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(54) **MERCHANDISE INFORMATION DISPLAY SYSTEM, STORE SERVER, AND DISPLAY CONTROL METHOD**

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(52) **U.S. Cl.**

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(57) **ABSTRACT**

A merchandise information display system includes a store server, an information terminal, and a first storage unit. The store server is configured to manage a merchandise database that stores merchandise information on each merchandise item available in a store. The information terminal includes a communication unit configured to communicate with an external device and a display unit configured to display information and is capable of being carried by a shopper in the store. The first storage unit is configured to store purchase-planned item information indicating an item of merchandise that the shopper wants to purchase. The store server is configured to acquire the purchase-planned item information from the first storage unit when information can be exchanged with the information terminal. The store server is configured to search the merchandise database based on the purchase-planned item information and to check the stock of an item of merchandise that the shopper wants to purchase. The store server is configured to transmit stock information including the stock availability of the item of merchandise that the shopper wants to purchase is in stock to the information terminal and to display the stock information on the display unit of the information terminal.

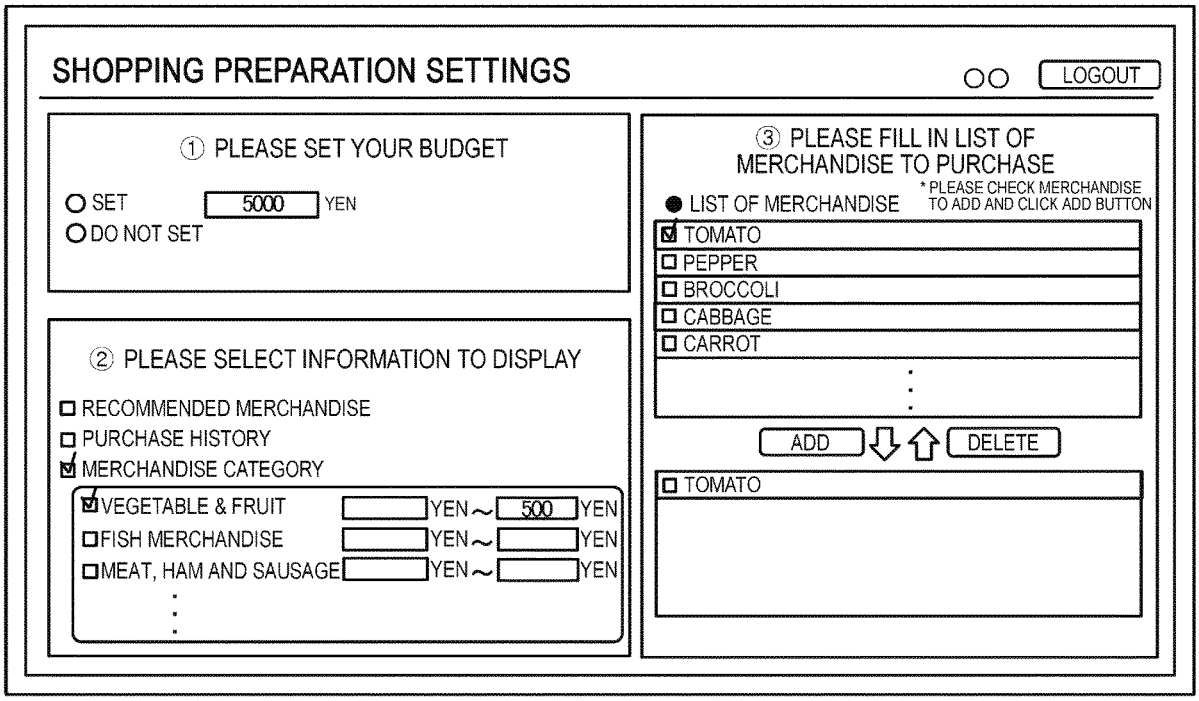


FIG. 1

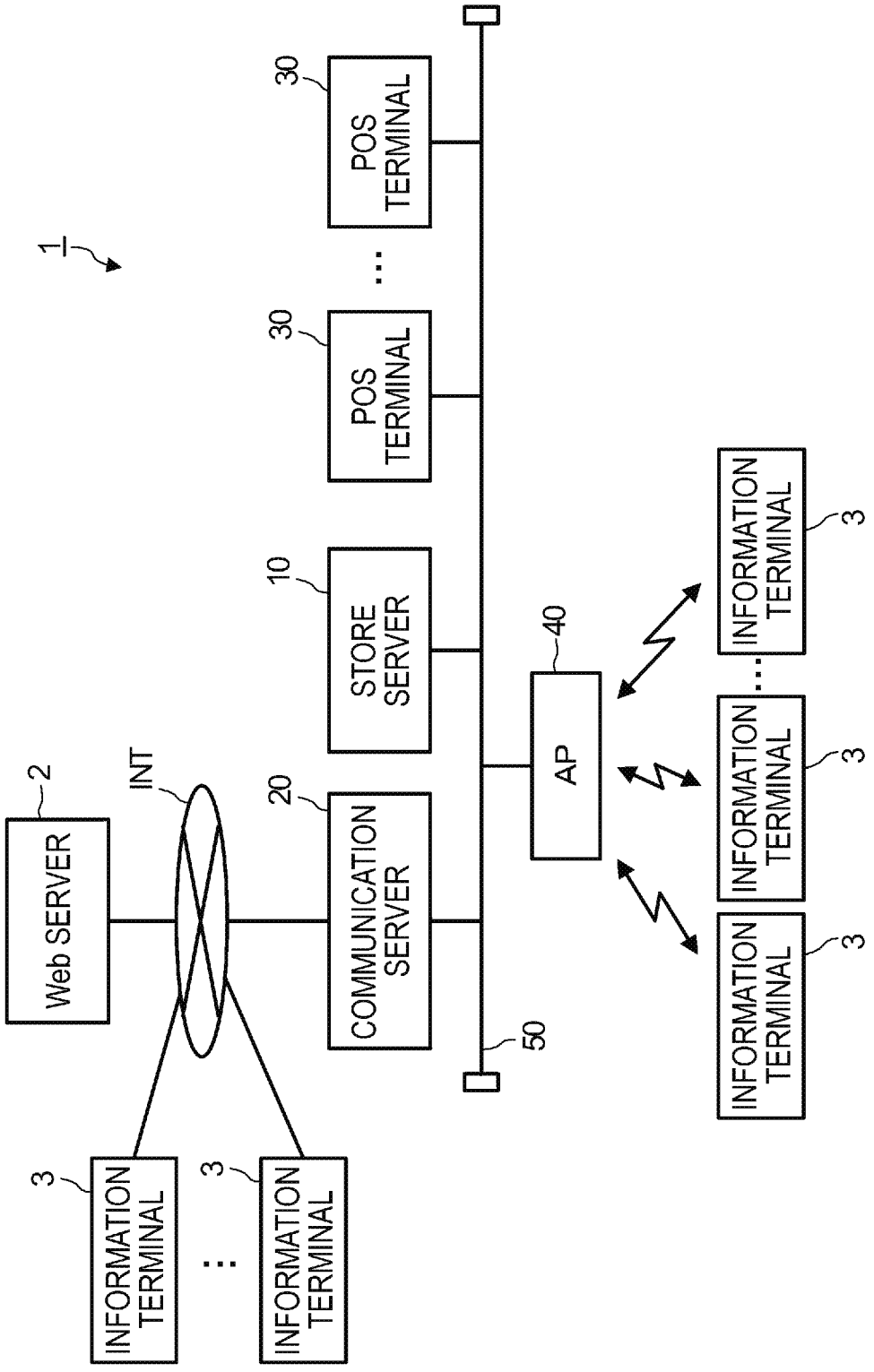

1
2
Web SERVER
INT
10
STORE SERVER
20
COMMUNICATION SERVER
30
POS TERMINAL
30
POS TERMINAL
30
POS TERMINAL
40
AP
50
3
INFORMATION TERMINAL
3
INFORMATION TERMINAL
3
INFORMATION TERMINAL
3
INFORMATION TERMINAL
3
INFORMATION TERMINAL

