[CLAIMS]

[Claim 1] A billing processing system that performs a billing process for specific road usage, the billing processing system comprising:

a positioning device installed in a vehicle and configured to measure a position using a signal transmitted from another device; and

a billing processing device installed in the vehicle and configured to perform the billing process for the specific road usage,

wherein the billing processing device includes:

a storage unit configured to store information on a predetermined positioning error in advance, the predetermined positioning error being generated due to a surrounding condition and being determined in advance depending on a position;

a position specifying unit configured to read the information on the positioning error from the storage unit, to correct a positioning result by the positioning device using the information on the positioning error, and to specify a position of the vehicle;

a road use determining unit configured to determine whether the vehicle is using the specific road based on information on the position specified by the position specifying unit; and

a billing processing unit configured to perform the billing process for the specific road usage when the road use determining unit determines that the vehicle is using the specific road.

[Claim 2] The billing processing system according to claim 1, wherein the billing processing device further includes a billing amount calculating unit configured to calculate a billing amount for use of the road when the road use determining unit determines that the vehicle is using the specific road, and

wherein the billing processing unit performs the billing process based on the billing amount calculated by the billing amount calculating unit.

[Claim 3] The billing processing system according to claim 2, wherein the billing processing device further includes a travel distance calculating unit configured to calculate a travel distance of the vehicle based on the information of the position specified by the position specifying unit when the road use determining unit determines that the vehicle is using the specific road, and

wherein the billing amount calculating unit calculates the billing amount based on the travel distance calculated by the travel distance calculating unit.

[Claim 4] A billing processing method of performing a billing process for specific road usage, the billing processing method comprising:

a storing step of storing information on a predetermined positioning error in advance, the predetermined positioning error being generated due to a surrounding condition and being determined in advance depending on a position;

a position specifying step of reading the information on the positioning error from the storage unit, correcting a positioning result measured by a positioning device, which is installed in a vehicle to measure a position using a signal transmitted from another device, using the information on the positioning error, and specifying a position of the vehicle;

a road use determining step of determining whether the vehicle is using the specific road based on information on the position specified in the position specifying step; and

a billing processing step of performing the billing process for the specific road usage when it is determined in the road use determining step that the vehicle is using the specific road.

[Claim 5] A billing processing device that is installed in a vehicle to perform a billing process for specific road usage, the billing processing device comprising:

a storage unit configured to store information on a predetermined positioning error in advance, the predetermined positioning error being generated due to a surrounding condition and being determined in advance depending on a position;

a position specifying unit configured to read the information on the positioning error from the storage unit, to correct a positioning result measured by a positioning device, which is installed in a vehicle to measure a position using a signal transmitted from another device, using the information on the positioning error, and to specify a position of the vehicle;

a road use determining unit configured to determine whether the vehicle is using the specific road based on information on the position specified by the position specifying unit; and

a billing processing unit configured to perform the billing process for the specific road usage when the road use determining unit determines that the vehicle is using the specific road.

[Claim 6] A program causing a computer to serve as a billing processing device which is installed in a vehicle to perform a billing process for specific road usage, the program causing the computer to serve as:

a storage unit configured to store information on a predetermined positioning error in advance, the predetermined positioning error being generated due to a surrounding condition and being determined in advance depending on a position;

a position specifying unit configured to read the information on the positioning error from the storage unit, to correct a positioning result measured by a positioning device, which is installed in a vehicle to measure a position using a signal transmitted from another device, using the information on the positioning error, and to specify a position of the vehicle;

a road use determining unit configured to determine whether the vehicle is using the specific road based on information on the position specified by the position specifying unit; and

a billing processing unit configured to perform the billing process for the specific road usage when the road use determining unit determines that the vehicle is using the specific road.

