

(19) World Intellectual Property Organization
International Bureau



(43) International Publication Date
10 December 2009 (10.12.2009)

(10) International Publication Number
WO 2009/149231 A3

- (51) **International Patent Classification:**
H01M 2/30 (2006.01) H01M 2/10 (2006.01)
H01M 2/26 (2006.01)
- (21) **International Application Number:**
PCT/US2009/046206
- (22) **International Filing Date:**
4 June 2009 (04.06.2009)
- (25) **Filing Language:** English
- (26) **Publication Language:** English
- (30) **Priority Data:**
12/133,195 4 June 2008 (04.06.2008) US
- (71) **Applicant (for all designated States except US):** **IMARA CORPORATION** [US/US]; 1555 Adams Drive, Menlo Park, CA 94025 (US).
- (72) **Inventors; and**
- (75) **Inventors/Applicants (for US only):** **BLOMGREN, George** [US/US]; 1554 Clarence Avenue, Lakewood, OH 44107 (US). **CHANG, On** [US/US]; 1031 Belvedere Lane, San Jose, CA 95129 (US). **GHANTOUS, Dania** [US/US]; 1939 Stratton Circle, Walnut Creek, CA 94598 (US). **MAO, Ou** [CA/US]; 1999 Rheem Drive, Pleasanton, CA 94588 (US).
- (74) **Agent:** **KIM, Elaine, A.**; Wilson Sonsini Goodrich & Rosati, 650 Page Mill Road, Palo Alto, CA 94304-1050 (US).

- (81) **Designated States (unless otherwise indicated, for every kind of national protection available):** AE, AG, AL, AM, AO, AT, AU, AZ, BA, BB, BG, BH, BR, BW, BY, BZ, CA, CH, CL, CN, CO, CR, CU, CZ, DE, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IS, JP, KE, KG, KM, KN, KP, KR, KZ, LA, LC, LK, LR, LS, LT, LU, LY, MA, MD, ME, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RS, RU, SC, SD, SE, SG, SK, SL, SM, ST, SV, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW.
- (84) **Designated States (unless otherwise indicated, for every kind of regional protection available):** ARIPO (BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LT, LU, LV, MC, MK, MT, NL, NO, PL, PT, RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Published:

— with international search report (Art. 21(3))

(88) **Date of publication of the international search report:**
25 February 2010

(54) **Title:** SYSTEMS AND METHODS FOR RECHARGEABLE BATTERY COLLECTOR TAB CONFIGURATIONS AND FOIL THICKNESS

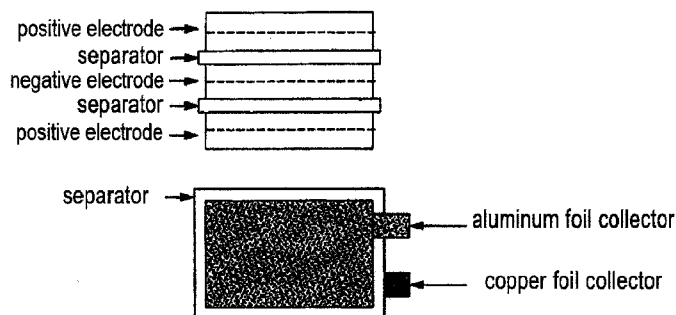


FIGURE 8

(57) **Abstract:** Systems and methods for configuring tabs on a rechargeable battery may include a current collector comprising one or more collector foil and one or more tabs connected to the collector foil for conveying generated current from the current collector. The tabs may be configured to extract greater capacity from the battery electrodes so that the resulting battery may exhibit higher performance. The tabs may be configured so that the length of the tab is greater than the height of the collector foil so the tab may cover the height of the collector foil and may protrude from the foil.



WO 2009/149231 A3

A. CLASSIFICATION OF SUBJECT MATTER**H01M 2/30(2006.01)i, H01M 2/26(2006.01)i, H01M 2/10(2006.01)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)

H01M 2/30; H01M 10/36; H01M 10/40; H01M 10/42; H01M 2/10; H01M 4/00; H01M 4/04; H01M 4/64

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Korean utility models and applications for utility models since 1975.
Japanese utility models and applications for utility models since 1975.

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

eKOMPASS(KIPO internal) & Keywords:current, collecting, tab, resistance, battery and similar terms

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 5587253 A1 (GOZDZ; ANTONI S. et al.) 24 December 1996 See the abstract, column 3 line 40 - column 3 line 63.	1,20
X A	column 3 line 40 - column 7 line 2, claims [1-11] and figures 2, 4, column 2 line 44 - column 3 line 5.	2-19,21-24,26-30,32-3 6 25,31,37-46
A	US 2007-0269685 A1 (CHU et al.) 22 November 2007 See the abstract, claims [3-6] and figures 1-5.	1-46
A	US 6881514 B2 (SOON-HO AHN et al.) 19 April 2005 See the abstract, column 3 line 57 - column 4 line 9.	1-46
A	US 6951699 B2 (SHIZUKUNI YATA et al.) 04 October 2005 See the abstract, claims [1-10] and figures 2, 10-11.	1-46

 Further documents are listed in the continuation of Box C. See patent family annex.

