPO)	OR	ON	ON	2022/07/13 09:31 PM
L59	10	L57 AND L14 AND @pd<"20140117"	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO); FPRS; EPO; JPO)	OR	ON	ON	2022/07/13 09:31 PM
L60	308	((("TAO") near3 ("Tao")) OR (("MO") near3 ("Ming") near3 ("Liang"))).INV.	(US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT)	OR	ON	ON	2022/07/14 10:56 AM
L61	2	L60 AND L14 AND @pd<"20140117"	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO); FPRS; EPO; JPO)	OR	ON	ON	2022/07/14 10:57 AM
L62	130343969	L60AND @pd<"20140117"	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO); FPRS; EPO; JPO)	OR	ON	ON	2022/07/14 10:57 AM
L63	2325	L60 AND @pd<"20140117"	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO);	OR	ON	ON	2022/07/14 10:57 AM

			FPRS; EPO; JPO)				
L65	0	L60 AND H01M50/5$.cpc. AND @pd<"20140117"	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO); FPRS; EPO; JPO)	OR	ON	ON	2022/07/14 10:58 AM
L66	46	L60 AND H01M.cpcl. AND @pd<"20140117"	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO); FPRS; EPO; JPO)	OR	ON	ON	2022/07/14 10:59 AM
L67	47	((JP-2003132875-A OR WO-2013038677-A1 OR WO-2013038676-A1 OR CN-202495523-U OR JP-6652125-B2 OR CN-103066239-A OR CN-101939873-A OR CN-201087907-Y OR CN-1221054-C OR CN-1350350-A OR CN-1221054-A).did. AND FTDB.dbnm.) OR ((US-20140349179-A1 OR US-20140120417-A1 OR US-20090111011-A1 OR US-20110104539-A1 OR US-20110151295-A1 OR US-20010033962-A1 OR US-20090166192-A1 OR US-20140302366-A1 OR US-20130316207-A1 OR US-20080233474-A1 OR US-20130045406-A1 OR US-20120214049-A1 OR US-20110027636-A1 OR US-20060222937-A1 OR US-20130045405-A1 OR US-20130316209-A1 OR US-20130101891-A1 OR US-20120321942-A1 OR US-	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/07/14 11:11 AM

		20100086858-A1 OR US-20150295270-A1 OR US-20120009450-A1 OR US-20040191634-A1 OR US-20060051662-A1 OR US-20090081530-A1 OR US-20090035638-A1 OR US-20070122714-A1).did. AND PGPB.dbnm.) OR ((US-9142840-B2 OR US-8837115-B2 OR US-6100114-A OR US-5478668-A OR US-5017442-A).did. AND USPT.dbnm.) OR ((JP-2014225326-A OR JP-2001015096-A OR JP-2000277155-A).did. AND JPAB.dbnm.) OR ((KR-101475367-B1 OR CN-1221054-A).did. AND FPRS.dbnm.)					
L68	12	(US-20050250052-$ OR US-20110003211-$).did. OR (CN-1489229-$ OR CN-101939869-$ OR CN-103262310-$ OR JP-2005283643-$).did.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO); FPRS; EPO; JPO)	OR	ON	ON	2022/07/14 12:00 PM
L69	53	((JP-2003132875-A OR WO-2013038677-A1 OR WO-2013038676-A1 OR CN-202495523-U OR JP-6652125-B2 OR CN-103066239-A OR CN-101939873-A OR CN-201087907-Y OR CN-1221054-C OR CN-1350350-A OR CN-1221054-A OR CN-103262310-A OR CN-101939869-A OR JP-2005283643-A OR CN-1489229-A).did. AND FTDB.dbnm.) OR ((US-20140349179-A1 OR US-20140120417-A1 OR US-20090111011-A1 OR US-20110104539-A1 OR US-20110151295-A1	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/07/14 12:12 PM

		OR US-20010033962-A1 OR US-20090166192-A1 OR US-20140302366-A1 OR US-20130316207-A1 OR US-20080233474-A1 OR US-20130045406-A1 OR US-20120214049-A1 OR US-20110027636-A1 OR US-20060222937-A1 OR US-20130045405-A1 OR US-20130316209-A1 OR US-20130101891-A1 OR US-20120321942-A1 OR US-20100086858-A1 OR US-20150295270-A1 OR US-20120009450-A1 OR US-20040191634-A1 OR US-20060051662-A1 OR US-20090081530-A1 OR US-20090035638-A1 OR US-20070122714-A1 OR US-20110003211-A1 OR US-20050250052-A1).did. AND PGPB.dbnm.) OR ((US-9142840-B2 OR US-8837115-B2 OR US-6100114-A OR US-5478668-A OR US-5017442-A).did. AND USPT.dbnm.) OR ((JP-2014225326-A OR JP-2001015096-A OR JP-2000277155-A).did. AND JPAB.dbnm.) OR ((KR-101475367-B1 OR CN-1221054-A).did. AND FPRS.dbnm.)					
L70	53	((JP-2003132875-A OR WO-2013038677-A1 OR WO-2013038676-A1 OR CN-202495523-U OR JP-6652125-B2 OR CN-103066239-A OR CN-101939873-A OR CN-201087907-Y OR CN-1221054-C OR CN-1350350-A OR CN-1221054-A OR CN-103262310-A OR CN-101939869-A OR JP-	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/07/15 11:48 AM

		2005283643-A OR CN-1489229-A).did. AND FTDB.dbnm.) OR ((US-20140349179-A1 OR US-20140120417-A1 OR US-20090111011-A1 OR US-20110104539-A1 OR US-20110151295-A1 OR US-20010033962-A1 OR US-20090166192-A1 OR US-20140302366-A1 OR US-20130316207-A1 OR US-20080233474-A1 OR US-20130045406-A1 OR US-20120214049-A1 OR US-20110027636-A1 OR US-20060222937-A1 OR US-20130045405-A1 OR US-20130316209-A1 OR US-20130101891-A1 OR US-20120321942-A1 OR US-20100086858-A1 OR US-20150295270-A1 OR US-20120009450-A1 OR US-20040191634-A1 OR US-20060051662-A1 OR US-20090081530-A1 OR US-20090035638-A1 OR US-20070122714-A1 OR US-20110003211-A1 OR US-20050250052-A1).did. AND PGPB.dbnm.) OR ((US-9142840-B2 OR US-8837115-B2 OR US-6100114-A OR US-5478668-A OR US-5017442-A).did. AND USPT.dbnm.) OR ((JP-2014225326-A OR JP-2001015096-A OR JP-2000277155-A).did. AND JPAB.dbnm.) OR ((KR-101475367-B1 OR CN-1221054-A).did. AND FPRS.dbnm.)					
L71	4105191	(tape OR adhesive OR insulat$7) NEAR25 (electrode OR lead OR tab)	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU,	OR	ON	ON	2022/07/15 11:49 AM

			CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO); FPRS; EPO; JPO)				
L72	34	L70 AND L71	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO); FPRS; EPO; JPO)	OR	ON	ON	2022/07/15 11:49 AM
L73	25	L70 AND L71 AND @fd<"20140117"	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2022/07/15 11:50 AM
L74	275044	(pair OR couple) NEAR10 (adhesiv$6 OR tape)	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO); FPRS; EPO; JPO)	OR	ON	ON	2022/07/15 03:31 PM
L75	578	L14 AND L74	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO); FPRS; EPO; JPO)	OR	ON	ON	2022/07/15 03:32 PM
L76	214	L14 AND L74 AND @fd<"20140117"	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO))	OR	ON	ON	2022/07/15 03:32 PM
L77	50	L14 AND L74 AND @fd<"20140117"	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2022/07/15 03:32 PM
L78	139	L14 AND L74 AND @pd<"20140117"	(FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV,	OR	ON	ON	2022/07/15 03:35 PM

			MA, OA, RU, SU, WO); FPRS; EPO; JPO)				
L79	987872	(insulat$7 ADJ4 (tape OR adhesive OR resin))	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO); FPRS; EPO; JPO)	OR	ON	ON	2022/07/15 03:43 PM
L80	8568	L79 AND L14	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO); FPRS; EPO; JPO)	OR	ON	ON	2022/07/15 03:44 PM
L81	6063	(insulat$7 ADJ4 (tape OR adhesive OR resin)) NEAR25 (((first AND second) OR oppos$8) ADJ surfac$7)	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO); FPRS; EPO; JPO)	OR	ON	ON	2022/07/15 03:44 PM
L82	175	L14 AND L81	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO); FPRS; EPO; JPO)	OR	ON	ON	2022/07/15 03:44 PM
L83	14	L14 AND L81 AND @fd<"20140117"	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2022/07/15 03:45 PM
L84	53	L14 AND L81 AND @fd<"20140117"	(FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO))	OR	ON	ON	2022/07/15 03:48 PM
L85	52	L14 AND L81 AND @pd<"20140117"	(FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP,	OR	ON	ON	2022/07/15 03:48 PM

			ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO); FPRS; EPO; JPO)				
L86	1	US-20110027636-$.did.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO); FPRS; EPO; JPO)	OR	ON	ON	2022/07/15 03:51 PM
L87	53	((JP-2003132875-A OR WO-2013038677-A1 OR WO-2013038676-A1 OR CN-202495523-U OR JP-6652125-B2 OR CN-103066239-A OR CN-101939873-A OR CN-201087907-Y OR CN-1221054-C OR CN-1350350-A OR CN-1221054-A OR CN-103262310-A OR CN-101939869-A OR JP-2005283643-A OR CN-1489229-A).did. AND FTDB.dbnm.) OR ((US-20140349179-A1 OR US-20140120417-A1 OR US-20090111011-A1 OR US-20110104539-A1 OR US-20110151295-A1 OR US-20010033962-A1 OR US-20090166192-A1 OR US-20140302366-A1 OR US-20130316207-A1 OR US-20110027636-A1 OR US-20080233474-A1 OR US-20130045406-A1 OR US-20120214049-A1 OR US-20060222937-A1 OR US-20130045405-A1 OR US-20130316209-A1 OR US-20130101891-A1 OR US-20120321942-A1 OR US-20100086858-A1 OR US-20150295270-A1	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/07/15 05:32 PM

		OR US-20120009450-A1 OR US-20040191634-A1 OR US-20060051662-A1 OR US-20090081530-A1 OR US-20090035638-A1 OR US-20070122714-A1 OR US-20110003211-A1 OR US-20050250052-A1).did. AND PGPB.dbnm.) OR ((US-9142840-B2 OR US-8837115-B2 OR US-6100114-A OR US-5478668-A OR US-5017442-A).did. AND USPT.dbnm.) OR ((JP-2014225326-A OR JP-2001015096-A OR JP-2000277155-A).did. AND JPAB.dbnm.) OR ((KR-101475367-B1 OR CN-1221054-A).did. AND FPRS.dbnm.)					
L88	184982	((insulat$7 OR adhesiv$6 OR tape OR glue OR resin) NEAR10 (oppos$10 OR paired OR pair$5 OR face-to-face OR corresponding)) SAME ((short ADJ circuit) OR short-circuit OR short$7)	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO); FPRS; EPO; JPO)	OR	ON	ON	2022/07/20 11:07 AM
L89	1468	L14 AND L88	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO); FPRS; EPO; JPO)	OR	ON	ON	2022/07/20 11:07 AM
L90	137	L14 AND L88 AND @fd<"20140117"	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2022/07/20 11:07 AM
L91	387	L14 AND L88 AND @pd<"20140117"	(FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO); FPRS; EPO; JPO)	OR	ON	ON	2022/07/20 02:15 PM

L92	58	((JP-2003132875-A OR WO-2013038677-A1 OR WO-2013038676-A1 OR KR-20090027314-A OR CN-202495523-U OR WO-2013080966-A1 OR JP-6652125-B2 OR CN-103066239-A OR CN-101939873-A OR CN-201087907-Y OR CN-1221054-C OR CN-1350350-A OR CN-1221054-A OR CN-103262310-A OR CN-101939869-A OR JP-2005283643-A OR CN-1489229-A).did. AND FTDB.dbnm.) OR ((US-20140349179-A1 OR US-20140120417-A1 OR US-20110104539-A1 OR US-20110151295-A1 OR US-20010033962-A1 OR US-20140302366-A1 OR US-20130316207-A1 OR US-20110027636-A1 OR US-20110014509-A1 OR US-20100285342-A1 OR US-20060051662-A1 OR US-20090111011-A1 OR US-20080233474-A1 OR US-20130045406-A1 OR US-20120214049-A1 OR US-20090166192-A1 OR US-20060222937-A1 OR US-20130045405-A1 OR US-20130316209-A1 OR US-20130101891-A1 OR US-20120321942-A1 OR US-20100086858-A1 OR US-20150295270-A1 OR US-20120009450-A1 OR US-20040191634-A1 OR US-20090081530-A1 OR US-20130230749-A1 OR US-20090035638-A1 OR US-20070122714-A1 OR US-20110003211-	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/07/20 03:01 PM

		A1 OR US-20050250052-A1).did. AND PGPB.dbnm.) OR ((US-9142840-B2 OR US-8837115-B2 OR US-6100114-A OR US-5478668-A OR US-5017442-A).did. AND USPT.dbnm.) OR ((JP-2014225326-A OR JP-2001015096-A OR JP-2000277155-A).did. AND JPAB.dbnm.) OR ((KR-101475367-B1 OR CN-1221054-A).did. AND FPRS.dbnm.)					
L93	59	((JP-2003132875-A OR WO-2013038677-A1 OR WO-2013038676-A1 OR KR-20090027314-A OR CN-202495523-U OR WO-2013080966-A1 OR KR-20060027266-A OR JP-6652125-B2 OR CN-103066239-A OR CN-101939873-A OR CN-201087907-Y OR CN-1221054-C OR CN-1350350-A OR CN-1221054-A OR CN-103262310-A OR CN-101939869-A OR JP-2005283643-A OR CN-1489229-A).did. AND FTDB.dbnm.) OR ((US-20140349179-A1 OR US-20140120417-A1 OR US-20110104539-A1 OR US-20110151295-A1 OR US-20010033962-A1 OR US-20140302366-A1 OR US-20130316207-A1 OR US-20110027636-A1 OR US-20110014509-A1 OR US-20100285342-A1 OR US-20060051662-A1 OR US-20090111011-A1 OR US-20080233474-A1 OR US-20130045406-A1 OR US-20120214049-A1 OR US-20090166192-A1 OR US-20060222937-A1	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/09/08 04:47 PM

		OR US-20130045405-A1 OR US-20130316209-A1 OR US-20130101891-A1 OR US-20120321942-A1 OR US-20100086858-A1 OR US-20150295270-A1 OR US-20120009450-A1 OR US-20040191634-A1 OR US-20090081530-A1 OR US-20130230749-A1 OR US-20090035638-A1 OR US-20070122714-A1 OR US-20110003211-A1 OR US-20050250052-A1).did. AND PGPB.dbnm.) OR ((US-9142840-B2 OR US-8837115-B2 OR US-6100114-A OR US-5478668-A OR US-5017442-A).did. AND USPT.dbnm.) OR ((JP-2014225326-A OR JP-2001015096-A OR JP-2000277155-A).did. AND JPAB.dbnm.) OR ((KR-101475367-B1 OR CN-1221054-A).did. AND FPRS.dbnm.)					
L94	24	(US-41406506-$ | US-5017442-$ | US-5478668-$ | US-6100114-$ | US-6551143-$).DID. (AL-20010036574-$ | AL-20070122714-$ | AL-20090035638-$ | CN-101939873-$ | CN-103066239-$ | CN-1221054-$ | CN-1350350-$ | CN-201087907-$ | CN-202495523-$ | DB-241406506-$ | JP-1993013064-$ | JP-1999317218-$ | JP-2000277155-$ | JP-2003132875-$).DID.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO); FPRS; EPO; JPO)	OR	ON	ON	2022/09/08 06:55 PM
L95	3	(US-20010036574-$ | US-20070122714-$ | US-20090035638-$).did.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA,	OR	ON	ON	2022/09/08 06:55 PM

			EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO); FPRS; EPO; JPO)				
L96	0	(JP-0513064-$).did.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO); FPRS; EPO; JPO)	OR	ON	ON	2022/09/08 06:55 PM
L97	0	(JPH-0513064-$).did.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO); FPRS; EPO; JPO)	OR	ON	ON	2022/09/08 06:55 PM
L98	0	(JP-00513064-$).did.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO); FPRS; EPO; JPO)	OR	ON	ON	2022/09/08 06:55 PM
L99	4	(JP-3161778-$).did.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO); FPRS; EPO; JPO)	OR	ON	ON	2022/09/08 06:55 PM
L100	92	(US-10135097-$ | US-10868290-$ | US-11024868-$ | US-11108118-$ | US-20100055560-$ | US-20100285370-$ | US-20170092925-$ | US-20180190963-$ | US-20180366775-$ | US-5017442-$ | US-5478668-$ | US-	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO); FPRS; EPO; JPO)	OR	ON	ON	2022/09/08 06:55 PM

		6100114-$ | US-6551143-$ | US-7195844-$ | US-9741988-$).DID. (CN-103367700-$ | CN-105576191-$ | CN-105990612-$ | CN-106169540-$ | CN-107534127-$ | CN-108376759-$ | CN-109888162-$ | CN-112272877-$ | CN-112582583-$ | CN-113826240-$ | CN-201087907-$ | CN-202495523-$ | CN-205355186-$ | GB-2548361-$ | JP-2005222744-$ | JP-2007294198-$ | JP-2010086754-$ | JP-2011103249-$ | JP-2013137943-$ | JP-2014241267-$ | JP-2018166080-$ | JP-4850996-$ | JP-5284933-$ | JP-5623073-$ | JP-5821913-$ | JP-6237187-$ | JP-6288015-$ | JP-6926991-$ | KR-101489993-$ | KR-101515672-$ | KR-101980974-$ | KR-200364044-$ | KR-20060009411-$ | KR-20120022773-$ | WO-2017149977-$).DID.					
L101	4	("20020197535" | "20040191634" | "20140030607" | "20150207111").pn. OR ("11108118").urpn. AND (PGPB | USPT | USOC).dbnm.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2022/09/08 06:55 PM
L102	3	("20090305120" | "20140349179" | "20150207111").pn. OR ("11024868").urpn. AND (PGPB | USPT | USOC).dbnm.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2022/09/08 06:55 PM
L103	1	US-20060051662-$.did.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA,	OR	ON	ON	2022/09/08 06:55 PM

			EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO); FPRS; EPO; JPO)				
L104	30	(US-10014495-$ | US-10038212-$ | US-10193125-$ | US-10312497-$ | US-10396336-$ | US-11024868-$ | US-11043700-$ | US-20060127774-$ | US-20080274410-$ | US-20110159344-$ | US-20110183191-$ | US-20130252053-$ | US-20130266845-$ | US-20130316207-$ | US-20140349179-$ | US-20160126511-$ | US-20160260954-$ | US-20180315991-$ | US-8877371-$ | US-8974944-$ | US-9159963-$ | US-9203074-$ | US-9224989-$ | US-9293744-$ | US-9397329-$ | US-9490468-$ | US-9564626-$ | US-9595699-$ | US-9627677-$ | US-9960404-$).DID.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO); FPRS; EPO; JPO)	OR	ON	ON	2022/09/08 06:55 PM
L105	7	("20060111625" | "20080233474" | "20090111011" | "20130045405" | "20140120417" | "20140349179" | "20140377593").pn. OR ("11043700").urpn. AND (PGPB | USPT | USOC).dbnm.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2022/09/08 06:55 PM
L106	22	((JP-2003132875-A OR CN-202495523-U OR CN-103066239-A OR CN-101939873-A OR CN-201087907-Y OR CN-1221054-C OR CN-1350350-A OR CN-1221054-A).did. AND FTDB.dbnm.) OR ((US-20140349179-A1 OR US-20140120417-A1 OR US-20090111011-	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/09/08 06:55 PM

		A1 OR US-20080233474-A1 OR US-20130045405-A1 OR US-20040191634-A1 OR US-20060051662-A1 OR US-20090035638-A1 OR US-20070122714-A1).did. AND PGPB.dbnm.) OR ((JP-2000277155-A).did. AND JPAB.dbnm.) OR ((US-6100114-A OR US-5478668-A OR US-5017442-A).did. AND USPT.dbnm.) OR ((CN-1221054-A).did. AND FPRS.dbnm.)					
L107	79516	(H01M10/0431 OR H01M10/0587 OR H01M50/531 OR H01M50/533 OR H01M50/538).cpc.	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/09/08 06:55 PM
L108	5257187	(recess$7 OR pocket OR (non-coat$7 ADJ (portion OR part)) OR cavity OR hole OR gap) NEAR10 (tab$5 OR tap$5 OR lead$5)	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO); FPRS; EPO; JPO)	OR	ON	ON	2022/09/08 06:55 PM
L109	10494	L14 AND L15	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO); FPRS; EPO; JPO)	OR	ON	ON	2022/09/08 06:55 PM
L110	955	L14 AND L15 AND @fd<"20140117"	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2022/09/08 06:55 PM
L111	1	US-8795879-$.did.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA,	OR	ON	ON	2022/09/08 06:55 PM

			EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO); FPRS; EPO; JPO)				
L112	1	("20090296318").pn. OR ("8795879").urpn. AND (PGPB | USPT | USOC).dbnm.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2022/09/08 06:55 PM
L113	77	(US-20040126654-$ | US-20040207974-$ | US-20090296318-$ | US-20150332857-$ | US-8014127-$ | US-8218293-$ | US-8795879-$ | US-8837115-$ | US-9070511-$).DID. (CN-104137303-$ | CN-108713233-$ | CN-110706928-$ | CN-201156473-$ | EP-1580774-$ | JP-2001023866-$ | JP-2001284190-$ | JP-2006286959-$ | JP-2008147541-$ | JP-2009010070-$ | JP-2009152514-$ | JP-2009212117-$ | JP-2009212283-$ | JP-2010074083-$ | JP-2010074089-$ | JP-2012019061-$ | JP-2012064601-$ | JP-2018157012-$ | JP-3587333-$ | JP-4413003-$ | JP-6893123-$ | JP-6953724-$ | KR-101404532-$ | KR-101434923-$ | KR-101475367-$ | KR-102079677-$ | KR-20130116836-$ | WO-2010116656-$ | WO-2021172440-$).DID.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO); FPRS; EPO; JPO)	OR	ON	ON	2022/09/08 06:55 PM
L114	293	L14 AND L15 AND (length NEAR10(tab$5 OR tap$5 OR lead$5)) AND @fd<"20140117"	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2022/09/08 06:55 PM
L115	17601	((recess$7 OR pocket OR (non-coat$7 ADJ (portion OR part)) OR cavity OR hole OR gap) NEAR10 (energ$6 NEAR5 densit$7))	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB,	OR	ON	ON	2022/09/08 06:55 PM

			HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO); FPRS; EPO; JPO)				
L116	1	L14 AND L15 AND (length NEAR10(tab$5 OR tap$5 OR lead$5)) AND L22 AND @fd<"20140117"	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2022/09/08 06:55 PM
L117	18	L14 AND L15 AND (length NEAR10(tab$5 OR tap$5 OR lead$5)) AND L22 AND @fd<"20140117"	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO))	OR	ON	ON	2022/09/08 06:55 PM
L118	8	L14 AND L15 AND (length NEAR10(tab$5 OR tap$5 OR lead$5)) AND L22 AND @pd<"20140117"	(FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO); FPRS; EPO; JPO)	OR	ON	ON	2022/09/08 06:55 PM
L119	6698	(H01M10/0431 AND H01M50/538).cpc.	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/09/08 06:55 PM
L120	127	L26 AND L15 AND @fd<"20140117"	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2022/09/08 06:55 PM
L121	2	(US-20100124694-$ OR US-2006022937-$ OR US-20090166192-$).did.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO); FPRS; EPO; JPO)	OR	ON	ON	2022/09/08 06:55 PM
L122	0	(US-2006022937-$).did.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB,	OR	ON	ON	2022/09/08 06:55 PM

			HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO); FPRS; EPO; JPO)				
L123	1	(US-20060022937-$).did.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO); FPRS; EPO; JPO)	OR	ON	ON	2022/09/08 06:55 PM
L124	1	(US-20060222937-$).did.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO); FPRS; EPO; JPO)	OR	ON	ON	2022/09/08 06:55 PM
L125	1	(US-6828059-$).did.	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO); FPRS; EPO; JPO)	OR	ON	ON	2022/09/08 06:55 PM
L126	1	(US-20100124694-$).did.	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO); FPRS; EPO; JPO)	OR	ON	ON	2022/09/08 06:55 PM
L127	1	(jp-09017410-$).did.	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO); FPRS; EPO; JPO)	OR	ON	ON	2022/09/08 06:55 PM
L128	1	(jp-09161837$).did.	(US-PGPUB; USPAT; USOCR; FIT (AP, AT,	OR	ON	ON	2022/09/08 06:55 PM

			AU, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO); FPRS; EPO; JPO)				
L129	1	US-20070122714-$.did.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO); FPRS; EPO; JPO)	OR	ON	ON	2022/09/08 06:55 PM
L130	37	((JP-2003132875-A OR CN-202495523-U OR CN-103066239-A OR CN-101939873-A OR CN-201087907-Y OR CN-1221054-C OR CN-1350350-A OR CN-1221054-A).did. AND FTDB.dbnm.) OR ((US-20140349179-A1 OR US-20140120417-A1 OR US-20090111011-A1 OR US-20110104539-A1 OR US-20110151295-A1 OR US-20010033962-A1 OR US-20090166192-A1 OR US-20080233474-A1 OR US-20130045406-A1 OR US-20120214049-A1 OR US-20110027636-A1 OR US-20060222937-A1 OR US-20130045405-A1 OR US-20130316207-A1 OR US-20130316209-A1 OR US-20130101891-A1 OR US-20120321942-A1 OR US-20040191634-A1 OR US-20060051662-A1 OR US-20090035638-A1 OR US-20070122714-A1).did. AND PGPB.dbnm.) OR ((US-9142840-B2 OR US-	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/09/08 06:55 PM

		8837115-B2 OR US-6100114-A OR US-5478668-A OR US-5017442-A).did. AND USPT.dbnm.) OR ((KR-101475367-B1 OR CN-1221054-A).did. AND FPRS.dbnm.) OR ((JP-2000277155-A).did. AND JPAB.dbnm.)					
L131	147477	(non-coat$6 OR (non ADJ coat$6) OR un-coat$6 OR (un ADJ coat$6) OR non-application$9 OR (non ADJ application$9))	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO); FPRS; EPO; JPO)	OR	ON	ON	2022/09/08 06:55 PM
L132	4977	L14 AND L38	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO); FPRS; EPO; JPO)	OR	ON	ON	2022/09/08 06:55 PM
L133	257	L14 AND L38 AND (L38 NEAR15 (width OR length OR size OR area)) AND (L38 SAME3 (energ$7 NEAR5 dens$6))	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO); FPRS; EPO; JPO)	OR	ON	ON	2022/09/08 06:55 PM
L134	23	L14 AND L38 AND (L38 NEAR15 (width OR length OR size OR area)) AND (L38 SAME3 (energ$7 NEAR5 dens$6)) AND @fd<"20140117"	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2022/09/08 06:55 PM
L135	438	(H01M50/538).cpc. AND (recess$6 near15 (tab OR lead OR tap))	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO);	OR	ON	ON	2022/09/08 06:55 PM

			FPRS; EPO; JPO)				
L136	41	(H01M50/538).cpc. AND (recess$6 near15 (tab OR lead OR tap)) AND @fd<"20140117"	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2022/09/08 06:55 PM
L137	509	(H01M50/5$).cpc. AND (recess$6 near15 (tab OR lead OR tap)) AND @fd<"20140117"	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2022/09/08 06:55 PM
L138	112	(H01M50/538).cpc. AND (recess$6 near15 (tab OR lead OR tap)) AND @pd<"20140117"	(FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO); FPRS; EPO; JPO)	OR	ON	ON	2022/09/08 06:55 PM
L139	13	("20100216001" OR "20110274953" OR "20140017565" OR "20150295270" OR "6139986" OR "20050287428" OR "20090148766" OR "20090297941" OR "20110076547" OR "20160197379" OR "7923139" OR "7955736" OR "8450006").pn.	(US-PGPUB; USPAT)	OR	ON	ON	2022/09/08 06:55 PM
L140	1	US-10320024-$.did.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO); FPRS; EPO; JPO)	OR	ON	ON	2022/09/08 06:55 PM
L141	9	("20110104539" | "20110129708" | "20110151295" | "20120009450" | "20120321924" | "20130260203" | "20130316207" | "20140072877" | "20140302366").pn. OR ("10320024").urpn. AND (PGPB | USPT | USOC).dbnm.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2022/09/08 06:55 PM
L142	0	(KR-1038115-$ OR KR-1615712-$ OR KR-20110035566-$ OR	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2022/09/08 06:55 PM

