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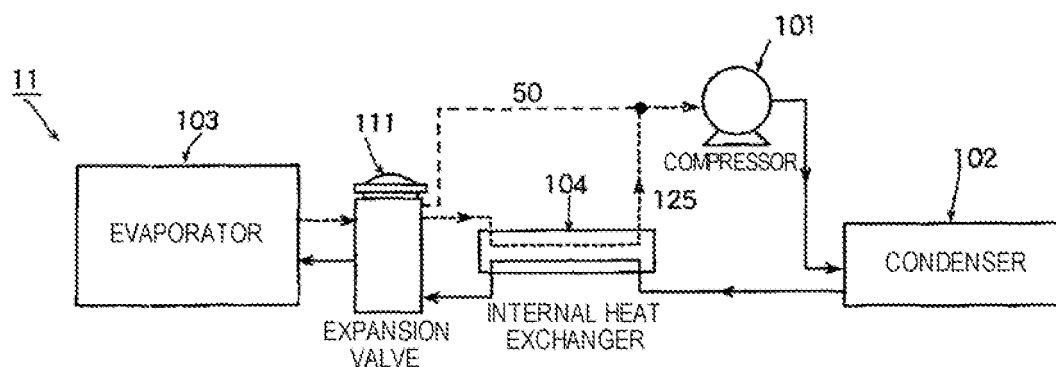
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(54) **Refrigerating Cycle**

(57) A refrigerating cycle capable of certainly and effectively suppressing an excessive increase of refrigerant temperature at a suction side of a compressor without complicating a piping system and a structure of an expansion valve is provided. A refrigerant cycle includes a compressor 101, a condenser 102, an evaporator 103, an internal heat exchanger 104, and an expansion valve 111. In the internal heat exchanger 104, a heat exchange is carried out between a high-temperature refrigerant introduced from the condenser 102 to the expansion valve 111 and a low-temperature refrigerant introduced from

the evaporator 103 to the suction side of the compressor 101. In order to detect temperature and/or pressure of a low-temperature refrigerant introduced toward the suction side of the compressor 101 after carrying out the heat exchange in the internal heat exchanger 104, a temperature-sensitive cylinder 70 and/or an external pressure introduction pipe 50 are additionally provided at the expansion valve 111. In the expansion valve 111, a flowing rate of a refrigerant introduced to the evaporator 103 is adjusted responding to temperature and/or pressure of a low-temperature refrigerant after the heat exchange.

**FIG. 1(A)**





## EUROPEAN SEARCH REPORT

Application Number  
EP 09 17 5357

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	US 6 460 358 B1 (HEBERT THOMAS H [US]) 8 October 2002 (2002-10-08) * column 6, lines 10-37; claim 1; figure 2 *	1-3	INV. F25B41/06 F25B40/00
X	JP 2000 356419 A (JAPAN CLIMATE SYSTEMS CORP) 26 December 2000 (2000-12-26) * paragraphs [0014], [0027] - [0031]; figures 1,7 *	1-3	
A	JP H06 241580 A (NIPPON DENSO CO) 30 August 1994 (1994-08-30) * the whole document *	1-3	
A	US 2007/074538 A1 (KURATA SYUN [JP] ET AL) 5 April 2007 (2007-04-05) * figures 1,3 *	1-3	
			TECHNICAL FIELDS SEARCHED (IPC)
			F25B
The present search report has been drawn up for all claims			
Place of search		Date of completion of the search	Examiner
The Hague		11 December 2013	Léandre, Arnaud
<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 ..... &amp; : member of the same patent family, corresponding document</p>			

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EPO FORM 1503 03.82 (P04C01)

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

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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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11-12-2013

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
US 6460358	B1	08-10-2002	NONE	
JP 2000356419	A	26-12-2000	JP 4323619 B2 JP 2000356419 A	02-09-2009 26-12-2000
JP H06241580	A	30-08-1994	NONE	
US 2007074538	A1	05-04-2007	DE 102006041612 A1 JP 4246189 B2 JP 2007071461 A US 2007074538 A1	22-07-2010 02-04-2009 22-03-2007 05-04-2007