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LUO et al.(10) **Pub. No.: US 2023/0231528 A1**(43) **Pub. Date: Jul. 20, 2023**(54) **RESONATOR AND PREPARATION METHOD OF A RESONATOR, AND FILTER**(52) **U.S. Cl.**CPC *H03H 3/02* (2013.01); *H03H 9/173* (2013.01); *H03H 9/564* (2013.01); *H03H 2003/021* (2013.01)(71) Applicant: **Wuhan MEMSonic Technologies Co.,Ltd.,** Wuhan (CN)

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ABSTRACT(72) Inventors: **Tiancheng LUO**, Wuhan (CN); **Yao CAI**, Wuhan (CN); **Chao GAO**, Wuhan (CN); **Yang ZOU**, Wuhan (CN); **Binghui LIN**, Wuhan (CN); **Kaixiang LONG**, Wuhan (CN); **Bowoon SOON**, Singapore (SG); **Chengliang SUN**, Wuhan (CN)

A resonator and a preparation method of a resonator, and a filter relate to the technical field of resonators. The preparation method includes: forming a piezoelectric layer, a first electrode layer, and a first bonding layer on a first substrate; patterning the first bonding layer to form a first bonding ring, a second bonding ring, and a third bonding ring, and etching an exposed part of the first electrode layer to form a first window; forming a first supporting layer and a second bonding layer on the second substrate; patterning the second bonding layer to form a fourth bonding ring and a fifth bonding ring, and etching an exposed part of the first supporting layer to form a second window and a third window to obtain a boundary ring located between the third window and the second window; bonding the third bonding ring and the fifth bonding ring, and bonding the second bonding ring and the fourth bonding ring to obtain a cavity structure of the resonator; and removing the first substrate, and forming a second electrode layer on the piezoelectric layer. According to the preparation method, preparation of the boundary ring is realized through a packaging and bonding process, and the preparation process of a resonator is simple.

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