

Title (en)  
DEVICE AND METHOD FOR THE SURFACE TREATMENT OF A MATERIAL

Title (de)  
VORRICHTUNG UND VERFAHREN ZUR OBERFLÄCHENBEHANDLUNG EINES MATERIALS

Title (fr)  
DISPOSITIF ET PROCÉDÉ POUR LE TRAITEMENT SUPERFICIEL D'UN MATÉRIAU

Publication  
**EP 3787836 A1 20210310 (FR)**

Application  
**EP 19721291 A 20190503**

Priority  
• FR 1853853 A 20180504  
• EP 2019061437 W 20190503

Abstract (en)  
[origin: WO2019211462A1] The invention concerns a device and a method for the surface treatment of a material by a pressurised jet of liquid nitrogen or supercritical or hypercritical cryogenic nitrogen that may be loaded with particles. The device comprises: • - a mixing chamber (10) closed by a downstream wall in which an outlet hole is provided; and • - a focusing barrel (20) having an inlet opening and an outlet opening, the inlet opening of the barrel being designed to be attached to the mixing chamber (10), being in fluid contact with the outlet hole of the mixing chamber (10), the pressurised jet of nitrogen needing to pass through the focusing barrel from the inlet opening to the outlet opening. According to the invention, the focusing barrel is a diffusion focusing barrel (20) constituted by a hollow tube having three successive portions positioned one after the other, i.e.: - a convergent portion (21) situated at the side of the inlet opening of the diffusion focusing barrel and of which the inner surface, considered in the direction of flow of the nitrogen jet, is convergent, - a neck (22) of which the inner surface is cylindrical, and - a divergent portion (23) that ends at the outlet opening of the diffusion focusing barrel and of which the inner surface, considered in the direction of flow of the nitrogen jet, is divergent.

IPC 8 full level  
**B24C 1/00** (2006.01); **B24C 5/04** (2006.01)

CPC (source: EP US)  
**B24C 1/003** (2013.01 - EP US); **B24C 5/04** (2013.01 - EP US)

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

Designated extension state (EPC)  
BA ME

DOCDB simple family (publication)  
**WO 2019211462 A1 20191107**; CA 3097619 A1 20191107; CA 3097619 C 20240130; EP 3787836 A1 20210310; FR 3080791 A1 20191108; FR 3080791 B1 20210604; JP 2021522081 A 20210830; JP 7412416 B2 20240112; US 11559872 B2 20230124; US 2021178552 A1 20210617

DOCDB simple family (application)  
**EP 2019061437 W 20190503**; CA 3097619 A 20190503; EP 19721291 A 20190503; FR 1853853 A 20180504; JP 2021510542 A 20190503; US 201917052620 A 20190503