		KR-20160085063-$).DID.					
L143	4	(KR-1038115-$ OR KR-1615712-$ OR KR-20110035566-$ OR KR-20160085063-$).DID.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO); FPRS; EPO; JPO)	OR	ON	ON	2022/09/08 06:55 PM
L144	4	(KR-101038115-$ OR KR-101615712-$).DID.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO); FPRS; EPO; JPO)	OR	ON	ON	2022/09/08 06:55 PM
L145	44	(Artificial Intelligence) More like doc: US-20140302366-A1 Text: (US-9520588-B2 OR WO-2013038701-A1 OR JP-WO2013038701-A1 OR JP-5849234-B2 OR WO-2013038677-A1 OR JP-2014225326-A OR JP-2007109612-A OR JP-6208239-B2 OR JP-6439839-B2 OR CN-103733418-B OR JP-H09180761-A OR JP-2003288941-A OR KR-20030078019-A OR CN-110178250-B OR KR-100990800-B1 OR JP-WO2017149977-A1 OR JP-4097443-B2 OR JP-2013073680-A OR JP-2016081881-A OR CN-103733418-A).did.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA, VN); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/09/08 06:55 PM
L146	49	(Artificial Intelligence) More like doc: WO-2013038677-A1 Text: (WO-2013038701-A1 OR JP-5849234-B2 OR JP-WO2013038701-A1 OR WO-2013038676-A1 OR JP-2014225326-	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO,	OR	ON	ON	2022/09/08 06:55 PM

		A OR US-9520588-B2 OR US-20140302366-A1 OR WO-2016079943-A1 OR JP-2007109612-A OR JP-2010061893-A OR JP-2008311011-A OR WO-2018061381-A1 OR JP-2018018646-A OR JP-WO2018061381-A1 OR JP-2016122628-A OR JP-6567821-B2 OR WO-2019065871-A1 OR US-8530072-B2 OR JP-H09306471-A OR JP-2010086812-A).did.	MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA, VN); FPRS; EPO; JPO; DERWENT; IBM_TDB)				
L147	47	((JP-2003132875-A OR WO-2013038677-A1 OR WO-2013038676-A1 OR CN-202495523-U OR JP-6652125-B2 OR CN-103066239-A OR CN-101939873-A OR CN-201087907-Y OR CN-1221054-C OR CN-1350350-A OR CN-1221054-A).did. AND FTDB.dbnm.) OR ((US-20140349179-A1 OR US-20140120417-A1 OR US-20090111011-A1 OR US-20110104539-A1 OR US-20110151295-A1 OR US-20010033962-A1 OR US-20090166192-A1 OR US-20140302366-A1 OR US-20130316207-A1 OR US-20080233474-A1 OR US-20130045406-A1 OR US-20120214049-A1 OR US-20110027636-A1 OR US-20060222937-A1 OR US-20130045405-A1 OR US-20130316209-A1 OR US-20130101891-A1 OR US-20120321942-A1 OR US-20100086858-A1 OR US-20150295270-A1 OR US-20120009450-A1 OR US-20040191634-A1 OR US-20060051662-A1	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA, VN); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/09/08 06:55 PM

		OR US-20090081530-A1 OR US-20090035638-A1 OR US-20070122714-A1).did. AND PGPB.dbnm.) OR ((US-9142840-B2 OR US-8837115-B2 OR US-6100114-A OR US-5478668-A OR US-5017442-A).did. AND USPT.dbnm.) OR ((JP-2014225326-A OR JP-2001015096-A OR JP-2000277155-A).did. AND JPAB.dbnm.) OR ((KR-101475367-B1 OR CN-1221054-A).did. AND FPRS.dbnm.)					
L148	135	((("NINGDE") near3 ("AMPEREX") near3 ("TECHNOLOGY") near3 ("LIMITED"))).AS,AANM.	(USPAT)	OR	ON	ON	2022/09/08 06:55 PM
L149	139	((("NINGDE") near3 ("AMPEREX"))).AS,AANM.	(USPAT)	OR	ON	ON	2022/09/08 06:55 PM
L150	575	((("NINGDE") near3 ("AMPEREX"))).AS,AANM.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2022/09/08 06:55 PM
L151	1286	L57 AND L14	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO); FPRS; EPO; JPO)	OR	ON	ON	2022/09/08 06:55 PM
L152	10	L57 AND L14 AND @pd<"20140117"	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO); FPRS; EPO; JPO)	OR	ON	ON	2022/09/08 06:55 PM
L153	316	((("TAO") near3 ("Tao")) OR (("MO") near3 ("Ming") near3 ("Liang"))).INV.	(US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT)	OR	ON	ON	2022/09/08 06:55 PM
L154	2	L60 AND L14 AND	(US-PGPUB; USPAT;	OR	ON	ON	2022/09/08

		@pd<"20140117"	USOCR; FIT (AP, AT, AU, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO); FPRS; EPO; JPO)				06:55 PM
L155	130423336	L60AND @pd<"20140117"	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO); FPRS; EPO; JPO)	OR	ON	ON	2022/09/08 06:55 PM
L156	2325	L60 AND @pd<"20140117"	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO); FPRS; EPO; JPO)	OR	ON	ON	2022/09/08 06:55 PM
L157	0	L60 AND H01M50/5$.cpc. AND @pd<"20140117"	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO); FPRS; EPO; JPO)	OR	ON	ON	2022/09/08 06:55 PM
L158	46	L60 AND H01M.cpcl. AND @pd<"20140117"	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO); FPRS; EPO; JPO)	OR	ON	ON	2022/09/08 06:55 PM
L159	47	((JP-2003132875-A OR WO-2013038677-A1 OR WO-2013038676-A1 OR CN-202495523-U OR JP-6652125-B2 OR CN-103066239-A OR CN-101939873-A	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS,	OR	ON	ON	2022/09/08 06:55 PM

		OR CN-201087907-Y OR CN-1221054-C OR CN-1350350-A OR CN-1221054-A).did. AND FTDB.dbnm.) OR ((US-20140349179-A1 OR US-20140120417-A1 OR US-20090111011-A1 OR US-20110104539-A1 OR US-20110151295-A1 OR US-20010033962-A1 OR US-20090166192-A1 OR US-20140302366-A1 OR US-20130316207-A1 OR US-20080233474-A1 OR US-20130045406-A1 OR US-20120214049-A1 OR US-20110027636-A1 OR US-20060222937-A1 OR US-20130045405-A1 OR US-20130316209-A1 OR US-20130101891-A1 OR US-20120321942-A1 OR US-20100086858-A1 OR US-20150295270-A1 OR US-20120009450-A1 OR US-20040191634-A1 OR US-20060051662-A1 OR US-20090081530-A1 OR US-20090035638-A1 OR US-20070122714-A1).did. AND PGPB.dbnm.) OR ((US-9142840-B2 OR US-8837115-B2 OR US-6100114-A OR US-5478668-A OR US-5017442-A).did. AND USPT.dbnm.) OR ((JP-2014225326-A OR JP-2001015096-A OR JP-2000277155-A).did. AND JPAB.dbnm.) OR ((KR-101475367-B1 OR CN-1221054-A).did. AND FPRS.dbnm.)	IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)				
L160	12	(US-20050250052-$ OR US-20110003211-$).did. OR (CN-1489229-$ OR CN-	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU,	OR	ON	ON	2022/09/08 06:55 PM

		101939869-$ OR CN-103262310-$ OR JP-2005283643-$).did.	CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO); FPRS; EPO; JPO)				
L163	4151033	(tape OR adhesive OR insulat$7) NEAR25 (electrode OR lead OR tab)	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO); FPRS; EPO; JPO)	OR	ON	ON	2022/09/08 06:55 PM
L166	277493	(pair OR couple) NEAR10 (adhesiv$6 OR tape)	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO); FPRS; EPO; JPO)	OR	ON	ON	2022/09/08 06:55 PM
L171	997639	(insulat$7 ADJ4 (tape OR adhesive OR resin))	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO); FPRS; EPO; JPO)	OR	ON	ON	2022/09/08 06:55 PM
L173	6138	(insulat$7 ADJ4 (tape OR adhesive OR resin)) NEAR25 (((first AND second) OR oppos$8) ADJ surfac$7)	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO); FPRS; EPO; JPO)	OR	ON	ON	2022/09/08 06:55 PM
L180	185922	((insulat$7 OR adhesiv$6 OR tape OR glue OR resin) NEAR10 (oppos$10 OR paired OR pair$5 OR face-to-face OR corresponding)) SAME ((short ADJ circuit) OR short-circuit OR short$7)	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO); FPRS; EPO; JPO)	OR	ON	ON	2022/09/08 06:55 PM

L189	10969	((precipitat$9) NEAR10 (lithium OR li!)) SAME ((short ADJ circuit) OR short-circuit OR short$7)	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO); FPRS; EPO; JPO)	OR	ON	ON	2022/09/14 12:16 PM
L195	60	((JP-2003132875-A OR WO-2013038677-A1 OR WO-2013038676-A1 OR KR-20090027314-A OR CN-202495523-U OR WO-2013080966-A1 OR KR-20060027266-A OR JP-6652125-B2 OR CN-103066239-A OR CN-101939873-A OR CN-201087907-Y OR CN-1221054-C OR CN-1350350-A OR CN-1221054-A OR CN-103262310-A OR CN-101939869-A OR JP-2005283643-A OR CN-1489229-A).did. AND FTDB.dbnm.) OR ((US-20140349179-A1 OR US-20140120417-A1 OR US-20110104539-A1 OR US-20110151295-A1 OR US-20010033962-A1 OR US-20140302366-A1 OR US-20130316207-A1 OR US-20110027636-A1 OR US-20110014509-A1 OR US-20100285342-A1 OR US-20060051662-A1 OR US-20090111011-A1 OR US-20080233474-A1 OR US-20130045406-A1 OR US-20120214049-A1 OR US-20090166192-A1 OR US-20060222937-A1 OR US-20130045405-A1 OR US-20130316209-A1 OR US-20130101891-A1 OR US-20120321942-A1 OR US-	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/09/14 01:11 PM

		20100086858-A1 OR US-20150295270-A1 OR US-20120009450-A1 OR US-20040191634-A1 OR US-20090081530-A1 OR US-20130230749-A1 OR US-20110143201-A1 OR US-20090035638-A1 OR US-20070122714-A1 OR US-20110003211-A1 OR US-20050250052-A1).did. AND PGPB.dbnm.) OR ((US-9142840-B2 OR US-8837115-B2 OR US-6100114-A OR US-5478668-A OR US-5017442-A).did. AND USPT.dbnm.) OR ((JP-2014225326-A OR JP-2001015096-A OR JP-2000277155-A).did. AND JPAB.dbnm.) OR ((KR-101475367-B1 OR CN-1221054-A).did. AND FPRS.dbnm.)					
L196	4	(JP-2007165224-A JP-4929701-B2).DID.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO); FPRS; EPO; JPO)	OR	ON	ON	2022/10/12 09:16 AM
L197	1	US-20070172736-A1.DID.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO); FPRS; EPO; JPO)	OR	ON	ON	2022/10/12 09:27 AM
L198	25	(CN-109891639-$ | EP-3121865-$ | JP-2001135298-$ | JP-2001266946-$ | JP-2005259639-$ | JP-2005310622-$ | JP-2018129459-$ | KR-20140132134-$).DID.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV,	OR	ON	ON	2023/03/22 04:39 PM

		(US-10115969-$ | US-10553892-$ | US-20210384548-$ | JP-H10241737-$ | JP-H1126008-$ | JP-H11026008-$).DID.	MA, OA, RU, SU, WO); FPRS; EPO; JPO)				
L199	144159	H01M.cpcl. AND (((tape OR adhesive OR insulat$7) NEAR25 (electrode OR lead OR tab)) SAME5 (lithium OR Li! NEAR20 precip$9 OR deposit$8))	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO); FPRS; EPO; JPO)	OR	ON	ON	2023/03/24 03:49 PM
L200	1329	H01M.cpcl. AND (tape OR adhes$ OR glue) SAME (short$circuit OR (short ADJ circuit)) AND ((lithium OR li!) ADJ5 (precipit$9 OR depos$9))	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO); FPRS; EPO; JPO)	OR	ON	ON	2023/03/24 03:50 PM
L201	464	H01M.cpcl. AND (tape OR adhes$ OR glue) SAME (short$circuit OR (short ADJ circuit)) AND ((lithium OR li!) ADJ5 (precipit$9 OR depos$9)) AND @pd<"20150101"	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO); FPRS; EPO; JPO)	OR	ON	ON	2023/03/24 03:50 PM
L202	1905	H01M.cpcl. AND (tab$9 OR collect$9) SAME (short$circuit OR (short ADJ circuit)) AND ((lithium OR li!) ADJ5 (precipit$9 OR depos$9)) AND @pd<"20150101"	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO); FPRS; EPO; JPO)	OR	ON	ON	2023/03/24 03:51 PM
L203	116	H01M.cpcl. AND ((tab$9 OR collect$9) NEAR25 (tap$9 OR adhes$9 OR glue)) SAME (short$circuit OR (short ADJ circuit)) AND ((lithium OR li!) ADJ5 (precipit$9 OR depos$9)) AND @pd<"20150101"	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO); FPRS; EPO; JPO)	OR	ON	ON	2023/03/24 03:52 PM

PE2E SEARCH - Search History (Interference)

There are no Interference searches to show.

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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
17/746,755	05/17/2022	Tao TAO	024607-02-5119-US	8911

24341 7590 05/11/2023

Morgan, Lewis & Bockius LLP (PA)
1400 Page Mill Road
Palo Alto, CA 94304-1124

EXAMINER	
BARTON, JASON AARON	

ART UNIT	PAPER NUMBER
1721	

NOTIFICATION DATE	DELIVERY MODE
05/11/2023	ELECTRONIC

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

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

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

donald.mixon@morganlewis.com
padocketingdepartment@morganlewis.com

Applicant-Initiated Interview Summary	**Application No.** 17/746,755	**Applicant(s)** TAO et al.		
	Examiner JASON A BARTON	**Art Unit** 1721	**AIA (First Inventor to File) Status** Yes	**Page** 1 of 1

All Participants (applicant, applicants representative, PTO personnel)	**Title**	**Type**
JASON A BARTON	Examiner	Video Conference
YALEI SUN	Attorney of Record	

Date of Interview: 04 May 2023

Issues Discussed:

35 U.S.C. 103

Examiner and Applicant's counsel discussed the draft declaration of TAO TAO (see attachment) in relation to related application 17/407,081. Examiner indicated that the arguments presented at section 7 of the declaration could advance prosecution if accompanied by amendment. Examiner suggested to advance prosecution by requiring the positive electrode does not include an insulating glue layer across the separator.

Applicant's counsel followed-up the interview with proposed claim language. Examiner indicated the proposed claim language would overcome the rejection of record and advance prosecution. See attachments.

☑ Attachment

/JASON BARTON/ Examiner, Art Unit 1721	/WILLIAM E MCCLAIN/ Primary Examiner, Art Unit 1721

Applicant is reminded that a complete written statement as to the substance of the interview must be made of record in the application file. It is the applicants responsibility to provide the written statement, unless the interview was initiated by the Examiner and the Examiner has indicated that a written summary will be provided. See MPEP 713.04
Please further see:
MPEP 713.04
Title 37 Code of Federal Regulations (CFR) § 1.133 Interviews, paragraph (b)
37 CFR § 1.2 Business to be transacted in writing

Applicant recordation instructions: The formal written reply to the last Office action must include the substance of the interview. (See MPEP section 713.04). If a reply to the last Office action has already been filed, applicant is given a non-extendable period of the longer of one month or thirty days from this interview date, or the mailing date of this interview summary form, whichever is later, to file a statement of the substance of the interview.

Examiner recordation instructions: Examiners must summarize the substance of any interview of record. A complete and proper recordation of the substance of an interview should include the items listed in MPEP 713.04 for complete and proper recordation including the identification of the general thrust of each argument or issue discussed, a general indication of any other pertinent matters discussed regarding patentability and the general results or outcome of the interview, to include an indication as to whether or not agreement was reached on the issues raised.

Application of:	Tao Tao et al.	Confirmation No.:	2876
Serial No.:	17/407,081	Art Unit:	1721
Filed:	August 19, 2021	Examiner:	Barton, Jason Aaron
For:	*Lithium-Ion Battery Having Desirable Safety Performance*	Attorney Docket No.:	024607-02-5113-US

1. (Currently Amended) A lithium-ion battery, comprising:

a first plate comprising a first current collector, a first film and a first lead, wherein the first film is disposed on the first current collector and is provided with a first recess configured to receive the first lead, and the first lead is electrically connected to the first current collector;

a first insulating glue layer, disposed on a first location of a surface of the first lead;

a second plate comprising a second current collector, a second film and a second lead, wherein the second film is disposed on the second current collector and is provided with a second recess configured to receive the second lead, and the second lead is electrically connected to the second current collector; and

a separator disposed between the first plate and the second plate;

wherein a length of a portion of the first lead in the first recess is less than a width of a remaining portion of the first film from an edge of the first insulating glue layer covering the first film to an edge of the first film opposite to the first recess; and a second insulating glue layer is disposed on a second location of the surface of the first film ~~corresponding~~ opposite to the second lead across the separator in a thickness direction of the first plate and the second plate and there is no insulating glue layer disposed on the surface of the second film opposite to the first lead across the separator in the thickness direction of the first plate and the second plate;

the first plate is a positive plate, the first current collector is a positive current collector, the first film is a positive film, the first lead is a positive lead; and

the second plate is a negative plate, the second current collector is a negative current collector, the second film is a negative film and the second lead is a negative lead.

20. (Currently Amended) A lithium-ion battery, comprising:

a positive electrode comprising a positive current collector and a positive electrode active material layer containing $LiCoO_2$, wherein the positive electrode active material layer is formed on the positive current collector, the positive electrode active material layer being provided with a first recess accommodating a positive lead being coupled with the positive current collector;

a negative electrode comprising a negative current collector and a negative electrode active material layer containing graphite or silicon, wherein the negative electrode active material layer is formed on the negative current collector, the negative electrode active material layer being provided with a second recess accommodating a negative lead being coupled with the negative current collector;

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

an electrolyte,

wherein, a top surface of the positive lead is provided with a first insulating glue layer, a surface of the positive electrode active material layer opposite to the second recess across the separator in a thickness direction of the positive plate and the negative plate is pasted with a second insulating glue layer, the second insulating glue layer has a width larger than a width of the second recess, and the second insulating glue layer has a length larger than a length of the second recess, and there is no insulating glue layer disposed on the surface of the negative electrode active material layer opposite to the second lead across the separator in the thickness direction of the positive plate and the negative plate.

Barton, Jason

From: Barton, Jason
Sent: Thursday, May 4, 2023 12:48 PM
To: Sun, Yalei
Subject: RE: Phone Interview Agenda for US Application No. 17/407,081

Hi Mr. Sun,

These amendments will advance prosecution of both applications and are supported by the specification. Since we ended up discussing both applications today I will submit an interview summary in both cases.

Please let me know if you have any further questions. Otherwise, I look forward to reviewing the amendments upon formal filing. Thank you.

Best regards,

Jason Barton
Junior Patent Examiner | AU 1721
Email: jason.barton@uspto.gov
Ph.: (571)-270-3551

From: Sun, Yalei <yalei.sun@morganlewis.com>
Sent: Thursday, May 4, 2023 12:32 PM
To: Barton, Jason <Jason.Barton@uspto.gov>
Subject: RE: Phone Interview Agenda for US Application No. 17/407,081

CAUTION: This email has originated from a source outside of USPTO. **PLEASE CONSIDER THE SOURCE** before responding, clicking on links, or opening attachments.

Examiner Barton,

Thanks for your time for having the phone interview.

Please find the proposed amendments to claim 1 of the '081 application and claim 20 of the '755 application (which has incorporated claim 21).

I highlighted the claim language we discussed today during the phone interview.

Thanks,

Yalei Sun | 孙亚雷
Morgan, Lewis & Bockius LLP
1400 Page Mill Road | Palo Alto, CA 94304
Direct: +1.650.843.7558 | Main: +1.650.843.4000 | Fax: +1.650.843.4001
yalei.sun@morganlewis.com | www.morganlewis.com
Assistant: Cheryl A. Rogers | +1.650.843.7839 | cheryl.rogers@morganlewis.com

From: Barton, Jason <jason.Barton@uspto.gov>
Sent: Monday, May 1, 2023 9:02 AM
To: Sun, Yalei <yalei.sun@morganlewis.com>
Subject: RE: Phone Interview Agenda for US Application No. 17/407,081

[EXTERNAL EMAIL]
Hi Mr. Sun,

I just sent you a meeting request for 11:00 AM PT on Thursday.

Best regards,

Jason Barton
Junior Patent Examiner | AU 1721
Email: jason.barton@uspto.gov
Ph.: (571)-270-3551

From: Sun, Yalei <yalei.sun@morganlewis.com>
Sent: Monday, May 1, 2023 9:58 AM
To: Barton, Jason <jason.Barton@uspto.gov>
Subject: RE: Phone Interview Agenda for US Application No. 17/407,081

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Examiner Barton,

I got your voicemail.

I am available for the phone interview on Wednesday or Thursday morning before 12 PM PT.

Please let me know if this works for you.

Thanks,
Yalei Sun | 孙亚雷
Morgan, Lewis & Bockius LLP
1400 Page Mill Road | Palo Alto, CA 94304
Direct: +1.650.843.7558 | Main: +1.650.843.4000 | Fax: +1.650.843.4001
yalei.sun@morganlewis.com | www.morganlewis.com
Assistant: Cheryl A. Rogers | +1.650.843.7839 | cheryl.rogers@morganlewis.com

From: Barton, Jason <jason.Barton@uspto.gov>
Sent: Sunday, April 30, 2023 8:15 PM
To: Sun, Yalei <yalei.sun@morganlewis.com>
Subject: RE: Phone Interview Agenda for US Application No. 17/407,081

[EXTERNAL EMAIL]

Hi Mr. Sun,

I apologize but I need to cancel our interview for tomorrow.

I will contact you on Monday to reschedule. If you don't hear from me, please give me a call. Thanks.

Best regards,

Jason Barton
Junior Patent Examiner | AU 1721
Email: jason.barton@uspto.gov
Ph.: (571)-270-3551

From: Barton, Jason
Sent: Wednesday, April 19, 2023 1:06 PM
To: Sun, Yalei <yalei.sun@morganlewis.com>
Subject: RE: Phone Interview Agenda for US Application No. 17/407,081

Mr. Sun,

Sure, I just sent you a MS Teams meeting invite for 4 PM ET next Monday, April 24.

Best regards,

Jason Barton
Junior Patent Examiner | AU 1721
Email: jason.barton@uspto.gov
Ph.: (571)-270-3551

From: Sun, Yalei <yalei.sun@morganlewis.com>
Sent: Wednesday, April 19, 2023 12:20 PM
To: Barton, Jason <Jason.Barton@uspto.gov>
Subject: RE: Phone Interview Agenda for US Application No. 17/407,081

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Examiner Barton,

How about 4 PM ET, 1 PM PT on Monday, April 24? Is it okay if we can discuss this case over Teams?

Thanks,

Yalei Sun | 孙亚雷
Morgan, Lewis & Bockius LLP
1400 Page Mill Road | Palo Alto, CA 94304
Direct: +1.650.843.7558 | Main: +1.650.843.4000 | Fax: +1.650.843.4001
yalei.sun@morganlewis.com | www.morganlewis.com
Assistant: Cheryl A. Rogers | +1.650.843.7839 | cheryl.rogers@morganlewis.com

From: Barton, Jason <jason.Barton@uspto.gov>
Sent: Wednesday, April 19, 2023 10:39 AM
To: Sun, Yalei <yalei.sun@morganlewis.com>
Subject: RE: Phone Interview Agenda for US Application No. 17/407,081

[EXTERNAL EMAIL]
Hi Mr. Sun,

Do you have availability between 2:00-4:30 PM ET for an interview on next Monday, April 24th?

Best regards,

Jason Barton
Junior Patent Examiner | AU 1721
Email: jason.barton@uspto.gov
Ph.: (571)-270-3551

From: Sun, Yalei <yalei.sun@morganlewis.com>
Sent: Saturday, April 15, 2023 5:44 PM
To: Barton, Jason <jason.Barton@uspto.gov>
Subject: RE: Phone Interview Agenda for US Application No. 17/407,081

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Examiner Barton,

I am following up with you about the outstanding OA.

Last week, I left you a voicemail to have a phone interview for the above-identified matter.

Attached is a 1.132 declaration from Mr. Tao TAO, the first inventor of the pending application. I would like to discuss it with you during the phone interview.

Thanks,
Yalei Sun | 孙亚雷
Morgan, Lewis & Bockius LLP
1400 Page Mill Road | Palo Alto, CA 94304
Direct: +1.650.843.7558 | Main: +1.650.843.4000 | Fax: +1.650.843.4001
yalei.sun@morganlewis.com | www.morganlewis.com
Assistant: Cheryl A. Rogers | +1.650.843.7839 | cheryl.rogers@morganlewis.com

From: Sun, Yalei
Sent: Monday, September 12, 2022 5:47 PM
To: jason.barton@uspto.gov
Subject: Phone Interview Agenda for US Application No. 17/407,081

Examiner Barton,

Please find the phone interview agenda for this matter.

Looking forward to talking to you on Wednesday at 1 PM ET and 10 AM PT.

Thanks,

Yalei Sun | 孙亚雷
Morgan, Lewis & Bockius LLP
1400 Page Mill Road | Palo Alto,CA 94304
Direct: +1.650.843.7558 | Main:+1.650.843.4000 | Fax: +1.650.843.4001
yalei.sun@morganlewis.com| www.morganlewis.com
Assistant: Cheryl A. Rogers |+1.650.843.7839 | cheryl.rogers@morganlewis.com

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Application of:	Tao Tao et al.	Confirmation No.:	2876
Serial No.:	17/407,081	Art Unit:	1721
Filed:	August 19, 2021	Examiner:	Barton, Jason Aaron
For:	*Lithium-Ion Battery Having Desirable Safety Performance*	Attorney Docket No.:	024607-02-5113-US

DECLARATION OF TAO TAO UNDER 37 C.F.R. § 1.132

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

I, TAO TAO, declare that:

1. I am currently employed at the department of battery core design of Amperex Technology Co., Limited (ATL). My current title is Senior Manager.
2. I have a technical background in support of the statements made herein below. My qualifications include a BS degree and a MS degree at Harbin Engineering University, majoring in chemical engineering and approximately 14 years of experience developing secondary batteries. I have been listed as a named inventor for 13 US and Chinese patents/patent applications.
3. I am familiar with the instant application, Serial No. 16/453,789, and am listed as the first-named inventor.
4. I have read and reviewed the English translation of JP 2007165224A (Atsuo), which was cited by the Examiner.
5. I intend this declaration to highlight, for the Examiner's consideration, the differences between (i) the technical problem addressed by the pending

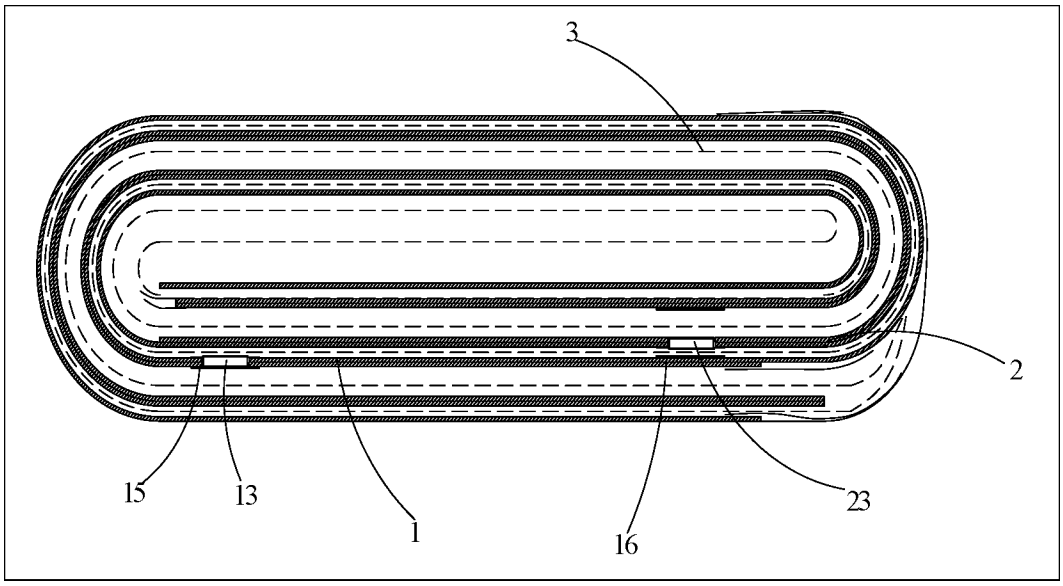
application and its associated solution covered by the pending claims and (ii) the technical problem addressed by Atsuo.

