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(19) **United States**(12) **Patent Application Publication**
FENG et al.(10) **Pub. No.: US 2022/0352728 A1**(43) **Pub. Date: Nov. 3, 2022**(54) **VARIABLE STEP SIZE EQUALIZATION
PROCESSING METHOD, AND DEVICE,
MEDIUM, BATTERY PACKAGE, AND
VEHICLE***H01M 10/48* (2006.01)*H01M 10/44* (2006.01)(52) **U.S. Cl.**CPC *H02J 7/0014* (2013.01); *B60R 16/033*(2013.01); *H01M 10/482* (2013.01); *H01M**10/441* (2013.01); *H02J 7/0048* (2020.01);*H01M 2220/20* (2013.01)(71) Applicant: **BYD COMPANY LIMITED,**
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ABSTRACT(21) Appl. No.: **17/763,943**(22) PCT Filed: **Sep. 24, 2020**(86) PCT No.: **PCT/CN2020/117324**

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A step-varying equalization method, a device, a medium, a battery pack, and a vehicle are provided. The method includes: initiating coarse-tuning equalization for a cell in the series-connected battery when an initial equalization difference of the cell reaches a preset coarse-tuning requirement; determining a first state of charge (SOC) equalization difference according to a first voltage value of the cell after completion of the coarse-tuning equalization when a first real equalization difference of the cell after the coarse-tuning equalization reaches a preset fine-tuning requirement, and initiating fine-tuning equalization for the cell with a first equalization step size based on the first SOC equalization difference; and determining that SOC equalization of the cell is completed when a second real equalization difference of the cell after completion of the fine-tuning equalization is less than or equal to a target equalization value.

Initiating coarse-tuning equalization for a cell in the series-connected battery when an initial equalization difference of the cell reaches a preset coarse-tuning requirement, where the initial equalization difference is determined according to a first SOC value of each cell in the series-connected battery

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Determining a first SOC equalization difference according to a first voltage value of the cell after the coarse-tuning equalization when a first real equalization difference of the cell after the coarse-tuning equalization reaches a preset fine-tuning requirement, and initiating fine-tuning equalization for the cell by a first equalization step size based on the first SOC equalization difference, where the first equalization step size is less than the first SOC equalization difference

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Determining that SOC equalization of the cell is completed when a second real equalization difference of the cell after the fine-tuning equalization is less than or equal to a target equalization value

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