

Title (en)  
HEAT EXCHANGER, REFRIGERATION CYCLE DEVICE, AND AIR CONDITIONING DEVICE

Title (de)  
WÄRMETAUSCHER, KÄLTEKREISLAUFVORRICHTUNG UND KLIMAAANLAGE

Title (fr)  
ÉCHANGEUR DE CHALEUR, DISPOSITIF À CYCLE FRIGORIFIQUE, ET DISPOSITIF DE CLIMATISATION

Publication  
**EP 3770535 A1 20210127 (EN)**

Application  
**EP 18911206 A 20180320**

Priority  
JP 2018011044 W 20180320

Abstract (en)  
A heat exchanger according to the present disclosure includes: heat transfer tubes each of which allow fluid to flow therethrough and has an inner surface provided with grooves that are recessed parts spirally extending in a direction of a tube axis of each heat transfer tube; and heat exchanger bodies including fins that are in contact with the heat transfer tubes to promote heat exchange of the fluid. In the case where of the heat transfer tubes, heat transfer tubes that allow the fluid to flow from an inlet of the heat exchanger to an outlet of the heat exchanger have a flow passage length L of 10 m or less, the grooves of the inner surface of each of those heat transfer tubes are formed such that a lead angle  $\theta$  between the tube axis and an extending direction of the grooves falls within a range of 25 degrees to 45 degrees, and in the case where the heat transfer tubes that allow the fluid to flow from the inlet of the heat exchanger to the outlet of the heat exchanger have a flow passage length L of greater than 10 m, the grooves of the inner surface of each of those heat transfer tubes are formed such that the lead angle  $\theta$  is 5 degrees or more and less than 25 degrees.

IPC 8 full level  
**F25B 39/00** (2006.01); **F28D 1/04** (2006.01); **F28F 1/40** (2006.01); **F28F 13/02** (2006.01)

CPC (source: EP)  
**F28F 1/06** (2013.01); **F28F 1/40** (2013.01); **F25B 39/02** (2013.01); **F25B 39/04** (2013.01); **F28D 1/0477** (2013.01); **F28D 2021/0061** (2013.01); **F28F 1/32** (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

Designated extension state (EPC)  
BA ME

DOCDB simple family (publication)  
**EP 3770535 A1 20210127**; **EP 3770535 A4 20210127**; CN 111886459 A 20201103; JP 6925508 B2 20210825; JP WO2019180817 A1 20210107; WO 2019180817 A1 20190926

DOCDB simple family (application)  
**EP 18911206 A 20180320**; CN 201880091134 A 20180320; JP 2018011044 W 20180320; JP 2020507166 A 20180320