FIG. 2

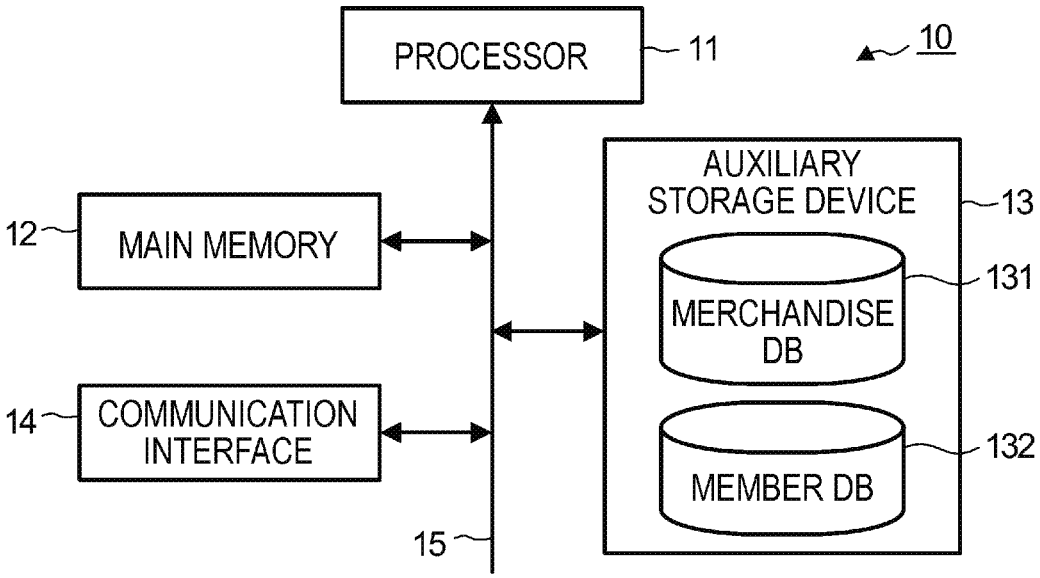


FIG. 3

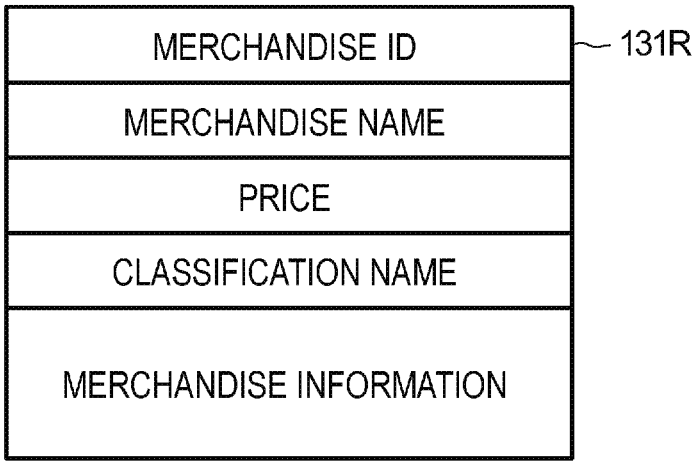


FIG. 4

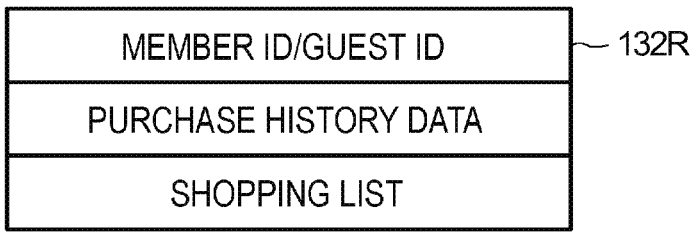


FIG. 5

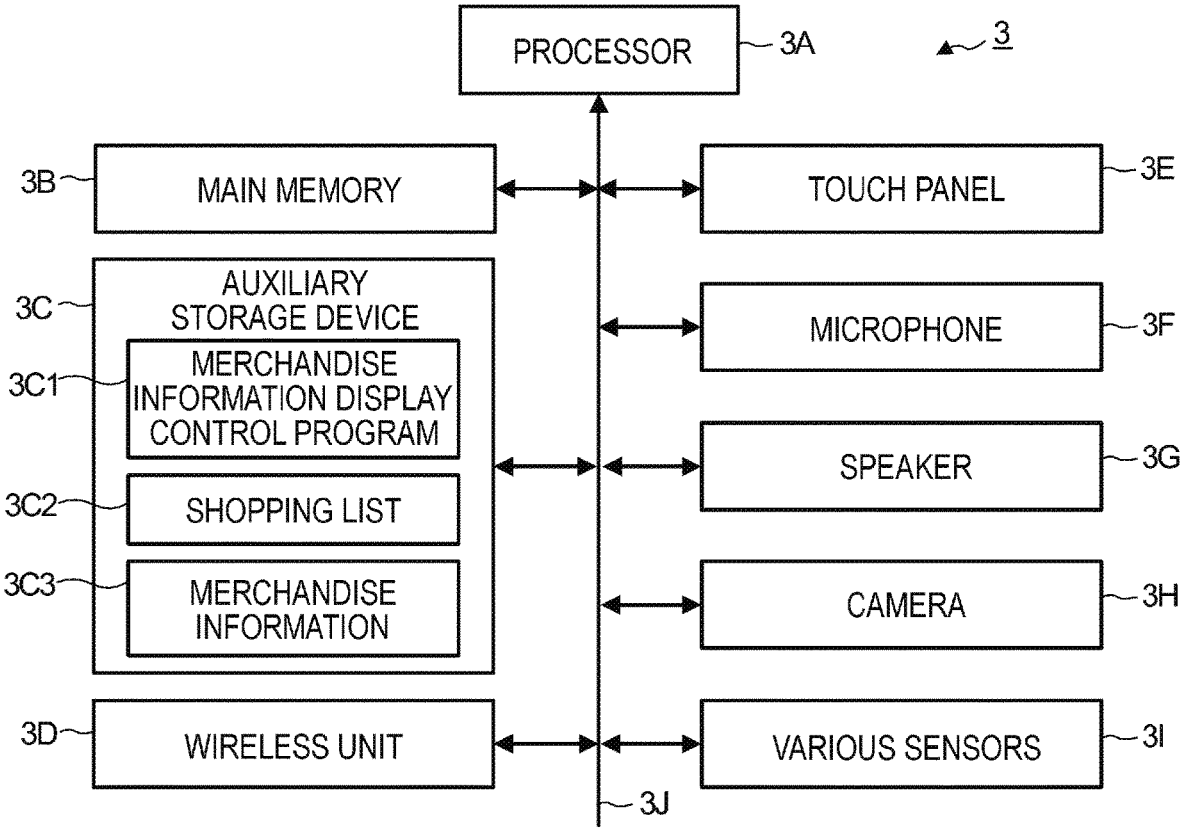


FIG. 6

A1	A2	A3	A4	
5,000 YEN	TOMATO		1	3C2
	NOODLE SOUP	300 YEN	0	
	...		0	
	⋮	⋮	⋮	

FIG. 7

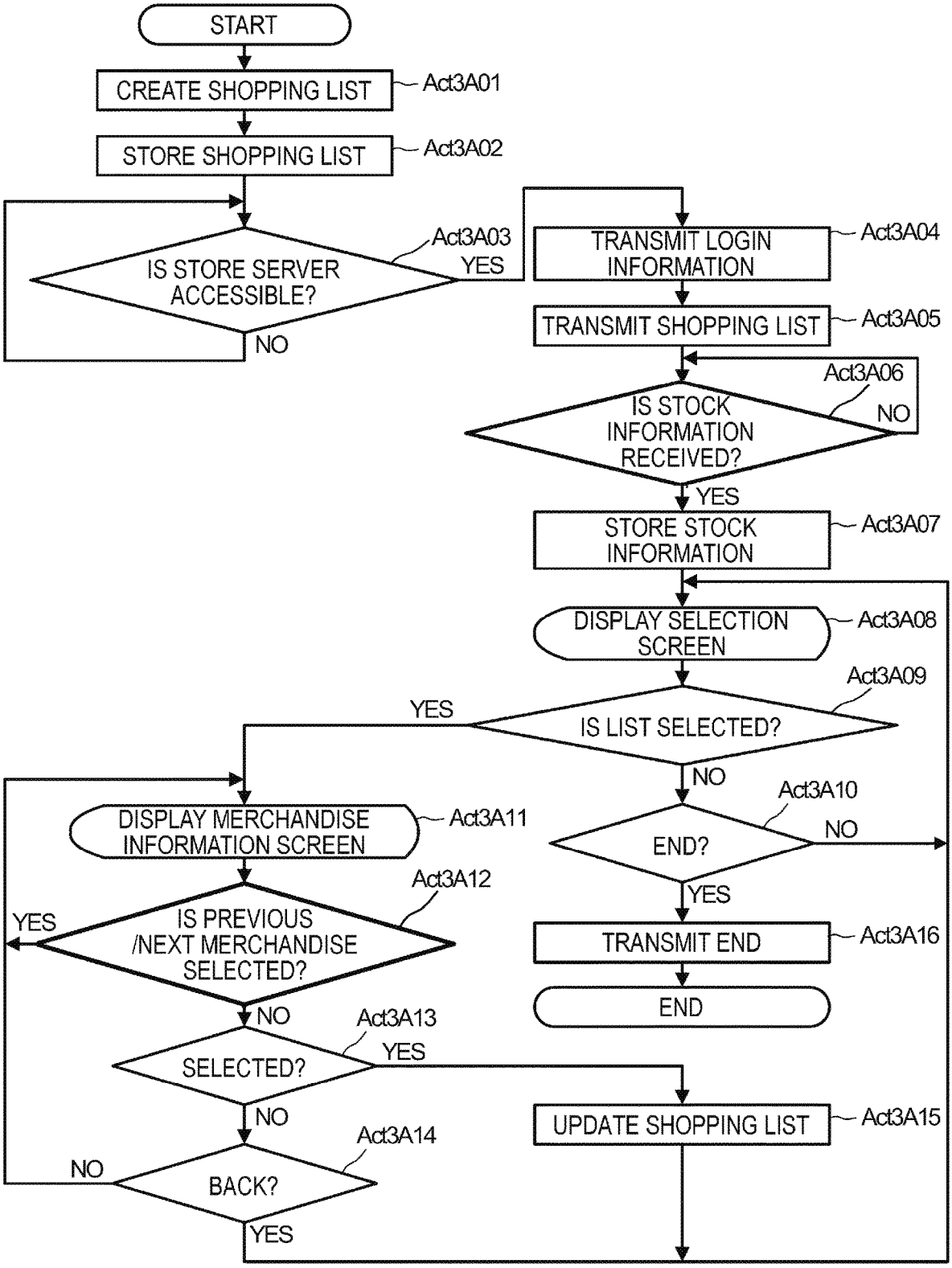

START
CREATE SHOPPING LIST
Act3A01
STORE SHOPPING LIST
Act3A02
IS STORE SERVER ACCESSIBLE?
Act3A03
YES
NO
TRANSMIT LOGIN INFORMATION
Act3A04
TRANSMIT SHOPPING LIST
Act3A05
IS STOCK INFORMATION RECEIVED?
Act3A06
NO
YES
STORE STOCK INFORMATION
Act3A07
DISPLAY SELECTION SCREEN
Act3A08
IS LIST SELECTED?
Act3A09
YES
NO
END?
Act3A10
NO
YES
DISPLAY MERCHANDISE INFORMATION SCREEN
Act3A11
IS PREVIOUS /NEXT MERCHANDISE SELECTED?
Act3A12
YES
NO
TRANSMIT END
Act3A16
END
SELECTED?
Act3A13
YES
NO
UPDATE SHOPPING LIST
Act3A15
BACK?
Act3A14
NO
YES

FIG. 8

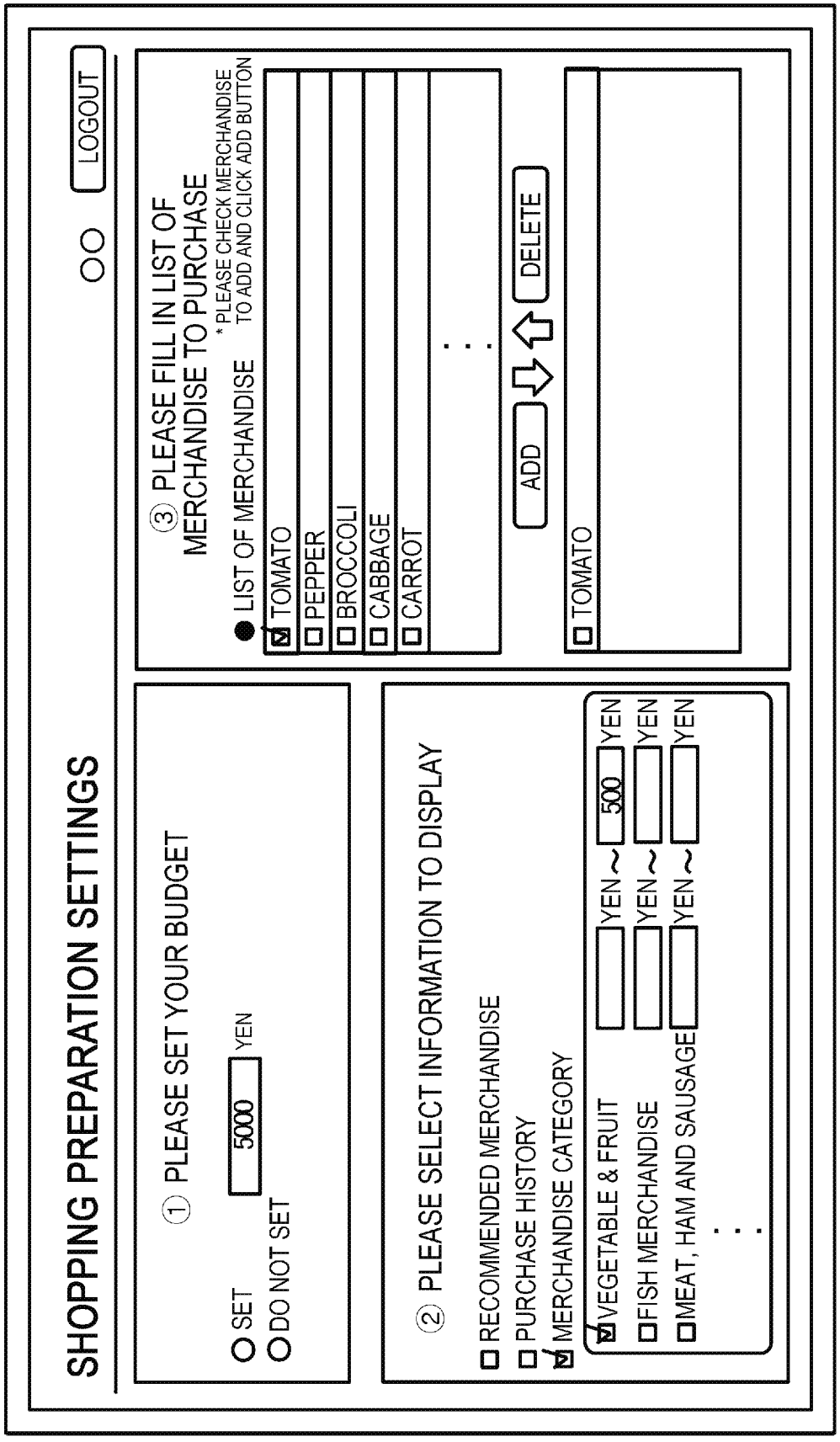

SHOPPING PREPARATION SETTINGS
OO
LOGOUT
① PLEASE SET YOUR BUDGET
SET
5000
YEN
DO NOT SET
② PLEASE SELECT INFORMATION TO DISPLAY
RECOMMENDED MERCHANDISE
PURCHASE HISTORY
MERCHANDISE CATEGORY
VEGETABLE & FRUIT
YEN～
500
YEN
FISH MERCHANDISE
YEN～
YEN
MEAT, HAM AND SAUSAGE
YEN～
YEN
③ PLEASE FILL IN LIST OF MERCHANDISE TO PURCHASE
* PLEASE CHECK MERCHANDISE TO ADD AND CLICK ADD BUTTON
LIST OF MERCHANDISE
TOMATO
PEPPER
BROCCOLI
CABBAGE
CARROT
ADD
DELETE
TOMATO

FIG. 9

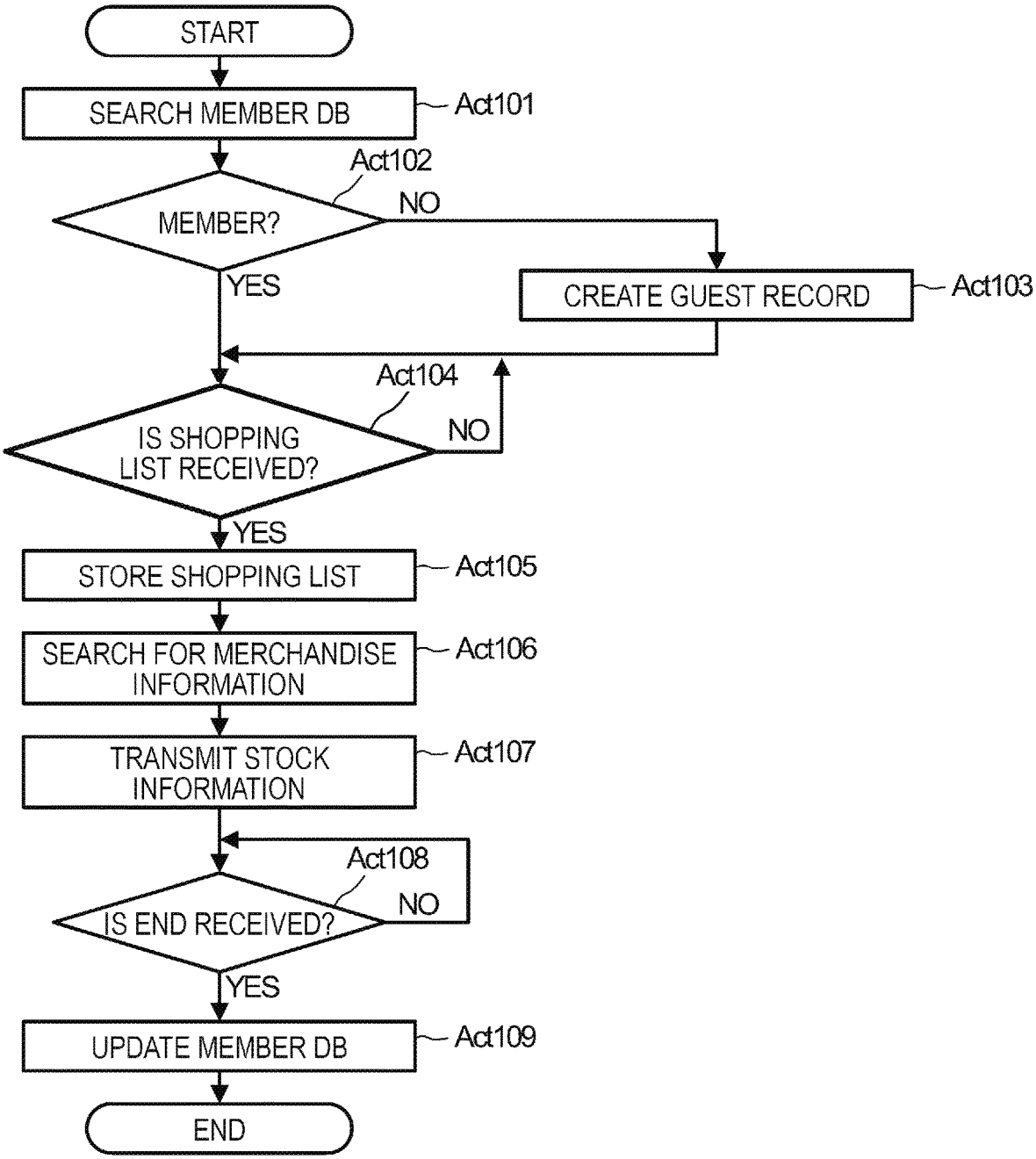

START
SEARCH MEMBER DB
Act101
Act102
MEMBER?
NO
YES
CREATE GUEST RECORD
Act103
Act104
IS SHOPPING LIST RECEIVED?
NO
YES
STORE SHOPPING LIST
Act105
SEARCH FOR MERCHANDISE INFORMATION
Act106
TRANSMIT STOCK INFORMATION
Act107
Act108
IS END RECEIVED?
NO
YES
UPDATE MEMBER DB
Act109
END

