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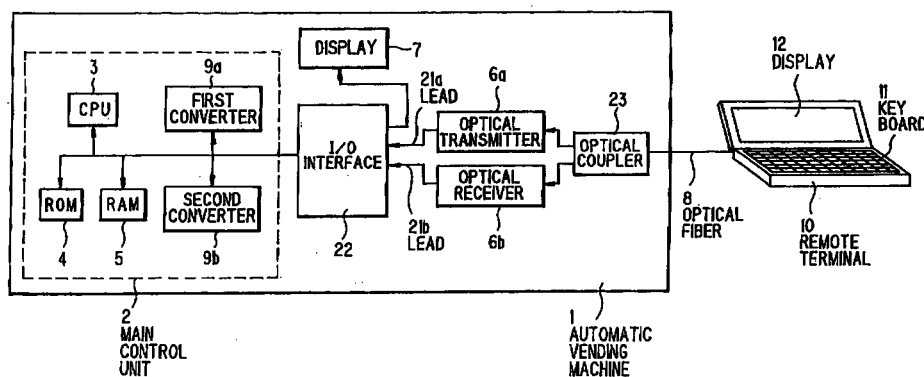
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(54) **Control apparatus for vending machine**

(57) A control apparatus for vending machine (1) is provided which facilitates resetting of control data with reduced costs by means of a commonly used remote terminal (10) and a public telecommunication network. The control data stored in a memory in the control unit (2) are converted to data information in a form, such as HTML, compatible with a public telecommunication network (e.g., Internet), transmitted through the line to a remote terminal (10) and renewed therein. The renewed data are transmitted again through a public telecommunication network in a form, such as HTTP, compatible with the telecommunication network toward the control

unit (2), in which the data stored in the memory are renewed according to the renewed data transmitted from the remote terminal (10). A control apparatus for vending machine (1) is also provided which facilitates collection of sales data and maintenance data with reduced costs by means of a commonly used remote terminal (10) and a public telecommunication network. Data stored in a memory in the control unit are converted to data information in HTML form and transmitted through Internet to a remote terminal (10), whereby the received data are displayed in a display (12).

FIG. 1



Description

FIELD OF THE INVENTION

[0001] This invention relates to a control apparatus for a vending machine, and more particularly to a control apparatus for a vending machine in which control data stored in the main computer can be set or reset from exterior, especially from a remote keyboard.

BACKGROUND OF THE INVENTION

[0002] A vending machine is controlled by control data stored in the main computer therein, such as price, ratio of mixing of the raw materials, cup size, etc. of each article sold by the machine. The control data are set by the use of an input device, such as key board, communicated with the main computer either by wire or by wireless. Sometimes, the control data have to be renewed, for example, for changing the price.

[0003] A number of vending machines are installed at many places for serving foods or beverages for the public. If vending machines each have own key boards built therein connected to the main computer, a high cost is required for providing key boards equal in number to the vending machines. Further, resetting of the control data stored in the main computer of each vending machine requires a great labor when it is necessitated because all vending machines have to be reached by service men for resetting.

[0004] In some vending machines, setting or resetting of the control data is accomplished by a handy terminal, like a POS terminal, used usually for collecting data, such as the amount of sale, the state of maintenance, etc. with respect to each vending machine, through an optical communication means attached to the handy terminal. More recently, a portable personal computer is used for setting or resetting of the control data in place of a handy terminal. In such vending machines, too, a great labor is required for resetting of the control data by handy terminals or personal computers at every vending machine. If the vending machines differ in their types, the handy terminals must have different soft wares adapted to every type of the machines, which cause a higher cost. These conventional control apparatuses for vending machine are disclosed in, for example, Japanese Patent Application Laid Open No.Hei8-161599.

SUMMARY OF THE INVENTION

[0005] Accordingly, it is an object of the invention to provide a control apparatus for a vending machine facilitating setting or resetting of control data with reduced costs and labor by means of a commonly used remote terminal and a public telecommunication network.

[0006] It is another object of the invention to provide a control apparatus for a vending machine facilitating

collecting information with respect to the vending machine, such as sales data and maintenance data, with reduced coats by means of a commonly used portable personal computer and a public telecommunication network.

[0007] According to the first feature of the invention, a control apparatus for a vending machine comprises:

a memory for storing control data to control the vending machine, the memory being provided inside the vending machine;

a control unit for controlling the vending machine by reading the control data from the memory, the control unit being provided inside the vending machine;

a terminal for setting the control data into the memory, the terminal being provided outside the vending machine;

a network for providing a connection between the memory and the terminal, the network being widely used by non-limited subscribers; and means for converting the control data between a first form to be used in the control unit and a second form to be used in the network, the converting means being provided inside the vending machine.

