(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) EP 0 709 641 A3

(12) EUROPEAN PATENT APPLICATION

(88) Date of publication A3:
18.06.1997 Bulletin 1997/25

(43) Date of publication A2:
01.05.1996 Bulletin 1996/18

(21) Application number: **95117043.0**

(22) Date of filing: **30.10.1995**

(51) Int. Cl.[6]: **F28F 1/32**, F28F 1/02, B21D 53/08

(84) Designated Contracting States:
DE ES FR GB IT SE

(30) Priority: **31.10.1994 IT TO940872**

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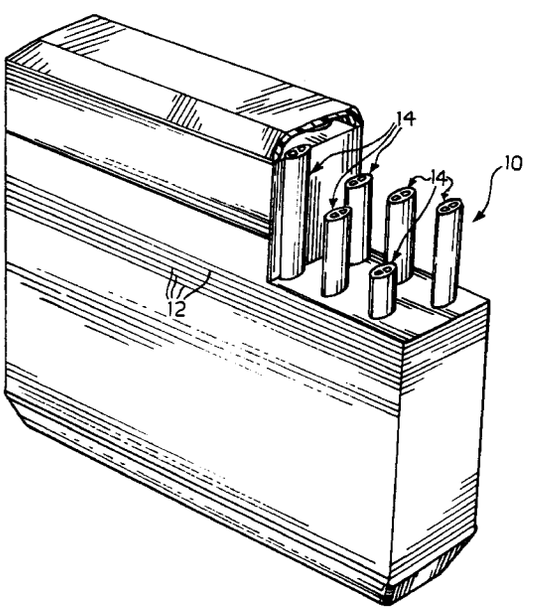
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(54) Heat exchanger for vehicles and method for the assembly of a heat exchange matrix

(57) A heat exchanger for vehicles, in particular a condenser for air-conditioning units. The exchanger comprises a stack of substantially flat fins (12) and a plurality of tubes (14) fixed to the fins (12) by means of mechanical expansion. Each tube (14) has an oblong transverse section and a stiffening septum (18) which extends along the minor axis of the transverse section of the tube (14) and which is formed integrally with the wall of the tube (14).

FIG. 1



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EUROPEAN SEARCH REPORT

Application Number
EP 95 11 7043

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.6)
X	EP 0 176 729 A (PIETZCKER) * page 5, line 6 - page 7, line 13 * * page 9, line 18 - page 12, line 12; figures 1-9 *	1-4	F28F1/32 F28F1/02 B21D53/08
A	PATENT ABSTRACTS OF JAPAN vol. 15, no. 61 (M-1081), 13 February 1991 & JP 02 290666 A (TOYO RADIATOR CO LTD), 30 November 1990, * abstract *	1-4	
A	DE 93 15 296 U (AUTOKÜHLER GMBH & CO KG) * the whole document *	1-4	
A	EP 0 389 970 A (AUTOKÜHLER GMBH & CO KG) * the whole document *	1-4	
A	GB 2 003 762 A (S.A. FRANÇAISE DU FERODO) * the whole document *	1-4	
A	EP 0 538 846 A (BORLETTI CLIMATIZZAZIONE SRL) * the whole document *	1-4	TECHNICAL FIELDS SEARCHED (Int.Cl.6) F28F B21D
A	US 4 570 317 A (VELING ET AL) * the whole document *	1-4	
A	PATENT ABSTRACTS OF JAPAN vol. 11, no. 128 (M-583), 22 April 1987 & JP 61 268985 A (MATSUSHITA REFRIG CO), 28 November 1986, * abstract *	1-4	
A	US 3 603 384 A (HUGGINS) * the whole document *	1-4	
P,A	DE 43 32 768 A (BEHR GMBH & CO KG) * the whole document *	1-4	

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
THE HAGUE	29 April 1997	Beltzung, F

CATEGORY OF CITED DOCUMENTS

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EPO FORM 1503 03.82 (P04C01)