FIG. 10

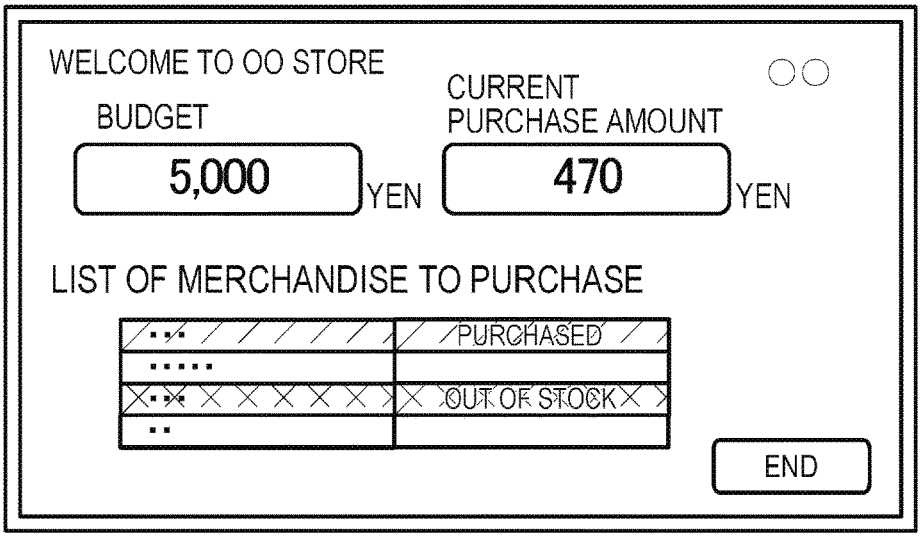


FIG. 11

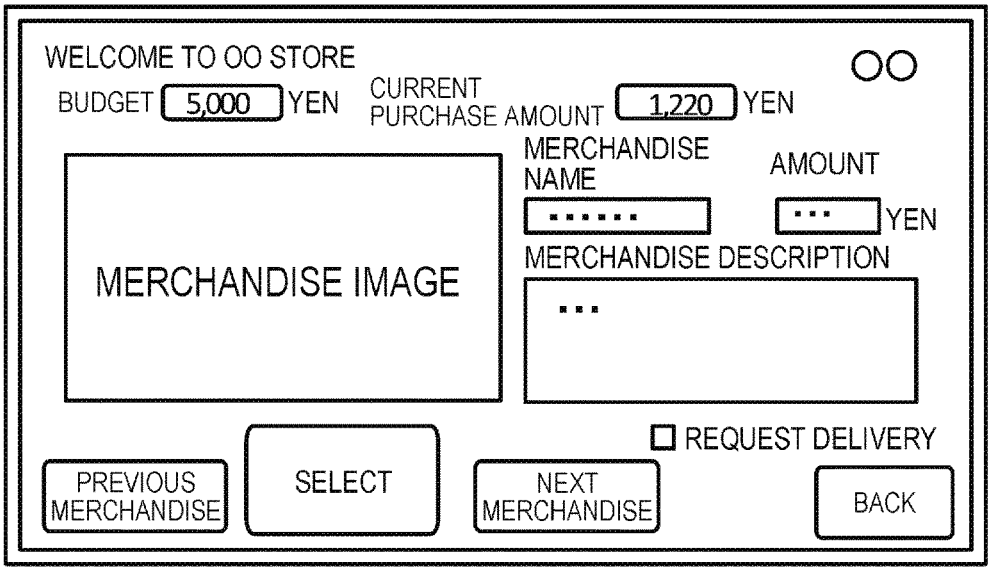


FIG. 12

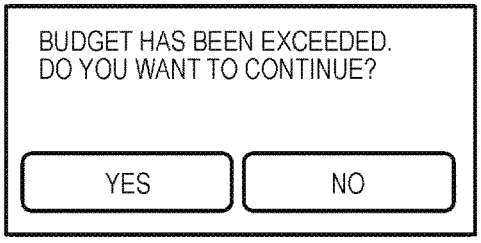


FIG. 13

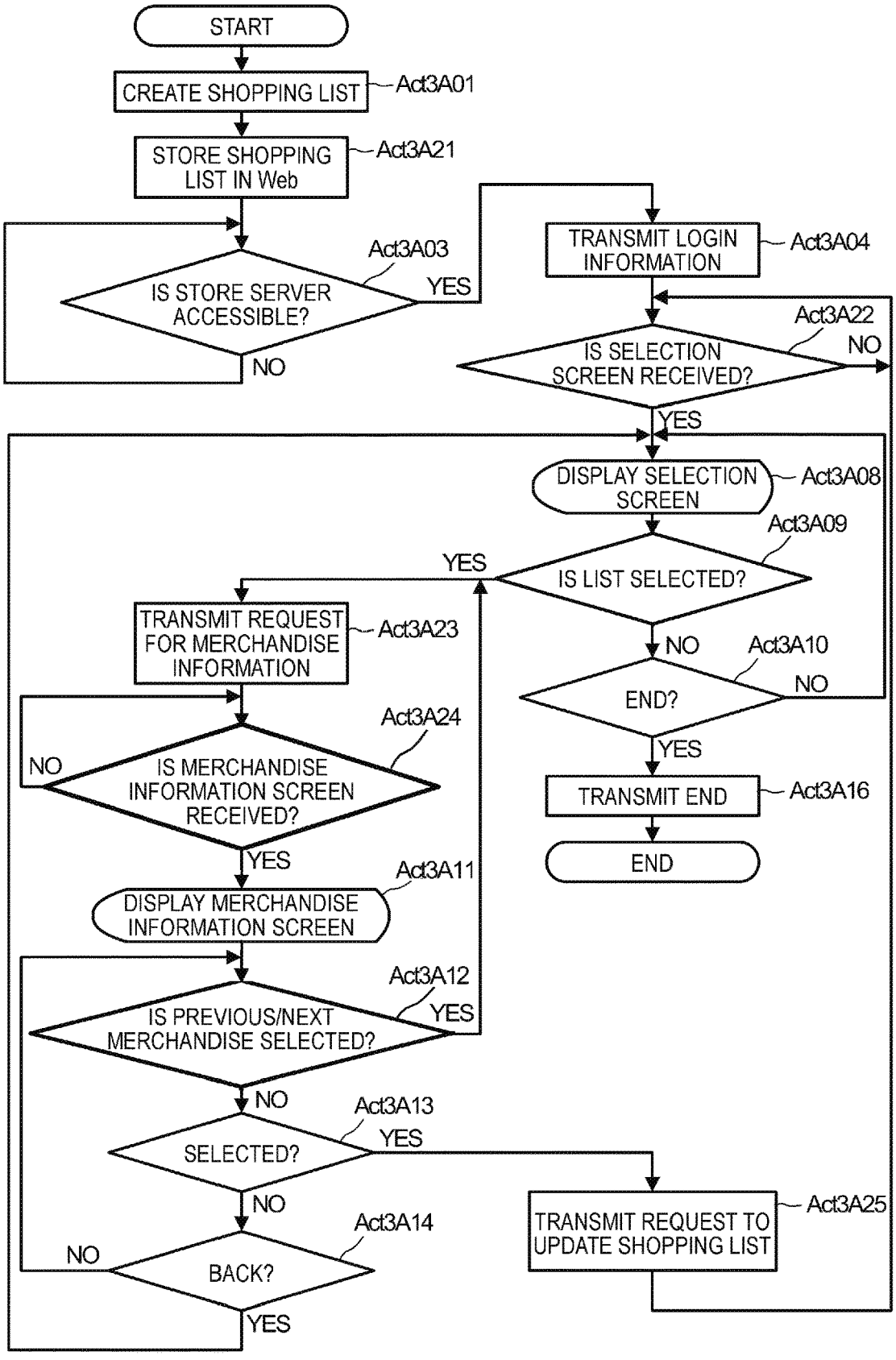

START
CREATE SHOPPING LIST
Act3A01
STORE SHOPPING LIST IN Web
Act3A21
IS STORE SERVER ACCESSIBLE?
Act3A03
YES
NO
TRANSMIT LOGIN INFORMATION
Act3A04
IS SELECTION SCREEN RECEIVED?
Act3A22
NO
YES
DISPLAY SELECTION SCREEN
Act3A08
IS LIST SELECTED?
Act3A09
YES
NO
TRANSMIT REQUEST FOR MERCHANDISE INFORMATION
Act3A23
END?
Act3A10
NO
YES
IS MERCHANDISE INFORMATION SCREEN RECEIVED?
Act3A24
NO
YES
TRANSMIT END
Act3A16
END
DISPLAY MERCHANDISE INFORMATION SCREEN
Act3A11
IS PREVIOUS/NEXT MERCHANDISE SELECTED?
Act3A12
YES
NO
SELECTED?
Act3A13
YES
NO
TRANSMIT REQUEST TO UPDATE SHOPPING LIST
Act3A25
BACK?
Act3A14
NO
YES

FIG. 14

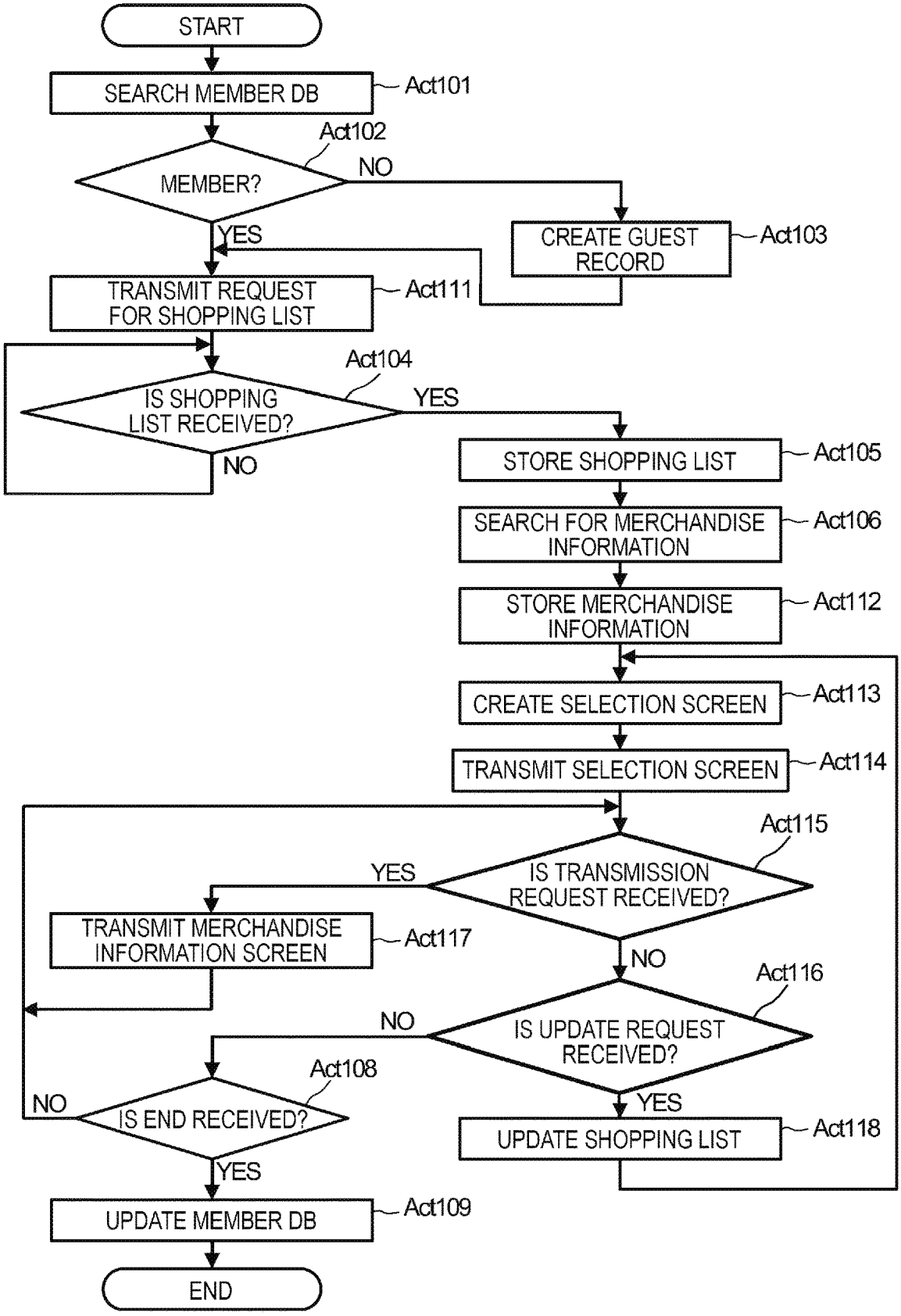

START
SEARCH MEMBER DB
Act101
Act102
MEMBER?
NO
YES
CREATE GUEST RECORD
Act103
TRANSMIT REQUEST FOR SHOPPING LIST
Act111
Act104
IS SHOPPING LIST RECEIVED?
YES
NO
STORE SHOPPING LIST
Act105
SEARCH FOR MERCHANDISE INFORMATION
Act106
STORE MERCHANDISE INFORMATION
Act112
CREATE SELECTION SCREEN
Act113
TRANSMIT SELECTION SCREEN
Act114
Act115
IS TRANSMISSION REQUEST RECEIVED?
YES
TRANSMIT MERCHANDISE INFORMATION SCREEN
Act117
NO
Act116
IS UPDATE REQUEST RECEIVED?
NO
YES
UPDATE SHOPPING LIST
Act118
Act108
IS END RECEIVED?
NO
YES
UPDATE MEMBER DB
Act109
END

FIG. 15

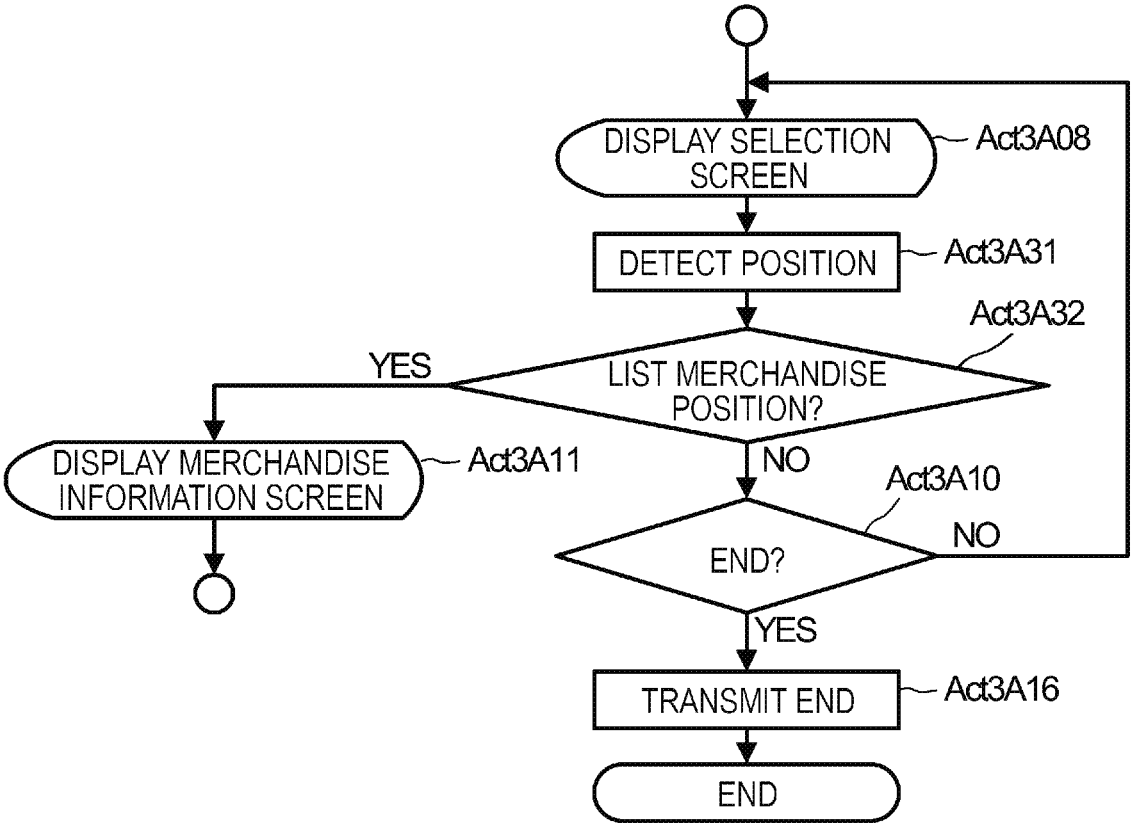

DISPLAY SELECTION SCREEN
Act3A08
DETECT POSITION
Act3A31
Act3A32
LIST MERCHANDISE POSITION?
YES
NO
DISPLAY MERCHANDISE INFORMATION SCREEN
Act3A11
Act3A10
END?
NO
YES
TRANSMIT END
Act3A16
END

