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(54) **FOOD PURCHASE SUPPORTING SYSTEM AND IMAGE FORMING APPARATUS**

(71) Applicant: **KYOCERA Document Solutions Inc.**, Osaka (JP)

(72) Inventor: **Yukihiro Nakao**, Osaka-shi (JP)

(73) Assignee: **KYOCERA Document Solutions Inc.**, Osaka (JP)

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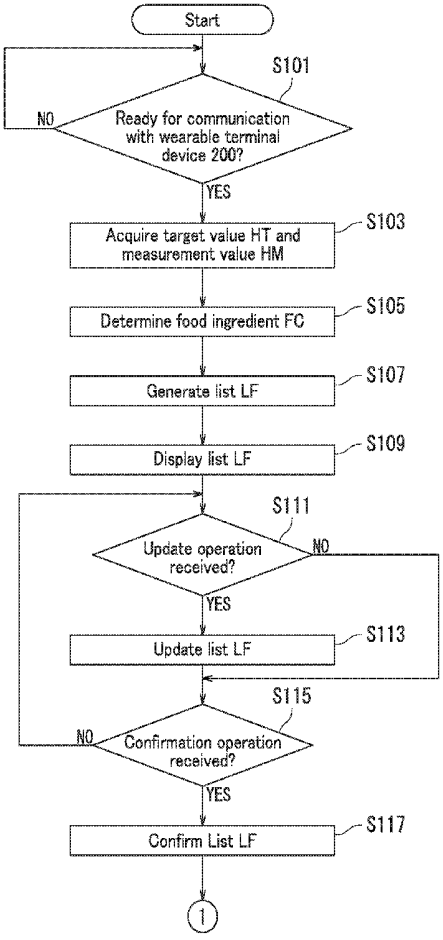
(57) **ABSTRACT**

A food purchase supporting system includes a wearable terminal device and an image forming apparatus. The wearable terminal device stores a measurement value with respect to an indicator for management of health of a user. The image forming apparatus includes a first communication device, an acquisition section, a determination section, and a generation section. The first communication device communicates with the wearable terminal device. The acquisition section acquires the measurement value from the wearable terminal device via the first communication device. The determination section determines a food ingredient recommended for the user to ingest based on the measurement value and a target value with respect to the indicator for the management of health of the user. The generation section generates a list of food recommended for the user to purchase based on the food ingredient.



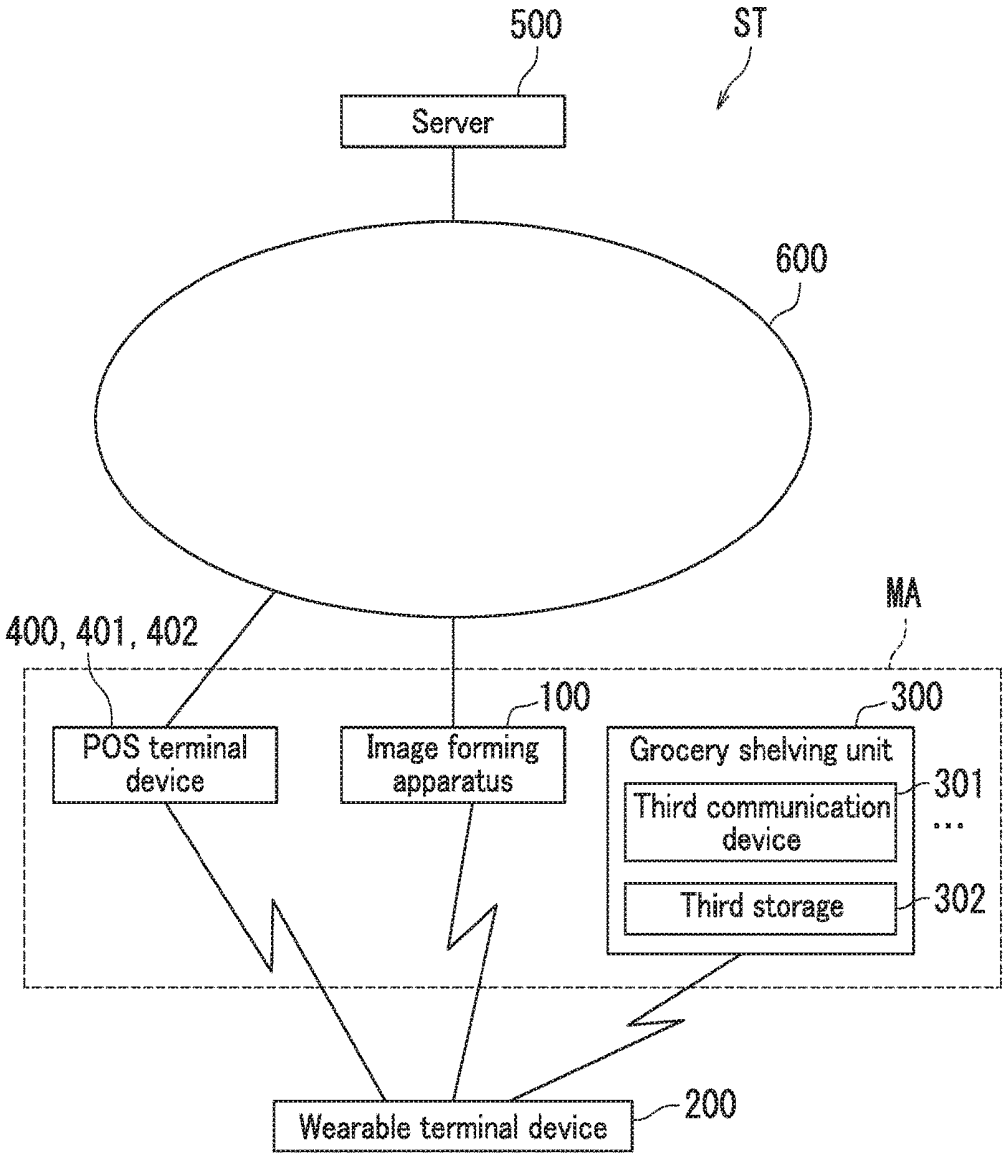

500
ST
Server
600
MA
400, 401, 402
100
300
POS terminal device
Image forming apparatus
Grocery shelving unit
Third communication device
301
...
Third storage
302
Wearable terminal device
200

