



- (51) International Patent Classification:
B66F 9/24 (2006.01) *G07C 5/08* (2006.01)
- (21) International Application Number:
PCT/US2016/015382
- (22) International Filing Date:
28 January 2016 (28.01.2016)
- (25) Filing Language: English
- (26) Publication Language: English
- (30) Priority Data:
62/140,819 31 March 2015 (31.03.2015) US
62/246,225 26 October 2015 (26.10.2015) US
- (71) Applicant: **CROWN EQUIPMENT CORPORATION** [US/US]; A Corporation of the State Of Ohio, 40 South Washington Street, New Bremen, OH 45869 (US).
- (72) Inventors: **CASTANEDA, Anthony, T.**; 554 Woodbury Court, Troy, OH 45373 (US). **CLAPP, James, E.**; 4479 Tuttle Brooke Drive, Dublin, OH 43016 (US). **THOBE, Nicholas, D.**; 79 S. Roosevelt Street, Chickasaw, OH 45826 (US). **ADDISON, Mark, E.**; 1723 South Greenlee Road, Ludlow Falls, OH 45339 (US). **SCHNIPKE, Eric, L.**; 1856 Towne Park Drive, Apt 5B, Troy, OH 45373 (US).
- (74) Agents: **LIGIBEL, Bradley, T.** et al.; **STEVENS & SHOWALTER LLP**, 7019 Corporation Way, Dayton, OH 45459 (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, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IR, IS, JP, KE, KG, KN, KP, KR, KZ, LA, LC, LK, LR, LS, LU, LY, MA, MD, ME, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, 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))
- before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments (Rule 48.2(h))

- (88) Date of publication of the international search report:
24 November 2016

(54) Title: METHOD FOR CONTROLLING A FUNCTIONAL SYSTEM OF A MATERIALS HANDLING VEHICLE

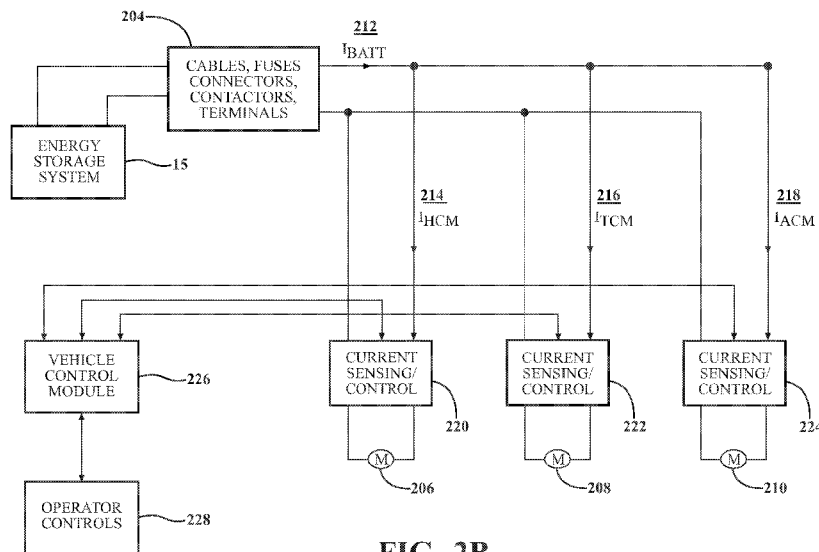


FIG. 2B

(57) Abstract: Controlling a functional system of a materials handling vehicle (10) includes monitoring a current (IBATT) delivered by an energy storage system (15) for powering the functional system, wherein the energy storage system may include at least one of a battery and a fuel cell. When the current delivered by the energy storage system exceeds a first predetermined amount, performance of the functional system is reduced from a first operating level to a second operating level for at least one task of the functional system to attempt to reduce the current delivered by the energy storage system.

WO 2016/160113 A3

INTERNATIONAL SEARCH REPORT

International application No
PCT/US2016/015382

A. CLASSIFICATION OF SUBJECT MATTER
INV. B66F9/24 G07C5/08
ADD.
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)
B66F G07C

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

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)
EPO-Internal, WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	DE 102 60 355 A1 (STILL GMBH [DE]) 8 July 2004 (2004-07-08) abstract paragraph [0026] - paragraph [0034] claims 1,3,5,8,9 figures	1-22, 26-35
X	US 2012/209478 A1 (DAMMEYER KARL L [US] ET AL) 16 August 2012 (2012-08-16) abstract paragraph [0088] - paragraph [0096] figure 14 claims 15,25	1-22, 26-35
	----- -/--	

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 another 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 6 October 2016	Date of mailing of the international search report 14/10/2016
---	--

Name and mailing address of the ISA/ European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Fax: (+31-70) 340-3016	Authorized officer Sheppard, Bruce
--	---