6. The experimental data, as discussed in paragraphs [0005], [0024], and [0078] of the instant application and illustrated in Table 1 of the instant application, demonstrates that there is a strong correlation between internal short circuit and lithium precipitation in the conventional design of secondary battery (e.g., Comparative Example 1). For reference, Table 1 of the instant application is reproduced below (with emphasis).

Table 1 **Short circuit** and **lithium precipitation** on the negative plate occurs to lithium-ion batteries according to Examples 1 to 3 and Comparative Example 1 after cycle test

Group	Number of batteries occurring **short circuit** after 300 cycles	Number of batteries occurring **lithium precipitation** on the negative plate after 100 cycles
Example 1	0	0
Example 2	0	1
Example 3	1	0
Comparative Example 1	**5**	**7**

7. It is my personal knowledge and belief that one cause behind the frequent short circuits occurring in the Comparative Example 1 is that "[t]he surface of the positive film 12 corresponding to the second recess 24 has **no second insulating glue layer 16** pasted thereon." [0074] of the instant application. For reference, FIG. 5 of the instant application is reproduced below to highlight the location of the second insulating glue layer 16 according to the invention of the instant application.



8. During the charging process of a lithium-ion battery, lithium ions migrate from the positive plate 1 to the negative plate 2 through the electrolyte and the separator (represented by the dashed line in FIG. 5). At the negative plate 2, the lithium ions become embedded in the porous electrode material in a process known as intercalation. But when there is not sufficient amount of porous electrode material at the negative plate 2 for intercalating the lithium ions, the extra amount of lithium ions end up being combined with electrons on the surface of the negative plate 2, therefore triggering lithium precipitation.
9. As shown in FIG. 5 of the instant application above, the negative film of the negative plate 2 corresponding to the location of the negative lead 23 has been removed to form the second recess 24 for hosting the negative lead 23. Therefore, there is a reduction of negative active material on the negative plate 2 when compared with the positive active material on the positive plate 1 located on other side of the second insulating glue layer 16. Without the second insulating glue layer 16 covering the surface of the positive plate 1 at the location specified in the claim 1 of the instant application, an extra amount of lithium ions would arrive at the surface of the negative plate 2 and result in lithium precipitation near the negative lead 23.
10. In contrast, with the second insulating glue layer 16 covering the surface of the positive plate 1 at the location specified in the claim 1 of the instant application,

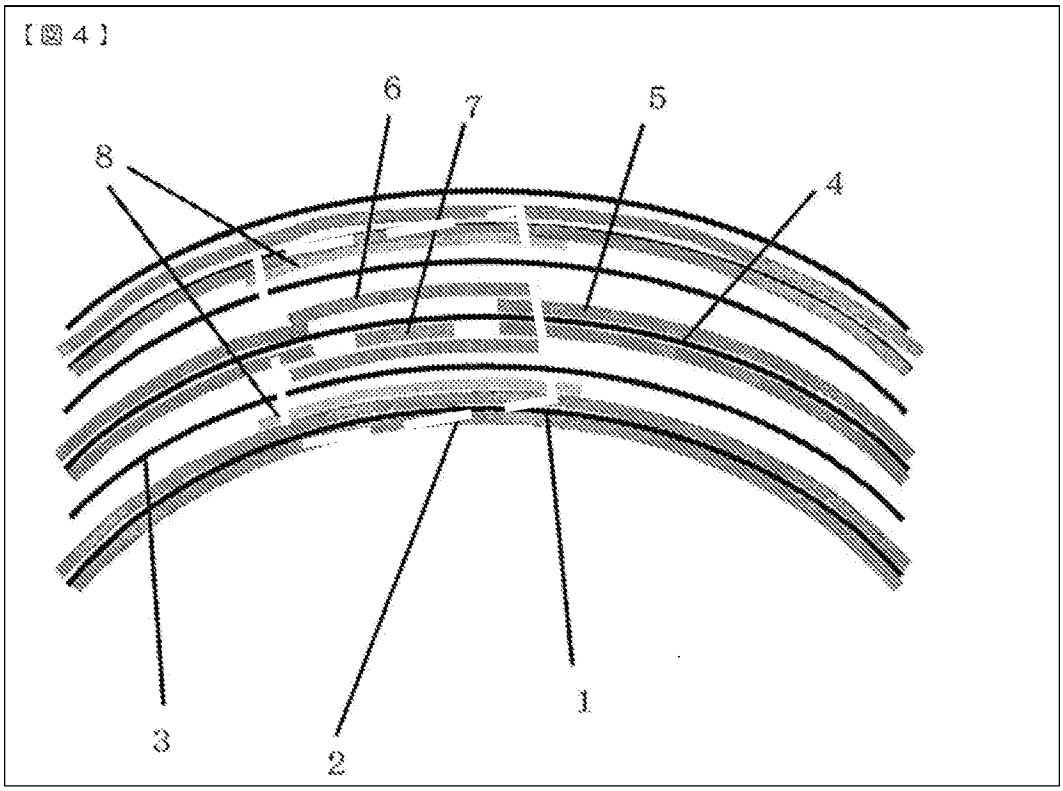
most of lithium ions in the positive active material of the positive plate 1 covered by the second insulating glue layer 16 would not be able to arrive at the surface of the negative plate 2 and cause lithium precipitation on the negative plate 2 near the negative lead 23.

11. It is my understanding and belief that our innovative secondary battery design of deploying the second insulating glue layer 16 on the surface of the positive plate 1 opposite to the second recess 24 across the separator as claimed in the independent claim 1 is the key to the significant reduction of internal short circuit as demonstrated by the experimental data shown in Table 1 above, which is the result of 1 year of complicated and extensive design and experimentation.
12. It is my understanding and belief that the technical problem addressed by Atsuo is different from ours as described above. For reference, the English translation of the "problem to be solved" and the "solution" of the abstract Atsuo is provided below (with emphasis):

> "Problem to be solved - When an **internal short circuit occurs between the uncoated part of the positive current collector and the negative electrode plate coated with negative active material**, a large current may flow and there is a possibility of causing a significant decrease in open circuit voltage and generating heat."
>
> "Solution - In a non-aqueous electrolyte secondary battery with an electrode group wound via a separator, comprising a positive electrode plate coated with a positive active material and a negative electrode plate coated with a negative active material on a negative current collector, an uncoated part is provided on the positive electrode plate except for the longitudinal end. **A positive lead is connected to the uncoated part of the positive electrode plate, the positive lead is covered with tape, and a heat-resistant protective film is formed on the surface of the negative electrode plate facing the uncoated part of the positive electrode plate.**"

13. As highlighted above and illustrated in FIG. 4 of Atsuo (reproduced below with annotation), the location of the short circuit to be addressed by Atsuo is near the uncoated part of the **positive current collector** 4 and the **negative electrode plate** 1 coated with negative active material 2. Note that this location is completely opposite to the location of internal short circuit to be addressed by the instant application, i.e., near the uncoated part of the **negative current collector**

21 (i.e., location of the second recess 24) and the **positive plate** 1 coated with positive active material.



14. More importantly, it is well-known in the art that, during the charging process of a lithium battery depicted in FIG. 4 of Atsuo, lithium precipitation would only occur on the surface of the negative electrode plate 1 during the charging process because of the extra amount of lithium ions that cannot be intercalated in the negative electrode material 2. But as shown in FIG. 4 above, because the portion of the positive current collector 4 is uncoated, there would be **no** extra amount of lithium ions coming from the positive electrode arriving at the surface of the negative electrode plate, with or without the porous insulating film 8 formed on the surface of the negative electrode plate facing the uncoated part of the positive electrode plate.
15. Further, the heat-resistant protective film taught by Atsuo is **porous** in nature. For example, paragraphs [0043]-[0044] of Atsuo teach specific ways of forming a porous heat-resistant protective film on the negative electrode plate using alumina or titania particles of certain dimensions (e.g., 0.3μm). The porosity of the heat-

resistant protective film cannot prevent the lithium ions from moving through to cause lithium precipitation on the surface of the negative electrode plate of Atsuo.

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the application, any patent issuing thereon, or any patent to which this verified statement is directed.

Respectfully submitted,

Date: _____ _____

TAO, Tao

PTO/SB/06 (09-11)
Approved for use through 1/31/2014. OMB 0651-0032
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
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PATENT APPLICATION FEE DETERMINATION RECORD Substitute for Form PTO-875	Application or Docket Number 17/746,755	Filing Date 05/17/2022	☐ To be Mailed

ENTITY: ☑ LARGE ☐ SMALL ☐ MICRO

APPLICATION AS FILED - PART I

FOR	(Column 1) NUMBER FILED	(Column 2) NUMBER EXTRA		RATE ($)	FEE ($)
☐ BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A		N/A	
☐ SEARCH FEE (37 CFR 1.16(k), (i), or (m))	N/A	N/A		N/A	
☐ EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A		N/A	
TOTAL CLAIMS (37 CFR 1.16(i))	minus 20 =	*		x $100 =	
INDEPENDENT CLAIMS (37 CFR 1.16(h))	minus 3 =	*		x $480 =	
☐ APPLICATION SIZE FEE (37 CFR 1.16(s))	If the specification and drawings exceed 100 sheets of paper, the application size fee due is $310 ($155 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).				
☐ MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))					
* If the difference in column 1 is less than zero, enter "0" in column 2.				TOTAL	

APPLICATION AS AMENDED - PART II

		(Column 1)		(Column 2)	(Column 3)			
AMENDMENT	06/29/2023	CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA		RATE ($)	ADDITIONAL FEE ($)
	Total (37 CFR 1.16(i))	* 20	Minus	** 20	= 0		x $100 =	0
	Independent (37 CFR 1.16(h))	* 2	Minus	*** 3	= 0		x $480 =	0
	☐ Application Size Fee (37 CFR 1.16(s))							
	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							
							TOTAL ADD'L FEE	0

		(Column 1)		(Column 2)	(Column 3)			
AMENDMENT		CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA		RATE ($)	ADDITIONAL FEE ($)
	Total (37 CFR 1.16(i))	*	Minus	**	=		x $0 =	
	Independent (37 CFR 1.16(h))	*	Minus	***	=		x $0 =	
	☐ Application Size Fee (37 CFR 1.16(s))							
	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							
							TOTAL ADD'L FEE	

* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.	LIE
** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".	/NINA RATANAVONG/
*** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3".	
The "Highest Number Previously Paid For" (Total or Independent) is the highest number found in the appropriate box in column 1.	

This collection of information is required by 37 CFR 1.16. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

Electronically filed June 29, 2023

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Application of:	Tao Tao et al.	Confirmation No.:	8911
Serial No.:	17/746,755	Art Unit:	1721
Filed:	May 17, 2022	Examiner:	Barton, Jason Aaron
For:	*Lithium-Ion Battery Having Desirable Safety Performance*	Attorney Docket No.:	024607-02-5119-US

AMENDMENT AND RESPONSE TO NON-FINAL OFFICE ACTION

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

The enclosed Amendment is in response to the Office Action dated March 31, 2023 for the above-identified patent application.

The Commissioner is hereby authorized to charge any required fee(s) to Morgan, Lewis & Bockius LLP Deposit Account No. 50-0310 (order no. 024607-02-5119-US).

Amendments to the Specification

Please revise the specification as follows:

Please amend paragraphs **[0026]** and **[0027]** as follows:

[0026] FIG. 2 depicts an exemplary [[front]] top view of a ~~negative~~ positive plate of a lithium-ion battery according to one embodiment of the present disclosure;

[0027] FIG. 3 depicts an exemplary [[top]] front view of a ~~positive~~ negative plate of a lithium-ion battery according to one embodiment of the present disclosure;

Amendments to the Claims

The following listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1-19. (Canceled)

20. (Previously Presented) A lithium-ion battery, comprising:

a positive electrode comprising a positive current collector and a positive electrode active material layer containing $LiCoO_2$, wherein the positive electrode active material layer is formed on the positive current collector, the positive electrode active material layer being provided with a first recess accommodating a positive lead being coupled with the positive current collector;

a negative electrode comprising a negative current collector and a negative electrode active material layer containing graphite or silicon, wherein the negative electrode active material layer is formed on the negative current collector, the negative electrode active material layer being provided with a second recess accommodating a negative lead being coupled with the negative current collector;

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

an electrolyte,

wherein, a top surface of the positive lead is provided with a first insulating glue layer, a surface of the positive electrode active material layer opposite to the second recess across the separator in a thickness direction of the positive plate and the negative plate is pasted with a second insulating glue layer, the second insulating glue layer has a width larger than a width of the second recess, and the second insulating glue layer has a length larger than a length of the second recess.

21. (Previously Presented) The lithium-ion battery of claim 20, wherein a distance between a center of the first recess and one end of the positive electrode active material layer is 1/4-3/4 of a length of the positive electrode active material layer; and a distance between a center of the second recess and one end of the negative electrode active material layer is 1/4-3/4 of a length of the negative electrode active material layer.

22. (Previously Presented) The lithium-ion battery of claim 21, wherein, the distance between the center of the first recess and the one end of the positive electrode active material layer is half of the length of the positive electrode active material layer; and the distance between the center of the second recess and the one end of the negative electrode active material layer is half of the length of the negative electrode active material layer.

23. (Previously Presented) The lithium-ion battery of claim 22, wherein the first recess has a length of 1-100 mm less than a length of the positive lead, the first recess has a width of 1-10 mm larger than a width of the positive lead, the second recess has a length of 1-100 mm less than a length of the negative lead, and the second recess has a width of 1-10 mm larger than a width of the negative lead.

24. (Previously Presented) The lithium-ion battery of claim 20, wherein the first recess has a length of 1-100 mm less than a width of the positive electrode active material layer, and the second recess has a length of 1-100 mm less than a width of the negative electrode active material layer.

25. (Previously Presented) The lithium-ion battery of claim 20, wherein the first recess has a depth of 0.005-0.1 mm larger than a thickness of the positive lead, and the second recess has a depth of 0.005-0.1 mm larger than a thickness of the negative lead.

26. (Previously Presented) The lithium-ion battery of claim 20, wherein a length of a portion of the positive lead in the first recess is less than a width of a remaining portion of the positive electrode active material layer from an edge of the first insulating glue layer covering the positive electrode active material layer to an edge of the positive electrode active material layer opposite to the first recess.

27. (Previously Presented) The lithium-ion battery of claim 20, wherein a width of a portion of the positive lead in the first recess is greater than a width of a remaining portion of the first recess not occupied by the positive lead located on one side of the positive lead.

28. (Canceled)

29. (Currently Amended) A lithium-ion battery, comprising:

a positive electrode, comprising a positive current collector and a positive electrode active material layer being formed on the positive current collector, the positive electrode

active material layer being provided with a first recess accommodating a positive lead being coupled with the positive current collector;

a negative electrode, comprising a negative current collector and a negative electrode active material layer being formed on the negative current collector, the negative electrode active material layer being provided with a second recess accommodating a negative lead being coupled with the negative current collector;

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

an electrolyte,

wherein, a first location of a top surface of the positive lead is provided with a first insulating glue layer; a second location of a surface of the positive electrode active material layer opposite to the second recess across the separator in a thickness direction of the positive plate and the negative plate is pasted with a second insulating glue layer; a third location of a surface of the positive current collector opposite to the surface of the positive current collector where the positive lead ~~coupled~~ is covered with another first insulating glue layer; the second insulating glue layer has a width larger than a width of the second recess, and the second insulating glue layer has a length larger than a length of the second recess.

30. (Previously Presented) The lithium-ion battery of claim 29, wherein a distance between a center of the first recess and one end of the positive electrode active material layer is 1/4-3/4 of a length of the positive electrode active material layer, and a distance between a center of the second recess and one end of the negative electrode active material layer is 1/4-3/4 of a length of the negative electrode active material layer.

31. (Previously Presented) The lithium-ion battery of claim 29, wherein a distance between a center of the first recess and one end of the positive electrode active material layer is half of a length of the positive electrode active material layer, and a distance between a center of the second recess and one end of the negative electrode active material layer is half of a length of the negative electrode active material layer.

32. (Previously Presented) The lithium-ion battery of claim 29, wherein the first recess has a length of 1-100mm less than a length of the positive lead, the first recess has a width of 1-10mm larger than a width of the positive lead, the second recess has a length of 1-100mm less than a length of the negative lead, and the second recess has a width of 1-10mm larger than a width of the negative lead.

33. (Previously Presented) The lithium-ion battery of claim 29, wherein the first recess has a length of 1-100mm less than a width of the positive electrode active material layer, and the second recess has a length of 1-100mm less than a width of the negative electrode active material layer.

34. (Previously Presented) The lithium-ion battery of claim 29, wherein the first recess has a depth of 0.005-0.1mm larger than a thickness of the positive lead, and the second recess has a depth of 0.005-0.1mm larger than a thickness of the negative lead.

35. (Previously Presented) The lithium-ion battery of claim 29, wherein a length of a portion of the positive lead in the first recess is less than a width of a remaining portion of the positive electrode active material layer from an edge of the first insulating glue layer covering the positive electrode active material layer to an edge of the positive electrode active material layer opposite to the first recess.

36. (Previously Presented) The lithium-ion battery of claim 29, wherein a width of a portion of the positive lead in the first recess is greater than a width of a remaining portion of the first recess not occupied by the positive lead located on one side of the positive lead.

37. (Previously Presented) A lithium-ion battery, comprising:

a positive electrode, comprising a positive current collector and a positive electrode active material layer being formed on the positive current collector, the positive electrode active material layer being provided with a first recess accommodating a positive lead being coupled with the positive current collector;

a negative electrode, comprising a negative current collector and a negative electrode active material layer being formed on the negative current collector, the negative electrode active material layer being provided with a second recess accommodating a negative lead being coupled with the negative current collector;

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

an electrolyte,

wherein, a first location of a top surface of the positive lead is provided with a first insulating glue layer; a second location of a surface of the positive electrode active material layer opposite to the second recess across the separator in a thickness direction of the positive plate and the negative plate is pasted with a second insulating glue layer; the second

insulating glue layer has a width larger than a width of the second recess, and the second insulating glue layer has a length larger than a length of the second recess.

38. (Currently Amended) The lithium-ion battery of claim 37, wherein a length of a portion of the first lead in the first recess is less than a width of a remaining portion of [[the]] a first film from an edge of the first insulating glue layer covering the first film to an edge of the first film opposite to the first recess.

39. (Previously Presented) The lithium-ion battery of claim 37, wherein a width of a portion of the first lead in the first recess is greater than a width of a remaining portion of the first recess not occupied by the first lead located on one side of the first lead.

40. (New) The lithium-ion battery of claim 20, wherein two insulating layers are disposed on two opposite surfaces of the positive plate, and a winding end of the negative plate is located between the two insulating layers; and the two insulating layers extend over the winding end of the negative plate along the winding direction.

41. (New) The lithium-ion battery of claim 29, wherein two insulating layers are disposed on two opposite surfaces of the positive plate, and a winding end of the negative plate is located between the two insulating layers; and the two insulating layers extend over the winding end of the negative plate along the winding direction.

42. (New) The lithium-ion battery of claim 37, wherein two insulating layers are disposed on two opposite surfaces of the positive plate, and a winding end of the negative plate is located between the two insulating layers; and the two insulating layers extend over the winding end of the negative plate along the winding direction.

REMARKS

This amendment responds to the office action mailed March 31, 2023. In the office action, the Examiner:

- rejected claim 38 under 35 U.S.C. § 112(b) as being indefinite for failing to particularly point out and distinctly claim the subject matter;
- rejected claims 20-27 and 37-39 under 35 U.S.C. 103 as being unpatentable over Sugita et al. (WO 2013/038677), in view of Matsushita et al. (U.S. Patent Publication No. 2014/0120417), and Atsuo (Yoneda) et al. (JP 2007165224A); and
- rejected claims 29-36 under 35 U.S.C. 103 as being unpatentable over Sugita, in view of Matsushita, Atsuo, and Kwak et al. (U.S. Patent Publication No. 2006/0051662).

INTERVIEW SUMMARY

Applicant's attorneys thank Examiners Barton for the opportunity to discuss the application during a telephone interview on May 4, 2023 with Yalei Sun. In the interview, the Examiner and the Applicant discussed the draft declaration of Tao TAO. Although no agreement was reached, the Applicant thanks the Examiner for his time and suggestion.

REMARKS CONCERNING SPECIFICATION

Applicant's attorney submits that corrections to typos in paragraphs [0026] and [0027] are submitted with this response.

REMARKS CONCERNING CLAIMS

Claims 29 and 38 have been amended.

Claims 40-42 have been added.

Support for the amendments can be found in at least FIGS. 1 and 5 and related paragraphs of the application as filed. No new matter has been added.

With respect to all amendments, Applicant has not dedicated or abandoned any unclaimed subject matter. Moreover, Applicant has not acquiesced to any characterizations of the invention, nor any rejections or objections of the claims, made by the Examiner.

Moreover, the Applicant hereby rescinds any prior disclaimer of claim scope, to the extent they exist, made during the prosecution of this application or made during the prosecution of any patent or other related patents/applications, and advises the Examiner that any such previous disclaimers and the cited references that they were made to avoid may need to be revisited.

After entry of this amendment, the pending claims are: claims 20-27 and 29-42.

REMARKS CONCERNING REJECTIONS UNDER 35 U.S.C. 112

I. REJECTION OF CLAIM 38 UNDER 35 U.S.C. 112(B) AS BEING INDEFINITE FOR FAILING TO PARTICULARLY POINT OUT AND DISTINCTLY CLAIM THE SUBJECT MATTER.

Claim 38 has been amended to recite "a first film" instead of "the first film," to correct the antecedent basis for the term. In light of so, the Applicant respectfully submits that the rejection of claim 38 should be withdrawn.

REMARKS CONCERNING REJECTIONS UNDER 35 U.S.C. 103

II. REJECTION OF CLAIMS 20-27 AND 37-39 UNDER 35 U.S.C. 103 AS BEING UNPATENTABLE OVER SUGITA, IN VIEW OF MATSUSHITA AND ATSUO.

III. REJECTION OF CLAIMS 29-36 UNDER 35 U.S.C. 103 AS BEING UNPATENTABLE OVER SUGITA, IN VIEW OF MATSUSHITA, ATSUO, AND KWAK.

In the office action (pp. 8-9), the Examiner argued as follows:

> Atsuo does not specifically teach a surface of the positive electrode active material layer opposite to the second recess across the separator in a thickness direction of the positive plate in the negative plate. Rather, the opposite configuration is used as claimed by Applicant. However, Atsuo does not specifically teach that the prevention of short-circuiting is limited to when the negative electrode plate is covered with the alleged second insulating layer. Accordingly, the skilled person would have modified Sugita with Atsuo to include either (1) the second insulating layer on the positive electrode active material or, and perhaps more likely, (2) the second insulating layer on both of the positive electrode active material and the negative electrode active material (i.e., both electrode leads are protected by inclusion of the alleged second insulating layer).

Thus, it would have been obvious before the effective filing date of the claimed invention to incorporated the second insulating glue layer (porous insulating film 8) of Atsuo with Sugita to arrive at the claimed invention. In modifying Sugita with Atsuo, the skilled person would have arrived at the claimed invention wherein a surface of the positive electrode active material layer opposite to the second recess across the separator in a thickness direction of the positive plate and the negative plate is pasted with a second insulating glue layer, the second insulating glue layer has a width larger than a width of the second recess, and the second insulating glue layer has a length larger than a length of the second recess. The skilled person would have been motivated to combine Sugita with Atsuo to prevent short-circuiting (Atsuo, pg. 7, §9).

The Applicant respectfully disagrees.

1. The claimed invention should be considered as a whole.

In determining obviousness, both pre-AIA and AIA §103 expressly require that the Examiner should consider the claimed invention "as a whole."

First, as illustrated in FIG. 4 of Atsuo (reproduced below), the porous insulating film 8 is **not** disposed on the surface of the positive film as required by the pending claims. Rather, the porous insulating film 8 is disposed on the surface of the negative film (i.e., the negative active material 2 disposed on the negative current collector 1).

According to Atsuo, the porous insulating film 8 is a **heat-resistant protective film** and its function is to "suppress heat generation **at the time of an internal short circuit** occurring between the uncoated portion of the positive electrode current collector and the negative electrode plate coated with the negative electrode active material, which is most likely to generate heat" Atsuo, [0010].

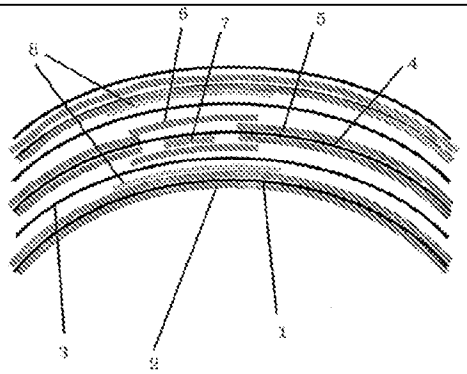


FIG. 4 of Atsuo

Actually, nowhere in Atsuo teaches that the alleged insulating glue layer of Atsuo can be disposed on the positive electrode active material, not to mention that the alleged insulating glue layer of Atsuo can be disposed on both of the positive electrode active material and the negative electrode active material. For example, although the term "short circuit" or the like appears 16 times in Atsuo, they are all directed to the internal short circuit between the uncoated portion of the positive electrode current collector and the negative electrode plate coated with the negative electrode active material, which may result in "a large amount of current flows, which can lead to a large drop in open circuit voltage and abnormal heat generation". Atsuo, [0004].

In the office action, the Examiner improperly disregards the "as a whole" statutory mandate. MPEP 2141.02. See *Jones v. Hardy*, 727 F.2d 1524, 1530 (Fed. Cir. 1984); *Ruiz v. A.B. Chance Co.*, 357 F.3d 1270, 1275 (Fed. Cir. 2004)

> The "as a whole" instruction in title 35 prevents evaluation of the invention part by part. … **This form of hindsight reasoning, using the invention as a roadmap to find its prior art components, would discount the value of combining various existing features or principles in a new way to achieve a new result - often the very definition of invention**. (*emphasis added*)

2. The Examiner fails to show a reasonable motivation to modify Atsuo to arrive at the claimed invention because Atsuo addresses a very different technical problem.

First, a table is provided below to illustrate the differences between Atsuo and the present application in at least three different aspects.

	Atsuo	**The present application**
Cause of short circuit	Burrs on the **positive** electrode lead may penetrate the separator	Lithium precipitation on the surface of the **negative** plate near the negative lead
Before or after short circuit	The porous insulating film 8 suppresses heat **after** the short circuit has occurred.	The second insulating glue layer functions to prevent the short circuit from occurring.
Material of the insulating layer	The large porosity of the porous insulating film 8 **cannot** prevent the movement of lithium ions across the separator even if it was disposed on the surface of the positive film.	The second insulating glue layer can prevent the movement of lithium ions across the separator even if it was disposed on the surface of the positive film.