[0008] According to the second feature of the invention, a control apparatus for vending machine comprises:

a memory for storing control data to control the vending machine and storing sales data and maintenance data with respect to the vending machine, the memory being provided inside the vending machine;

a control unit for controlling the vending machine by reading the control data from the memory, the control unit being provided inside the vending machine;

a terminal for displaying the sales data and maintenance data stored in the memory, the terminal being provided outside the vending machine;

a network for providing a connection between the memory and the terminal, the network being widely used by non-limited subscribers; and means for converting the sales data and the maintenance data in a first form to be used in the control unit into data in a second form to be used in the network.

[0009] The memory may be included in the control unit. The remote terminal may be a personal computer, which may be provided with a display for displaying information according to the control data, sales data and the maintenance data. The personal computer may include a key board for resetting the control data. The network may be an optical communication network comprising optical fibers. It is preferred that the network is a public communication network.

BRIEF DESCRIPTION OF THE DRAWINGS

[0010] The invention will be described in more detail in conjunction with the accompanying drawings, wherein:

Fig.1 is a block diagram of a preferred embodiment of control apparatus for vending machine according to the invention;

Fig.2 is a plan view of an example of display on display screen in a remote terminal;

Fig.3 is an example of display data in HTML form transmitted to a remote terminal, according to the invention; and

Fig.4 is an example of control data in HTTP form transmitted from the remote terminal, according to the invention.

PREFERRED EMBODIMENTS OF THE INVENTION

[0011] Preferred embodiments of the invention will be described in detail with reference to Fig.1 to Fig.4.

[0012] Fig.1 shows a control apparatus for a vending machine in a preferred embodiment of the invention. Automatic vending machine 1 has main control unit 2 which includes CPU 3, ROM 4, RAM 5, first converter 9a and second converter 9b. CPU 3 controls automatic vending machine 1 with respect to serving operation, display operation, money handling operation and so on of automatic vending machine 1. The program for executing the control by CPU 3 is stored in ROM 4. The control data such as prices of the articles to be served, mixing ratios of the raw materials, cup sizes and so on, including data for displaying some of these data, are stored in RAM 5. Sales data such as the amount of sale and maintenance data for monitoring the state of operation of the machine are stored in RAM 5, too.

[0013] CPU 3 is connected with ROM 4, RAM 5, first converter 9a, second converter 9b and I/O interface 22. Display 7 for displaying some information for customers is connected with I/O interface 22. Optical transmitter 6a and optical receiver 6b are connected with I/O interface 22 by way of lead 21a and lead 21b, respectively. Optical fiber 8 is coupled with optical transmitter 6a and optical receiver 6b by means of optical coupler 23. The other end of optical fiber 8 is connected with remote terminal 10, which includes key board 11 and display 12. Main control unit 2, I/O interface 22, display 7, lead 21a, lead 21b, optical transmitter 6a, optical receiver 6b and optical coupler 23 are built in automatic vending machine 1. First converter 9a serves to convert the data read from RAM 5 into data in the form of HTML (Hyper Text Markup Language). The program for the conversion is stored in ROM 4. Second converter 9b serves to convert the data received by optical receiver 6b from remote terminal 10 in the form of HTTP (Hyper Text Transfer Protocol) and processed by I/O interface 22 into data in the form used in CPU 3 and RAM 5.

[0014] Fig.2 shows an example of data displayed in display 12. The displayed data include unit price, ratio of the raw materials and hot water and cup size.

[0015] In operation, the control data, the sales data and the maintenance data stored in RAM 5 are supplied under control by CPU 3 to first converter 9a in which these data are converted into data in the form of HTML (Hyper Text Markup Language). The program for the conversion is stored in ROM 4. The data in HTML form are supplied to optical transmitter 6a through I/O interface 22 and converted thereby into optical signals. The optical signals in HTML form are transmitted, then, to remote terminal 10 through optical fiber 8 in a public communication network. The optical signals received by remote terminal 10 are converted therein into electric signals and processed therein, some of the data are supplied to display 12 which displays the data.

