

Title (en)
FREEZE-DRYING SYSTEM WITH A LOADING AND UNLOADING DEVICE

Title (de)
GEFRIERTROCKNUNGSANLAGE MIT EINER BE- UND ENTLADEVORRICHTUNG

Title (fr)
INSTALLATION DE LYOPHILISATION ÉQUIPÉE D'UN DISPOSITIF DE CHARGEMENT ET DÉCHARGEMENT

Publication
EP 2773913 A1 20140910 (DE)

Application
EP 12786840 A 20121103

Priority
• DE 102011117628 A 20111104
• EP 2012004595 W 20121103

Abstract (en)
[origin: WO2013064266A1] A freeze-drying system (1) consists among other things of an arrangement of individual storage shelves (19) that are vertically guided in a frame (20) and can each be transferred into a displacement plane in which lateral guides (20, 21) intended for receiving a carriage (15) are fixedly arranged horizontally, cooperating with the guides (16, 18) of the loading and unloading device located outside the drying chamber in order to guide the carriage (15). The arrangement of the storage shelves (19) relative to the displacement plane is designed with the condition that drying containers can be pushed onto the storage shelf (19) in the displacement plane by means of the back side (24) of the carriage (15) functioning as the first guiding edge, all storage shelves (19) of the drying chamber being fillable by cyclical repetition of this process. In order to unload the drying chamber, the arrangement of storage shelves (19) is moved into a position in which the carriage (15) can be moved across the displacement plane into its rear limit position inside the drying chamber, travelling in the process under each loaded storage shelf (19), wherein after lowering of the next higher storage shelf (19) into the displacement plane, the carriage (15) can then be used for pushing out the drying containers supported thereon by means of its front side (23) acting as the guiding edge. The unloading process for the drying chamber is completed by moving the carriage (15) cyclically in the displacement plane into the aforementioned rear limit position and pushing out the drying containers on the subsequently lowered storage shelf (19) by means of the carriage (15). It is a particular advantage that aseptic conditions are easily provided because the carriage travels only under loaded storage shelves (19).

IPC 8 full level
F26B 5/06 (2006.01); **F26B 25/00** (2006.01)

CPC (source: EP US)
F26B 5/06 (2013.01 - EP US); **F26B 25/001** (2013.01 - EP US)

Citation (search report)
See references of WO 2013064266A1

Cited by
EP3473959A1; US10982896B2; EP3499160A1

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

DOCDB simple family (publication)
DE 102011117628 A1 20130508; **DE 102011117628 B4 20151022**; CN 103857969 A 20140611; CN 103857969 B 20160309; DE 202012013409 U1 20161109; EP 2773913 A1 20140910; EP 2773913 B1 20170301; EP 3144618 A1 20170322; EP 3144618 B1 20170621; EP 3144618 B2 20200401; ES 2624146 T3 20170713; ES 2638237 T3 20171019; ES 2638237 T5 20210118; US 11236942 B2 20220201; US 11236943 B2 20220201; US 2014230265 A1 20140821; US 2017059246 A1 20170302; WO 2013064266 A1 20130510

DOCDB simple family (application)
DE 102011117628 A 20111104; CN 201280046823 A 20121103; DE 202012013409 U 20121103; EP 12786840 A 20121103; EP 16191639 A 20121103; EP 2012004595 W 20121103; ES 12786840 T 20121103; ES 16191639 T 20121103; US 201214345913 A 20121103; US 201615299803 A 20161021