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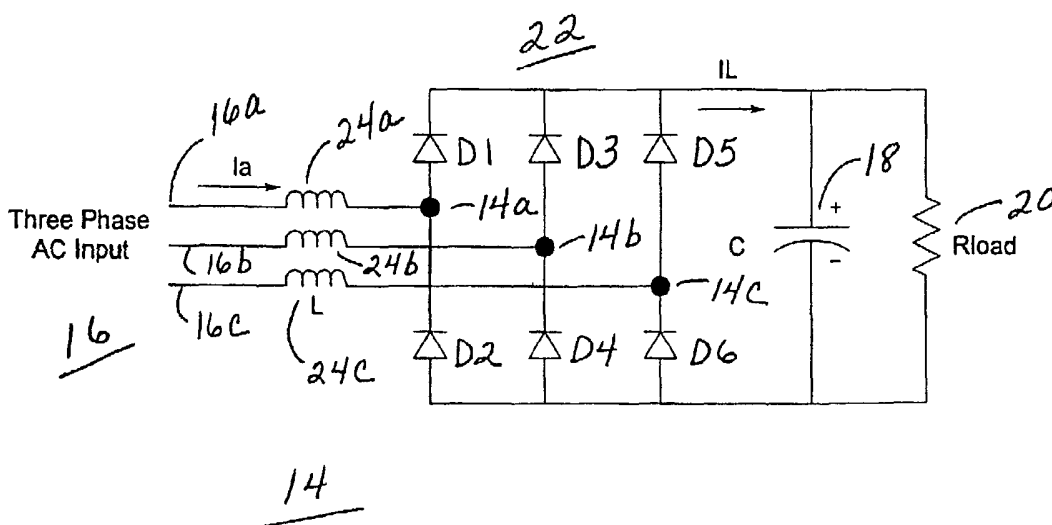
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For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

(54) Title: LOW HARMONIC RECTIFIER CIRCUIT



(57) Abstract: Non-linear inductor(s) are used to reduce the percent total harmonic distortion of the harmonics in the line currents in the input side rectifier system of an ac drive system. Several constructions for the non-linear inductor(s) are described. The non-linear inductor(s) may be constructed from E and I laminations. The gap depends on the construction of the middle leg of the E laminations and may have a step with a constant spacing or a variable spacing which depends on the stacking of the laminations. Alternatively the non-linear inductor(s) may be constructed from a toroidal core that either has a step gap or a variable type gap.

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INTERNATIONAL SEARCH REPORT

International Application No

PCT/US 03/26583

A. CLASSIFICATION OF SUBJECT MATTER
 IPC 7 H02M1/00 H01F3/14

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 H02M H01F

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, PAJ

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 4 222 096 A (CAPEWELL DENNIS) 9 September 1980 (1980-09-09) column 8, line 46 - line 63; figure 12 figure 5	1,2
X	US 4 914 559 A (DEISCH CECIL W) 3 April 1990 (1990-04-03) column 5, line 61 - column 6, line 3; figures 1-10	3,4
X	US 5 559 396 A (BRUNING GERT W ET AL) 24 September 1996 (1996-09-24) figures 1-4	3,4
A	US 4 369 490 A (BLUM FRITHJOF) 18 January 1983 (1983-01-18) figures 10,11	1-4
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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

6 April 2004

Date of mailing of the international search report

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INTERNATIONAL SEARCH REPORT

International Application No
PCT/US 03/26583

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT		
Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO 02/19350 A (LEISTEN JOE ; DODDS STUART (GB); LEES BRIAN (GB); MINEBEA KK (JP)) 7 March 2002 (2002-03-07) abstract; figures 5,7,8 -----	5-12
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INTERNATIONAL SEARCH REPORT

International application No.
PCT/US 03/26583

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.:

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. claims: 1-4

A low harmonic rectifier circuit comprising
a rectifier
a capacitor
an inductance
where said inductance comprises one or more non-linear
inductors.

2. claims: 5-21

a non-linear inductor of a particular model and method for
making such inductor.

INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/US 03/26583

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