[0016] New control and display data are inputted to replace the previous data by means of key board 11 by the help of display 12. For example, for changing the cash price of a cup of hot regular coffee from 80 yen to 90 yen, the column of "cash price" in display shown in Fig.2 is designated by clicking of a mouse (not shown), "90" (yen) is inputted using the keyboard 11 and the column "execute" is designated by mouse clicking. The optical signals of control data thus newly set in the form of HTTP (Hyper Text Transfer Protocol) are transmitted from remote terminal 10 through optical fiber 8 and optical coupler 23 to optical receiver 6b. The optical signals received by optical receiver 6b are converted into electric signals therein. The data information is inputted through lead 21b and I/O interface 22 in second converter 9b and converted thereby into a data form used in CPU 3 and RAM 5. The program for the conversion is stored in ROM 4. The converted data are written into RAM 5, renewing the data previously stored, some of which are displayed in display 7.

[0017] Fig.3 shows an example of data information in HTML form transmitted from optical transmitter 6a. Fig.4 shows an example of data information in HTTP form transmitted from remote terminal 10. The data information shown in Fig.4 corresponds to the data information shown in Fig.3 except that the unit price is changed from 80 yen to 90 yen.

[0018] The renewed data in RAM 5 may be transmitted again to remote terminal 10 in HTML form by way of optical fiber 8 and displayed in display 12 for the purpose of confirmation.

[0019] The data may be converted into data in any form other than HTML which is compatible with Internet. For example, XML and VRML (Virtual Reality Modeling Language) which are improved versions of HTML may be used.

[0020] A browser commonly used in Internet, such as Internet Explorer, Netscape Navigator (registered service marks), etc. may be installed in remote terminal 10.

[0021] Data signals may be transmitted between

the main control unit and a remote terminal by communication means other than optical communication system, including wired communication system using a cable and connectors and wireless communication system such as PHS.

[0022] In a control apparatus for vending machine according to the first feature of the invention, the control data stored in a memory in the control unit are converted into data information in a form (for example, HTML) compatible with a public telecommunication network such as Internet and transmitted through the network to a remote terminal to be renewed (reset) in the remote terminal, the renewed data are transmitted again through a public telecommunication network such as Internet in a form (for example, HTTP) compatible with the network toward the control unit, and the transmitted data information is converted to data information in a form suited to the control process in the control unit. That is, resetting of the control data can be accomplished by a remote terminal commonly used and a public communication network, thereby, costs and labor can be reduced significantly.

[0023] In a control apparatus for a vending machine according to the second feature of the invention, the sales and maintenance data stored in a memory in the control unit are converted into data information in a form (for example, HTML) compatible with a public telecommunication network such as Internet and transmitted through the network to a remote terminal to be displayed in a display. That is, the sales and maintenance data related to the vending machine can be displayed using a remote terminal commonly used and a public communication network, thereby, costs can be reduced significantly.

[0024] Although the invention has been described with respect to the specific embodiments for complete and clear disclosure, the appended claims are not to be thus limited but are to be construed as embodying all modification and alternative constructions that may occur to one skilled in the art which fairly fall within the basic teaching herein set forth.

[0025] The features disclosed in the foregoing description, in the claims and/or in the accompanying drawings may, both separately and in any combination thereof, be material for realising the invention in diverse forms thereof.

Claims

1. A control apparatus for a vending machine, comprising:

a memory for storing control data to control said vending machine, said memory being provided inside said vending machine;
a control unit for controlling said vending machine by reading said control data from said memory, said control unit being provided inside

said vending machine;

a terminal for setting said control data into said memory, said terminal being provided outside said vending machine;

a network for providing a connection between said memory and said terminal, said network being widely used by non-limited subscribers; and

means for converting said control data between a first form to be used in said control unit and a second form to be used in said network, said converting means being provided inside said vending machine.

2. The control apparatus as defined in claim 1, wherein:

said terminal comprises a display for displaying said control data read from said memory and transmitted thereto in said second form via said network, and a keyboard for changing a content of said control data displayed on said display to provide changed control data, said changed control data being written into said memory in said first form.

3. The control apparatus as defined in claim 2, wherein said terminal is a personal computer.

4. The control apparatus as defined in claim 2, wherein:

said memory comprises a first memory for storing said control data, and a second memory for storing sales data; and

said display of said terminal displays said sales data read in said first form from said second memory and transmitted in said second form via said network thereto.

