US 20240237561A9

(19) **United States**

(12) **Patent Application Publication**

CHARPIN-NICOLLE et al.

(10) **Pub. No.: US 2024/0237561 A9**

(48) **Pub. Date: Jul. 11, 2024**

CORRECTED PUBLICATION

(54) **RESISTIVE MEMORY DEVICE AND MANUFACTURING METHOD**

(71) Applicant: **COMMISSARIAT A L'ENERGIE ATOMIQUE ET AUX ENERGIES ALTERNATIVES**, Paris (FR)

(72) Inventors: **Christelle CHARPIN-NICOLLE**, Grenoble Cedex 09 (FR); **Serge BLONKOWSKI**, Grenoble Cedex 09 (FR); **Rémy GASSILLOUD**, Grenoble Cedex 09 (FR); **Thomas MAGIS**, Grenoble Cedex 09 (FR)

(73) Assignee: **COMMISSARIAT A L'ENERGIE ATOMIQUE ET AUX ENERGIES ALTERNATIVES**, Paris (FR)

(21) Appl. No.: **18/493,921**

(22) Filed: **Oct. 25, 2023**

Prior Publication Data

(15) Correction of US 2024/0138273 A1 Apr. 25, 2024
See (22) filed
See (30) Foreign Application Data

(65) US 2024/0138273 A1 Apr. 25, 2024

(30) **Foreign Application Priority Data**

Oct. 25, 2022 (FR) 22 11046

Publication Classification

(51) **Int. Cl.**
H10N 70/00 (2006.01)
H10B 63/00 (2006.01)
H10N 70/20 (2006.01)

(52) **U.S. Cl.**
CPC ***H10N 70/828*** (2023.02); ***H10B 63/30*** (2023.02); ***H10N 70/063*** (2023.02); ***H10N 70/24*** (2023.02); ***H10N 70/826*** (2023.02); ***H10N 70/841*** (2023.02)

(57) **ABSTRACT**

A resistive memory device including at least one first electrode based on a first metal and a second electrode based on a second metal, and a memory element in the form of a metal filament based on a third metal and inserted between the first and second electrodes, the memory element having a filament cross-section strictly smaller than the electrode cross-sections, wherein the third metal has a chemical composition, different from those of the first and second metals giving it an etching speed greater than those of the first and second metals, preferably such that the selectivity at the etching is greater than or equal to 3:1, vis-á-vis the first and second metals. A method for manufacturing such a device is also disclosed.