FIG. 1

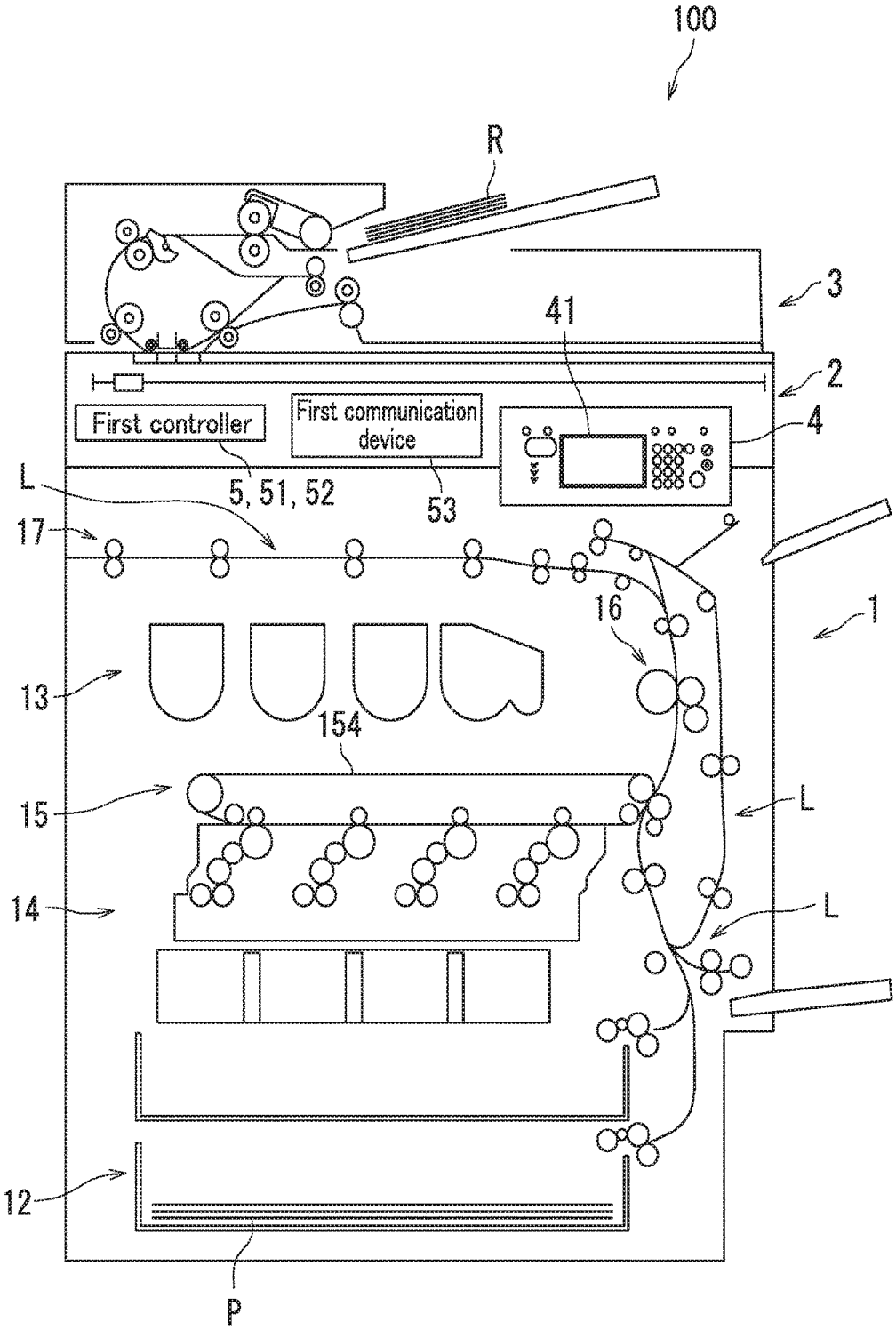

100
R
3
41
2
First controller
First communication device
4
5, 51, 52
53
L
17
16
1
13
154
15
L
14
L
12
P

FIG. 2

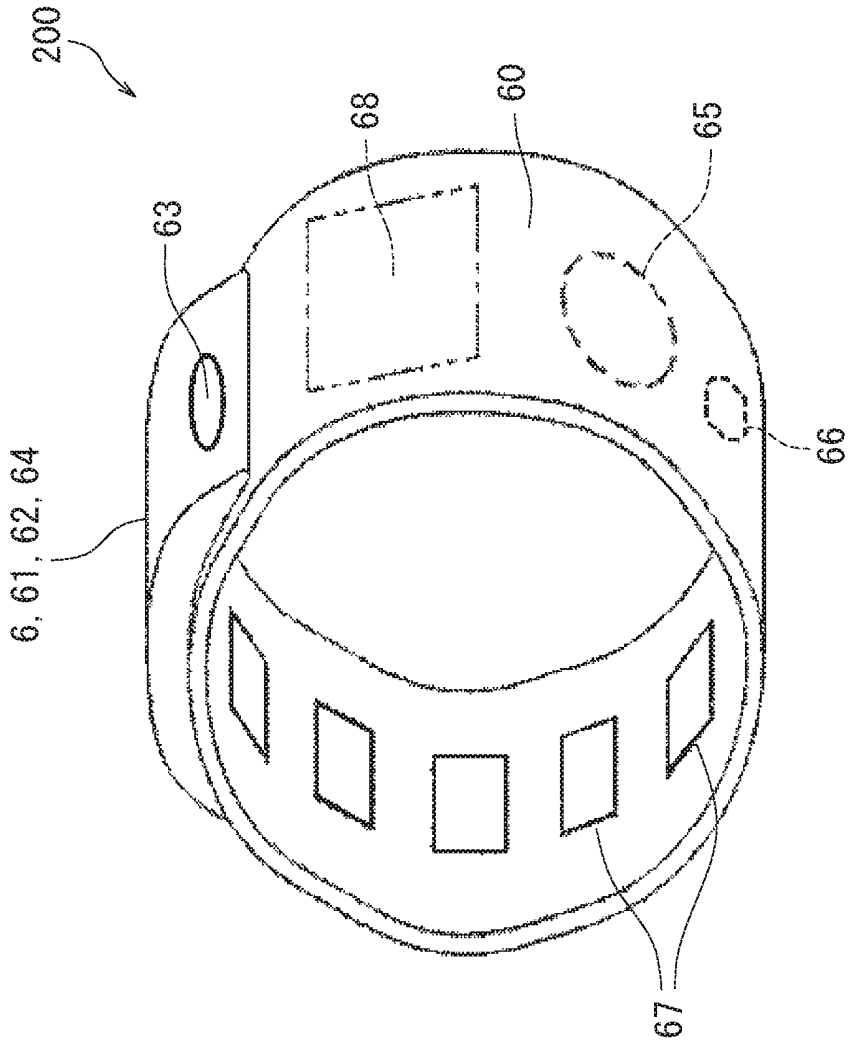


FIG. 3

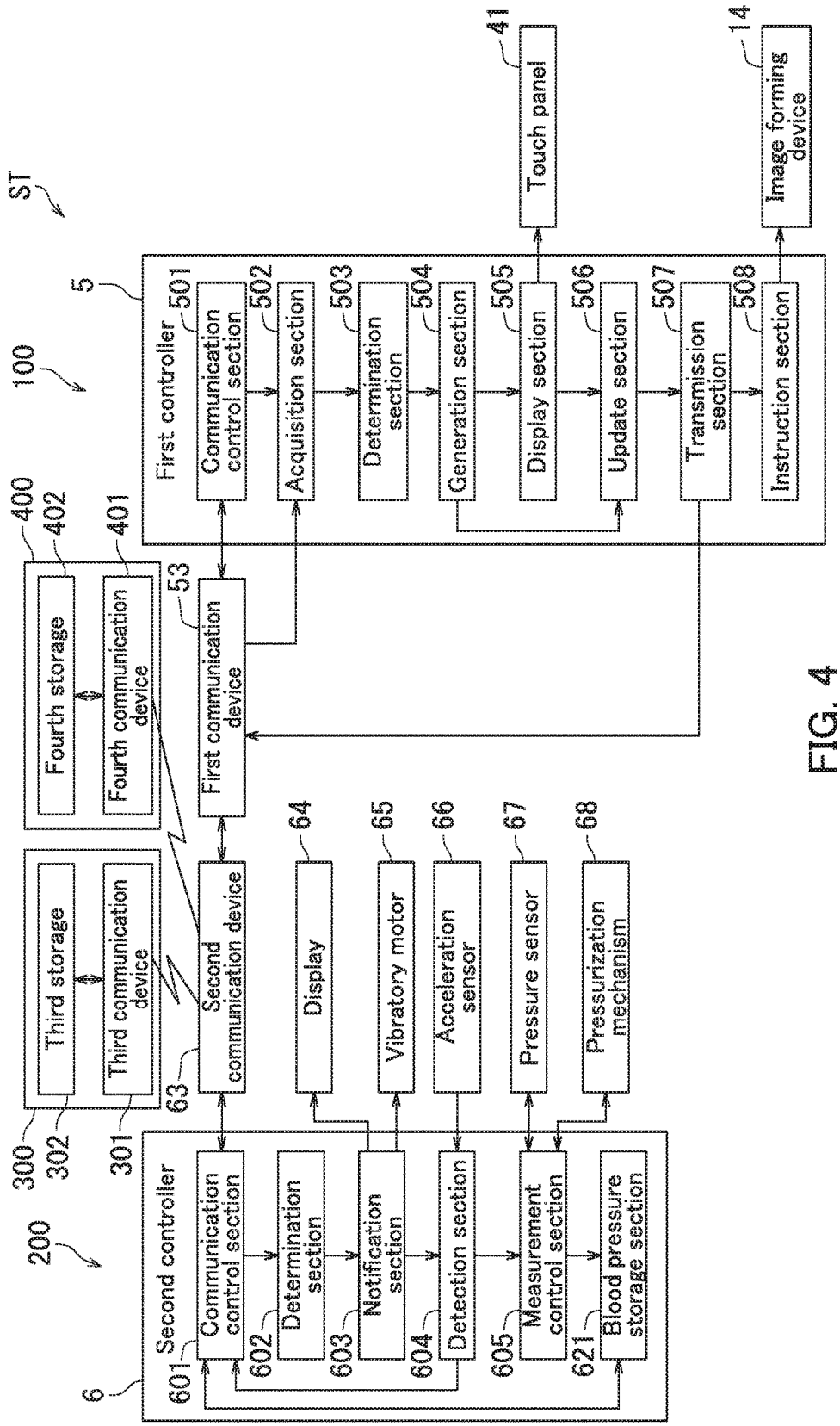

ST
100
5
First controller
501 Communication control section
502 Acquisition section
503 Determination section
504 Generation section
505 Display section
506 Update section
507 Transmission section
508 Instruction section
41 Touch panel
14 Image forming device
400
402 Fourth storage
401 Fourth communication device
53 First communication device
300
302 Third storage
