

Title (en)  
HEAT EXCHANGER

Title (de)  
WÄRMETAUSCHER

Title (fr)  
ÉCHANGEUR DE CHALEUR

Publication  
**EP 3561430 A2 20191030 (EN)**

Application  
**EP 19169686 A 20190416**

Priority  
JP 2018083667 A 20180425

Abstract (en)  
[Problem to be Solved]In a condition in which frost formation is likely to occur as in a cold region or at midwinter, frost formation cannot be suppressed, and there are involved generation of air blockade, an increase in draft resistance, and a reduction in an amount of air passing through the heat exchanger, resulting in deterioration in heat exchange performance.[Solution]Front edge cutouts 18 are provided in a plate-like fin 11 including a flat portion 14, tube insertion cutouts 16, and collar portions 17, the front edge cutouts 18 extending from at least a part of airflow upstream side surfaces of flat tubes 12 inserted in the tube insertion cutouts 16 to the flat portion 14.

IPC 8 full level  
**F28F 1/02** (2006.01); **F28D 1/02** (2006.01); **F28D 1/053** (2006.01); **F28F 13/00** (2006.01)

CPC (source: CN EP)  
**F24F 13/22** (2013.01 - EP); **F28D 1/0535** (2013.01 - CN); **F28D 1/05383** (2013.01 - EP); **F28F 1/022** (2013.01 - CN); **F28F 1/325** (2013.01 - CN EP); **F28F 17/005** (2013.01 - EP); **F28D 2021/0068** (2013.01 - EP); **F28F 2215/08** (2013.01 - EP); **F28F 2215/12** (2013.01 - EP)

Citation (applicant)  
JP 2012233680 A 20121129 - MITSUBISHI ELECTRIC CORP

Cited by  
CN115127258A; WO2024080937A1

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

DOCDB simple family (publication)  
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DOCDB simple family (application)  
**EP 19169686 A 20190416**; CN 201910317247 A 20190419; JP 2018083667 A 20180425