

Claims

1. System comprising:

- 5 - a vehicle comprising a positioning determining system, said positioning determining system comprising:
- a plurality of sensors for measuring the magnetic field strength of a magnetic marker element;
- computation means for determining the position
10 of the sensed magnetic marker element with respect to the plurality of sensors;
- wherein
- the plurality of sensors are arranged in a two dimensional array;
- 15 wherein
- said computation means is configured for:
- obtaining the magnetic field strength measurements from the plurality of sensors;
- associating a position within the array of
20 sensors with each individual magnetic field strength measurement;
- fitting the set of magnetic field strength measurements and associated positions to a spatial model of the magnetic field of a magnetic marker
25 element; and
- determining the position of the sensed magnetic marker element with respect to the plurality of sensors; and
- multiple individual magnetic marker elements
30 provided in a surface suitable for said vehicle to drive on;
- wherein

- the positions of multiple magnetic marker elements are determined from a single measurement by the two-dimensional array of sensors,

wherein hierarchical functionality provided by a Digital Signal Processor (DSP) and a navigation computer is the following:

a first level which is the Input/Output (IO) level, wherein the first level is responsible for obtaining the magnetic field strength readouts from the array of sensors,

a second level, wherein a position within the array of sensors is associated with each individual magnetic field strength measurement,

a third level, wherein the set of magnetic field strength positions is fitted in a fitter-level to a 3-dimensional model of a magnetic marker element, this resulting in an estimated position of the magnetic marker element relative to the array of sensors,

wherein the estimated relative position of the magnetic marker element is used in a fourth level, to determine a position of the vehicle.

2. System according to claim 1, wherein the sensors are evenly interspaced in both dimensions.

3. System according to any of claims 1 or 2, wherein the sensitivity of the sensors for a magnetic field component perpendicular to the plane wherein the plurality of sensors are arranged is higher than the sensitivity for magnetic field components parallel to this plane.

4. System according to any of claims 1 to 3, wherein the positioning determining system is arranged to decode

information that is coded by means of a mutual arrangement of a group of magnetic marker elements in the surface and/or the polarity of the individual magnetic marker elements in a group of magnetic marker elements.

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5. System according to any of claims 1-4,
wherein

- the position of the magnetic marker elements is
a grid-like pattern.

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6. Method for determining a position of a vehicle,
comprising the steps of:

- acquiring from a plurality of sensors
arranged in a two-dimensional array, the magnetic field
15 strengths of a magnetic marker element measured by the
sensors;

- associating a position within the array of
sensors with each individual magnetic field strength
measurement;

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- fitting the set of magnetic field strength
measurements and associated positions to a spatial model of
the magnetic field of a magnetic marker element; and

- determining the position of said magnetic marker
element with respect to the plurality of sensors
25 on the basis of the set of magnetic field strength
measurements and associated positions fitted to said spatial
model of the magnetic field of a magnetic marker element.

7. Method according to claim 6,
30 further comprising the step of:

- determining the position of said vehicle
using said determined position of the sensed magnetic marker

element with respect to the plurality of sensors.

~~1. System for determining the position of a vehicle comprising:~~

~~a plurality of sensors for measuring the magnetic field strength of a magnet;~~

~~computation means for determining the position of the magnet with respect to the plurality of sensors;~~

~~wherein the plurality of sensors are arranged in a two-dimensions array.~~

~~2. System according to claim 1, wherein the sensors are evenly interspaced in both dimensions.~~

~~3. System according to claim 1 or 2, further comprising means for fitting the magnetic field strengths measured by the plurality of sensors to a spatial model of the magnetic field of a magnet.~~

~~4. System according to claim 1, 2, or 3, wherein the sensitivity of the sensors for a magnetic field component perpendicular to the plane wherein the plurality of sensors are arranged is substantially higher than the sensitivity for magnetic field components parallel to this plane.~~

~~5. System according to any of claims 1-4, wherein the system is arranged to decode information that is coded by means of a mutual arrangement of a group of magnets in the surface and/or the polarity of the individual magnets in a group of magnets.~~

~~6. Vehicle comprising a system according to any of claims 1-5.~~

7. Method for determining a position of a vehicle,
comprising the steps of:

5 acquiring from a plurality of sensor, the magnetic
field strengths measured by the sensors;

determining the position of a sensed magnet with
respect to the plurality of sensors;

wherein the plurality of sensors are arranged in a two-
dimensional area.

10 8. Method according to claim 7, wherein the
position of a sensed magnet is determined by fitting the
acquired magnetic field strengths to a spatial model of the
magnetic field of a magnet.

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