

Title (en)
CRYOGEN FREE COOLING APPARATUS AND METHOD

Title (de)
KRYOGENFREIE KÜHLVORRICHTUNG UND VERFAHREN

Title (fr)
APPAREIL ET PROCÉDÉ DE REFROIDISSEMENT SANS CRYOGÈNE

Publication
EP 2409096 B2 20240619 (EN)

Application
EP 10710389 A 20100315

Priority

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- GB 0904500 A 20090316

Abstract (en)
[origin: WO2010106309A2] A cryogen free cooling apparatus comprises at least one heat radiation shield (54) surrounding a working region (20) and located in a vacuum chamber (4). A cryogen free cooling system has a cooling stage coupled to the heat radiation shield (54). Aligned apertures (56,58) are provided in the heat radiation shield and vacuum chamber walls. Sample loading apparatus has a sample holding device (2) attached to one or more elongate probes (3) for inserting the sample holding device through the aligned apertures (56,58) to the working region (20); and a thermal connector enables the sample holding device to be releasably coupled for heat conduction via said connector to a cold body or cold bodies within the vacuum chamber so as to pre-cool a sample on or in the sample holding device.

IPC 8 full level
F25D 19/00 (2006.01)

CPC (source: EP US)
F25B 9/14 (2013.01 - EP); **F25B 9/145** (2013.01 - EP); **F25D 19/00** (2013.01 - EP US)

Citation (opposition)
Opponent :

- WO 2007101305 A1 20070913 - CAMBRIDGE MAGNETIC REFRIGERATI [GB], et al
- J.E.RIX ET AL.: "Automated sample exchange and tracking system for neutron research at cryogenic temperatures", REVIEW OF SCIENTIFIC INSTRUMENTS, vol. 78, 2007, DOI: 10.1063/1.2426878
- H. Kambara, T. Matsui, Y. Niimi, and Hiroshi Fukuyama: "Construction of a versatile ultralow temperature scanning tunneling microscope", Review of Scientific Instruments 78,073703, published online 2 July 2007

Cited by
WO2021229149A1; US11360140B1; GB2592415A; EP4246064A3; WO2021170976A1; WO2022132331A1; EP4150272B1; EP4088068B1; US12013170B2

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