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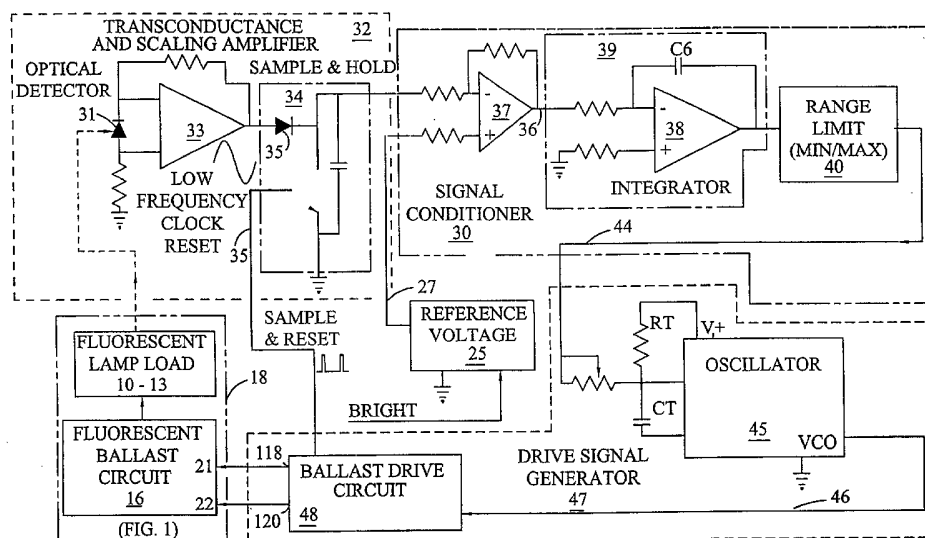
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- (51) International Patent Classification⁷: **H05B 41/392** (72) Inventor: **O'MEARA, Kevan**; 10437 Laramie Avenue, Chatsworth, CA 91311 (US).
- (21) International Application Number: PCT/US2003/004775 (74) Agent: **GESS, Albin, H**; SNELL & WILMER LLP, 1920 Main Street, Suite 1200, Irvine, CA 92614 (US).
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- (71) Applicant: **NORTHROP GRUMMAN CORPORATION** [US/US]; BUILDING 35, 21240 BURBANK BOULEVARD, WOODLAND HILLS, CA 91367 (US). 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: A FLUORESCENT LAMP BRIGHTNESS CONTROL PROCESS BY BALLAST FREQUENCY ADJUSTMENT



(57) Abstract: A fluorescent ballast and control circuit having a drive signal generator responsive to a drive frequency control signal, the drive signal generator providing a ballast drive signal having a drive signal frequency proportional to the drive frequency control signal. A fluorescent ballast is driven by the ballast drive signal and has an output voltage coupled to drive a fluorescent lamp load. The fluorescent ballast circuit provides a change in the output voltage applied to the lamp load in response to a change in the ballast drive signal frequency. A means for monitoring the brightness of the lamp load develops a brightness signal that characterizes the brightness of the lamp load. A signal conditioner responds to the brightness signal and to a reference signal and provides and adjusts a drive frequency control signal to keep the brightness signal substantially constant.

INTERNATIONAL SEARCH REPORT

International Application No
PCT/US 03/04775

A. CLASSIFICATION OF SUBJECT MATTER
IPC 7 H05B41/392

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 H05B

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.
X	US 6 094 016 A (SOEHNEL CHRISTIAN ET AL) 25 July 2000 (2000-07-25)	1,5
Y	column 3, line 49 -column 8, line 39; figures 4-7	4,10,11, 13,18,20
X	US 4 874 989 A (NILSSEN OLE K) 17 October 1989 (1989-10-17)	1,5
Y	column 4, line 44 -column 7, line 29; figures 1-5	2,3
Y	US 5 510 681 A (NILSSEN OLE K) 23 April 1996 (1996-04-23)	2,3
	column 3, line 16 -column 5, line 59; figures 1-3	
A	US 5 747 942 A (RANGANATH KRISHNAPPA) 5 May 1998 (1998-05-05)	2,3
	abstract; figure 5	
	-/--	

☒ 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

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"&" document member of the same patent family

Date of the actual completion of the international search

20 November 2003

Date of mailing of the international search report

11.12.2003

Name and mailing address of the ISA

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INTERNATIONAL SEARCH REPORT

International Application No
PCT/US 03/04775

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	WO 97 22232 A (PHILIPS ELECTRONICS NV ;PHILIPS NORDEN AB (SE)) 19 June 1997 (1997-06-19)	4
A	page 2, line 9 - line 34; figure 2 ---	14,15
A	US 5 047 691 A (LESEA RONALD A ET AL) 10 September 1991 (1991-09-10) column 5, line 26 -column 15, line 63; figures 1-9 ---	4,14,15
A	US 5 544 214 A (LAAR JOSEPHUS CORNELUS VAN DER) 6 August 1996 (1996-08-06) column 3, line 9 -column 5, line 35; figures 1-5 ---	6-9,12, 16,17,19
Y	US 6 188 177 B1 (LANGER GEORGE O ET AL) 13 February 2001 (2001-02-13) column 2, line 47 -column 12, line 30; figures 1-3 ---	10,11, 13,18,20
A	WO 89 06894 A (ETTA IND INC) 27 July 1989 (1989-07-27) ---	
A	US 4 277 728 A (STEVENS CARLILE R) 7 July 1981 (1981-07-07) ---	
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A	US 3 491 242 A (KASS SEYMOUR ET AL) 20 January 1970 (1970-01-20) ---	
A	US 6 232 727 B1 (CHEE ALLAND ET AL) 15 May 2001 (2001-05-15) -----	

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US 03/04775

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: 1-3,5
2. Claims: 4,14,15
3. Claims: 6-9,12,16,17,19
4. Claims: 10,11,13,18,20

INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/US 03/04775

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