[Claim 7] A recording medium having a program, which causes a computer to serve as a billing processing device installed in a vehicle to perform a billing process for specific road usage, recorded thereon, the program causing the computer to serve as:

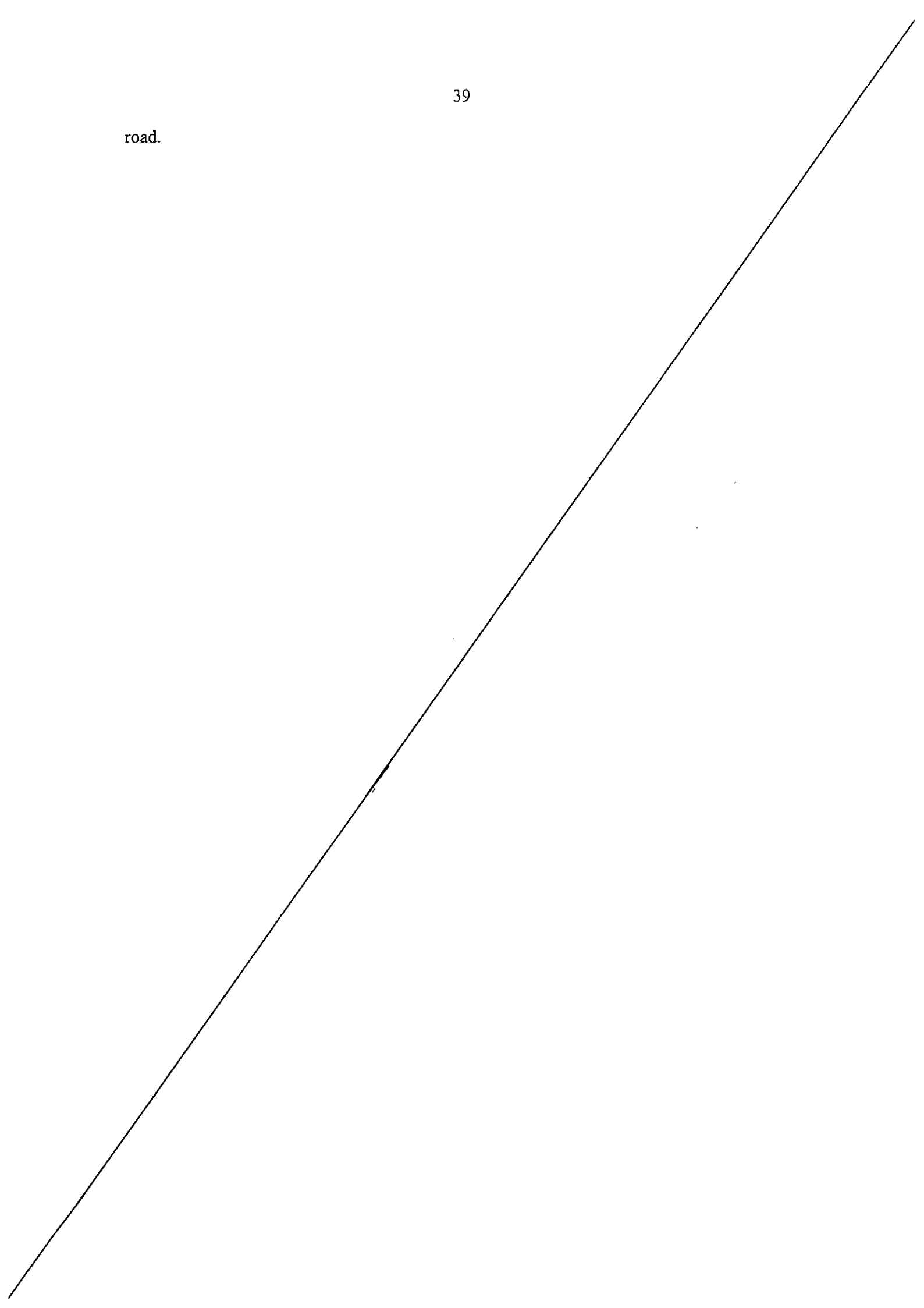
a storage unit configured to store information on a predetermined positioning error in advance, the predetermined positioning error being generated due to a surrounding condition and being determined in advance depending on a position;

a position specifying unit configured to read the information on the positioning error from the storage unit, to correct a positioning result measured by a positioning device, which is installed in a vehicle to measure a position using a signal transmitted from another device, using the information on the positioning error, and to specify a position of the vehicle;

a road use determining unit configured to determine whether the vehicle is using the specific road based on information on the position specified by the position specifying unit; and

a billing processing unit configured to perform the billing process for the specific road usage when the road use determining unit determines that the vehicle is using the specific

road.