* Special categories of cited documents:

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier application or patent but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&" document member of the same patent family

Date of the actual completion of the international search

29 DECEMBER 2009 (29.12.2009)

Date of mailing of the international search report

30 DECEMBER 2009 (30.12.2009)

Name and mailing address of the ISA/KR

Korean Intellectual Property Office
Government Complex-Daejeon, 139 Seonsa-ro, Seo-
gu, Daejeon 302-701, Republic of Korea

Facsimile No. 82-42-472-7140

Authorized officer

KIM, Yeon-gyeong

Telephone No. 82-42-481-5393



INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No.

PCT/US2009/046206

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 5587253 A1	24. 12. 1996	AU 1996-64571 B2	15. 07. 1996
		AU 700237 B2	24. 12. 1998
		AU 700453 B2	07. 01. 1999
		CA 2228228 C	25. 06. 2002
		JP 02-853096 B2	20. 11. 1998
		JP 02-967127 B2	20. 08. 1999
		JP 03-090952 B2	21. 07. 2000
		JP 03-164586 B2	02. 03. 2001
		JP 03-253090 B2	22. 11. 2001
		JP 08-507407 A	06. 08. 1996
		JP 08-509100 A	24. 09. 1996
		JP 09-500485 A	14. 01. 1997
		JP 09-506208 A	17. 06. 1997
		JP 10-510669 A	13. 10. 1998
		JP 10-511216 A	27. 10. 1998
		JP 2853096 B2	03. 02. 1999
		TW 393791 A	11. 06. 2000
		US 5296318 A1	22. 03. 1994
		US 5418091 A1	23. 05. 1995
		US 5429891 A1	04. 07. 1995
		US 5456000 A1	10. 10. 1995
		US 5460904 A1	24. 10. 1995
		US 5470357 A1	28. 11. 1995
		US 5478668 A1	26. 12. 1995
		US 5540741 A1	30. 07. 1996
		US 5571634 A1	05. 11. 1996
		US 5587253 A1	24. 12. 1996
		US 5607485 A1	04. 03. 1997
		WO 1994-020996 A1	15. 09. 1994
		WO 1995-015589 A1	08. 06. 1995
		WO 1995-031835 A1	23. 11. 1995
		WO 1995-031836 A1	23. 11. 1995
		WO 1997-006569 A1	20. 02. 1997
WO 1997-006573 A1	20. 02. 1997		
US 2007-0269685 A1	22. 11. 2007	US 2007-117011 A1	24. 05. 2007
		US 2007-269685 A1	22. 11. 2007
US 6881514 B2	19. 04. 2005	CN 1228879 C	23. 11. 2005
		CN 1363123 A	07. 08. 2002
		EP 1175709 A1	30. 01. 2002
		EP 1175709 A4	18. 10. 2006
		EP 1175709 B1	11. 11. 2009
		JP 04-202650 B2	24. 12. 2008
		JP 2003-523060 T	29. 07. 2003
		KR 10-0515571 B1	20. 09. 2005
		TW 492213 A	21. 06. 2002
		TW 492213 B	21. 06. 2002
		US 2003-0013012 A1	16. 01. 2003
		US 6881514 B2	19. 04. 2005

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No.

PCT/US2009/046206

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
		WO 2001-059869 A1	16.08.2001
US 6951699 B2	04.10.2005	AU 1999-38501 A1	20.05.1999
		AU 2003-239609 A1	30.01.2003
		AU 2003-239609 A2	02.09.2003
		AU 2003-239609 A2	30.01.2003
		AU 2003-239609 B2	23.10.2008
		AU 2003-239609 B2	30.01.2003
		AU 3850199 A	06.12.1999
		CA 2332452 C	08.09.2009
		CA 2332452-A1	25.11.1999
		CA 2473591-A1	07.08.2003
		CA 2531776-A1	25.11.1999
		CA 2532270-A1	25.11.1999
		CA 2532333-A1	25.11.1999
		EP 1083618 A1	14.03.2001
		EP 1083618 A4	27.09.2006
		EP 1489077 A1	22.12.2004
		EP 1489077 A4	21.06.2006
		JP 2003-064404 A1	07.08.2003
		JP 2009-009947 A	15.01.2009
		JP 9960652 A1	25.11.1999
		KR 10-0409210 B1	12.12.2003
		KR 10-0926839 B1	12.11.2009
		KR 10-2009-0083491 A	03.08.2009
		US 2004-048152 A1	11.03.2004
		US 2005-0171196 A1	04.08.2005
		US 2005-118500 A1	02.06.2005
		US 2005-233204 A1	20.10.2005
		US 2006-251955 A1	09.11.2006
		US 2006-281004 A1	14.12.2006
		US 6902847 B1	07.06.2005
		US 6951699 B2	04.10.2005
		US 7514452 B2	07.04.2009
		WO 1999-060652 A1	25.11.1999
		WO 2003-064404 A1	07.08.2003