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US2016/015382

Box No. II Observations where certain claims were found unsearchable (Continuation of item 2 of first sheet)

This international search report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:

2. Claims Nos.:
because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out, specifically:

3. Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box No. III Observations where unity of invention is lacking (Continuation of item 3 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

see additional sheet

1. As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims.
2. As all searchable claims could be searched without effort justifying an additional fees, this Authority did not invite payment of additional fees.
3. As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims for which fees were paid, specifically claims Nos.:
4. No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

Remark on Protest

- The additional search fees were accompanied by the applicant's protest and, where applicable, the payment of a protest fee.
- The additional search fees were accompanied by the applicant's protest but the applicable protest fee was not paid within the time limit specified in the invitation.
- No protest accompanied the payment of additional search fees.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

This International Searching Authority found multiple (groups of) inventions in this international application, as follows:

1. claims: 1-22, 26-35

A method and device for controlling a functional system of a materials handling vehicle monitoring a current delivered by an energy storage system; and when the current delivered by the energy storage system exceeds a first predetermined amount, reducing performance of a functional system from a first operating level to a second operating level for at least one task of the functional system to attempt to reduce the current delivered by the energy storage system.

2. claims: 23-25

A method of estimating a period of time comprising periodically sensing a respective temperature of each of a plurality of components of an industrial vehicle while the vehicle is powered on; from among the most recently sensed respective temperatures, storing the maximum respective temperature; from among the most recently sensed respective temperatures, storing the minimum respective temperature; detecting that the vehicle is powered on from a powered off condition; sensing a new respective temperature of each of the plurality of components; from among the new respective temperatures, determining a maximum new respective temperature; and estimating a period of time the vehicle was in the powered off condition based on the stored maximum respective temperature and the maximum new respective temperature.

INTERNATIONAL SEARCH REPORT

International application No
PCT/US2016/015382

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	WO 2009/129295 A2 (RAYMOND CORP [US]; MEDWIN STEVE [US]; MCCABE PAUL P [US]) 22 October 2009 (2009-10-22) abstract paragraph [0030] - paragraph [0042] -----	23
A	US 2004/015288 A1 (WOLBER JENS [DE] ET AL) 22 January 2004 (2004-01-22) abstract paragraph [0015] - paragraph [0016] figures -----	23

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

PCT/US2016/015382

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
DE 10260355	A1	08-07-2004	NONE

US 2012209478	A1	16-08-2012	AU 2012217996 A1 02-05-2013
			AU 2016225901 A1 29-09-2016
			CA 2826440 A1 23-08-2012
			CN 103380074 A 30-10-2013
			EP 2675745 A1 25-12-2013
			EP 2865635 A2 29-04-2015
			EP 2894122 A1 15-07-2015
			EP 2894123 A1 15-07-2015
			KR 20140005285 A 14-01-2014
			RU 2013137976 A 27-03-2015
			US 2012209478 A1 16-08-2012
			US 2014326541 A1 06-11-2014
			US 2014326542 A1 06-11-2014
			US 2014330488 A1 06-11-2014
			US 2015344278 A1 03-12-2015
			WO 2012112431 A1 23-08-2012

WO 2009129295	A2	22-10-2009	AU 2009236284 A1 22-10-2009
			AU 2010246559 A1 23-12-2010
			AU 2010246560 A1 23-12-2010
			AU 2010246561 A1 23-12-2010
			AU 2010246562 A1 23-12-2010
			CA 2721463 A1 22-10-2009
			CA 2937962 A1 22-10-2009
			CA 2937963 A1 22-10-2009
			CN 102066234 A 18-05-2011
			CN 102120554 A 13-07-2011
			CN 102120555 A 13-07-2011
			CN 102139846 A 03-08-2011
			CN 102173368 A 07-09-2011
			EP 2279148 A2 02-02-2011
			EP 2289836 A2 02-03-2011
			HK 1157727 A1 29-08-2014
			HK 1157729 A1 29-04-2016
			HK 1157730 A1 12-08-2016
			HK 1157731 A1 24-03-2016
			US 2009265059 A1 22-10-2009
			US 2012239243 A1 20-09-2012
			US 2012239261 A1 20-09-2012
			US 2012245765 A1 27-09-2012
			WO 2009129295 A2 22-10-2009

US 2004015288	A1	22-01-2004	BR 0114037 A 22-07-2003
			DE 10043695 A1 14-03-2002
			EP 1317615 A1 11-06-2003
			ES 2264987 T3 01-02-2007
			JP 5150031 B2 20-02-2013
			JP 2004508487 A 18-03-2004
			US 2004015288 A1 22-01-2004
			WO 0220966 A1 14-03-2002
