

Title (en)  
HEAT EXCHANGER AND VEHICLE AIR CONDITIONING APPARATUS PROVIDED WITH THE SAME

Title (de)  
WÄRMETAUSCHER UND FAHRZEUGKLIMAANLAGENVORRICHTUNG DAMIT

Title (fr)  
ÉCHANGEUR DE CHALEUR ET APPAREIL CLIMATISEUR DE VÉHICULE LE COMPORTANT

Publication  
**EP 2489974 A4 20180411 (EN)**

Application  
**EP 10823153 A 20100817**

Priority  
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• JP 2010005089 W 20100817

Abstract (en)  
[origin: EP2489974A1] There is provided a heat exchanger 10 in which each of header tanks 20A and 20B is configured so that each of intermediate plates 60 and 90 is held between a header plate 40 and a tank plate 50. The intermediate plate 60, 90 functions as a reinforcing member, so that the strength of the header tank 20A, 20B is improved. The intermediate plate 60, 90 serving as a reinforcing element comprises bent parts 100 between the central portion and both the end portions in the width direction of the header tank 20A, 20B. By the elastic deformation of the bent parts 100, for example, the stresses developed in brazing of the header tank 20A, 20B, and the stresses at the time when a refrigerant pressure is applied can be prevented from concentrating in the joint portion of the header plate 40, the tank plate 50, and the intermediate plate 60, 90.

IPC 8 full level  
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Citation (search report)  
• [IY] US 2009236086 A1 20090924 - HIGASHIYAMA NAOHISA [JP], et al  
• [Y] US 2007131391 A1 20070614 - ICHIYANAGI SHIGE HARU [JP]  
• [A] US 2008296003 A1 20081204 - HIGASHIYAMA NAOHISA [JP]  
• [A] US 2008141706 A1 20080619 - TUCKER JEFFERY LEE [US], et al  
• See references of WO 2011045884A1

Cited by  
CN104019583A; CN104019582A; US11073345B2

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