CLAIMS

1. A magnetic measurement system which measures magnetism by using a magnetic sensor, the magnetic sensor being provided with a magnetic-field generation part which generates a magnetic field in accordance with a current passed, the system comprising:

a storage part which stores characteristic information of the magnetic-field generation part indicating a magnetic output characteristic, which is a relation between the current passed to the magnetic-field generation part and the magnetism acting on the magnetic sensor;

an estimation part which estimates a magnetic differential value A, which is an amount of change of the magnetism acting on the magnetic sensor due to a current differential value A, which is an amount of change of the current passed to the magnetic-field generation part, by referring to the characteristic information of the magnetic-field generation part stored by the storage part; and

a calibration part which calibrates the magnetic sensor by adjusting a ratio between an output differential value A, which is an amount of change of a sensor output outputted by the magnetic sensor in accordance with a change of the current by the current differential value A acting on the magnetic-field generation part, and the magnetic differential value A estimated by the estimation part for the current differential value A.

2. The magnetic measurement system according to claim 1, wherein the characteristic information of the magnetic-field generation part stored by the storage part is information of a combination of a current differential value, which is the amount of change of the current passed to the magnetic-field generation part, and a magnetic differential value, which is the amount of change of the magnetism acting on the magnetic sensor.

3. The magnetic measurement system according to claim 1 ~~or 2~~, wherein the magnetic-field generation part includes a coil with an electric wire wound therearound to generate the magnetic field in accordance with energization to the coil.

4. The magnetic measurement system according to claim 3, wherein the magnetic sensor includes a magnetic wire as a magnetically sensitive body and a coil with an electric wire wound around the magnetic wire, and

the coil of the magnetic sensor and the coil of the magnetic-field generation part have common specifications except a number of winding.

5. A method of calibrating a magnetic sensor which measures magnetism, the magnetic sensor provided with a magnetic-field generation part which generates a magnetic field in accordance with a current passed and provided with a storage part which stores characteristic information of the magnetic-field generation part indicating a magnetic output characteristic, which is a relation between the current passed to the magnetic-field generation part and the magnetism acting on the magnetic sensor,

the method comprising:

a magnetic estimation step of estimating a magnetic differential value A, which is an amount of change of the magnetism acting on the magnetic sensor due to a current differential value A, which is an amount of change of the current passed to the magnetic-field generation part, based on the characteristic information of the magnetic-field generation part stored by the storage part; and

a calibration step of calibrating the magnetic sensor by adjusting a ratio between an output differential value A, which is an amount of change of a sensor output outputted by the magnetic

sensor in accordance with a change of the current by the current differential value A acting on the magnetic-field generation part, and the magnetic differential value A estimated at the magnetic estimation step for the current differential value A.

6. The method of calibrating the magnetic sensor according to claim 5, wherein the characteristic information of the magnetic-field generation part stored by the storage part is information of a combination of a current differential value, which is the amount of change of the current passed to the magnetic-field generation part, and a magnetic differential value, which is the amount of change of the magnetism acting on the magnetic sensor.

7. The method of calibrating the magnetic sensor according to claim 5~~ or 6~~, further comprising:

a sensor characteristic acquiring step of acquiring characteristic information of the magnetic sensor indicating a sensor output characteristic, which is a relation between the magnetism acting on the magnetic sensor and the sensor output outputted by the magnetic sensor, by measuring an amount of change serving as a reference of the sensor output of the magnetic sensor when the magnetism acting on the magnetic sensor is changed by a reference amount;

a magnetic measurement step of measuring the magnetism acting on the magnetic sensor when the current passed to the magnetic-field generation part is changed and acquiring an output differential value B, which is an amount of change of the sensor output outputted by the magnetic sensor in accordance with a current differential value B, which is an amount of change of the current passed to the magnetic-field generation part; and

a magnetic output characteristic acquiring step of estimating a magnetic differential value B corresponding to the output

differential value B acquired at the magnetic measurement step with reference to the characteristic information indicating the sensor output characteristic of the magnetic sensor, acquiring a combination of the magnetic differential value B and the current differential value B as the characteristic information indicating a magnetic output characteristic of the magnetic-field generation part, and storing the combination in the storage part.

