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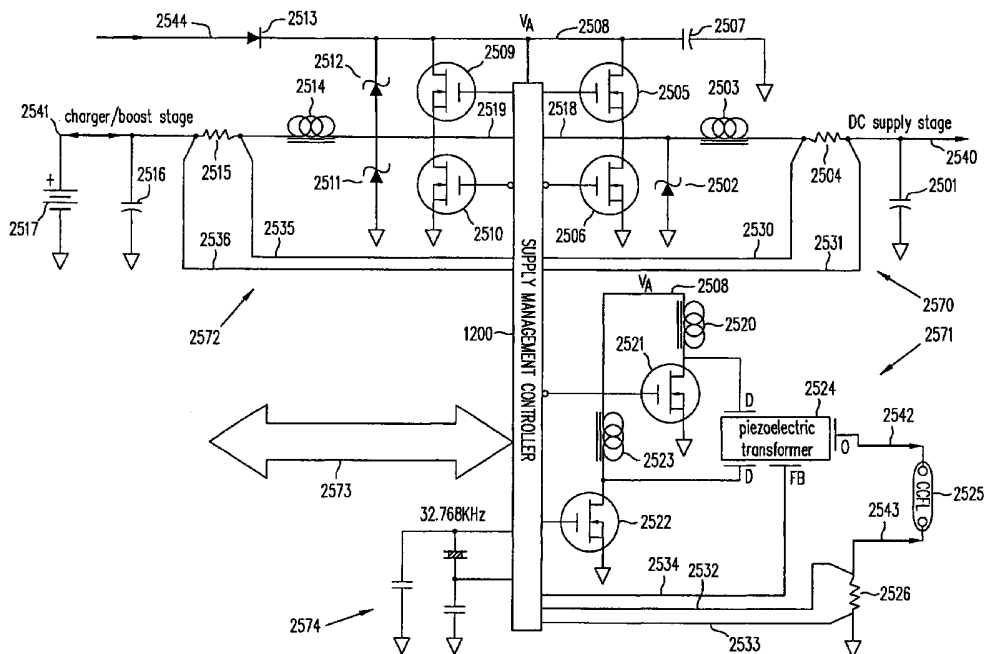
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Declarations under Rule 4.17:

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

[Continued on next page]

(54) Title: POWER CONVERTER CIRCUITRY AND METHOD



(57) Abstract: A control system and method for simultaneously regulating the operation of a plurality of different types of switching power converters. The system utilizes in regulating the power converters sampled data and nonlinear feedback control loops.

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**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*

*For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.*

**(88) Date of publication of the international search report:**

21 October 2004

## INTERNATIONAL SEARCH REPORT

International Application No

PCT/US 03/36580

A. CLASSIFICATION OF SUBJECT MATTER  
 IPC 7 H02J7/00 H02M3/157

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 7 H02J H02M

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 practical, search terms used)

EPO-Internal, WPI Data, PAJ

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 5 610 450 A (SAEKI ET AL) 11 March 1997 (1997-03-11) column 4, line 31 - column 7, line 34; figures 1,2	1
A	----- US 6 348 744 B1 (LEVESQUE) 19 February 2002 (2002-02-19) column 2, line 45 - column 10, line 47; figures 1-4	1
A	----- WO 02/058217 A (PHILIPS) 25 July 2002 (2002-07-25) page 3, line 25 - page 6, line 29; figures 1-4	1



Further documents are listed in the continuation of box C.



Patent family members are listed in 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 document 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

18 May 2004

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20/08/2004

Name and mailing address of the ISA

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# INTERNATIONAL SEARCH REPORT

International application No.  
PCT/US 03/36580

## Box I Observations where certain claims were found unsearchable (Continuation of item 1 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 II Observations where unity of invention is lacking (Continuation of item 2 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 fee, this Authority did not invite payment of any additional fee.
  
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.:

1

Remark on Protest

- The additional search fees were accompanied by the applicant's protest.
- 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. claim: 1

Method for controlling a switching power converter connected to a battery by applying control pulses, sampling a voltage and computing the energy taken from the battery.

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2. claims: 2-5

A circuit comprising an analog circuit, a counter and a digital controller for controlling said analog circuit and said counter.

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3. claims: 6,7

A touch screen display circuit.

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# INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/US 03/36580

Patent document cited in search report	Publication date	Publication date	Patent family member(s)	Publication date
US 5610450	A	11-03-1997	JP 8140286 A	31-05-1996
US 6348744	B1	19-02-2002	EP 1072079 A1 WO 9953595 A1	31-01-2001 21-10-1999
WO 02058217	A	25-07-2002	EP 1356577 A2 WO 02058217 A2	29-10-2003 25-07-2002