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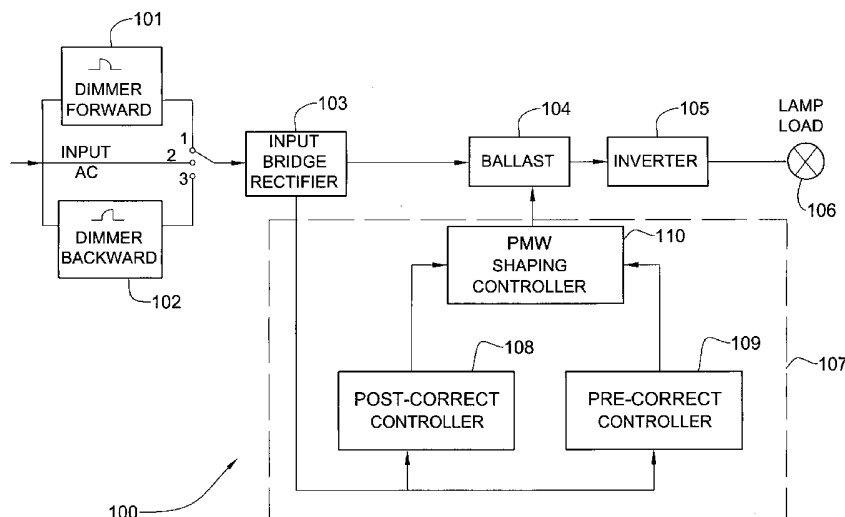
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(54) Title: CONTROLLABLE POWER SUPPLY CIRCUIT FOR AN ILLUMINATION SYSTEM AND METHODS OF OPERATION THEREOF



(57) Abstract: A method for reducing acoustic noise produced during use of a lamp dimmer detects whether the dimmer is a leading edge (101) or a trailing edge dimmer (102). A nominal firing time of a leading edge dimmer is determined and a post-correction applied to a voltage applied to the dimmer starting from the nominal firing time so as to build-up the voltage gradually during a predetermined post-correction time period and thereby reduce the rate of rise of the leading edge thereof. A nominal cutoff time of a trailing edge dimmer is determined and a pre-correction applied to a voltage applied to the dimmer starting from the nominal cut-off time so as to diminish the voltage gradually during a predetermined pre-correction time period and thereby reduce the rate of rise of the leading edge thereof. Other methods are disclosed for soft starting filament lamps and controlling dimmer circuits.

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INTERNATIONAL SEARCH REPORT

International Application No  
PCT/IL2005/000816

A. CLASSIFICATION OF SUBJECT MATTER  
H05B39/04 H05B39/08 H02M5/293 H05B39/02

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)  
H05B 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

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 2003/127994 A1 (PATCHORNIK JOSHUA ET AL) 10 July 2003 (2003-07-10) paragraphs [0001] - [0008] paragraphs [0013] - [0045] paragraphs [0049], [0053] figures 1-10c	1-6,13
X	US 6 034 790 A (KAMEI ET AL) 7 March 2000 (2000-03-07) column 1, lines 24-67 column 8, lines 14-30 column 10, line 35 - column 11, line 16 figures 1,2,6a-6i ----- -/--	14,16-18

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

27 January 2006

Date of mailing of the international search report

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## INTERNATIONAL SEARCH REPORT

International Application No  
PCT/IL2005/000816

## C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 2002/071299 A1 (FRANCK FELIX ET AL) 13 June 2002 (2002-06-13) paragraphs '0001! - '0004!, '0017!, '0018! figures 1,2,7,8 -----	19,20
X	US 2003/168996 A1 (BREVETTI PAOLO ET AL) 11 September 2003 (2003-09-11) paragraphs '0001! - '0023! paragraphs '0044! - '0056! paragraphs '0059! - '0078! -----	1-6,13
X	US 4 528 494 A (BLOOMER ET AL) 9 July 1985 (1985-07-09) column 1, line 1 - column 4, line 40 column 7, lines 1-34 figures 1,2 -----	14,16-18
X	US 5 600 233 A (WARREN ET AL) 4 February 1997 (1997-02-04) column 1, line 12 - column 2, line 60 column 3, lines 18-37 column 6, line 18 - column 7, line 15 figures 5A,5B,6A,6B,10A-10E -----	14,16-18
X	US 6 246 182 B1 (YAMASAKI SHIGEAKI ET AL) 12 June 2001 (2001-06-12) column 5, line 65 - column 8, line 65 figures 17,19-21 -----	19,20
X	US 5 740 021 A (LECHELER ET AL) 14 April 1998 (1998-04-14) column 1, lines 46-49 column 6, line 50 - column 7, line 25 column 8, lines 7-18 figures 1,4 -----	19,20
X	EP 1 220 579 A (GENERAL ELECTRIC COMPANY) 3 July 2002 (2002-07-03) paragraphs '0002! - '0017!, '0022! figures 1-3 -----	19,20

# INTERNATIONAL SEARCH REPORT

International application No.  
PCT/IL2005/000816

## Box 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.: 7-9, 10-12, 15  
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:  
see FURTHER INFORMATION sheet PCT/ISA/210
  
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 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 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**

Continuation of Box II.2

Claims Nos.: 7-9, 10-12, 15

Claims 7-9:

These claims are obscurely drafted because they define a simulation operation (a method for simulating operation of a dimmer), where no simulation appears to take place when carrying out the defined steps of the method. Therefore, these claims are thus rendered unclear and consequently no opinion needs to be formed on said claims.

Claims 10-12:

These claims are obscurely drafted because they define a method for simulating a firing pulse applied to a dimmer, where no simulation appears to take place when carrying out the defined steps of the method. Therefore, these claims are thus rendered unclear and consequently no opinion needs to be formed on said claims.

Claim 15:

This claim has as its object 'a method of soft starting a lamp' by maintaining the duration of a successive voltage phase control segment to be equal to that of the previous segment. This appears to define normal, steady-state lamp operation. Therefore, dependent claim 15 is contradictory and hence unclear, thereby rendering a meaningful search impossible.

The applicant's attention is drawn to the fact that claims relating to inventions in respect of which no international search report has been established need not be the subject of an international preliminary examination (Rule 66.1(e) PCT). The applicant is advised that the EPO policy when acting as an International Preliminary Examining Authority is normally not to carry out a preliminary examination on matter which has not been searched. This is the case irrespective of whether or not the claims are amended following receipt of the search report or during any Chapter II procedure. If the application proceeds into the regional phase before the EPO, the applicant is reminded that a search may be carried out during examination before the EPO (see EPO Guideline C-VI, 8.5), should the problems which led to the Article 17(2) declaration be overcome.

**FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210**

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

1. claims: 1-6 and 13

The special technical features of these claims concern a method for reducing the acoustic noise produced during use of a lamp dimmer in a lighting system by determining whether the dimmer is leading- or trailing-edge and applying an appropriate correction to the voltage applied to the dimmer to reduce the amount of noise.

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2. claims: 14-18

The special technical features of these claims concern a method for the soft-starting of a filament lamp in a lighting system in order to protect the lamp and circuit from inrush or shock currents

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3. claims: 19, 20

The special technical features of these claims concern a method for igniting an inverter and an ignition circuit in a lighting system.

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# INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/IL2005/000816

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