8. The method of calibrating the magnetic sensor according to claim 7, wherein the characteristic information of the magnetic sensor is information of a combination of a magnetic differential value C corresponding to the reference amount and an output differential value C, which is an amount of change serving as a reference of the sensor output outputted by the magnetic sensor, and

the sensor characteristic acquiring step includes a calibration process of adjusting a ratio between the magnetic differential value C and the output differential value C of the magnetic sensor.

9. The method of calibrating the magnetic sensor according to ~~any one of claims 5 to 8~~ claim 5, wherein the magnetic sensor is ~~the magnetic sensor described in any one of claims 1 to 4.~~included in a magnetic measurement system, the system comprising:

a storage part which stores characteristic information of the magnetic-field generation part indicating a magnetic output characteristic, which is a relation between the current passed to the magnetic-field generation part and the magnetism acting on the magnetic sensor;

an estimation part which estimates a magnetic differential value A, which is an amount of change of the magnetism acting on the magnetic sensor due to a current differential value A, which

is an amount of change of the current passed to the magnetic-field generation part, by referring to the characteristic information of the magnetic-field generation part stored by the storage part; and

a calibration part which calibrates the magnetic sensor by adjusting a ratio between an output differential value A, which is an amount of change of a sensor output outputted by the magnetic sensor in accordance with a change of the current by the current differential value A acting on the magnetic-field generation part, and the magnetic differential value A estimated by the estimation part for the current differential value A.

10. The magnetic measurement system according to claim 2, wherein the magnetic-field generation part includes a coil with an electric wire wound therearound to generate the magnetic field in accordance with energization to the coil.

11. The magnetic measurement system according to claim 10, wherein the magnetic sensor includes a magnetic wire as a magnetically sensitive body and a coil with an electric wire wound around the magnetic wire, and

the coil of the magnetic sensor and the coil of the magnetic-field generation part have common specifications except a number of winding.

12. The method of calibrating the magnetic sensor according to claim 6, further comprising:

a sensor characteristic acquiring step of acquiring characteristic information of the magnetic sensor indicating a sensor output characteristic, which is a relation between the magnetism acting on the magnetic sensor and the sensor output outputted by the magnetic sensor, by measuring an amount of change serving as a reference of the sensor output of the magnetic sensor

when the magnetism acting on the magnetic sensor is changed by a reference amount;

a magnetic measurement step of measuring the magnetism acting on the magnetic sensor when the current passed to the magnetic-field generation part is changed and acquiring an output differential value B, which is an amount of change of the sensor output outputted by the magnetic sensor in accordance with a current differential value B, which is an amount of change of the current passed to the magnetic-field generation part; and

a magnetic output characteristic acquiring step of estimating a magnetic differential value B corresponding to the output differential value B acquired at the magnetic measurement step with reference to the characteristic information indicating the sensor output characteristic of the magnetic sensor, acquiring a combination of the magnetic differential value B and the current differential value B as the characteristic information indicating a magnetic output characteristic of the magnetic-field generation part, and storing the combination in the storage part.

13. The method of calibrating the magnetic sensor according to claim 12, wherein the characteristic information of the magnetic sensor is information of a combination of a magnetic differential value C corresponding to the reference amount and an output differential value C, which is an amount of change serving as a reference of the sensor output outputted by the magnetic sensor, and

the sensor characteristic acquiring step includes a calibration process of adjusting a ratio between the magnetic differential value C and the output differential value C of the magnetic sensor.

14. The method of calibrating the magnetic sensor according to

claim 6, wherein the magnetic sensor is included in a magnetic measurement system, the system comprising:

a storage part which stores characteristic information of the magnetic-field generation part indicating a magnetic output characteristic, which is a relation between the current passed to the magnetic-field generation part and the magnetism acting on the magnetic sensor;

an estimation part which estimates a magnetic differential value A, which is an amount of change of the magnetism acting on the magnetic sensor due to a current differential value A, which is an amount of change of the current passed to the magnetic-field generation part, by referring to the characteristic information of the magnetic-field generation part stored by the storage part; and

a calibration part which calibrates the magnetic sensor by adjusting a ratio between an output differential value A, which is an amount of change of a sensor output outputted by the magnetic sensor in accordance with a change of the current by the current differential value A acting on the magnetic-field generation part, and the magnetic differential value A estimated by the estimation part for the current differential value A.

