

Title (en)
CRYOGENIC REFRIGERATOR AND CONTROL METHOD THEREFOR

Title (de)
TIEFKÜHLER UND STEUERVERFAHREN DAFÜR

Title (fr)
RÉFRIGÉRATEUR CRYOGÉNIQUE ET SON PROCÉDÉ DE COMMANDE

Publication
EP 2211124 A4 20150722 (EN)

Application
EP 08851240 A 20081105

Priority
• JP 2008070108 W 20081105
• JP 2007298812 A 20071119

Abstract (en)
[origin: EP2211124A1] A cryogenic refrigerator (10) which generates a cryogenic temperature by compressing and expanding a working gas in a closed loop (11). The cryogenic refrigerator comprises a bypass line (22) allowing a high-pressure portion and a low-pressure portion to communicate with each other, a gas storage tank (24) located midway in the bypass line and having pressure regulation valves (23a, 23b) on the high-pressure side and the low-pressure side, respectively, and a pressure control unit (26) controlling the pressure regulation valves. The pressure control unit (26) controls the pressure regulation valves (23a, 23b) so that the pressure in the gas storage tank (24) is equal to the pressure in the closed loop at room temperature and in a stopped state and so that the pressure in the gas storage tank (24) is between the pressures in the high-pressure portion and in the low-pressure portion and is close to the pressure in the low-pressure portion in an operating state.

IPC 8 full level
F25B 9/06 (2006.01); **F25B 9/00** (2006.01); **F25J 1/00** (2006.01)

CPC (source: EP US)
F25B 9/06 (2013.01 - EP US); **F25B 9/14** (2013.01 - EP US); **F25J 1/005** (2013.01 - EP US); **F25J 1/0062** (2013.01 - EP US); **F25J 1/0065** (2013.01 - EP US); **F25J 1/0248** (2013.01 - EP US); **F25J 1/0276** (2013.01 - EP); **F25J 1/0288** (2013.01 - EP); **F25B 45/00** (2013.01 - EP US); **F25B 2309/1401** (2013.01 - EP US); **F25B 2400/16** (2013.01 - EP US); **F25B 2500/27** (2013.01 - EP US); **F25B 2600/2519** (2013.01 - EP US); **F25J 2245/02** (2013.01 - EP US); **F25J 2270/16** (2013.01 - EP US); **F25J 2270/912** (2013.01 - EP US)

Citation (search report)
• [Y] JP H11257768 A 19990924 - SANYO ELECTRIC CO
• [A] JP H07270062 A 19951020 - NIPPON OXYGEN CO LTD
• [A] JP H0694317 A 19940405 - AISIN SEIKI, et al
• [A] US 3375675 A 19680402 - CHRISTIAN TREPP, et al
• [A] JP H01121660 A 19890515 - JAPAN ATOMIC ENERGY RES INST, et al
• [YA] DEAN ET AL: "Liquid helium refrigerator control", CRYOGENICS, ELSEVIER, KIDLINGTON, GB, vol. 25, no. 2, 1 February 1985 (1985-02-01), pages 87 - 91, XP024049647, ISSN: 0011-2275, [retrieved on 19850201], DOI: 10.1016/0011-2275(85)90110-9
• See references of WO 2009066565A1

Cited by
FR3119669A1; EP2729705A4; FR3101404A1; FR3119667A1; EP2625474A4; EP3339605A1; EP2940406A4; EP3153795A1; US9546647B2; US9863669B2; US11137181B2; WO2022171485A1; WO2018115456A1; US10677498B2; WO2022171390A1; WO2022171391A1; WO2022171392A1

Designated contracting state (EPC)
AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC MT NL NO PL PT RO SE SI SK TR

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