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(54) **REFRIGERANT HEAT EXCHANGER WITH INTEGRAL MULTIPASS AND FLOW DISTRIBUTION TECHNOLOGY**

(57) A microtube heat exchanger for cooling or heating fluid of a heat exchange system, the microtube heat exchanger comprising a tube stack comprising a plurality of microtubes extending between a first end and a second end. The microtube heat exchanger also comprises a first header including a first header surface provided at the first end of the tube stack, and wherein the first header is configured to provide a refrigerant fluid to the tube stack in a first direction; and a second header including a second header surface provided at

the second end of the tube stack, and wherein the second header is configured to provide the refrigerant fluid to the tube stack in a second direction. The first header surface comprises a first surface, a second surface larger than the first surface, and a third surface larger than the second surface, wherein the second surface is at least 25% larger than the first surface, and wherein the third surface is at least 15% larger than the second surface.

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EUROPEAN SEARCH REPORT

Application Number

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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)
A	US 2018/073809 A1 (SEO KANG TAE [KR] ET AL) 15 March 2018 (2018-03-15) * the whole document *	1-15	INV. F28F9/02
A	US 2012/199327 A1 (GAISER GERD [DE]) 9 August 2012 (2012-08-09) * the whole document *	1-15	
A	EP 0 284 463 A1 (VALEO CHAUSSON THERMIQUE [FR]) 28 September 1988 (1988-09-28) * the whole document *	1-15	
			TECHNICAL FIELDS SEARCHED (IPC)
			F25B F28F F28D
The present search report has been drawn up for all claims			
Place of search		Date of completion of the search	Examiner
Munich		14 September 2026	Mellado Ramirez, J
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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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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Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 2018073809 A1	15-03-2018	CN 107816824 A	20-03-2018
		KR 20180029730 A	21-03-2018
		US 2018073809 A1	15-03-2018

US 2012199327 A1	09-08-2012	DE 102011003609 A1	09-08-2012
		EP 2485007 A2	08-08-2012
		JP 2012163324 A	30-08-2012
		US 2012199327 A1	09-08-2012

EP 0284463 A1	28-09-1988	EP 0284463 A1	28-09-1988
		FR 2611881 A1	09-09-1988

EPO FORM P0459

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