15. The method of calibrating the magnetic sensor according to claim 7, wherein the magnetic sensor is included in a magnetic measurement system, the system comprising:

a storage part which stores characteristic information of the magnetic-field generation part indicating a magnetic output characteristic, which is a relation between the current passed to the magnetic-field generation part and the magnetism acting on the magnetic sensor;

an estimation part which estimates a magnetic differential value A, which is an amount of change of the magnetism acting on the magnetic sensor due to a current differential value A, which

is an amount of change of the current passed to the magnetic-field generation part, by referring to the characteristic information of the magnetic-field generation part stored by the storage part; and

a calibration part which calibrates the magnetic sensor by adjusting a ratio between an output differential value A, which is an amount of change of a sensor output outputted by the magnetic sensor in accordance with a change of the current by the current differential value A acting on the magnetic-field generation part, and the magnetic differential value A estimated by the estimation part for the current differential value A.

16. The method of calibrating the magnetic sensor according to claim 8, wherein the magnetic sensor is included in a magnetic measurement system, the system comprising:

a storage part which stores characteristic information of the magnetic-field generation part indicating a magnetic output characteristic, which is a relation between the current passed to the magnetic-field generation part and the magnetism acting on the magnetic sensor;

an estimation part which estimates a magnetic differential value A, which is an amount of change of the magnetism acting on the magnetic sensor due to a current differential value A, which is an amount of change of the current passed to the magnetic-field generation part, by referring to the characteristic information of the magnetic-field generation part stored by the storage part; and

a calibration part which calibrates the magnetic sensor by adjusting a ratio between an output differential value A, which is an amount of change of a sensor output outputted by the magnetic sensor in accordance with a change of the current by the current differential value A acting on the magnetic-field generation part, and the magnetic differential value A estimated by the estimation part for the current differential value A.

17. The method of calibrating the magnetic sensor according to claim 9, wherein the magnetic sensor is included in a magnetic measurement system, the system comprising:

a storage part which stores characteristic information of the magnetic-field generation part indicating a magnetic output characteristic, which is a relation between the current passed to the magnetic-field generation part and the magnetism acting on the magnetic sensor;

an estimation part which estimates a magnetic differential value A, which is an amount of change of the magnetism acting on the magnetic sensor due to a current differential value A, which is an amount of change of the current passed to the magnetic-field generation part, by referring to the characteristic information of the magnetic-field generation part stored by the storage part; and

a calibration part which calibrates the magnetic sensor by adjusting a ratio between an output differential value A, which is an amount of change of a sensor output outputted by the magnetic sensor in accordance with a change of the current by the current differential value A acting on the magnetic-field generation part, and the magnetic differential value A estimated by the estimation part for the current differential value A,

wherein the characteristic information of the magnetic-field generation part stored by the storage part is information of a combination of a current differential value, which is the amount of change of the current passed to the magnetic-field generation part, and a magnetic differential value, which is the amount of change of the magnetism acting on the magnetic sensor.

18. The method of calibrating the magnetic sensor according to claim 9, wherein the magnetic-field generation part includes a coil with an electric wire wound therearound to generate the magnetic

field in accordance with energization to the coil,

the magnetic sensor includes a magnetic wire as a magnetically sensitive body and a coil with an electric wire wound around the magnetic wire, and

the coil of the magnetic sensor and the coil of the magnetic-field generation part have common specifications except a number of winding.

19. The method of calibrating the magnetic sensor according to claim 14, wherein the magnetic-field generation part includes a coil with an electric wire wound therearound to generate the magnetic field in accordance with energization to the coil,

the magnetic sensor includes a magnetic wire as a magnetically sensitive body and a coil with an electric wire wound around the magnetic wire, and

the coil of the magnetic sensor and the coil of the magnetic-field generation part have common specifications except a number of winding.