CLAIMS

[Claim 1] A billing processing system that performs a billing process for specific road usage, the billing processing system comprising:

a positioning device installed in a vehicle and configured to measure a position using a signal transmitted from another device; and

a billing processing device installed in the vehicle and configured to perform the billing process for the specific road usage,

wherein the billing processing device includes:

a storage unit configured to store, in advance, position information for correcting a predetermined positioning error, the predetermined positioning error being generated due to a surrounding condition and being determined in advance depending on a position;

a position specifying unit configured to read the position information from the storage unit, to correct a positioning result by the positioning device to the position information, and to specify a position of the vehicle;

a road use determining unit configured to determine whether the vehicle is using the specific road based on information on the position specified by the position specifying unit; and

a billing processing unit configured to perform the billing process for the specific road usage when the road use determining unit determines that the vehicle is using the specific road.

[Claim 2] The billing processing system according to claim 1, wherein the billing processing device further includes a billing amount calculating unit configured to calculate a billing amount for use of the road when the road use determining unit determines that the vehicle is using the specific road, and

wherein the billing processing unit performs the billing process based on the billing amount calculated by the billing amount calculating unit.

[Claim 3] The billing processing system according to claim 2, wherein the billing processing device further includes a travel distance calculating unit configured to calculate a travel distance of the vehicle based on the information of the position specified by the position specifying unit when the road use determining unit determines that the vehicle is using the specific road, and

wherein the billing amount calculating unit calculates the billing amount based on the travel distance calculated by the travel distance calculating unit.

[Claim 4] A billing processing method of performing a billing process for specific road usage, the billing processing method comprising:

a storing step of storing, in advance, position information for correcting a predetermined positioning error, the predetermined positioning error being generated due to a surrounding condition and being determined in advance depending on a position;

a position specifying step of reading the position information from the storage unit, correcting a positioning result measured by a positioning device, which is installed in a vehicle to measure a position using a signal transmitted from another device, to the position information, and specifying a position of the vehicle;

a road use determining step of determining whether the vehicle is using the specific road based on information on the position specified in the position specifying step; and

a billing processing step of performing the billing process for the specific road usage when it is determined in the road use determining step that the vehicle is using the specific road.

[Claim 5] A billing processing device that is installed in a vehicle to perform a billing process for specific road usage, the billing processing device comprising:

a storage unit configured to store, in advance, position information for correcting a predetermined positioning error, the predetermined positioning error being generated due to a surrounding condition and being determined in advance depending on a position;

a position specifying unit configured to read the position information from the storage unit, to correct a positioning result measured by a positioning device, which is installed in a vehicle to measure a position using a signal transmitted from another device, to the position information, and to specify a position of the vehicle;

a road use determining unit configured to determine whether the vehicle is using the specific road based on information on the position specified by the position specifying unit; and

a billing processing unit configured to perform the billing process for the specific road usage when the road use determining unit determines that the vehicle is using the specific road.

[Claim 6] A program causing a computer to serve as a billing processing device which is installed in a vehicle to perform a billing process for specific road usage, the program causing the computer to serve as:

a storage unit configured to store, in advance, position information for correcting a predetermined positioning error, the predetermined positioning error being generated due to a surrounding condition and being determined in advance depending on a position;

a position specifying unit configured to read the position information from the storage unit, to correct a positioning result measured by a positioning device, which is installed in a vehicle to measure a position using a signal transmitted from another device, to the position information, and to specify a position of the vehicle;

a road use determining unit configured to determine whether the vehicle is using the specific road based on information on the position specified by the position specifying unit; and

a billing processing unit configured to perform the billing process for the specific road usage when the road use determining unit determines that the vehicle is using the specific road.

[Claim 7] A recording medium having a program, which causes a computer to serve as a billing processing device installed in a vehicle to perform a billing process for specific road usage, recorded thereon, the program causing the computer to serve as:

a storage unit configured to store, in advance, position information for correcting a predetermined positioning error, the predetermined positioning error being generated due to a surrounding condition and being determined in advance depending on a position;

a position specifying unit configured to read the position from the storage unit, to correct a positioning result measured by a positioning device, which is installed in a vehicle to measure a position using a signal transmitted from another device, to the position information, and to specify a position of the vehicle;

a road use determining unit configured to determine whether the vehicle is using the specific road based on information on the position specified by the position specifying unit; and

a billing processing unit configured to perform the billing process for the specific road usage when the road use determining unit determines that the vehicle is using the specific road.

