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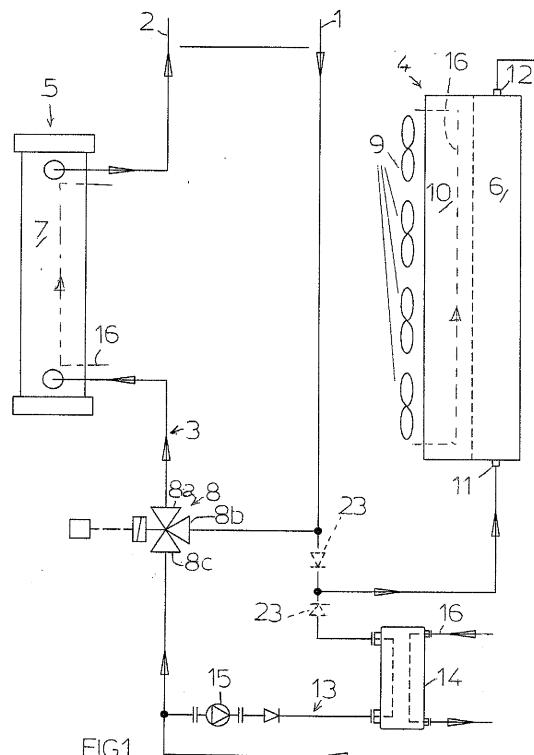
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(54) System for the refrigeration of a liquid and method for controlling said system

(57) A system for the refrigeration of a liquid suitable for circulating between at least one inlet (1) and at least one outlet (2) of a primary liquid cooling circuit (3), comprises at least a first air-cooled refrigeration unit (4) having at least a first air-cooled cooling coil (6) inserted on the primary liquid cooling circuit (3), at least a second refrigeration unit (5) with a cooling cycle having at least one evaporator (7) inserted on the primary liquid cooling circuit (3) in cascade with the first air-cooled cooling coil (6), means for shutting off the first air-cooled cooling coil (6) from the primary liquid cooling circuit (3), forced air ventilation means suitable for acting on at least the first air-cooled cooling coil (6) and on at least a second air-cooled cooling coil (10) provided for at least one condenser of the second refrigeration unit (5) for condensing the refrigerant fluid operating in the cooling cycle, there being further provided a secondary liquid circuit (13) on which at least the first air-cooled cooling coil (6) and at least one secondary exchanger (14) for subcooling the refrigerant fluid leaving the second air-cooled cooling coil are inserted.





EUROPEAN SEARCH REPORT

Application Number
EP 12 17 1665

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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)
X	EP 2 233 863 A2 (JOHNSON CONTROLS TECHNOLOGY C [US]) 29 September 2010 (2010-09-29) * paragraphs [0005], [0006]; figure 8 * * paragraphs [0022], [0023], [0027] * * paragraph [0033] - paragraph [0035] * * paragraph [0046] * -----	1-4,6,7, 11-14	INV. F25B25/00 F25D16/00 F25B41/00
A	EP 1 134 523 A1 (RC GROUP S P A [IT]) 19 September 2001 (2001-09-19) * paragraph [0002] - paragraph [0014]; figures 1,3 *	1-4,6,7, 11-14	
A	GB 2 218 499 A (MITSUBISHI ELECTRIC CORP [JP]) 15 November 1989 (1989-11-15) * page 3 - page 7; figure 2 *	1-4,6,7, 11-14	
			TECHNICAL FIELDS SEARCHED (IPC)
			F25B F25D
The present search report has been drawn up for all claims			
1	Place of search Munich	Date of completion of the search 15 January 2015	Examiner Gasper, Ralf
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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CLAIMS INCURRING FEES

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The present European patent application comprised at the time of filing claims for which payment was due.

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- Only part of the claims have been paid within the prescribed time limit. The present European search report has been drawn up for those claims for which no payment was due and for those claims for which claims fees have been paid, namely claim(s):
- No claims fees have been paid within the prescribed time limit. The present European search report has been drawn up for those claims for which no payment was due.

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LACK OF UNITY OF INVENTION

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The Search Division considers that the present European patent application does not comply with the requirements of unity of invention and relates to several inventions or groups of inventions, namely:

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see sheet B

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- All further search fees have been paid within the fixed time limit. The present European search report has been drawn up for all claims.
- As all searchable claims could be searched without effort justifying an additional fee, the Search Division did not invite payment of any additional fee.
- Only part of the further search fees have been paid within the fixed time limit. The present European search report has been drawn up for those parts of the European patent application which relate to the inventions in respect of which search fees have been paid, namely claims:

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- None of the further search fees have been paid within the fixed time limit. The present European search report has been drawn up for those parts of the European patent application which relate to the invention first mentioned in the claims, namely claims:

"see additional sheet(s)"

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- The present supplementary European search report has been drawn up for those parts of the European patent application which relate to the invention first mentioned in the claims (Rule 164 (1) EPC).



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LACK OF UNITY OF INVENTION
SHEET B

Application Number

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The Search Division considers that the present European patent application does not comply with the requirements of unity of invention and relates to several inventions or groups of inventions, namely:

10 1. claims: 1-4, 6, 7, 11-14

directed to the arrangement of a refrigeration system and a method to operate it

15 2. claims: 1, 5, 8-10

directed to the design of heat exchangers

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

10 15-01-2015

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Patent document cited in search report		Publication date		Patent family member(s)		Publication date
EP 2233863	A2	29-09-2010	EP	2233863 A2		29-09-2010
			US	2010242532 A1		30-09-2010
<hr/>						
EP 1134523	A1	19-09-2001	AT	270422 T		15-07-2004
			DE	60104034 D1		05-08-2004
			DE	60104034 T2		18-08-2005
			DK	1134523 T3		08-11-2004
			EP	1134523 A1		19-09-2001
			ES	2223656 T3		01-03-2005
			IT	MI20000543 A1		17-09-2001
			US	2003188543 A1		09-10-2003
<hr/>						
GB 2218499	A	15-11-1989	DE	3907859 A1		23-11-1989
			GB	2218499 A		15-11-1989
			JP	H01285725 A		16-11-1989
			US	4932221 A		12-06-1990
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