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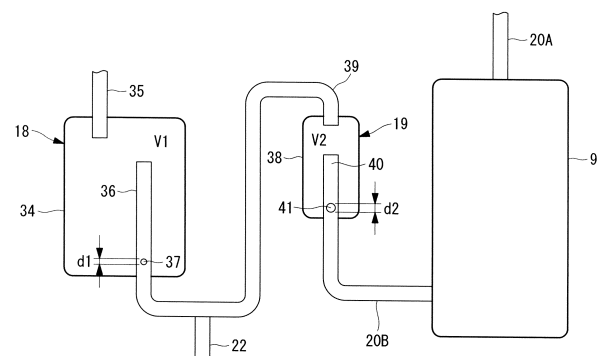
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(54) **Refrigerant circuit system**

(57) It is an object of the present invention to provide a refrigerant circuit system in which the volume of a plurality of accumulators provided in series and the size of an oil return hole are appropriately set so as to achieve both the prevention of liquid backflow and the prevention of oil discharge from a compressor caused by deteriorated oil return. The refrigerant circuit system includes: a compressor 9 having a refrigerant suction pipe 20B; a first accumulator 18; and a second accumulator 19, the first accumulator 18 and the second accumulator 19 being provided in series inside the refrigerant suction pipe 20B of the compressor 9 along a refrigerant circulation direction, wherein the first accumulator 18 and the second accumulator 19 are adapted to satisfy $V1 > V2$ where $V1$ is a volume of the first accumulator 18 and $V2$ is a volume of the second accumulator 19, and wherein the first accumulator 18 and the second accumulator 19 are also adapted to satisfy $A1 < A2$ where $A1$ is an opening area of a first oil return hole 37 provided in a refrigerant exit pipe 36 of the first accumulator 18 and $A2$ is an opening area of a second oil return hole 41 provided in a refrigerant exit pipe 40 of the second accumulator 19.

FIG. 2





EUROPEAN SEARCH REPORT

 Application Number
 EP 12 18 2123

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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)
Y,D	JP 2011 047545 A (PANASONIC CORP) 10 March 2011 (2011-03-10)	1,2,5	INV. F25B43/00 F25B31/00
A	* the whole document * -----	3,4	
Y	JP S61 27074 U (N.N.) 18 February 1986 (1986-02-18) * figure 1 *	1,2,5	
A	JP H02 298770 A (DAIKIN IND LTD) 11 December 1990 (1990-12-11) * abstract; figure 1 *	1	
A	JP S61 128075 A (TOSHIBA CORP) 16 June 1986 (1986-06-16) * figure 2 *	1	
A	EP 0 339 267 A2 (MITSUBISHI ELECTRIC CORP [JP]) 2 November 1989 (1989-11-02) * the whole document * -----	1	
			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		15 March 2017	de Graaf, Jan Douwe
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			

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 EPO FORM 1503 03/82 (P04C01)

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

EP 12 18 2123

5 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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15-03-2017

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
JP 2011047545 A	10-03-2011	NONE	
JP S6127074 U	18-02-1986	JP H0248780 Y2 JP S6127074 U	20-12-1990 18-02-1986
JP H02298770 A	11-12-1990	NONE	
JP S61128075 A	16-06-1986	NONE	
EP 0339267 A2	02-11-1989	DE 68907634 D1 DE 68907634 T2 EP 0339267 A2 ES 2043925 T3 US 4912937 A	26-08-1993 17-02-1994 02-11-1989 01-01-1994 03-04-1990