

SPECIFICATION

TITLE OF THE INVENTION: FUELING STATION SYSTEM,
FUELING DEVICE AND SERVER

TECHNICAL FIELD

[0001.] The present invention relates to a fueling station system, a fueling device and a server, and more particularly to a technique for simplifying the device configuration of a fueling station system by using a function of a mobile terminal.

BACKGROUND ART

[0002.] In a fueling station that fuels a fuel tank of a vehicle with fuel oil such as gasoline, for example, as described in Patent Document 1, are mounted a fueling device that fuels the vehicle; a POS main body that performs management of fueling data and settlement processing in an office when receiving the fueling data from the fueling device; a POS external machine that performs fueling setting and settlement processing in a fueling area between the POS main body; and so on.

[0003.] Recently, mobile terminals such as mobile phones and tablets have become widespread, and are used not only for call functions but also for various operations such as customer service, facility and inventory management and inspection. In addition, fueling stations that fuel fuel oil such as gasoline are also required to utilize new technologies such as IoT.

PRIOR ART DOCUMENT

PATENT DOCUMENT

[0004.] Patent Document 1: Japanese Patent Publication No. 2013-235524 gazette

OUTLINE OF THE INVENTION

PROBLEMS TO BE SOLVED BY THE INVENTION

[0005.] The present invention has been made in view of the above-mentioned conventional technique, and an object thereof is to simplify device configuration of a fueling station system by performing fueling and settlement while linking a fueling device and a server with a function of a mobile terminal.

MEANS OF SOLVING THE PROBLEMS

[0006.] In order to attain the above object, a fueling station system of the present invention is characterized in that when a user reads, with a mobile terminal, an identification code including fueling station information provided in a fueling device, user information and the fueling station information are transmitted from the mobile terminal to a server; when receiving the user information and the fueling station information, the server transmits a fueling permission signal to the fueling device; and when receiving the fueling permission signal, the fueling device becomes operable.

[0007.] With the fueling station system of the present invention, since the fueling device and the server can be linked using the function of the mobile terminal to fuel, the server can manage the fueling data from each fueling station collectively, and a POS installed at each fueling station is no longer required.

[0008.] In the fueling station system, when receiving the fueling information and a fueling end signal from the fueling device, the server can generate settlement information based on the fueling information, and can memorize the user information, the fueling station information, the fueling information and the settlement information in association with each other. With this, credit card payments can be made using the payment information stored in the server.

[0009.] Further, another fueling device of the present invention is characterized by including an identification code including fueling station information and receiving means for receiving a fueling permission signal from a server, wherein when the receiving means receives the fueling permission signal from the server, the fueling device becomes operable.

[0010.] In the above fueling device, the fueling station information may include a fueling station name, a fueling device number and a fueling station area, which enables to identify a fueling device that fuels fuel oil.

[0011.] The above fueling device can further include display means for displaying the identification code, and the display means may include different information for each display, which prevents fraud using an identification code.

[0012.] Still further, a server of the present invention is characterized by including receiving means for receiving user information and fueling station information from a mobile terminal and transmitting means for transmitting a fueling permission signal to a fueling device when the receiving means receives the user information and the fueling station information.

[0013.] The above server may further include settlement information generating means for generating settlement information based on the fueling information when the receiving means receives the fueling information and the fueling end signal from the fueling device, and storage means for associating and storing the user information, the fueling station information, the fueling information and the settlement information. With the settlement information and others, credit card payments or the like can be performed.

[0014.] In the above server, the user information may include a user name, a credit card number and an oil type, which prevents mixing of oils.

[0015.] In the above server, the transmitting means can transfer the fueling information received with the receiving means from the fueling

device in real time to the mobile terminal in real time. With this, customers can check fueling status on their own mobile terminals.

EFFECTS OF THE INVENTION

[0016.] As described above, with the present invention, the device configuration of a fueling station system can be simplified by linking a fueling device and a server using a function of a mobile terminal to perform fueling and settlement.

BRIEF DESCRIPTION OF THE DRAWINGS

[0017.] [Figure 1] A schematic view showing the whole structure of the first embodiment of a fueling station system according to the present invention.

