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- (81) **Designated States (unless otherwise indicated, for every kind of national protection available):** AE, AG, AL, AM,

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Declarations under Rule 4.17:

- as to applicant's entitlement to apply for and be granted a patent (Rule 4.17(ii))
- as to the applicant's entitlement to claim the priority of the earlier application (Rule 4.17(iii))

Published:

- with international search report (Art. 21(3))

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(54) **Title:** BULK ACOUSTIC WAVE RESONATOR

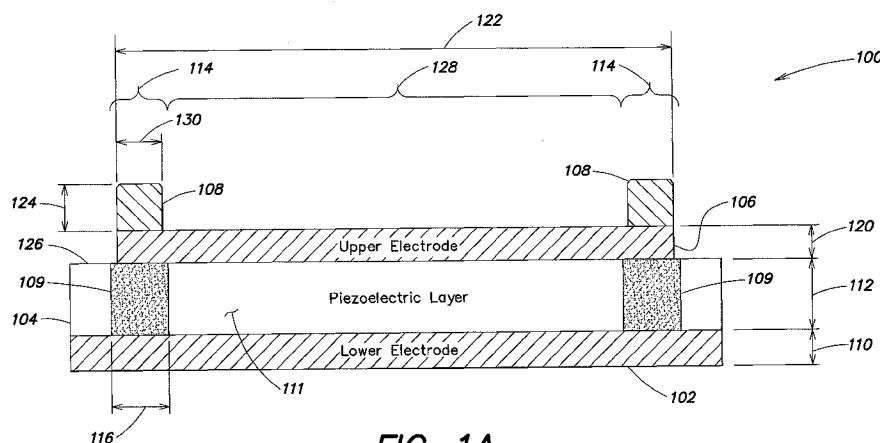


FIG. 1A

(57) **Abstract:** According to an exemplary embodiment, a bulk acoustic wave (BAW) resonator includes a piezoelectric layer situated between upper and lower electrodes, where each of the upper and lower electrodes are a high density metal. In one example, the BAW resonator further includes a controlled thickness region including a material segment that is one of a low density metal segment and a dielectric segment, where the material segment is situated adjacent to the piezoelectric layer, and where the controlled thickness region has controlled electromechanical coupling. The controlled thickness region can provide reduced electromechanical coupling into lateral modes. In another example, the piezoelectric layer has a disrupted texture region, where the disrupted texture region is situated in the controlled thickness region of the BAW resonator. The disrupted texture region can be situated at an edge of the BAW resonator and can extend along a perimeter of the BAW resonator.

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A. CLASSIFICATION OF SUBJECT MATTER**H03H 9/17(2006.01)i, H03H 9/25(2006.01)i, H03H 9/15(2006.01)i**

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC8: H03H

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Korean Utility Models and applications for Utility Models since 1975

Japanese Utility Models and applications for Utility Models since 1975

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

eKOMPASS(KIPO internal), keywords : BAW resonator, piezoelectric

C. DOCUMENTS CONSIDERED TO BE RELEVANT

| Category* | Citation of document, with indication, where appropriate, of the relevant passages | Relevant to claim No. |
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 Further documents are listed in the continuation of Box C. See patent family annex.

* Special categories of cited documents:

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Date of the actual completion of the international search

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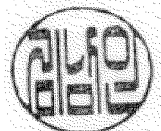
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INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No.

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