FIG. 16

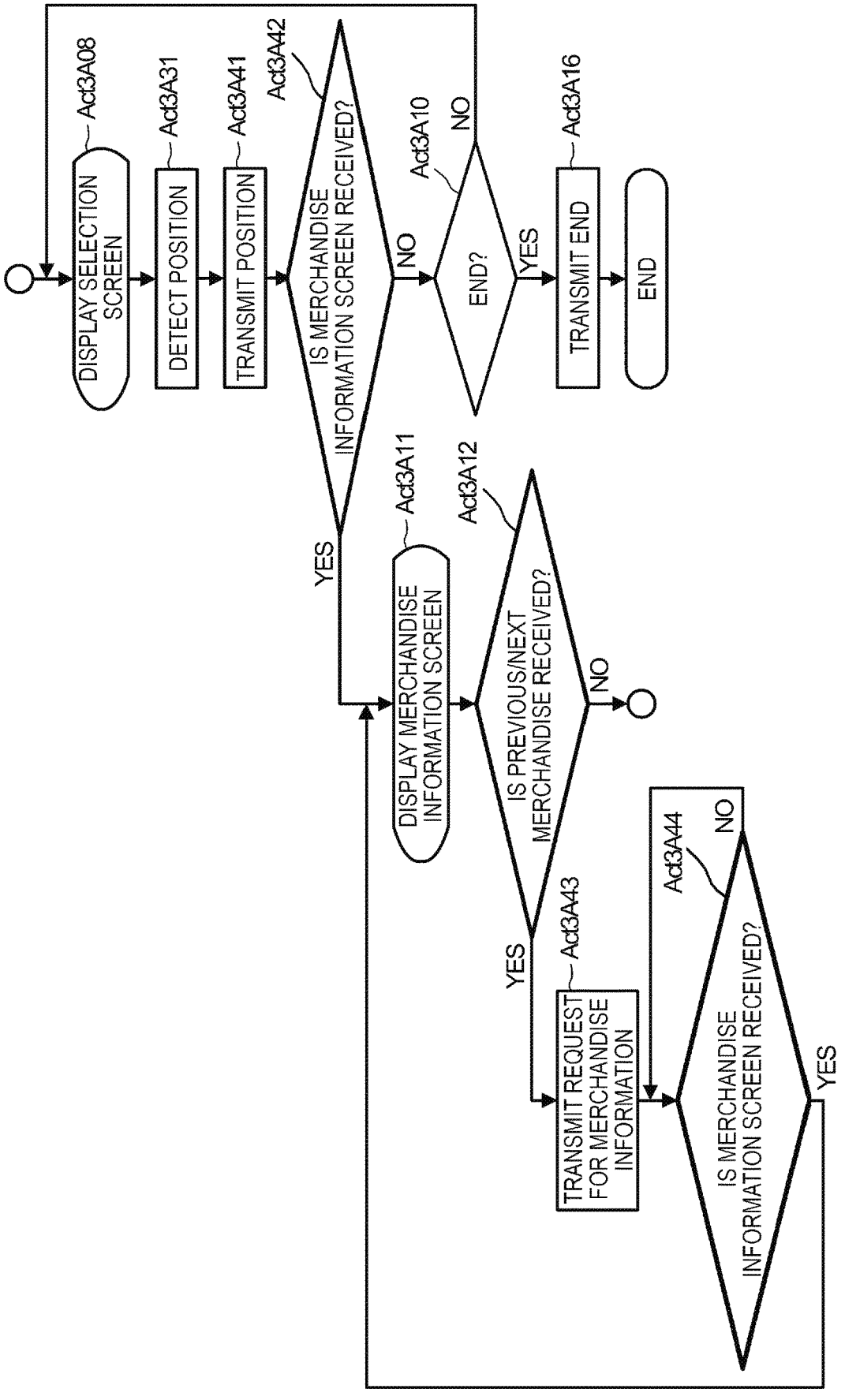

Act3A08
DISPLAY SELECTION SCREEN
Act3A31
DETECT POSITION
Act3A41
TRANSMIT POSITION
Act3A42
IS MERCHANDISE INFORMATION SCREEN RECEIVED?
NO
Act3A10
END?
NO
YES
Act3A16
TRANSMIT END
END
YES
Act3A11
DISPLAY MERCHANDISE INFORMATION SCREEN
Act3A12
IS PREVIOUS/NEXT MERCHANDISE RECEIVED?
NO
YES
Act3A43
TRANSMIT REQUEST FOR MERCHANDISE INFORMATION
Act3A44
IS MERCHANDISE INFORMATION SCREEN RECEIVED?
NO
YES

FIG. 17

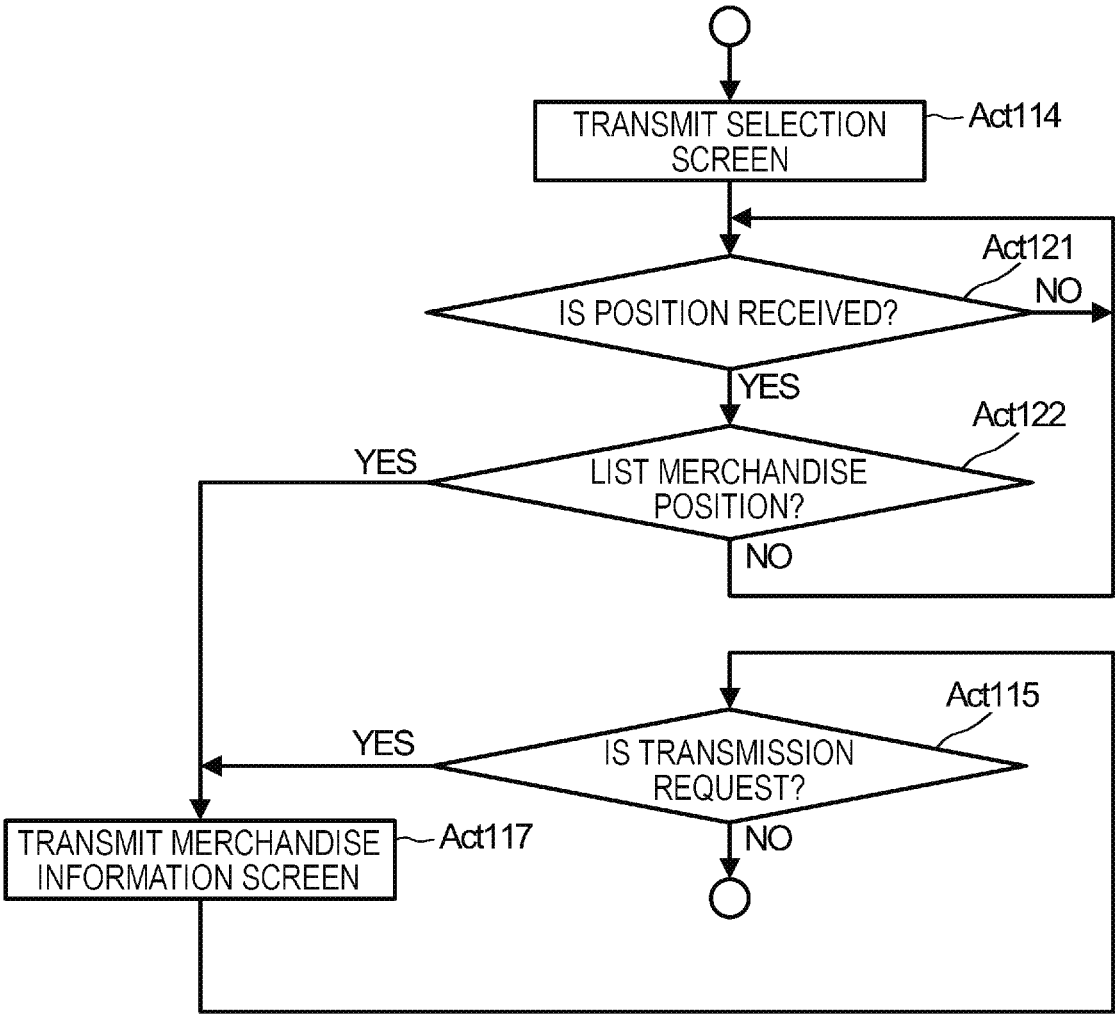

TRANSMIT SELECTION SCREEN
Act114
Act121
IS POSITION RECEIVED?
NO
YES
Act122
LIST MERCHANDISE POSITION?
YES
NO
Act115
IS TRANSMISSION REQUEST?
YES
NO
TRANSMIT MERCHANDISE INFORMATION SCREEN
Act117

FIG. 18

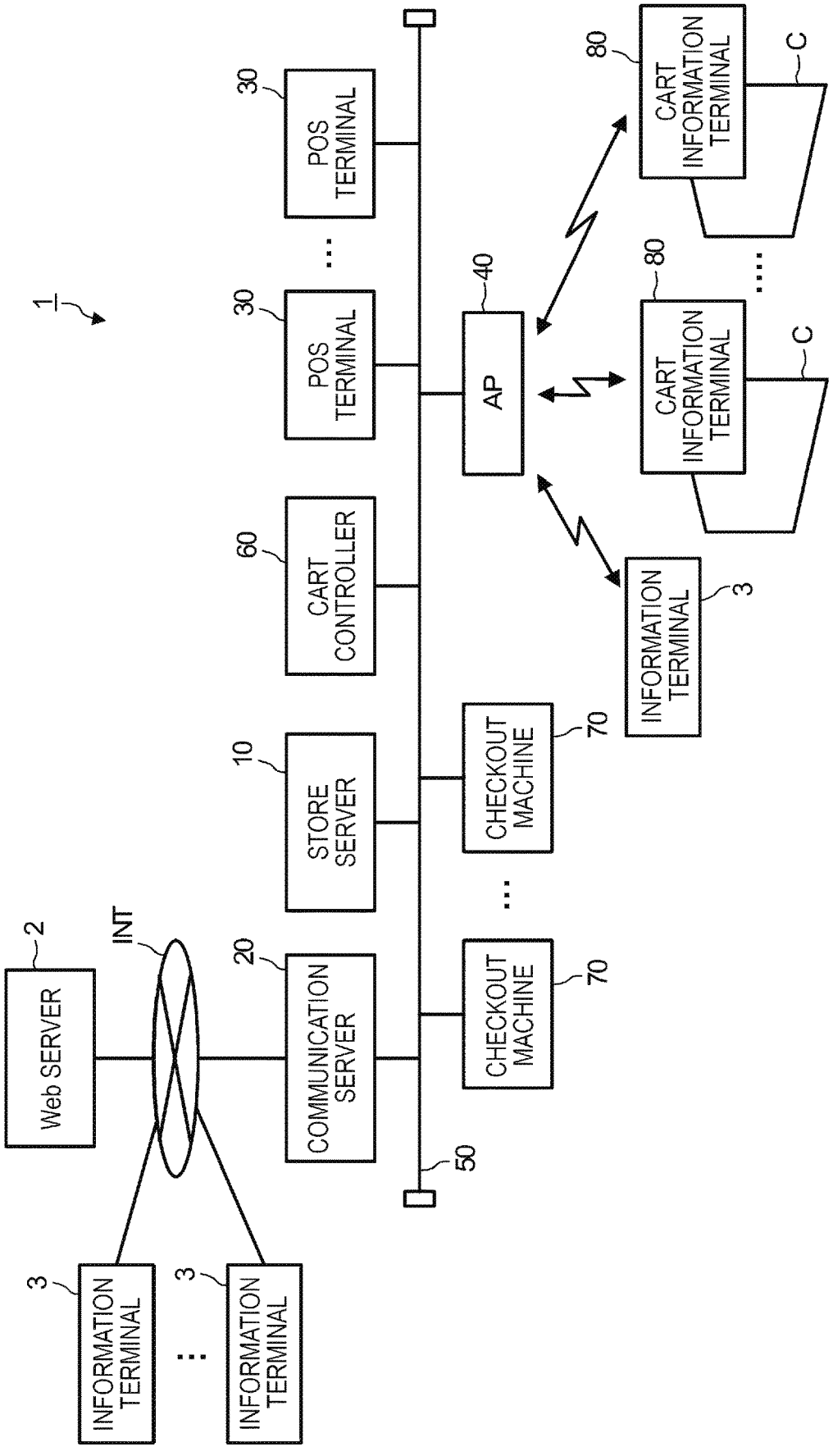

1
2
Web SERVER
INT
3
INFORMATION TERMINAL
3
INFORMATION TERMINAL
20
COMMUNICATION SERVER
10
STORE SERVER
60
CART CONTROLLER
30
POS TERMINAL
30
POS TERMINAL
30
POS TERMINAL
50
40
AP
70
CHECKOUT MACHINE
70
CHECKOUT MACHINE
3
INFORMATION TERMINAL
80
CART INFORMATION TERMINAL
C
80
CART INFORMATION TERMINAL
C
80
CART INFORMATION TERMINAL
C