[Figure 2] A flowchart showing the operation of the fueling station system shown in Fig. 1.

[Figure 3] A schematic view showing the whole structure of the second embodiment of a fueling station system according to the present invention.

[Figure 4] A flowchart showing the operation of the fueling station system shown in Fig. 3.

MODE FOR CARRYING OUT THE INVENTION

[0018.] Next, embodiments of the present invention will be explained with reference to the drawings in detail.

[0019.] Figure 1 shows a fueling station system according to the first embodiment of the present invention. The fueling station system 1 includes a fueling device 2, a server (data server) 3 and a payment machine 5.

[0020.] The fueling device 2 includes a display 2a for displaying fueling data, a data input/output device 2b for setting fueling and others, an identification code 2c printed on a sticker or the like attached to a surface of a main body, communication means for transmitting and receiving information to and from the server 3 and a fueling system and so on provided in a normal fueling device.

[0021.] The identification code 2c includes fueling station data such as a fueling station name, a fueling device number and a fueling station area.

[0022.] The server 3 collectively manages fueling data from fueling stations nationwide, including the fueling station where the fueling device 2 is installed, and can communicate with each fueling device 2 via the Internet or the like as described above via transmission/reception means. The server 3 generates settlement data from the fueling data received from each fueling device 2 by the settlement information generating means, and stores data related to fueling in the storage means for each customer.

[0023.] The mobile terminal 4 is a mobile phone, a tablet or the like owned by the customer, and is provided with communication means for communicating with the server 3 via the Internet or the like, a credit

(deferred payment) payment function, and so on. As will be described later, the user information output by the mobile terminal 4 to the server 3 may include, for example, a user name, a credit card (hereinafter referred to as "card") number and an oil type.

[0024.] The payment machine 5 is provided to respond to a customer's cash payment, and includes communication means for communicating with the server 3 and other components such as cash counting means provided in a normal payment machine.

[0025.] A credit card company 6 has a contract with the customer in advance, and includes communication means for communicating with the server 3.

[0026.] Next, the operation of the fueling station system 1 having the above configuration will be described with reference to FIGS. 1 and 2. In a step where a route in FIG. 2 branches, unless otherwise specified, a downward direction corresponds to "Yes" and a horizontal direction corresponds to "No".

[0027.] In step S1 of the mobile terminal 4, the customer reads the identification code 2c of the fueling device 2 via the mobile terminal 4. When the identification code 2c is read (step S1; Yes), a payment method selection guide is displayed on a screen of the mobile terminal 4. In step S2, when the customer selects either cash payment or credit card payment as a payment method (step S2; Yes), user information, payment method information (including card number in case of card payment) and fueling station information read from the code 2c are output to the server 3 (step S3).

[0028.] When the user information, the payment method information and the fueling station information are input from the mobile terminal 4 in step S11 of the server 3 (step S11; Yes), in step S12, it is confirmed whether or not the customer has selected card payment. Then, when the customer selects card payment (step S12; Yes), a credit confirmation signal including the card number is output to the credit card company 6 (step S13). On the other hand, if the customer selects cash payment in step S12 (step S12; No), the process proceeds to step S15, which will be described later.

[0029.] In step S31 of the credit card company 6, when the credit confirmation signal is input from the server 3 (step S31; Yes), in step S32, the customer's credit is confirmed from the card number, and if the credit can be confirmed (step S32; Yes), a credit pass (OK) signal is output to the server 3 (step S33). On the other hand, if the credit of the designated customer cannot be confirmed (step S32; No), a credit failure (NO) signal is output to the server 3 and the operation of the credit card company 6 is terminated (step S34).

[0030.] When the credit pass signal is input from the credit card company 6 in step S14 of the server 3 (step S14; Yes), a fueling

permission signal is transmitted to the fueling device 2 (step S15).

