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- (54) **PARKING LOCK DEVICE**
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CPC **B60T 1/005** (2013.01); **F16D 63/006** (2013.01); **F16H 63/3425** (2013.01); **F16D 2125/66** (2013.01)

- (58) **Field of Classification Search**
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See application file for complete search history.

- (56) **References Cited**
U.S. PATENT DOCUMENTS
2007/0062779 A1* 3/2007 Kusamoto et al. 192/219.5
- FOREIGN PATENT DOCUMENTS
EP 1717490 A2 11/2006
JP 03124068 U 12/1991
JP 2006-131109 A 5/2006
JP 2006131109 A * 5/2006
JP 2006-308018 A 11/2006
JP 2009-208568 A 9/2009
JP 2009208568 A * 9/2009
- * cited by examiner

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- (57) **ABSTRACT**
A parking lock device that is installed in a transmission of a vehicle includes a gear, a lock, a receiver, a cam, and a damper. The lock has a pawl that can be engaged in a tooth space between the teeth of the gear. The lock moves between an engagement position at which the pawl is engaged in the tooth space to lock the gear and a retreat position at which the pawl is not engaged in the tooth space. The receiver is arranged to be fixed to a case of the transmission. The cam moves forward and backward with respect to a gap between the receiver and the lock. The cam holds the lock at the engagement position when having entered the gap. The damper is provided in a vibration transmission path to dampen vibrations transmitted to the case of the transmission.

14 Claims, 5 Drawing Sheets