Second, as explained in the attached declaration by Mr. Tao TAO, the porous insulating film 8 disposed on the surface of the negative electrode plate in Atsuo is **not reciprocal** (as suggested by the Examiner) **of** the second insulating glue layer disposed on the surface of the positive film in the present application. In other words, one of ordinary skill in the art, after reading Atsuo as well as the other two references, would not be motivated to dispose the porous insulating film 8 on the surface of the positive film with a reasonable expectation of likelihood of success.

Even arguendo, if a person skilled in the art provides the heat insulation film of Atsuo on the surface of the positive active material layer (as asserted by the Examiner), the heat insulation layer of Atsuo being porous will not be able to achieve the function of stopping the lithium ions from crossing over and preventing short circuit as achieved by the invention as claimed in the instant application.

In view of the above, the Applicant respectfully submits that the pending independent claims 1 and 10 as well as their respective dependent claims 20-27 and 29-39 are patentable over the cited references.

REMARKS CONCERNING NEW CLAIMS 40-42

Claims 40-42 further recite the structure of the winding ends of the positive plate and the negative plate, wherein "the two insulating layers [at the winding end of the positive plate] extend over the winding end of the negative plate alone the winding direction" to provide additional protection for the negative plate. Because none of the cited references teach or suggest what is recited in claims 40-42, claims 40-42 are further patentable over the cited references.

CONCLUDING REMARKS

By responding in the foregoing remarks only to particular positions asserted by the examiner, the Applicant does not necessarily acquiesce in other positions that have not been explicitly addressed. In addition, the Applicant's arguments for the patentability of a claim should not be understood as implying that no other reasons for the patentability of that claim exist.

In light of the above amendments and remarks, the Applicant respectfully requests that the Examiner reconsider this application with a view towards allowance. The Examiner is invited to call the undersigned attorney at (650) 843-7558, if a telephone call could help resolve any remaining items.

Respectfully submitted,

Date: June 29, 2023

/Yalei Sun/ 57,765

Yalei Sun (Reg. No.)
MORGAN, LEWIS & BOCKIUS LLP
1400 Page Mill Road
Palo Alto, CA 94304
Phone: (650) 843-7558
E-mail: yalei.sun@morganlewis.com

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Application of:	Tao Tao et al.	Confirmation No.:	8911
Serial No.:	17/746,755	Art Unit:	1721
Filed:	May 17, 2022	Examiner:	Barton, Jason Aaron
For:	*Lithium-Ion Battery Having Desirable Safety Performance*	Attorney Docket No.:	024607-02-5119-US

DECLARATION OF TAO TAO UNDER 37 C.F.R. § 1.132

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

I, TAO TAO, declare that:

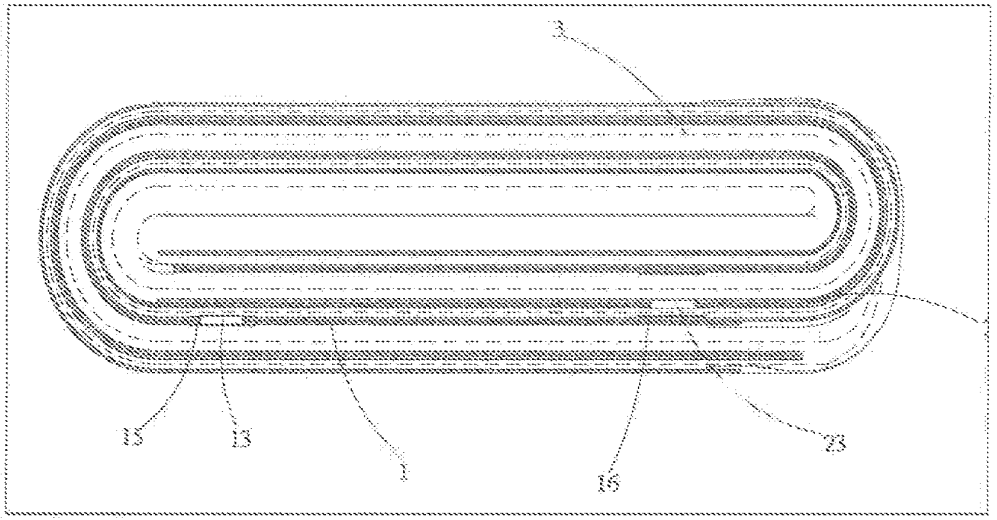
1. I am currently employed at the department of battery core design of Amperex Technology Co., Limited (ATL). My current title is Senior Manager.
2. I have a technical background in support of the statements made herein below. My qualifications include a BS degree and a MS degree at Harbin Engineering University, majoring in chemical engineering and approximately 14 years of experience developing secondary batteries. I have been listed as a named inventor for 13 US and Chinese patents/patent applications.
3. I am familiar with the instant application, Serial No. 16/453,789, and am listed as the first-named inventor.
4. I have read and reviewed the English translation of JP 2007165224A (Atsuo), which was cited by the Examiner.
5. I intend this declaration to highlight, for the Examiner's consideration, the differences between (i) the technical problem addressed by the pending application and its associated solution covered by the pending claims and (ii) the technical problem addressed by Atsuo.
6. The experimental data, as discussed in paragraphs [0005], [0024], and [0078] of the instant application and illustrated in Table 1 of the instant application,

demonstrates that there is a strong correlation between internal short circuit and lithium precipitation in the conventional design of secondary battery (e.g., Comparative Example 1). For reference, Table 1 of the instant application is reproduced below (with emphasis).

Table 1 **Short circuit** and **lithium precipitation** on the negative plate occurs to lithium-ion batteries according to Examples 1 to 3 and Comparative Example 1 after cycle test

Group	Number of batteries occurring **short circuit** after 300 cycles	Number of batteries occurring **lithium precipitation** on the negative plate after 100 cycles
Example 1	0	0
Example 2	0	1
Example 3	1	0
Comparative Example 1	8	7

7. It is my personal knowledge and belief that one cause behind the frequent short circuits occurring in the Comparative Example 1 is that "[t]he surface of the positive film 12 corresponding to the second recess 24 has **no second insulating glue layer 16** pasted thereon." [0074] of the instant application. For reference, FIG. 5 of the instant application is reproduced below to highlight the location of the second insulating glue layer 16 according to the invention of the instant application.



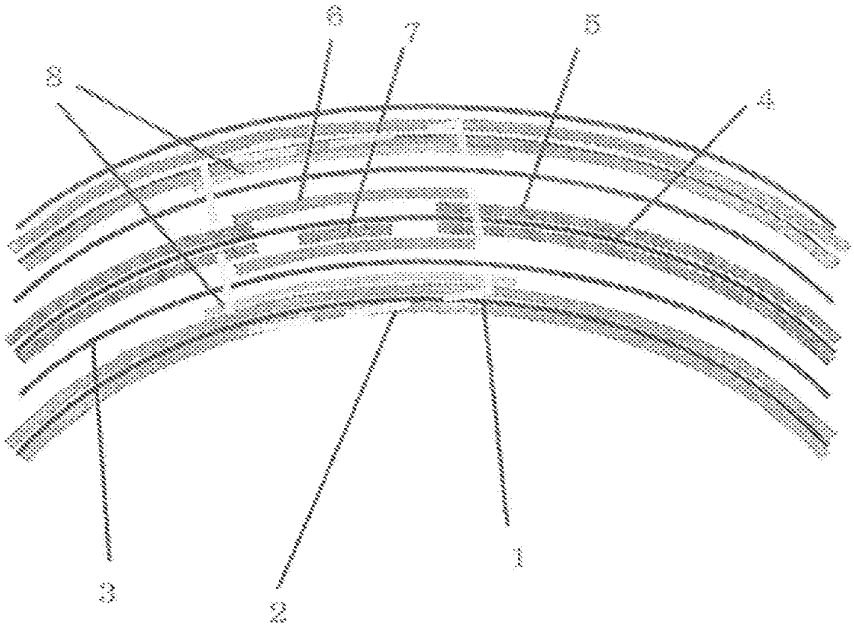
8. During the charging process of a lithium-ion battery, lithium ions migrate from the positive plate 1 to the negative plate 2 through the electrolyte and the separator (represented by the dashed line in FIG. 5). At the negative plate 2, the lithium ions become embedded in the porous electrode material in a process known as intercalation. But when there is not sufficient amount of porous electrode material at the negative plate 2 for intercalating the lithium ions, the extra amount of lithium ions end up being combined with electrons on the surface of the negative plate 2, therefore triggering lithium precipitation.
9. As shown in FIG. 5 of the instant application above, the negative film of the negative plate 2 corresponding to the location of the negative lead 23 has been removed to form the second recess 24 for hosting the negative lead 23. Therefore, there is a reduction of negative active material on the negative plate 2 when compared with the positive active material on the positive plate 1 located on other side of the second insulating glue layer 16. Without the second insulating glue layer 16 covering the surface of the positive plate 1 at the location specified in the claim 1 of the instant application, an extra amount of lithium ions would arrive at the surface of the negative plate 2 and result in lithium precipitation near the negative lead 23.
10. In contrast, with the second insulating glue layer 16 covering the surface of the positive plate 1 at the location specified in the claim 1 of the instant application, most of lithium ions in the positive active material of the positive plate 1 covered by the second insulating glue layer 16 would not be able to arrive at the surface of the negative plate 2 and cause lithium precipitation on the negative plate 2 near the negative lead 23.
11. It is my understanding and belief that our innovative secondary battery design of deploying the second insulating glue layer 16 on the surface of the positive plate 1 opposite to the second recess 24 across the separator as claimed in the independent claim 1 is the key to the significant reduction of internal short circuit as demonstrated by the experimental data shown in Table 1 above, which is the result of 1 year of complicated and extensive design and experimentation.
12. It is my understanding and belief that the technical problem addressed by Atsuo is different from ours as described above. For reference, the English

translation of the "problem to be solved" and the "solution" of the abstract Atsuo is provided below (with emphasis):

> "Problem to be solved - When an **internal short circuit occurs between the uncoated part of the positive current collector and the negative electrode plate coated with negative active material**, a large current may flow and there is a possibility of causing a significant decrease in open circuit voltage and generating heat."
>
> "Solution - In a non-aqueous electrolyte secondary battery with an electrode group wound via a separator, comprising a positive electrode plate coated with a positive active material and a negative electrode plate coated with a negative active material on a negative current collector, an uncoated part is provided on the positive electrode plate except for the longitudinal end. **A positive lead is connected to the uncoated part of the positive electrode plate, the positive lead is covered with tape, and a heat-resistant protective film is formed on the surface of the negative electrode plate facing the uncoated part of the positive electrode plate.**"

13. As highlighted above and illustrated in FIG. 4 of Atsuo (reproduced below with annotation), the location of the short circuit to be addressed by Atsuo is near the uncoated part of the **positive current collector** 4 and the **negative electrode plate** 1 coated with negative active material 2. Note that this location is completely opposite to the location of internal short circuit to be addressed by the instant application, i.e., near the uncoated part of the **negative current collector** 21 (i.e., location of the second recess 24) and the **positive plate** 1 coated with positive active material.

[図４]



14. More importantly, it is well-known in the art that, during the charging process of a lithium battery depicted in FIG. 4 of Atsuo, lithium precipitation would only occur on the surface of the negative electrode plate 1 during the charging process because of the extra amount of lithium ions that cannot be intercalated in the negative electrode material 2. But as shown in FIG. 4 above, because the portion of the positive current collector 4 is uncoated, there would be no extra amount of lithium ions coming from the positive electrode arriving at the surface of the negative electrode plate, with or without the porous insulating film 8 formed on the surface of the negative electrode plate facing the uncoated part of the positive electrode plate.

15. Further, the heat-resistant protective film taught by Atsuo is **porous** in nature. For example, paragraphs [0043]-[0044] of Atsuo teach specific ways of forming a porous heat-resistant protective film on the negative electrode plate using alumina or titania particles of certain dimensions (e.g., 0.3μm). The porosity of the heat-resistant protective film cannot prevent the lithium ions from moving through to cause lithium precipitation on the surface of the negative electrode plate of Atsuo.

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the application, any patent issuing thereon, or any patent to which this verified statement is directed.

Respectfully submitted,

Date: 2023/6/28 TAO, Tao

TAO, Tao

Electronic Acknowledgement Receipt

EFS ID:	48231083
Application Number:	17746755
International Application Number:	
Confirmation Number:	8911
Title of Invention:	LITHIUM-ION BATTERY HAVING DESIRABLE SAFETY PERFORMANCE
First Named Inventor/Applicant Name:	Tao TAO
Customer Number:	24341
Filer:	Yalei Sun
Filer Authorized By:	
Attorney Docket Number:	024607-02-5119-US
Receipt Date:	29-JUN-2023
Filing Date:	17-MAY-2022
Time Stamp:	17:34:05
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1		024607-02-5119-US_P2014010US5_RNFOA_132.pdf	1780982 808f132ded75a2656687c2762cab9688d0ae8b96	yes	19

	Multipart Description/PDF files in .zip description		
	Document Description	**Start**	**End**
	Amendment/Request for Reconsideration-After Non-Final Rejection	1	1
	Specification	2	2
	Claims	3	7
	Applicant Arguments/Remarks Made in an Amendment	8	13
	Affidavit-traversing rejections or objections rule 132	14	19
Warnings:			
Information:			
	Total Files Size (in bytes):	1780982	

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111
If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.
National Stage of an International Application under 35 U.S.C. 371
If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.
New International Application Filed with the USPTO as a Receiving Office
If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

NOTICE OF ALLOWANCE AND FEE(S) DUE

24341 7590 09/07/2023

Morgan, Lewis & Bockius LLP (PA)
1400 Page Mill Road
Palo Alto, CA 94304-1124

EXAMINER	
DOMONE, CHRISTOPHER P	
ART UNIT	PAPER NUMBER
1725	

DATE MAILED: 09/07/2023

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
17/746,755	05/17/2022	Tao TAO	024607-02-5119-US	8911

TITLE OF INVENTION: LITHIUM-ION BATTERY HAVING DESIRABLE SAFETY PERFORMANCE

APPLN. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	UNDISCOUNTED	$1200	$0.00	$0.00	$1200	12/07/2023

THE APPLICATION IDENTIFIED ABOVE HAS BEEN EXAMINED AND IS ALLOWED FOR ISSUANCE AS A PATENT. PROSECUTION ON THE MERITS IS CLOSED. THIS NOTICE OF ALLOWANCE IS NOT A GRANT OF PATENT RIGHTS. THIS APPLICATION IS SUBJECT TO WITHDRAWAL FROM ISSUE AT THE INITIATIVE OF THE OFFICE OR UPON PETITION BY THE APPLICANT. SEE 37 CFR 1.313 AND MPEP 1308.

THE ISSUE FEE AND PUBLICATION FEE (IF REQUIRED) MUST BE PAID WITHIN THREE MONTHS FROM THE MAILING DATE OF THIS NOTICE OR THIS APPLICATION SHALL BE REGARDED AS ABANDONED. THIS STATUTORY PERIOD CANNOT BE EXTENDED. SEE 35 U.S.C. 151. THE ISSUE FEE DUE INDICATED ABOVE DOES NOT REFLECT A CREDIT FOR ANY PREVIOUSLY PAID ISSUE FEE IN THIS APPLICATION. IF AN ISSUE FEE HAS PREVIOUSLY BEEN PAID IN THIS APPLICATION (AS SHOWN ABOVE), THE RETURN OF PART B OF THIS FORM WILL BE CONSIDERED A REQUEST TO REAPPLY THE PREVIOUSLY PAID ISSUE FEE TOWARD THE ISSUE FEE NOW DUE.

HOW TO REPLY TO THIS NOTICE:

I. Review the ENTITY STATUS shown above. If the ENTITY STATUS is shown as SMALL or MICRO, verify whether entitlement to that entity status still applies.

If the ENTITY STATUS is the same as shown above, pay the TOTAL FEE(S) DUE shown above.

If the ENTITY STATUS is changed from that shown above, on PART B - FEE(S) TRANSMITTAL, complete section number 5 titled "Change in Entity Status (from status indicated above)".

For purposes of this notice, small entity fees are 40% the amount of undiscounted fees, and micro entity fees are 20% the amount of undiscounted fees.

II. PART B - FEE(S) TRANSMITTAL, or its equivalent, must be completed and returned to the United States Patent and Trademark Office (USPTO) with your ISSUE FEE and PUBLICATION FEE (if required). If you are charging the fee(s) to your deposit account, section "4b" of Part B - Fee(s) Transmittal should be completed. If an equivalent of Part B is filed, a request to reapply a previously paid issue fee must be clearly made, and delays in processing may occur due to the difficulty in recognizing the paper as an equivalent of Part B.

III. All communications regarding this application must give the application number. Please direct all communications prior to issuance to Mail Stop ISSUE FEE unless advised to the contrary.

IMPORTANT REMINDER: Maintenance fees are due in utility patents issuing on applications filed on or after Dec. 12, 1980. It is patentee's responsibility to ensure timely payment of maintenance fees when due. More information is available at www.uspto.gov/PatentMaintenanceFees.

PART B - FEE(S) TRANSMITTAL

Complete and send this form, together with applicable fee(s), by mail or fax, or via EFS-Web.

By mail, send to: Mail Stop ISSUE FEE
Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450

By fax, send to: (571)-273-2885

INSTRUCTIONS: This form should be used for transmitting the ISSUE FEE and PUBLICATION FEE (if required). Blocks 1 through 5 should be completed where appropriate. All further correspondence will be mailed to the current correspondence address as indicated unless corrected below or directed otherwise in Block 1, by (a) specifying a new correspondence address; and/or (b) indicating a separate "FEE ADDRESS" for maintenance fee notifications. **Because electronic patent issuance may occur shortly after issue fee payment, any desired continuing application should preferably be filed prior to payment of this issue fee in order not to jeopardize copendency.**

CURRENT CORRESPONDENCE ADDRESS (Note: Use Block 1 for any change of address)

24341 7590 09/07/2023
Morgan, Lewis & Bockius LLP (PA)
1400 Page Mill Road
Palo Alto, CA 94304-1124

Note: A certificate of mailing can only be used for domestic mailings of the Fee(s) Transmittal. This certificate cannot be used for any other accompanying papers. Each additional paper, such as an assignment or formal drawing, must have its own certificate of mailing or transmission.

Certificate of Mailing or Transmission

I hereby certify that this Fee(s) Transmittal is being deposited with the United States Postal Service with sufficient postage for first class mail in an envelope addressed to the Mail Stop ISSUE FEE address above, or being transmitted to the USPTO via EFS-Web or by facsimile to (571) 273-2885, on the date below.

(Typed or printed name)
(Signature)
(Date)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
17/746,755	05/17/2022	Tao TAO	024607-02-5119-US	8911

TITLE OF INVENTION: LITHIUM-ION BATTERY HAVING DESIRABLE SAFETY PERFORMANCE

APPLN. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	UNDISCOUNTED	$1200	$0.00	$0.00	$1200	12/07/2023

EXAMINER	ART UNIT	CLASS-SUBCLASS
DOMONE, CHRISTOPHER P	1725	429-162000

1. Change of correspondence address or indication of "Fee Address" (37 CFR 1.363).

❑ Change of correspondence address (or Change of Correspondence Address form PTO/AIA/122 or PTO/SB/122) attached.

❑ "Fee Address" indication (or "Fee Address" Indication form PTO/AIA/47 or PTO/SB/47; Rev 03-02 or more recent) attached. **Use of a Customer Number is required.**

2. For printing on the patent front page, list
(1) The names of up to 3 registered patent attorneys or agents OR, alternatively,
(2) The name of a single firm (having as a member a registered attorney or agent) and the names of up to 2 registered patent attorneys or agents. If no name is listed, no name will be printed.

1 _____
2 _____
3 _____

3. ASSIGNEE NAME AND RESIDENCE DATA TO BE PRINTED ON THE PATENT (print or type)

PLEASE NOTE: Unless an assignee is identified below, no assignee data will appear on the patent. If an assignee is identified below, the document must have been previously recorded, or filed for recordation, as set forth in 37 CFR 3.11 and 37 CFR 3.81(a). Completion of this form is NOT a substitute for filing an assignment.

(A) NAME OF ASSIGNEE (B) RESIDENCE: (CITY and STATE OR COUNTRY)

Please check the appropriate assignee category or categories (will not be printed on the patent) : ❑ Individual ❑ Corporation or other private group entity ❑ Government

4a. Fees submitted: ❑ Issue Fee ❑ Publication Fee (if required)

4b. Method of Payment: *(Please first reapply any previously paid fee shown above)*

❑ Electronic Payment via Patent Center or EFS-Web ❑ Enclosed check ❑ Non-electronic payment by credit card (Attach form PTO-2038)

❑ The Director is hereby authorized to charge the required fee(s), any deficiency, or credit any overpayment to Deposit Account No. _____

5. **Change in Entity Status** (from status indicated above)

❑ Applicant certifying micro entity status. See 37 CFR 1.29

NOTE: Absent a valid certification of Micro Entity Status (see forms PTO/SB/15A and 15B), issue fee payment in the micro entity amount will not be accepted at the risk of application abandonment.

❑ Applicant asserting small entity status. See 37 CFR 1.27

NOTE: If the application was previously under micro entity status, checking this box will be taken to be a notification of loss of entitlement to micro entity status.

❑ Applicant changing to regular undiscounted fee status.

NOTE: Checking this box will be taken to be a notification of loss of entitlement to small or micro entity status, as applicable.

NOTE: This form must be signed in accordance with 37 CFR 1.31 and 1.33. See 37 CFR 1.4 for signature requirements and certifications.

Authorized Signature _____ Date _____

Typed or printed name _____ Registration No. _____

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
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P.O. Box 1450
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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
17/746,755	05/17/2022	Tao TAO	024607-02-5119-US	8911

24341 7590 09/07/2023

Morgan, Lewis & Bockius LLP (PA)
1400 Page Mill Road
Palo Alto, CA 94304-1124

EXAMINER	
DOMONE, CHRISTOPHER P	
ART UNIT	PAPER NUMBER
1725	

DATE MAILED: 09/07/2023

Determination of Patent Term Adjustment under 35 U.S.C. 154 (b)
(Applications filed on or after May 29, 2000)

The Office has discontinued providing a Patent Term Adjustment (PTA) calculation with the Notice of Allowance.

Section 1(h)(2) of the AIA Technical Corrections Act amended 35 U.S.C. 154(b)(3)(B)(i) to eliminate the requirement that the Office provide a patent term adjustment determination with the notice of allowance. See Revisions to Patent Term Adjustment, 78 Fed. Reg. 19416, 19417 (Apr. 1, 2013). Therefore, the Office is no longer providing an initial patent term adjustment determination with the notice of allowance. The Office will continue to provide a patent term adjustment determination with the Issue Notification Letter that is mailed to applicant approximately three weeks prior to the issue date of the patent, and will include the patent term adjustment on the patent. Any request for reconsideration of the patent term adjustment determination (or reinstatement of patent term adjustment) should follow the process outlined in 37 CFR 1.705.

Any questions regarding the Patent Term Extension or Adjustment determination should be directed to the Office of Patent Legal Administration at (571)-272-7702. Questions relating to issue and publication fee payments should be directed to the Customer Service Center of the Office of Patent Publication at 1-(888)-786-0101 or (571)-272-4200.

OMB Clearance and PRA Burden Statement for PTOL-85 Part B

The Paperwork Reduction Act (PRA) of 1995 requires Federal agencies to obtain Office of Management and Budget approval before requesting most types of information from the public. When OMB approves an agency request to collect information from the public, OMB (i) provides a valid OMB Control Number and expiration date for the agency to display on the instrument that will be used to collect the information and (ii) requires the agency to inform the public about the OMB Control Number's legal significance in accordance with 5 CFR 1320.5(b).

The information collected by PTOL-85 Part B is required by 37 CFR 1.311. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 30 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, Virginia 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, Virginia 22313-1450. Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

Privacy Act Statement

The Privacy Act of 1974 (P.L. 93-579) requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether disclosure of these records is required by the Freedom of Information Act.
2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.
3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.
4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).
5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.
6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).
7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.
8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspection or an issued patent.
9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

Notice of Allowability	Application No. 17/746,755	Applicant(s) TAO et al.	
	Examiner CHRISTOPHER P DOMONE	Art Unit 1725	AIA (FITF) Status Yes

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☑ This communication is responsive to Declaration and Applicant Arguments filed 06/29/2023.
   ☐ A declaration(s)/affidavit(s) under **37 CFR 1.130(b)** was/were filed on _____.

2. ☐ An election was made by the applicant in response to a restriction requirement set forth during the interview on _____; the restriction requirement and election have been incorporated into this action.

3. ☑ The allowed claim(s) is/are 20-27 and 29-42 . As a result of the allowed claim(s), you may be eligible to benefit from the **Patent Prosecution Highway** program at a participating intellectual property office for the corresponding application. For more information , please see **http://www.uspto.gov/patents/init_events/pph/index.jsp** or send an inquiry to **PPHfeedback@uspto.gov.**

4. ☑ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

   Certified copies:

   a) ☑ All b) ☐ Some* c) ☐ None of the:

   1. ☐ Certified copies of the priority documents have been received.
   2. ☑ Certified copies of the priority documents have been received in Application No. 14/596,873 .
   3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

   * Certified copies not received: _____ .

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.
THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
   ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____ .

   Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).

6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☐ Notice of References Cited (PTO-892)
2. ☐ Information Disclosure Statements (PTO/SB/08), Paper No./Mail Date _____.
3. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material _____.
4. ☐ Interview Summary (PTO-413), Paper No./Mail Date. _____.
5. ☐ Examiner's Amendment/Comment
6. ☑ Examiner's Statement of Reasons for Allowance
7. ☐ Other _____.

/CHRISTOPHER P DOMONE/
Examiner, Art Unit 1725

DETAILED ACTION

Notice of Pre-AIA or AIA Status

The present application, filed on or after March 16, 2013, is being examined under the first inventor to file provisions of the AIA.

Response to Arguments

Applicant's arguments and filed Declaration under 37 C.F.R. § 1.132, see page 8, filed 06/29/2023, with respect to claims 20, 29, 37 have been fully considered and are persuasive in light of the lack of the previously cited prior's teaching or suggestion of the variable of width relationship as shown in the claims, as well as the lack of teaching or suggestion that the insulating glue layer being applied to both active layers as shown in the claims. The rejection of claims 20, 29, 37 has been withdrawn.

Allowable Subject Matter

Claims 20-27 and 29-42 allowed.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to CHRISTOPHER P DOMONE whose telephone number is (571)270-7582. The examiner can normally be reached M-F 8:00-4:30 PM.

Examiner interviews are available via telephone, in-person, and video conferencing using a USPTO supplied web-based collaboration tool. To schedule an interview, applicant is encouraged to use the USPTO Automated Interview Request (AIR) at http://www.uspto.gov/interviewpractice.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Basia Ridley can be reached on (571)272-1453. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of published or unpublished applications may be obtained from Patent Center. Unpublished application information in Patent Center is available to registered users. To file and manage patent submissions in Patent Center, visit: https://patentcenter.uspto.gov. Visit https://www.uspto.gov/patents/apply/patent-center for more information about Patent Center and

https://www.uspto.gov/patents/docx for information about filing in DOCX format. For additional questions, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/CHRISTOPHER P DOMONE/
Primary Patent Examiner
Art Unit 1725

Search Notes	Application/Control No.	Applicant(s)/Patent Under Reexamination
	17/746,755	TAO et al.
	Examiner	Art Unit
	CHRISTOPHER P DOMONE	1725

CPC - Searched*		
Symbol	**Date**	**Examiner**
H01M10/0431	07/14/2022	JB
H01M10/0587	07/14/2022	JB
H01M50/531, 533, 538	07/14/2022	JB
H01M50/5$	07/14/2022	JB
H01M.cpcl.	07/14/2022	JB
H01M10/0431	09/08/2022	JB
H01M10/0587	09/08/2022	JB
H01M50/531, 533, 538	09/08/2022	JB
H01M50/5$	09/08/2022	JB
H01M.cpcl.	09/08/2022	JB
H01M.cpcl.	03/24/2023	JB
H01M50/538,536,593,595,59	09/01/2023	/CD/

CPC Combination Sets - Searched*		
Symbol	**Date**	**Examiner**

US Classification - Searched*			
Class	**Subclass**	**Date**	**Examiner**

* See search history printout included with this form or the SEARCH NOTES box below to determine the scope of the search.

