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(54) **UNIVERSAL LED TUBE AND POWER SYSTEM OF THE UNIVERSAL LED TUBE**

(57) A universal LED tube and a power system of the universal LED tube are provided. The universal LED tube utilizes an external electric power being selectably a low frequency electric power to emit light. The universal LED tube comprises a LED unit (101) and a LED driving circuit. The LED driving circuit comprises a power converter unit (102, 102') and a power filter unit (104, 104'). The power converter unit (102, 102') provides a DC power to the LED unit (101) according to the low frequency electric

power. The power filter unit (104, 104') is electrically coupled to a first side portion (1a) and the power converter unit (102, 102'). The low frequency electric power passes from the first side portion (1a) through the power filter unit (104, 104') to the power converter unit (102, 102'), for driving the LED unit (101). The universal LED tube can be applied to an existing tube holder of a conventional fluorescent tube, for avoiding cost of wire modifications.

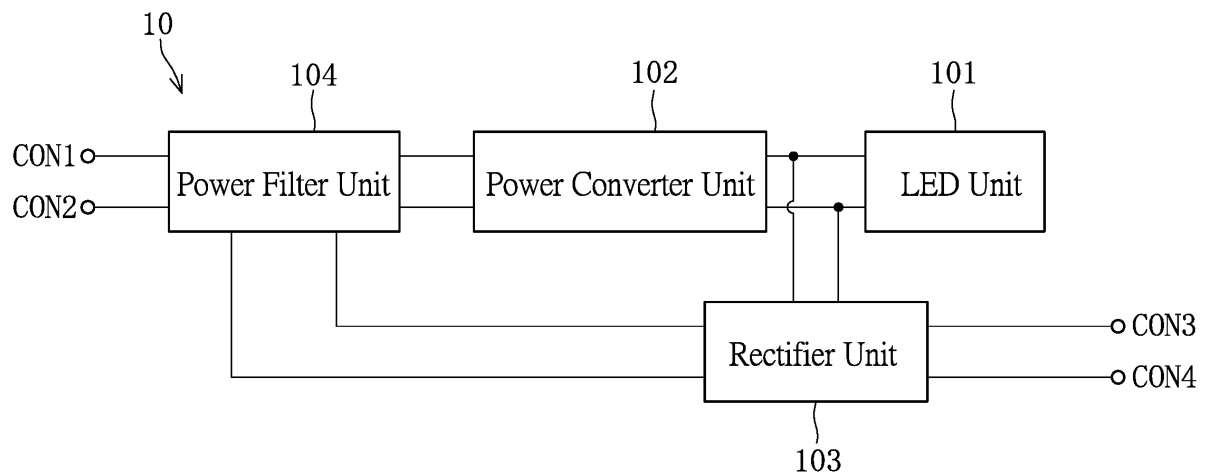


FIG.1A



EUROPEAN SEARCH REPORT

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EP 15 20 0101

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DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	CN 102 355 780 A (ZHEJIANG SHIMING OPTICS TECHNOLOGY CO LTD) 15 February 2012 (2012-02-15) * the whole document *	1-16	INV. H05B33/08 F21S4/28 F21K9/27
X	CN 202 979 375 U (ZHEJIANG HENGMAN PHOTOELECTRIC TECHNOLOGY CO LTD) 5 June 2013 (2013-06-05) * the whole document *	1-16	
X	CN 202 652 610 U (HOU LIGUANG) 2 January 2013 (2013-01-02) * the whole document *	1-16	
X	US 2013/234614 A1 (YU CHUNG-HUNG [TW] ET AL) 12 September 2013 (2013-09-12) * paragraph [0005] - paragraph [0026] *	1-16	
X	CN 204 291 470 U (BYD CO LTD) 22 April 2015 (2015-04-22) * the whole document *	1-16	
			TECHNICAL FIELDS SEARCHED (IPC)
			H05B F21S F21K F21V
The present search report has been drawn up for all claims			
Place of search Munich		Date of completion of the search 23 November 2016	Examiner Hernandez Serna, J
<p>CATEGORY OF CITED DOCUMENTS</p> <p>X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document</p> <p>T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document</p>			

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**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

EP 15 20 0101

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This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
The members are as contained in the European Patent Office EDP file on
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23-11-2016

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Patent document cited in search report	Publication date	Patent family member(s)	Publication date
CN 102355780 A	15-02-2012	NONE	
CN 202979375 U	05-06-2013	NONE	
CN 202652610 U	02-01-2013	NONE	
US 2013234614 A1	12-09-2013	CN 103313461 A TW 201338630 A US 2013234614 A1	18-09-2013 16-09-2013 12-09-2013
CN 204291470 U	22-04-2015	NONE	

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EPO FORM P0459

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