

CLAIMS

1. A magnetic marker installation method for laying magnetic markers in a road for driving assist control on a vehicle side, the method comprising:

5 a step of laying the magnetic marker in the road by allowing a positional error;

a step of detecting the laid magnetic marker by using a work apparatus including a magnetic sensor capable of detecting magnetism, and measuring lateral shift amount with respect to
10 the detected magnetic marker;

a step of identifying position of the work apparatus when the magnetic marker is detected;

a step of identifying the laying position of the magnetic marker by combining the position of the work apparatus when the magnetic marker is detected and the lateral shift amount measured
15 with the magnetic marker to generate position data regarding the magnetic marker; and

a step of generating a database of position data regarding the magnetic markers usable for identifying position of a vehicle
20 when the magnetic marker is detected.

2. The magnetic marker installation method according to claim 1, wherein position data regarding the magnetic marker is data representing deviation Offset in a width direction of the road
25 with respect to a design laying line for arranging the magnetic markers.

3. The magnetic marker installation method according to claim 1, wherein the laying position of the magnetic marker is
30 identified by estimating relative position of the magnetic marker by inertial navigation calculation with taking a point where its absolute position is known as a reference position.

4. A magnetic marker installation method for laying magnetic markers in a road for driving assist control on a vehicle side, wherein

5 after the magnetic markers are laid in the road, by using a work apparatus including a magnetic sensor capable of detecting magnetism, the laid magnetic markers are detected,

as for first and second magnetic markers where their absolute positions are known, a relative position of the second magnetic marker is estimated by inertial navigation calculation with taking a position of the first magnetic marker as the reference position, and a relative position of a magnetic marker positioned in between the first and second magnetic markers is estimated by an estimation process of making a difference between the relative position of the second magnetic marker and an actual relative position of the second magnetic marker with respect to the first magnetic marker closer to zero, and laying positions of the magnetic markers are thereby identified to generate position data regarding the magnetic markers.

20 5. The magnetic marker installation method according to any one of claims 1 to 4, wherein by using, as the work apparatus, a work vehicle including a detection apparatus which detects the magnetic markers by using the magnetic sensor and a positioning apparatus which measures a position, the magnetic markers are detected while the work vehicle is moving along the road, and the laying positions of the magnetic markers are identified based on the position measured by the positioning apparatus.

30 6. The magnetic marker installation method according to claim 5, wherein the work vehicle is configured to detect magnetic markers while traveling along the road by automatic traveling.

7. The magnetic marker installation method according to claim 6, wherein the work vehicle is configured to automatically travel by traveling control based on the lateral shift amount with respect to the detected magnetic marker.

8. The magnetic marker installation method according to any one of claims 5 to 7, wherein a positional relation between the detection apparatus and the positioning apparatus is preset in the work apparatus, and

the positioning apparatus is configured to measure a position of a specific location of the detection apparatus.

9. The magnetic marker installation method according to any one of claims 5 to 8, wherein the positioning apparatus is an apparatus which measures an absolute position.

10. A work system for performing a work of laying magnetic markers for driving assist control on a vehicle side, comprising:

a laying apparatus which lays magnetic markers in a road by allowing a positional error;

a detection apparatus which senses magnetism for detecting a magnetic marker and measures lateral shift amount with respect to the detected magnetic marker; and

a positioning apparatus which measures a position, wherein the work system is configured to

detect, by the detection apparatus, the magnetic marker laid in the road by the laying apparatus and identify, by the positioning apparatus, position of the detection apparatus when the magnetic marker is detected, and

identify laying position of the magnetic marker by combining the position of the detection apparatus measured by

the positioning apparatus when the magnetic marker is detected and the lateral shift amount measured with the magnetic marker to generate position data regarding the magnetic marker, and generate a database of position data regarding the magnetic markers usable for identifying position of a vehicle when the magnetic marker is detected.

11. The work system according to claim 10, wherein the detection apparatus and the positioning apparatus are provided in one work apparatus, and the one work apparatus can move independently from a work apparatus including the laying apparatus.

12. The work system according to claim 11, wherein the one work apparatus is a work vehicle that can travel on the road, and the work vehicle is configured to detect magnetic markers while traveling along the road by automatic traveling.

13. The work system according to claim 12, wherein the work vehicle is configured to automatically travel by traveling control based on the lateral shift amount with respect to the detected magnetic marker.