

Title (en)  
IMPROVEMENTS RELATING TO HEAT EXCHANGERS

Publication  
**EP 0099627 A3 19840606 (EN)**

Application  
**EP 83302977 A 19830524**

Priority  
GB 8220954 A 19820720

Abstract (en)  
[origin: EP0099627A2] A heat exchanger such as a vehicle radiator comprises a pair of tube plates 11, 12 between which flat tubes 13 extend, interspersed with corrugated fins forming airways 14. Header tanks are formed by attaching shells (not shown) to the tube plates. In production of the radiator, the tubes and airways are assembled, between clamping channels 17, as a separate item. To hold the matrix together, ties 16 hold the clamping channels together. The ties have end portions 17 which are bent laterally with respect to the axes of the ties, and which extend in different, preferably substantially opposite directions. Thus the ties can only be removed from the apertures in the channels by twisting the ties about their axes, and thus cannot jump out as a result of vibration.

IPC 1-7  
**F28F 9/02**; **F28D 1/02**

IPC 8 full level  
**F28D 1/053** (2006.01); **F28F 9/00** (2006.01)

CPC (source: EP)  
**F28D 1/05383** (2013.01); **F28F 9/001** (2013.01)

Citation (search report)  
• [A] DE 3045087 A1 19820701 - LAENGERER & REICH KUEHLER [DE]  
• [A] DE 1962466 A1 19700702 - FERODO SA

Cited by  
EP0635693A3

Designated contracting state (EPC)  
DE FR GB IT

DOCDB simple family (publication)  
**EP 0099627 A2 19840201**; **EP 0099627 A3 19840606**; **EP 0099627 B1 19860827**; DE 3365616 D1 19861002; GB 2123943 A 19840208; GB 2123943 B 19850807; JP S59122896 A 19840716

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**EP 83302977 A 19830524**; DE 3365616 T 19830524; GB 8220954 A 19820720; JP 13265083 A 19830720