301 Third communication device
63 Second communication device
64 Display
65 Vibratory motor
66 Acceleration sensor
67 Pressure sensor
68 Pressurization mechanism
200
6
Second controller
601 Communication control section
602 Determination section
603 Notification section
604 Detection section
605 Measurement control section
621 Blood pressure storage section

FIG. 4

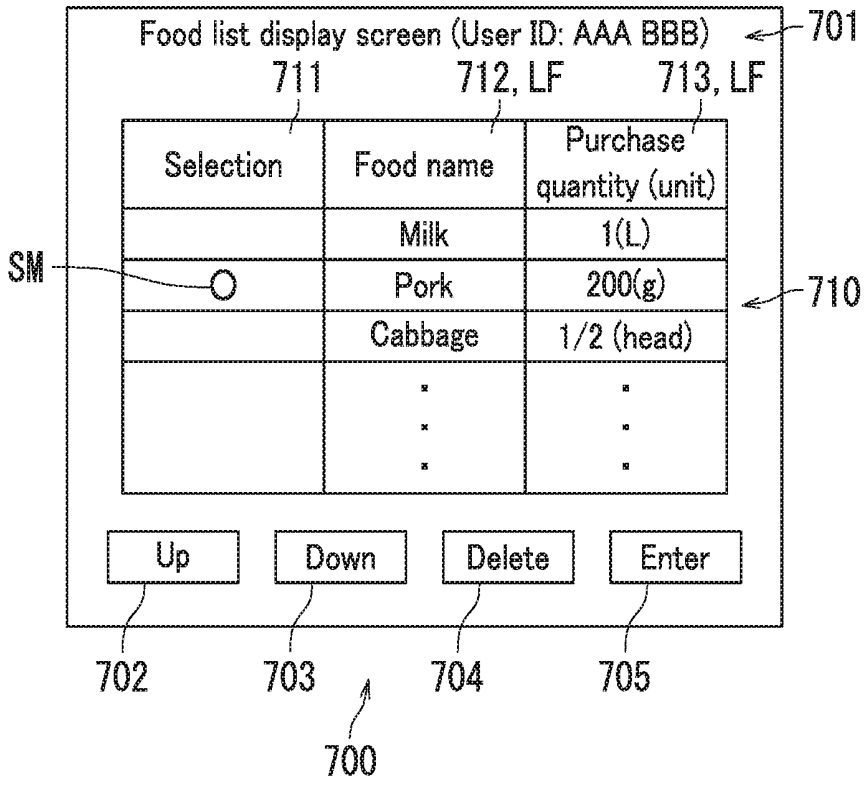

Food list display screen (User ID: AAA BBB)
701
711
712, LF
713, LF
Selection
Food name
Purchase quantity (unit)
Milk
1(L)
SM
Pork
200(g)
710
Cabbage
1/2 (head)
Up
Down
Delete
Enter
702
703
704
705
700