/CHRISTOPHER P DOMONE/ Examiner, Art Unit 1725	

Search Notes	Application/Control No.	Applicant(s)/Patent Under Reexamination
	17/746,755	TAO et al.
	Examiner	Art Unit
	CHRISTOPHER P DOMONE	1725

Search Notes		
Search Notes	**Date**	**Examiner**
Global dossier search	07/14/2022	JB
Applicant and inventor search in SEARCH	07/14/2022	JB
CPC and CPC-limited text search in SEARCH	07/14/2022	JB
“More like this” searching in SEARCH and IP.COM	07/14/2022	JB
Additional search (refresh)	09/08/2022	JB
Discussion with Will McClain regarding strategy and search	03/23/2023	JB
Additional searching in SEARCH	03/24/2023	JB
INVENTOR SEARCH (DAV & Search History)	09/01/2023	/CD/
Search Text Search (USPat, US PGPub, FIT, EPO, JPO, Derwent)	09/01/2023	/CD/
Global Dossier Search	09/01/2023	/CD/
IP.com (NPL + US & Foreign Patents) (first 50 results 9/1/23)	09/01/2023	/CD/
Review of search histories, cited references, office actions, and potential double patenting of 14/596,873, 16/133,938 and 17/407,081 .	09/01/2023	/CD/

Interference Search			
US Class/CPC Symbol	**US Subclass/CPC Group**	**Date**	**Examiner**
	Interference Search - See Interference Print-out	09/01/2023	/CD/

/CHRISTOPHER P DOMONE/ Examiner, Art Unit 1725	

Issue Classification	Application/Control No.	Applicant(s)/Patent Under Reexamination
	17/746,755	TAO et al.
	Examiner	**Art Unit**
	CHRISTOPHER P DOMONE	1725

CPC						
Symbol					**Type**	**Version**
H01M	/	10	/	0525	F	2013-01-01
H01M	/	4	/	13	I	2013-01-01
H01M	/	4	/	139	I	2013-01-01
H01M	/	10	/	058	I	2013-01-01
H01M	/	50	/	538	I	2021-01-01
H01M	/	50	/	536	I	2021-01-01

CPC Combination Sets								
Symbol					**Type**	**Set**	**Ranking**	**Version**
	/		/					

NONE		Total Claims Allowed:	
(Assistant Examiner)	(Date)	22	
/CHRISTOPHER P DOMONE/ Examiner, Art Unit 1725	01 September 2023	O.G. Print Claim(s)	O.G. Print Figure
(Primary Examiner)	(Date)	20, 29, 37	5

U.S. Patent and Trademark Office — Part of Paper No.: 20230901

Issue Classification	Application/Control No.	Applicant(s)/Patent Under Reexamination
	17/746,755	TAO et al.
	Examiner	**Art Unit**
	CHRISTOPHER P DOMONE	1725

INTERNATIONAL CLASSIFICATION				
CLAIMED				
H01M	/	10	/	0525
H01M	/	4	/	13
H01M	/	4	/	139
H01M	/	10	/	058
H01M	/	50	/	538
H01M	/	50	/	543

NON-CLAIMED				
	/		/	

US ORIGINAL CLASSIFICATION	
CLASS	**SUBCLASS**

CROSS REFERENCES(S)						
CLASS	**SUBCLASS (ONE SUBCLASS PER BLOCK)**					

NONE (Assistant Examiner)	(Date)	**Total Claims Allowed:** 22	
/CHRISTOPHER P DOMONE/ Examiner, Art Unit 1725 (Primary Examiner)	01 September 2023 (Date)	O.G. Print Claim(s) 20, 29, 37	O.G. Print Figure 5

U.S. Patent and Trademark Office — Part of Paper No.: 20230901

Issue Classification	Application/Control No.	Applicant(s)/Patent Under Reexamination
	17/746,755	TAO et al.
	Examiner	**Art Unit**
	CHRISTOPHER P DOMONE	1725

☑ Claims renumbered in the same order as presented by applicant ☐ CPA ☐ T.D. ☐ R.1.47

CLAIMS

Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original

NONE		**Total Claims Allowed:**	
(Assistant Examiner)	(Date)	22	
/CHRISTOPHER P DOMONE/ Examiner, Art Unit 1725	01 September 2023	O.G. Print Claim(s)	O.G. Print Figure
(Primary Examiner)	(Date)	20, 29, 37	5

U.S. Patent and Trademark Office — Part of Paper No.: 20230901

Bibliographic Data

Application No: 17/746,755

Foreign Priority claimed: (•) Yes ( ) No

35 USC 119 (a-d) conditions met: [✓] Yes [ ] No [ ] Met After Allowance

Verified and Acknowledged: /CHRISTOPHER DOMONE/ Examiner's Signature | Initials

Title: LITHIUM-ION BATTERY HAVING DESIRABLE SAFETY PERFORMANCE

FILING or 371(c) DATE	CLASS	GROUP ART UNIT	ATTORNEY DOCKET NO.
05/17/2022	429	1725	024607-02-5119-US
RULE			

APPLICANTS

NINGDE AMPEREX TECHNOLOGY LIMITED, Ningde, CHINA

INVENTORS

Tao TAO, Ningde, CHINA

Ming Liang MO, Ningde, CHINA

CONTINUING DATA

This application is a CON of 17407081 08/19/2021

17407081 is a CON of 16113938 08/27/2018ABN

16113938 is a CON of 14596873 01/14/2015 PAT 10541441

FOREIGN APPLICATIONS

CHINA CN201420030319.4 01/17/2014

IF REQUIRED, FOREIGN LICENSE GRANTED**

05/24/2022

STATE OR COUNTRY

CHINA

ADDRESS

Morgan, Lewis & Bockius LLP (PA)
1400 Page Mill Road
Palo Alto, CA 94304-1124
UNITED STATES

FILING FEE RECEIVED

$6,160

PE2E SEARCH - Search History (Prior Art)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	British Equivalents	Time Stamp
L1	1	17/746755	(US-PGPUB; USPAT)	OR	ON	ON	2023/09/01 09:19 AM
L2	31	H01M50/538,536,593,595,59.cpc. AND glue NEAR (layer OR coating) WITH (groove OR recess OR recessed OR depression)	(US-PGPUB; USPAT; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA, VN); EPO; JPO; DERWENT)	OR	ON	ON	2023/09/01 10:46 AM
L3	54	H01M50/538,536,593,595,59.cpc. AND glue WITH insulat$8 WITH (groove OR recess OR recessed OR depression)	(US-PGPUB; USPAT; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA, VN); EPO; JPO; DERWENT)	OR	ON	ON	2023/09/01 10:49 AM
L4	5	(Ningde NEAR Amperex) AND glue.clm. WITH insulat$8.clm. WITH (groove OR recess OR recessed OR depression).clm.	(US-PGPUB; USPAT)	OR	ON	ON	2023/09/01 11:32 AM
L5	5	(Tao NEAR Tao).in. AND glue.clm. WITH insulat$8.clm. WITH (groove OR recess OR recessed OR depression).clm.	(US-PGPUB; USPAT)	OR	ON	ON	2023/09/01 11:32 AM
L6	4	(Ming NEAR liang NEAR Mo).in. AND glue.clm. WITH insulat$8.clm. WITH (groove OR recess OR recessed OR	(US-PGPUB; USPAT)	OR	ON	ON	2023/09/01 11:33 AM

		depression).clm.					

PE2E SEARCH - Search History (Interference)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	British Equivalents	Time Stamp
N1	4	(lithium OR Li).clm. NEAR2 (battery OR cell).clm. AND glue.clm. WITH insulat$8.clm. WITH (groove OR recess OR recessed OR depression).clm. AND layer.clm.	(US-PGPUB; USPAT)	OR	ON	ON	2023/09/01 02:29 PM

Search History

Report Run Date: 2023-09-01 UTC
Searches: 1
Markers: 0

Search #	Timestamp	Results	Page
1	2023-09-01 15:35 UTC	~55,939,550	3

Content: Patents + NPL (192)

US Patents | US Designs | US Applications | EPO Patents | EPO Applications | China Patents | China Applications | Japan Patents | Japan Applications | Korea Patents | Korea Applications | WIPO Applications | Argentina Patents | Argentina Applications | Brazil Patents | Brazil Applications | Canada Patents | Canada Applications | Chile Patents | Chile Applications | Colombia Applications | Costa Rica Applications | Cuba Patents | Cuba Applications | Dominican Republic Applications | Ecuador Patents | Ecuador Applications | El Salvador Applications | Guatemala Applications | Honduras Applications | Mexico Patents | Mexico Applications | Nicaragua Patents | Panama Applications | Peru Applications | Trinidad & Tobago Patents | Uruguay Applications | Austria Patents | Austria Applications | Belarus Patents | Belgium Patents | Belgium Applications | Bosnia & Herzegovina Patents | Bosnia & Herzegovina Applications | Bulgaria Patents | Bulgaria Applications | Croatia Patents | Croatia Applications | Czech Republic Patents | Czech Republic Applications | Czechoslovakia Patents | Czechoslovakia Applications | Denmark Patents | Denmark Applications | Estonia Patents | Estonia Applications | EUIPO Patents | Finland Patents | Finland Applications | France Patents | France Applications | Germany Patents | Germany Applications | Great Britain Patents | Great Britain Applications | Greece Patents | Greece Applications | Hungary Patents | Hungary Applications | Iceland Patents | Iceland Applications | Ireland Patents | Ireland Applications | Italy Patents | Italy Applications | Latvia Patents | Latvia Applications | Lithuania Patents | Lithuania Applications | Luxembourg Patents | Luxembourg Applications | Malta Patents | Monaco Patents | Montenegro Patents | Montenegro Applications | Netherlands Patents | Netherlands Applications | Norway Patents | Norway Applications | Poland Patents | Poland Applications | Portugal Patents | Portugal Applications | Republic of Moldova Patents | Republic of Moldova Applications | Romania Patents | Romania Applications | San Marino Patents | San Marino Applications | Serbia Patents | Serbia Applications | Slovakia Patents | Slovakia Applications | Slovenia Patents | Spain Patents | Spain Applications | Sweden Patents | Sweden Applications | Switzerland Patents | Switzerland Applications | Ukraine Patents | Yugoslavia/Serbia and Montenegro Patents | Yugoslavia/Serbia and Montenegro Applications | Armenia Patents | Australia Patents | Australia Applications | Cyprus Patents | Gulf Cooperation Council Patents | Hong Kong Patents | India Patents | India Applications | Indonesia Patents | Indonesia Applications | Israel Patents | Israel Applications | Jordan Patents | Jordan Applications | Kyrgyzstan Patents | Macao Applications | Malaysia Patents | Mongolia Patents | New Zealand Patents | Philippines Patents | Philippines Applications | Saudi Arabia Patents | Saudi Arabia Applications | Singapore Patents | Singapore Applications | Taiwan Patents | Taiwan Applications | Tajikistan Patents | Tajikistan Applications | Thailand Patents | Thailand Applications | Uzbekistan Patents | Vietnam Patents | Algeria Patents | ARIPO Patents | ARIPO Applications | Egypt Patents | Kenya Patents | Malawi Patents | Morocco Patents | Morocco Applications | OAPI Patents | South Africa Patents | Tunisia Applications | Zambia Patents | Zimbabwe Patents | EAPO Patents | EAPO Applications | Georgia Patents | Georgia Applications | Kazakhstan Patents | Kazakhstan Applications | Russia Patents | Russia Applications | Turkey Patents | Turkey Applications | IEEE Xplore Publications: IEEE Periodicals | IEEE Xplore Publications: IEEE Conferences | IEEE Xplore Publications: IEEE Standards | IEEE Xplore Publications: IEEE Early Access | IEEE Xplore Publications: SMPTE Periodicals | IEEE Xplore Publications: SMPTE Conferences | IEEE Xplore Publications: SMPTE Standards | IEEE Xplore Publications: MIT Press eBooks | IEEE Xplore Publications: Wiley-IEEE eBooks | IEEE Xplore Publications: IBM Periodicals | IEEE Xplore Publications: URSI Periodicals | IEEE Xplore Publications: VDE Conferences | IEEE Xplore Publications: Periodicals from China | IP.com Prior Art Database: The IP.com Journal | IP.com Prior Art Database: Internet Society RFC | IP.com Prior Art Database: IBM TDB Archive | IP.com Prior Art Database: Legacy Journals | IP.com Prior Art Database: Software Patent Institute | OnePetro.org: Periodicals at OnePetro.org | OnePetro.org: Conferences at OnePetro.org | Other Literature: IBM Redbooks | Other Literature: PubMed Central | Other Literature: arXiv.org

0425

1 **2023-09-01 15:35 UTC | ~55,939,550 results from**

De-Dup: Extended Family Numbers (PAT only) | **Relevance Cut-off:** None | **Sort:** Relevance

Main Concept: Text
lithium battery containing active material layer that is provided with recesses that accommodate leads and glue layers

Concept Modifiers: None

Filters: None

Interference Print-out

Date of Search: 09/01/2023

Databases Searched: USPat, US PGPub

Search Query: (lithium *OR* Li).clm. *NEAR2* (battery *OR* cell).clm. *AND* glue.clm. *WITH* insulat$8.clm. *WITH* (groove *OR* recess *OR* recessed *OR* depression).clm. *AND* layer.clm.

Electronically filed September 8, 2023

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Application of:	Zuchao LIU	Confirmation No.:	4436
Serial No.:	17/956,690	Art Unit:	OPAP
Filed:	September 29, 2022	Examiner:	DOCKET CENTRAL
For:	Current Collector, Electrode Plate, Electrochemical Apparatus, And Electronic Apparatus	Attorney Docket No.:	024607-02-5099-US

INFORMATION DISCLOSURE STATEMENT

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

In accordance with the duty of disclosure provisions of 37 C.F.R. §1.56, there is hereby provided certain information which the Examiner may consider material to the examination of the subject U.S. patent application. It is requested that the Examiner make this information of record if it is deemed material to the examination of the application.

1. Enclosures accompanying this Information Disclosure Statement are:

1a. ☒ A list of all patents, publications, applications, or other information submitted for consideration by the office.

1b. A legible copy of:

☒ Each foreign patent;

☐ Each publication or that portion which caused it to be listed on the PTO-1449;

☐ For each cited pending U.S. application, the application specification including the claims, and any drawing of the application, or portion of the application which caused it to be listed on the PTO-1449 including any claims directed to that portion;

☒ all other information or portion which caused it to be listed on the PTO-1449.

1c. ☒ An English language copy of search report(s) from a counterpart foreign application or PCT International Search Report.

1d. ☐ Explanations of relevancy (ATTACHMENT 1(d), hereto) or English language abstracts of the non-English language publications.

2. ☐ This Information Disclosure Statement is filed under 37 C.F.R. §1.97(b):

☐ Within three months of the filing date of a national application other than a continued prosecution application under §1.53(d);

☐ Within three months of the date of entry of the national stage as set forth in §1.491 in an international application;

☐ Before the mailing of the first Office action on the merits;

☐ Before the mailing of a first Office action after the filing of a request for continued examination under §1.114.

3. ☒ This Information Disclosure Statement is filed under 37 C.F.R. §1.97(c) after the period specified in 37 C.F.R. §1.97(b), but before the mailing date of any of a final action under 37 C.F.R. §1.113, a notice of allowance under 37 C.F.R. §1.311 or an action that otherwise closes prosecution in the application.

(Check either Item 3a, 3b, 3c or 3d)

3a. ☐ The Certification Statement in Item 5 below is applicable. Accordingly, no fee is required.

3b. ☒ The $260 (large entity) fee set forth in 37 C.F.R. §1.17(p) in accordance with 37 C.F.R. §1.97(c) is to be charged to Morgan, Lewis & Bockius LLP Deposit Account No. 50-0310 (order no. 024607-02-5099-US).

3c. ☐ The $104 (small entity) fee set forth in 37 C.F.R. §1.17(p) in accordance with 37 C.F.R. §1.97(c) is to be charged to Morgan, Lewis & Bockius LLP Deposit Account No. 50-0310 (order no.).

3d. ☐ The $52 (micro entity) fee set forth in 37 C.F.R. §1.17(p) in accordance with 37 C.F.R. §1.97(c) is to be charged to Morgan, Lewis & Bockius LLP Deposit Account No. 50-0310 (order no.).

(Items 3b or 3c to be checked if any reference known for more than 3 months)

4. ☐ This Information Disclosure Statement is filed under 37 C.F.R. §1.97(d) after the period specified in 37 C.F.R. §1.97(c), but on or before the date of payment of the issue fee.

(Check Item 4a, and 4b, 4c or 4d)

4a. ☐ The Certification Statement in Item 5 below is applicable.

4b. ☐ The $260 (large entity) fee set forth in 37 C.F.R. §1.17(p) in accordance with 37 C.F.R. §1.97(c) is to be charged to Morgan, Lewis & Bockius LLP Deposit Account No. 50-0310 (order no.).

4c. ☐ The $104(small entity) fee set forth in 37 C.F.R. §1.17(p) in accordance with 37 C.F.R. §1.97(c) is to be charged to Morgan, Lewis & Bockius LLP Deposit Account No. 50-0310 (order no.).

4d. ☐ The $52 (micro entity) fee set forth in 37 C.F.R. §1.17(p) in accordance with 37 C.F.R. §1.97(c) is to be charged to Morgan, Lewis & Bockius LLP Deposit Account No. 50-0310 (order no.).

5. ☐ Certification Statement (applicable if Item 3a or Item 4a is checked)

(Check either Item 5a, 5b, 5c or 5d)

5a. ☐ In accordance with 37 C.F.R. §1.97(e)(1), it is certified that each item of information contained in this information disclosure statement was first cited in a communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of this Information Disclosure Statement.

5b. ☐ In accordance with 37 C.F.R. §1.97(e)(2), it is certified that no item of information contained in the information disclosure statement was cited in a communication from a foreign patent office in a counterpart foreign application, and, to the knowledge of the person signing the certification after making reasonable inquiry, no item of information contained in the information disclosure statement was known to any individual designated in 37 C.F.R. §1.56(c) more than three months prior to the filing of this information disclosure statement.

5c. ☐ Each item of information contained in this information disclosure statement was cited in a communication from a foreign patent office in a counterpart application, and the communication was not **received** by any individual designated in 37 C.F.R. §1.56(c) more than thirty days prior to the filing of this information disclosure statement.

5d. ☐ Pursuant to 37 C.F.R. §1.704(d), each item of information contained in this information disclosure statement was cited in a communication from a foreign patent office in a counterpart application, and the communication was not **received** by any individual designated in 37 C.F.R. §1.56(c) more than thirty days prior to the filing of this information disclosure statement.

6. ☒ Copies of each cited U.S. patent and each U.S. patent application publication are not enclosed pursuant to the USPTO OG Notice dated 05 August 2003 waiving the requirement under 37 C.F.R. 1.98(a)(2)(i) for U.S. patent applications filed after June 30, 2003.

7. ☐ This application is a continuation application under 37 C.F.R. §1.53(b) or (d).

(Check appropriate Items 7a, 7b and/or 7c)

7a. ☐ A Petition to Withdraw from issue under 37 C.F.R. §1.313(b)(5) is concurrently filed herewith.

7b. ☐ Copies of publications listed on Form PTO-1449 from prior application Serial No. , filed on , of which this application claims priority under 35 U.S.C. §120, are not being submitted pursuant to 37 C.F.R. §1.98(d).

7c. ☐ Copies of the publications listed on the attached Form PTO-1449 that were not previously cited in prior application Serial No. , filed on , are provided herewith.

8. ☐ This is a Supplemental Information Disclosure Statement. (Check Item 8a)

8a. ☐ This Supplemental Information Disclosure Statement under 37 C.F.R. §1.97(f) supplements the Information Disclosure Statement filed on . A bona fide attempt was made to comply with 37 C.F.R. §1.98, but inadvertent omissions were made. These omissions have been corrected herein. Accordingly, additional time is requested so that this Supplemental Information Disclosure Statement can be considered as if properly filed on .

9. ☐ In accordance with 37 C.F.R. §1.98, a concise explanation of what is presently understood to be the relevance of each non-English language publication is:

(Check Item 9a, 9b, or 9c)

9a. ☐ satisfied because all non-English language publications were cited on the enclosed English language copy of the PCT International Search Report or the search report from a counterpart foreign application indicating the degree of relevance found by the foreign office.

9b. ☐ set forth in the application.

9c. ☐ enclosed as an attachment hereto.

10. ☒ The Commissioner is authorized to charge any additional fee required or credit any overpayment for this Information Disclosure Statement and/or Petition to Morgan, Lewis & Bockius LLP Deposit Account No. 50-0310 (order no. 024607-02-5099-US).

11. ☒ No admission is made that the information cited in this Statement is, or is considered to be, material to patentability nor a representation that a search has been made (other than a search report of a foreign counterpart application or PCT International Search Report if submitted herewith). 37 C.F.R. §§1.97(g) and (h).

Respectfully submitted,

Date: September 6, 2023

/Yalei Sun/ 57,765

Yalei Sun (Reg. No.)

MORGAN, LEWIS & BOCKIUS LLP
1400 Page Mill Road
Palo Alto, CA 94304
(650) 843-4000

UNITED STATES
PATENT AND TRADEMARK OFFICE

P.O. Box 1450
Alexandria, VA 22313 - 1450
www.uspto.gov

ELECTRONIC ACKNOWLEDGEMENT RECEIPT

APPLICATION #	RECEIPT DATE / TIME	ATTORNEY DOCKET #
17/746,755	**09/08/2023 01:09:47 PM ET**	**024607-02-5119-US**

Title of Invention

LITHIUM-ION BATTERY HAVING DESIRABLE SAFETY PERFORMANCE

Application Information

APPLICATION TYPE	Utility - Nonprovisional Application under 35 USC 111(a)	PATENT #	-
CONFIRMATION #	8911	FILED BY	Edith Fuentes
PATENT CENTER #	62758741	FILING DATE	05/17/2022
CUSTOMER #	24341	FIRST NAMED INVENTOR	Tao TAO
CORRESPONDENCE ADDRESS	-	AUTHORIZED BY	Yalei Sun

Documents

TOTAL DOCUMENTS: 55

DOCUMENT	PAGES	DESCRIPTION	SIZE (KB)
CN202423456U.pdf	7	Foreign Reference	444 KB
CN201336332Y.pdf	7	Foreign Reference	446 KB
CN202373667U.pdf	8	Foreign Reference	602 KB
CN202839841U.pdf	9	Foreign Reference	844 KB
CN105514352A.pdf	12	Foreign Reference	1073 KB
CN204538109U.pdf	8	Foreign Reference	392 KB
CN203574050U.pdf	15	Foreign Reference	1318 KB

CN203733894U.pdf	12	Foreign Reference	1076 KB
JP2010-73653A.pdf	14	Foreign Reference	744 KB
CN1017834024A.pdf	12	Foreign Reference	1024 KB
CN1805183A.pdf	9	Foreign Reference	832 KB
CN2786795Y.pdf	8	Foreign Reference	695 KB
CN204946995U.pdf	25	Foreign Reference	2402 KB
CN101826609A.pdf	7	Foreign Reference	374 KB
CN1983682A.pdf	26	Foreign Reference	2386 KB
CN101615694A.pdf	18	Foreign Reference	1640 KB
CN101304103B.pdf	19	Foreign Reference	1814 KB
CN1357966A.pdf	60	Foreign Reference	3433 KB
CN102315477A.pdf	23	Foreign Reference	1825 KB
CN104157914A.pdf	14	Foreign Reference	1450 KB
JP2010073653A.pdf	14	Foreign Reference	743 KB
JP4380201B2.pdf	13	Foreign Reference	684 KB
JP2013201094A.pdf	14	Foreign Reference	806 KB
JP2000067907A.pdf	10	Foreign Reference	774 KB
JP2000323135A.pdf	5	Foreign Reference	352 KB
WO2012072222A1.pdf	32	Foreign Reference	2151 KB
JP2008171593A.pdf	18	Foreign Reference	981 KB

JP2010055906A.pdf	13	Foreign Reference	744 KB
JPH0527951A-JP1993027951B2.pdf	37	Foreign Reference	7826 KB
Office Action, CN201420030319.4, 14JUL2023.pdf	6	Non Patent Literature	355 KB
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New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

INFORMATION DISCLOSURE STATEMENT BY APPLICANT Substitute for Form 1449-PTO				*Electronically filed September 8, 2023*	
				Application Number	*17/746,755*
				Filing Date	*May 17, 2022*
				First Named Inventor	*Tao TAO*
				Art Unit	*1721*
				Examiner Name	*Barton, Jason Aaron*
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				Art Unit	*1721*
				Examiner Name	*Barton, Jason Aaron*
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Examiner Signature		Date Considered	

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				Examiner Name	*Barton, Jason Aaron*
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		WO-2012072222-A1	6/1/2012	ZSW [DE]; STERN RAINER [DE]; KASPER MICHAEL [DE]		
		WO2013038677A1	3/1/2013	ENDO K		

NON PATENT LITERATURE DOCUMENTS

Examiner Initials	Cite No.	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published
		Office Action, CN201420030319.4, 17AUG2023, 5 pgs.
		Office Action, CN201420030319.4, 14JUL2023, 6 pgs.
		Office Action, CN201580082766.1, 27MAY2020, 7 pgs.
		Office Action, CN201580082766.1, 08JAN2021, 7 pgs.

Examiner Signature		Date Considered	

INFORMATION DISCLOSURE STATEMENT BY APPLICANT Substitute for Form 1449-PTO				***Electronically filed September 8, 2023***	
				Application Number	***17/746,755***
				Filing Date	***May 17, 2022***
				First Named Inventor	***Tao TAO***
				Art Unit	***1721***
				Examiner Name	***Barton, Jason Aaron***
Sheet	4	of	4	Attorney Docket Number	***024607-02-5119-US***

		Office Action, CN201580082766.1, 02JUN2021, 2 pgs.
		International Search Report PCT/CN2015/088638, 27MAY2016, 5 pgs.
		Invalidity Request, ZL201420030319.4, 04AUG2023, 92 pgs.
		Invalidity, ZL201420030319.4, 04JUL2023, 7 pgs.
		Guo, Office Action., US15/908,327, 24OCT2019, 10 pgs.
		Guo, Final Office Action., US15/908,327, 31JAN2020, 9 pgs.
		Guo, Office Action., US15/908,327, 19OCT2020, 8 pgs.
		Guo, Final Office Action, US15/908,327, 09MAR2021, 8 pgs.
		Guo, Office Action, US15/908,327, 23JUL2021, 8 pgs.
		Guo, Examiner-Initiated Interview Summary, US15/908,327, 06DEC2021, 1 pg.
		Guo, Notice of Allowance, US15/908,327, 12JAN2022, 29 pg.
		Guo, Office Action, US17/710,936, 05MAY2023, 14 pgs.
		Machine translation of JP2007165224A, (Year: 2007), 8 pgs.
		Machine translation of WO2013038677A1, (Year:2013), 15 pgs.
		Professional translation of CN-101826609A, obtained 1 May 2023 (Year: 2010)
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		TAO, Office Action, US17746755, 31MAR2023, 27 pgs.
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		TAO, Office Action, US17407081, 05AUG2022, 69 pgs.
		TAO, Final Office Action, US17407081, 18JAN2023, 19 pgs.
		ZHUHAI COSMX BATTERY CO LTD, Petitioner, v. NINGDE AMPEREX TECHNLOGY LIMITED, Patent Owner, Petition for *Inter Partes* Review, Case No. IPR2023-00585, 31MAR2023, 116 pgs.

