

Title (en)  
Heat exchanger

Title (de)  
Wärmeübertrager

Title (fr)  
Caloporteur

Publication  
**EP 2190256 B1 20161102 (DE)**

Application  
**EP 09175647 A 20091111**

Priority  
• EP 08291088 A 20081120  
• EP 09175647 A 20091111

Abstract (en)  
[origin: EP2190256A1] A heat exchanger comprises a positive temperature coefficient (PTC) element (1), where the PTC heating element is electrically connected to conductors (20), particularly printed circuit boards (3,4) to direct electrical current. A heat conducting element (2) is provided for transferring heat from the PTC element to a fluid. An agent is also included for connecting the PTC element, conductors and two conductors to each other. An electrical insulating element (5a) is arranged between conductor and heat conducting elements. An independent claim is also included for a method for manufacturing heat exchanger, which includes providing PTC element, two electrical conductors, particularly printed circuit boards and heat conducting elements, where the two electrical conductors are connected with PTC element.

IPC 8 full level  
**H05B 3/50** (2006.01); **F24H 9/18** (2006.01)

CPC (source: EP)  
**F24H 3/0405** (2013.01); **F24H 3/0429** (2013.01); **F24H 3/0435** (2013.01); **F24H 3/0452** (2013.01); **F24H 3/0476** (2013.01); **F24H 3/082** (2013.01); **F24H 9/1872** (2013.01); **H05B 3/50** (2013.01); **H05B 2203/02** (2013.01)

Citation (opposition)  
Opponent : Eichenauer Heizelemente GmbH & Co. KG  
• EP 1768457 A1 20070328 - CATEM GMBH & CO KG [DE]  
• US 6178292 B1 20010123 - FUKUOKA MIKIO [JP], et al  
• EP 2023056 A1 20090211 - WU CHIA-HSIUNG [CN]  
• DE 8503272 U1 19850523  
• EP 1768459 B1 20080521 - CATEM GMBH & CO KG [DE]  
• DE 2804818 C2 19861211  
• DE 2804749 A1 19790809 - EICHENAUER FA FRITZ  
• EP 1515587 B1 20061213 - CATEM GMBH & CO KG [DE]  
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• US 5192853 A 19930309 - YEH YUAN-CHANG [TW]

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