FIG. 5

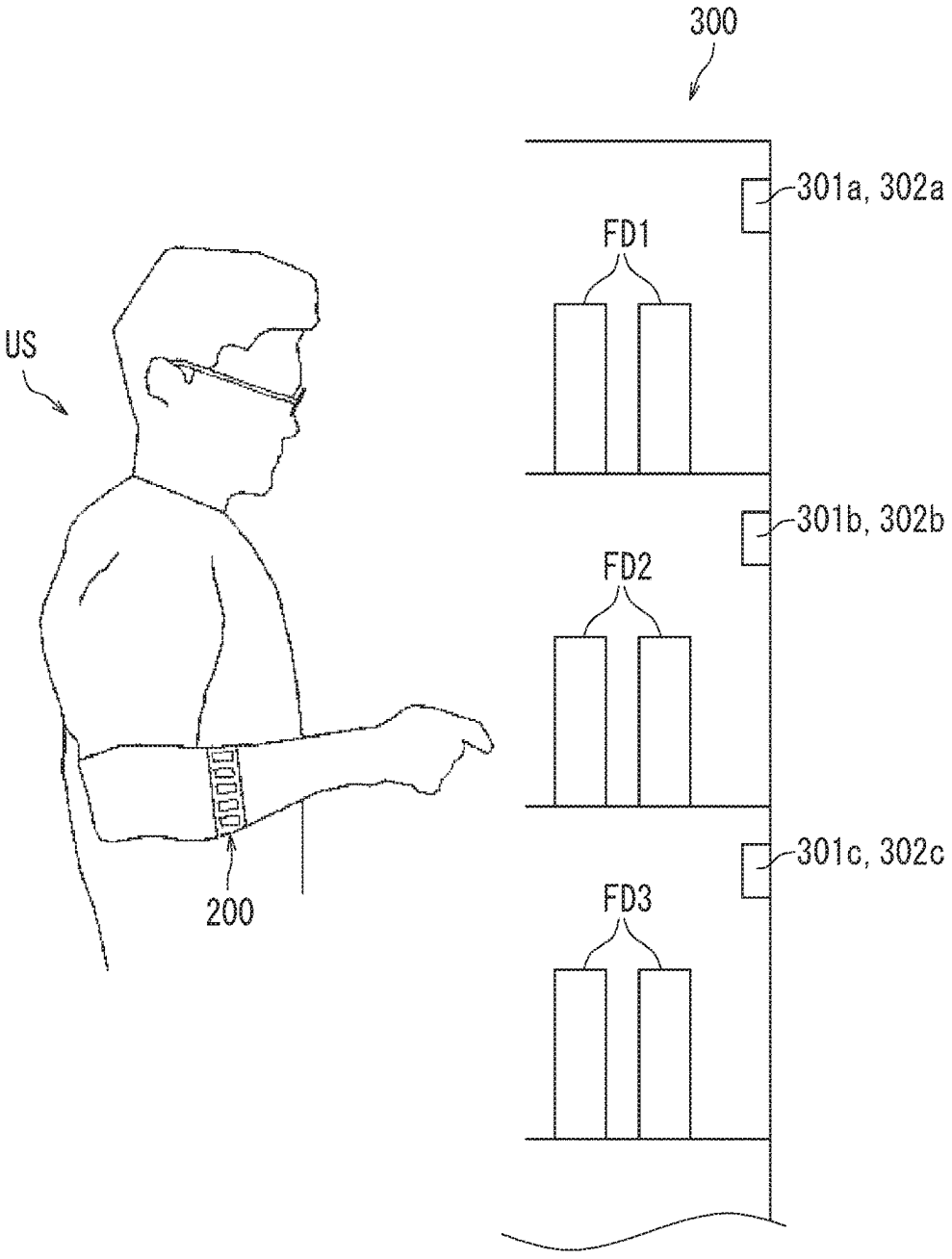


FIG. 6

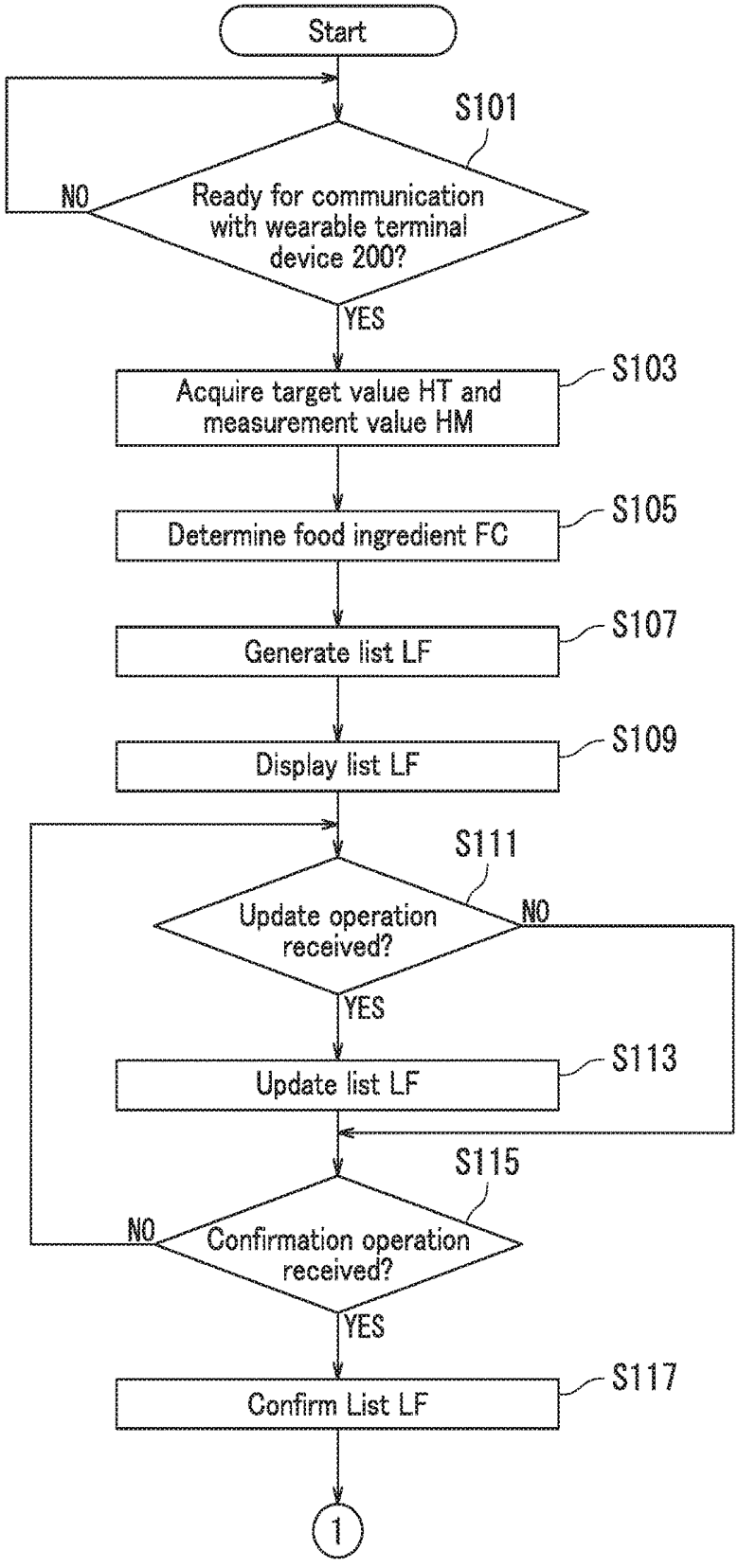

Start
S101
Ready for communication with wearable terminal device 200?
NO
YES
S103
Acquire target value HT and measurement value HM
S105
Determine food ingredient FC
S107
Generate list LF
S109
Display list LF
S111
Update operation received?
NO
YES
S113
Update list LF
S115
Confirmation operation received?
NO
YES
S117
Confirm List LF
1

