

Title (en)  
MULTIMODE ELECTROMECHANICAL VARIABLE SPEED TRANSMISSION APPARATUS AND METHOD OF CONTROL

Title (de)  
MULTIMODALE ELEKTROMECHANISCHE STUFENLOSE GETRIEBEVORRICHTUNG UND VERFAHREN ZUR STEUERUNG

Title (fr)  
APPAREIL DE TRANSMISSION À VITESSE VARIABLE ÉLECTROMÉCANIQUE MULTIMODE ET PROCÉDÉ DE COMMANDE

Publication  
**EP 3167206 A4 20170823 (EN)**

Application  
**EP 15889564 A 20150515**

Priority  
• US 201514694881 A 20150423  
• CN 2015079062 W 20150515

Abstract (en)  
[origin: WO2016169075A1] A multi-mode electro-mechanical variable speed transmission, includes an input shaft (Input), an output system (Output), at least one planetary gear set having at least three branches each representing a co-axial rotating member, two electric machines (EM1, EM2) along with the associated controllers for the electric machines, and at least a clutch (CL). The first branch couples to the first electric machine (EM1) with a constant speed ratio, the second branch couples to the output system (Output) with a constant speed ratio, the third branch couples to the input shaft (Input) with a constant speed ratio, and the second electric machine (EM2) selectively couples to two different branches of the planetary gear set with two different constant speed ratios, respectively. Said multi-mode electro-mechanical variable speed transmission is capable of providing multiple operation modes including two electric drive modes and two power split operation modes. Different operation modes cover different speed ratio regimes and are suitable for different power requirements. At the mode switching point, the corresponding clutch is automatically synchronized. This avoids shock loads during operation mode switching. The transmission is capable of providing operations with at least a fixed output to input speed ratio.

IPC 8 full level  
**F16H 3/76** (2006.01); **F16H 3/72** (2006.01); **F16H 37/10** (2006.01)

CPC (source: EP)  
**F16H 3/728** (2013.01); **F16H 2037/103** (2013.01); **F16H 2200/207** (2013.01); **F16H 2200/2035** (2013.01); **F16H 2200/2064** (2013.01); **F16H 2200/2082** (2013.01); **F16H 2200/2097** (2013.01)

Citation (search report)  
• [X] US 2010210388 A1 20100819 - GROCHOWSKI EDWIN T [US], et al  
• [X] US 2010261565 A1 20101014 - AI XIAOLIN [CN], et al  
• [A] US 2006046886 A1 20060302 - HOLMES ALAN G [US], et al  
• [A] US 2011053724 A1 20110303 - PHILLIPS ANDREW W [US]  
• [A] US 2001008859 A1 20010719 - MASAKI RYOSO [JP]  
• [A] US 2672768 A 19540323 - DEAN HANES VAUGHN  
• See references of WO 2016169075A1

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 2016169075 A1 20161027**; CN 106536980 A 20170322; CN 106536980 B 20190111; EP 3167206 A1 20170517; EP 3167206 A4 20170823; JP 2018529899 A 20181011; JP 6535414 B2 20190626

DOCDB simple family (application)  
**CN 2015079062 W 20150515**; CN 201580020450 A 20150515; EP 15889564 A 20150515; JP 2018506464 A 20150515