



(11) **EP 2 141 430 A3**

(12) **EUROPEAN PATENT APPLICATION**

(88) Date of publication A3:
13.04.2011 Bulletin 2011/15

(51) Int Cl.:
F28D 1/047 ^(2006.01) **F28F 1/32** ^(2006.01)
F28F 13/08 ^(2006.01)

(43) Date of publication A2:
06.01.2010 Bulletin 2010/01

(21) Application number: **09164420.3**

(22) Date of filing: **02.07.2009**

(84) Designated Contracting States:
**AT BE BG CH CY CZ DE DK EE ES FI FR GB GR
HR HU IE IS IT LI LT LU LV MC MK MT NL NO PL
PT RO SE SI SK SM TR**
Designated Extension States:
AL BA RS

- **Lee, Han Choon**
153-802 Seoul (KR)
- **Kim, Dong Hwi**
153-802 Seoul (KR)
- **Kim, Ju Hyok**
153-802 Seoul (KR)
- **Kim, Hong Seong**
153-802 Seoul (KR)
- **Sa, Yong Cheol**
153-802 Seoul (KR)

(30) Priority: **04.07.2008 KR 20080065059**

(71) Applicant: **LG Electronics Inc.**
Seoul 150-721 (KR)

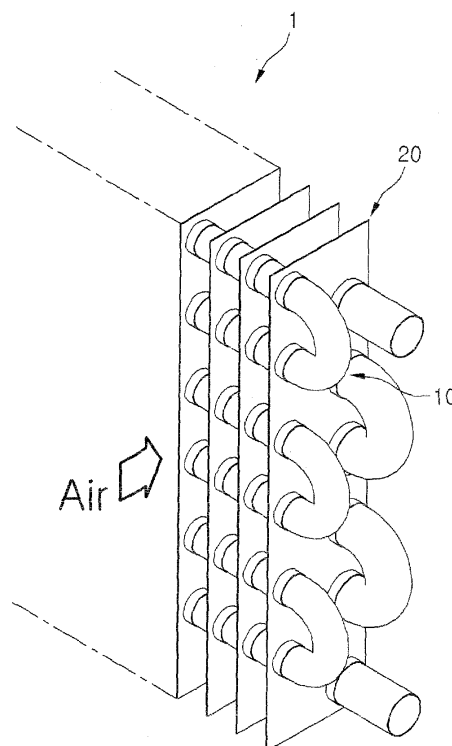
(72) Inventors:
• **Lee, Sang Yeul**
153-802 Seoul (KR)

(74) Representative: **Vossius & Partner**
Siebertstrasse 4
81675 München (DE)

(54) **Heat exchanger**

(57) A heat exchanger is provided. The heat exchanger includes at least one fin provided with a plurality of slits and a plurality of refrigerant tubes penetrating the fin. The refrigerant tubes include at least one front line tube and at least one rear line tube having a different diameter from the front line tube with reference to a fluid flow direction. The slits include at least one front line slit and at least one rear line slit having a difference width with reference to the fluid flow direction (Fig. 1).

FIG. 1



EP 2 141 430 A3



EUROPEAN SEARCH REPORT

 Application Number
 EP 09 16 4420

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	JP 2005 083715 A (SHARP KK) 31 March 2005 (2005-03-31)	1,9,10, 14	INV. F28D1/047
Y	* abstract; figures 1-13 *	2-8, 11-13,15	F28F1/32 F28F13/08
Y	----- GB 2 299 656 A (TOSHIBA KK [JP]) 9 October 1996 (1996-10-09)	2-8,12, 13,15	
A	* figures 3-8 *	1	
Y	----- JP 58 108394 A (HITACHI LTD) 28 June 1983 (1983-06-28)	11	
A	* abstract; figures 1-5 *	1,2	
A	----- JP 2008 111622 A (TOSHIBA CARRIER KK) 15 May 2008 (2008-05-15)	1-15	
A	* abstract; figures 1-5 *		
A	----- US 2007/204614 A1 (KOLB JOHN A [US]) 6 September 2007 (2007-09-06)	1-15	
	* paragraphs [0059] - [0061]; figures 9-11 *		

The present search report has been drawn up for all claims			TECHNICAL FIELDS SEARCHED (IPC)
			F28F
Place of search		Date of completion of the search	Examiner
Munich		4 March 2011	Leclaire, Thomas
CATEGORY OF CITED DOCUMENTS 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 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			

 1
 EPO FORM 1503 03.82 (P04C01)

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

EP 09 16 4420

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
The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

04-03-2011

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
JP 2005083715 A	31-03-2005	JP 4073850 B2	09-04-2008
GB 2299656 A	09-10-1996	CN 1149117 A	07-05-1997
		JP 3361405 B2	07-01-2003
		JP 8270985 A	18-10-1996
JP 58108394 A	28-06-1983	NONE	
JP 2008111622 A	15-05-2008	CN 101173830 A	07-05-2008
US 2007204614 A1	06-09-2007	AR 057945 A1	26-12-2007
		AU 2006340012 A1	20-09-2007
		CA 2640389 A1	20-09-2007
		CN 101395357 A	25-03-2009
		EP 1991767 A1	19-11-2008
		US 2009158730 A1	25-06-2009
		WO 2007106146 A1	20-09-2007