



US 20230231390A1

(19) **United States**

(12) **Patent Application Publication**
XU et al.

(10) **Pub. No.: US 2023/0231390 A1**

(43) **Pub. Date: Jul. 20, 2023**

(54) **BATTERY UNIT, BATTERY PACK,
ELECTRICAL DEVICE, METHOD AND
APPARATUS FOR MANUFACTURING
BATTERY UNIT, AND METHOD FOR
CONTROLLING BATTERY UNIT**

(71) Applicant: **CONTEMPORARY AMPEREX
TECHNOLOGY CO., LIMITED,**
Ningde (CN)

(72) Inventors: **Xiaofu XU**, Ningde (CN); **Yonghuang
YE**, Ningde (CN); **Xinyu ZHANG**,
Ningde (CN); **Jianfu PAN**, Ningde
(CN); **Qian LIU**, Ningde (CN);
Quanguo LI, Ningde (CN)

(73) Assignee: **CONTEMPORARY AMPEREX
TECHNOLOGY CO., LIMITED,**
Ningde (CN)

(21) Appl. No.: **18/125,143**

(22) Filed: **Mar. 23, 2023**

Related U.S. Application Data

(63) Continuation of application No. PCT/CN2021/
131688, filed on Nov. 19, 2021.

Publication Classification

(51) **Int. Cl.**
H02J 7/00 (2006.01)
H01M 4/525 (2006.01)
H01M 10/44 (2006.01)
H01M 50/51 (2006.01)
H01M 4/131 (2006.01)
(52) **U.S. Cl.**
CPC **H02J 7/0016** (2013.01); **H01M 4/525**
(2013.01); **H01M 10/446** (2013.01); **H01M**
50/51 (2021.01); **H01M 4/131** (2013.01);
H02J 7/0048 (2020.01)

(57) **ABSTRACT**

A battery unit may comprise a first cell type and a second cell type electrically connected at least in series, wherein the first cell type may include N first cells, the second cell type may include M second cells, and N and M are positive integers; the first cell may have a discharge cell balance rate of CB1, the second cell may have a discharge cell balance rate of CB2, with $0.5 \leq CB1 \leq CB2 \leq 1.4$, and when the battery unit is charged to 95%-100% of the state of charge, the first cell may have a corresponding open-circuit voltage change rate of not greater than 0.005 V/% SOC, and the second cell type may have a corresponding open-circuit voltage change rate greater than that of the first cell.

5

