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(54) **DETECTION OF J-COUPLING USING ATOMIC MAGNETOMETER**

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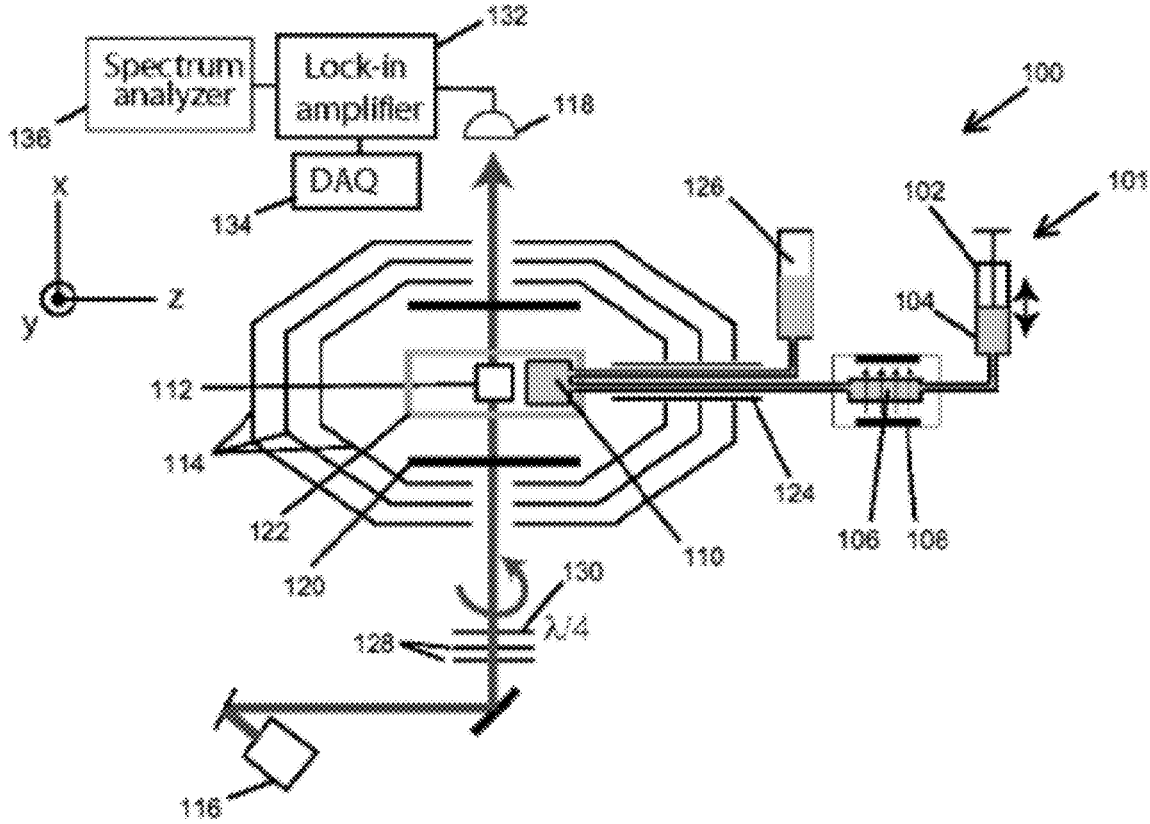
(57) **ABSTRACT**

An embodiment of a method of detecting a J-coupling includes providing a polarized analyte adjacent to a vapor cell of an atomic magnetometer; and measuring one or more J-coupling parameters using the atomic magnetometer. According to an embodiment, measuring the one or more J-coupling parameters includes detecting a magnetic field created by the polarized analyte as the magnetic field evolves under a J-coupling interaction.