CLAIMS

Claim 1. An automatic parking system which controls a vehicle so as to cause the vehicle to be moved to a parking place and to be accommodated in a parking frame provided in the parking place, the system comprising:

a route where a magnetic marker forming a magnetism generation source is laid so as to be detectable by using each of ~~a~~ magnetic detecting parts provided to the vehicle;

a position information providing part which provides position identification information capable of identifying a laying position of the magnetic marker; ~~and~~

a position identifying part which identifies a vehicle position, where the vehicle is located based on the laying position of the magnetic marker, and an orientation of the vehicle; and

the vehicle has the magnetic detecting parts which detect the magnetic marker and capable of identifying a lateral shift amount indicating a relative position in a vehicle-width direction with respect to the detected magnetic marker, the magnetic detecting parts arranged at two locations separated with a predetermined space in a longitudinal direction of the vehicle, wherein

two said magnetic markers are arranged as separated with a space equal to the said predetermined space are arranged in at least either one frame of a vehicle-stop frame and the parking frame for the vehicle to be forwarded to the parking place, and

when the magnetic detecting parts at the two locations in the longitudinal direction of the vehicle simultaneously detect the two magnetic markers arranged in the frame, the position identifying part identifies the orientation of the vehicle with reference to an azimuth connecting the two magnetic markers based on the lateral shift amounts identified by each of the magnetic detecting parts.

Claim 2. The automatic parking system according to claim 1,

comprising a control unit configured to cause the vehicle, when starting control of the vehicle stopped in the frame, to move forward or backward in the frame until the magnetic detecting parts at the two locations in the longitudinal direction of the vehicle simultaneously detect the two magnetic markers arranged in the frame, thereby allowing the orientation of the vehicle to be identified by the position identifying part.

Claim 3. An automatic parking system which controls a vehicle so as to cause the vehicle to be moved to a parking place and to be accommodated in a parking frame provided in the parking place,

a standard garaging path being identified as a guiding line for each said parking frame, the system comprising:

a route where a magnetic marker forming a magnetism generation source is laid so as to be detectable by using each of magnetic detecting parts provided to the vehicle;

a position information providing part which provides position identification information capable of identifying a laying position of the magnetic marker;

a position identifying part which identifies a vehicle position where the vehicle is located based on the laying position of the magnetic marker;

a storage medium which stores vehicle spec information including specification information of the vehicle; and

a configuration which calculates a garaging path as a control target by using the specification information of the vehicle included in the vehicle spec information and calculates a deviation of the garaging path as the control target with respect to the guiding line.

Claim 4. The automatic parking system according to claim 3, wherein

guiding markers are laid as other magnetic markers along the guiding line, and

the configuration which calculates the deviation of the garaging path calculates the deviation of the garaging path for each position of the guiding markers.

Claim 5. The automatic parking system according to claim 4, wherein a magnetic polarity of guiding markers is different from a magnetic polarity of the magnetic markers laid in the route so that the vehicle side is able to distinguish the guiding markers.

Claim ~~2~~6. ~~(Amended)~~ The automatic parking system according to any one of claims ~~7 to 15~~ 1 to 5, wherein the position information providing part is a wireless tag provided correspondingly to the magnetic marker so as to provide the position identification information to the vehicle side via wireless communications.

Claim ~~3~~7. The automatic parking system according to claim ~~2~~6, wherein the wireless tag and the magnetic marker are integrally configured.

Claim ~~4~~8. ~~(Amended)~~ The automatic parking system according to any one of claims ~~2, 3 and 7 to 15~~ 1 to 7, wherein the magnetic detecting parts ~~is~~ are capable of measuring a relative position of the vehicle in a width direction with respect to the magnetic marker, and at least either ~~one~~ of the magnetic detecting parts and the magnetic marker is provided so as to allow an orientation of the vehicle to be identified in accordance with detection of the magnetic marker.

Claim ~~5~~9. The automatic parking system according to claim ~~4~~8, wherein laying locations of a plurality of the magnetic markers are

provided in a discrete manner along the route, and two or more of the magnetic markers are arranged at least any of the laying locations along a direction of the route.

Claim ~~6~~10. The automatic parking system according to claim 8 or 9, wherein the magnetic detecting parts ~~is~~ are provided to the vehicle at ~~each of~~ two or more locations in a longitudinal direction.

~~Claim 7. (Amended) The automatic parking system according to claim 1, further comprising a storage medium which stores a virtual parking place model which is a virtual model of the parking place and has incorporated existing vehicle information indicating a presence or an absence of the vehicle in the parking frame, wherein the virtual parking place model is the virtual model for mapping the vehicle moving on an inside route and the vehicle being garaged.~~

~~Claim 8. (New) The automatic parking system according to claim7, further comprising a parking frame selecting part which selects the parking frame where the vehicle is to be accommodated with reference to the existing vehicle information of the parking frame incorporated in the virtual parking place model, wherein~~

~~the virtual parking place model is used to select a forwarding route allowing the vehicle to be efficiently forwarded without interference with an other vehicle.~~

~~Claim 9. (New) The automatic parking system according to claim 7 or 8, further comprising a map data indicating a structure of routes where the vehicle is caused to automatically travel by remote control and a structure of an arrangement of the parking frame in the parking place, wherein~~

~~the virtual parking place model is constructed in a storage area of the storage medium in addition to the map data.~~

~~Claim 10. (New) The automatic parking system according to any one of claims 7 to 9, wherein a standard garaging path for each parking frame is identified as a guiding line in the virtual parking place model.~~

~~Claim 11. (New) The automatic parking system according to any one of claims 1 and 7 to 10, wherein a standard garaging path for each parking frame is identified as a guiding line, and~~

~~the system further comprises~~

~~a storage medium which stores a vehicle spec information including a specification information of the vehicle, and~~

~~a configuration which calculates a garaging path as a control target by using the specification information of the vehicle in the vehicle spec information and calculates a deviation of the garaging path as the control target with respect to the guiding line.~~

~~Claim 12. (New) The automatic parking system according to claim 11, wherein~~

~~guiding markers are laid as other magnetic markers along the guiding line, and~~

~~the configuration which calculates the deviation of the garaging path calculates the deviation of the garaging path for each position of the guiding markers.~~

~~Claim 13. (New) The automatic parking system according to claim 12, wherein a magnetic polarity of guiding markers is different from a magnetic polarity of the magnetic markers laid in the route so that the vehicle side is able to distinguish the guiding markers.~~

~~Claim 14. (New) The automatic parking system according to any one of claims 1 and 7 to 13, further comprising~~

~~a configuration which calculates a degree of interference indicating a possibility of interference with an other vehicle under control.~~

~~Claim 15. (New) The automatic parking system according to claim 14, further comprising~~

~~a configuration which selects the parking frame with a lowest degree of the degree of interference when selecting the parking frame.~~