FIG. 7

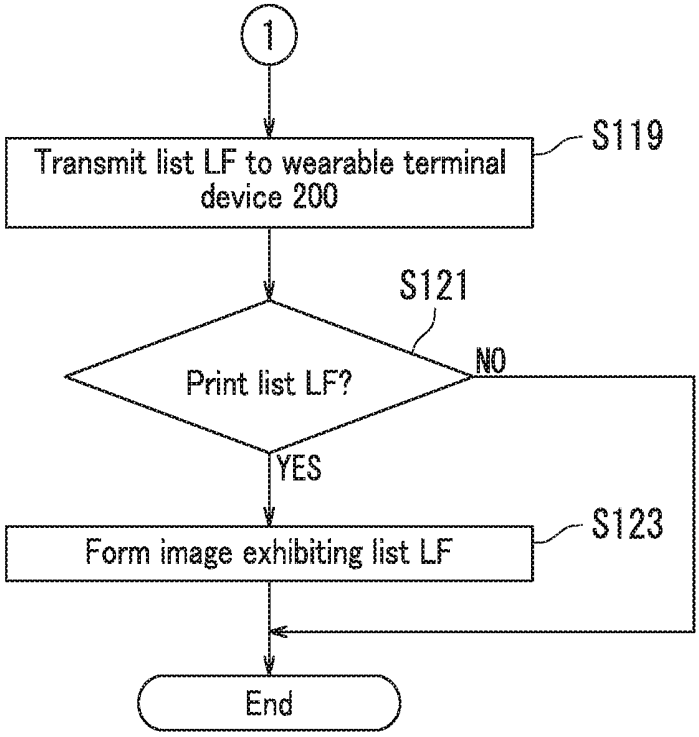

1
Transmit list LF to wearable terminal device 200
S119
S121
Print list LF?
NO
YES
Form image exhibiting list LF
S123
End

FIG. 8

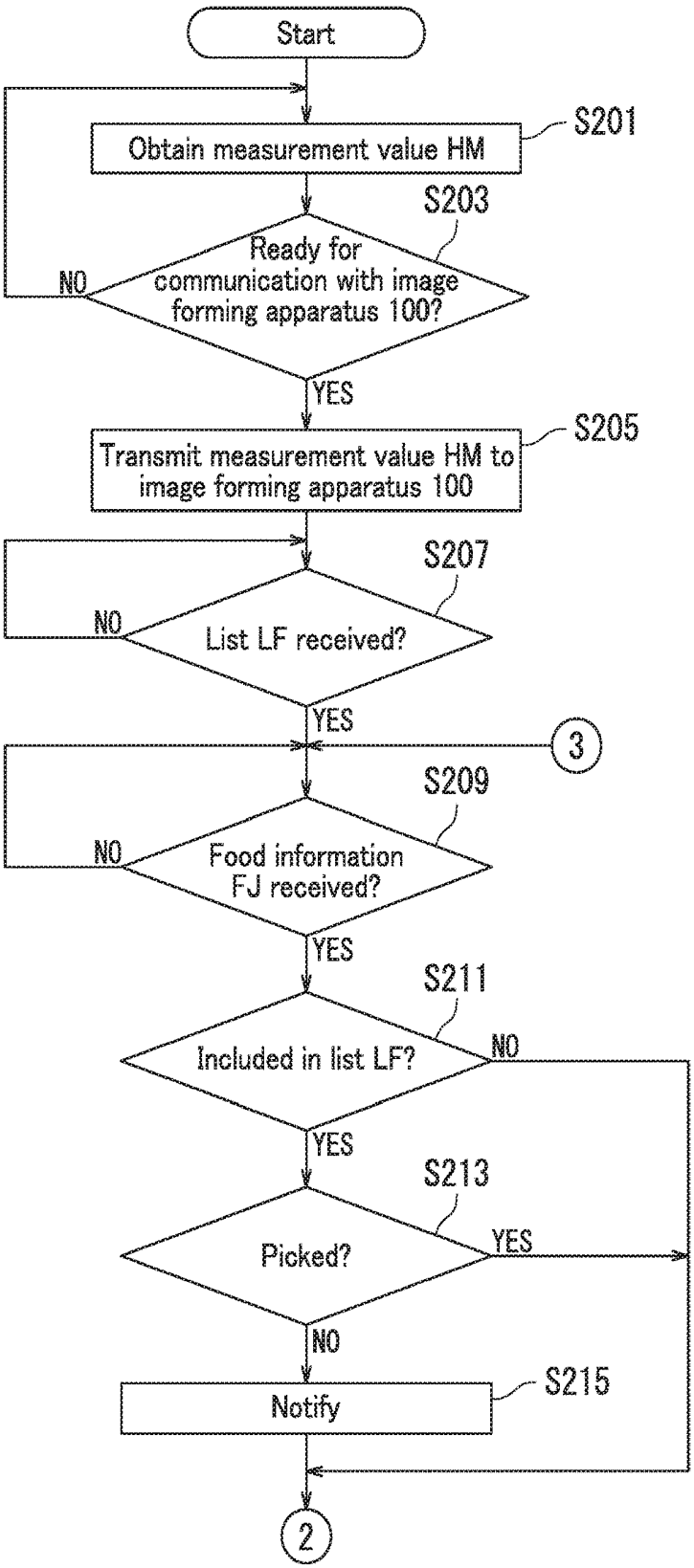

Start
Obtain measurement value HM
S201
S203
Ready for communication with image forming apparatus 100?
NO
YES
Transmit measurement value HM to image forming apparatus 100
S205
S207
NO
List LF received?
YES
3
S209
NO
Food information FJ received?
YES
S211
Included in list LF?
NO
YES
S213
Picked?
YES
NO
Notify
S215
2