Examiner Signature		Date Considered	

UNITED STATES
PATENT AND TRADEMARK OFFICE

P.O. Box 1450
Alexandria, VA 22313 - 1450
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ELECTRONIC PAYMENT RECEIPT

APPLICATION #	RECEIPT DATE / TIME	ATTORNEY DOCKET #
17/746,755	**09/08/2023 01:09:47 PM ET**	**024607-02-5119-US**

Title of Invention

LITHIUM-ION BATTERY HAVING DESIRABLE SAFETY PERFORMANCE

Application Information

APPLICATION TYPE	Utility - Nonprovisional Application under 35 USC 111(a)	PATENT #	-
CONFIRMATION #	8911	FILED BY	Edith Fuentes
PATENT CENTER #	62758741	AUTHORIZED BY	Yalei Sun
CUSTOMER #	24341	FILING DATE	05/17/2022
CORRESPONDENCE ADDRESS	-	FIRST NAMED INVENTOR	Tao TAO

Payment Information

PAYMENT METHOD	PAYMENT TRANSACTION ID	PAYMENT AUTHORIZED BY
CARD / 9183	**E202398D11247506**	**Edith Fuentes**

FEE CODE	DESCRIPTION	ITEM PRICE($)	QUANTITY	ITEM TOTAL($)
1806	SUBMISSION OF AN INFORMATION DISCLOSURE STATEMENT	260.00	1	260.00
			TOTAL AMOUNT:	**$260.00**

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

UNITED STATES
PATENT AND TRADEMARK OFFICE

P.O. Box 1450
Alexandria, VA 22313 - 1450
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ELECTRONIC ACKNOWLEDGEMENT RECEIPT

APPLICATION #	RECEIPT DATE / TIME	ATTORNEY DOCKET #
17/746,755	**09/13/2023 08:26:50 PM ET**	**024607-02-5119-US**

Title of Invention

LITHIUM-ION BATTERY HAVING DESIRABLE SAFETY PERFORMANCE

Application Information

APPLICATION TYPE	Utility - Nonprovisional Application under 35 USC 111(a)	PATENT #	-
CONFIRMATION #	8911	FILED BY	Edith Fuentes
PATENT CENTER #	62793435	FILING DATE	05/17/2022
CUSTOMER #	24341	FIRST NAMED INVENTOR	Tao TAO
CORRESPONDENCE ADDRESS	-	AUTHORIZED BY	Yalei Sun

Documents

TOTAL DOCUMENTS: 1

DOCUMENT	PAGES	DESCRIPTION	SIZE (KB)
024607-02-5119-US_IDS.pdf	4	Transmittal Letter	189 KB

Digest

DOCUMENT	MESSAGE DIGEST(SHA-512)
024607-02-5119-US_IDS.pdf	AABB1BC27A486D76A2F9F2C864972B9C0212ED49754B1FD1E FD6D14CAB97E11F6083CD66145BCAF8A6DD66E1A61212CCD AA2F781837E1391F543D81BBA3ABD51

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as

described in MPEP 503.

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If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

Electronically filed September 8, 2023

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Application of:	Tao TAO et al.	Confirmation No.:	8911
Serial No.:	17/746,755	Art Unit:	1725
Filed:	May 17, 2022	Examiner:	Christopher P. Domone
For:	Lithium-Ion Battery Having Desirable Safety Performance	Attorney Docket No.:	024607-02-5119-US

INFORMATION DISCLOSURE STATEMENT

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

In accordance with the duty of disclosure provisions of 37 C.F.R. §1.56, there is hereby provided certain information which the Examiner may consider material to the examination of the subject U.S. patent application. It is requested that the Examiner make this information of record if it is deemed material to the examination of the application.

1. Enclosures accompanying this Information Disclosure Statement are:

1a. ☒ A list of all patents, publications, applications, or other information submitted for consideration by the office.

1b. A legible copy of:

☒ Each foreign patent;

☐ Each publication or that portion which caused it to be listed on the PTO-1449;

☐ For each cited pending U.S. application, the application specification including the claims, and any drawing of the application, or portion of the application which caused it to be listed on the PTO-1449 including any claims directed to that portion;

☒ all other information or portion which caused it to be listed on the PTO-1449.

1c. ☒ An English language copy of search report(s) from a counterpart foreign application or PCT International Search Report.

1d. ☐ Explanations of relevancy (ATTACHMENT hereto) or English language abstracts of the non-English language publications.

2. ☐ This Information Disclosure Statement is filed under 37 C.F.R. §1.97(b):

☐ Within three months of the filing date of a national application other than a continued prosecution application under §1.53(d);

☐ Within three months of the date of entry of the national stage as set forth in §1.491 in an international application;

☐ Before the mailing of the first Office action on the merits;

☐ Before the mailing of a first Office action after the filing of a request for continued examination under §1.114.

3. ☒ This Information Disclosure Statement is filed under 37 C.F.R. §1.97(c) after the period specified in 37 C.F.R. §1.97(b), but before the mailing date of any of a final action under 37 C.F.R. §1.113, a notice of allowance under 37 C.F.R. §1.311 or an action that otherwise closes prosecution in the application.

(Check either Item 3a, 3b, 3c or 3d)

3a. ☐ The Certification Statement in Item 5 below is applicable. Accordingly, no fee is required.

3b. ☒ The $260 (large entity) fee set forth in 37 C.F.R. §1.17(p) in accordance with 37 C.F.R. §1.97(c) is to be charged to Morgan, Lewis & Bockius LLP Deposit Account No. 50-0310 (order no. 024607-02-5119-US).

3c. ☐ The $104 (small entity) fee set forth in 37 C.F.R. §1.17(p) in accordance with 37 C.F.R. §1.97(c) is to be charged to Morgan, Lewis & Bockius LLP Deposit Account No. 50-0310 (order no.).

3d. ☐ The $52 (micro entity) fee set forth in 37 C.F.R. §1.17(p) in accordance with 37 C.F.R. §1.97(c) is to be charged to Morgan, Lewis & Bockius LLP Deposit Account No. 50-0310 (order no.).

(Items 3b or 3c to be checked if any reference known for more than 3 months)

4. ☐ This Information Disclosure Statement is filed under 37 C.F.R. §1.97(d) after the period specified in 37 C.F.R. §1.97(c), but on or before the date of payment of the issue fee.

(Check Item 4a, and 4b, 4c or 4d)

4a. ☐ The Certification Statement in Item 5 below is applicable.

4b. ☐ The $260 (large entity) fee set forth in 37 C.F.R. §1.17(p) in accordance with 37 C.F.R. §1.97(c) is to be charged to Morgan, Lewis & Bockius LLP Deposit Account No. 50-0310 (order no.).

4c. ☐ The $104 (small entity) fee set forth in 37 C.F.R. §1.17(p) in accordance with 37 C.F.R. §1.97(c) is to be charged to Morgan, Lewis & Bockius LLP Deposit Account No. 50-0310 (order no.).

4d. ☐ The $52 (micro entity) fee set forth in 37 C.F.R. §1.17(p) in accordance with 37 C.F.R. §1.97(c) is to be charged to Morgan, Lewis & Bockius LLP Deposit Account No. 50-0310 (order no.).

5. ☐ Certification Statement (applicable if Item 3a or Item 4a is checked)

(Check either Item 5a, 5b, 5c or 5d)

5a. ☐ In accordance with 37 C.F.R. §1.97(e)(1), it is certified that each item of information contained in this information disclosure statement was first cited in a communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of this Information Disclosure Statement.

5b. ☐ In accordance with 37 C.F.R. §1.97(e)(2), it is certified that no item of information contained in the information disclosure statement was cited in a communication from a foreign patent office in a counterpart foreign application, and, to the knowledge of the person signing the certification after making reasonable inquiry, no item of information contained in the information disclosure statement was known to any individual designated in 37 C.F.R. §1.56(c) more than three months prior to the filing of this information disclosure statement.

5c. ☐ Each item of information contained in this information disclosure statement was cited in a communication from a foreign patent office in a counterpart application, and the communication was not **received** by any individual designated in 37 C.F.R. §1.56(c) more than thirty days prior to the filing of this information disclosure statement.

5d. ☐ Pursuant to 37 C.F.R. §1.704(d), each item of information contained in this information disclosure statement was cited in a communication from a foreign patent office in a counterpart application, and the communication was not **received** by any individual designated in 37 C.F.R. §1.56(c) more than thirty days prior to the filing of this information disclosure statement.

6. ☒ Copies of each cited U.S. patent and each U.S. patent application publication are not enclosed pursuant to the USPTO OG Notice dated 05 August 2003 waiving the requirement under 37 C.F.R. 1.98(a)(2)(i) for U.S. patent applications filed after June 30, 2003.

7. ☐ This application is a continuation application under 37 C.F.R. §1.53(b) or (d).

(Check appropriate Items 7a, 7b and/or 7c)

7a. ☐ A Petition to Withdraw from issue under 37 C.F.R. §1.313(b)(5) is concurrently filed herewith.

7b. ☐ Copies of publications listed on Form PTO-1449 from prior application Serial No. , filed on , of which this application claims priority under 35 U.S.C. §120, are not being submitted pursuant to 37 C.F.R. §1.98(d).

7c. ☐ Copies of the publications listed on the attached Form PTO-1449 that were not previously cited in prior application Serial No. , filed on , are provided herewith.

8. ☐ This is a Supplemental Information Disclosure Statement. (Check Item 8a)

8a. ☐ This Supplemental Information Disclosure Statement under 37 C.F.R. §1.97(f) supplements the Information Disclosure Statement filed on . A bona fide attempt was made to comply with 37 C.F.R. §1.98, but inadvertent omissions were made. These omissions have been corrected herein. Accordingly, additional time is requested so that this Supplemental Information Disclosure Statement can be considered as if properly filed on .

9. ☐ In accordance with 37 C.F.R. §1.98, a concise explanation of what is presently understood to be the relevance of each non-English language publication is:

(Check Item 9a, 9b, or 9c)

9a. ☐ satisfied because all non-English language publications were cited on the enclosed English language copy of the PCT International Search Report or the search report from a counterpart foreign application indicating the degree of relevance found by the foreign office.

9b. ☐ set forth in the application.

9c. ☐ enclosed as an attachment hereto.

10. ☒ The Commissioner is authorized to charge any additional fee required or credit any overpayment for this Information Disclosure Statement and/or Petition to Morgan, Lewis & Bockius LLP Deposit Account No. 50-0310 (order no. 024607-02-5119-US).

11. ☒ No admission is made that the information cited in this Statement is, or is considered to be, material to patentability nor a representation that a search has been made (other than a search report of a foreign counterpart application or PCT International Search Report if submitted herewith). 37 C.F.R. §§1.97(g) and (h).

Respectfully submitted,

Date: September 8, 2023

/Yalei Sun/ 57,765

Yalei Sun (Reg. No.)
MORGAN, LEWIS & BOCKIUS LLP
1400 Page Mill Road
Palo Alto, CA 94304
(650) 843-4000

INFORMATION DISCLOSURE STATEMENT BY APPLICANT Substitute for Form 1449-PTO				***Electronically filed September 16, 2023***	
				Application Number	***17/746,755***
				Filing Date	***May 17, 2022***
				First Named Inventor	***Tao TAO***
				Art Unit	***1721***
				Examiner Name	***Barton, Jason Aaron***
Sheet	1	of	1	Attorney Docket Number	***024607-02-5119-US***

U.S. PATENT DOCUMENTS					
Examiner Initials	Cite No.	Document Number Number - Kind Code	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear

FOREIGN PATENT DOCUMENTS						
Examiner Initials	Cite No.	Foreign Patent Document Country Code – Number - Kind Code *(if known)*	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear	T
		CN101783402A	7/21/2010	AMPEREX TECHNOLOGY LTD		
		CN103579666A	2/12/2014	WIDO NEW ENERGY CO LTD		

NON PATENT LITERATURE DOCUMENTS		
Examiner Initials	Cite No.	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published

Examiner Signature		Date Considered	

UNITED STATES
PATENT AND TRADEMARK OFFICE

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Alexandria, VA 22313 - 1450
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ELECTRONIC ACKNOWLEDGEMENT RECEIPT

APPLICATION #	RECEIPT DATE / TIME	ATTORNEY DOCKET #
17/746,755	**09/16/2023 10:56:56 PM ET**	**024607-02-5119-US**

Title of Invention

LITHIUM-ION BATTERY HAVING DESIRABLE SAFETY PERFORMANCE

Application Information

APPLICATION TYPE	Utility - Nonprovisional Application under 35 USC 111(a)	PATENT #	-
CONFIRMATION #	8911	FILED BY	Edith Fuentes
PATENT CENTER #	62810754	FILING DATE	05/17/2022
CUSTOMER #	24341	FIRST NAMED INVENTOR	Tao TAO
CORRESPONDENCE ADDRESS	-	AUTHORIZED BY	Yalei Sun

Documents

TOTAL DOCUMENTS: 4

DOCUMENT	PAGES	DESCRIPTION	SIZE (KB)
024607-02-5119-US_Supplemental IDS.pdf	4	Transmittal Letter	191 KB
024607-02-5119-US_Supp_1449.pdf	1	Information Disclosure Statement (IDS) Form (SB08)	168 KB
Warning: This is not a USPTO supplied IDS fillable form. Data in the form cannot be automatically loaded to other USPTO systems.			
CN101783402A.pdf	9	Foreign Reference	745 KB
CN103579666A.pdf	11	Foreign Reference	906 KB

Digest

DOCUMENT	MESSAGE DIGEST(SHA-512)
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CN103579666A.pdf	4C75010AAB74BB61819C4E5263464FEE40A8BDEEFCF760D8A9123C6D8776B67BB8667837E2C3F96C87454735778169A098938F4D0936A42094FB332021C5EEAC

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111

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National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

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Electronically filed September 16, 2023

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Application of:	Tao TAO et al.	Confirmation No.:	8911
Serial No.:	17/746,755	Art Unit:	1725
Filed:	May 17, 2022	Examiner:	Christopher P. Domone
For:	Lithium-Ion Battery Having Desirable Safety Performance	Attorney Docket No.:	024607-02-5119-US

SUPPLEMENTAL INFORMATION DISCLOSURE STATEMENT

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

In accordance with the duty of disclosure provisions of 37 C.F.R. §1.56, there is hereby provided certain information which the Examiner may consider material to the examination of the subject U.S. patent application. It is requested that the Examiner make this information of record if it is deemed material to the examination of the application.

1. Enclosures accompanying this Information Disclosure Statement are:

1a. ☒ A list of all patents, publications, applications, or other information submitted for consideration by the office.

1b. A legible copy of:

☒ Each foreign patent;

☐ Each publication or that portion which caused it to be listed on the PTO-1449;

☐ For each cited pending U.S. application, the application specification including the claims, and any drawing of the application, or portion of the application which caused it to be listed on the PTO-1449 including any claims directed to that portion;

☐ all other information or portion which caused it to be listed on the PTO-1449.

1c. ☐ An English language copy of search report(s) from a counterpart foreign application or PCT International Search Report.

1d. ☐ Explanations of relevancy (ATTACHMENT hereto) or English language abstracts of the non-English language publications.

2. ☐ This Information Disclosure Statement is filed under 37 C.F.R. §1.97(b):

☐ Within three months of the filing date of a national application other than a continued prosecution application under §1.53(d);

☐ Within three months of the date of entry of the national stage as set forth in §1.491 in an international application;

☐ Before the mailing of the first Office action on the merits;

☐ Before the mailing of a first Office action after the filing of a request for continued examination under §1.114.

3. ☐ This Information Disclosure Statement is filed under 37 C.F.R. §1.97(c) after the period specified in 37 C.F.R. §1.97(b), but before the mailing date of any of a final action under 37 C.F.R. §1.113, a notice of allowance under 37 C.F.R. §1.311 or an action that otherwise closes prosecution in the application.

(Check either Item 3a, 3b, 3c or 3d)

3a. ☐ The Certification Statement in Item 5 below is applicable. Accordingly, no fee is required.

3b. ☐ The $260 (large entity) fee set forth in 37 C.F.R. §1.17(p) in accordance with 37 C.F.R. §1.97(c) is to be charged to Morgan, Lewis & Bockius LLP Deposit Account No. 50-0310 (order no.).

3c. ☐ The $104 (small entity) fee set forth in 37 C.F.R. §1.17(p) in accordance with 37 C.F.R. §1.97(c) is to be charged to Morgan, Lewis & Bockius LLP Deposit Account No. 50-0310 (order no.).

3d. ☐ The $52 (micro entity) fee set forth in 37 C.F.R. §1.17(p) in accordance with 37 C.F.R. §1.97(c) is to be charged to Morgan, Lewis & Bockius LLP Deposit Account No. 50-0310 (order no.).

(Items 3b or 3c to be checked if any reference known for more than 3 months)

4. ☐ This Information Disclosure Statement is filed under 37 C.F.R. §1.97(d) after the period specified in 37 C.F.R. §1.97(c), but on or before the date of payment of the issue fee.

(Check Item 4a, and 4b, 4c or 4d)

4a. ☐ The Certification Statement in Item 5 below is applicable.

4b. ☐ The $260 (large entity) fee set forth in 37 C.F.R. §1.17(p) in accordance with 37 C.F.R. §1.97(c) is to be charged to Morgan, Lewis & Bockius LLP Deposit Account No. 50-0310 (order no.).

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5. ☐ Certification Statement (applicable if Item 3a or Item 4a is checked)

(Check either Item 5a, 5b, 5c or 5d)

5a. ☐ In accordance with 37 C.F.R. §1.97(e)(1), it is certified that each item of information contained in this information disclosure statement was first cited in a communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of this Information Disclosure Statement.

5b. ☐ In accordance with 37 C.F.R. §1.97(e)(2), it is certified that no item of information contained in the information disclosure statement was cited in a communication from a foreign patent office in a counterpart foreign application, and, to the knowledge of the person signing the certification after making reasonable inquiry, no item of information contained in the information disclosure statement was known to any individual designated in 37 C.F.R. §1.56(c) more than three months prior to the filing of this information disclosure statement.

5c. ☐ Each item of information contained in this information disclosure statement was cited in a communication from a foreign patent office in a counterpart application, and the communication was not **received** by any individual designated in 37 C.F.R. §1.56(c) more than thirty days prior to the filing of this information disclosure statement.

5d. ☐ Pursuant to 37 C.F.R. §1.704(d), each item of information contained in this information disclosure statement was cited in a communication from a foreign patent office in a counterpart application, and the communication was not **received** by any individual designated in 37 C.F.R. §1.56(c) more than thirty days prior to the filing of this information disclosure statement.

6. ☐ Copies of each cited U.S. patent and each U.S. patent application publication are not enclosed pursuant to the USPTO OG Notice dated 05 August 2003 waiving the requirement under 37 C.F.R. 1.98(a)(2)(i) for U.S. patent applications filed after June 30, 2003.

7. ☐ This application is a continuation application under 37 C.F.R. §1.53(b) or (d).

(Check appropriate Items 7a, 7b and/or 7c)

7a. ☐ A Petition to Withdraw from issue under 37 C.F.R. §1.313(b)(5) is concurrently filed herewith.

7b. ☐ Copies of publications listed on Form PTO-1449 from prior application Serial No. , filed on , of which this application claims priority under 35 U.S.C. §120, are not being submitted pursuant to 37 C.F.R. §1.98(d).

7c. ☐ Copies of the publications listed on the attached Form PTO-1449 that were not previously cited in prior application Serial No. , filed on , are provided herewith.

8. ☒ This is a Supplemental Information Disclosure Statement. (Check Item 8a)

8a. ☒ This Supplemental Information Disclosure Statement under 37 C.F.R. §1.97(f) supplements the Information Disclosure Statement filed on **September 8, 2023**. A bona fide attempt was made to comply with 37 C.F.R. §1.98, but inadvertent omissions were made. These omissions have been corrected herein. Accordingly, additional time is requested so that this Supplemental Information Disclosure Statement can be considered as if properly filed on **September 8, 2023**.

9. ☐ In accordance with 37 C.F.R. §1.98, a concise explanation of what is presently understood to be the relevance of each non-English language publication is:

(Check Item 9a, 9b, or 9c)

9a. ☐ satisfied because all non-English language publications were cited on the enclosed English language copy of the PCT International Search Report or the search report from a counterpart foreign application indicating the degree of relevance found by the foreign office.

9b. ☐ set forth in the application.

9c. ☐ enclosed as an attachment hereto.

10. ☒ The Commissioner is authorized to charge any additional fee required or credit any overpayment for this Information Disclosure Statement and/or Petition to Morgan, Lewis & Bockius LLP Deposit Account No. 50-0310 (order no. 024607-02-5119-US).

11. ☒ No admission is made that the information cited in this Statement is, or is considered to be, material to patentability nor a representation that a search has been made (other than a search report of a foreign counterpart application or PCT International Search Report if submitted herewith). 37 C.F.R. §§1.97(g) and (h).

Respectfully submitted,

Date: September 16, 2023

/Yalei Sun/ 57,765

Yalei Sun (Reg. No.)
MORGAN, LEWIS & BOCKIUS LLP
1400 Page Mill Road
Palo Alto, CA 94304
(650) 843-4000

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
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Alexandria, Virginia 22313-1450
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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
17/746,755	05/17/2022	Tao TAO	024607-02-5119-US	8911

7590 10/04/2023

Morgan, Lewis & Bockius LLP (PA)
1400 Page Mill Road
Palo Alto, CA 94304-1124

EXAMINER	
DOMONE, CHRISTOPHER P	
ART UNIT	PAPER NUMBER
1725	
NOTIFICATION DATE	DELIVERY MODE
10/04/2023	ELECTRONIC

NOTICE OF NON-COMPLIANT INFORMATION DISCLOSURE STATEMENT

An Information Disclosure Statement (IDS) filed 9.08.2023 in the above-identified application fails to meet the requirements of 37 CFR 1.97(d) for the reason(s) specified below. Accordingly, the IDS will be placed in the file, but the information referred to therein has not been considered.

The IDS is not compliant with 37 CFR 1.97(d) because:

☒ The IDS lacks a statement as specified in 37 CFR 1.97(e).

☐ The IDS lacks the fee set forth in 37 CFR 1.17(p).

☐ The IDS was filed after the issue fee was paid. Applicant may wish to consider filing a petition to withdraw the application from issue under 37 CFR 1.313(c) to have the IDS considered. See MPEP 1308.

N. Horne, for

571-272-4200 or 1-888-786-0101
Application Assistance Unit
Office of Data Management

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
17/746,755	05/17/2022	Tao TAO	024607-02-5119-US	8911

7590 10/04/2023

Morgan, Lewis & Bockius LLP (PA)
1400 Page Mill Road
Palo Alto, CA 94304-1124

EXAMINER	
DOMONE, CHRISTOPHER P	
ART UNIT	PAPER NUMBER
1725	
NOTIFICATION DATE	DELIVERY MODE
10/04/2023	ELECTRONIC

NOTICE OF NON-COMPLIANT INFORMATION DISCLOSURE STATEMENT

An Information Disclosure Statement (IDS) filed 9.16.2023 in the above-identified application fails to meet the requirements of 37 CFR 1.97(d) for the reason(s) specified below. Accordingly, the IDS will be placed in the file, but the information referred to therein has not been considered.

The IDS is not compliant with 37 CFR 1.97(d) because:

☒ The IDS lacks a statement as specified in 37 CFR 1.97(e).

☐ The IDS lacks the fee set forth in 37 CFR 1.17(p).

☐ The IDS was filed after the issue fee was paid. Applicant may wish to consider filing a petition to withdraw the application from issue under 37 CFR 1.313(c) to have the IDS considered. See MPEP 1308.

N. Horne, for

571-272-4200 or 1-888-786-0101
Application Assistance Unit
Office of Data Management

Electronically filed November 9, 2023

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Application of:	Tao TAO et al.	Confirmation No.:	8911
Serial No.:	17/746,755	Art Unit:	1725
Filed:	May 17, 2022	Examiner:	Christopher P. Domone
For:	Lithium-Ion Battery Having Desirable Safety Performance	Attorney Docket No.:	024607-02-5119-US

SUPPLEMENTAL INFORMATION DISCLOSURE STATEMENT

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

In accordance with the duty of disclosure provisions of 37 C.F.R. §1.56, there is hereby provided certain information which the Examiner may consider material to the examination of the subject U.S. patent application. It is requested that the Examiner make this information of record if it is deemed material to the examination of the application.

1. Enclosures accompanying this Information Disclosure Statement are:

1a. ☒ A list of all patents, publications, applications, or other information submitted for consideration by the office.

1b. A legible copy of:

☐ Each foreign patent;

☐ Each publication or that portion which caused it to be listed on the PTO-1449;

☐ For each cited pending U.S. application, the application specification including the claims, and any drawing of the application, or portion of the application which caused it to be listed on the PTO-1449 including any claims directed to that portion;

☐ all other information or portion which caused it to be listed on the PTO-1449.

1c. ☐ An English language copy of search report(s) from a counterpart foreign application or PCT International Search Report.

1d. ☐ Explanations of relevancy (ATTACHMENT hereto) or English language abstracts of the non-English language publications.

2. ☐ This Information Disclosure Statement is filed under 37 C.F.R. §1.97(b):

☐ Within three months of the filing date of a national application other than a continued prosecution application under §1.53(d);

☐ Within three months of the date of entry of the national stage as set forth in §1.491 in an international application;

☐ Before the mailing of the first Office action on the merits;

☐ Before the mailing of a first Office action after the filing of a request for continued examination under §1.114.

3. ☐ This Information Disclosure Statement is filed under 37 C.F.R. §1.97(c) after the period specified in 37 C.F.R. §1.97(b), but before the mailing date of any of a final action under 37 C.F.R. §1.113, a notice of allowance under 37 C.F.R. §1.311 or an action that otherwise closes prosecution in the application.

(Check either Item 3a, 3b, 3c or 3d)

3a. ☐ The Certification Statement in Item 5 below is applicable. Accordingly, no fee is required.

3b. ☐ The $260 (large entity) fee set forth in 37 C.F.R. §1.17(p) in accordance with 37 C.F.R. §1.97(c) is to be charged to Morgan, Lewis & Bockius LLP Deposit Account No. 50-0310 (order no.).

3c. ☐ The $104 (small entity) fee set forth in 37 C.F.R. §1.17(p) in accordance with 37 C.F.R. §1.97(c) is to be charged to Morgan, Lewis & Bockius LLP Deposit Account No. 50-0310 (order no.).

3d. ☐ The $52 (micro entity) fee set forth in 37 C.F.R. §1.17(p) in accordance with 37 C.F.R. §1.97(c) is to be charged to Morgan, Lewis & Bockius LLP Deposit Account No. 50-0310 (order no.).

(Items 3b or 3c to be checked if any reference known for more than 3 months)

4. ☒ This Information Disclosure Statement is filed under 37 C.F.R. §1.97(d) after the period specified in 37 C.F.R. §1.97(c), but on or before the date of payment of the issue fee.

(Check Item 4a, and 4b, 4c or 4d)

4a. ☒ The Certification Statement in Item 5 below is applicable.

4b. ☒ The $260 (large entity) fee set forth in 37 C.F.R. §1.17(p) in accordance with 37 C.F.R. §1.97(c) is to be charged to Morgan, Lewis & Bockius LLP Deposit Account No. 50-0310 (order no. 024607-02-5119-US).

4c. ☐ The $104 (small entity) fee set forth in 37 C.F.R. §1.17(p) in accordance with 37 C.F.R. §1.97(c) is to be charged to Morgan, Lewis & Bockius LLP Deposit Account No. 50-0310 (order no.).

4d. ☐ The $52 (micro entity) fee set forth in 37 C.F.R. §1.17(p) in accordance with 37 C.F.R. §1.97(c) is to be charged to Morgan, Lewis & Bockius LLP Deposit Account No. 50-0310 (order no.).

5. ☒ Certification Statement (applicable if Item 3a or Item 4a is checked)

(Check either Item 5a, 5b, 5c or 5d)

5a. ☒ In accordance with 37 C.F.R. §1.97(e)(1), it is certified that each item of information contained in this information disclosure statement was first cited in a communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of this Information Disclosure Statement.

5b. ☐ In accordance with 37 C.F.R. §1.97(e)(2), it is certified that no item of information contained in the information disclosure statement was cited in a communication from a foreign patent office in a counterpart foreign application, and, to the knowledge of the person signing the certification after making reasonable inquiry, no item of information contained in the information disclosure statement was known to any individual designated in 37 C.F.R. §1.56(c) more than three months prior to the filing of this information disclosure statement.

5c. ☐ Each item of information contained in this information disclosure statement was cited in a communication from a foreign patent office in a counterpart application, and the communication was not **received** by any individual designated in 37 C.F.R. §1.56(c) more than thirty days prior to the filing of this information disclosure statement.

