



US 20220352871A1

(19) **United States**(12) **Patent Application Publication**
HARAI(10) **Pub. No.: US 2022/0352871 A1**(43) **Pub. Date: Nov. 3, 2022**(54) **ACOUSTIC WAVE RESONATOR, FILTER,
AND MULTIPLEXER****H03H 9/64** (2006.01)**H03H 9/72** (2006.01)(71) Applicant: **TAIYO YUDEN CO., LTD.**, Tokyo
(JP)(52) **U.S. Cl.**
CPC **H03H 9/02818** (2013.01); **H03H 9/25**
(2013.01); **H03H 9/145** (2013.01); **H03H**
9/6483 (2013.01); **H03H 9/72** (2013.01)(72) Inventor: **Shodai HARAI**, Tokyo (JP)(73) Assignee: **TAIYO YUDEN CO., LTD.**, Tokyo
(JP)(21) Appl. No.: **17/713,590**(22) Filed: **Apr. 5, 2022**(30) **Foreign Application Priority Data**

Apr. 30, 2021 (JP) 2021-077435

Publication Classification(51) **Int. Cl.****H03H 9/02** (2006.01)**H03H 9/25** (2006.01)**H03H 9/145** (2006.01)(57) **ABSTRACT**

An acoustic wave resonator includes two comb-shaped electrodes provided on a piezoelectric substrate, each of the comb-shaped electrodes including electrode fingers and a bus bar coupled to the electrode fingers, an acoustic velocity of an acoustic wave propagating through a gap region, which is located between tips of electrode fingers of one of the comb-shaped electrodes and a bus bar of the other of the comb-shaped electrodes, being equal to or greater than 0.98 times and equal to or less than 1.02 times an acoustic velocity of an acoustic wave propagating through an edge region located in an edge in an extension direction of the electrode fingers in an overlap region, and an additional film that is provided over the piezoelectric substrate from the edge region to the gap region and is not provided in a center region located further in than the edge region in the overlap region.