FIG. 9

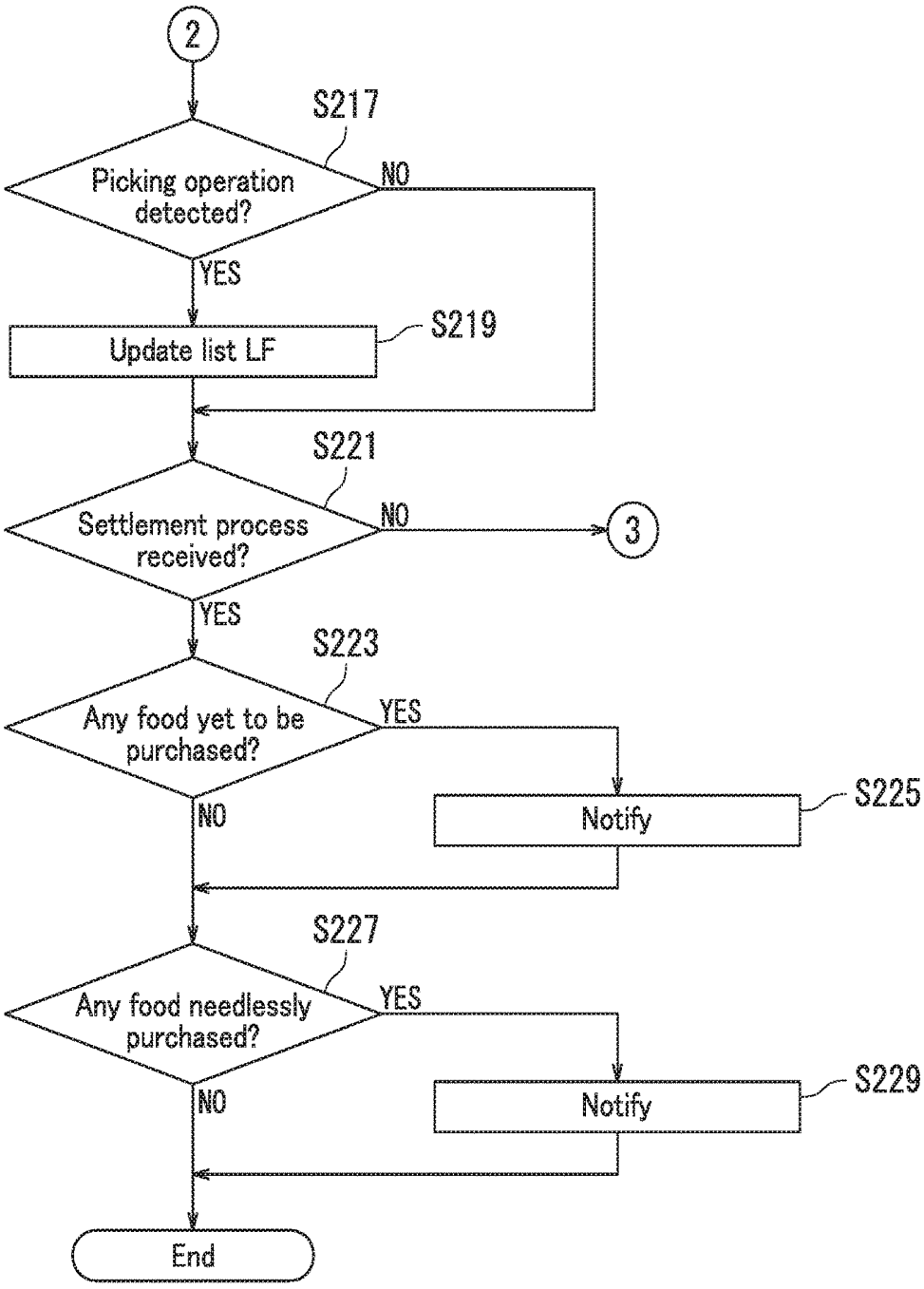

2
S217
Picking operation detected?
NO
YES
S219
Update list LF
S221
Settlement process received?
NO
3
YES
S223
Any food yet to be purchased?
YES
NO
S225
Notify
S227
Any food needlessly purchased?
YES
NO
S229
Notify
End

FIG. 10

FOOD PURCHASE SUPPORTING SYSTEM AND IMAGE FORMING APPARATUS

INCORPORATION BY REFERENCE

[0001] The present application claims priority under 35 U.S.C. § 119 to Japanese Patent Application No. 2017-189466, filed on Sep. 29, 2017. The contents of this application are incorporated herein by reference in their entirety.

BACKGROUND

[0002] The present disclosure relates to a food purchase supporting system and an image forming apparatus.

[0003] One example of a healthcare information providing system includes a management device, an information providing device, and a user terminal. The information providing device acquires a physical examination result from the management device and determines or calculates a deficient nutritional component and caloric need based on the physical examination result. The information providing device selects ingredients and dishes to recommend based on the deficient nutritional component and the caloric need, and displays the recommendations on the user terminal.

SUMMARY

[0004] A food purchase supporting system according to an aspect of the present disclosure includes a wearable terminal device and an image forming apparatus communicatively connected to the wearable terminal device. The wearable terminal device is for a user to wear on a body thereof. The wearable terminal device stores a measurement value with respect to an indicator for management of health of the user. The image forming apparatus includes a communication device, an acquisition section, a determination section, and a generation section. The communication device communicates with the wearable terminal device. The acquisition section acquires the measurement value from the wearable terminal device via the communication device. The determination section determines a food ingredient recommended for the user to ingest based on the measurement value and a target value with respect to the indicator. The generation section generates a list of food recommended for the user to purchase based on the food ingredient.

[0005] An image forming apparatus according to another aspect of the present disclosure is communicatively connected to a wearable terminal device. The wearable terminal device is for a user to wear on a body thereof. The image forming apparatus includes a communication device, an acquisition section, a determination section, and a generation section. The communication device communicates with the wearable terminal device. The acquisition section acquires a measurement value with respect to an indicator for management of health of the user from the wearable terminal device. The determination section determines a food ingredient recommended for the user to ingest based on the measurement value and a target value with respect to the indicator. The generation section generates a list of food recommended for the user to purchase based on the food ingredient.

BRIEF DESCRIPTION OF THE DRAWINGS

[0006] FIG. **1** is a diagram illustrating connection between an image forming apparatus, a wearable terminal device, a point of sale (POS) terminal device, and a server according to an embodiment of the present disclosure.

[0007] FIG. **2** is a diagram illustrating a configuration of the image forming apparatus according to the embodiment of the present disclosure.

[0008] FIG. **3** is a diagram illustrating a configuration of the wearable terminal device according to the embodiment of the present disclosure.

[0009] FIG. **4** is a diagram illustrating a configuration of a first controller and a configuration of a second controller.

[0010] FIG. **5** is a screen image illustrating an example of a food list display screen.

[0011] FIG. **6** is a diagram illustrating an example of a grocery shelving unit.

[0012] FIG. **7** is a flowchart illustrating an example of a process performed by the first controller.

[0013] FIG. **8** is a flowchart illustrating the example of the process performed by the first controller.

[0014] FIG. **9** is a flowchart illustrating an example of a process performed by the second controller.

[0015] FIG. **10** is a flowchart illustrating the example of the process performed by the second controller.

DETAILED DESCRIPTION

[0016] The following describes an embodiment of the present disclosure with reference to the drawings (FIGS. **1** to **10**). Note that in the drawings, elements that are the same or equivalent are labelled using the same reference signs and description thereof is not repeated.

[0017] First, connection between an image forming apparatus **100**, a wearable terminal device **200**, a point of sale (POS) terminal device **400**, and a server **500** according to the embodiment of the present disclosure will be described with reference to FIG. **1**. As illustrated in FIG. **1**, the image forming apparatus **100** is communicatively connected to the POS terminal device **400** and the server **500** via a network **600**.

[0018] The image forming apparatus **100** is also communicatively connected to the wearable terminal device **200** through short-range wireless communication. The POS terminal device **400** is communicatively connected to the wearable terminal device **200** through short-range wireless communication. The term "short-range wireless communication" means wireless communication within a short communication distance (for example, 1 m), and examples thereof include BLUETOOTH (registered Japanese trademark).

[0019] The image forming apparatus **100** and the POS terminal device **400** are installed in a store MA. The store MA has a grocery shelving unit **300**. Items of food for purchase by users are placed on the grocery shelving unit **300**.

[0020] The image forming apparatus **100** is a so-called multifunction peripheral and has a communication function. The image forming apparatus **100** exchanges various information with the wearable terminal device **200** through short-range wireless communication. The image forming apparatus **100** also acquires information indicating a target value HT from the server **500** via the network **600**. The target value HT means a value to be achieved with respect to an indicator for management of health of a user. The target value HT is for example a blood pressure level. The target value HT will be described in detail with reference to FIG. **4**.

[0021] The wearable terminal device **200** is for the user to wear and has a short-range wireless communication function. The wearable terminal device **200** stores information indicating a measurement value HM. The measurement value HM means a value measured with respect to the indicator for management of health of the user. A configuration of the wearable terminal device **200** will be described in detail with reference to FIG. **3**.

[0022] A third communication device **301** and third storage **302** are provided on the grocery shelving unit **300**. The third communication device **301** is communicatively connected to the wearable terminal device **200** through short-range wireless communication. The third storage **302** stores therein food information FJ indicating types of the food on the grocery shelving unit **300**. A configuration of the grocery shelving unit **300** will be described in detail with reference to FIG. **6**.

