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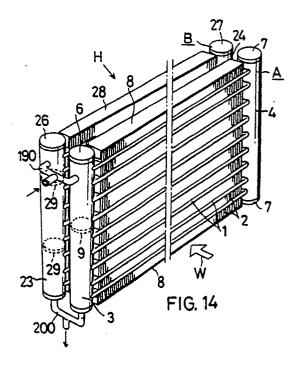
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- (54) Duplex heat exchanger.
- © A duplex heat exchanger comprises unit heat exchangers (A, B) which have a plurality of tubes (1, 21) arranged parallel with each other and comprise fins (2, 22) each interposed between two adjacent ones of such tubes, opposite ends of each tube being connected to a pair of headers (3, 4 and 23, 24) in fluid connection therewith. The unit heat exchangers are closely juxtaposed to each other fore and aft in a direction of air flow. Coolant circuits of the unit heat exchangers are connected either in series or in parallel with each other.





## EUROPEAN SEARCH REPORT

EP 90 30 8921

DOCUMENTS CONSIDERED TO BE RELEVANT					
Category		n indication, where appropriate, ant passages		elevant claim	CLASSIFICATION OF THE APPLICATION (Int. CI.5)
D,Y	JP-A-6 334 466 (SHOWA) * Whole document *		i	3,10, ,13	F 28 D 1/04 F 28 D 1/053
Y	US-A-4 190 105 (DANKOWWSKI)  * Whole document *		1-6	3	F 28 F 9/00
Υ	US-A-3 229 760 (HURTER * Whole document *	)	1,1	0,11,	
Α	DE-A-2 423 440 (BEHR) * Whole document *	· <del></del>	12		
Α	US-A-4 531 574 (HOCH) * Whole document *	- <del></del>	7,8	)	
E	EP-A-0 401 752 (THERMA * Whole document *	L-WERKE)	1,2	2	
		. <b></b>			TECHNICAL FIELDS
					SEARCHED (Int. CI.5)
					F 28 D F 28 F
	The present search report has t	peen drawn up for all claims			
		Date of completion o	f search		Examiner
		20 February	20 February 91		SMETS E.D.C.
CATEGORY OF CITED DOCUMENTS  X: particularly relevant if taken alone Y: particularly relevant if combined with another document of the same catagory  A: technological background			E: earlier patent document, but published on, or after the filing date     D: document cited in the application     L: document cited for other reasons		
0: P:	non-written disclosure intermediate document theory or principle underlying the in	vention	&: member o		e patent family, corresponding