

Title (en)  
HEAT EXCHANGER AND AIR CONDITIONER

Title (de)  
WÄRMETAUSCHER UND KLIMAANLAGE

Title (fr)  
ÉCHANGEUR DE CHALEUR ET CONDITIONNEUR D'AIR

Publication  
**EP 4155652 A4 20230621 (EN)**

Application  
**EP 20937082 A 20200522**

Priority  
JP 2020020357 W 20200522

Abstract (en)  
[origin: EP4155652A1] A heat exchanger includes a plurality of flat tubes in which refrigerant flows and a plurality of fins provided between the plurality of flat tubes and configured to transfer heat of refrigerant flowing in the plurality of flat tubes. An upstream end portion of each of the plurality of flat tubes in an air flow direction is located at the same position as an upstream end portion of each of the plurality of fins or protrudes farther than the upstream end portion of each of the plurality of fins, and an opening port is formed at the upstream end portion of each of the plurality of flat tubes or at the upstream end portion of each of the plurality of fins.

IPC 8 full level  
**F28F 1/32** (2006.01); **F28D 1/053** (2006.01); **F28F 1/02** (2006.01)

CPC (source: EP US)  
**F28D 1/05383** (2013.01 - EP); **F28D 7/1653** (2013.01 - US); **F28F 1/025** (2013.01 - EP); **F28F 1/04** (2013.01 - US); **F28F 1/128** (2013.01 - EP); **F28F 1/325** (2013.01 - EP); **F28F 9/02** (2013.01 - US); **F28F 17/005** (2013.01 - EP); **F28D 2021/0068** (2013.01 - EP); **F28F 2225/04** (2013.01 - EP); **F28F 2250/02** (2013.01 - EP); **F28F 2265/02** (2013.01 - EP)

Citation (search report)

- [X] JP 2018009743 A 20180118 - HITACHI JOHNSON CONTROLS AIR CONDITIONING INC
- [X] WO 2017221303 A1 20171228 - MITSUBISHI ELECTRIC CORP [JP]
- [X] JP 2019128060 A 20190801 - DAIKIN IND LTD
- [A] US 2012227945 A1 20120913 - TARAS MICHAEL F [US], et al
- See references of WO 2021234964A1

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 4155652 A1 20230329**; **EP 4155652 A4 20230621**; CN 115516269 A 20221223; JP 7292510 B2 20230616; JP WO2021234964 A1 20211125; US 2023101157 A1 20230330; WO 2021234964 A1 20211125

DOCDB simple family (application)  
**EP 20937082 A 20200522**; CN 202080100232 A 20200522; JP 2020020357 W 20200522; JP 2022524852 A 20200522; US 202017911036 A 20200522