



US 20240213882A1

(19) **United States**(12) **Patent Application Publication****FERRER DURAN et al.**(10) **Pub. No.: US 2024/0213882 A1**(43) **Pub. Date: Jun. 27, 2024**(54) **DC-TO-DC CONVERTER AND METHOD
FOR CONTROLLING SAME****B60L 58/18** (2006.01)**H02M 1/00** (2006.01)(71) Applicant: **Lear Corporation**, Southfield, MI (US)(52) **U.S. Cl.**CPC **H02M 3/33576** (2013.01); **B60L 53/22**
(2019.02); **B60L 58/18** (2019.02); **H02M**
1/0035 (2021.05); **H02M 3/33573** (2021.05);
B60L 2210/10 (2013.01)(72) Inventors: **Marc FERRER DURAN**, Valls (ES);
Cesar RUANO ALVAREZ, Valls (ES);
Julia GINE ELIES, Valls (ES);
Youssef GHABBOUR, Valls (ES);
Ivan CASADO GARCIA, Valls (ES);
Roser RUE OLIVE, Valls (ES); **Luis**
RODA CORNEJO, Valls (ES)

(57)

ABSTRACT

The present disclosure provides a converter including a primary stage having a plurality of primary stage switches, a secondary stage having a plurality of secondary stage switches and a capacitor, and a controller that isolates the secondary stage from a second battery, and that controls switching of the plurality of primary stage switches and the plurality of secondary stage switches to provide a plurality of bursts of energy from a first battery to the capacitor to pre-charge the capacitor to a threshold voltage, wherein after an initial burst of the plurality of bursts having an initial duration, a subsequent burst of the plurality of bursts provided has a duration equal to a duration of a preceding burst plus a time period based on a voltage of the first battery.

(73) Assignee: **Lear Corporation**, Southfield, MI (US)(21) Appl. No.: **18/145,410**(22) Filed: **Dec. 22, 2022****Publication Classification**(51) **Int. Cl.****H02M 3/335** (2006.01)**B60L 53/22** (2006.01)