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(54) **SURFACE ACOUSTIC WAVE BIOSENSOR EMPLOYING AN ANALOG FRONT END AND DNA ENCODED LIBRARIES TO IMPROVED LIMIT OF DETECTION (LOD) WITH EXEMPLARY APPARATUS OF THE SAME**

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(57) **ABSTRACT**

A surface acoustic wave (SAW) performs a rapid, label-free detection of biological species. Biosensing and detection of multiple analytes multiplexed by an array of sensing lanes is configured to enable bio-amplification using engineered DNA encoded libraries as the probe through a phage display procedure to enhance specificity, capture statistics for the detection, screening and analyzing of the analyte in vitro. A biochemical formulation minimizes the limit of detection (LOD) at a threshold magnitude on the order of a femto-molar concentration. Additional enhancement of the apparatus is achieved by use of an analog front end to amplify biochemical events.