Title (en)

APPARATUS AND METHOD FOR GENERATING CRYOGENIC TEMPERATURES AND USE THEREOF

Title (de)

VORRICHTUNG UND VERFAHREN ZUR ERZEUGUNG KRYOGENER TEMPERATUREN UND IHRE VERWENDUNG

Title (fr)

APPAREIL ET PROCÉDÉ DE GÉNÉRATION DE TEMPÉRATURES CRYOGÉNIQUES ET UTILISATION CORRESPONDANTE

Publication

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Application

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Abstract (en)

[origin: WO2021214225A1] The invention relates to an apparatus (112) and to a method (210) for generating cryogenic temperatures. The apparatus (112) comprises at least one cooling stage (111) which has a cold region (110) and a warm region (116), and a refrigerant mixture designed specifically for the cooling stage (111) is provided in the warm region (116), the refrigerant mixture having at least two components each having a different boiling temperature, and the cold region (110) comprises at least one cooling stage (111): - a first heat exchanger (122), which has a high-pressure side (120) to receive the refrigerant mixture at a high-pressure level from the warm region (116) of the cooling stage (111) and a low-pressure side (126) to deliver the refrigerant mixture to the warm region (116) of the cooling stage (111); - a first expansion device (136), which is designed for expansion and for cooling of the refrigerant mixture at a low-pressure level; - a second heat exchanger (148), which is designed for cooling and for partial condensation of a proportion of the refrigerant mixture located in a buffer volume (140), the buffer volume (140) being designed to limit the pressure exerted by the refrigerant mixture; and - a second expansion device (150), which is designed for separation of the buffer volume (140) from the low-pressure level of the cooling stage (111) or connection of the buffer volume (140) to said low-pressure level. The invention enables autonomous operation of the apparatus (112) and of the method (210) for generating cryogenic temperatures, in which each cooling stage (111) of the apparatus (112) can be filled with a pre-defined refrigerant mixture and can be permanently operated, and in particular in the cooling phase the refrigerating capacity can be increased, while incorrect distribution of the refrigerant of the relevant cooling stage (111) among parallel flow channels at the cold end of the first heat exchanger (122) can be prevented.

IPC 8 full level

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