[0023] The POS terminal device **400** aggregates sales figures resulting from selling goods (food, according to the embodiment of the present disclosure) on a product-by-product basis. The POS terminal device **400** has a communication function. The POS terminal device **400** is communicatively connected to a server (not illustrated) via the network **600**. The POS terminal device **400** also has a short-range wireless communication function. Specifically, the POS terminal device **400** includes a fourth communication device **401** and fourth storage **402**. The fourth communication device **401** is communicatively connected to the wearable terminal device **200** through short-range wireless communication.

[0024] The server **500** has a communication function. The server **500** stores information indicating the target value HT. The target value HT is for example determined based on a physical examination. The target value HT may alternatively be determined based on age and gender.

[0025] The network **600** is for example the Internet. Note that the network **600** is not limited to the Internet. The network **600** may be a wide area network (WAN) or a local area network (LAN).

[0026] The following describes a configuration of the image forming apparatus **100** according to the embodiment of the present disclosure with reference to FIG. **2**. FIG. **2** is a diagram illustrating the configuration of the image forming apparatus **100**. The image forming apparatus **100** is a color multifunction peripheral. The image forming apparatus **100** reads an image from an original document R and forms an image on paper P using toner.

[0027] As illustrated in FIG. **2**, the image forming apparatus **100** includes an image forming unit **1**, an image reading unit **2**, a document feeding unit **3**, an operation panel **4**, a first controller **5**, and a first communication device **53**. The image forming unit **1** forms the image on the paper P. The image reading unit **2** reads the image from the original document R and generates image information. The document feeding unit **3** feeds the original document R to the image reading unit **2**. The operation panel **4** receives an operation from a user. The first controller **5** controls operation of the image forming apparatus **100**. The first communication device **53** performs short-range wireless communication.

[0028] The image forming unit **1** includes a paper feeder **12**, a conveyance device L, a toner supply device **13**, an image forming device **14**, a fixing device **16**, and an ejection device **17**. The image forming device **14** includes a transfer device **15**.

[0029] The paper feeder **12** feeds the paper P to the conveyance device L. The conveyance device L conveys the paper P to the ejection device **17** through the transfer device **15** and the fixing device **16**. The paper P is equivalent to an example of what is referred to as a "recording medium".

[0030] The toner supply device **13** supplies the toner to the image forming device **14**. The image forming device **14** forms the image on the paper P.

[0031] The transfer device **15** includes an intermediate transfer belt **154**. The image forming device **14** transfers cyan, magenta, yellow, and black toner images onto the intermediate transfer belt **154**. The toner images of the respective colors are superimposed on the intermediate transfer belt **154**, and thus an image is formed on the intermediate transfer belt **154**. The transfer device **15** transfers the image formed on the intermediate transfer belt **154** onto the paper P. As a result, the image is formed on the paper P.

[0032] After the image is formed on the paper P, the fixing device **16** applies heat and pressure to the paper P to fix the image on the paper P. The ejection device **17** ejects the paper P out of the image forming apparatus **100**.

[0033] The operation panel **4** includes a touch panel **41**. The touch panel **41** for example includes a liquid crystal display (LCD) and displays various images. The touch panel **41** also includes a touch sensor and receives an operation from the user.

[0034] The first controller **5** includes a processor **51** and storage **52**. The processor **51** for example includes a central processing unit (CPU). The storage **52** includes memory, such as semiconductor memory, and optionally includes a hard disk drive (HDD). The storage **52** stores therein a control program.

[0035] The following describes the configuration of the wearable terminal device **200** with reference to FIG. **3**. FIG. **3** is a diagram illustrating the configuration of the wearable terminal device **200**. As illustrated in FIG. **3**, the wearable terminal device **200** includes a band **60**, a second controller **6**, a second communication device **63**, a display **64**, a vibratory motor **65**, an acceleration sensor **66**, a pressure sensor **67**, and a pressurization mechanism **68**.

[0036] The band **60** is stretchable and is to be wound around an arm of the user. The band **60** is capable of altering pressure to apply to the arm of the user. The band **60** includes a cuff (not illustrated).

[0037] The second controller **6** includes a processor **61** and storage **62**. The processor **61** for example includes a central processing unit (CPU). The storage **62** includes memory, such as semiconductor memory, and optionally includes a hard disk drive (HDD). The storage **62** stores therein a control program. The processor **61** controls the wearable terminal device **200** by executing the control program.

[0038] The second communication device **63** performs short-range wireless communication.

[0039] The display **64** for example includes an LCD and displays various images.

[0040] The vibratory motor **65** produces a vibration. Specifically, a weight is eccentrically provided on a tip of a rotary shaft of the vibratory motor **65**. Rotation of the

vibratory motor **65** causes the centroid position of the weight to circle around the rotary shaft, thus producing a vibration.

[0041] The acceleration sensor **66** detects acceleration.

[0042] The pressure sensor **67** is disposed on an inner circumferential surface of the band **60** and detects pressure.

[0043] The pressurization mechanism **68** alters pressure to apply to the arm from the band **60**. Specifically, the pressurization mechanism **68** increases the pressure to apply to the arm of the user by inflating the cuff and decreases the pressure to apply to the arm of the user by deflating the cuff.

[0044] The following describes a configuration of the first controller **5** and a configuration of the second controller **6** according to the embodiment of the present disclosure with reference to FIGS. **1** to **4**. FIG. **4** is a diagram illustrating the configuration of the first controller **5** of the image forming apparatus **100** and the configuration of the second controller **6** of the wearable terminal device **200**.

[0045] As illustrated in FIG. **4**, the first controller **5** includes a communication control section **501**, an acquisition section **502**, a determination section **503**, a generation section **504**, a display section **505**, an update section **506**, a transmission section **507**, and an instruction section **508**. Specifically, the processor **51** functions as the communication control section **501**, the acquisition section **502**, the determination section **503**, the generation section **504**, the display section **505**, the update section **506**, the transmission section **507**, and the instruction section **508** by executing the control program.

[0046] The communication control section **501** controls operation of the first communication device **53**. Specifically, the communication control section **501** determines whether or not the first communication device **53** is ready for communication with the wearable terminal device **200** (the second communication device **63**). The communication control section **501** is equivalent to a "part of a communication device". The first communication device **53** and the communication control section **501** are equivalent to an example of what is referred to as a "communication device".

[0047] The acquisition section **502** acquires the information indicating the target value HT from the server **500**. The acquisition section **502** also acquires the information indicating the measurement value HM from the wearable terminal device **200** via the first communication device **53**. Specifically, upon the communication control section **501** determining that the first communication device **53** is ready for communication with the second communication device **63**, the acquisition section **502** acquires the information indicating the measurement value HM from the wearable terminal device **200** via the first communication device **53**.

[0048] The determination section **503** determines a food ingredient FC recommended for the user to ingest based on the target value HT and the measurement value HM.

[0049] The generation section **504** generates a list LF of food recommended for the user to purchase based on the food ingredient FC.

[0050] The display section **505** displays the list LF on the touch panel **41**.

[0051] The update section **506** updates the list LF based on an operation of the wearable terminal device **200**.

[0052] The transmission section **507** transmits information indicating the list LF to the wearable terminal device **200**.

