(19) World Intellectual Property Organization International Bureau

- (43) International Publication Date 14 August 2008 (14.08.2008)
- (51) International Patent Classification: HOIM 2120 (2006.01)
- (21) International Application Number: PCT/US2008/053463
- (22) International Filing Date: 8 February 2008 (08.02.2008)
- (25) Filing Language: English
- (26) Publication Language: English
- (30) Priority Data: 60/889,130 9 February 2007 (09.02.2007) US 60/960,348 26 September 2007 (26.09.2007) US
- (71) Applicant (for all designated States except US): JOHN¬ SON CONTROLS--SAFT ADVANCED POWER SO¬ LUTIONS LLC [US/US]; 1209 Orange Street, Wilmington, DE 19801-1120 (US).

### (72) Inventors; and

(75) Inventors/Applicants (for US only): TRESTER, Dale, B. [US/US]; 3045 North 89th Street, Milwaukee, WI 53222 (US). WOOD, Steven J [US/US]; 4490 N Woodburn Street, Shorewood, WI 53211 (US).

(54) Title: BUSS BAR FOR BATTERIES

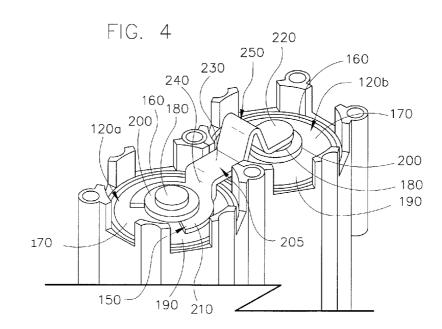


# (10) International Publication Number WO 2008/098193 A3

HOUCHIN-MILLER, Gary, P. [US/US]; 205 E Calumet Road, Fox Point, W1 53217 (US).

- (74) Agent: HUSSIN, Christopher, J.; Lathrop & Clark LIp, 740 Regent Street, Suite 400, Madison, WI 53715 (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, 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, 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, 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).

[Continued on next page]



(57) Abstract: A buss bar for use in connecting terminals of cells in a battery module. The buss bar has a body including an arch feature that helps buss bar to form in response to vibratory forces and/or imperfect manufacturing tolerances. In various embodiments, the buss bar further includes a cover to substantially insulate conductive members of buss bars to reduce the possibility of a short circuit or shock when a battery module is damaged due to circumstances such as a vehicle crash. In various embodiments, the buss bar also includes a voltage sense terminal to help measure voltage and communicate voltage measurements to a controller or controller circuit board.

## **Declaration under Rule 4.17:**

— as to the applicant's entitlement to claim the priority *f* the earlier application (Rule 4.17(Hi))

### **Published:**

— with international search report

- before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments
- (88) Date of publication of the international search report: 25 September 2008

# A CLASSIFICATION OF SUBJECT MATTER IPC(8) H01 M 2/20 (2008.04) USPC 429/123 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) IPC(8) H01M 2/20 (2008 04) USPC 429/123

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched 429/158, 429/160

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used) PubWEST (USPT, PGPB, EPAB, JPAB), DialogPRO (Engineering), Google Scholar

| C DOCUMENTS CONSIDERED TO BE RELEVANT   |  |  |  |                             |  |
|---|--|--|--|-----------------------------|--|
| Category  | * Citation of document, with indication, where appropriate, of the relevant passages   |  |  | Relevant to claim No        |  |
| X   | US 2006/0127754 A1 (HAMADA et al ) 15 June 2006 (15 01 2006) Figure 7, para [0055] and claim 4   |  |  | 1-5                         |  |
| Y   |  |  |  | 6-12                        |  |
| Y   | US 5985480 A (SATO et al ) 16 November 1999 (16 11 2006) Figure 8 and column 6 lines 46-<br>57   |  |  | 6-9, 12                     |  |
| Y   | US 2004/0190294 A1 (GASQUET et al ) 30 September 2004 (30 09 2004)<br>Figure 7 and para [0078]   |  |  | 9, 12                       |  |
| Y   | US 6152776 (IKEDA et al ) 28 November 2000 (28 11 2000) Figure 25(A) and column 1 lines 15 -36   |  |  | 10-1 1                      |  |
| Y   | US 7037146 B2 (NAKAMURA) 02 May 2006 (02 05 2006) Figure 2 and abstract  |  |  | 11-12                       |  |
|   |  |  |  |                             |  |
|   |  |  |  |                             |  |
|   |  |  |  |                             |  |
|   |  |  |  |                             |  |
|   |  |  |  |                             |  |
| L   | 1  |  | ···  |                             |  |
| Further documents are listed in the continuation of Box C   |  |  |  |                             |  |
| <ul> <li>Special categories of cited documents</li> <li>"A" document defining the general state of the art which is not considered<br/>to be of particular relevance</li> </ul> |  | "T'  | It later document published after the international filing date or priority<br>date and not in conflict with the application but cited to understand<br>the principle or theory underlying the invention   |                             |  |
|   | <ul> <li>"E" earlier application or patent but published on or after the international filing date</li> <li>"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)</li> <li>"O" document referring to an oral disclosure, use, exhibition or other means</li> </ul> |  | <ul> <li>' document of particular relevance, the claimed invention cannot be<br/>considered novel or cannot be considered Io involve an inventive<br/>step when the document is taken alone</li> <li>'' document of particular relevance, the claimed invention cannot be</li> </ul> |                             |  |
| cited   |  |  |  |                             |  |
| "O" docu  |  |  | considered to involve an inventive<br>combined with one or more other such<br>being obvious to a person skilled in th  | documents, such combination |  |
|   | ment published prior to the international filing date but later than<br>riority date claimed_  | "&"  | document member of the same patent f   |                             |  |
| Date of the actual completion of the international search   |  | Date of mailing of the international search report |  |                             |  |
| 06 July 2008 (06 07 2008)   |  | 14 JUL 2008  |  |                             |  |
| Name and mailing address of the ISAAJS  |  | Authorized officer                                 |  |                             |  |
| Mail Stop PCT, Attn ISA/US, Commissioner for Patents<br>P O Box 1450, Alexandria, Virginia 22313-1450   |  |  | Lee W Young  |                             |  |
|   |  |  | PCT Helpdesk 571-272-4300 PCTOSP 571-272-7774  |                             |  |
| Form PCT/ISA/210 (second sheet) (Aprtl 2007)  |  |  |  |                             |  |