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20 Red Lion Street, London WC1R 4PQ (GB).(81) Designated States (unless otherwise indicated, for every
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DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT,
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KR, KZ, LA, LC, LK, LR, LS, LT, LU, LY, MA, MD,
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RW, SC, SD, SE, SG, SK, SL, SM, ST, SV, SY, TH, TJ,
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(54) Title: METHOD OF CALCULATING THE INPUT CURRENT DRAWN BY A POWER CONVERTER

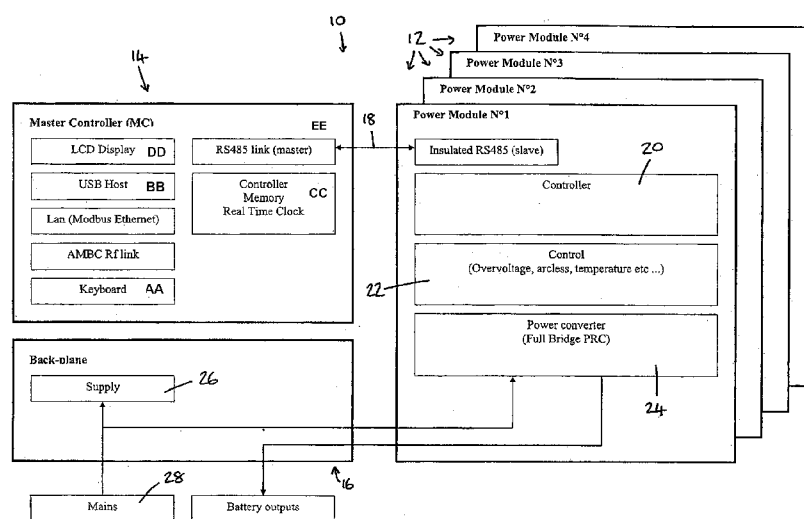


FIG. 1

(57) Abstract: The invention relates to a method and apparatus for calculating the input current being drawn by a power converter. The power converter may be connected to and charging a battery and the method includes the steps of measuring the current and voltage being supplied to the battery, along with the frequency at which the power converter is operating. The voltage being supplied to the power converter may be calculated using a pre-determined relationship with the current and voltage being supplied to the power converter and the frequency of operation. The voltage being supplied to the converter may then be used to calculate the current being drawn by the converter.



INTERNATIONAL SEARCH REPORT

International application No
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A. CLASSIFICATION OF SUBJECT MATTER

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ADD.

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B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

H02M B60L H02J

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.
Y	US 2009/306914 A1 (COHEN ISAAC [US]) 10 December 2009 (2009-12-10) paragraph [0022] - paragraph [0031]; figures 2,4	1-10
Y	EP 1 137 157 A2 (SONY CORP [JP]) 26 September 2001 (2001-09-26) paragraph [0052]; figure 14	1-5
X	US 5 803 215 A (HENZE CHRISTOPHER P [US] ET AL) 8 September 1998 (1998-09-08)	11
Y	column 4, line 41 - column 6, line 10; figures 1, 2	6-10



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See patent family annex.

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INTERNATIONAL SEARCH REPORT

Information on patent family members

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Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 2009306914	A1	10-12-2009	NONE
EP 1137157	A2	26-09-2001	CN 1318896 A 24-10-2001
			EP 1137157 A2 26-09-2001
			JP 2001275351 A 05-10-2001
			KR 20010090539 A 18-10-2001
			TW 506184 B 11-10-2002
			US 2001036092 A1 01-11-2001
US 5803215	A	08-09-1998	US 5803215 A 08-09-1998
			WO 9832209 A1 23-07-1998