

Title (en)  
HEATING ELEMENT FOR HEATING STREAMING, ESPECIALLY GASEOUS MEDIA

Publication  
**EP 0194507 B1 19890125 (DE)**

Application  
**EP 86102472 A 19860226**

Priority  
DE 3509204 A 19850314

Abstract (en)  
[origin: EP0194507A1] 1. Heating element for heating flowing, in particular gaseous media, in which a metal body (1) is used as a heat exchanger and is heated using lamelliform ceramic PTC resistors (7, 24) which are secured on part of the surface of the metal body using a thermally conductive and electrically insulating plastic adhesive (14) or using a thermally and electrically conductive plastic adhesive (13), characterized by the following features : a) the metal body (1) is composed of a metal of good thermal conductivity, in particular, aluminium or copper, and is provided with passage openings (2, 12, 22, 23, 29) arranged in regular fashion, the inside widths of which decrease, starting from the inlet side (3), for the purpose of providing favourable flow conditions and avoiding turbulences and, at the outlet side (4), correspond to no more than the inside width at the inlet side (3), b) the total volume of the parts of the metal body (1) between the passage openings (2, 12, 22, 23, 29) is equal to or greater than the total volume of the passage openings (2, 12, 22, 23, 29), c) the ceramic PTC resistors (7) are adhesively bonded to opposite parts of the outer surface of the metal body (1).

IPC 1-7  
**H05B 3/14**

IPC 8 full level  
**F24H 3/04** (2006.01); **H05B 3/14** (2006.01)

CPC (source: EP KR)  
**F28F 21/00** (2013.01 - KR); **H05B 3/14** (2013.01 - KR); **H05B 3/141** (2013.01 - EP)

Cited by  
CN108180631A; US5318757A; US5262619A; DE3936933A1; US5234668A; DE3816819A1; EP0465184A1; EP0452125A3; DE10017264A1; DE10017264C2; US5229079A; US5200154A; US5028763A; US5288975A; DE10118599A1; DE10118599B4; US4899032A; DE19711031A1; DE19711031B4; EP1783439A3; US5204066A; US5286460A; DE4013212A1; DE19846282A1; DE19846282B4; US5278940A; US5229080A; WO9107068A1

Designated contracting state (EPC)  
AT BE CH DE FR GB IT LI NL SE

DOCDB simple family (publication)  
**EP 0194507 A1 19860917**; **EP 0194507 B1 19890125**; AT E40502 T1 19890215; AU 5468086 A 19860918; BR 8601072 A 19861125; DE 3661978 D1 19890302; ES 553052 A0 19870116; ES 8703010 A1 19870116; JP H0613937 B2 19940223; JP S61213440 A 19860922; KR 860007529 A 19861013; KR 940007205 B1 19940808; ZA 861867 B 19861029

DOCDB simple family (application)  
**EP 86102472 A 19860226**; AT 86102472 T 19860226; AU 5468086 A 19860313; BR 8601072 A 19860313; DE 3661978 T 19860226; ES 553052 A 19860314; JP 5027786 A 19860307; KR 860001831 A 19860314; ZA 861867 A 19860313