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(54) **FILTER DEVICE**

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(57) **ABSTRACT**

Filter devices are disclosed. A filter device includes a piezoelectric plate comprising a supported portion, a first diaphragm, and a second diaphragm. The supported portion is attached to a substrate and the first and second diaphragms spans respective cavities in the substrate. A first interdigital transducer (IDT) has interleaved fingers on the first diaphragm. A second interdigital transducer (IDT) has interleaved fingers on the second diaphragm. A first dielectric layer is between the interleaved fingers of the first IDT, and a second dielectric layer is between the interleaved fingers of the second IDT. A thickness of the first dielectric layer is greater than a thickness of the second dielectric layer. The piezoelectric plate and the first and second IDTs are configured such that radio frequency signals applied to first and second IDTs excite primary shear acoustic modes in the respective diaphragms.