CLAIMS

1. A deterioration prediction device for a magnetic body, comprising:

a magnetic sensor configured to detect a magnetic field affected by a magnetic body as an inspection target and output a sensor signal;

a deterioration score calculation means configured to calculate a deterioration score indicating a degree of deterioration of the magnetic body, based on the sensor signal;

a deterioration score storage unit configured to store the deterioration score;

a deterioration prediction model storage unit configured to store a deterioration prediction model indicating a change in the degree of deterioration, the deterioration prediction model including a set of the deterioration scores calculated based on a sensor signal output from a sensor of the same type as the magnetic sensor by applying a load to a magnetic body of the same type as the magnetic body as an inspection target at a plurality of time points;

a deterioration prediction model update means configured to update the deterioration prediction model based on the deterioration score at a plurality of time points to acquire an updated deterioration prediction model, the deterioration prediction model including a set of the deterioration scores calculated based on a sensor signal output from a sensor of the same type as the magnetic sensor by applying a load to a magnetic body of the same type as the magnetic body as an inspection target at a plurality of time points; and

a deterioration score prediction means configured to estimate a future deterioration score or a life of the magnetic body from the updated deterioration prediction model.

2. The deterioration prediction device for a magnetic body as recited in claim 1,

wherein when the deterioration prediction model update means detects an unexpected event, the deterioration prediction model update means updates the deterioration prediction model based on the deterioration score at a plurality of time points after the detection of the unexpected event to acquire the updated deterioration prediction model.

3. The deterioration prediction device for a magnetic body as recited in claim 1 or 2,

wherein the magnetic body is a wire rope.

4. The deterioration prediction device for a magnetic body as recited in any one of claims 1 to 3, further comprising:

a registration unit configured to register at least one of a target predetermined section of the magnetic body and the deterioration prediction model.

5. The deterioration prediction device for a magnetic body as recited in claim 2,

wherein the unexpected event includes at least one of an earthquake, a fire, a lightning strike, flooding, and maintenance.

6. The deterioration prediction device for a magnetic body as recited in any one of claims 3 to 5,

wherein the magnetic sensor detects the magnetic field by a total magnetic flux method.

7. The deterioration prediction device for a magnetic body as recited in any one of claims 3 to 5,

wherein the deterioration prediction model includes a set of deterioration scores calculated based on a sensor signal output from a sensor of the same type as the magnetic sensor each time a load is applied to a wire rope of the same type as the wire rope at a plurality of time points.

8. A deterioration prediction method for a magnetic body, comprising:

a sensor signal acquisition step of acquiring a sensor signal by detecting a magnetic field affected by a magnetic body as an inspection target by a magnetic sensor;

a deterioration score calculation step of calculating a deterioration score indicating a degree of deterioration of the magnetic body, based on the sensor signal;

a deterioration prediction model update step of updating a deterioration prediction model indicating a change in the degree of deterioration based on the deterioration score at a plurality of time points to acquire an updated deterioration prediction model, the deterioration prediction model including a set of the deterioration

scores calculated based on a sensor signal output from a sensor of the same type as the magnetic sensor by applying a load to a magnetic body of the same type as the magnetic body as an inspection target at a plurality of time points;

a deterioration score estimation step of estimating a future deterioration score from the updated deterioration prediction model; and

a deterioration prediction model preparation step of preparing the deterioration prediction model including a set of the deterioration scores calculated based on a sensor signal output from a sensor of the same type as the magnetic sensor by applying a load to a magnetic body of the same type as the magnetic body as an inspection target at a plurality of time points.

9. The deterioration prediction method for a magnetic body as recited in claim 8,

wherein when an unexpected event is detected, the deterioration prediction model update step updates the deterioration prediction model based on the deterioration score at the plurality of time points after the detection of the unexpected event to acquire the updated deterioration prediction model.

10. The deterioration prediction method of a magnetic body as recited in claim 8 or 9,

wherein the deterioration prediction model preparation step prepares the deterioration prediction model including a set of the deterioration scores calculated based on a sensor signal output from a sensor of the same type as the magnetic sensor

each time a load is applied to a magnetic body of the same type as the magnetic body as the inspection target at a plurality of time points.