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(54) Title: METHOD FOR LOW FREQUENCY NOISE CANCELLATION IN MAGNETO-RESISTIVE MIXED SENSORS

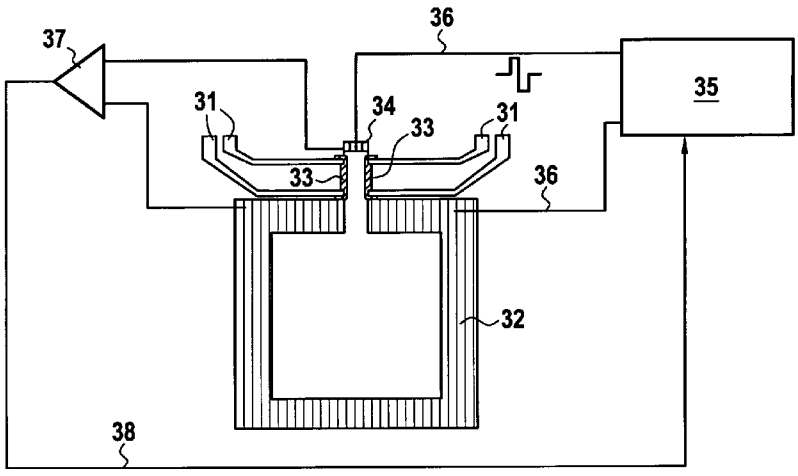

FIG.5

(57) Abstract: The method for cancellation of low frequency noise in a magneto-resistive mixed sensor (1) comprising at least a superconducting loop with at least one constriction and at least one magneto-resistive element (6) comprises a set of measuring steps with at least one measuring step being conducted with the normal running of the mixed sensor and at least another measuring step being conducted whilst an additional super-current is temporarily injected in the at least one constriction of the at least one superconducting loop of the mixed sensor (1) up to a critical super-current of the constriction so that the result of the at least another measuring step is used as a reference level of the at least one magneto-resistive element (6).

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AMENDED CLAIMS

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1. A method for cancellation of low frequency noise in a magneto-resistive mixed sensor comprising at least a superconducting loop with at least one constriction and at least one magneto-resistive element associated with said at least one constriction, characterized in that it comprises a set of measuring steps with at least one measuring step being conducted with the normal running of the mixed sensor, an additional current being injected in any constriction of any loop so that only the signal to be sensed is measured, and at least another measuring step being conducted whilst an additional super-current is temporarily injected in said at least one constriction of said at least one superconducting loop of the mixed sensor up to a critical super-current of the said constriction so that the result of the said at least another measuring step is used as a reference level of said at least one magneto-resistive element, and in that the cycle of one set of measuring steps is performed at a sampling frequency which is at least two times higher than the maximal frequency to the detected.

2. A method according to claim 1, characterized in that the cancellation of low frequency noise is obtained by a set of a first and a second measuring steps, the first measuring step being conducted without any injected current whereas the second measuring step is conducted with the injection of an additional super-current, and the final measurement results in the substraction of the result of the second measuring step from the result of the first measuring step.

3. A method according to claim 1, characterized in that said at least another measuring step is conducted whilst at first an additional positive current is injected and then a negative current is injected.

4. A method according to claim 3, characterized in that the cancellation of low frequency noise is obtained by a set of three measuring steps, wherein a first measuring step is conducted without any injected current, a second measuring step is conducted with the injection

of a positive additional current and a third measuring step is conducted with the injection of a negative additional current.

5. A method according to claim 3, characterized in that the cancellation of low frequency noise is obtained by a set of four measuring steps, wherein a first measuring step is conducted without any injected current, a second measuring step is conducted with the injection of a positive additional current, a third measuring step is conducted with the injection of a negative additional current and a fourth measuring step is conducted after the removal of the previously injected additional current, the result of the fourth measuring step constituting a reference for a next set of measuring steps.

6. A method according to claim 5, characterized in that a plurality of sets of four measuring steps are conducted and at the end of each set of measuring steps, the result of the fourth measuring step of the preceding set is subtracted from the result of the first measuring step of the current set to provide a first difference, the mean value of the results of the second and third measuring steps of the current set is subtracted from said first difference to provide a second difference and the mean value of the results of the second and third measuring steps of the first set is added to the second difference as a reference of zero super-current.

7. A method according to anyone of claims 1 to 6, characterized in that the additional current is injected by wires in some part of the superconducting loop of the mixed sensor.

8. A method according to anyone of claims 1 to 6, characterized in that the additional current is injected by the use of an additional magnetic field applied on the superconducting loop of the mixed sensor.