CLAIMS

1. A communication system comprising: a vehicle-mounted device mounted on a vehicle; and a communication device configured to communicate with the vehicle-mounted device, wherein

the communication device comprises: an output part configured to emit energy to the vehicle-mounted part; and a vehicle information receiving part configured to receive vehicle information, which is information regarding the vehicle that the vehicle-mounted device is mounted on,

the vehicle-mounted device comprises: a communication circuit configured to communicate with the communication device; and an electric power conversion part configured to convert the energy supplied from the communication device to electric power and to supply the electric power to the communication circuit, and

the communication circuit comprises: a vehicle information storing part configured to store the vehicle information in a non-volatile manner; and a vehicle information transmitting part configured to transmit the vehicle information stored by the vehicle information storing part to the communication device.

2. The communication system according to Claim 1, wherein the vehicle-mounted device further comprises: a user interface circuit configured to perform input-outputof information between a user of the vehicle and the vehicle-mounted device; and a power supply part configured to receive electric power from the vehicle that the vehicle-mounted device is mounted on and to supply the electric power to the user interface circuit and the communication circuit.

3. The communication system according to Claim 2, wherein

the communication circuit further comprises: a communication storing part configured to store information indicating whether the communication circuit communicated with the communication device or not in a non-volatile manner; and a communication recording part configured to rewrite the information stored by the communication storing part to information indicating that the communication circuit communicated with the communication device in a case where the communication circuit communicated with the communication device, and

the user interface circuit is configured to present predetermined information to the user in a case where the information stored in the communication storing part indicates that the communication circuit communicated with the communication device.

4. The communication system according to any one of Claims 1 to 3, wherein the communication system further comprises a parking space billing apparatus configured to bill depending on a parking time in a case where the vehicle is in a parked state,

the parking space billing apparatus comprises: a vehicle information obtaining part configured to obtain the vehicle information regarding the vehicle from the communication device; and a billing part configured to calculate a billing amount based on a time difference between a time, at which the communication device obtained the vehicle information from the vehicle-mounted device, and a clock time, at which the vehicle identified by the vehicle information leaves the parking state, to perform a billing process to the vehicle identified by the vehicle information.

5. The communication system according to Claim 4, wherein the vehicle-mounted device further comprises a detection part configured to detect movement of the vehicle

that the vehicle-mounted device is mounted on, and

the billing part of the parking space billing apparatus is configured to calculate the billing amount by assigning a clock time when the detection part detected the movement of the vehicle to the parking end clock time of the vehicle.

6. The communication system according to any one of Claims 1 to 5, wherein the communication circuit further comprises:

a program storing part configured to store a program checking whether or not there is a malfunction in the vehicle-mounted device;

a checking target processing part which is a target to be checked by the program storing part;

a program executing part configured to execute the program stored in the program storing part in a case where the electric power is supplied by the electric power conversion part; and

a check result transmitting part configured to transmit a check result obtained by the program executing part to a portable terminal.

7. The communication system according to any one of Claims 1 to 6, wherein

the output part emits the energy toward a predetermined direction, and

the vehicle information receiving part receives the vehicle information through an antenna with a directionality to the direction that the output part emits the energy to.

8. A communication method using a communication system with a vehicle-mounted device mounted on a vehicle and a communication device configured to communicate with the vehicle-mounted device, the method comprising the steps of:

outputting energy to a vehicle-mounted device from an output part of the communication device;

converting the energy supplied from the communication device to electric power with an electric power conversion part of the vehicle-mounted device to supply the electric power to a communication circuit;

transmitting vehicle information with a vehicle information transmitting part from a vehicle information storing part of the communication circuit to the communication device, the vehicle information being information regarding the vehicle and stored by the vehicle information storing part in a non-volatile manner; and

receiving the vehicle information regarding the vehicle from the vehicle-mounted device with a vehicle information receiving part.

9. A vehicle-mounted device configured to be mounted on a vehicle and to communicate with a communication device, the vehicle-mounted device comprising:

a communication circuit configured to communicate with the communication device; and

an electric power conversion part configured to convert energy supplied from the communication device to electric power and to supply the electric power to the communication circuit, wherein

the communication circuit comprises: a vehicle information storing part configured to store vehicle information in a non-volatile manner, the vehicle information being information regarding the vehicle that the vehicle-mounted device is mounted on; and

a vehicle information transmitting part configured to transmit the vehicle information stored in the vehicle information storing part to the communication device.

