

Title (en)

AN APPARATUS FOR DRYING BULK PARTICULATE MATERIAL AND A METHOD OF DRYING BULK PARTICULATE MATERIAL

Title (de)

VORRICHTUNG ZUR TROCKNUNG VON PARTIKELFÖRMIGEM SCHÜTTMATERIAL UND VERFAHREN ZUR TROCKNUNG VON PARTIKELFÖRMIGEM SCHÜTTMATERIAL

Title (fr)

APPAREIL ET PROCÉDÉ DE SÉCHAGE DE MATIÈRE PARTICULAIRE EN VRAC

Publication

EP 3009777 B1 20180404 (EN)

Application

EP 15189711 A 20151014

Priority

- EP 14189037 A 20141015
- EP 15189711 A 20151014

Abstract (en)

[origin: EP3009776A1] An apparatus for drying bulk particulate material, the apparatus comprises 1) a vessel capable of maintaining superheated steam at a pressure equal to or larger than the ambient pressure surrounding the vessel. The vessel defines a lower cylindrical part which defines a first cross-sectional area which is perpendicular to the length of the lower cylindrical part and an upper cylindrical part which defines a second cross-sectional area which is perpendicular to the length of the upper cylindrical part; 2) an inner cylindrical part centrally located within the upper cylindrical part and the lower cylindrical part of the vessel to establish a first fluid path from the upper cylindrical part to the lower cylindrical part within the inner cylindrical part and a second fluid path from the lower cylindrical part to the upper cylindrical part outside the inner cylindrical part; 3) a first number of partitioning walls which extend radially within the lower cylindrical part between the lower cylindrical part and the inner cylindrical part and which defines in the lower cylindrical part an inlet chamber, an outlet chamber and a second number of intermediate chambers located between the inlet chamber and the outlet chamber in a circumferential direction, the inlet chamber comprises an inlet in order to receive a moist bulk particulate materials, the outlet chamber comprises an outlet for ejecting a dry bulk particulate materials, the inlet chamber and the intermediate chambers each defines a steam permeable bottom, the outlet chamber defines a non-steam permeable bottom; 4) a heat exchanger located within the inner cylindrical part for heating the superheated steam; 5) an impeller to generate a flow of superheated steam along the first fluid path from the upper cylindrical part through the heat exchanger within the inner cylindrical part to the lower cylindrical part via the steam permeable bottom, and along the second fluid path from the lower cylindrical part to the upper cylindrical part outside the inner cylindrical part; and 6) the steam permeable bottom of the inlet chamber which is adapted to receive between 20% and 50% of the flow of superheated steam from the impeller.

IPC 8 full level

F26B 3/08 (2006.01); **F26B 17/10** (2006.01)

CPC (source: EP)

F26B 3/08 (2013.01); **F26B 17/10** (2013.01)

Citation (examination)

WO 9201200 A1 19920123 - NIRO ATOMIZER AS [DK]

Citation (opposition)

- Opponent : BMA Braunschweigische Maschinenbauanstalt AG
- US 2010126034 A1 20100527 - CASPERS GERALD [DE], et al
 - WO 9201200 A1 19920123 - NIRO ATOMIZER AS [DK]

Cited by

US2022026146A1; US11913721B2; EP3663687B1

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)

EP 3009776 A1 20160420; DE 202015009570 U1 20180504; DE 202015009713 U1 20190607; EP 3009777 A1 20160420; EP 3009777 B1 20180404; EP 3351884 A1 20180725; EP 3550242 A1 20191009; EP 3550242 B1 20230927; EP 3550242 C0 20230927; PL 3009777 T3 20180831; PL 3550242 T3 20240318; RS 64984 B1 20240131; TR 201808829 T4 20180723

DOCDB simple family (application)

EP 14189037 A 20141015; DE 202015009570 U 20151014; DE 202015009713 U 20151014; EP 15189711 A 20151014; EP 18154880 A 20151014; EP 19171293 A 20151014; PL 15189711 T 20151014; PL 19171293 T 20151014; RS P20231211 A 20151014; TR 201808829 T 20151014