FIG. 19

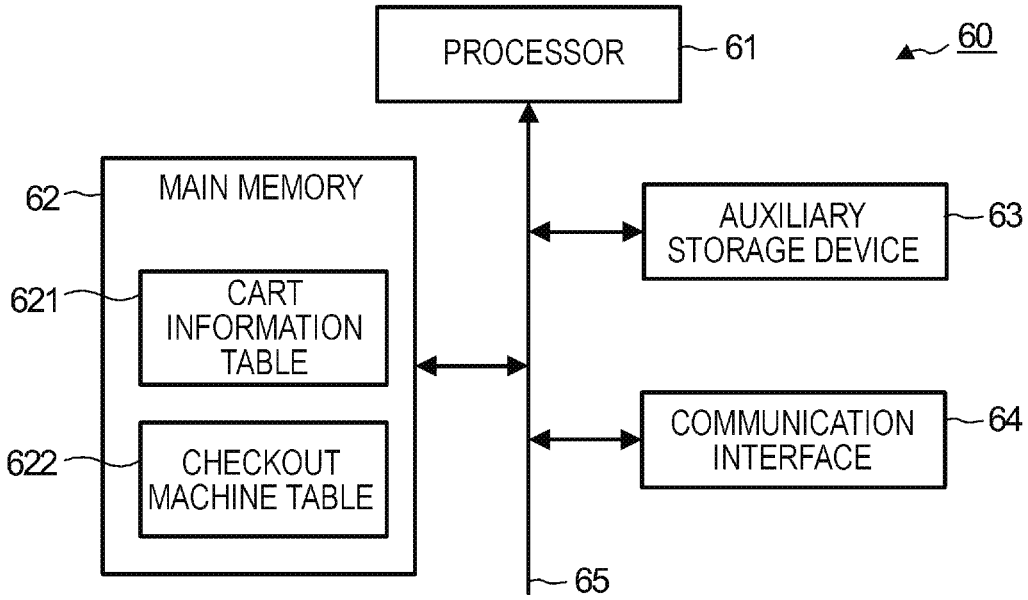
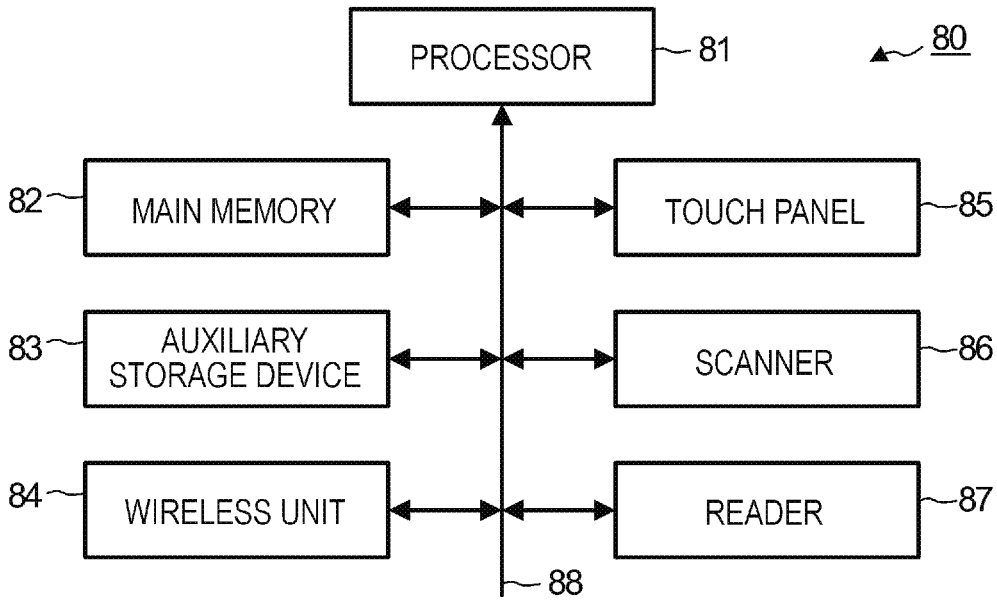

PROCESSOR
61
60
62
MAIN MEMORY
621
CART INFORMATION TABLE
622
CHECKOUT MACHINE TABLE
AUXILIARY STORAGE DEVICE
63
COMMUNICATION INTERFACE
64
65

FIG. 20


PROCESSOR
81
80
82
MAIN MEMORY
83
AUXILIARY STORAGE DEVICE
84
WIRELESS UNIT
TOUCH PANEL
85
SCANNER
86
READER
87
88

MERCHANDISE INFORMATION DISPLAY SYSTEM, STORE SERVER, AND DISPLAY CONTROL METHOD

CROSS-REFERENCE TO RELATED APPLICATION

[0001] This application is based upon and claims the benefit of priority from. Japanese Patent Application No. 2019-171397, filed in Sep. 20, 2019, the entire contents of which are incorporated herein by reference.

FIELD

[0002] Embodiments of the present invention relate to a merchandise information display system, a store server, and a display control method.

BACKGROUND

[0003] Many among the shoppers who plan to purchase a large number of merchandise items prepare a memo with a merchandise name and an item name on a piece of paper and purchase merchandise in a store while checking the merchandise written in the memo to not omit the merchandise to plan to purchase. In some cases, a shopping list function for pre-recording merchandise to be purchased is used as a memo by using a shopping support program, which is one of the application programs installed in an information terminal owned by the shopper himself or herself.

[0004] On the other hand, in a store, the merchandise that a shopper wants to purchase may be out of stock, or the merchandise itself may not be handled in a store. The shopper does not know whether the merchandise is in the store, and therefore he or she searches around the store looking for such merchandise out of stock or not handled in that store. Examples of related art include JP-A-2013-37428.

DESCRIPTION OF THE DRAWINGS

[0005] FIG. **1** is a block diagram illustrating an overall arrangement of a merchandise information display system according to a first embodiment;

[0006] FIG. **2** is a block diagram illustrating a main circuit arrangement of a customer server in FIG. **1**;

[0007] FIG. **3** is a schematic diagram illustrating a main data structure of a merchandise data record stored in a merchandise database in the customer server;

[0008] FIG. **4** is a schematic diagram illustrating a main data structure of a member data record stored in a member database in the customer server;

[0009] FIG. **5** is a block diagram illustrating a main circuit configuration of an information terminal in FIG. **1**;

[0010] FIG. **6** is a schematic diagram illustrating a main data structure of a shopping list storage unit in the information terminal;

[0011] FIG. **7** is a flowchart illustrating a procedure of main information processing executed by a processor of the information terminal;

[0012] FIG. **8** is a schematic diagram illustrating an example of a shopping list creation screen displayed on a touch panel of the information terminal;

[0013] FIG. **9** is a flow chart illustrating a procedure of main information processing executed by a processor of a store server;

[0014] FIG. **10** is a schematic diagram illustrating an example of a selection screen displayed on the touch panel of the information terminal;

[0015] FIG. **11** is a schematic diagram illustrating an example of a merchandise information screen displayed on the touch panel of the information terminal;

[0016] FIG. **12** is a schematic diagram illustrating an example of an alert screen displayed as a pop-up on the merchandise information screen;

[0017] FIG. **13** is a flowchart illustrating a procedure of main information processing executed by a processor of an information terminal in a merchandise information display system according to a second embodiment;

[0018] FIG. **14** is a flowchart illustrating a procedure of main information processing executed by a processor of a store server;

[0019] FIG. **15** is a flowchart illustrating apart of a procedure of main information processing executed by a processor of an information terminal in a merchandise information display system according to a third embodiment;

[0020] FIG. **16** is a flowchart illustrating apart of a procedure of main information processing executed by a processor of an information terminal in a merchandise information display system according to a fourth embodiment;

[0021] FIG. **17** is a flowchart illustrating apart of a procedure of main information processing executed by a processor of a store server;

[0022] FIG. **18** is a block diagram illustrating an overall arrangement of a merchandise information display system according to a fifth embodiment;

[0023] FIG. **19** is a block diagram illustrating a main circuit arrangement of a cart controller in FIG. **18**; and

[0024] FIG. **20** is a block diagram illustrating a main circuit arrangement of a cart information terminal.

DETAILED DESCRIPTION

[0025] A problem to be solved by at least one embodiment of the present invention is to provide a merchandise information display system, a store server, and a display control method that can notify a shopper of the availability of merchandise that the shopper wants to purchase.

[0026] In at least one embodiment, a merchandise information display system includes a store server, an information terminal, and a first storage unit. The store server is configured to manage a merchandise database that stores merchandise information on each merchandise item available in a store. The information terminal includes a communication unit configured to communicate with an external device and a display unit configured to display information and is capable of being carried by a shopper in the store. The first storage unit stores purchase-planned item information indicating an item of merchandise that the shopper wants to purchase. The store server is configured to acquire the purchase-planned item information from the first storage unit when information can be exchanged with the information terminal. The store server is configured to search the merchandise database based on the purchase-planned item information and to check the stock of an item of merchandise that the shopper wants to purchase. The store server is configured to transmit stock information including the stock availability of the item of merchandise that the shopper wants to purchase is in stock to the information terminal and to display the stock information on the display unit of the information terminal.

[0027] Hereinafter, embodiments will be described with reference to drawings.

First Embodiment

[0028] FIG. **1** is a block diagram illustrating an overall at least one of a merchandise information display system according to a first embodiment. The merchandise information display system includes a store system **1**, a Web server **2**, and an information terminal **3**. The store system **1**, Web server **2**, and information terminal **3** can exchange information via a network INT such as the Internet.

[0029] The store system **1** includes a store server **10**, a communication server **20**, a plurality of point of sales (POS) terminals **30**, and an access point (illustrated as AP in FIG. **1**) **40**. The store server **10**, communication server **20**, POS terminal **30**, and access point **40** are connected to a network **50** such as a local area network (LAN).

[0030] The information terminal **3** is an information processing device such as a smartphone or a tablet owned by the shopper. The shopper carries the information terminal **3** when visiting the store where the store system **1** is configured and purchases merchandise. The information terminal **3** includes a wireless unit. The information terminal **3** performs wireless communication with the access point **40**. The access point **40** relays communication between the store server **10** connected to the network **50** and the information terminal **3**. Although only one access point **40** is illustrated in FIG. **1**, there may be two or more access points depending on the scale of the store and the like.

[0031] The POS terminal **30** is disposed at a face-to-face cash register where a cashier as a clerk in charge of checkout performs registration and settlement of purchased merchandise. The facing cash register has a scanner. The scanner may be stationary or hand-held. The cashier registers the sales data of the purchased merchandise in the POS terminal **30** by scanning the barcode of the purchased merchandise items one by one with the scanner. The POS terminal **30** calculates the settlement amount of the registered purchased merchandise. The shopper pays the cashier the price corresponding to the amount to be settled. The price can be paid by cash, a credit card, electronic money, points, cash vouchers such as gift certificates, and the like. The POS terminal **30** is an example of a merchandise sales processing device that processes registration and checkout of purchased merchandise.

[0032] FIG. **2** is a block diagram illustrating a main circuit arrangement of the store server **10**. The store server **10** includes a processor **11**, a main memory **12**, an auxiliary storage device **13**, a communication interface **14**, and a system transmission path **15**. The system transmission path **15** includes an address bus, a data bus, a control signal line, and the like. The store server **10** connects the processor **11**, the main memory **12**, the auxiliary storage device **13**, and the communication interface **14** to the system transmission path **15**. In the store server **10**, a computer is configured with the processor **11**, the main memory **12**, the auxiliary storage device **13**, and the system transmission path **15** connecting therebetween.

[0033] The processor **11** corresponds to the central part of the above computer. The processor **11** controls each unit to realize various functions as the store server **10** according to an operating system and application programs. The processor **11** is, for example, a central processing unit (CPU).

[0034] The main memory **12** corresponds to the main memory portion of the computer. The main memory **12** includes a nonvolatile memory area and a volatile memory area. The main memory **12** stores the operating system and the application programs in a nonvolatile memory area. The main memory **12** sometimes stores data necessary for the processor **11** to control each part in a nonvolatile or volatile memory area. The main memory **12** uses a volatile memory area as a work area where data is appropriately rewritten by the processor **11**. For example, the nonvolatile memory area is a read-only memory (ROM). The volatile memory area is a random access memory (RAM).

[0035] The auxiliary storage device **13** corresponds to an auxiliary storage part of the above computer. For example, electric erasable programmable read-only memory (EEPROM), hard disc drive (HDD), solid state drive (SSD), and the like are used as the auxiliary storage device **13**. The auxiliary storage device **13** stores data used by the processor **11** in performing various kinds of processing and data created by processing in the processor **11**. The auxiliary storage device **13** sometimes stores the above application programs.

[0036] The communication interface **14** transmits and receives data to and from each unit connected via the network **50** according to a communication protocol.

[0037] The store server **10** includes a merchandise database **131** and a member database **132** in the auxiliary storage device **13**. In FIG. **2**, the database is abbreviated as DB.

[0038] The merchandise database **131** stores data on each merchandise item to be sold in the store. FIG. **3** is a schematic diagram illustrating the main data structure of a merchandise data record **131**R per merchandise item stored in the merchandise database **131**. As illustrated in FIG. **3**, the merchandise data record **131**R includes items such as a merchandise ID, a merchandise name, a price, a classification name, and merchandise information.

[0039] The merchandise ID is a unique code set for each merchandise item in order to identify each merchandise item individually. The merchandise name and price are the name of the merchandise identified by the merchandise ID and the selling price per unit.

[0040] The classification name is information for identifying the classification to which the merchandise identified by the merchandise ID belongs. For example, merchandise "apple" has many varieties such as "Fuji", "Jonagold", and "Jonathan", and a different merchandise ID is set for each type. However, for all varieties, the classification name is unified to "apple".

[0041] The merchandise information is detailed information on the merchandise identified by the merchandise ID. The merchandise information includes, for example, a merchandise image, a merchandise name, a price, and a merchandise description of the merchandise. The merchandise description may include information such as raw materials, components and quantities, a manufacturer, a factory, and a place of origin, which are information to be used when the shopper determines whether to purchase the merchandise.

[0042] The member database **132** stores data relating to customers who have been registered as members, such as point members, so-called members. FIG. **4** is a schematic diagram illustrating a main data structure of a member data record **132**R per member stored in the member database **132**.

As illustrated, the member data record **132**R includes items such as a member ID, purchase history data, a shopping list, and the like.

[0043] The member ID is a unique code set for each member to identify each member individually. The member owns a recording medium on which the member ID is recorded. The recording medium is, for example, a magnetic card, a contact integrated circuit (IC) card, a non-contact IC card, a smartphone, that is, an information terminal **3**, or the like.

[0044] The purchase history data is data indicating a purchase history indicating when and what the member identified by the member ID purchased.

[0045] The shopping list is data on merchandise that the member identified by the member ID plans to buy. The shopper can create a shopping list in advance before visiting the store by using a merchandise information display control program downloaded from the Web server **2** to the information terminal **3**. The shopping list includes an item name that is purchase-planned item information indicating an item of merchandise that the shopper plans to buy, that is, an item of merchandise that the shopper wants to purchase. The item name may be a merchandise name set in the merchandise data record **131**R or a classification name. That is, a shopper who plans to purchase merchandise "apple" regardless of the type may register "apple" as an item name in the shopping list. On the other hand, for example, a shopper who plans to purchase merchandise "apple" with a merchandise name of "Fuji Apple" may register "Fuji Apple" as an item name on the shopping list.