CLAIMS

1. A communication system comprising: a vehicle-mounted device mounted on a vehicle; and a portable communication device configured to communicate with the vehicle-mounted device, wherein

the communication device comprises: an output part configured to emit energy to the vehicle-mounted part according to a user's operation; a vehicle information receiving part configured to receive vehicle information, which is information regarding the vehicle that the vehicle-mounted device is mounted on; and a communication part configured to transmit the vehicle information to an apparatus using the vehicle information,

the vehicle-mounted device comprises: a communication circuit configured to communicate with the communication device; and an electric power conversion part configured to convert the energy supplied from the communication device to electric power and to supply the electric power to the communication circuit, and

the communication circuit comprises: a vehicle information storing part configured to store the vehicle information in a non-volatile manner; and a vehicle information transmitting part configured to transmit the vehicle information stored by the vehicle information storing part to the communication device.

2. The communication system according to Claim 1, wherein the vehicle-mounted device further comprises: a user interface circuit configured to perform input-output of information between a user of the vehicle and the vehicle-mounted device; and a power supply part configured to receive electric power from the vehicle that the vehicle-mounted device is mounted on and to supply the electric power to the user interface circuit and the communication circuit.

3. The communication system according to Claim 2, wherein

the communication circuit further comprises: a communication storing part configured to store information indicating whether the communication circuit communicated with the communication device or not in a non-volatile manner; and a communication recording part configured to rewrite the information stored by the communication storing part to information indicating that the communication circuit communicated with the communication device in a case where the communication circuit

communicated with the communication device, and

the user interface circuit is configured to present predetermined information to the user in a case where the information stored in the communication storing part indicates that the communication circuit communicated with the communication device.

4. The communication system according to any one of Claims 1 to 3, wherein the communication system further comprises a parking space billing apparatus configured to perform billing depending on a parking time in a case where the vehicle is in a parked state,

the parking space billing apparatus comprises: a vehicle information obtaining part configured to obtain the vehicle information regarding the vehicle from the communication device; and a billing part configured to calculate a billing amount based on a time difference between a time, at which the communication device obtained the vehicle information from the vehicle-mounted device, and a parking end clock time, at which the vehicle identified by the vehicle information leaves the parking state, to perform a billing process for the vehicle identified by the vehicle information.

5. The communication system according to Claim 4, wherein the vehicle-mounted device further comprises a detection part configured to detect movement of the vehicle that the vehicle-mounted device is mounted on, and

the billing part of the parking space billing apparatus is configured to calculate the billing amount by assigning a clock time when the detection part detected the movement of the vehicle to the parking end clock time of the vehicle.

6. The communication system according to any one of Claims 1 to 5, wherein the communication circuit further comprises:

a program storing part configured to store a program checking whether or not there is a malfunction in the vehicle-mounted device;

a checking target processing part which is a target to be checked by the program storing part;

a program executing part configured to execute the program stored in the program storing part in a case where the electric power is supplied by the electric power conversion part; and

a check result transmitting part configured to transmit a check result obtained by

the program executing part to a portable terminal.

7. The communication system according to any one of Claims 1 to 6, wherein

the output part emits the energy toward a predetermined direction, and

the vehicle information receiving part receives the vehicle information through an antenna with directionality to the direction that the output part emits the energy to.

8. A communication method using a communication system with a vehicle-mounted device mounted on a vehicle and a portable communication device configured to communicate with the vehicle-mounted device, the method comprising the steps of:

outputting energy to a vehicle-mounted device according to a user's operation from an output part of the communication device;

converting the energy supplied from the communication device to electric power with an electric power conversion part of the vehicle-mounted device to supply the electric power to a communication circuit;

transmitting vehicle information with a vehicle information transmitting part from a vehicle information storing part of the communication circuit to the communication device, the vehicle information being information regarding the vehicle and stored by the vehicle information storing part in a non-volatile manner;

receiving the vehicle information regarding the vehicle from the vehicle-mounted device with a vehicle information receiving part; and

transmitting the vehicle information to an apparatus using the vehicle information.

9. A vehicle-mounted device configured to be mounted on a vehicle and to communicate with the communication device which is included in the communication system according to any one of Claims 1 to 7, the vehicle-mounted device comprising:

a communication circuit configured to communicate with the communication device; and

an electric power conversion part configured to convert energy supplied from the communication device to electric power and to supply the electric power to the communication circuit, wherein

the communication circuit comprises: a vehicle information storing part configured to store vehicle information in a non-volatile manner, the vehicle information

being information regarding the vehicle that the vehicle-mounted device is mounted on; and

a vehicle information transmitting part configured to transmit the vehicle information stored in the vehicle information storing part to the communication device.