

Title (en)  
HEAT EXCHANGER AND REFRIGERATION CYCLE DEVICE

Title (de)  
WÄRMETAUSCHER UND KÄLTEKREISLAUFVORRICHTUNG

Title (fr)  
ÉCHANGEUR DE CHALEUR ET DISPOSITIF À CYCLE DE RÉFRIGÉRATION

Publication  
**EP 4253896 A1 20231004 (EN)**

Application  
**EP 20963563 A 20201127**

Priority  
JP 2020044334 W 20201127

Abstract (en)  
A heat exchanger (HE) includes: a fin (F) extending in a widthwise direction (D1) along an air flow direction (D0) and extending in a longitudinal direction (D2) crossing the air flow direction (D0); and a heat transfer tube (P) passing through the fin (F). The fin (F) includes a planar portion (SP), and a plurality of first protruding portions (MP1) and a plurality of second protruding portions (MP2) that protrude from the planar portion (SP). The plurality of first protruding portions (MP1) include a first projection (C1) curved downward in the longitudinal direction (D2), and a second projection (C2) curved upward in the longitudinal direction (D2). Each of the plurality of second protruding portions (MP2) surrounds a corresponding one of the plurality of through holes (TH). A vertex of the first projection (C1) and a vertex of the second projection (C2) are located at the same position in the widthwise direction (D1).

IPC 8 full level  
**F28F 1/32** (2006.01)

CPC (source: EP US)  
**F28D 1/047** (2013.01 - EP); **F28F 1/32** (2013.01 - EP US); **F28F 17/005** (2013.01 - EP); **F28F 19/006** (2013.01 - EP); **F28D 1/0477** (2013.01 - EP); **F28D 2021/0068** (2013.01 - EP); **F28F 2215/10** (2013.01 - EP); **F28F 2225/06** (2013.01 - EP); **F28F 2265/26** (2013.01 - EP)

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

Designated extension state (EPC)  
BA ME

Designated validation state (EPC)  
KH MA MD TN

DOCDB simple family (publication)  
**EP 4253896 A1 20231004**; **EP 4253896 A4 20240117**; CN 116457625 A 20230718; JP WO2022113299 A1 20220602;  
US 2023358483 A1 20231109; WO 2022113299 A1 20220602

DOCDB simple family (application)  
**EP 20963563 A 20201127**; CN 202080107348 A 20201127; JP 2020044334 W 20201127; JP 2022564962 A 20201127;  
US 202018247236 A 20201127