[0046] The member database **132** can temporarily store data on one-time members who are customers who are not members. A guest record, which is the member data record **132**R for a one-time member, includes a guest ID instead of the member ID. Even if the shopper is not a member of the store, the shopper can receive services according to those of a member by using the guest ID issued by the merchandise information display control program. In the one-time member data record **132**R, the purchase history data is ignored. After the shopping, the one-time member data record **132**R is deleted from the member database **132**.

[0047] The communication server **20** supports data communication processing performed between the store server **10** and the Web server **2** or an electronic money center (not illustrated) via a network INT such as the Internet or a dedicated network for electronic money. The electronic money center manages, for each registered user for electronic money, an electronic money database that stores an electronic money record in which data relating to the electronic money is described, and supports settlement by electronic money.

[0048] FIG. **5** is a block diagram showing a main circuit configuration of the information terminal **3**. The information terminal **3** includes a processor **3**A, a main memory **3**B, an auxiliary storage device **3**C, a wireless unit **3**D, a touch panel **3**E, a microphone **3**F, a speaker **3**G, a camera **3**H, various sensors **3**I, and a system transmission path **3**J. The system transmission path **3**J includes an address bus, a data bus, a control signal line, and the like. The information terminal **3** connects the processor **3**A, the main memory **3**B, the auxiliary storage device **3**C, the wireless unit **3**D, the touch panel **3**E, the microphone **3**F, the speaker **3**G, the camera **3**H, and the various sensors **3**I to the system transmission path **3**J. In the information terminal **3**, a computer is configured with the processor **3**A, the main memory **3**B, the auxiliary storage device **3**C, and the system transmission path **3**J connecting therebetween.

[0049] The processor **3**A corresponds to a central part of the computer. The processor **3**A controls each unit to realize various functions according to an operating system and an application program. The processor **3**A is, for example, a CPU.

[0050] The main memory **3**B corresponds to a main storage part of the computer. The main memory **3**B includes a nonvolatile memory area and a volatile memory area. The main memory **3**B stores an operating system and application programs in the nonvolatile memory area. The main memory **3**B may store data necessary for the processor **3**A to execute processing for controlling each unit in the nonvolatile or volatile memory area. The main memory **3**B uses the volatile memory area as a work area in which data is appropriately rewritten by the processor **3**A. For example, the nonvolatile memory area is ROM. The volatile memory area is RAM.

[0051] The auxiliary storage device **3**C corresponds to an auxiliary storage part of the computer. For example, an EEPROM or an SSD is used as the auxiliary storage device **3**C. The auxiliary storage device **3**C stores data used by the processor **3**A to perform various types of processing and data created by the processing in the processor **3**A. The auxiliary storage device **3**C may store the above application program.

[0052] The wireless unit **3**D wirelessly transmits and receives data to and from each unit according to a communication protocol. For example, the wireless unit **3**D can communicate with a mobile phone base station (not illustrated), connect to a telephone network, and provide a call function. The wireless unit **3**D performs wireless communication with an access point (not illustrated) disposed at a shopper's home, office, street, or the like to exchange information with the Web server **2** via the network INT such as the Internet. When entering the store, the wireless unit **3**D can perform wireless communication with the access point **40** of the store system **1** to exchange information with the store server **10**.

[0053] The touch panel **3**E is a device that includes both an input device and a display device of the information terminal **3**. The microphone **3**F is an input device for inputting voice, and the speaker **3**G is an output device for outputting voice and music. The camera **3**H is an input device for capturing an image. The various sensors **3**I may include an illuminance sensor for measuring brightness, a GPS sensor for measuring a position, a gyro sensor for measuring a posture, and the like.

[0054] The information terminal **3** can include a merchandise information display control program **3C1**, a shopping list storage unit **3C2**, and a merchandise information storage unit **3C3** in the auxiliary storage device **13**. The merchandise information display control program **3C1** is an application program for causing a computer having the processor **3**A as a central part to execute processing of creating a shopping list, processing of displaying merchandise information, and the like.

[0055] The shopping list storage unit **3C2** stores a shopping list created by the shopper' s operation by executing the merchandise information display control program **3C1**. FIG. **6** is a schematic diagram illustrating the main data structure of the shopping list storage unit **3C2**. The shopping list

storage unit **3C2** has areas A**1** to A**4** for describing information of a total budget, an item name, an individual budget, and a purchase flag. The area A**1** is an area for describing the total amount of the budget to be used for this time of shopping. The area A**2** is an area for describing a merchandise name or a classification name, which is an item name of merchandise to be purchased. The area A**3** is an area for describing a budget amount that can be used for each merchandise item. The area A**4** is an area for describing a purchase flag indicating whether each merchandise item has been purchased. The purchase flag is reset to "0" at the stage when the shopping list is created, and "1" is set by purchasing the corresponding merchandise.

[0056] The merchandise information storage unit **3C3** is an area for storing merchandise information transmitted from the store server **10** of the store system **1** based on the shopping list.

[0057] Hereinafter, the main operations of the merchandise information display system according to the first embodiment will be described. The content of the processing described below is an example. The processing procedure and processing content are not particularly limited as long as a similar result can be obtained.

[0058] FIG. **7** is a flowchart illustrating a procedure of main information processing executed by the processor **3**A of the information terminal **3** according to the product information display control program. First, the processor **3**A creates a shopping list (Act **3A01**).

[0059] FIG. **8** is a schematic diagram illustrating an example of a shopping list creation screen displayed on the touch panel **3**E of the information terminal **3** at this time. As illustrated in FIG. **8**, in the shopping list, the budget to be used in this time of shopping, the merchandise name or the classification name of merchandise to be purchased, and the like can be specified. If the shopper is a member of the store and is logged in with a member ID, the Web server **2** may be used for the shopper to narrow down merchandise from the store server **10** of the store, such as merchandise based on the purchase history of the shopper and recommended merchandise.

[0060] When a shopping list is created, the processor **3**A stores the content in the shopping list storage unit **3C2** of the auxiliary storage device **3**C (Act **3A02**).

[0061] Then, the processor **3**A waits for the shopper to visit the store, establish wireless communication with the access point **40** of the store system **1** by the wireless unit **3**D, and enable access to the store server **10** (Act **3A03**). Communication setting information for the wireless unit **3**D to establish communication with the access point **40** is stored in the auxiliary storage device **3**C as a part of the merchandise information display control program.

[0062] If the processor **3**A determines that access to the store server **10** is enabled (Act **3A03**: YES), the processor **3**A transmits the login information to the store server **10** and receives authentication (Act **3A04**). This login information includes a member ID if the member is a member of the store. Otherwise, the login information includes a guest ID.

[0063] FIG. **9** is a flowchart illustrating a procedure of information processing related to merchandise information display executed by the processor **11** of the store server **10**. The processor **11** starts the procedure illustrated in the flowchart in response to the reception of the login information from the information terminal **3** through the communication interface **14**. First, the processor **11** searches the member database **132** based on the ID included in the received login information (Act **101**) and determines whether the shopper is a member (Act **102**). If it is determined that the shopper is not a member (Act **102**: NO), the processor **11** creates a guest record which is a member data record **132**R for the one-time member in the member database **132** (Act **103**).

[0064] Thereafter, or when it is determined in Act **102** that the shopper is a member (Act **102**: YES), the processor **11** transmits authentication OK to the information terminal **3** by the wireless unit **3**D and waits for the information of the shopping list to be transmitted from the information terminal **3** (Act **104**).

[0065] As illustrated in FIG. **7**, the processor **3**A of the information terminal **3** transmits the information of the shopping list stored in the shopping list storage unit **3C2** to the store server **10** by the wireless unit **3**D (Act **3A05**). Then, the processor **3**A waits for the stock information to be transmitted from the store server **10** (Act **3A06**).

[0066] As illustrated in FIG. **9**, when it is determined that the information of the shopping list has been received from the information terminal **3** through the communication interface **14** (Act **104**: YES), the processor **11** of the store server **10** stores the received information of the shopping list in the corresponding member data record **132**R of the member database **132** (Act **105**). Then, based on the information of the shopping list stored in the member data record **132**R, the processor **11** searches the merchandise database **131** and acquires merchandise information (Act **106**). That is, if the merchandise name of merchandise exists as an item name in the shopping list, the processor **11** acquires the merchandise information on the corresponding merchandise. If a classification name exists as an item name in the shopping list, the processor **11** acquires the merchandise information for all the merchandise corresponding to the classification. Then, the processor **11** transmits the stock information including the acquired merchandise information to the information terminal **3** through the communication interface **14** (Act **107**). As a result of searching the merchandise database **131**, for the merchandise that is out of stock or the merchandise that is not handled in the store, the processor **11** includes out-of-stock information instead of merchandise information in the stock information. Thereafter, the processor **11** waits for a termination instruction to be transmitted from the information terminal **3** (Act **108**).

[0067] As illustrated in FIG. **7**, when it is determined that the stock information from the store server **10** has been received by the wireless unit **3**D (Act **3A06**: YES), the processor **3**A of the information terminal **3** stores the received stock information in the merchandise information storage unit **3C3** of the auxiliary storage device **3**C (Act **3A07**). Then, the processor **3**A creates a selection screen based on the stock information and displays the selection screen on the touch panel **3**E (Act **3A08**).

[0068] FIG. **10** is a schematic diagram illustrating an example of a selection screen displayed on the touch panel **3**E of the information terminal **3**. As illustrated in FIG. **10**, on the selection screen, the budget to be used in this time of shopping, the list of merchandise to be purchased, which is a list of item names of the merchandise to be purchased, and a current purchase amount can be displayed. The current purchase amount is the total price of the merchandise selected to be purchased on the merchandise information screen as described later.

[0069] Purchased merchandise is identified and displayed in the list of merchandise to be purchased on the selection screen. This allows the shopper to easily determine which merchandise is not purchased.

[0070] In the list of merchandise to be purchased on the selection screen, according to out-of-stock information included in the stored stock information, the merchandise that is not in stock or the merchandise that is not handled in the store is identified and displayed as "out of stock". This eliminates the need for the shopper to search for the merchandise that is not in the store.

[0071] When the selection screen is displayed in this manner, the processor **3**A determines whether the position corresponding to one of the merchandise items to be purchased on the selection screen of the touch panel **3**E has been touched, that is, determines whether a list has been selected by the shopper (Act **3A09**). When it is determined that a list has not been selected (Act **3A09**: NO), the processor **3**A determines whether the position corresponding to the [End] button image on the selection screen of the touch panel **3**E has been touched (Act **3A10**). When it is determined that the position corresponding to the [End] button image on the selection screen of the touch panel **3**E has not been touched (NO in Act **3A09**), the processor **3**A returns the control processing to Act **3A08**.

[0072] When it is determined that the list has been selected by the shopper (Act **3A09**: YES), the processor **3**A creates a merchandise information screen from the merchandise information of the corresponding merchandise in the stock information stored in the merchandise information storage unit **3C3** and displays the merchandise information screen on the touch panel **3**E (Act **3A11**).

[0073] FIG. **11** is a schematic diagram illustrating an example of a merchandise information screen displayed on the touch panel **3**E of the information terminal **3**. As illustrated in FIG. **11**, on the merchandise information screen, a merchandise image, a merchandise name, an amount, a merchandise description, and the like, which are merchandise information on candidate merchandise, can be displayed. If the list selected by the shopper includes item names, a plurality of merchandise items may correspond. In such a case, the merchandise information screen can include a [Previous Merchandise] button image and a [Next Merchandise] button image so that merchandise information on other candidate merchandise can be browsed. When there are a plurality of such products, the order in which the merchandise information of the candidate merchandise is displayed may be determined by system design or may be specified in advance by the shopper when creating the shopping list. For example, the recommendation order may be such that merchandise recommended by the store is preferentially selected as candidate merchandise. The order includes, for example, displaying the number of merchandise items to be sold at the store in descending order, displaying the merchandise on sale first, and the like. Displaying the merchandise with price in ascending order, displaying the merchandise with the price per unit in ascending order, displaying the merchandise with points added on purchase in descending order, and the like can be considered. When the shopper is a member, since the purchase history data of the shopper is stored in the member database **132**, the order of candidates is determined based on the data, thereby providing information reflecting the shopper's preferences.

[0074] The merchandise information screen also includes a [Select] button image that is touched when the shopper purchases the displayed candidate merchandise. The shopper can touch the position corresponding to the [Select] button image at any time before and after putting the merchandise in the shopping basket.

[0075] The merchandise information screen can include a checkbox to be checked when a delivery request is desired. For example, when purchasing heavy goods such as rice and beverages, by touching the position corresponding to this checkbox and checking the box, and then touching the position corresponding to the [Select] button image, it is possible to request delivery of the corresponding merchandise. When the shopper is a member, delivery is possible by registering the delivery destination of the shopper in the member database **132**. Therefore, for a shopper who logs in with a guest ID that is not a member, the checkbox is set to a state where selection is impossible. It goes without saying that the actual delivery must be performed for the merchandise specified for the delivery after confirming that the price has been paid at the POS terminal **30** at the time of checkout.

[0076] The shopper can select a list at any time. For example, the shopper can select one of the items to display the merchandise information screen, proceed to the corner of the merchandise shelf on which the merchandise of the corresponding item is displayed in that state, and determine the merchandise to purchase while viewing the merchandise information. Conversely, on the merchandise selection screen, the shopper can also check the list of merchandise to purchase and proceed to the corner of the merchandise shelf on which the merchandise of any item is displayed, select the list of the item there, display a merchandise information screen, and determine the merchandise to purchase while viewing the merchandise information.

[0077] After displaying the merchandise information screen on the touch panel **3**E in Act **3A11**, the processor **3**A determines whether the position corresponding to the [Previous Merchandise] button image or the [Next Merchandise] button image has been touched (Act **3A12**). When it is determined that the position corresponding to the [Previous Merchandise] button image or the [Next Merchandise] button image has been touched (Act **3A12**: YES), the processor **3**A returns the control processing to Act **3A11**. Returning to Act **3A11**, the processor **3**A displays a merchandise information screen for the previous or next candidate merchandise on the touch panel **3**E.

[0078] When it is determined that the position corresponding to the [Previous Merchandise] button image or the [Next Merchandise] button image has not been touched (Act **3A12**: NO), the processor **3**A determines whether the position corresponding to the [Select] button image has been touched (Act **3A13**). When it is determined that the position corresponding to the [Select] button image has not been touched (Act **3A13**: NO), the processor **3**A determines whether the position corresponding to the [Back] button image has been touched (Act **3A14**). When it is determined that the position corresponding to the [Back] button image has not been touched (Act **3A14**: NO), the processor **3**A returns the control processing to Act **3A11** and continues to display the merchandise information screen for the candidate merchandise. On the other hand, when it is determined that the position corresponding to the [Back] button image has been touched (YES in Act **3A14**), the processor **3**A

returns the control processing to Act **3A08** and displays the selection screen on the touch panel **3**E.

