

Title (en)

Integrated heat exchanger, more particularly for automotive vehicle

Title (de)

Integrierter Wärmetauscher, insbesondere für Kraftfahrzeug

Title (fr)

Echangeur de chaleur combiné, en particulier pour véhicule automobile

Publication

**EP 1003005 B1 20040310 (FR)**

Application

**EP 99122374 A 19991110**

Priority

FR 9814655 A 19981120

Abstract (en)

[origin: EP1003005A1] The combined motor vehicle oil and coolant heat exchanger comprises a tube bundle (10) connected to a manifold box (16,18). It is divided into a part (A) forming a gearbox oil cooler having tubes (12a) through which oil (H) passes and a part (B) forming a condenser with tubes (12b) through which a refrigerant flows. The same air flow cools both oil and refrigerant. The two sets of tubes have different hydraulic diameters (Dha,DHb) connected by the following inequality:  $0.8 \text{ mm} < 2 \leq Dha \times DHb \leq 3.00 \text{ mm} < 2$ . The hydraulic diameter of the oil cooler tubes is greater than the hydraulic diameter of the condenser tubes.

IPC 1-7

**F28D 1/04**

IPC 8 full level

**F25B 39/04** (2006.01); **F28D 1/04** (2006.01); **F28F 1/02** (2006.01); **F28F 13/00** (2006.01)

CPC (source: EP US)

**F25B 39/04** (2013.01 - EP US); **F28D 1/0443** (2013.01 - EP US); **F28D 1/05391** (2013.01 - EP US); **F28F 1/022** (2013.01 - EP US); **F28F 13/00** (2013.01 - EP US); **F25B 2500/01** (2013.01 - EP US); **F28D 2021/0084** (2013.01 - EP US); **F28D 2021/0089** (2013.01 - EP US); **F28F 2270/02** (2013.01 - EP US); **Y10S 165/916** (2013.01 - EP US)

Cited by

EP1816424A1; DE102006017434B4; EP2171387A4; US6883600B2; DE10158436A1; US7337832B2; US6904963B2; US7527087B2; WO2007014560A3; WO2008064247A1; WO2012059344A3; US8276651B2; US8196646B2; US8561681B2; US7059393B2; US6942023B2; US6793012B2; WO2011005986A3; WO03095918A3; EP1700077A1

Designated contracting state (EPC)

AT BE CH CY DE DK ES FI FR GB GR IE IT LI LU MC NL PT SE

DOCDB simple family (publication)

**EP 1003005 A1 20000524**; **EP 1003005 B1 20040310**; AT E261573 T1 20040315; BR 9905655 A 20000912; DE 69915431 D1 20040415; DE 69915431 T2 20040819; ES 2217672 T3 20041101; FR 2786259 A1 20000526; FR 2786259 B1 20010202; US 6394176 B1 20020528

DOCDB simple family (application)

**EP 99122374 A 19991110**; AT 99122374 T 19991110; BR 9905655 A 19991118; DE 69915431 T 19991110; ES 99122374 T 19991110; FR 9814655 A 19981120; US 44228199 A 19991119