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13/566,842 3 August 2012 (03.08.2012) US(71) Applicant (for all designated States except US): **JOHNSON CONTROLS TECHNOLOGY COMPANY** [US/US]; 915 East 32nd Street, Holland, Michigan 49423 (US).

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(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, 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, PA, PE, PG, PH, PL, PT, QA, RO, RS, RU, RW, 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.

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Declarations under Rule 4.17:

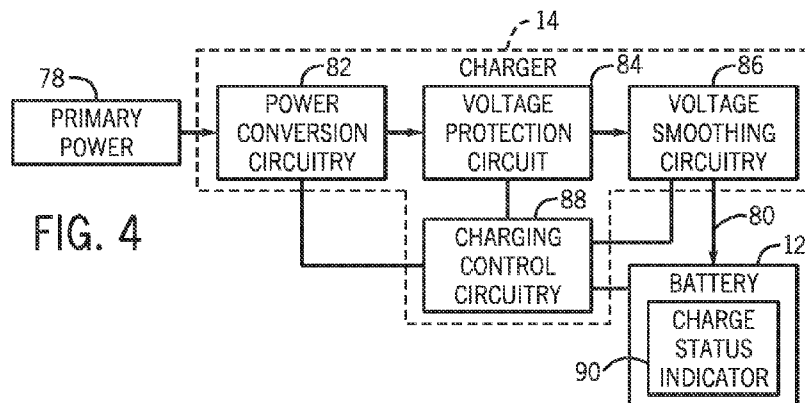
- as to applicant's entitlement to apply for and be granted a patent (Rule 4.17(ii))
- as to the applicant's entitlement to claim the priority of the earlier application (Rule 4.17(iii))

Published:

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

(88) Date of publication of the international search report:
18 July 2013

(54) Title: BATTERY CHARGING DEVICES AND SYSTEMS



(57) Abstract: A charger for a starting, lighting, and ignition (SLI) battery is provided. The charger includes a base unit having a pair of terminals that are adapted to engage a pair of conductive terminals coupled to a battery unit to electrically couple the base unit to the battery unit. The charger also includes charging circuitry having power conversion circuitry that is adapted to receive primary power and to convert the primary power to a battery power output compatible with a charging voltage of the battery unit.



INTERNATIONAL SEARCH REPORT

International application No

PCT/US2012/054073

A. CLASSIFICATION OF SUBJECT MATTER
INV. H02J7/00
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)
H02J H01M

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

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	GB 1 569 967 A (JACKSON J) 25 June 1980 (1980-06-25)	1,3-8, 10,11
Y	pages 1-3; figures 1-6 -----	2,9
Y	US 3 781 631 A (NELSON R ET AL) 25 December 1973 (1973-12-25)	2,9
A	section B: battery fully charged; page 4, lines 10-50 -----	4
Y	WO 2008/056316 A1 (POWER MAN TECHNOLOGIES NZ LTD [NZ]; LUCINSKY DARREN GRANT [NZ]) 15 May 2008 (2008-05-15)	2,9
A	pages 28-31; figure 17 -----	4
A	US 2009/009142 A1 (NISHIKAWA TSUTOMU [JP]) 8 January 2009 (2009-01-08) paragraphs [0024] - [0027] -----	3
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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

17 January 2013

Date of mailing of the international search report

17/04/2013

Name and mailing address of the ISA/

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INTERNATIONAL SEARCH REPORT

International application No

PCT/US2012/054073

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 6 188 202 B1 (YAGI KAZUHIKO [JP] ET AL) 13 February 2001 (2001-02-13) column 1, lines 1-30 -----	4

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US2012/054073

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.:

see annex

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: 1-11

charger for a SLI battery comprising voltage protection
circuitry

2. claims: 12-18

a battery system with a base unit and a separate charging
unit

3. claims: 19-22

point of sale battery case

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

PCT/US2012/054073

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
GB 1569967	A	25-06-1980	NONE	

US 3781631	A	25-12-1973	NONE	

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			WO 2008056316 A1	15-05-2008

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			US 2009009142 A1	08-01-2009

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			JP 2000023383 A	21-01-2000
			US 6188202 B1	13-02-2001
