Title (en)

Boiling liquid cooling system for internal combustion engines.

Title (de)

Verdampfungskühleinrichtung für Brennkraftmaschinen.

Title (fr)

Système de refroidissement à ébullition pour un moteur à combustion interne.

Publication

EP 0041853 A1 19811216 (EN)

Application

EP 81302520 A 19810605

Priority

- US 15789280 A 19800609
- US 22871481 A 19810127
- US 26169581 A 19810508

Abstract (en)

A boiling liquid coolant system for a vehicular internal combustion engine (11) which operates at a virtually constant predetermined pressure and predetermined temperature having a condenser (13) which assures that all vaporized coolant is condensed under all engine operating conditions by matching the rate of condensation of vaporized coolant in the condenser to the rate vaporized coolant is generated by the engine and flows to the condenser during operation of the engine. In one embodiment, an electrically-driven fan (14) is actuated by a thermal or pressure sensitive switch (42) in the condenser (13) for assuring an adequate flow of ambient air across the condenser tubes during high ambient air temperature engine operating conditions, e.g. low speed, under load or stationary idle conditions of engine operation, and during the hot soak period after engine shutdown. Condensate may be returned to a gravity supply tank (12) by either an electric or an engine-driven pump (16), and a non-return flow valve (17) assures that vapor cannot flow from the separation tank of the system to the sump in the absence of the flow of liquid coolant from the sump to the separation tank. A pipe may connect the upper and lower parts of the engine cooling jacket through a pump for positive direct circulation, without heat loss, of liquid coolant in the jacket to shorten engine warm up time. Other features include a perforated inlet tube (40,41) extending into a vapor separator/condenser supply tank (12), a U-trap in the liquid coolant supply line, a combined pressure/vacuum relief vent valve, and a passenger compartment heater and oil temperature control integral with the separation tank.

IPC 1-7

F01P 3/22

IPC 8 full level

F01P 3/22 (2006.01); F01P 7/08 (2006.01)

CPC (source: EP)

F01P 3/2271 (2013.01); F01P 7/08 (2013.01); F01P 2025/52 (2013.01)

Citation (search report)

- US 3168080 A 19650202 - LATTERNER MICHAEL P, et al
- FR 973203 A 19510208 - CITROEN SA ANDRE
- US 3384304 A 19680521 - BARLOW LESTER P
- DE 753423 C 19520922 - DAIMLER BENZ AG
- US 2240065 A 19410429 - ARTHUR BERGER, et al
- GB 480461 A 19380223 - ROBERT WILLIAM HARVEY BAILEY
- US 1815240 A 19310721 - HENRY CLEGG WILLIAM
- US 1651157 A 19271129 - RUSHMORE SAMUEL W
- US 2804860 A 19570903 - TACCHELLA ADOLPH A, et al
- GB 255427 A 19271003 - ALEXANDRE LAMBLIN
- US 3286933 A 19661122 - SAVAGE HARRY A

Cited by

CN111963296A; US4450389A; CN102052137A; CN112324553A; EP0121182A1; US4554891A; GB2140911A; US4657180A; CN109899570A

Designated contracting state (EPC)

AT BE CH DE FR GB IT LI LU NL SE

DOCDB simple family (publication)

EP 0041853 A1 19811216; BR 8103591 A 19820302

DOCDB simple family (application)

EP 81302520 A 19810605; BR 8103591 A 19810605