



US 20220360178A1

(19) **United States**(12) **Patent Application Publication**
PARK et al.(10) **Pub. No.: US 2022/0360178 A1**(43) **Pub. Date: Nov. 10, 2022**(54) **INTEGRATED POWER CONVERSION
APPARATUS FOR XEV AND INTEGRATED
POWER CONVERSION METHOD THEREOF****H02P 27/06** (2006.01)**B60L 53/20** (2006.01)(52) **U.S. Cl.**CPC **H02M 3/335** (2013.01); **H02M 5/4585**
(2013.01); **H02P 27/06** (2013.01); **B60L 53/20**
(2019.02)(71) Applicant: **UIF (University Industry
Foundation), Yonsei University, Seoul
(KR)**(72) Inventors: **Jung Wook PARK, Seoul (KR); Issac
KIM, Seoul (KR)**(21) Appl. No.: **17/662,621**(22) Filed: **May 9, 2022**(30) **Foreign Application Priority Data**

May 10, 2021 (KR) 10-2021-0060063

Publication Classification(51) **Int. Cl.****H02M 3/335** (2006.01)**H02M 5/458** (2006.01)(57) **ABSTRACT**

According to the integrated power conversion apparatus and method according to the exemplary embodiment of the present disclosure, the on-board battery charger (OBC), the lower voltage battery charger (LDC), and the traction converter (TC) are integrated to convert the power so that all the functions which need to be performed by the power conversion system of the related art can be performed. Further, the number of switches is reduced to increase a power density and not only the number of switches, but also the number of controllers is reduced to improve feasibility.

