

(12) **United States Patent**  
**Uehara et al.**

(10) **Patent No.:** **US 9,410,345 B2**  
(45) **Date of Patent:** **Aug. 9, 2016**

(54) **VEHICLE DOOR LOCK DEVICE**  
(75) Inventors: **Hiroki Uehara**, Nagoya (JP); **Hiroshi Kawai**, Nagoya (JP)  
(73) Assignee: **ANSEI CORPORATION**, Obu-shi (JP)  
(\*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 364 days.

(56) **References Cited**  
**U.S. PATENT DOCUMENTS**  
2,864,641 A 12/1958 Leslie  
3,799,596 A 3/1974 Nozomu et al.  
4,536,021 A 8/1985 Mochida  
(Continued)  
**FOREIGN PATENT DOCUMENTS**  
CN 1122870 5/1996  
DE 1678024 B1 \* 8/1971 ..... E05B 77/06  
(Continued)

(21) Appl. No.: **13/985,995**  
(22) PCT Filed: **Mar. 16, 2011**  
(86) PCT No.: **PCT/JP2011/056188**  
§ 371 (c)(1),  
(2), (4) Date: **Aug. 16, 2013**  
(87) PCT Pub. No.: **WO2012/124069**  
PCT Pub. Date: **Sep. 20, 2012**

**OTHER PUBLICATIONS**  
English translation of International Preliminary Examination Report from parent application No. PCT/JP2011/056188.  
(Continued)

(65) **Prior Publication Data**  
US 2013/0328325 A1 Dec. 12, 2013

*Primary Examiner* — Carlos Lugo  
(74) *Attorney, Agent, or Firm* — J-Tek Law PLLC; Jeffrey D. Tekanic; Scott T. Wakeman

(51) **Int. Cl.**  
**E05C 3/06** (2006.01)  
**E05B 77/06** (2014.01)  
**E05B 77/04** (2014.01)  
**E05B 77/00** (2014.01)  
(Continued)

(57) **ABSTRACT**  
A switching mechanism of vehicle door lock device includes a pivotable first lever and a second lever that pivotably acts on a pawl. An inertial lever is provided on the first lever and is pivotable about an axis (X3) from an initial position when an inertial force is applied thereto. A transmitting portion is provided on the second lever and transmits the pivotal movement of the first lever to the second lever when the inertial lever is disposed in its initial position. In contrast, the transmitting portion does not transmit the pivotal movement of the first lever to the second lever when the inertial lever has been pivoted away from its initial position. A first axial center of pivotal movement of the first lever and a second axial center of pivotal movement of the second lever are coaxial axial centers of pivotal movement (X1).

(52) **U.S. Cl.**  
CPC ..... **E05B 77/06** (2013.01); **E05B 77/00** (2013.01); **E05B 77/02** (2013.01); **E05B 77/04** (2013.01); **Y10T 292/0949** (2015.04)

(58) **Field of Classification Search**  
CPC ..... E05B 77/00; E05B 77/02; E05B 77/04; E05B 77/06; Y10S 292/22  
USPC ..... 292/216  
See application file for complete search history.

**20 Claims, 10 Drawing Sheets**

