



(12) **EUROPEAN PATENT APPLICATION**

(88) Date of publication A3:
06.11.2013 Bulletin 2013/45

(51) Int Cl.:
F28D 9/00 ^(2006.01) **F24H 1/38** ^(2006.01)
F28D 9/04 ^(2006.01)

(43) Date of publication A2:
30.11.2005 Bulletin 2005/48

(21) Application number: **05010819.0**

(22) Date of filing: **19.05.2005**

(84) Designated Contracting States:
AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HU IE IS IT LI LT LU MC NL PL PT RO SE SI SK TR
Designated Extension States:
AL BA HR LV MK YU

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(30) Priority: **25.05.2004 IT MO20040132**

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(54) **Combustion apparatus**

(57) A heat-exchanger element (1; 20) suitable for enabling the circulation within it of a heat-exchanging fluid, said heat-exchanger element (1; 20) being provided

with at least an inlet (7; 8) and with at least an outlet (7; 8) for said fluid, inside said heat-exchanger element (1; 20) a path (5; 19; 22) is defined for the circulation of said fluid.

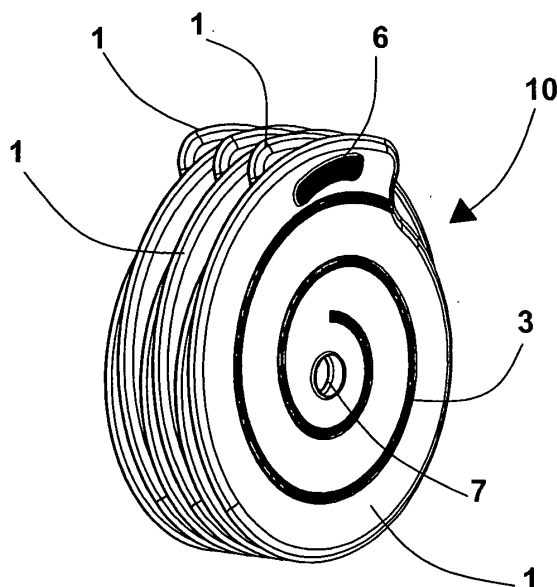


Fig. 8



EUROPEAN SEARCH REPORT

Application Number
EP 05 01 0819

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	FR 2 339 151 A1 (OSTBO JOHN DAVID [SE]) 19 August 1977 (1977-08-19) * page 2, line 11 - page 3, line 21; figures 1,2,3 *	1-3	INV. F28D9/00 F24H1/38 F28D9/04
X	US 3 848 665 A (UERLICHES J ET AL) 19 November 1974 (1974-11-19) * column 2, line 55 - column 3, line 19; figures 1-3 *	1,2,4,5	
X	FR 2 323 119 A1 (PARCA NORRAHAMMAR AB [SE]) 1 April 1977 (1977-04-01) * page 2, line 34 - page 4, line 17; figures 2,3 *	1-3, 6-15,21	
X	GB 487 840 A (AHLBORN E AG) 24 June 1938 (1938-06-24) * page 2, line 107 - page 3, line 31; figures 1-4 *	1,2,18	
X	EP 0 430 752 A1 (VALEO ENGINE COOLING INC [US] LONG MFG LTD [CA]) 5 June 1991 (1991-06-05) * column 8, line 30 - line 41; figures 1-7 *	1,15,16, 19,20,22	TECHNICAL FIELDS SEARCHED (IPC) F24H F28D F28F
X	GB 153 728 A (ANGUS MCDONALD LOTT; WILLIAM DAVID GIFFIN) 18 November 1920 (1920-11-18) * page 3, line 100 - page 4, line 39; figures 1-5 *	1,23-25	
X	GB 424 580 A (STONE J & CO LTD; FREDERIC JOHN PIKE) 25 February 1935 (1935-02-25) * page 5, line 9 - line 86; figures 1,2,4 *	1-3	
The present search report has been drawn up for all claims			
Place of search The Hague		Date of completion of the search 26 September 2013	Examiner Delval, Stéphane
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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EPO FORM 1503.03.82 (P04C01)



EUROPEAN SEARCH REPORT

Application Number
EP 05 01 0819

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 2 129 300 A (BICHOWSKY FRANCIS R) 6 September 1938 (1938-09-06) * page 2, line 34 - line 46; figures 1,13 *	4	
X	----- CH 621 623 A5 (ESCHLER MAX PAUL) 13 February 1981 (1981-02-13) * figures 1-4 * -----	1-3	
The present search report has been drawn up for all claims			TECHNICAL FIELDS SEARCHED (IPC)
Place of search		Date of completion of the search	Examiner
The Hague		26 September 2013	Delval, Stéphane
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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EPO FORM 1503 03 82 (P04C01)

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

EP 05 01 0819

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26-09-2013

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
FR 2339151	A1	19-08-1977	AU 504029 B2	27-09-1979
			AU 2125277 A	20-07-1978
			BR 7700351 A	20-09-1977
			CA 1079263 A1	10-06-1980
			CH 600281 A5	15-06-1978
			CS 207380 B2	31-07-1981
			DD 128907 A5	14-12-1977
			DE 2701633 A1	28-07-1977
			DK 27377 A	23-07-1977
			FI 770043 A	23-07-1977
			FR 2339151 A1	19-08-1977
			GB 1558836 A	09-01-1980
			IT 1082381 B	21-05-1985
			JP S5290850 A	30-07-1977
			US 4285397 A	25-08-1981
			YU 16477 A	31-05-1982

US 3848665	A	19-11-1974	AU 473414 B2	24-06-1976
			AU 4231572 A	22-11-1973
			BE 782727 A1	16-08-1972
			CA 988710 A1	11-05-1976
			DE 2124303 A1	26-10-1972
			FR 2138035 A1	29-12-1972
			GB 1349817 A	10-04-1974
			IT 957713 B	20-10-1973
			JP S4744416 A	22-12-1972
			JP S4826253 B2	08-08-1973
			NL 7205612 A	21-11-1972
			SE 379844 B	20-10-1975
			US 3848665 A	19-11-1974

FR 2323119	A1	01-04-1977	CA 1048013 A1	06-02-1979
			DE 2639371 A1	10-03-1977
			DK 385176 A	03-03-1977
			FI 762505 A	03-03-1977
			FR 2323119 A1	01-04-1977
			JP S5248860 A	19-04-1977
			JP S6015875 B2	22-04-1985
			PL 118511 B1	31-10-1981
			SE 414829 B	18-08-1980
			SE 7509716 A	03-03-1977

GB 487840	A	24-06-1938	NONE	

EP 0430752	A1	05-06-1991	BR 9005827 A	24-09-1991
			CA 2030155 A1	18-05-1991

EPO FORM P0459

For more details about this annex : see Official Journal of the European Patent Office, No. 12/82

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

EP 05 01 0819

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.

26-09-2013

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
		DE 69004220 D1	02-12-1993
		DE 69004220 T2	10-03-1994
		EP 0430752 A1	05-06-1991
		JP H0648150 B2	22-06-1994
		JP H03213996 A	19-09-1991
		US 5203832 A	20-04-1993
		US 5343936 A	06-09-1994

GB 153728	A	18-11-1920	NONE

GB 424580	A	25-02-1935	NONE

US 2129300	A	06-09-1938	NONE

CH 621623	A5	13-02-1981	NONE