[Claim 8] A billing processing system that performs a billing process for specific road usage, the billing processing system comprising:

a positioning device installed in a vehicle and configured to measure a position using a signal transmitted from another device; and

a billing processing device installed in the vehicle and configured to perform the billing process for the specific road usage,

wherein the billing processing device includes:

a storage unit configured to store, in advance, position information for correcting a predetermined positioning error, the predetermined positioning error being generated due to a surrounding condition and being determined in advance depending on a position;

a position specifying unit configured to read the position information from the storage unit when a variation from a position based on a previous positioning result to a position based on a current positioning result is equal to or greater than a threshold value, to correct a positioning result by the positioning device to the position information, and to specify a position of the vehicle;

a road use determining unit configured to determine whether the vehicle is using the specific road based on information on the position specified by the position specifying unit; and

a billing processing unit configured to perform the billing process for the specific road usage when the road use determining unit determines that the vehicle is using the specific road.

[Claim 9] A billing processing method of performing a billing process for specific road usage, the billing processing method comprising:

a storing step of storing, in advance, position information for correcting a predetermined positioning error, the predetermined positioning error being generated due to a surrounding condition and being determined in advance depending on a position;

a position specifying step of reading the position information from the storage unit when a variation from a position based on a previous positioning result to a position based on a current positioning result is equal to or greater than a threshold value, correcting a positioning result measured by a positioning device, which is installed in a vehicle to measure a position using a signal transmitted from another device, to the position information, and specifying a position of the vehicle;

a road use determining step of determining whether the vehicle is using the specific

road based on information on the position specified in the position specifying step; and

a billing processing step of performing the billing process for the specific road usage when it is determined in the road use determining step that the vehicle is using the specific road.

[Claim 10] A billing processing device that is installed in a vehicle to perform a billing process for specific road usage, the billing processing device comprising:

a storage unit configured to store, in advance, position information for correcting a predetermined positioning error, the predetermined positioning error being generated due to a surrounding condition and being determined in advance depending on a position;

a position specifying unit configured to read the position information from the storage unit when a variation from a position based on a previous positioning result to a position based on a current positioning result is equal to or greater than a threshold value, to correct a positioning result measured by a positioning device, which is installed in a vehicle to measure a position using a signal transmitted from another device, to the position information, and to specify a position of the vehicle;

a road use determining unit configured to determine whether the vehicle is using the specific road based on information on the position specified by the position specifying unit; and

a billing processing unit configured to perform the billing process for the specific road usage when the road use determining unit determines that the vehicle is using the specific road.

[Claim 11] A program causing a computer to serve as a billing processing device which is installed in a vehicle to perform a billing process for specific road usage, the program causing the computer to serve as:

a storage unit configured to store, in advance, position information for correcting a predetermined positioning error, the predetermined positioning error being generated due to a surrounding condition and being determined in advance depending on a position;

a position specifying unit configured to read the position information from the storage unit when a variation from a position based on a previous positioning result to a position based on a current positioning result is equal to or greater than a threshold value, to correct a positioning result measured by a positioning device, which is installed in a vehicle to measure a position using a signal transmitted from another device, to the position information, and to

specify a position of the vehicle;

a road use determining unit configured to determine whether the vehicle is using the specific road based on information on the position specified by the position specifying unit; and

a billing processing unit configured to perform the billing process for the specific road usage when the road use determining unit determines that the vehicle is using the specific road.

[Claim 12] A recording medium having a program, which causes a computer to serve as a billing processing device installed in a vehicle to perform a billing process for specific road usage, recorded thereon, the program causing the computer to serve as:

a storage unit configured to store, in advance, position information for correcting a predetermined positioning error, the predetermined positioning error being generated due to a surrounding condition and being determined in advance depending on a position;

a position specifying unit configured to read the position information from the storage unit when a variation from a position based on a previous positioning result to a position based on a current positioning result is equal to or greater than a threshold value, to correct a positioning result measured by a positioning device, which is installed in a vehicle to measure a position using a signal transmitted from another device, to the position information, and to specify a position of the vehicle;

a road use determining unit configured to determine whether the vehicle is using the specific road based on information on the position specified by the position specifying unit; and

a billing processing unit configured to perform the billing process for the specific road usage when the road use determining unit determines that the vehicle is using the specific road.