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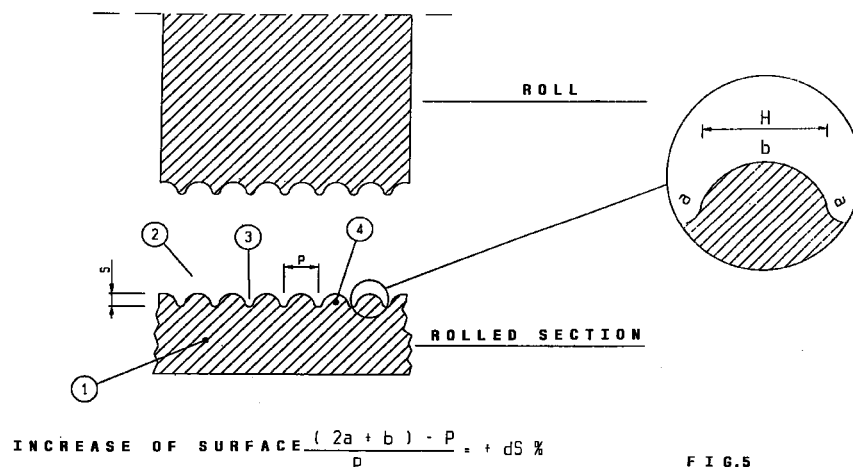
(54) **Rolled section for the realization of heat exchangers and relevant production method**

(57) A rolled section (1) for the production of heat exchangers, and in particular for the production of micro-fins (4) to be used in this kind of apparatus, that presents on one or both sides a series of scoring suitable to determine the same number of micro-fins (4) so as to increase the width of the corresponding exchange surface between rolled section and fluid. The process for the production of rolled sections is including the steps of:

- rolling a metallic sheet to obtain the required thick-

ness

- rolling afterwards the sheet obtained in this way by means of a rolling-mill where at least one of these rolls presents on the surface a series of engraving suitable to engrave the corresponding surface of the rolled section in order to produce said micro-fins, the surface of said roll of the second rolling-mill being worked by means of photogravure techniques.



EP 0 819 908 A3



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# EUROPEAN SEARCH REPORT

Application Number  
EP 97 11 1302

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)
Y	EP 0 603 108 A (CARRIER CORP) 22 June 1994 * column 3, line 29 - column 5, line 6; figures 1-7 *	1,2,4-7	F28F1/10 B21D53/04
Y	EP 0 489 964 A (ALUMINUM CO OF AMERICA) 17 June 1992	1,2,4-7	
A	* column 5, line 52 - column 7, line 51; figures *	3	
A	EP 0 037 854 A (KABEL METALLWERKE GH) 21 October 1981 * page 2, last paragraph - page 5; figures *	1,7	
A	FR 2 539 499 A (DEGROLARD RAYMOND) 20 July 1984 * the whole document *	1,7	
A	US 3 885 622 A (MCLAIN CHARLES D) 27 May 1975 * column 3, line 7 - column 7, line 54; figures 1-4 *	1,7	TECHNICAL FIELDS SEARCHED (Int.Cl.6)
P,X	EP 0 733 871 A (KM EUROPA METAL AG) 25 September 1996 * column 4, line 19 - column 6, line 28; figures *	1,2,4-8	F28F B21B
E	DE 196 36 367 A (EMITEC EMISSIONSTECHNIK) 12 March 1998 * column 1, paragraph 2 * * column 4, paragraph 2; figure 2 *	1,2,4,5, 7	
The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 19 April 1999	Examiner Van Dooren, M
CATEGORY OF CITED DOCUMENTS		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	
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			

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

EP 97 11 1302

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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19-04-1999

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
EP 0603108 A	22-06-1994	US 5332034 A	26-07-1994
		BR 9305053 A	21-06-1994
		CA 2110622 A,C	17-06-1994
		CN 1094157 A	26-10-1994
		DE 69302668 D	20-06-1996
		DE 69302668 T	26-09-1996
		ES 2087695 T	16-07-1996
		JP 2534450 B	18-09-1996
		JP 6221788 A	12-08-1994
		KR 124811 B	23-12-1997
		MX 9308036 A	30-06-1994
EP 0489964 A	17-06-1992	CA 2028711 A,C	30-04-1992
		JP 1895484 C	26-12-1994
		JP 4167906 A	16-06-1992
		JP 6013125 B	23-02-1994
		US 4996113 A	26-02-1991
		AU 620740 A	20-02-1992
		AU 6573390 A	20-02-1992
		DE 69016666 D	16-03-1995
		DE 69016666 T	24-08-1991
EP 0037854 A	21-10-1981	DE 3010450 A	24-09-1981
FR 2539499 A	20-07-1984	NONE	
US 3885622 A	27-05-1975	US 3918626 A	11-11-1975
		US 3858785 A	07-01-1975
		US 3861462 A	21-01-1975
EP 0733871 A	25-09-1996	DE 19510124 A	26-09-1996
		JP 8327273 A	13-12-1996
		US 5682946 A	04-11-1997
DE 19636367 A	12-03-1998	AU 4617197 A	26-03-1998
		WO 9809745 A	12-03-1998