

Title (en)

Triple-tube type heat exchanger and method of producing same

Title (de)

Wärmetauscher mit dreifachen Rohren und Verfahren zu dessen Herstellung

Title (fr)

Echangeur de chaleur à triple tubes et sa méthode de fabrication

Publication

EP 1388720 A3 20060913 (EN)

Application

EP 03018139 A 20030808

Priority

- JP 2002230780 A 20020808
- JP 2002230779 A 20020808

Abstract (en)

[origin: EP1388720A2] Outer (4), middle (3) and inner (2) tubes are arranged to define between the outer (4) and middle (3) tubes a first cylindrical space (20) and between the middle (3) and inner (2) tubes a second cylindrical space (11). The inner tube (2) has a third cylindrical space (12) defined therein. Radially depressed two portions (18) of the outer tube (4) are respectively mated with radially raised two portions (8) of the middle tube (3) so that openings (19) formed in the radially depressed two portions (8,18) are merged with openings formed in the radially raised two portions respectively. Inlet and outlet pipes (5,6) are inserted at their base ends into the merged openings (19) of the radially depressed and raised portions (8,18) to connect with the second cylindrical space (11), and the base ends (22) are caulked to peripheral edges of the merged openings. Diametrically reduced end portions of the middle tube (3) intimately contact and hold axially spaced end portions of the inner tube (2), so that the second cylindrical space has an isolated part which is defined between the diametrically reduced end portions and communicated with only the input and output pipes (5,6).

IPC 8 full level

F28D 7/10 (2006.01); **F02M 25/07** (2006.01); **F28F 1/40** (2006.01); **F28F 13/12** (2006.01)

CPC (source: EP)

F02M 26/32 (2016.02); **F28D 7/103** (2013.01); **F28F 1/40** (2013.01); **F28F 13/12** (2013.01); **F28D 21/0003** (2013.01); **F28F 2275/04** (2013.01);
F28F 2275/122 (2013.01)

Citation (search report)

- [YA] DE 3515830 A1 19861106 - GERCKEN KARL
- [A] FR 1162651 A 19580916 - MODINE MFG CO
- [A] US 3889746 A 19750617 - LAFFFRANCHI ERNEST
- [A] WO 0163197 A1 20010830 - YOO O T & C CORP LTD [KR], et al
- [A] US 2929408 A 19600322 - WEATHERWAX KENNETH A, et al
- [Y] PATENT ABSTRACTS OF JAPAN vol. 015, no. 081 (M - 1086) 25 February 1991 (1991-02-25)
- [A] PATENT ABSTRACTS OF JAPAN vol. 1996, no. 06 28 June 1996 (1996-06-28)
- [A] PATENT ABSTRACTS OF JAPAN vol. 1995, no. 01 28 February 1995 (1995-02-28)
- [A] PATENT ABSTRACTS OF JAPAN vol. 015, no. 182 (M - 1111) 10 May 1991 (1991-05-10)
- [A] PATENT ABSTRACTS OF JAPAN vol. 2000, no. 02 29 February 2000 (2000-02-29)

Cited by

CN102135382A; DE102006014188A1; GB2559182A; GB2559182B; EP1995542A3; CN104634813A; DE102012107908A1; DE102012107908B4; EP3133363A1; CN106401808A; US7478630B2; US10995998B2; EP1995542A2; US9394813B2; US11029095B2; JP2005249312A

Designated contracting state (EPC)

AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HU IE IT LI LU MC NL PT RO SE SI SK TR

DOCDB simple family (publication)

EP 1388720 A2 20040211; EP 1388720 A3 20060913; EP 1388720 B1 20120523

DOCDB simple family (application)

EP 03018139 A 20030808