5d. ☐ Pursuant to 37 C.F.R. §1.704(d), each item of information contained in this information disclosure statement was cited in a communication from a foreign patent office in a counterpart application, and the communication was not **received** by any individual designated in 37 C.F.R. §1.56(c) more than thirty days prior to the filing of this information disclosure statement.

6. ☒ Copies of each cited U.S. patent and each U.S. patent application publication are not enclosed pursuant to the USPTO OG Notice dated 05 August 2003 waiving the requirement under 37 C.F.R. 1.98(a)(2)(i) for U.S. patent applications filed after June 30, 2003.

7. ☐ This application is a continuation application under 37 C.F.R. §1.53(b) or (d).

(Check appropriate Items 7a, 7b and/or 7c)

7a. ☐ A Petition to Withdraw from issue under 37 C.F.R. §1.313(b)(5) is concurrently filed herewith.

7b. ☐ Copies of publications listed on Form PTO-1449 from prior application Serial No. , filed on , of which this application claims priority under 35 U.S.C. §120, are not being submitted pursuant to 37 C.F.R. §1.98(d).

7c. ☐ Copies of the publications listed on the attached Form PTO-1449 that were not previously cited in prior application Serial No. , filed on , are provided herewith.

8. ☒ This is a Supplemental Information Disclosure Statement. (Check Item 8a)

8a. ☒ This Supplemental Information Disclosure Statement under 37 C.F.R. §1.97(f) supplements the Information Disclosure Statement filed on **September 8, 2023**. A bona fide attempt was made to comply with 37 C.F.R. §1.98, but inadvertent omissions were made. These omissions have been corrected herein. Accordingly, additional time is requested so that this Supplemental Information Disclosure Statement can be considered as if properly filed on **September 8, 2023**.

9. ☐ In accordance with 37 C.F.R. §1.98, a concise explanation of what is presently understood to be the relevance of each non-English language publication is:

(Check Item 9a, 9b, or 9c)

9a. ☐ satisfied because all non-English language publications were cited on the enclosed English language copy of the PCT International Search Report or the search report from a counterpart foreign application indicating the degree of relevance found by the foreign office.

9b. ☐ set forth in the application.

9c. ☐ enclosed as an attachment hereto.

10. ☒ The Commissioner is authorized to charge any additional fee required or credit any overpayment for this Information Disclosure Statement and/or Petition to Morgan, Lewis & Bockius LLP Deposit Account No. 50-0310 (order no. 024607-02-5119-US).

11. ☒ No admission is made that the information cited in this Statement is, or is considered to be, material to patentability nor a representation that a search has been made (other than a search report of a foreign counterpart application or PCT International Search Report if submitted herewith). 37 C.F.R. §§1.97(g) and (h).

Respectfully submitted,

Date: November 9, 2023

/Yalei Sun/ 57,765

Yalei Sun (Reg. No.)

MORGAN, LEWIS & BOCKIUS LLP
1400 Page Mill Road
Palo Alto, CA 94304
(650) 843-4000

UNITED STATES
PATENT AND TRADEMARK OFFICE

P.O. Box 1450
Alexandria, VA 22313 - 1450
www.uspto.gov

ELECTRONIC ACKNOWLEDGEMENT RECEIPT

APPLICATION #	RECEIPT DATE / TIME	ATTORNEY DOCKET #
17/746,755	**11/09/2023 12:33:50 PM Z ET**	**024607-02-5119-US**

Title of Invention

LITHIUM-ION BATTERY HAVING DESIRABLE SAFETY PERFORMANCE

Application Information

APPLICATION TYPE	Utility - Nonprovisional Application under 35 USC 111(a)	PATENT #	-
CONFIRMATION #	8911	FILED BY	Edith Fuentes
PATENT CENTER #	63206406	FILING DATE	05/17/2022
CUSTOMER #	24341	FIRST NAMED INVENTOR	Tao TAO
CORRESPONDENCE ADDRESS	-	AUTHORIZED BY	Yalei Sun

Documents

TOTAL DOCUMENTS: 2

DOCUMENT	PAGES	DESCRIPTION	SIZE (KB)
024607-02-5119-US_Supplemental IDS.pdf	4	Transmittal Letter	164 KB
024607-02-5119-US_Suppl-1449.pdf	2	Information Disclosure Statement (IDS) Form (SB08)	176 KB

Warning: This is not a USPTO supplied IDS fillable form. Data in the form cannot be automatically loaded to other USPTO systems.

Digest

DOCUMENT	MESSAGE DIGEST(SHA-512)

024607-02-5119-US_Supplemental IDS.pdf	26D76047C9CA685C8D9E5F1A74C975002202B41DE04953CFC4A6871665F1A5890405A7A13102832F1C4884C7A1D7A937EA332A3A22ACA3DEEE2F546836761609
024607-02-5119-US_Suppl-1449.pdf	E8048BECE6687C9D2CA0B7A61A3C24DF3422194489A91FC6D01E4A1A7F1ECEDAB8FB8603A7F57CD877D7351C54554BBA3269FB6CF0FE6C1BA7166655FA920F5E

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

INFORMATION DISCLOSURE STATEMENT BY APPLICANT Substitute for Form 1449-PTO				*Electronically filed November 9, 2023*	
				Application Number	*17/746,755*
				Filing Date	*May 17, 2022*
				First Named Inventor	*Tao TAO*
				Art Unit	*1725*
				Examiner Name	*Christopher P Domone*
Sheet	1	of	2	Attorney Docket Number	*024607-02-5119-US*

U.S. PATENT DOCUMENTS

Examiner Initials	Cite No.	Document Number Number - Kind Code	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
		2013/0260203 A1	10-03-2013	Yoshida et al.	

FOREIGN PATENT DOCUMENTS

Examiner Initials	Cite No.	Foreign Patent Document Country Code – Number - Kind Code *(if known)*	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear	T
		CN101304103B	8/25/2010	SONY CORP		
		CN101615694A	12/30/2009	SAMSUNG SDI CO LTD		
		CN101783402A	7/21/2010	AMPEREX TECHNOLOGY LTD		
		CN102187497A	9/14/2011	PANASONIC CORP		
		CN1983682A	6/20/2007	MATSUSHITA ELECTRIC IND CO LTD [JP]		
		CN2786795Y	6/7/2006	WUHAN HUAFENG SENSOR CO LTD [CN]		
		JPH0527951A-JP1993027951B2	2/5/1993	HITACHI LTD		
		JP2000067907A	3/3/2000	MITSUBISHI ELECTRIC CORP		
		JP2010055906A	3/11/2010	SANYO ELECTRIC CO		
		JP4380201B2	12/9/2009	MATSUSHITA ELECTRIC IND CO LTD		
		JP2008171593A	7/24/2008	SHOEI ELECTRONICS KK		
		JP2010-73653A	4/2/2010	PANASONIC CORP		
		JP2013201094A	10/3/2013	HITACHI MAXELL		

NON PATENT LITERATURE DOCUMENTS

Examiner Signature		Date Considered	

INFORMATION DISCLOSURE STATEMENT BY APPLICANT Substitute for Form 1449-PTO				***Electronically filed November 9, 2023***	
				Application Number	***17/746,755***
				Filing Date	***May 17, 2022***
				First Named Inventor	***Tao TAO***
				Art Unit	***1725***
				Examiner Name	***Christopher P Domone***
Sheet	2	of	2	Attorney Docket Number	***024607-02-5119-US***

Examiner Initials	Cite No.	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published
		Office Action, CN201420030319.4, 17AUG2023, 5 pgs.
		Office Action, CN201420030319.4, 14JUL2023, 6 pgs.
		Invalidity Request, ZL201420030319.4, 04AUG2023, 92 pgs.
		Invalidity, ZL201420030319.4, 04JUL2023, 7 pgs.

Examiner Signature		Date Considered	

UNITED STATES
PATENT AND TRADEMARK OFFICE

P.O. Box 1450
Alexandria, VA 22313 - 1450
www.uspto.gov

ELECTRONIC ACKNOWLEDGEMENT RECEIPT

APPLICATION #	RECEIPT DATE / TIME	ATTORNEY DOCKET #
17/746,755	**11/09/2023 12:37:35 PM Z ET**	**024607-02-5119-US**

Title of Invention

LITHIUM-ION BATTERY HAVING DESIRABLE SAFETY PERFORMANCE

Application Information

APPLICATION TYPE	Utility - Nonprovisional Application under 35 USC 111(a)	PATENT #	-
CONFIRMATION #	8911	FILED BY	Edith Fuentes
PATENT CENTER #	63206614	FILING DATE	05/17/2022
CUSTOMER #	24341	FIRST NAMED INVENTOR	Tao TAO
CORRESPONDENCE ADDRESS	-	AUTHORIZED BY	Yalei Sun

Documents

TOTAL DOCUMENTS: 2

DOCUMENT	PAGES	DESCRIPTION	SIZE (KB)
024607-02-5119-US_197-i_IDS.pdf	4	Transmittal Letter	157 KB
024607-02-5119-US_197-i_Form 1449.pdf	3	Information Disclosure Statement (IDS) Form (SB08)	187 KB

Warning: This is not a USPTO supplied IDS fillable form. Data in the form cannot be automatically loaded to other USPTO systems.

Digest

DOCUMENT	MESSAGE DIGEST(SHA-512)

024607-02-5119-US_197-i_IDS.pdf	4B3980466D5A3D78221811BDF760450A82F38963821EEF1A32F020B4162A47C52E58914375DB9F8608C00E2886F9772F3C776E3C512DA1F5D29330A1B7369F0C
024607-02-5119-US_197-i_Form 1449.pdf	F51D1BD7191B2DB0A8B9AECBA2B82A5FE6FE978DE2DAC14876DEE3FC0A45F85E6CBBA76FF7CD21B510E884C567AC18640EB304CFEC4302C1ECA0581B18A57657

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

Electronically filed November 9, 2023

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Application of:	Tao TAO et al.	Confirmation No.:	8911
Serial No.:	17/746,755	Art Unit:	1725
Filed:	May 17, 2022	Examiner:	Christopher P. Domone
For:	Lithium-Ion Battery Having Desirable Safety Performance	Attorney Docket No.:	024607-02-5119-US

INFORMATION DISCLOSURE STATEMENT SUBMITTED UNDER 37 C.F.R. § 1.97(i)

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

In accordance with the duty of disclosure provisions of 37 C.F.R. §1.56, there is hereby provided certain information that the applicant considers cumulative with respect to references already of record in the subject U.S. patent application or otherwise not material to the examination of the application. It is requested that the references cited herein be made of record in the application in accordance with rule 37 C.F.R. §1.97(i).

1. Enclosures accompanying this Information Disclosure Statement are:

1a. ☒ A list of all patents, publications, applications, or other information submitted for consideration by the office.

1b. A legible copy of :

☐ Each foreign patent;

☐ Each publication or that portion which caused it to be listed on the PTO-1449;

☐ For each cited pending U.S. application, the application specification including the claims, and any drawing of the application, or portion of the application which caused it to be listed on the PTO-1449 including any claims directed to that portion;

☐ all other information or portion which caused it to be listed on the PTO-1449.

1c. ☐ An English language copy of search report(s) from a counterpart foreign application or PCT International Search Report.

1d. ☐ Explanations of relevancy (ATTACHMENT 1(d), hereto) or English language abstracts of the non-English language publications.

2. ☐ This Information Disclosure Statement is filed under 37 C.F.R. §1.97(b):

☐ Within three months of the filing date of a national application other than a continued prosecution application under §1.53(d);

☐ Within three months of the date of entry of the national stage as set forth in §1.491 in an international application;

☐ Before the mailing of the first Office action on the merits;

☐ Before the mailing of a first Office action after the filing of a request for continued examination under §1.114.

3. ☐ This Information Disclosure Statement is filed under 37 C.F.R. §1.97(c) after the period specified in 37 C.F.R. §1.97(b), but before the mailing date of any of a final action under 37 C.F.R. §1.113, a notice of allowance under 37 C.F.R. §1.311 or an action that otherwise closes prosecution in the application.

(Check either Item 3a, 3b or 3c)

3a. ☐ The Certification Statement in Item 5 below is applicable. Accordingly, no fee is required.

3b. ☐ The $260 (large entity) fee set forth in 37 C.F.R. §1.17(p) in accordance with 37 C.F.R. §1.97(c).

3c. ☐ The $104 (small entity) fee set forth in 37 C.F.R. §1.17(p) in accordance with 37 C.F.R. §1.97(c).

(Items 3b or 3c to be checked if any reference known for more than 3 months)

4. ☐ This Information Disclosure Statement is filed under 37 C.F.R. §1.97(d) after the period specified in 37 C.F.R. §1.97(c), but on or before the date of payment of the issue fee.

(Check either Item 4a and 4b or 4c)

4a. ☐ The Certification Statement in Item 5 below is applicable.

4b. ☐ The $260 (large entity) fee set forth in 37 C.F.R. §1.17(p) in accordance with 37 C.F.R. §1.97(c).

4c. ☐ The $104 (small entity) fee set forth in 37 C.F.R. §1.17(p) in accordance with 37 C.F.R. §1.97(c).

5. ☒ This Information Disclosure Statement is filed under 37 C.F.R. §1.97(i) as it does not comply with § 1.97(a)-(d), Applicants request that this Information Disclosure Statement be placed in the file by the office.

6. ☐ Copies of each cited U.S. patent and each U.S. patent application publication are not enclosed pursuant to the USPTO OG Notice dated 05 August 2003 waiving the requirement under 37 C.F.R. 1.98(a)(2)(i) for U.S. patent applications filed after June 30, 2003.

7. ☐ This application is a continuing application under 37 C.F.R. §1.53(b) or (d).

(Check appropriate Items 7a, 7b and/or 7c)

7a. ☐ A Petition to Withdraw from issue under 37 C.F.R. §1.313(b)(5) is concurrently filed herewith.

7b. ☐ Copies of publications listed on Form PTO-1449 from prior application Serial No. , filed on , of which this application claims priority under 35 U.S.C. §120, are not being submitted pursuant to 37 C.F.R. §1.98(d).

7c. ☐ Copies of the publications listed on Form PTO-1449 were not previously cited in prior application Serial No. , filed on , and are provided herewith.

8. ☐ This is a Supplemental Information Disclosure Statement. (Check Item 8a)

8a. ☐ This Supplemental Information Disclosure Statement under 37 C.F.R. §1.97(f) supplements the Information Disclosure Statement filed on . A bona fide attempt was made to comply with 37 C.F.R. §1.98, but inadvertent omissions were made. These omissions have been corrected herein. Accordingly, additional time is requested so that this Supplemental Information Disclosure Statement can be considered as if properly filed on .

9. ☐ In accordance with 37 C.F.R. §1.98, a concise explanation of what is presently understood to be the relevance of each non-English language publication is:

(Check Item 9a, 9b, or 9c)

9a. ☐ satisfied because all non-English language publications were cited on the enclosed English language copy of the PCT International Search Report or the search report from a counterpart foreign application indicating the degree of relevance found by the foreign office.

9b. ☐ set forth in the application.

9c. ☐ enclosed as an attachment hereto.

10. ☒ Payment has been made via Financial Manager, however, the Director is hereby authorized to charge any required fees to Morgan, Lewis & Bockius LLP Deposit Account No. 50-0310 (order no. 024607-02-5119-US).

11. ☒ No admission is made that the information cited in this Statement is, or is considered to be, material to patentability nor a representation that a search has been made (other than a search report of a foreign counterpart application or PCT International Search Report if submitted herewith). 37 C.F.R. §§1.97(g) and (h).

Respectfully submitted,

Date: November 9, 2023

/Yalei Sun/ 57,765

Yalei Sun (Reg. No.)
MORGAN, LEWIS & BOCKIUS LLP
1400 Page Mill Road
Palo Alto, CA 94304
(650) 843-4000

INFORMATION DISCLOSURE STATEMENT BY APPLICANT Substitute for Form 1449-PTO				*Electronically filed November 9, 2023*	
				Application Number	*17/746,755*
				Filing Date	*May 17, 2022*
				First Named Inventor	*Tao TAO*
				Art Unit	*1721*
				Examiner Name	*Barton, Jason Aaron*
Sheet	1	of	3	Attorney Docket Number	*024607-02-5119-US*

U.S. PATENT DOCUMENTS					
Examiner Initials	Cite No.	Document Number Number - Kind Code	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
		6,300,002 B1	10-2001	Webb	
		8,232,008 B2	07-2012	Morishima	
		8,969,756 B2	03-03-2015	Dougherty	
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		2017/0092925 A1	03-30-2017	Shiu et al.	

FOREIGN PATENT DOCUMENTS						
Examiner Initials	Cite No.	Foreign Patent Document Country Code – Number - Kind Code *(if known)*	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear	T
		CN101826609A	9/1/2010	HUNAN CPEV BATTERY CO LTD		
		CN104157914A	11/1/2014	SHANDONG QIXING NEW ENERGY SCIENCE AND TECHNOLOGY CO LTD		
		CN105514352A	4/20/2016	DONGGUAN AMPEREX TECH LTD		

Examiner Signature		Date Considered	

INFORMATION DISCLOSURE STATEMENT BY APPLICANT Substitute for Form 1449-PTO				*Electronically filed November 9, 2023*	
				Application Number	*17/746,755*
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				First Named Inventor	*Tao TAO*
				Art Unit	*1721*
				Examiner Name	*Barton, Jason Aaron*
Sheet	2	of	3	Attorney Docket Number	*024607-02-5119-US*

		CN102315477A	1/11/2012	SHENZHEN YAKANG PREC MACHINERY CO LTD		
		CN103579666A	2/12/2014	WIDO NEW ENERGY CO LTD		
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		CN201336332Y	10/28/2009	SHENZHEN BETTERPOWER BATTERY C [CN]		
		CN202373667U	8/8/2012	AMPEREX TECHNOLOGY LTD; NINGDE AMPEREX TECHNOLOGY LTD		
		CN203574050U	4/30/2014	AMPEREX TECHNOLOGY LTD; NINGDE AMPEREX TECHNOLOGY LTD		
		CN202423456U	9/5/2012	YIYANG KELIYUAN BATTERY CO LTD		
		CN202839841U	3/27/2013	AMPEREX TECHNOLOGY LTD; NINGDE AMPEREX TECHNOLOGY LTD		
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		JP2007165224A	6/1/2007	NAGASAKI A		

Examiner Signature		Date Considered	

INFORMATION DISCLOSURE STATEMENT BY APPLICANT Substitute for Form 1449-PTO				*Electronically filed November 9, 2023*	
				Application Number	*17/746,755*
				Filing Date	*May 17, 2022*
				First Named Inventor	*Tao TAO*
				Art Unit	*1721*
				Examiner Name	*Barton, Jason Aaron*
Sheet	3	of	3	Attorney Docket Number	*024607-02-5119-US*

		WO-2012072222-A1	6/1/2012	ZSW [DE]; STERN RAINER [DE]; KASPER MICHAEL [DE]		
		WO2013038677A1	3/1/2013	ENDO K		

NON PATENT LITERATURE DOCUMENTS

Examiner Initials	Cite No.	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published
		Office Action, CN201580082766.1, 27MAY2020, 7 pgs.
		Office Action, CN201580082766.1, 08JAN2021, 7 pgs.
		Office Action, CN201580082766.1, 02JUN2021, 2 pgs.
		International Search Report PCT/CN2015/088638, 27MAY2016, 5 pgs.
		Guo, Office Action, US15/908,327, 24OCT2019, 10 pgs.
		Guo, Final Office Action, US15/908,327, 31JAN2020, 9 pgs.
		Guo, Office Action, US15/908,327, 19OCT2020, 8 pgs.
		Guo, Final Office Action, US15/908,327, 09MAR2021, 8 pgs.
		Guo, Office Action, US15/908,327, 23JUL2021, 8 pgs.
		Guo, Examiner-Initiated Interview Summary, US15/908,327, 06DEC2021, 1 pg.
		Guo, Notice of Allowance, US15/908,327, 12JAN2022, 29 pg.
		Guo, Office Action, US17/710,936, 05MAY2023, 14 pgs.
		Machine translation of JP2007165224A, (Year: 2007), 8 pgs.
		Machine translation of WO2013038677A1, (Year:2013), 15 pgs.
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		TAO, Office Action, US17746755, 31MAR2023, 27 pgs.
		TAO, Office Action, US17746755, 28JUL2023, 18 pgs.
		TAO, Office Action, US17407081, 05AUG2022, 69 pgs.
		TAO, Final Office Action, US17407081, 18JAN2023, 19 pgs.
		ZHUHAI COSMX BATTERY CO LTD, Petitioner, v. NINGDE AMPEREX TECHNLOGY LIMITED, Patent Owner, Petition for *Inter Partes* Review, Case No. IPR2023-00585, 31MAR2023, 116 pgs.

Examiner Signature		Date Considered	

INFORMATION DISCLOSURE STATEMENT BY APPLICANT Substitute for Form 1449-PTO				*Electronically filed November 26, 2023*	
				Application Number	*17/746,755*
				Filing Date	*May 17, 2022*
				First Named Inventor	*Tao TAO*
				Art Unit	*1725*
				Examiner Name	*Christopher P Domone*
Sheet	1	of	1	Attorney Docket Number	*024607-02-5119-US*

U.S. PATENT DOCUMENTS					
Examiner Initials	Cite No.	Document Number Number - Kind Code	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
		10,833,363 B2	11-10-2020	Wang et al.	
		10,964,987 B2	03-30-2021	Yi et al.	
		2009/0246639 A1	10-01-2009	Kim	

FOREIGN PATENT DOCUMENTS						
Examiner Initials	Cite No.	Foreign Patent Document Country Code – Number - Kind Code *(if known)*	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear	T
		CN1921180A	02/28/2007	ZHOU JIPING [CN]		
		JPH10326629A	12/08/1998	SHIN KOBE ELECTRIC MACHINERY		
		JP2000285902A	10/13/2000	JAPAN STORAGE BATTERY CO LTD; GS MERUKOTEKKU KK		
		JP2003068271A	03/07/2003	MATSUSHITA ELECTRIC IND CO LTD		

NON PATENT LITERATURE DOCUMENTS		
Examiner Initials	Cite No.	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published
		Guo, Final Office Action, US17/710,936, 01SEP2023, 8 pgs.
		Request for Invalidation of Patent Right, ZL201420030319.4, 04SEP2023, 4 pgs.
		Invalidation Request Text, ZL201420030319.4, 21SEP2023, 10 pgs.
		Invalidity Supplementary Comment Text, ZL201420030319.4, 23OCT2023, 230 pgs.
		Statement of Opinions on the Reexamination Invalidation Procedure, ZL201420030319.4, 4 pgs.
		Notice of Acceptance of the Invalidation Request, ZL201420030319.4, 8 pgs.
		TAO, Office Action, US17407081, 25OCT2023, 27 pgs.

Examiner Signature		Date Considered	

UNITED STATES
PATENT AND TRADEMARK OFFICE

P.O. Box 1450
Alexandria, VA 22313 - 1450
www.uspto.gov

ELECTRONIC ACKNOWLEDGEMENT RECEIPT

APPLICATION #	RECEIPT DATE / TIME	ATTORNEY DOCKET #
17/746,755	**11/26/2023 05:08:45 PM Z ET**	**024607-02-5119-US**

Title of Invention

LITHIUM-ION BATTERY HAVING DESIRABLE SAFETY PERFORMANCE

Application Information

APPLICATION TYPE	Utility - Nonprovisional Application under 35 USC 111(a)	PATENT #	-
CONFIRMATION #	8911	FILED BY	Edith Fuentes
PATENT CENTER #	63373329	FILING DATE	05/17/2022
CUSTOMER #	24341	FIRST NAMED INVENTOR	Tao TAO
CORRESPONDENCE ADDRESS	-	AUTHORIZED BY	Yalei Sun

Documents

TOTAL DOCUMENTS: 14

DOCUMENT	PAGES	DESCRIPTION	SIZE (KB)
CN1921180A.pdf	12	Foreign Reference	823 KB
JPH10326629A.pdf	5	Foreign Reference	366 KB
JP2000285902A.pdf	7	Foreign Reference	425 KB
JP2003068271A.pdf	10	Foreign Reference	726 KB
Guo_Final Office Action US17710936_01SEP2023.pdf	8	Non Patent Literature	346 KB
Request for invalidation ZL201420030319-	4	Non Patent Literature	175 KB

4_04SEP2023.pdf			
Invalidation request text ZL201420030319-4_21SEP2023.pdf	10	Non Patent Literature	1393 KB
Invalid suppl comment text ZL201420030319-4_23OCT2023-Part2.pdf	61	Non Patent Literature	14916 KB
Invalid suppl comment text ZL201420030319-4_23OCT2023-Part1.pdf	169	Non Patent Literature	20346 KB
Statement Opinion Reexam Invalidation_ ZL201420030319-4.pdf	4	Non Patent Literature	134 KB
Notice Acceptance Invalidation Request ZL201420030319.4.pdf	8	Non Patent Literature	493 KB
Tao-Office Action_US17407081_25OCT 2023.pdf	21	Non Patent Literature	1296 KB
024607-02-5119-US_IDS.pdf	4	Transmittal Letter	157 KB
024607-02-5119-US_1449.pdf	1	Information Disclosure Statement (IDS) Form (SB08)	172 KB

Warning: This is not a USPTO supplied IDS fillable form. Data in the form cannot be automatically loaded to other USPTO systems.

Digest

DOCUMENT	MESSAGE DIGEST(SHA-512)

CN1921180A.pdf	A53420789F9B78A1BEBB583BB4C9202FCE54BF0327F56A4210E6CC617C4AF4336B48BB12D781824A9969B51A59A05EF392BA4A429323E3276225001D1EA55677
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JP2003068271A.pdf	01BFA861917F08002FBCA74F58EBB49F8A7356977B930FF547099DAF0DE4F2569FEF8665DEA1D78ACCD5183475A4C28C2ECC28124AFD48D96B17E1E12B403F2A
Guo_Final Office Action US17710936_01SEP2023.pdf	3255AC4AC45CA1566CC53985752513E7FAD446BF8995EF0C3CBB518E6BF16227DF9A341273E8A06763747DCA77A8B24A9E257DE8D003EA5EBD1AE4565243DF72
Request for invalidation ZL201420030319-4_04SEP2023.pdf	522BA1C044CBD063AE36B589536499391DC54828D9410B29E710CA95F62398A4A1C5856B6DD7DA6244B52799D0459F9A57E9EE367BA6F51E933CDD988968974F
Invalidation request text ZL201420030319-4_21SEP2023.pdf	8C2A208029AB19D10D750C3945D715DDFD070DBB7028D80D6B282A4FAC72C1EEDA574031D8C53F9A7D683598022171 37E8A1FD49C489DF384F256DC010756BC0
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Statement Opinion Reexam Invalidation_ ZL201420030319-4.pdf	DFDB571F6D09033FDC2F89729B297370AD035D8C5890E83897188B08B1C5C96839F54D6E42848EF3FEF743B9CD463B7E140AEE2005EE4E60F3DB4D032BCFC88B

Notice Acceptance Invalidation Request ZL201420030319.4.pdf	F3D91ECCA7F70BEEFC2709FFE3F90219B939D376B0595BB1E302A7887DE432ED699C372131B4C21429BC442629726EB1E3DE829279C0A73A6BEDD6F00BCE32FB
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024607-02-5119-US_1449.pdf	E1A270BA747F8DE63D1F12FC452AE44162E8590CFC9F22CF1E7028A0C545BE6AB049A83034FF5160FD709B13597CCF25119167768C114211237C33B2D17A41A5

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

Electronically filed November 26, 2023

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Application of:	Tao TAO et al.	Confirmation No.:	8911
Serial No.:	17/746,755	Art Unit:	1725
Filed:	May 17, 2022	Examiner:	Christopher P. Domone
For:	Lithium-Ion Battery Having Desirable Safety Performance	Attorney Docket No.:	024607-02-5119-US

INFORMATION DISCLOSURE STATEMENT SUBMITTED UNDER 37 C.F.R. § 1.97(i)

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

In accordance with the duty of disclosure provisions of 37 C.F.R. §1.56, there is hereby provided certain information that the applicant considers cumulative with respect to references already of record in the subject U.S. patent application or otherwise not material to the examination of the application. It is requested that the references cited herein be made of record in the application in accordance with rule 37 C.F.R. §1.97(i).

