

Title (en)

Heat exchanger with open profile as housing

Title (de)

Wärmetauscher mit offenem Profil als Gehäuse

Title (fr)

Echangeur de chaleur avec un profilé ouvert en tant que boîtier

Publication

EP 1657512 B2 20100616 (DE)

Application

EP 04026647 A 20041110

Priority

EP 04026647 A 20041110

Abstract (en)

[origin: EP1657512A1] The exchanger has a stack of flat tubes (10) for gas, where the tubes have wide and narrow sides and spaced to form channels for a coolant flow. A housing (30) encloses only a part of a periphery of the stack. Cross-sectional widenings (24) along a length of the tubes maintain the tubes in a spaced condition along the periphery not enclosed by the housing and close the channels along the periphery not enclosed by the housing.

IPC 8 full level

F28D 9/00 (2006.01); **F28D 7/16** (2006.01); **F28F 9/00** (2006.01)

CPC (source: EP US)

F28D 7/1684 (2013.01 - EP US); **F28D 9/0037** (2013.01 - EP US); **F28F 9/001** (2013.01 - EP US); **F28D 21/0003** (2013.01 - EP US); **F28F 2250/102** (2013.01 - EP)

Citation (opposition)

Opponent :

- JP 2000055585 A 20000225 - TOYO RADIATOR CO LTD
- DE 10302708 A1 20040729 - BEHR GMBH & CO KG [DE]
- DE 10302948 A1 20040805 - BEHR GMBH & CO KG [DE]
- DE 20118511 U1 20020214 - AUTOKUEHLER GMBH & CO KG [DE]
- US 6250380 B1 20010626 - STRAHLE ROLAND [DE], et al
- EP 1626238 A1 20060215 - MODINE MFG CO [US]
- DE 19927607 A1 20001221 - BEHR GMBH & CO [DE]
- DE 10214467 A1 20031009 - MODINE MFG CO [US]
- US 2003010479 A1 20030116 - HAYASHI TAKAYUKI [JP], et al
- DE 3815070 A1 19891123 - LAENGERER & REICH KUEHLER [DE]
- US 4183402 A 19800115 - COTTER RAY W [US]

Cited by

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Designated contracting state (EPC)

DE ES FR GB IT SE

DOCDB simple family (publication)

EP 1657512 A1 20060517; **EP 1657512 B1 20070328**; **EP 1657512 B2 20100616**; DE 502004003357 D1 20070510; ES 2285337 T3 20071116; ES 2285337 T5 20101004; US 2006096747 A1 20060511; US 7631688 B2 20091215

DOCDB simple family (application)

EP 04026647 A 20041110; DE 502004003357 T 20041110; ES 04026647 T 20041110; US 27220405 A 20051110