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(54) **TRANSVERSELY-EXCITED FILM BULK ACOUSTIC RESONATORS WITH PIEZOELECTRIC DIAPHRAGM SUPPORTED BY PIEZOELECTRIC SUBSTRATE**

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(57) **ABSTRACT**

Acoustic resonators and filter devices, and methods for making acoustic resonators and filter devices. An acoustic resonator includes a substrate having a surface and a single-crystal piezoelectric plate having front and back surfaces. The back surface is attached to the surface of the substrate except for a portion of the piezoelectric plate forming a diaphragm spanning a cavity in the substrate. A conductor pattern formed is formed on the front surface of the piezoelectric plate, including an interdigital transducer (IDT) with interleaved fingers of the IDT on the diaphragm. An insulating layer is formed between the piezoelectric plate and portions of the conductor pattern other than the interleaved fingers.

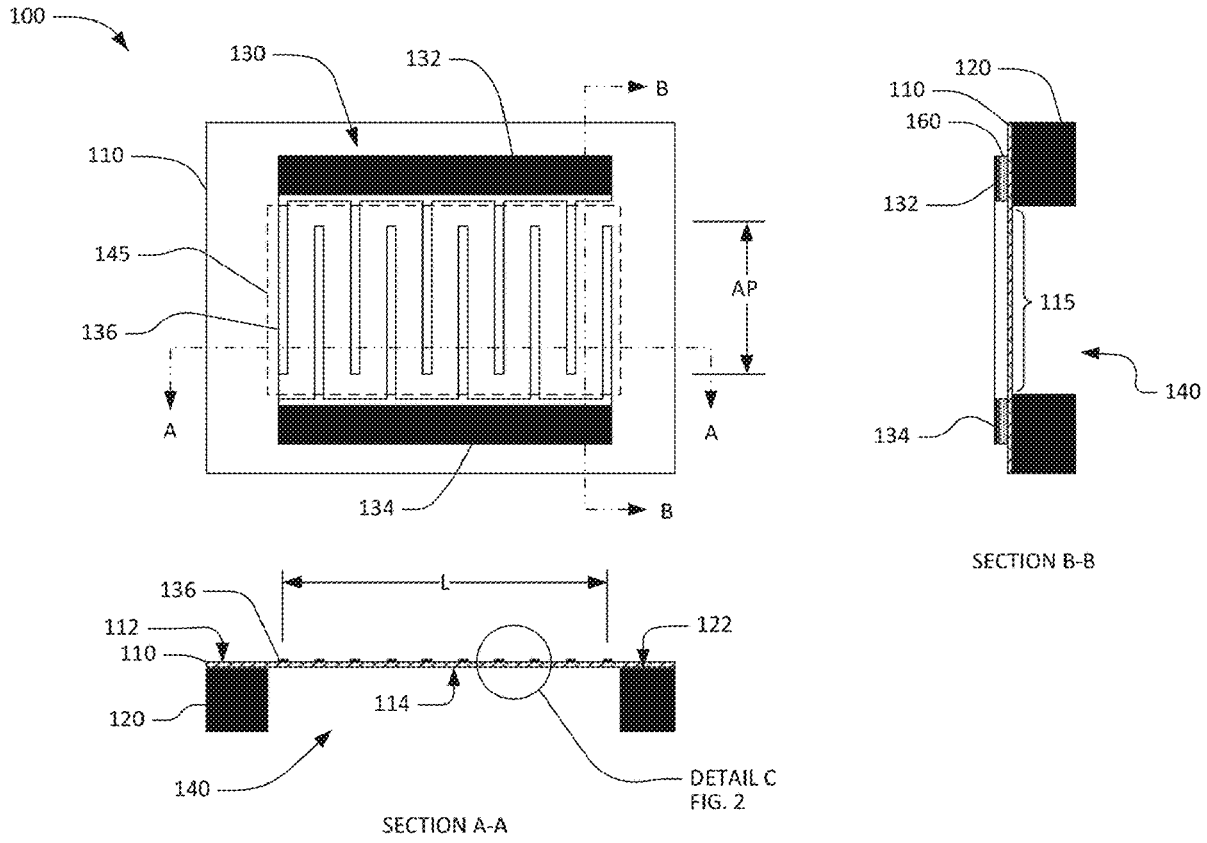

FIG. 2