

Title (en)  
HEAT EXCHANGER AND HEAT EXCHANGE UNIT

Title (de)  
WÄRMETAUSCHER UND WÄRMETAUSCHEINHEIT

Title (fr)  
ÉCHANGEUR DE CHALEUR ET UNITÉ D'ÉCHANGE DE CHALEUR

Publication  
**EP 3992564 B1 20230823 (EN)**

Application  
**EP 20836392 A 20200710**

Priority  
• JP 2019128402 A 20190710  
• JP 2020027038 W 20200710

Abstract (en)  
[origin: EP3992564A1] A heat exchanger (30) includes a plurality of heat transfer tubes (40) and a plurality of fins (45). Each of the fins (45) has a plurality of tube receiving openings (46). The tube receiving openings (46) of the fin (45) constitute an opening row (50). The lowermost one of the tube receiving openings (46) in the opening row (50) is the tube-free opening (47) in which no heat transfer tube (40) is inserted.

IPC 8 full level  
**F28D 1/053** (2006.01); **F24F 1/0067** (2019.01); **F24F 13/22** (2006.01); **F24F 13/30** (2006.01); **F28D 1/02** (2006.01); **F28D 1/047** (2006.01); **F28D 21/00** (2006.01); **F28F 1/02** (2006.01); **F28F 1/32** (2006.01); **F28F 9/02** (2006.01); **F28F 17/00** (2006.01); **F28F 19/00** (2006.01); **F28F 21/08** (2006.01); **F28F 27/02** (2006.01)

CPC (source: EP)  
**F24F 1/0067** (2019.01); **F28D 1/0471** (2013.01); **F28D 1/05333** (2013.01); **F28D 1/05341** (2013.01); **F28D 1/05366** (2013.01); **F28D 1/05391** (2013.01); **F28F 1/32** (2013.01); **F28F 17/005** (2013.01); **F28F 19/00** (2013.01); **F28D 2001/0273** (2013.01); **F28D 2021/0064** (2013.01); **F28F 2215/12** (2013.01); **F28F 2265/00** (2013.01); **F28F 2270/02** (2013.01)

Designated contracting state (EPC)  
AL AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO PL PT RO RS SE SI SK SM TR

DOCDB simple family (publication)  
**EP 3992564 A1 20220504**; **EP 3992564 A4 20220824**; **EP 3992564 B1 20230823**; CN 217635915 U 20221021; JP 2021014929 A 20210212; WO 2021006336 A1 20210114

DOCDB simple family (application)  
**EP 20836392 A 20200710**; CN 202090000706 U 20200710; JP 2019128402 A 20190710; JP 2020027038 W 20200710