

CLAIMS

1. A magnetic marker diagnostic system which diagnoses operation situations of magnetic markers laid as spaced in or on a traveling road so as to be magnetically detectable by a vehicle,
5 the diagnostic system comprising:

a magnetic measuring part which obtains a one-dimensional or two-dimensional magnetic distribution, which includes magnetic measurement values in at least a vehicle-width direction,
by measuring a magnitude of magnetism with which any of magnetic
10 markers acts therearound;

an imaging part which obtains a marker image, which is one-dimensional or two-dimensional image information, by imaging the magnetic marker in at least the vehicle-width direction, wherein an imaging area of the imaging part covers a magnetic detection
15 area of the magnetic measuring part; and

a diagnosing part which determines presence or absence of a flaw in the magnetic marker based on a comparison between the magnetic distribution and the marker image.

20 2. The magnetic marker diagnostic system in claim 1, comprising:

a storage part which stores information indicating a positional relation between a reference point in ~~a~~ the magnetic detection area by the magnetic measuring part and ~~an~~ the imaging
25 area by the imaging part; and

a processing part which associates the magnetic detection area with the imaging area based on a result of estimation of a motion of the vehicle and the positional relation between the reference point in the magnetic detection area and the imaging
30 area.

3. The magnetic marker diagnostic system in claim 1 or 2,

wherein the diagnosing part has a threshold processing part which performs a threshold process regarding a positional deviation between a distribution center in the magnetic distribution and a center of a marker area in the marker image, and is configured
5 to determine presence or absence of the flaw in accordance with the result of the threshold process.

4. The magnetic marker diagnostic system in claim 3, wherein a boundary between the marker area in the marker image and a road
10 surface area corresponding to a road surface, which is a surface of the traveling road is identified, and a position corresponding to a center of the boundary forming an outer edge of the marker area is identified as the center of the marker area.

15 5. The magnetic marker diagnostic system in claim 3, wherein an average position of each pixel obtained by weighting a pixel value of each pixel belonging to the marker area is identified as the center of the marker area.

20 6. The magnetic marker diagnostic system in claim 1 or 2, wherein the diagnosing part is configured to obtain an index indicating symmetry of the marker image or the marker area with reference to a distribution center in the magnetic distribution and determine presence or absence of the flaw by a threshold
25 process regarding the index.

7. The magnetic marker diagnostic system in any one of claims 1 to 6, wherein the magnetic marker is buried at a position deeper than a road surface forming a surface of the traveling
30 road, and the marker image is an eyemark provided on the road surface corresponding to the buried magnetic marker or a taken image of a plug to be put in an accommodation hole bored in the

road surface to have the magnetic marker buried therein.

8. The magnetic marker diagnostic system in any one of claims 1 to 6, wherein the magnetic marker is a sheet-shaped magnetic marker arranged on a road surface forming a surface of the traveling road, and the marker image is a taken image of the sheet-shaped magnetic marker.

9. A magnetic marker diagnostic method of diagnosing operation situations of magnetic markers laid in or on a traveling road so as to be magnetically detectable by a vehicle, the method comprising:

a magnetic distribution obtaining process of obtaining a one-dimensional or two-dimensional magnetic distribution, which includes magnetic measurement values in at least a vehicle-width direction, by measuring a magnitude of magnetism with which any of magnetic markers acts therearound;

an image obtaining process of obtaining a marker image, which is a one-dimensional or two-dimensional image, by imaging the magnetic marker in at least the vehicle-width direction, wherein an imaging area of the image obtaining process covers a magnetic detection area of the magnetic distribution obtaining process; and

a diagnostic process of determining presence or absence of a flaw in the magnetic marker based on a comparison between the magnetic distribution and the marker image.

10. The magnetic marker diagnostic method in claim 9, wherein the diagnostic process is a process of determining presence or absence of the flaw by threshold determination regarding a positional deviation between a distribution center in the magnetic distribution and a center of a marker area in the marker

image.