

Title (en)

WAVE RELIEVING GEOMETRIC FEATURES IN STRUCTURAL MEMBERS THAT ARE RADIALY EXPANDABLE INTO WORKPIECES

Title (de)

WELLENENTLASTENDE GEOMETRISCHE MERKMALE VON RADIAL IN WERKSTÜCKE EXPANDIERBAREN STRUKTURELEMENTEN

Title (fr)

CARACTÉRISTIQUES GÉOMÉTRIQUES DE DÉCHARGE POUR VAGUE DANS DES ÉLÉMENTS STRUCTURAUX DILATABLES RADIALEMENT À L'INTÉRIEUR DE PIÈCES

Publication

EP 2021635 A2 20090211 (EN)

Application

EP 07776383 A 20070427

Priority

- US 2007010291 W 20070427
- US 79588806 P 20060427

Abstract (en)

[origin: WO2007127399A2] A bushing with wave relieving geometric features includes a unique geometric end feature such as a countersink or arcuate surface, which creates a pocket, volume, and/or reservoir, to receive an amount of material that is extruded in a longitudinal direction during radial expansion of the bushing. At the mandrel exit side of the bushing, the extruded material may be accumulated from a propagating wave of material preceding a radial-expansion mandrel. At the mandrel entry side of the bushing, the extruded material may be caused by the radial force of the expansion mandrel near the unrestrained end surface at the entry side of the bushing. The unique geometric end features of the bushing may also include a high portion on the end surface of the bushing to direct the fastener clamp-up loads through the radial flange of the bushing and into the workpiece.

IPC 8 full level

F16B 4/00 (2006.01); **B23P 9/02** (2006.01)

CPC (source: EP US)

B23P 9/025 (2013.01 - EP US); **F16B 4/004** (2013.01 - EP US)

Citation (search report)

See references of WO 2007127399A2

Designated contracting state (EPC)

AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HU IE IS IT LI LT LU LV MC MT NL PL PT RO SE SI SK TR

Designated extension state (EPC)

AL BA HR MK RS

DOCDB simple family (publication)

WO 2007127399 A2 20071108; **WO 2007127399 A3 20071221**; EP 2021635 A2 20090211; JP 2009535577 A 20091001; JP 5204096 B2 20130605; US 2007289351 A1 20071220

DOCDB simple family (application)

US 2007010291 W 20070427; EP 07776383 A 20070427; JP 2009507828 A 20070427; US 79654507 A 20070427