



US 20240244973A1

(19) **United States**

(12) **Patent Application Publication**

(10) **Pub. No.: US 2024/0244973 A1**

(43) **Pub. Date: Jul. 18, 2024**

SUI et al.

(54) **PREPARATION METHOD OF CONTACT MATERIAL WITH HIGH THERMAL STABILITY AND LOW CONTACT RESISTANCE BASED ON MGAGSB-BASED THERMOELECTRIC MATERIAL**

(52) **U.S. CL.**

B22F 3/12 (2006.01)

B22F 5/00 (2006.01)

B22F 9/04 (2006.01)

CPC *H10N 10/01* (2023.02); *B22F 1/054* (2022.01); *B22F 3/12* (2013.01); *B22F 5/006* (2013.01); *B22F 9/04* (2013.01); *H10N 10/853* (2023.02)

(71) Applicant: **HARBIN INSTITUTE OF TECHNOLOGY**, Harbin (CN)

(72) Inventors: **Jiehe SUI**, Harbin (CN); **Liangjun Xie**, Harbin (CN); **Zihang Liu**, Harbin (CN); **Fengkai Guo**, Harbin (CN)

(21) Appl. No.: **18/533,907**

(22) Filed: **Dec. 8, 2023**

Related U.S. Application Data

(63) Continuation of application No. PCT/CN2023/084140, filed on Sep. 27, 2023.

Foreign Application Priority Data

Jan. 16, 2023 (CN) 202310063279.7

Publication Classification

(51) **Int. CL.**

H10N 10/01 (2006.01)

B22F 1/054 (2006.01)

ABSTRACT

The present disclosure provides a preparation method of a contact material with high thermal stability and low contact resistance based on an MgAgSb-based thermoelectric material and relates to the field of the contact materials preparation. The present disclosure aims to solve the problem of failure to achieve long-term stability for the MgAgSb/Mg₃Bi₂ device due to the fact that a contact material used by MgAgSb is Ag and MgAgSb may easily yield Ag₃Sb in an Ag-rich environment at present. The method includes: at step 1, preparing MgCuSb nano-powder; at step 2, preparing MgCu_{0.1}Ag_{0.87}Sb_{0.99} nano-powder; at step 3, preparing MgCu_{0.1}Ag_{0.87}Sb_{0.99}—Mg_{3.2}Bi_{1.5}Sb_{0.5} thermoelectric generation device. The present disclosure is applied to preparation of a contact material with high thermal stability and low contact resistance based on an MgAgSb-based thermoelectric material.