1. Enclosures accompanying this Information Disclosure Statement are:

1a. ☒ A list of all patents, publications, applications, or other information submitted for consideration by the office.

1b. A legible copy of :

☒ Each foreign patent;

☐ Each publication or that portion which caused it to be listed on the PTO-1449;

☐ For each cited pending U.S. application, the application specification including the claims, and any drawing of the application, or portion of the application which caused it to be listed on the PTO-1449 including any claims directed to that portion;

☒ all other information or portion which caused it to be listed on the PTO-1449.

1c. ☐ An English language copy of search report(s) from a counterpart foreign application or PCT International Search Report.

1d. ☐ Explanations of relevancy (ATTACHMENT 1(d), hereto) or English language abstracts of the non-English language publications.

2. ☐ This Information Disclosure Statement is filed under 37 C.F.R. §1.97(b):

☐ Within three months of the filing date of a national application other than a continued prosecution application under §1.53(d);

☐ Within three months of the date of entry of the national stage as set forth in §1.491 in an international application;

☐ Before the mailing of the first Office action on the merits;

☐ Before the mailing of a first Office action after the filing of a request for continued examination under §1.114.

3. ☐ This Information Disclosure Statement is filed under 37 C.F.R. §1.97(c) after the period specified in 37 C.F.R. §1.97(b), but before the mailing date of any of a final action under 37 C.F.R. §1.113, a notice of allowance under 37 C.F.R. §1.311 or an action that otherwise closes prosecution in the application.

(Check either Item 3a, 3b or 3c)

3a. ☐ The Certification Statement in Item 5 below is applicable. Accordingly, no fee is required.

3b. ☐ The $260 (large entity) fee set forth in 37 C.F.R. §1.17(p) in accordance with 37 C.F.R. §1.97(c).

3c. ☐ The $104 (small entity) fee set forth in 37 C.F.R. §1.17(p) in accordance with 37 C.F.R. §1.97(c).

(Items 3b or 3c to be checked if any reference known for more than 3 months)

4. ☐ This Information Disclosure Statement is filed under 37 C.F.R. §1.97(d) after the period specified in 37 C.F.R. §1.97(c), but on or before the date of payment of the issue fee.

(Check either Item 4a and 4b or 4c)

4a. ☐ The Certification Statement in Item 5 below is applicable.

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4c. ☐ The $104 (small entity) fee set forth in 37 C.F.R. §1.17(p) in accordance with 37 C.F.R. §1.97(c).

5. ☒ This Information Disclosure Statement is filed under 37 C.F.R. §1.97(i) as it does not comply with § 1.97(a)-(d), Applicants request that this Information Disclosure Statement be placed in the file by the office.

6. ☐ Copies of each cited U.S. patent and each U.S. patent application publication are not enclosed pursuant to the USPTO OG Notice dated 05 August 2003 waiving the requirement under 37 C.F.R. 1.98(a)(2)(i) for U.S. patent applications filed after June 30, 2003.

7. ☐ This application is a continuing application under 37 C.F.R. §1.53(b) or (d).

(Check appropriate Items 7a, 7b and/or 7c)

7a. ☐ A Petition to Withdraw from issue under 37 C.F.R. §1.313(b)(5) is concurrently filed herewith.

7b. ☐ Copies of publications listed on Form PTO-1449 from prior application Serial No. , filed on , of which this application claims priority under 35 U.S.C. §120, are not being submitted pursuant to 37 C.F.R. §1.98(d).

7c. ☐ Copies of the publications listed on Form PTO-1449 were not previously cited in prior application Serial No. , filed on , and are provided herewith.

8. ☐ This is a Supplemental Information Disclosure Statement. (Check Item 8a)

8a. ☐ This Supplemental Information Disclosure Statement under 37 C.F.R. §1.97(f) supplements the Information Disclosure Statement filed on . A bona fide attempt was made to comply with 37 C.F.R. §1.98, but inadvertent omissions were made. These omissions have been corrected herein. Accordingly, additional time is requested so that this Supplemental Information Disclosure Statement can be considered as if properly filed on .

9. ☐ In accordance with 37 C.F.R. §1.98, a concise explanation of what is presently understood to be the relevance of each non-English language publication is:

(Check Item 9a, 9b, or 9c)

9a. ☐ satisfied because all non-English language publications were cited on the enclosed English language copy of the PCT International Search Report or the search report from a counterpart foreign application indicating the degree of relevance found by the foreign office.

9b. ☐ set forth in the application.

9c. ☐ enclosed as an attachment hereto.

10. ☒ Payment has been made via Financial Manager, however, the Director is hereby authorized to charge any required fees to Morgan, Lewis & Bockius LLP Deposit Account No. 50-0310 (order no. 024607-02-5119-US).

11. ☒ No admission is made that the information cited in this Statement is, or is considered to be, material to patentability nor a representation that a search has been made (other than a search report of a foreign counterpart application or PCT International Search Report if submitted herewith). 37 C.F.R. §§1.97(g) and (h).

Respectfully submitted,

Date: November 26, 2023

/Yalei Sun/ 57,765

Yalei Sun (Reg. No.)
MORGAN, LEWIS & BOCKIUS LLP
1400 Page Mill Road
Palo Alto, CA 94304
(650) 843-4000

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
17/746,755	05/17/2022	Tao TAO	024607-02-5119-US	8911

7590 12/07/2023

Morgan, Lewis & Bockius LLP (PA)
1400 Page Mill Road
Palo Alto, CA 94304-1124

EXAMINER	
DOMONE, CHRISTOPHER P	
ART UNIT	PAPER NUMBER
1725	
NOTIFICATION DATE	DELIVERY MODE
12/07/2023	ELECTRONIC

NOTICE OF NON-COMPLIANT INFORMATION DISCLOSURE STATEMENT

An Information Disclosure Statement (IDS) filed 11.09.2023 in the above-identified application fails to meet the requirements of 37 CFR 1.97(d) for the reason(s) specified below. Accordingly, the IDS will be placed in the file, but the information referred to therein has not been considered.

The IDS is not compliant with 37 CFR 1.97(d) because:

*U.S. PATENT NO. 2013/0260203 A1 Yoshida et al.

☒ The IDS lacks a statement as specified in 37 CFR 1.97(e).

☐ The IDS lacks the fee set forth in 37 CFR 1.17(p).

☐ The IDS was filed after the issue fee was paid. Applicant may wish to consider filing a petition to withdraw the application from issue under 37 CFR 1.313(c) to have the IDS considered. See MPEP 1308.

N. Horne, for

571-272-4200 or 1-888-786-0101
Application Assistance Unit
Office of Data Management

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
17/746,755	05/17/2022	Tao TAO	024607-02-5119-US	8911

7590 12/07/2023

Morgan, Lewis & Bockius LLP (PA)
1400 Page Mill Road
Palo Alto, CA 94304-1124

EXAMINER	
DOMONE, CHRISTOPHER P	
ART UNIT	PAPER NUMBER
1725	
NOTIFICATION DATE	DELIVERY MODE
12/07/2023	ELECTRONIC

NOTICE OF NON-COMPLIANT INFORMATION DISCLOSURE STATEMENT

An Information Disclosure Statement (IDS) filed 11.26.2023 in the above-identified application fails to meet the requirements of 37 CFR 1.97(d) for the reason(s) specified below. Accordingly, the IDS will be placed in the file, but the information referred to therein has not been considered.

The IDS is not compliant with 37 CFR 1.97(d) because:

☒ The IDS lacks a statement as specified in 37 CFR 1.97(e).

☐ The IDS lacks the fee set forth in 37 CFR 1.17(p).

☐ The IDS was filed after the issue fee was paid. Applicant may wish to consider filing a petition to withdraw the application from issue under 37 CFR 1.313(c) to have the IDS considered. See MPEP 1308.

N. Horne, for

571-272-4200 or 1-888-786-0101
Application Assistance Unit
Office of Data Management

PART B - FEE(S) TRANSMITTAL

Electronically filed December 7, 2023

Complete and send this form with applicable fee(s), to: Mail
Mail Stop ISSUE FEE
Commissioner of Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450
or Fax (571) 273-2885

INSTRUCTIONS: This form should be used for transmitting the ISSUE FEE and PUBLICATION FEE (if required). Blocks 1 through 5 should be completed where appropriate. All further correspondence including the Patent, advanced orders and notification of maintenance fees will be mailed to the current correspondence address as indicated unless corrected below or directed otherwise in Block 1, by (a) specifying a new correspondence address; and/or (b) indicating a separate "FEE ADDRESS" for maintenance fee notifications.

CURRENT CORRESPONDENCE ADDRESS

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

Note: A certificate of mailing below can only be used for domestic mailings of the Fee(s) Transmittal. This certificate cannot be used for any other accompanying papers. Each additional paper, such as an assignment or formal drawing, must have its own certificate of mailing.

Certificate of Mailing

I hereby certify that this Fee(s) Transmittal is being deposited with the United States Postal Service with sufficient postage for first class mail in an envelope addressed to the Mail Stop ISSUE FEE address above, or being facsimile transmitted to the USPTO (571) 273-2885, on the date indicated below.

(Depositor's name)

(Signature)

(Date)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTY'S DOCKET NO.	CONFIRMATION NO.
17/746,755	05/17/2022	Tao TAO	024607-02-5119-US	8911

TITLE OF INVENTION **LITHIUM-ION BATTERY HAVING DESIRABLE SAFETY PERFORMANCE**

APPLN. TYPE	ENTITY STATUS	ISSUE FEE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	UNDISCOUNTED	$1200	0	$1200	12/07/2023

EXAMINER	ART UNIT	CLASS-SUB CLASS
DOMONE, CHRISTOPHER P	1725	429-162000

1. Change of correspondence address or indication of "Fee Address" (37 CFR 1.363).

☐ Change of correspondence address (or Change of Correspondence Address form PTO/SB/122) attached.

☐ "Fee Address" indication (or "Fee Address" Indication form PTO/SB/47) attached. **Use of a Customer Number is required.**

2. For printing on the patent front page, list (1) the names of up to 3 registered patent attorneys or agents OR, alternatively, (2) the name of a single firm (having as a member a registered attorney or agent) and the names of up to 2 registered patent attorneys or agents. If no name is listed, no name will be printed

1. **Morgan, Lewis & Bockius** LLP
2.
3.

3. ASSIGNEE NAME AND RESIDENCE DATA TO BE PRINTED ON THE PATENT (print or type)

PLEASE NOTE: Unless an assignee is identified below, no assignee data will appear on the patent. If an assignee is identified below, the document has been filed for recordation as set forth in 37 CFR 3.11. Completion of this form is NOT a substitute for filing an assignment.

(A) NAME OF ASSIGNEE: NINGDE AMPEREX TECHNOLOGY LIMITED

(B) RESIDENCE: (CITY and STATE OR COUNTRY) NINGDE, FUJIAN, CHINA

Please check the appropriate assignee category or categories (will not be printed on the patent) ☐ Individual ☒ Corporation or other private group entity ☐ Government

4a. The following fee(s) are submitted:

☒ Issue Fee

☐ Advanced Order - # of Copies ____

4b. Payment of Fee(s): **(Please first reapply any previously paid issue fee shown above.)**

☐ A check in the amount of the fee(s) enclosed

☐ Payment by credit card. Form PTO-2038 is attached.

☒ The Director is hereby authorized to charge the required fee(s), or credit any overpayment, to Deposit Account Number 50-0310 (order no. 024607-02-5119-US).

5. **Change in Small Entity Status** (from status indicated above)

☐ a. Applicant certifying micro entity status. See 37 CFR 1.29. NOTE: Absent a valid certification of Micro Entity (see form PTO/SB/15A and 15B), issue fee payment in the micro entity amount will not be accepted at the risk of application abandonment.

☐ Applicant asserting small entity status. See 37 CFR 1.27. NOTE: If the application was previously under micro entity status, checking this box will be taken to be a notification of loss of entitlement to micro entity status.

☐ Applicant changing to regular undiscounted fee status. NOTE: Checking this box will be taken to be a notification of loss of entitlement to small or micro entity status, as applicable.

NOTE: This form must be sign in accordance with 37 CFR 1.31 and 1.33. See 37 CFR 1.4 for signature requirements and certifications.

Authorized Signature /Yalei Sun/ Date: December 7, 2023

Printed Name: Yalei Sun Registration No. 57,765

UNITED STATES
PATENT AND TRADEMARK OFFICE

P.O. Box 1450
Alexandria, VA 22313 - 1450
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ELECTRONIC PAYMENT RECEIPT

APPLICATION #	RECEIPT DATE / TIME	ATTORNEY DOCKET #
17/746,755	12/07/2023 06:04:55 PM Z ET	024607-02-5119-US

Title of Invention

LITHIUM-ION BATTERY HAVING DESIRABLE SAFETY PERFORMANCE

Application Information

APPLICATION TYPE	Utility - Nonprovisional Application under 35 USC 111(a)	PATENT #	-
CONFIRMATION #	8911	FILED BY	Jacqueline Yu
PATENT CENTER #	63510053	AUTHORIZED BY	Yalei Sun
CUSTOMER #	24341	FILING DATE	05/17/2022
CORRESPONDENCE ADDRESS	-	FIRST NAMED INVENTOR	Tao TAO

Payment Information

PAYMENT METHOD	PAYMENT TRANSACTION ID	PAYMENT AUTHORIZED BY
CARD / 8433	E2023B7I05325306	Yalei Sun

FEE CODE	DESCRIPTION	ITEM PRICE($)	QUANTITY	ITEM TOTAL($)
1501	UTILITY ISSUE FEE	1200.00	1	1200.00
			TOTAL AMOUNT:	$1,200.00

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage

submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

UNITED STATES
PATENT AND TRADEMARK OFFICE

P.O. Box 1450
Alexandria, VA 22313 - 1450
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ELECTRONIC ACKNOWLEDGEMENT RECEIPT

APPLICATION #	RECEIPT DATE / TIME	ATTORNEY DOCKET #
17/746,755	**12/07/2023 06:04:55 PM Z ET**	**024607-02-5119-US**

Title of Invention

LITHIUM-ION BATTERY HAVING DESIRABLE SAFETY PERFORMANCE

Application Information

APPLICATION TYPE	Utility - Nonprovisional Application under 35 USC 111(a)	PATENT #	-
CONFIRMATION #	8911	FILED BY	Jacqueline Yu
PATENT CENTER #	63510053	FILING DATE	05/17/2022
CUSTOMER #	24341	FIRST NAMED INVENTOR	Tao TAO
CORRESPONDENCE ADDRESS	-	AUTHORIZED BY	Yalei Sun

Documents

TOTAL DOCUMENTS: 1

DOCUMENT	PAGES	DESCRIPTION	SIZE (KB)
024607-02-5119-US_P2014010US5_IFT.pdf	1	Issue Fee Payment (PTO-85B)	105 KB

Digest

DOCUMENT	MESSAGE DIGEST(SHA-512)
024607-02-5119-US_P2014010US5_IFT.pdf	6AFD0B45FA62E52979198B43044CCEBF010449A79438044215ACB4704F13ABFB6AF42D4A771DCB03DEFFBA48FB55517394E7EA7B6C67E26026C4531BEFC1374F

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized

by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application

National Stage of an International Application under 35 U.S.C. 371

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New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

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United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
17/746,755	05/17/2022	Tao TAO	024607-02-5119-US	8911

24341 7590 01/12/2024

Morgan, Lewis & Bockius LLP (PA)
1400 Page Mill Road
Palo Alto, CA 94304-1124

EXAMINER
DOMONE, CHRISTOPHER P

ART UNIT	PAPER NUMBER
1725	

NOTIFICATION DATE	DELIVERY MODE
01/12/2024	ELECTRONIC

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

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

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

donald.mixon@morganlewis.com
padocketingdepartment@morganlewis.com

Corrected ***Notice of Allowability***	**Application No.** 17/746,755	**Applicant(s)** TAO et al.	
	Examiner CHRISTOPHER P DOMONE	**Art Unit** 1725	**AIA (FITF) Status** Yes

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☑ This communication is responsive to IDS.
   ☐ A declaration(s)/affidavit(s) under **37 CFR 1.130(b)** was/were filed on _____.

2. ☐ An election was made by the applicant in response to a restriction requirement set forth during the interview on _____; the restriction requirement and election have been incorporated into this action.

3. ☑ The allowed claim(s) is/are 20-27 and 29-42 . As a result of the allowed claim(s), you may be eligible to benefit from the **Patent Prosecution Highway** program at a participating intellectual property office for the corresponding application. For more information , please see **http://www.uspto.gov/patents/init_events/pph/index.jsp** or send an inquiry to **PPHfeedback@uspto.gov.**

4. ☑ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

   Certified copies:

   a) ☑ All b) ☐ Some* c) ☐ None of the:

   1. ☐ Certified copies of the priority documents have been received.
   2. ☑ Certified copies of the priority documents have been received in Application No. 14/596,873 .
   3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

   * Certified copies not received: _____ .

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.
THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
   ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____ .

   Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).

6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☐ Notice of References Cited (PTO-892)
2. ☑ Information Disclosure Statements (PTO/SB/08), Paper No./Mail Date _____.
3. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material _____.
4. ☐ Interview Summary (PTO-413), Paper No./Mail Date. _____.
5. ☐ Examiner's Amendment/Comment
6. ☐ Examiner's Statement of Reasons for Allowance
7. ☐ Other _____.

/CHRISTOPHER P DOMONE/
Examiner, Art Unit 1725

Search Notes	Application/Control No.	Applicant(s)/Patent Under Reexamination
	17/746,755	TAO et al.
	Examiner	Art Unit
	CHRISTOPHER P DOMONE	1725

CPC - Searched*		
Symbol	**Date**	**Examiner**
H01M10/0431	07/14/2022	JB
H01M10/0587	07/14/2022	JB
H01M50/531, 533, 538	07/14/2022	JB
H01M50/5$	07/14/2022	JB
H01M.cpcl.	07/14/2022	JB
H01M10/0431	09/08/2022	JB
H01M10/0587	09/08/2022	JB
H01M50/531, 533, 538	09/08/2022	JB
H01M50/5$	09/08/2022	JB
H01M.cpcl.	09/08/2022	JB
H01M.cpcl.	03/24/2023	JB
H01M50/538,536,593,595,59	09/01/2023	/CD/

CPC Combination Sets - Searched*		
Symbol	**Date**	**Examiner**

US Classification - Searched*			
Class	**Subclass**	**Date**	**Examiner**

* See search history printout included with this form or the SEARCH NOTES box below to determine the scope of the search.

/CHRISTOPHER P DOMONE/ Examiner, Art Unit 1725	

Search Notes	Application/Control No.	Applicant(s)/Patent Under Reexamination
	17/746,755	TAO et al.
	Examiner	**Art Unit**
	CHRISTOPHER P DOMONE	1725

Search Notes		
Search Notes	**Date**	**Examiner**
Global dossier search	07/14/2022	JB
Applicant and inventor search in SEARCH	07/14/2022	JB
CPC and CPC-limited text search in SEARCH	07/14/2022	JB
“More like this” searching in SEARCH and IP.COM	07/14/2022	JB
Additional search (refresh)	09/08/2022	JB
Discussion with Will McClain regarding strategy and search	03/23/2023	JB
Additional searching in SEARCH	03/24/2023	JB
INVENTOR SEARCH (DAV & Search History)	09/01/2023	/CD/
Search Text Search (USPat, US PGPub, FIT, EPO, JPO, Derwent)	09/01/2023	/CD/
Global Dossier Search	09/01/2023	/CD/
IP.com (NPL + US & Foreign Patents) (first 50 results 9/1/23)	09/01/2023	/CD/
Review of search histories, cited references, office actions, and potential double patenting of 14/596,873, 16/133,938 and 17/407,081 .	09/01/2023	/CD/

Interference Search			
US Class/CPC Symbol	**US Subclass/CPC Group**	**Date**	**Examiner**
	Interference Search - See Interference Print-out	09/01/2023	/CD/

/CHRISTOPHER P DOMONE/ Examiner, Art Unit 1725	

Issue Classification	Application/Control No.	Applicant(s)/Patent Under Reexamination
	17/746,755	TAO et al.
	Examiner	**Art Unit**
	CHRISTOPHER P DOMONE	1725

CPC						
Symbol					**Type**	**Version**
H01M	/	10	/	0525	F	2013-01-01
H01M	/	4	/	13	I	2013-01-01
H01M	/	4	/	139	I	2013-01-01
H01M	/	10	/	058	I	2013-01-01
H01M	/	50	/	538	I	2021-01-01
H01M	/	50	/	536	I	2021-01-01

CPC Combination Sets								
Symbol					**Type**	**Set**	**Ranking**	**Version**
	/		/					

NONE		Total Claims Allowed:	
(Assistant Examiner)	(Date)	22	
/CHRISTOPHER P DOMONE/ Examiner, Art Unit 1725	08 January 2024	O.G. Print Claim(s)	O.G. Print Figure
(Primary Examiner)	(Date)	20, 29, 37	5

U.S. Patent and Trademark Office — Part of Paper No.: 20240108

Issue Classification	Application/Control No.	Applicant(s)/Patent Under Reexamination
	17/746,755	TAO et al.
	Examiner	**Art Unit**
	CHRISTOPHER P DOMONE	1725

INTERNATIONAL CLASSIFICATION				
CLAIMED				
H01M	/	10	/	0525
H01M	/	4	/	13
H01M	/	4	/	139
H01M	/	10	/	058
H01M	/	50	/	538
H01M	/	50	/	543

NON-CLAIMED				
	/		/	

US ORIGINAL CLASSIFICATION	
CLASS	**SUBCLASS**

CROSS REFERENCES(S)						
CLASS	**SUBCLASS (ONE SUBCLASS PER BLOCK)**					

NONE		Total Claims Allowed:	
(Assistant Examiner)	(Date)	22	
/CHRISTOPHER P DOMONE/ Examiner, Art Unit 1725	08 January 2024	O.G. Print Claim(s)	O.G. Print Figure
(Primary Examiner)	(Date)	20, 29, 37	5

U.S. Patent and Trademark Office — Part of Paper No.: 20240108

Issue Classification	Application/Control No.	Applicant(s)/Patent Under Reexamination
	17/746,755	TAO et al.
	Examiner	**Art Unit**
	CHRISTOPHER P DOMONE	1725

☑ Claims renumbered in the same order as presented by applicant ☐ CPA ☐ T.D. ☐ R.1.47

CLAIMS

Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original

NONE (Assistant Examiner)	(Date)	**Total Claims Allowed:** 22	
/CHRISTOPHER P DOMONE/ Examiner, Art Unit 1725 (Primary Examiner)	08 January 2024 (Date)	O.G. Print Claim(s) 20, 29, 37	O.G. Print Figure 5

U.S. Patent and Trademark Office Part of Paper No.: 20240108

INFORMATION DISCLOSURE STATEMENT BY APPLICANT Substitute for Form 1449-PTO				*Electronically filed November 9, 2023*	
				Application Number	*17/746,755*
				Filing Date	*May 17, 2022*
				First Named Inventor	*Tao TAO*
				Art Unit	*1721*
				Examiner Name	*Barton, Jason Aaron*
Sheet	1	of	3	Attorney Docket Number	*024607-02-5119-US*

U.S. PATENT DOCUMENTS

Examiner Initials	Cite No.	Document Number Number - Kind Code	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
		6,300,002 B1	10-2001	Webb	
		8,232,008 B2	07-2012	Morishima	
		8,969,756 B2	03-03-2015	Dougherty	
		9,935,339 B2	04-03-2018	Yoshida et al.	
		10,062,897 B2	08-2018	Stern	
		11,329,352 B2	05-2022	Guo	
		2004/0161662 A1	08-2004	Kim	
		2006/0051662 A1	03-2006	Kwak	
		2011/0020694 A1	01-27-2011	KHAKHALEV et al.	
		2011/0027636 A1	02-2011	Lee	
		2011/0159344 A1	06-2011	Kobayashi	
		2012/0052295 A1	03-01-2012	IWATA et al.	
		2013/0052499 A1	02-2013	Hasegawa	
		2013/0252053 A1	09-2013	Woo	
		2014/0042121 A1	02-13-2014	ZHANG et al.	
		2014/0120417 A1	05-2014	2014/0120417 A1	
		2013/0302674 A1	11-2013	Stern	
		2015/0207111 A1	07-23-2015	Tao	
		2016/0013455 A1	01-14-2016	Shiu et al.	
		2017/0092925 A1	03-30-2017	Shiu et al.	

FOREIGN PATENT DOCUMENTS

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Examiner Signature		Date Considered	

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /C.P.D/

INFORMATION DISCLOSURE STATEMENT BY APPLICANT Substitute for Form 1449-PTO				*Electronically filed November 9, 2023*	
				Application Number	*17/746,755*
				Filing Date	*May 17, 2022*
				First Named Inventor	*Tao TAO*
				Art Unit	*1721*
				Examiner Name	*Barton, Jason Aaron*
Sheet	2	of	3	Attorney Docket Number	*024607-02-5119-US*

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Examiner Signature		Date Considered	

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Sheet	3	of	3	Attorney Docket Number	*024607-02-5119-US*

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Examiner Signature	/CHRISTOPHER P DOMONE/	Date Considered	01/08/2024

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APPLICATION NO.	ISSUE DATE	PATENT NO.	ATTORNEY DOCKET NO.	CONFIRMATION NO.
17/746,755	03/05/2024	11923498	024607-02-5119-US	8911

24341 7590 02/14/2024

Morgan, Lewis & Bockius LLP (PA)
1400 Page Mill Road
Palo Alto, CA 94304-1124

ISSUE NOTIFICATION

The projected patent number and issue date are specified above. The patent will issue electronically. The electronically issued patent is the official patent grant pursuant to 35 U.S.C. § 153. The patent may be accessed on or after the issue date through Patent Center at https://patentcenter.uspto.gov/. The patent will be available in both the public and the private sides of Patent Center. Further assistance in electronically accessing the patent, or about Patent Center, is available by calling the Patent Electronic Business Center at 1-888-217-9197.

The USPTO is implementing electronic patent issuance with a transition period, during which period the USPTO will mail a ceremonial paper copy of the electronic patent grant to the correspondence address of record. Additional copies of the patent (i.e., certified and presentation copies) may be ordered for a fee from the USPTO's Certified Copy Center at https://certifiedcopycenter.uspto.gov/index.html. The Certified Copy Center may be reached at (800)972-6382.

Determination of Patent Term Adjustment under 35 U.S.C. 154 (b)
(application filed on or after May 29, 2000)

The Patent Term Adjustment is 0 day(s). Any patent to issue from the above-identified application will include an indication of the adjustment on the front page.

If a Continued Prosecution Application (CPA) was filed in the above-identified application, the filing date that determines Patent Term Adjustment is the filing date of the most recent CPA.

Applicant will be able to obtain more detailed information by accessing the Patent Center (https://patentcenter.uspto.gov).

Any questions regarding the Patent Term Extension or Adjustment determination should be directed to the Office of Patent Legal Administration at (571)-272-7702. Questions relating to issue and publication fee payments should be directed to the Application Assistance Unit (AAU) of the Office of Patents Stakeholder Experience (OPSE), Stakeholder Support Division (SSD) at (571)-272-4200.

INVENTOR(s) (Please see PATENT CENTER site https://patentcenter.uspto.gov for additional inventors):

Tao TAO, Ningde, CHINA;
Ming Liang MO, Ningde, CHINA;

APPLICANT(s) (Please see PATENT CENTER site https://patentcenter.uspto.gov for additional applicants):

NINGDE AMPEREX TECHNOLOGY LIMITED, Ningde, CHINA;

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17/746,755	05/17/2022	Tao TAO	024607-02-5119-US	8911

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Morgan, Lewis & Bockius LLP (PA)
1400 Page Mill Road
Palo Alto, CA 94304-1124

EXAMINER
DOMONE, CHRISTOPHER P

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NOTIFICATION DATE	DELIVERY MODE
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Please find below and/or attached an Office communication concerning this application or proceeding.

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

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

donald.mixon@morganlewis.com
padocketingdepartment@morganlewis.com

APPLICATION NO.	ISSUE DATE	PATENT NO.
17/746,755	05-Mar-2024	11923498

Morgan, Lewis & Bockius LLP (PA)
1400 Page Mill Road
Palo Alto, CA 94304-1124

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