



US 20230231491A1

(19) **United States**(12) **Patent Application Publication**
Falk(10) **Pub. No.: US 2023/0231491 A1**(43) **Pub. Date: Jul. 20, 2023**(54) **METHOD FOR OPERATING A HYBRID RECTIFIER, HYBRID RECTIFIER, AND ELECTROLYTIC SYSTEM HAVING SUCH A HYBRID RECTIFIER***H02M 1/00* (2006.01)*H02J 3/16* (2006.01)*C25B 9/65* (2006.01)(52) **U.S. Cl.**CPC *H02M 7/23* (2013.01); *H02M 7/17* (2013.01); *H02M 1/0095* (2021.05); *H02J 3/16* (2013.01); *C25B 9/65* (2021.01)(71) Applicant: **SMA Solar Technology AG, Niestetal (DE)**(72) Inventor: **Andreas Falk, Kassel (DE)**(21) Appl. No.: **18/188,236**(22) Filed: **Mar. 22, 2023****Related U.S. Application Data**

(63) Continuation of application No. PCT/EP2021/074252, filed on Sep. 2, 2021.

Foreign Application Priority Data

Sep. 24, 2020 (DE) 10 2020 124 964.0

Publication Classification(51) **Int. Cl.***H02M 7/23* (2006.01)*H02M 7/17* (2006.01)

(57)

ABSTRACT

A method for operating a hybrid rectifier includes an AC input, a DC output and a thyristor rectifier arranged in a first path, and a transistor rectifier arranged in a second, parallel path. The method includes when a DC voltage at the DC output of the hybrid rectifier is below a voltage threshold value, operating the hybrid rectifier in a first operating state in which the transistor rectifier is isolated from the DC output and connected to the AC input and the thyristor rectifier is connected both to the AC input and to the DC output. When the DC voltage at the DC output of the hybrid rectifier reaches or exceeds the voltage threshold value, operating the hybrid rectifier in a second operating state in which the thyristor rectifier and the transistor rectifier are each connected to the AC input and to the DC output.