[0079] When it is determined that the position corresponding to the [Select] button image has been touched (Act **3A13**: YES), the processor **3**A updates the shopping list stored in the shopping list storage unit **3C2** of the auxiliary storage device **3**C (Act **3A15**). That is, the purchase flag of the area A**4** corresponding to the merchandise name or classification name of the merchandise in the shopping list storage unit **3C2** is set to "1". Thereafter, the processor **3**A returns the control processing to Act **3A08**. As a result, on the displayed selection screen, the merchandise to be purchased is identified and displayed as purchased merchandise.

[0080] When the position corresponding to the [Select] button image has been touched, the processor **3**A calculates the total purchase amount of purchased merchandise, and when the total purchase amount exceeds the set budget, for example, as illustrated in FIG. **12**, an alert screen indicating that fact is displayed as a pop-up. That is, when the shopper attempts to select merchandise to exceed the budget, he or she confirms whether the budget can be exceeded. The alert screen only needs to be displayed at the time of first selection exceeding the budget.

[0081] Thus, the shopper can purchase desired merchandise at the corner of the merchandise shelf on which the merchandise of the corresponding item is displayed while viewing the selection screen or the merchandise information screen.

[0082] When it is determined that the position corresponding to the [End] button image on the selection screen has been touched (Act **3A310**: YES), the processor **3**A transmits an end instruction to the store server **10** by the wireless unit **3**D (Act **3A05**). Then, the processor **3**A ends the operation according to the merchandise information display control program. The end instruction includes information for identifying the purchased merchandise.

[0083] As illustrated in FIG. **9**, when the processor **11** of the store server **10** determines that an end instruction has been received from the information terminal **3** through the communication interface **14** (Act **108**: YES), the processor **11** updates the member database (Act **109**). That is, when the shopper is a member, the information of the purchased merchandise included in the end instruction is added to the purchase history data of the corresponding member data record **132**R of the member database. When the shopper is not a member, the guest record which is a member data record **132**R for the one-time member created in the member database is deleted. Then, the information processing related to the display of the merchandise information ends.

[0084] As described above, according to the at least one embodiment, the information terminal **3** stores the shopping list including the purchase-planned item information indicating an item of merchandise that the shopper wants to purchase in the shopping list storage unit **3C2** as the first storage unit. Thereafter, when the shopper carrying this information terminal **3** visits the store and information can be exchanged between the information terminal **3** and the store server **10**, the store server **10** acquires the shopping list including the purchase-planned item information from the information terminal **3**, searches the merchandise database based on the purchase-planned item information, and checks the stock of the merchandise of the item that the shopper wants to purchase. Then, the store server **10** transmits stock information including the stock availability of the merchandise of the item that the shopper wants to purchase to the information terminal **3**, and the information terminal **3** displays, as a selection screen, the stock availability of the corresponding merchandise on the touch panel **3**E as a display unit. Therefore, it is possible to notify the shopper whether the merchandise that the shopper wants to purchase is available.

[0085] The stock information transmitted from the store server **10** to the information terminal **3** includes the merchandise information on each merchandise item of the corresponding item in stock, and the information terminal **3** stores the merchandise information on each of the merchandise of the corresponding item in stock in the merchandise information storage unit **3C3** as a second storage unit. Then, the processor **3**A functioning as a display control unit of the information terminal **3** displays merchandise information on at least one type of candidate merchandise selected from the merchandise stored in the merchandise information storage unit **3C3** on the touch panel **3**E. When the item specified by the shopper in the shopping list is a classification name, there are a plurality of merchandise items corresponding to the item. When the shopper determines an item to purchase but has not determined merchandise, he or she determines merchandise to purchase based on not only the price of the merchandise but also his or her own viewpoint that the shopper prioritizes, such as quantity, ingredient, and place of origin. In order to make this determination, the shopper needs to read the information written on the label attached to the merchandise while taking each merchandise item arranged on the merchandise shelf of the store one by one. Even if only the price is prioritized, the position of the price tag specified on the merchandise shelf may be shifted from actual merchandise. According to the present embodiment, the shopper can check the merchandise information on the merchandise arranged on the merchandise shelf on the display of the touch panel **3**E of the information terminal **3**, and therefore he or she does not need to check the actual merchandise by hand, and even if the position of the actual merchandise and the price tag do not match, it is possible to know the correct price of the merchandise.

Second Embodiment

[0086] The shopping list created by the information terminal **3** may be stored in the Web server **2** instead of being stored in the auxiliary storage device **3**C. In that case, the shopping list storage unit **3C2** is not provided in the auxiliary storage device **3**C. Instead of transmitting the merchandise information from the store server **10** to the information terminal **3**, a screen including the merchandise information may be transmitted as image information. In that case, the merchandise information storage unit **3C3** is not provided in the auxiliary storage device **3**C. A case having such a configuration will be described as a second embodiment.

[0087] FIG. **13** is a flowchart illustrating a procedure of main information processing executed by the processor **3**A of the information terminal **3** in the second embodiment, and FIG. **14** is a flowchart illustrating a procedure of main information processing executed by the processor **11** of the store server **10** in the second embodiment. Hereinafter, a procedure of information processing in the second embodiment will be described with reference to these drawings, but the same procedures as those in the first embodiment will be

given the same reference numerals as in FIGS. **7** and **9**, and the description thereof will be omitted.

[0088] As illustrated in FIG. **13**, the processor **3**A of the information terminal **3** stores the content of the shopping list created in Act **3**A**01** in a storage unit managed by the Web server **2** via the network INT such as the Internet by the wireless unit **3**D (Act **3**A**21**). Thereafter, as in the first embodiment, when the shopper carrying the information terminal **3** visits the store and access to the store server **10** is enabled, the login information is transmitted to the store server **10**. Here, in the second embodiment, since the information of the shopping list is not stored in the information terminal **3**, the information of the shopping list is not transmitted as in Act **3**A**05** of the first embodiment, and the information terminal **3** waits for the image information of the selection screen including the stock information to be transmitted from the store server **10** (Act **3**A**22**).

[0089] As illustrated in FIG. **14**, when it is determined that the shopper is a member in Act **102**, or after creating a guest record that is a member data record **132**R for a one-time member in the member database **132** in Act **103**, the processor **11** of the store server **10** that has received the login information transmits a shopping list request to the Web server **2** via the network INT such as the Internet through the communication interface **14** (Act **111**). The shopping list request includes the member ID or the guest ID included in the login information received from the information terminal **3**. Then, the processor **11** advances the control processing to Act **104** and waits for the shopping list information to be transmitted from the Web server **2**.

[0090] The Web server **2** identifies the shopping list stored in the storage unit based on the member ID or the guest ID and sends a reply including the information of the shopping list to the store server **10**. Upon receiving the information of the shopping list from the Web server **2** through the communication interface **14**, the processor **11** stores the received information of the shopping list in the corresponding member data record **132**R of the member database **132**, as in the first embodiment and acquires the merchandise information from the merchandise database **131** based on the information of the shopping list. Then, the processor **11** stores the acquired merchandise information in the corresponding member data record **132**R of the member database **132** (Act **112**). Next, the processor **11** creates image information of a selection screen to be displayed on the information terminal **3** based on the stored shopping list information and the merchandise information (Act **113**). The image information on the selection screen includes the stock information as illustrated in FIG. **10**. Then, the processor **11** transmits the created image information of the selection screen to the information terminal **3** through the communication interface **14** (Act **114**).

[0091] Thereafter, the processor **11** determines whether a merchandise information request has been received from the information terminal **3** through the communication interface **14** (Act **115**). When it is determined that a merchandise information request has not been received (Act **115**: NO), the processor **11** determines whether the communication interface **14** has received a shopping list update request from the information terminal **3** (Act **116**). When it is determined that a shopping list update request has not been received (Act **116**: NO), the processor **11** determines whether an end instruction has been received from the information terminal **3** through the communication interface **14** (Act **108**). When it is determined that an end instruction has not been received (Act **108**: NO), the processor **11** returns the control processing to Act **115**. In this way, the processor **11** waits to receive a merchandise information request, a shopping list update request, or an end instruction from the information terminal **3**.

[0092] As illustrated in FIG. **13**, upon receiving the image information of the selection screen from the store server **10** by the wireless unit **3**D (Act **3**A**22**: YES), the processor **3**A of the information terminal **3** displays the selection screen based on the received image information on the touch panel **3**E (Act **3**A**08**). Thereafter, the processor **3**A waits for the shopper to select a list or to touch the position corresponding to the [End] button image on the selection screen.

[0093] When a list is selected by the shopper, the processor **3**A transmits a merchandise information request for a merchandise information screen for merchandise corresponding to the touched position to the store server **10** by the wireless unit **3**D (Act **3**A**23**). Thereafter, the processor **3**A waits for the image information of the merchandise information screen to be transmitted from the store server **10** (Act **3**A**24**).

[0094] As illustrated in FIG. **14**, when it is determined that a merchandise information request from the information terminal **3** has been received through the communication interface **14** (Act **115**: YES), the processor **11** of the store server **10** creates image information of the merchandise information screen from the merchandise information of the corresponding merchandise stored in the corresponding member data record **132**R of the member database **132** and transmits the created image information of the merchandise information screen to the information terminal **3** through the communication interface **14** (Act **117**). Thereafter, the processor **11** returns the control processing to Act **115**.

[0095] As illustrated in FIG. **13**, when the image information of the merchandise information screen is received from the store server **10** by the wireless unit **3**D (Act **3**A**24**: YES), the processor **3**A of the information terminal **3** displays a merchandise information screen based on the received image information on the touch panel **3**E (Act **3**A**11**). Thereafter, as in the first embodiment, the processor **3**A waits for positions corresponding to the [Previous Merchandise] button image, the [Next Merchandise] button image, the [Select] button image, and the [Back] button image on the merchandise information screen to be touched.

[0096] When the position corresponding to the [Previous Merchandise] button image or the [Next Merchandise] button image is touched, the processor **3**A returns the control processing to Act **3**A**23** and transmits to the store server **10** a merchandise information request for requesting a merchandise information screen for the previous or next merchandise.

[0097] When the position corresponding to the [Back] button image is touched, the processor **3**A returns the control processing to Act **3**A**08** and displays the selection screen on the touch panel **3**E.

[0098] When it is determined that the position corresponding to the [Select] button image has been touched (Act **3**A**13**: YES), the processor **3**A transmits a shopping list update request for requesting an update of the shopping list to the store server **10** by the wireless unit **3**D (Act **3**A**25**). Thereafter, the processor **3**A returns the control processing to Act **3**A**22** and waits for the updated image information of the new selection screen to be transmitted.

[0099] As illustrated in FIG. **14**, when it is determined that a shopping list update request has been received from the information terminal **3** through the communication interface **14** (Act **116**: YES), the processor **11** of the store server **10** updates the information of the shopping list stored in the corresponding member data record **132**R of the member database **132** (Act **118**). That is, the purchase flag in the shopping list information is set to "1". Thereafter, the processor **11** returns the control processing to Act **113** and creates updated new image information of the selection screen.

[0100] As described above, according to at least one embodiment, the information terminal **3** causes the Web server **2** as the first storage unit to store the shopping list including the purchase-planned item information indicating the item of the merchandise that the shopper wants to purchase. After that, when the shopper carrying the information terminal **3** visits the store and information can be exchanged between the information terminal **3** and the store server **10**, the store server **10** acquires a shopping list including the purchase-planned item information set by the shopper from. the Web server **2**, searches the merchandise database based on the purchase-planned item information, and checks the stock of the merchandise of the item that the shopper wants to purchase. Then, the store server **10** creates image information of the selection screen including the stock information indicating the stock availability of the merchandise of the item that the shopper wants to purchase, and transmits the image information to the information terminal so that the information terminal **3** displays the stock availability of the corresponding merchandise as a selection screen on the touch panel **3**E as a display unit. Therefore, it is possible to notify the shopper of the availability of the merchandise that the shopper wants to purchase.

[0101] The store server **10** further transmits, to the information terminal **3**, merchandise information on at least one type of candidate merchandise selected from the merchandise of the corresponding item in stock as image information on the merchandise and displays the merchandise information on the touch panel **3**E of the information terminal **3**. Therefore, the shopper can check the merchandise information on the merchandise arranged on the merchandise shelf on the display of the touch panel **3**E of the information terminal **3**, and therefore he or she does not need to check the actual merchandise by hand, and even if the position of the actual merchandise and the price tag do not match, it is possible to know the correct price of the merchandise.

Third Embodiment

[0102] In the first embodiment, the shopper displays a merchandise information screen at any time, but a selection screen may be switched to a merchandise screen without depending on the shopper's instruction. This will be described as a third embodiment.

[0103] For example, by installing an RFID tag or the like that transmits the item information of merchandise on a merchandise shelf where the merchandise is displayed and giving the wireless unit **3**D of the information terminal **3** a function of reading this RFID tag, the processor **3**A of the information terminal **3** can detect which item of merchandise the information terminal **3** is located near.

[0104] A plurality of fixed base stations are installed in the store, Bluetooth (Bluetooth is a registered trademark) low energy (BLE) waves and ultra-wideband (UWB) waves are transmitted from each fixed base station, and the BLE waves are received by the wireless unit **3**D of the information terminal **3**, and the position coordinates of the information terminal **3** can be measured based on the respective incident angles and arrival times of the BLE waves. If the information terminal **3** has a coordinate map in the store, by comparing the measured position coordinates with the map, the processor **3**A can detect which item of merchandise the information terminal **3** is located near.

[0105] FIG. **15** is a flowchart illustrating a part of a procedure of the main information processing executed by the processor **3**A of the information terminal **3** in the third embodiment. Hereinafter, the procedure of the information processing in the third embodiment will be described with reference to FIG. **15**, but the same procedures as those in the first embodiment will be given the same reference numerals as in FIG. **7**, and the description thereof will be omitted.

[0106] As illustrated in FIG. **15**, after displaying the selection screen in Act **3A08**, the processor **3**A of the information terminal **3** detects the position of the information terminal **3** (Act **3A31**). Then, the processor **3**A determines whether the detected position of the information terminal **3** is the position of the listed merchandise (Act **3A32**). That is, the processor **3**A determines whether the information terminal **3** has reached the position of the merchandise shelf on which the merchandise corresponding to the item described in the shopping list is displayed. When it is determined that the detected position of the information terminal **3** is not the position of the listed merchandise (Act **3A32**: NO), the processor **3**A advances the control processing to Act **3A10**. Then, when it is determined that the detected position of the information terminal **3** is the position of the listed merchandise (Act **3A32**: YES), the processor **3**A advances the control processing to Act **3A11** and displays the merchandise information screen.

