

Title (en)  
REFRIGERATION DEVICE AND FACILITY

Title (de)  
KÜHLVORRICHTUNG UND ANLAGE

Title (fr)  
DISPOSITIF ET INSTALLATION DE RÉFRIGÉRATION

Publication  
**EP 4010644 A1 20220615 (FR)**

Application  
**EP 20742182 A 20200708**

Priority  
• FR 1908948 A 20190805  
• EP 2020069174 W 20200708

Abstract (en)  
[origin: WO2021023455A1] Low-temperature refrigeration device arranged in a frame (100) and comprising a working circuit (10) forming a loop and containing a working fluid, the working circuit (10) forming a cycle comprising in series: a compression mechanism (2, 3), a cooling mechanism (4, 5, 6), an expansion mechanism (7) and a heating mechanism (6, 8), the device (1) comprising a refrigeration heat exchanger (8) intended to extract heat from at least one member (125) by exchanging heat with the working fluid, the mechanisms for cooling and reheating the working fluid comprising a common heat exchanger (6) in which the working fluid transits in counter-flow in two separate transit portions of the working circuit (10), the compression mechanism comprising at least two compressors (2, 3) and at least one motor (14, 15) for driving the compressors (2, 3), the working fluid expansion mechanism comprising at least one rotary turbine (7), the device comprising at least one drive motor (14, 15) comprising a drive shaft, one end of which drives a compressor (2) and the other end of which is coupled to a turbine (7), the motor (14) being attached to the frame (100) at at least one fixed point (104), the common heat exchanger (6) being attached to the frame (100) at at least one fixed point (106), the two counter-flow transit portions of the common heat exchanger (6) being orientated in a longitudinal direction (A) of the frame (100), the drive shaft of the drive motor (14, 15) being orientated in a direction parallel or substantially parallel to the longitudinal direction (A) and the turbine (7) and the compressor (2) being arranged relatively longitudinally such that the turbine (7) is located longitudinally on the side corresponding to the relatively cold end of the common heat exchanger (6) when the device is being operated and the compressor (2) is located longitudinally on the side corresponding to the relatively hot end of the common heat exchanger (6) when the device is being operated.

IPC 8 full level  
**F25J 1/00** (2006.01); **F25B 1/053** (2006.01); **F25B 1/10** (2006.01); **F25B 9/06** (2006.01); **F25B 11/04** (2006.01); **F25B 31/02** (2006.01); **F25J 1/02** (2006.01); **F25J 5/00** (2006.01)

CPC (source: EP KR US)  
**F25B 1/053** (2013.01 - EP KR US); **F25B 1/10** (2013.01 - EP KR US); **F25B 9/06** (2013.01 - EP KR US); **F25B 11/04** (2013.01 - EP KR US); **F25B 31/026** (2013.01 - EP KR US); **F25J 1/001** (2013.01 - EP KR); **F25J 1/0022** (2013.01 - EP KR); **F25J 1/0025** (2013.01 - EP KR US); **F25J 1/005** (2013.01 - EP KR US); **F25J 1/0062** (2013.01 - EP KR); **F25J 1/0065** (2013.01 - EP KR); **F25J 1/0067** (2013.01 - EP KR); **F25J 1/0072** (2013.01 - EP KR); **F25J 1/0204** (2013.01 - EP KR US); **F25J 1/0212** (2013.01 - EP KR); **F25J 1/0258** (2013.01 - EP KR); **F25J 1/0259** (2013.01 - EP KR US); **F25J 1/0261** (2013.01 - EP KR US); **F25J 1/0265** (2013.01 - EP KR); **F25J 1/0277** (2013.01 - EP KR); **F25J 1/0284** (2013.01 - EP KR); **F25J 1/0288** (2013.01 - EP KR US); **F25J 1/0296** (2013.01 - EP KR US); **F25B 2400/054** (2013.01 - EP KR US); **F25B 2400/072** (2013.01 - EP KR US); **F25B 2400/14** (2013.01 - EP KR); **F25B 2500/01** (2013.01 - EP KR US); **F25B 2600/0251** (2013.01 - EP KR); **F25J 2230/04** (2013.01 - EP KR); **F25J 2230/20** (2013.01 - EP KR); **F25J 2290/34** (2013.01 - EP KR); **F25J 2290/62** (2013.01 - EP KR)

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)  
**WO 2021023455 A1 20210211**; AU 2020325952 A1 20220224; CA 3146291 A1 20210211; CN 114286917 A 20220405; CN 114286917 B 20240924; EP 4010644 A1 20220615; FR 3099815 A1 20210212; FR 3099815 B1 20210910; JP 2022543220 A 20221011; KR 20220042402 A 20220405; US 11815295 B2 20231114; US 2022333828 A1 20221020

DOCDB simple family (application)  
**EP 2020069174 W 20200708**; AU 2020325952 A 20200708; CA 3146291 A 20200708; CN 202080060077 A 20200708; EP 20742182 A 20200708; FR 1908948 A 20190805; JP 2022506107 A 20200708; KR 20227006295 A 20200708; US 202017633095 A 20200708