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(54) **Title :** NOVEL MEMS BIOSENSOR WITH INTEGRATED IMPEDANCE AND MASS-SENSING CAPABILITIES

(57) **Abstract (AB) :**
A BIOSENSOR DEVICE (1) PROVIDING AN ANALYSIS PLATFORM FOR DETECTING CELL GROWTH, COMPRISING OFAN ALUMINIUM NITRIDE (AIN) BASE (2), A SHEAR HORIZONTAL-SURFACE ACOUSTIC WAVE (SH-SAW) RESONATOR INCLUDING AN INPUT TRANSDUCER (4) AND AN OUTPUT TRANSDUCER (5) SYMMETRICALLY POSITIONED ON THE ALUMINUM NITRIDE (AIN)

BASE (2), A COUNTER ELECTRODE (6) POSITIONED PARALLEL TO WORKING ELECTRODES (7) ON THE ALUMINUM NITRIDE (AIN) BASE (2), FOR TRANSMITTING FREQUENCY VOLTAGE TOWARDS THE LIVING CELL (3), A PLURALITY OF WORKING ELECTRODES (7) POSITIONED BENEATH THE LIVING CELL (3) ON THE ALUMINIUM NITRIDE (AIN) BASE (2) FOR RECEIVING FREQUENCY VOLTAGE FROM THE LIVING CELL (3), AN IMPEDANCE ANALYZER (8) FOR RECEIVING IMPEDANCE READINGS FROM THE COUNTER ELECTRODE (6) AND WORKING ELECTRODES (7), AND A BACK-ETCHED SILICON SUBSTRATE (9) COUPLED TO THE ALUMINIUM NITRIDE (AIN) BASE (2), FOR REDUCING CURRENT LOSS, WHEREIN THE LIVING CELL (3) IS POSITIONED IN BETWEEN OF THE INPUT TRANSDUCER AND OUTPUT TRANSDUCER ON THE ALUMINIUM NITRIDE (AIN) BASE (4).

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