(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) EP 1 580 496 A3

(12) EUROPEAN PATENT APPLICATION

(88) Date of publication A3:
23.11.2005 Bulletin 2005/47

(43) Date of publication A2:
28.09.2005 Bulletin 2005/39

(21) Application number: **04103085.9**

(22) Date of filing: **30.06.2004**

(51) Int Cl.[7]: **F25B 5/04**, F25B 41/06, F25B 41/04

(84) Designated Contracting States:
AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HU IE IT LI LU MC NL PL PT RO SE SI SK TR
Designated Extension States:
AL HR LT LV MK

(30) Priority: **23.03.2004 KR 2004019700**

(71) Applicant: **SAMSUNG ELECTRONICS CO., LTD.**
Suwon-si, Gyeonggi-do 442-742 (KR)

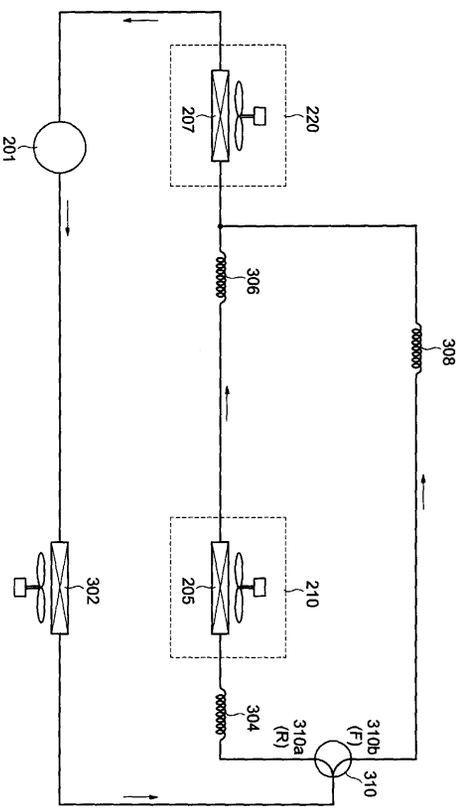
(72) Inventors:
- **Bae, Hak Gyun**
  Kyungsanbuk-do (KR)
- **Seo, Eung Ryeol**
  Gwangsan-gu, Gwangju-city (KR)

(74) Representative: **Read, Matthew Charles et al**
Venner Shipley LLP
20 Little Britain
London EC1A 7DH (GB)

(54) Heat pump

(57) A refrigerator and a control method thereof in which a smooth flow of a refrigerant can be provided through an effective control for a path change valve (310) when a flow path of the refrigerant is changed between two evaporators (205,207) equipped in the refrigerator by the path change valve (310). The refrigerator includes a refrigerating compartment evaporator (205), a freezing compartment evaporator (207), a first expansion device (304) adapted to expand a flow of a refrigerant to be introduced into the refrigerating compartment evaporator (205), a second expansion device (308) adapted to expand a flow of the refrigerant to be introduced into the freezing compartment evaporator (207), a path change device (310) adapted to change a flow path of the refrigerant between the first expansion device (304) and the second expansion device (308), and a control unit adapted to control the path change device so that, when the refrigerant flow path is changed from the second expansion device (308) to the first expansion device (304), a simultaneous opening stage causing the refrigerant to be introduced into both the first expansion device (304) and the second expansion device (308) is maintained for a predetermined time.

FIG 1



EP 1 580 496 A3

European Patent Office

EUROPEAN SEARCH REPORT

Application Number
EP 04 10 3085

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.7)
X	EP 1 394 481 A (SAMSUNG ELECTRONICS CO., LTD) 3 March 2004 (2004-03-03) * paragraph [0013] - paragraph [0031]; claims 1-15; figures 1-5 *	1-9	F25B5/04 F25B41/06 F25B41/04
X	PATENT ABSTRACTS OF JAPAN vol. 2002, no. 11, 6 November 2002 (2002-11-06) -& JP 2002 213626 A (SAGINOMIYA SEISAKUSHO INC), 31 July 2002 (2002-07-31) * paragraph [0018] - paragraph [0051]; figures 1-7 *	1,2, 5-11,13	
P,X	EP 1 426 711 A (SAMSUNG ELECTRONICS CO., LTD) 9 June 2004 (2004-06-09) * paragraph [0011] - paragraph [0036]; figures 1-20 *	1-11	
X	WO 99/42771 A (MATSUSHITA REFRIGERATION COMPANY; YAMADA, HIROSHI; HAMANO, HIROKI; HYO) 26 August 1999 (1999-08-26) * page 10, line 16 - page 34, line 15; figures 1-11 *	1,2,4-9	TECHNICAL FIELDS SEARCHED (Int.Cl.7) F25B F25D
A	EP 1 233 219 A (KABUSHIKI KAISHA SAGINOMIYASEISAKUSHO) 21 August 2002 (2002-08-21) * paragraph [0011] - paragraph [0069]; figures 1-12 *	12	

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
Munich	30 September 2005	Szilagyi, B

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

EPO FORM 1503 03.82 (P04C01)

ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO. EP 04 10 3085

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.

30-09-2005

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
EP 1394481 A	03-03-2004	CN 1479064 A	03-03-2004
		US 2004040341 A1	04-03-2004
JP 2002213626 A	31-07-2002	NONE	
EP 1426711 A	09-06-2004	CN 1504704 A	16-06-2004
		US 2004107727 A1	10-06-2004
WO 9942771 A	26-08-1999	AU 742491 B2	03-01-2002
		AU 2546999 A	06-09-1999
		CN 1291276 A	11-04-2001
		HK 1036101 A1	21-01-2005
		JP 3576103 B2	13-10-2004
		JP 2002504662 T	12-02-2002
		TW 418309 B	11-01-2001
		US 6497113 B1	24-12-2002
EP 1233219 A	21-08-2002	CN 1388876 A	01-01-2003
		WO 0214724 A1	21-02-2002
		JP 2002122366 A	26-04-2002
		US 2002148241 A1	17-10-2002

EPO FORM P0459

For more details about this annex : see Official Journal of the European Patent Office, No. 12/82