

Title (en)
METHOD OF MANUFACTURING VARIABLE VANE

Title (de)
VERFAHREN ZUR HERSTELLUNG EINER VERSTELLBAREN LEITSCHAUFEL

Title (fr)
PROCEDE DE FABRICATION D'UNE AUBE A INCIDENCE VARIABLE

Publication
EP 2343441 A4 20140917 (EN)

Application
EP 09819268 A 20091009

Priority
• JP 2009067621 W 20091009
• JP 2008262547 A 20081009

Abstract (en)
[origin: EP2343441A1] The present invention provides a variable vane manufacturing method capable of setting the dimensions of a shaft unit and a blade unit with desired dimensional precisions without any machining. A sinter is prepared such that the height of a blade unit 2 ranges within +0.3% to +0.9%, the thickness of the blade unit 2 ranges within - 0.6% to -0.0%, the diameter of a shaft unit 3 ranges within +0.3% to +0.9%, the length from the lower end of the blade unit 2 to the lower end of the shaft unit 3 ranges within - 0.6% to -0.0% with respect to the target dimensions of a final product, and a sintering density is 95% or more of a relative density. The height and thickness of the blade unit 2 in the sinter are set to desired product dimensions in a first pressing process at the same time; the coaxiality between the blade unit 2 and the shaft unit 3 is set to a desired product dimension in a second pressing process; and the roundness of the shaft unit 3 is set to a desired product dimension in a third pressing process.

IPC 8 full level
B22F 3/24 (2006.01); **B22F 3/16** (2006.01); **B22F 5/00** (2006.01); **F01D 25/00** (2006.01); **F02B 37/24** (2006.01); **F02B 39/00** (2006.01)

CPC (source: EP)
B22F 3/24 (2013.01); **B22F 5/009** (2013.01); **B22F 5/04** (2013.01); **F01D 17/162** (2013.01); **F01D 17/165** (2013.01); **B22F 2998/00** (2013.01); **B22F 2998/10** (2013.01); **F05D 2230/22** (2013.01)

Citation (search report)
• [A] US 2004237521 A1 20041202 - OHISHI SHINJIROH [JP]
• See references of WO 2010041735A1

Cited by
EP3779123A4; EP2607396A1; US9309383B2; US9249292B2; US11661861B2

Designated contracting state (EPC)
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 SE SI SK SM TR

DOCDB simple family (publication)
EP 2343441 A1 20110713; EP 2343441 A4 20140917; EP 2343441 B1 20151223; CN 102177324 A 20110907; CN 102177324 B 20130619; HU E028680 T2 20161228; JP 2011157816 A 20110818; JP 4317906 B1 20090819; WO 2010041735 A1 20100415

DOCDB simple family (application)
EP 09819268 A 20091009; CN 200980139862 A 20091009; HU E09819268 A 20091009; JP 2008262547 A 20081009; JP 2009067621 W 20091009