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(54) **RESONATORS WITH DIFFERENT MEMBRANE THICKNESSES ON THE SAME DIE**

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(57) **ABSTRACT**

An acoustic resonator is fabricated by bonding a first piezoelectric plate to a substrate and spans locations for a first and second cavity in the substrate. A top surface of the first piezoelectric plate is planarized to a first thickness. A bonding layer is formed on the first piezoelectric plate and spans the first and second cavity locations. A second piezoelectric plate is bonded to the bonding layer and spans the first and second cavity locations. A portion of the second piezoelectric plate spanning the second cavity location is etched away to form a first membrane over the first cavity location and a second membrane over the second cavity location. Interdigital transducers are formed on the first and second membranes over the first and second cavity location to form a first and second resonator on the same die.

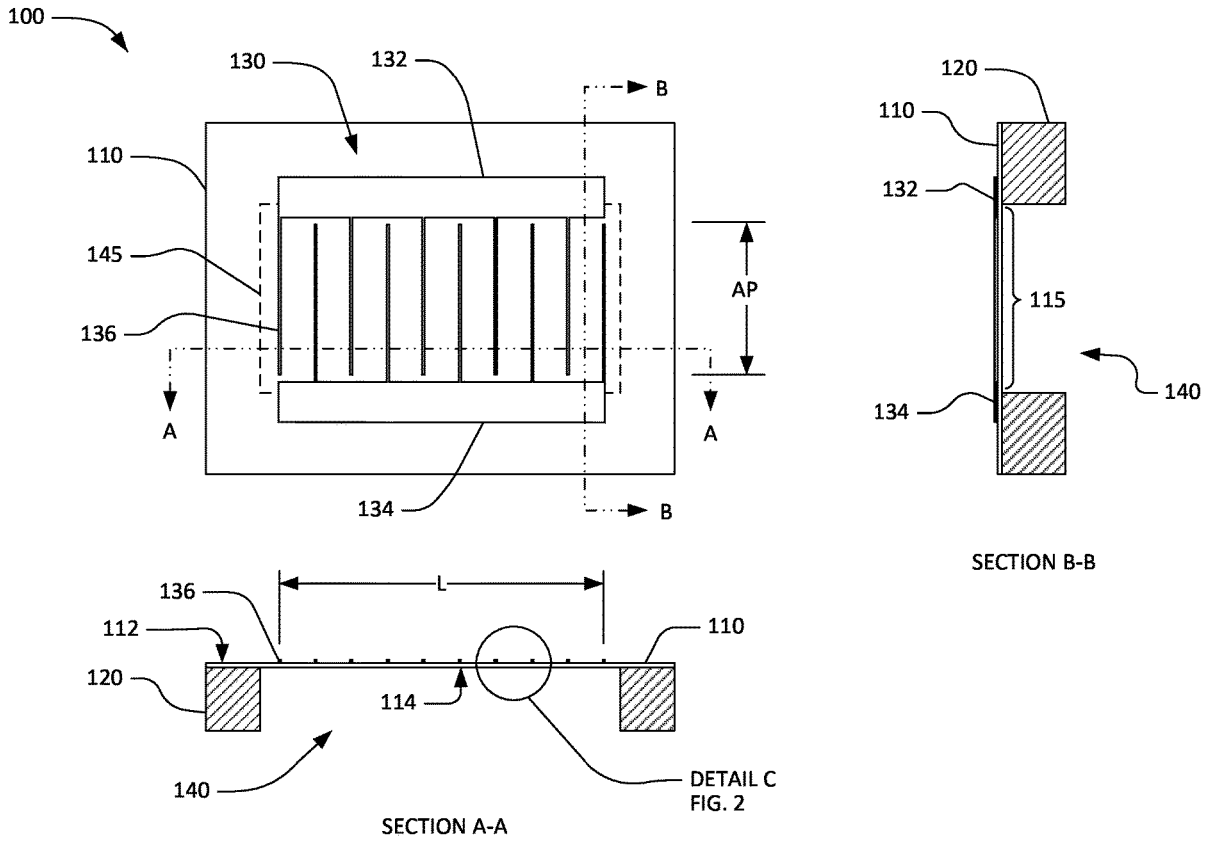

FIG. 2