

Title (en)  
PHASE-VARIABLE DEVICE FOR ENGINE

Title (de)  
PHASENVARIABLE VORRICHTUNG FÜR EINEN MOTOR

Title (fr)  
DISPOSITIF À PHASE VARIABLE POUR MOTEUR

Publication  
**EP 2400121 B1 20140702 (EN)**

Application  
**EP 09840363 A 20090223**

Priority  
JP 2009053150 W 20090223

Abstract (en)  
[origin: EP2400121A1] PROBLEMS TO BE SOLVED To provide an oil film for permitting transmission of torque between a clutch case and a rotary drum. MEANS FOR SOLVING THE PROBLEMS A phase-varying apparatus for an automobile engine for varying the valve timing of intake and exhaust valves by moving an intermediate member (30) to cause a relative rotation between an outer cylinder (10) and an inner cylinder (20). The apparatus includes a circular rotary drum (44) connected to the intermediate member (30) and an electromagnetic clutch (42) for generating a braking force that acts on the rotary drum 44. The electromagnetic clutch 42 has an annular clutch case (60) arranged to face the rotary drum (44) and an electromagnetic coil 62 for generating the braking force when energized. Grooves (66) and (67) are formed in the end face (63a) of the inner circumferential wall (63) and in the end face (64a) of the outer circumferential wall (64) of the clutch case (60) such that a torque is transmitted between the rotary drum (44) and the clutch case (60) via the oil film formed in and round the grooves (66 and 67).

IPC 8 full level  
**F01L 1/34** (2006.01); **F01L 1/344** (2006.01)

CPC (source: EP KR US)  
**F01L 1/34** (2013.01 - KR); **F01L 1/344** (2013.01 - KR); **F01L 1/34403** (2013.01 - EP US); **F01L 1/34406** (2013.01 - EP US);  
**F01L 2001/3522** (2013.01 - EP US)

Cited by  
US9840947B2; WO2015051789A1

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