

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property
Organization
International Bureau

(43) International Publication Date
08 October 2020 (08.10.2020)



(10) International Publication Number
WO 2020/204901 A1

(51) International Patent Classification:

H01M 2/02 (2006.01) *H01M 2/16* (2006.01)
H01M 2/04 (2006.01) *H01M 10/61* (2014.01)
H01M 2/12 (2006.01) *H01M 10/613* (2014.01)

(21) International Application Number:

PCT/US2019/025155

(22) International Filing Date:

01 April 2019 (01.04.2019)

(25) Filing Language:

English

(26) Publication Language:

English

(71) Applicant: **SPEAR POWER SYSTEMS, LLC** [US/US];
4020 E. 138th Street, Grandview, MO 64030 (US).

(72) Inventors; and

(71) Applicants: **MABREY, Mitch** [US/US]; 4020 E. 138th
Street, Grandview, MO 64030 (US). **ANDES, Jamie**
[US/US]; 4020 E. 138th Street, Grandview, MO 64030

(US). **KEHLER, Rick** [US/US]; 4020 E. 138th Street,
Grandview, MO 64030 (US). **CORLMAN, Shane**
[US/US]; 33475 Wieneke Branch Road, California, MO
65018 (US). **MEEHAN, Joe** [US/US]; 12315 McKee Road
N., Excelsior Springs, MO 64024 (US). **MYERS, Eliot**
[US/US]; 12905 State Highway A, Liberty, MO 64068
(US).

(74) Agent: **SKOCH, Gregory, J.**; Hovey Williams LLP,
10801 Mastin Blvd., Suite 1000, Overland Park, KS 66210
(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, BN, BR, BW, BY, BZ,
CA, CH, CL, CN, CO, CR, CU, CZ, DE, DJ, DK, DM, DO,
DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN,
HR, HU, ID, IL, IN, IR, IS, JO, JP, KE, KG, KH, KN, KP,
KR, KW, KZ, LA, LC, LK, LR, LS, LU, LY, MA, MD, ME,
MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ,

(54) Title: APPARATUS FOR MITIGATION OF THERMAL EVENT PROPAGATION FOR BATTERY SYSTEMS

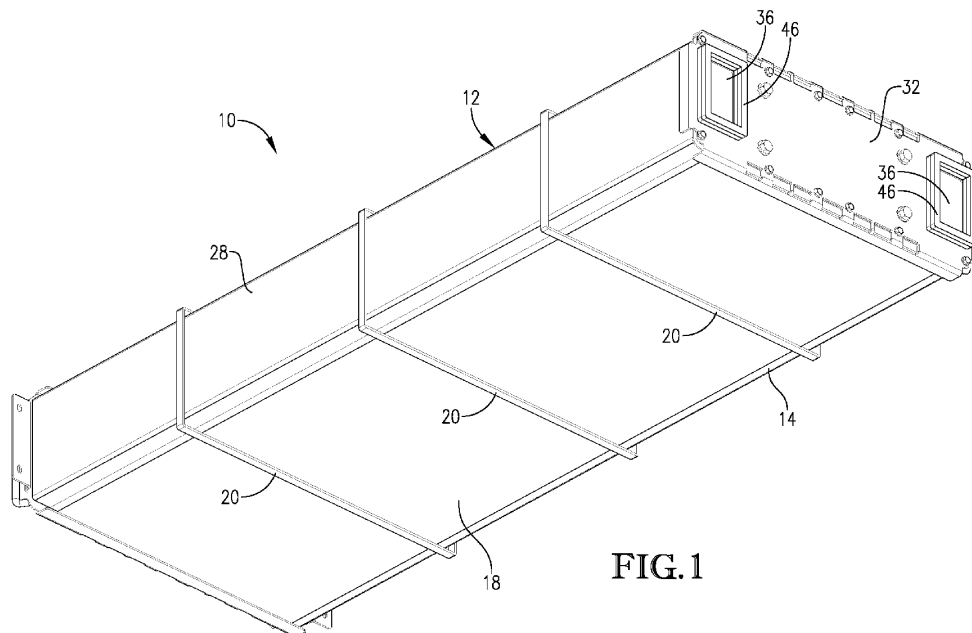


FIG. 1

(57) Abstract: Apparatus for mitigating propagation of thermal events between battery cells within a battery module assembly (10) is provided. The apparatus comprises one or more of several features that function to prevent a runaway thermal event within one battery cell (48) from triggering a fire or other thermal event within another battery cell within the battery module assembly (10). The apparatus may comprise one or more of: (i) a compressive wrap (88) applied to a battery cell (48); (ii) a layered barrier material (104) positioned between adjacent battery cells (48); (iii) silicone rubber supports (94) positioned adjacent the battery terminals (62, 64), (iv) a light-weight, fire-resistant housing composite panel, and (v) rupturable diaphragms (36) configured to vent gases and ejecta from a battery cell undergoing a thermal event.

[Continued on next page]

OM, PA, PE, PG, PH, PL, PT, QA, RO, RS, RU, RW, SA, SC, SD, SE, SG, SK, SL, SM, ST, SV, SY, TH, 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, LR, LS, MW, MZ, NA, RW, SD, SL, ST, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, RU, TJ, TM), European (AL, 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, RS, SE, SI, SK, SM, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, KM, ML, MR, NE, SN, TD, TG).

Published:

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