5. The control apparatus as defined in claim 4, wherein:

said second memory stores sales data and maintenance data with respect to said vending machine; and

said display of said terminal displays said sales data and said maintenance data read in said first form from said second memory and transmitted in said second form via said network thereto

6. The control apparatus as defined in claim 1, wherein said converting means comprises:

first converting means for converting said control data in a first form to be used in said control unit into a second form to be used in said net-

- work; and
 second converting means for converting said control data in a second form to be used in said network into a first form to be used in said control unit. 5
7. The control apparatus as defined in claim 1, wherein said network is an optical communication network comprising an optical fiber. 10
8. A control apparatus for vending machine, comprising:
 a memory for storing control data to control said vending machine and storing sales data with respect to said vending machine, said memory being provided inside said vending machine;
 a control unit for controlling said vending machine by reading said control data from said memory, said control unit being provided inside said vending machine; 20
 a terminal for displaying said sales data stored in said memory, said terminal being provided outside said vending machine; 25
 a network for providing a connection between said memory and said terminal, said network being widely used by non-limited subscribers; and
 means for converting said sales data in a first form to be used in said control unit into data in a second form to be used in said network, said converting means being provided inside said vending machine. 30
9. The control apparatus as defined in claim 8, wherein said terminal comprises a display for displaying said sales data read from said memory and transmitted in said second form via said network thereto. 35 40
10. A control apparatus for vending machine, comprising:
 a memory for storing control data to control said vending machine and storing maintenance data with respect to said vending machine, said memory being provided inside said vending machine;
 a control unit for controlling said vending machine by reading said control data from said memory, said control unit being provided inside said vending machine; 45
 a terminal for displaying said maintenance data stored in said memory, said terminal being provided outside said vending machine; 50
 a network for providing a connection between said memory and said terminal, said network 55
- being widely used by non-limited subscribers; and
 means for converting said maintenance data in a first form to be used in said control unit into data in a second form to be used in said network, said converting means being provided inside said vending machine.
11. The control apparatus as defined in claim 10, wherein said terminal comprises a display for displaying said maintenance data read from said memory and transmitted in said second form via said network to said terminal.
12. A control apparatus for vending machine, comprising:
 a memory for storing control data to control said vending machine and storing sales data and maintenance data with respect to said vending machine, said memory being provided inside said vending machine;
 a control unit for controlling said vending machine by reading said control data from said memory, said control unit being provided inside said vending machine;
 a terminal for displaying said sales data and maintenance data stored in said memory, said terminal being provided outside said vending machine;
 a network for providing a connection between said memory and said terminal, said network being widely used by non-limited subscribers; and
 means for converting said sales data and said maintenance data in a first form to be used in said control unit into data in a second form to be used in said network, said converting means being provided inside said vending machine.
13. The control apparatus as defined in claim 12, wherein said terminal comprises a display for displaying said sales data and said maintenance data read from said memory and transmitted in said second form via said network to said terminal.
14. The control apparatus as defined in claim 13, wherein said network is an optical communication network.

