US009410473B2

(12) **United States Patent**
Cregut et al.

(10) **Patent No.: US 9,410,473 B2**
(45) **Date of Patent: Aug. 9, 2016**

(54) **MOTOR VEHICLE COOLING DEVICE**

(75) Inventors: **Samuel Cregut**, Saint-Remy-les-Chevreuse (FR); **Marco Marsilia**, Boulogne Billancourt (FR)

(73) Assignee: **RENAULT S.A.S.**, Boulogne Billancourt (FR)

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 1064 days.

(21) Appl. No.: **13/518,208**

(22) PCT Filed: **Oct. 14, 2010**

(86) PCT No.: **PCT/FR2010/052177**

§ 371 (c)(1), (2), (4) Date: **Sep. 28, 2012**

(87) PCT Pub. No.: **WO2011/077020**

PCT Pub. Date: **Jun. 30, 2011**

(65) **Prior Publication Data**

US 2013/0056194 A1 Mar. 7, 2013

(30) **Foreign Application Priority Data**

Dec. 22, 2009 (FR) 09 59398

(51) **Int. Cl.**

F01P 3/00	(2006.01)
F01P 7/16	(2006.01)
B60K 11/02	(2006.01)
B60K 1/00	(2006.01)
F01P 5/10	(2006.01)

(52) **U.S. Cl.**

CPC ***F01P 7/164*** (2013.01); ***B60K 11/02*** (2013.01); *B60K 2001/003* (2013.01); *B60K 2001/006* (2013.01); *F01P 2005/105* (2013.01)

(58) **Field of Classification Search**

CPC F01P 3/00; F01P 7/00; F01P 7/14; F01P 7/164; F01P 7/167; B60K 11/02

See application file for complete search history.

(56) **References Cited**

U.S. PATENT DOCUMENTS

5,390,632	A *	2/1995	Ikebe	F01P 7/164 123/41.02
5,529,114	A	6/1996	Hall et al.	
5,678,760	A	10/1997	Muso et al.	
6,607,142	B1	8/2003	Boggs et al.	
6,705,254	B1	3/2004	Grabowski et al.	
2009/0139686	A1	6/2009	Suzuki	
2010/0170455	A1 *	7/2010	Feldhaus	F01P 3/20 123/41.08

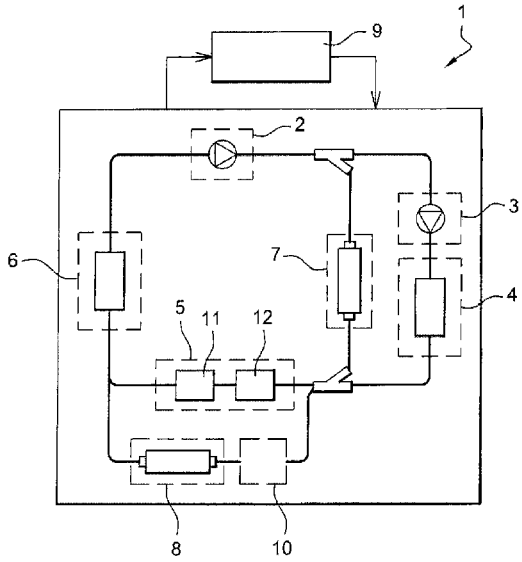
OTHER PUBLICATIONS

International Search Report Issued Feb. 8, 2011 in PCT/FR10/52177 Filed Oct. 14, 2010.

* cited by examiner

Primary Examiner — Lindsay Low
Assistant Examiner — Jacob Amick
(74) *Attorney, Agent, or Firm* — Oblon, McClelland, Maier & Neustadt, L.L.P.

(57) **ABSTRACT**

A cooling device for a motor vehicle, including a cooling circuit configured to cool an engine assembly using a liquid coolant circulated by at least one variable delivery pump, the delivery output by each pump being controlled by a control system. The control system is configured to regulate the delivery of each pump so that the temperature of the liquid coolant does not exceed a fixed datum temperature.

11 Claims, 10 Drawing Sheets