

Title (en)  
METHOD FOR IMPROVEMED APERTURE CLARITY IN THREE-DIMENSIONAL NONWOVEN FABRICS AND THE PRODUCTS THEREOF

Title (de)  
VERFAHREN ZUR REALISIERUNG SAUBERER DURCHBRÜCHE IN DREIDIMENSIONALEN VLIESSTOFFEN SOWIE DIE VERFAHRENSPRODUKTE

Title (fr)  
PROCEDE DE PRODUCTION DE NON-TISSES TRIDIMENSIONNELS PRESENTANT DES OUVERTURES PLUS NETTES ET PRODUITS CORRESPONDANTS

Publication  
**EP 1481120 A1 20041201 (EN)**

Application  
**EP 03713920 A 20030305**

Priority  
• US 0306757 W 20030305  
• US 36222502 P 20020306

Abstract (en)  
[origin: WO03076706A1] The present invention is directed a nonwoven fabric which is imparted with a three-dimensional image or pattern, and apertures essentially devoid of fiber, during the fabrication stage. The nonwoven fabric exhibits a fibrous extension out of the plane of the material, while apertures are present that have a pronounced uniformity and a significant reduction in fibrous occlusion.

IPC 1-7  
**D04H 1/46; D04H 3/10**

IPC 8 full level  
**D04H 1/46** (2012.01); **D04H 1/70** (2012.01)

CPC (source: EP US)  
**D04H 1/49** (2013.01 - EP US); **D04H 1/495** (2013.01 - EP US); **D04H 1/70** (2013.01 - EP US); **Y10T 442/60** (2015.04 - EP US);  
**Y10T 442/689** (2015.04 - EP US)

Designated contracting state (EPC)  
AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HU IE IT LI LU MC NL PT RO SE SI SK TR

DOCDB simple family (publication)  
**WO 03076706 A1 20030918**; AU 2003217945 A1 20030922; EP 1481120 A1 20041201; EP 1481120 A4 20070509;  
US 2003232558 A1 20031218

DOCDB simple family (application)  
**US 0306757 W 20030305**; AU 2003217945 A 20030305; EP 03713920 A 20030305; US 38223103 A 20030305