FIG. 1

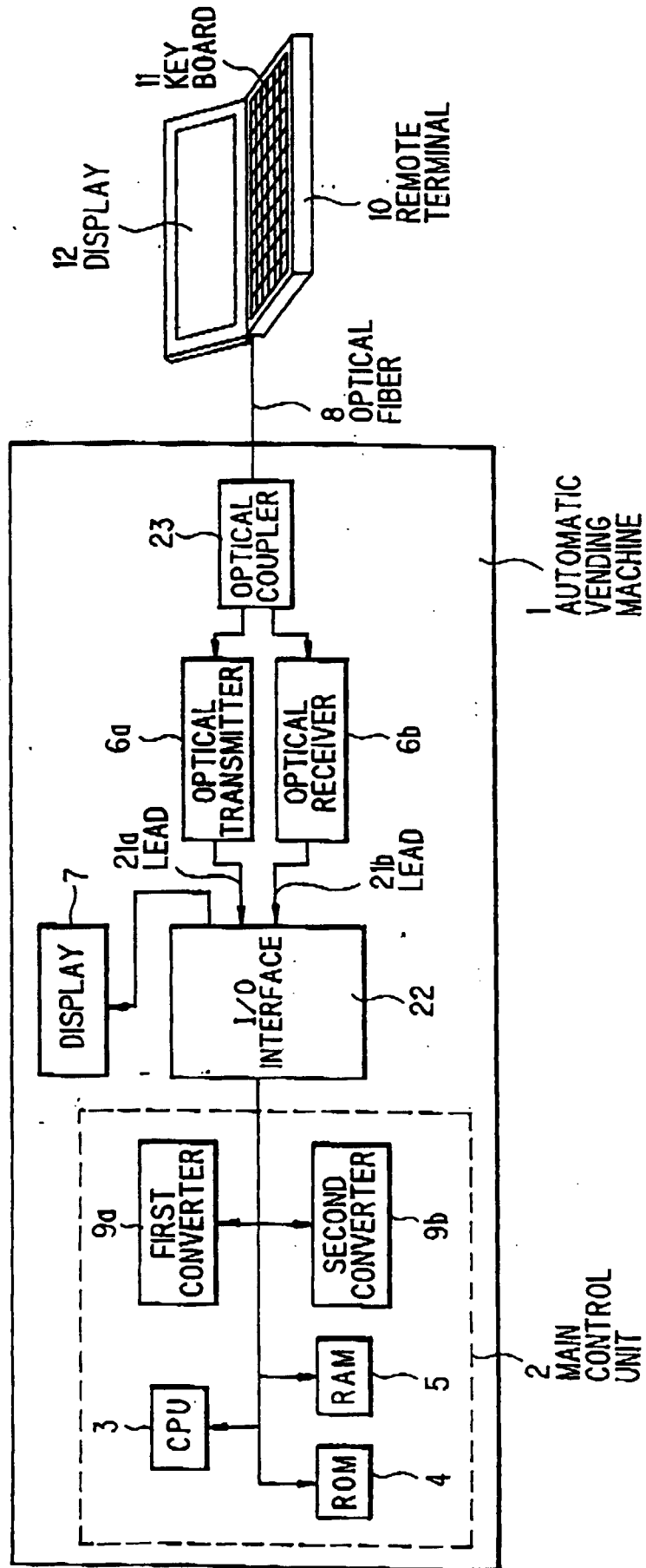


FIG. 2

12
DISPLAY

CUP DATA SETTING
REGULAR HOT COFFEE 1 (A)

CASH PRICE : 80 YEN
BEANS 1 : 05 g
SUGAR : 08 g
HOT WATER : 135 cc

CARD PRICE : 80 YEN
BEANS 2 : 05 g
CREAM : 02 g

CUP SIZE : ● 6.5 oz ○ 9 oz ○ 12 oz

EXECUTE CANCEL

FIG. 3

```

<HTML>
<HEAD>
<TITLE>HREG</TITLE>

</HEAD>
<BODY>
<TT>
<H1>CUP DATA SETTING</H1>
<H3>HOT REGULAR COFFEE 1(A) </H3>
<HR>
<FORM METHOD=POST ACTION="/cgi-bin/MY_SCRIPT">
CASH PRICE : <INPUT TYPE="text" NAME="price" SIZE=3 VALUE="80">YEN
CARD PRICE : <INPUT TYPE="text" NAME="card" SIZE=3 VALUE="80">YEN<P>
BEANS1 : <INPUT TYPE="text" NAME="name1" SIZE=2 VALUE="05">g
BEANS2 : <INPUT TYPE="text" NAME="name2" SIZE=2 VALUE="05">g
BEANS3 : <INPUT TYPE="text" NAME="name3" SIZE=2 VALUE="00">g<P>

SUGAR : <INPUT TYPE="text" NAME="sugar" SIZE=2 VALUE="08">g
CREAM : <INPUT TYPE="text" NAME="cream" SIZE=2 VALUE="02">g<P>

HOT WATER : <INPUT TYPE="text" NAME="yu" SIZE=3 VALUE="135">cc<P>

CUP SIZE:
<INPUT TYPE="radio" NAME="cup_radio" VALUE=1 CHECKED>6.5oz
<INPUT TYPE="radio" NAME="cup_radio" VALUE=2>9oz
<INPUT TYPE="radio" NAME="cup_radio" VALUE=3>12oz<P>

<INPUT TYPE="submit" NAME="submit_button" VALUE="EXECUTE">
<INPUT TYPE="reset" NAME="reset_button" VALUE="CANCEL">
</FORM>
<HR>
</TT>
</BODY>
</HTML>

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FIG. 4

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price=90&card=80&name1=05&name2=05&name3=00&sugar=08&cream=02&yu=135
&cup_radio=1

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European Patent
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EUROPEAN SEARCH REPORT

Application Number
EP 99 10 0567

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Place of search THE HAGUE		Date of completion of the search 23 June 1999	Examiner Rivero, C
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			

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**ANNEX TO THE EUROPEAN SEARCH REPORT
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This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on
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