

(51) International Patent Classification:
H05B 33/08 (2006.01)(21) International Application Number:
PCT/US2012/037468(22) International Filing Date:
11 May 2012 (11.05.2012)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
61/485,829 13 May 2011 (13.05.2011) US
13/436,040 30 March 2012 (30.03.2012) US(71) Applicant (for all designated States except US): **GENERAL ELECTRIC COMPANY** [US/US]; 1 River Road, Schenectady, NY 12345 (US).

(72) Inventor; and

(75) Inventor/Applicant (for US only): **GHANEM, Mohamed, Cherif** [CA/CA]; 1940 Onesime-gagon, Lachine, QC H8T 3M6 (CA).(74) Agents: **DIMAURO, Peter, T.** et al.; General Electric Company, Global Patent Operation, 2 Corporate Drive, Suite 648, Shelton, CT 06484 (US).

(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, 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, 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.

(84) Designated States (unless otherwise indicated, for every kind of regional protection available): ARIPO (BW, GH, GM, KE, LR, LS, MW, MZ, NA, RW, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, RU, TJ, TM), European (AL, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LT, LU, LV, MC, MK, MT, NL, NO, PL, PT, RO, RS, SE, SI, SK, SM, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

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:
26 September 2013

(54) Title: DIMMABLE LED LAMP

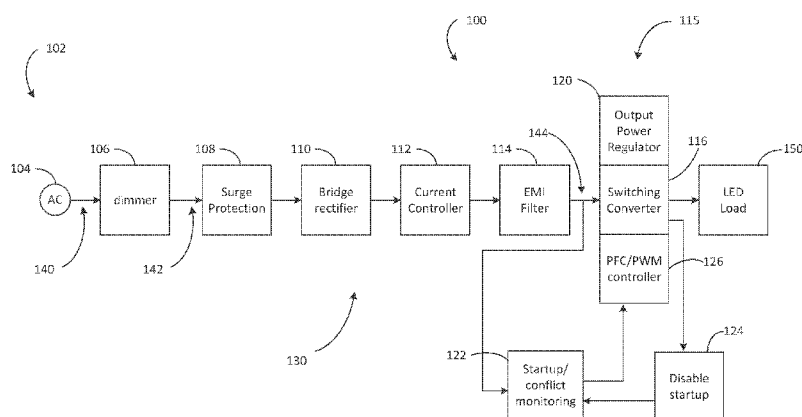


FIG. 1

(57) Abstract: A driver for an LED lamp assembly includes a rectifier configured to receive an AC power and produce a first DC power and a switching regulator coupled to the rectifier. The switching regulator is configured to receive the first DC power and produce an output DC power. The driver also includes a current controller coupled between the rectifier and the switching regulator. The current controller is configured to damp and stabilize an electric current flowing between the switching regulator and the rectifier.

INTERNATIONAL SEARCH REPORT

International application No
PCT/US2012/037468

A. CLASSIFICATION OF SUBJECT MATTER
INV. H05B33/08
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)
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 practicable, search terms used)

EPO-Internal, WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO 2011/008635 A1 (IWATT INC [US]; ZHENG JUNJIE [US]; KESTERSON JOHN W [US]; MYERS RICHA) 20 January 2011 (2011-01-20) figure 5 LED lamp; paragraph [0034] - paragraph [0035] power converter; paragraph [0042] - paragraph [0044] chopping circuit; paragraph [0036] - paragraph [0041]; figure 6 phase detection; paragraph [0053] - paragraph [0062] ----- -/-	1-17



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

27 June 2013

Date of mailing of the international search report

08/07/2013

Name and mailing address of the ISA/

European Patent Office, P.B. 5818 Patentlaan 2
NL - 2280 HV Rijswijk
Tel. (+31-70) 340-2040,
Fax: (+31-70) 340-3016

Authorized officer

Benedetti, Gabriele

INTERNATIONAL SEARCH REPORT

International application No
PCT/US2012/037468

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 2010/213859 A1 (SHTEYNBERG ANATOLY [US] ET AL) 26 August 2010 (2010-08-26)	1
Y	page 114; figure 114 ref.115D together with fig.14; figure 21	18,19
	page 121; figure 15 ref.115E paragraph [0138] - paragraph [0142]; figure 19	

X	US 2011/025217 A1 (ZHAN XIAODONG [US] ET AL) 3 February 2011 (2011-02-03) paragraph [0020]; figure 5	1

Y	MARVELL SEMICONDUCTOR: "Marvell Response (LED Driver PFC Section)", REPORT, 21 June 2010 (2010-06-21), pages 1-11, XP002699674, points 12 and 13; page 9	18,19

A	OSRAM SYLVANIA: "High quality down lighting luminaire", SPECIFICATION, 30 June 2008 (2008-06-30), pages 1-12, XP002699675, page 2 page 7; table 2	18,19

A	EP 2 224 789 A1 (OSRAM GMBH [DE]; OSRAM SPA [IT] OSRAM AG [DE]; OSRAM SPA [IT]) 1 September 2010 (2010-09-01) the whole document	1

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US2012/037468

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.:

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: 1-17

current limitation for avoiding high inrush current when the driver is connected to a phase-cut dimmer

2. claims: 18, 19

determination of the presence of an phase-cut dimmer and take appropriate measures based on the result of the determination

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

PCT/US2012/037468

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
WO 2011008635 A1	20-01-2011	CN 101959346 A KR 20120031298 A US 2011012530 A1 US 2012274227 A1 WO 2011008635 A1	26-01-2011 02-04-2012 20-01-2011 01-11-2012 20-01-2011
US 2010213859 A1	26-08-2010	NONE	
US 2011025217 A1	03-02-2011	CN 101990344 A DE 102010036703 A1 GB 2472504 A KR 20110014105 A TW 201127198 A US 2011025217 A1	23-03-2011 07-04-2011 09-02-2011 10-02-2011 01-08-2011 03-02-2011
EP 2224789 A1	01-09-2010	AT 557573 T CN 101820706 A EP 2224789 A1 KR 20100098351 A US 2010219763 A1	15-05-2012 01-09-2010 01-09-2010 06-09-2010 02-09-2010