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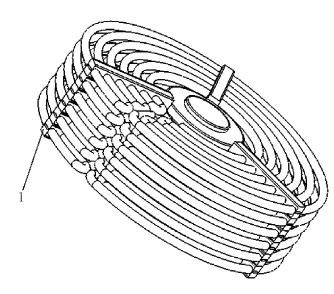
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(54) Title: A COOLING DEVICE AND LED LIGHTING APPARATUS COMPRISING THE SAME AND A METHOD OF MANUFACTURING THE COOLING DEVICE



(57) Abstract: The present invention relates to a cooling device for the electric heating element, comprising a plurality of cooling units (1), wherein, each cooling unit (1) possesses a defined heat dissipation performance, the number of the cooling units is determined according to the power of the electric heating element, and the cooling units (1) of the determined number can be stacked together. By the cooling device constructed by the stackable cooling units (1) according to the present gets variable heat dissipation capacities so as to meet the heat dissipation requirements of LED lighting apparatus with different powers. In addition, the present invention also relates to LED lighting apparatus having the cooling device of the above type.



INTERNATIONAL SEARCH REPORT

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A. CLASSIFICATION OF SUBJECT MATTER INV. F21V29/00 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) F21V 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 Relevant to claim No. Category* Citation of document, with indication, where appropriate, of the relevant passages EP 2 105 652 A1 (DELTA ELECTRONICS INC 1,2,6, Χ 11.12 [TW]) 30 September 2009 (2009-09-30) paragraph [0032] - paragraph [0045]; figures 1,3,5,6 Χ US 2009/135594 A1 (YU FANG-XIANG [CN] ET 1-4,11, AL) 28 May 2009 (2009-05-28) paragraph [0014] - paragraph [0023]; figures 1-5 US 2009/230834 A1 (LIU TAY-JIAN [TW]) 17 September 2009 (2009-09-17) Χ 1,2,11, paragraph [0023] - paragraph [0031]; figures 1-11 χ US 2008/089070 A1 (WANG CHIN-WEN [TW]) 1,2,6, 17 April 2008 (2008-04-17) 11,12 paragraph [0019] - paragraph [0020]; figures 1-6 Х Further documents are listed in the continuation of Box C. See patent family annex. Special categories of cited documents: "T" later document published after the international filing date or priority date and not in conflict with the application but "A" document defining the general state of the art which is not considered to be of particular relevance cited to understand the principle or theory underlying the invention "E" earlier document but published on or after the international "X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to filing date "L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another involve an inventive step when the document is taken alone "Y" document of particular relevance; the claimed invention citation or other special reason (as specified) cannot be considered to involve an inventive step when the document is combined with one or more other such docu-"O" document referring to an oral disclosure, use, exhibition or ments, such combination being obvious to a person skilled in the art. "P" document published prior to the international filing date but later than the priority date claimed "&" document member of the same patent family Date of the actual completion of the international search Date of mailing of the international search report 6 February 2012 13/02/2012 Name and mailing address of the ISA/ Authorized officer European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Fax: (+31-70) 340-3016 Schmid, Klaus

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Information on patent family members

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