[0031.] On the other hand, if the credit pass signal is not input in step S14 (step S14; No) and the credit failure signal is input from the credit card company 6 in step S16 (step S16; Yes), the credit failure signal is sent to the mobile terminal 4 to end the operation of the server 3 (step S17). When the credit failure signal is input from the server 3 in step S4 of the mobile terminal 4 (step S4; Yes), the operation of the mobile terminal 4 is terminated after notifying that the card cannot be paid (step S5). In this case, the customer cannot fuel.

[0032.] In step S41 of the fueling device 2, when a fueling permission signal is input from the server 3 (step S41; Yes), the customer operates the data input/output device 2b to set fueling (step S42), and removing a fueling nozzle from a nozzle hook by the customer turns on a nozzle SW (switch) (step S43; Yes).

[0033.] Here, if the customer has removed a fueling nozzle corresponding to the oil type selected in the fueling setting (step S44; Yes), a reset signal is transmitted to the display 2a of the fueling device 2, and information on the previous fueling is reset, and a fueling pump is driven (step S45).

[0034.] On the other hand, in step S44, if the customer has removed an erroneous fueling nozzle 26 (step S44; No), the customer is notified to confirm the fueling nozzle via the display 2a or the like (step S46).

[0035.] In step S47, when the fueling pump is driven; the flow meter is turned on; a flow rate pulse transmitter is turned on; and a pulse signal is transmitted from the flow rate pulse transmitter to the display 2a (step S47; Yes), fueling data is displayed on the display 2a, and the fueling data is output to the server 3 (step S48).

[0036.] When the fueling data is input from the fueling device 2 in step S18 of the server 3 (step S18; Yes), a fueling signal including the fueling data is output to the mobile terminal 4 (step S19). As a result, the credit failure signal is not input in step S4 of the mobile terminal 4 (step S4; No), and when the fueling signal is input from the server 3 in step S6 (step S6; Yes), on the display screen of the terminal 4 are displayed characters "fueling" and, for example, a moving image of a wave indicating that fueling is in progress (step S7). As a result, the customer can grasp the progress of fueling with the fueling device 2 without directly checking the fueling device 2.

[0037.] In the fueling device 2, when the customer returns the fueling nozzle to the nozzle hook and the nozzle SW is turned off (step S49; Yes), the drive of the fueling pump is stopped (step S50), a fueling end signal including the fueling data is output to the server 3 to end the operation of the fueling device 2 (step S51).

[0038.] In step S20 of the server 3, when the fueling end signal is input from the fueling device 2 (step S20; Yes), a settlement data is generated

based on the fueling data, and when the customer selects card payment (step S21; Yes), the settlement data is output to the credit card company 6 (step S22). In step S35 of the credit card company 6, when the settlement data is input from the server 3 (step S35; Yes), payment is made (step S36), the payment completion signal is output to the server 3, and the operation of the credit card company 6 is terminated (Step S37). The server 3 to which the payment completion signal is input from the credit card company 6 (step S23; Yes) transfers the payment completion signal to the mobile terminal 4 and ends the operation (step S24). The mobile terminal 4 to which the payment completion signal is input from the server 3 (step S8; Yes) displays fueling details on the screen and ends the operation (step S9).

[0039.] On the other hand, when the customer selects cash payment in step S21 of the server 3 (step S21; No), the settlement data is output to the payment machine 5 and the operation of the server 3 is terminated (step S25). In step S61 of the payment machine 5, when the settlement data is input from the server 3 (step S61; Yes), payment is made by the customer inserting cash into the payment machine 5 (step S62), and the fueling details are output (issue a receipt) and the operation of the payment machine 5 ends (step S63). In this way, the customer can conveniently select card payment or cash payment on the mobile terminal 4.

[0040.] Although not specified in the flowchart of FIG. 2, the server 3 has user information including a payment method (including a card number), fueling station data, fueling data and settlement data, and stores these in association with each other, so that it is not necessary to install a POS terminal in each fueling station, and the equipment cost and operating cost of the fueling station can be reduced.

[0041.] Next, a fueling station system according to the second embodiment of the present invention will be explained with reference to FIGS. 1 to 4. The fueling station system 11 includes a fueling device 12 having a configuration different from that of the fueling device 2 of the fueling station system 1. In the fueling station system 11, the same components as those in the fueling station system 1 are designated by the same reference numbers, and the description thereof will be omitted.

