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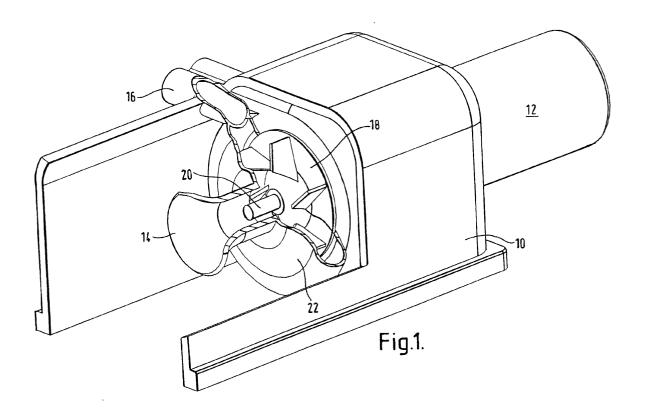
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(54) Improvements relating to the liquid cooled I.C. engines

(57) A liquid cooled internal combustion engine cooling system comprising a radiator 10, and an impeller 18 mounted on a drive shaft 20 and forming part of the radiator assembly. Preferably a compartment in the ra-

diator header tank is used as an impeller chamber and the chamber may be closed by a plate carrying a bearing and a seal for co-operation with the drive shaft from the drive motor 12.





EUROPEAN SEARCH REPORT

Application Number EP 98 30 9499

	DOCUMENTS CONSIDE		T 5 1	01 10015101555	
Category	Citation of document with ind of relevant passa		Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.5)	
X	DE 41 17 214 A (OPEL 3 December 1992 (199 * the whole document	1,2,4	F01P5/10		
X	EP 0 584 850 A (DSM 2 March 1994 (1994-0 * column 1, line 55 * column 3, line 24- * column 5, line 19	1,4-6,9, 14-16			
X	DE 196 15 511 A (WIL 23 October 1997 (199 * column 1, line 3 -		1,4		
X	US 5 660 149 A (KERS 26 August 1997 (1997 * abstract *	SHAW PETER A ET AL) '-08-26)	1		
A	US 4 645 432 A (TATA 24 February 1987 (19 * abstract *	3,12,13	TECHNICAL FIELDS SEARCHED (Int.Cl.6)		
Α	FR 2 720 783 A (VALE 8 December 1995 (199 * the whole document	5-9	F01P		
A	US 4 423 705 A (MATS 3 January 1984 (1984 * abstract *	SUURA MASAHIKO ET AL) 4-01-03)	10		
	The present search report has t	peen drawn up for all claims			
	Place of search	Date of completion of the search		Examiner	
X:pa Y:pa dc A:te O:nd P:in	MUNICH	23 June 2000	Sa	lentiny, G	
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		E : earlier patent of after the filing of	T: theory or principle underlying the invention E: earlier patent document, but published on, or after the filling date D: document ofted in the application L: document cited for other reasons 8: member of the same patent family, corresponding		

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

EP 98 30 9499

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.

23-06-2000

	atent document d in search repo	rt	Publication date	Patent family member(s)	Publication date
DE	4117214	Α	03-12-1992	NONE	
EP	0584850	Α	02-03-1994	NL 9201377 A JP 6185361 A US 5372098 A	16-02-199 05-07-199 13-12-199
DE	19615511	Α	23-10-1997	WO 9906232 A EP 0999943 A AU 4773397 A	11-02-199 17-05-200 22-02-199
US	5660149	A	26-08-1997	BR 9612209 A W0 9723713 A CN 1209187 A EP 0868597 A JP 2000502162 T US 6016774 A US 5970925 A US 5845612 A	21-09-199 03-07-199 24-02-199 07-10-199 22-02-200 25-01-200 26-10-199 08-12-199
US	4645432	A	24-02-1987	NONE	
FR	2720783	Α	08-12-1995	NONE	
US	4423705	Α	03-01-1984	JP 1515408 C JP 57159915 A JP 63067007 B JP 57159916 A	24-08-19 02-10-19 22-12-19 02-10-19

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