[0107] As described above, according to the present embodiment, the information terminal **3** detects the position of the information terminal **3** in the store, selects an appropriate merchandise image according to the detection result, and displays the selected merchandise image on the touch panel **3**E. Therefore, it is possible to save the trouble of the shopper.

Fourth Embodiment

[0108] The switching from the selection screen to the merchandise screen based on the position detection as in the third embodiment can be performed even when the shopping list is stored in the Web server **2** as in the second embodiment. This will be described as a fourth embodiment.

[0109] FIG. **16** is a flowchart illustrating a part of a procedure of main information processing executed by the processor **3**A of the information terminal **3** in the fourth embodiment, and FIG. **17** is a flowchart illustrating a part of a procedure of main information processing executed by the processor **11** of the store server **10** in the fourth embodiment. Hereinafter, the procedure of the information processing in the fourth embodiment will be described with reference to FIGS. **16** and **17**, but the same procedures as those in the second embodiment will be given the same reference numerals as in FIGS. **13** and **14**, and the description thereof will be omitted.

[0110] As illustrated in FIG. **16**, after displaying the selection screen in Act **3A08**, the processor **3**A of the information terminal **3** detects the position of the informa-

tion terminal **3** (Act **3**A**31**). Then, the processor **3**A transmits position information indicating the detected position of the information terminal **3** to the store server **10** by the wireless unit **3**D (Act **3**A**41**). Thereafter, the processor **3**A determines whether the image information of the merchandise information screen has been received from the store server **10** (Act **3**A**42**). When it is determined that the image information of the merchandise information screen has not been received from the store server (Act **3**A**42**: NO), the processor **3**A advances the control processing to Act **3**A**10**.

[0111] As illustrated in FIG. **17**, the processor **11** of the store server **10** transmits the image information of the selection screen to the information terminal **3** in Act **114**, and then waits to receive the position information from the information terminal **3** through the communication interface **14** (Act **121**). When it is determined that the position information has been received from the information terminal **3** (Act **121**: YES), the processor **11** determines whether the information terminal **3** has reached the position of the merchandise shelf on which the merchandise corresponding to the item described in the shopping list stored in the corresponding member data record **132**R of the member database **132**. When it is determined that the detected position of the information terminal **3** is not the position of the listed merchandise (Act **122**), the processor **11** returns the control processing to Act **121**. Then, when it is determined that the detected position of the information terminal **3** is the position of the listed merchandise (Act **122**: YES), the processor **11** advances the control processing to Act **117**, creates image information of the merchandise information screen from the merchandise information of the corresponding merchandise stored in the member data record **132**R, and transmits the created image information of the merchandise information screen to the information terminal **3** through the communication interface **14**.

[0112] As illustrated in FIG. **16**, when it is determined that the image information of the merchandise information screen has been received from the store server **10** (Act **3**A**42**: YES), the processor **3**A advances the control processing to Act **3**A**11** and displays the merchandise information screen based on the received image information on the touch panel **3**E. Then, when the position corresponding to the [Previous Merchandise] button image or the [Next Merchandise] button image on the merchandise information screen is touched, the processor **3**A transmits a merchandise information request for a merchandise information screen for merchandise corresponding to the touched position to the store server **10** by the wireless unit **3**D (Act **3**A**43**). Thereafter, the processor **3**Awaits for the image information of the merchandise information screen to be transmitted from the store server **10** (Act **3**A**44**). When the image information of the merchandise information screen is received from the store server **10** by the wireless unit **3**D (Act **3**A**44**: YES), the processor **3**A returns the control processing to Act **3**A**11** and displays the merchandise information screen based on the received image information on the touch panel **3**E.

[0113] Thus, according to the present embodiment, the information terminal **3** detects the position of the information terminal **3** in the store and transmits the detection result to the store server **10** so that an appropriate merchandise image is selected from the store server **10** according to the position of the information terminal **3**, and the image information on the merchandise information screen is returned. Therefore, it is possible to save the trouble of the shopper.

Fifth Embodiment

[0114] Next, as a fifth embodiment, a case where the store system **1** is a cart POS system will be described. In the cart POS system, a shopping cart is provided with an information terminal equipped with a touch panel, a scanner, and the like. When a shopper using a shopping cart places merchandise to purchase in the shopping cart, the shopper scans the identification code of the purchased merchandise with the scanner and registers the merchandise. As described above, in the cart POS system, since the shopper himself or herself performs the merchandise registration while shopping, it is possible to alleviate the congestion of the checkout place, that is, a so-called cash register.

[0115] FIG. **18** is a block diagram illustrating an overall arrangement of a merchandise information display system according to the fifth embodiment. Here, the same components as those in the first embodiment are denoted by the same reference numerals as those in FIG. **1**, and the description thereof will be omitted.

[0116] The store system **1** includes a cart controller **60**, a plurality of checkout machines **70**, and a plurality of cart information terminals **80**, in addition to the store server **10**, the communication server **20**, the plurality of POS terminals **30**, the access points **40**, and the network **50** described above. The cart controller **60** and the plurality of checkout machines **70** are connected to the store server **10** via the network **50**. The plurality of cart information terminals **80** can be connected to the store server **10** connected to the network **50** via the access point **40**.

[0117] The cart controller **60** cooperates with the cart information terminal **80** to support the cart information terminal **80** as if the cart information terminal **80** functions as the POS terminal **30**.

[0118] The checkout machine **70** is a device that allows the clerk or the shopper to perform checkout for purchased merchandise. The checkout machine **70** is a well-known self-service POS terminal. The number of checkout machines **70** is not particularly limited.

[0119] The cart information terminal **80** is a device that is lent to a shopper who visits the store to carry in the store, and which enables the shopper to input data relating to merchandise registration by himself or herself. The cart information terminal **80** is provided in the shopping cart C. Hereinafter, the shopping cart C is simply referred to as a cart C. Each of the plurality of carts C is provided with the cart information terminal **80**. The cart C is an example of a transporter that transports merchandise that a shopper using the cart C wants to purchase.

[0120] FIG. **19** is a block diagram illustrating a main circuit configuration of the cart controller **60**. The cart controller **60** includes a processor **61**, a main memory **62**, an auxiliary storage device **63**, a communication interface **64**, and a system transmission path **65** and connects the processor **61**, the main memory **62**, the auxiliary storage device **63**, and the communication interface **64** to the system transmission path **65**. In the cart controller **60**, a computer is configured with the processor **61**, the main memory **62**, the auxiliary storage device **63**, and the system transmission path **65** connecting therebetween. The schematic description of the processor **61**, the main memory **62**, the auxiliary storage device **63**, and the communication interface **64** may be the same as the description for the store server **10**.

[0121] The cart controller **60** uses a part of the volatile area in the main memory **62** as a cart information terminal

table **621** and a checkout machine table **622**. The cart information terminal table **621** has an area for saving various information for each cart information terminal **80** provided for each cart C.

[0122] The cart information terminal table **621** has an area for describing information such as a terminal ID, a member ID, a registration list, and a checkout code. The terminal ID is a unique code set for each cart information terminal **80** in order to identify each cart information terminal **80** individually. The registration list is a list of information on merchandise registered in the cart information terminal **80** and describes a merchandise ID, a merchandise name, quantity, amount, and the like in a series of numbers. The checkout code is a code issued for each commercial transaction in order to identify a commercial transaction for which merchandise registration has been performed in the cart information terminal **80**.

[0123] The checkout machine table **622** has an area for describing information such as a checkout machine ID, a checkout machine status, and the like. The checkout machine ID is a unique code set for each checkout machine **70** in order to identify each checkout machine **70** individually. The checkout machine status is information indicating the state of the checkout machine **70** identified by the checkout machine ID, whereby the processor **61** can determine which checkout machine **70** is in use.

[0124] FIG. **20** is a block diagram illustrating a main circuit configuration of the cart information terminal **80**. The cart information terminal **80** includes a processor **81**, a main memory **82**, an auxiliary storage device **83**, a wireless unit **84**, a touch panel **85**, a scanner **86**, a reader **87**, and a system transmission path **88**. The system transmission path **88** includes an address bus, a data bus, a control signal line, and the like. The cart information terminal **80** connects the processor **81**, the main memory **82**, the auxiliary storage device **83**, the wireless unit **84**, the touch panel **85**, the scanner **86**, and the reader **87** to the system transmission path **88** directly or via a signal input/output circuit. In the cart information terminal **80**, a computer is configured with a processor **81**, a main memory **82**, an auxiliary storage device **83**, and a system transmission line **88** connecting therebetween. The schematic description of the processor **81**, the main memory **82**, the auxiliary storage device **83**, and the wireless unit **84** may be the same as the description for the store server **10**.

[0125] The touch panel **85** is a device including both an input device and a display device of the cart information terminal **80**. The cart information terminal **80** can display an image on the touch panel **85** based on the image information created by the store server **10**.

[0126] The scanner **86** includes a camera as an imaging unit. The scanner **86** reads a code symbol such as a barcode or a two-dimensional data code from an image captured by the camera.

[0127] The reader **87** reads the member ID recorded on a recording medium. The reader **87** is a magnetic card reader when the recording medium is a magnetic card, and is an IC card reader when the recording medium is a contact IC card. In the case of a recording medium using RFID such as a non-contact IC card or a smartphone, an RFID reader is used as the reader **87**.

[0128] In such a cart POS system, as in the second or fourth embodiment, the shopper creates a shopping list before visiting the store and stores the shopping list in the Web server **2**. Then, when visiting the store, the shopper logs in by using the cart information terminal **80** instead of the information terminal **3**. Thereby, the processor **61** of the cart information terminal **80** can execute the control processing after the shopper visits the store in the processing procedure of the information terminal **3** described in the second or fourth embodiment. Thus, the selection screen and the merchandise information screen are displayed on the touch panel **85** of the cart information terminal **80**, and the shopper can browse the merchandise information as in the case where the shopper uses the information terminal **3** carried by himself or herself.

[0129] Thus, according to the present embodiment, the shopper accesses the Web server and stores the shopping list including the purchase-planned item information before visiting the store so that the shopper can browse the selection screen and the merchandise information screen by using the cart information terminal **80** lent to the shopper who has visited the store to carry in the store. Therefore, also in the fifth embodiment, the same effects as in the above-described second or fourth embodiment can be obtained.

[0130] The information terminal **3** carried by the shopper can be the same as any of the first to fourth embodiments described above.

[0131] The information terminal **3** can be used as an alternative to the cart information terminal **80**. That is, since the scanner **86** can be realized by a barcode reader application program and the camera **3**H, and the shopper is logged in the merchandise information display control program with the member ID, the reader **87** does not need to read the member ID.

[0132] As described above, while several embodiments of the present exemplary embodiment have been described, these embodiments have been presented byway of example and are not intended to limit the scope of the invention. These novel embodiments can be implemented in various other forms, and various omissions, replacements, and changes can be made without departing from the spirit of the invention. These embodiments and modification examples thereof are included in the scope and gist of the exemplary embodiment and are included in the exemplary embodiment described in the claims and the equivalent scope thereof.

What is claimed is:

1. A merchandise information display system comprising:

a store server configured to manage a merchandise database that stores merchandise information on each merchandise item available in a store;

an information terminal that includes a communication unit configured to communicate with an external device and a display unit configured to display information, the information terminal capable of being carried by a shopper in the store; and

a first storage unit that stores purchase-planned item information indicating an item of merchandise that the shopper wants to purchase, wherein

the store server

is configured to acquire the purchase-planned item information from the first storage unit when it is possible to exchange information with the information terminal,

configured to search the merchandise database based on the purchase-planned item information and to check stock of an item of merchandise that the shopper wants to purchase, and

configured to transmit and display stock information including stock availability of the item of merchandise that the shopper wants to purchase on the display unit of the information terminal.

2. The system according to claim **1**, wherein the information terminal includes at least one of a smart phone or a tablet.

3. The system according to claim **1**, wherein the information terminal includes a touch panel and the display unit of the information terminal.

4. The system according to claim **3**, wherein the touch panel is configured to allow a user to create a shopping list of items of merchandise corresponding to the purchased-planned item information.

5. The system according to claim **1**, further comprising a cart supporting the information terminal.

6. The system according to claim **1**, the information terminal further comprising a display control unit configured to display an alert screen when selected items of the purchase-planned item information exceed a set budget.

7. The system according to claim **1**, the information terminal further comprising a position detector arranged to detect a relative position of a user and merchandise items.

8. The system according to claim **7**, wherein the information terminal is configured to allow the user to select items of the purchase-planned item information based on the detected relative position of the merchandise items.

9. The system according to claim **1**, wherein

the store server is further configured to transmit to the information terminal merchandise information on at least one candidate merchandise item selected from among merchandise of the corresponding item in stock, and to display the merchandise information on the display unit of the information terminal.

10. The system according to claim **1**, wherein

the information terminal is provided to a shopper who visits the store to carry the information terminal in the store,

the first storage unit is managed by a Web server accessible by the store server, and

before visiting the store, the shopper accesses the Web server and stores the purchase-planned item information in the first storage unit.

11. The system according to claim **1**, wherein

the stock information transmitted from the store server to the information terminal includes merchandise information on each merchandise item of the corresponding item in stock, and

the information terminal includes

a second storage unit that stores the merchandise information on each merchandise item of the corresponding item in stock, which is included in the stock information received by the communication unit, and

a display control unit configured to display the merchandise information on at least one candidate merchandise item selected from among the stored merchandise displayed on the display unit.

12. A store server comprising:

a merchandise database that stores merchandise information on each merchandise item in a store;

when it is possible to exchange information with the information terminal carried by a shopper in the store, an acquisition unit is configured to acquire from the information terminal or a Web server purchase-planned item information indicating an item of merchandise that the shopper wants to purchase;

a check unit configured to search the merchandise database based on the purchase-planned item information and to check stock of an item of merchandise that the shopper wants to purchase; and

a transmission unit configured to transmit stock information, including stock availability indicating whether the item of merchandise that the shopper wants to purchase is in stock, to the information terminal.

13. The server according to claim **12**, wherein

the store server is further configured to transmit to the information terminal merchandise information on at least one candidate merchandise item selected from among merchandise of the corresponding item in stock, and to cause to be displayed the merchandise information on a display unit of the information terminal.

14. A display control method of a computer of an information terminal that includes a storage unit configured to store information, a communication unit configured to communicate with an external device and a display unit configured to display information, and the information terminal is capable of being carried by a shopper in a store, the method comprising:

receiving stock information on merchandise corresponding to an item that the shopper wants to purchase, which is determined based on purchase-planned item information indicating an item of merchandise that the shopper wants to purchase, and the shopper presets the item of merchandise that the shopper wants to purchase from a store server configured to manage a merchandise database that stores merchandise information on each merchandise item available in the store by the communication unit, and

displaying stock availability of the merchandise corresponding to the item that the shopper wants to purchase on the display unit, based on the stock information transmitted from the store server.

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