[0042.] The fueling device 12 includes a human body sensor 12d in addition to a display 12a for displaying fueling data and the like and a data input/output device 12b for performing fueling settings, etc. The identification code 12c is displayed on the data input/output device 12b when the human body sensor 12d detects a customer.

[0043.] The identification code 12c displayed on the data input/output device 12b includes, for example, the number of times of display in addition to the fueling station information, and the information is different each time it is displayed depending on detection result of the

human body sensor 12d.

[0044.] Next, the operation of the fueling station system 11 having the above configuration will be described with reference to FIGS. 1 to 4. Even in a step where a route in FIG. 4 branches, a downward direction corresponds to “Yes” and a horizontal direction corresponds to “No”, unless otherwise specified.

[0045.] As shown in FIG. 4, when the human body sensor 12d (see FIG. 3) detects a customer in step S71 of the fueling device 12 (step S71; Yes), the identification code 12c is displayed on the display 12b (step S72). Reading the displayed identification code 12c with the mobile terminal 4 (step S1) allows fueling by the fueling device 12 and information management by the server 3 to be performed as in FIG 2.

[0046.] According to the present embodiment, for example, another identification code is attached on the identification code printed on the fueling device, and fraud such as the customer reading an identification code having nothing to do with it can be prevented.

[0047.] In the above embodiment, the case where the payment machine 5 is provided in the fueling station systems 1 and 11 and the credit card company 6 that communicates with the server 3 is attached has been described, but in the fueling station dedicated to cash payment, the credit card company 6 is no longer required, and a payment machine 5 is not required at a fueling station dedicated to card payment.

DESCRIPTION OF THE REFERENCE NUMERALS

[0048.]

- 1 fueling station system
- 2 fueling device
- 2a display
- 2b data input/output device
- 2c identification code
- 3 server
- 4 mobile terminal
- 5 payment machine
- 6 credit card company
- 11 fueling station system
- 12 fueling device
- 12a display
- 12b data input/output device
- 12c identification code
- 12d human body sensor
- 26 fueling nozzle

CLAIMS

[Claim 1] A fueling station system characterized in that when a user reads, with a mobile terminal, an identification code including fueling station information provided in a fueling device, user information and the fueling station information are transmitted from the mobile terminal to a server; when receiving the user information and the fueling station information, the server transmits a fueling permission signal to the fueling device; and when receiving the fueling permission signal, the fueling device becomes operable.

[Claim 2] The server as claimed in claim 1, wherein when receiving the fueling information and a fueling end signal from the fueling device, the server generates settlement information based on the fueling information, and memorizes the user information, the fueling station information, the fueling information and the settlement information in association with each other.

[Claim 3] A fueling device comprising an identification code including fueling station information and receiving means for receiving a fueling permission signal from a server, wherein when the receiving means receives the fueling permission signal from the server, said fueling device becomes operable.

[Claim 4] The fueling device as claimed in claim 3, wherein said fueling station information includes a fueling station name, a fueling device number and a fueling station area.

[Claim 5] The fueling device as claimed in claim 3 or 4 further comprising display means for displaying the identification code, and the display means includes different information for each display.

[Claim 6] A server comprising receiving means for receiving user information and fueling station information from a mobile terminal and transmitting means for transmitting a fueling permission signal to a fueling device when the receiving means receives the user information and the fueling station information.

[Claim 7] The server as claimed in claim 6 further comprising settlement information generating means for generating settlement information based on the fueling information when the receiving means receives the fueling information and the fueling end signal from the fueling device, and storage means for associating and storing the user information, the fueling station information, the fueling information and the settlement information.

[Claim 8] The server as claimed in claim 6 or 7, wherein said user information includes a user name, a credit card number and an oil type.

[Claim 9] The server as claimed in claim 6, 7 or 8, wherein said transmitting means transfers the fueling information received with the receiving means from the fueling device in real time to the mobile terminal in real time.