[0053] The instruction section **508** instructs the image forming device **14** to form an image exhibiting the list LF on the paper P. In accordance with the instruction from the instruction section **508**, the image forming device **14** forms the image exhibiting the list LF on the paper P.

[0054] According to the embodiment of the present disclosure, as described above with reference to FIGS. **1** to **4**, the determination section **503** determines the food ingredient FC recommended for the user to ingest based on the target value HT and the measurement value HM. The generation section **504** generates the list LF of food recommended for the user to purchase based on the food ingredient FC. It is therefore possible to generate the list LF of food suitable for the health status of the user by frequently updating the measurement value HM.

[0055] According to the embodiment of the present disclosure, the acquisition section **502** acquires the information indicating the target value HT from the server **500**, but the present disclosure is not limited to such an embodiment. The acquisition section **502** may acquire the information indicating the target value HT from any source. For example, the acquisition section **502** may acquire the information indicating the target value HT from the wearable terminal device **200**.

[0056] Next, the configuration of the second controller **6** will be described with reference to FIG. **4**. As illustrated in FIG. **4**, the second controller **6** includes a communication control section **601**, a determination section **602**, a notification section **603**, a detection section **604**, a measurement control section **605**, and a blood pressure storage section **621**. Specifically, the processor **61** functions as the communication control section **601**, the determination section **602**, the notification section **603**, the detection section **604**, and the measurement control section **605** by executing the control program. The storage **62** functions as the blood pressure storage section **621**.

[0057] The blood pressure storage section **621** stores therein the measurement value HM. Specifically, the blood pressure storage section **621** stores a measured blood pressure level in association with a date and time of measurement. The measured blood pressure level is equivalent to an example of the measurement value HM.

[0058] The communication control section **601** controls operation of the second communication device **63**.

[0059] The determination section **602** receives, from the POS terminal device **400**, the food information FJ indicating a type of food purchased by the user and determines whether or not the food indicated by the food information FJ is included in the list LF. The determination section **602** is equivalent to an example of what is referred to as a "first determination section". The determination section **602** is also equivalent to an example of what is referred to as a "second determination section".

[0060] Upon the determination section **602** determining that the food indicated by the food information FJ received from the fourth communication device **401** is not included in the list LF, the notification section **603** performs the following process. That is, the notification section **603** causes the vibratory motor **65** to produce a vibration and displays, on the display **64**, information indicating that the food indicated by the food information FJ is not included in the list LF. The notification section **603** is equivalent to an example of what is referred to as a "second notification section".

[0061] The detection section **604** detects movement of the user based on a result of the detection by the acceleration sensor **66**.

[0062] The measurement control section **605** measures a blood pressure level of the user using the pressure sensor **67** and the pressurization mechanism **68**, and stores the measured blood pressure level in the blood pressure storage section **621**. The pressure sensor **67** and the pressurization mechanism **68** form an example of what is referred to as a "measurement device".

[0063] According to the embodiment of the present disclosure, as described above with reference to FIGS. **1** to **4**, the determination section **602** receives the food information FJ indicating the type of the food purchased by the user from the POS terminal device **400** and determines whether or not the food indicated by the food information FJ is included in the list LF of the recommended food. The notification section **603** notifies the user of a result of the determination by the determination section **602**. The user can therefore immediately know whether or not the food purchased by the user is included in the list LF of the recommended food. Thus, user convenience is enhanced.

[0064] Upon the determination section **602** determining that the food indicated by the food information FJ from the fourth communication device **401** of the POS terminal device **400** is not included in the list LF, for example, the notification section **603** performs the following process. That is, the notification section **603** causes the vibratory motor **65** to produce a vibration and displays, on the display **64**, information indicating that the food indicated by the food information FJ is not included in the list LF. The user can therefore immediately know that the food purchased by the user is not included in the list LF. Thus, user convenience is enhanced.

[0065] The following describes a food list display screen **700** with reference to FIGS. **2** to **5**. FIG. **5** is a screen image illustrating an example of the food list display screen **700**. The display section **505** displays the food list display screen **700** on the touch panel **41**.

[0066] As illustrated in FIG. **5**, the food list display screen **700** shows a user display section **701**, a list display section **710**, an up button **702**, a down button **703**, a delete button **704**, and an enter button **705**.

[0067] The user display section **701** displays identification information of the user. For example, the user display section **701** displays a user ID.

[0068] The list display section **710** displays the list LF. Specifically, the list display section **710** includes sections of selection **711**, food name **712**, and purchase quantity **713**. The food name **712** and the purchase quantity **713** form the list LF.

[0069] The section of the selection **711** shows a position of a selected food in the list LF. For example, the section of the selection **711** displays a selection mark SM in a position corresponding to the selected food. The selection mark SM is for example an open circle.

[0070] The food name **712** means a name of food recommended for the user to purchase.

[0071] The purchase quantity **713** means a quantity of food recommended for the user to purchase.

[0072] The up button **702** is to be touched by the user in order to move the selection mark SM to an upper cell of the section of the selection **711**. The update section **506** also moves the selection mark SM to an upper cell of the section of the selection **711** in response to the detection section **604** detecting a first movement of the user. The first movement is for example to move the wearable terminal device **200** upward.

[0073] Specifically, the acceleration sensor **66** detects upward acceleration when the wearable terminal device **200** is moved upward. The detection section **604** detects the first movement of the user through the acceleration sensor **66** detecting the upward acceleration. Accordingly, information indicating that the detection section **604** has detected the first movement is transmitted to the first controller **5** via the second communication device **63** and the first communication device **53**. In response to the transmission of the information indicating that the detection section **604** has detected the first movement, the update section **506** moves the selection mark SM to an upper cell of the section of the selection **711**.

[0074] The down button **703** is to be touched by the user in order to move the selection mark SM to a lower cell of the section of the selection **711**. The update section **506** also moves the selection mark SM to a lower cell of the section of the selection **711** in response to the detection section **604** detecting a second movement of the user. The second movement is for example to move the wearable terminal device **200** downward.

[0075] Specifically, the acceleration sensor **66** detects downward acceleration when the wearable terminal device **200** is moved downward. The detection section **604** detects the second movement of the user through the acceleration sensor **66** detecting the downward acceleration. Accordingly, information indicating that the detection section **604** has detected the second movement is transmitted to the first controller **5** via the second communication device **63** and the first communication device **53**. In response to the transmission of the information indicating that the detection section **604** has detected the second movement, the update section **506** moves the selection mark SM to a lower cell of the section of the selection **711**.

[0076] The delete button **704** is to be touched by the user in order to delete food for which the selection mark SM is being displayed. The update section **506** also deletes food for which the selection mark SM is being displayed and updates the list LF in response to the detection section **604** detecting a third movement of the user. The third movement is for example to move the wearable terminal device **200** rightward.

[0077] Specifically, the acceleration sensor **66** detects rightward acceleration when the wearable terminal device **200** is moved rightward. The detection section **604** detects the third movement of the user through the acceleration sensor **66** detecting the rightward acceleration. Accordingly, information indicating that the detection section **604** has detected the third movement is transmitted to the first controller **5** via the second communication device **63** and the first communication device **53**. The update section **506** deletes the food for which the selection mark SM is being displayed and updates the list LF in response to the transmission of the information indicating that the detection section **604** has detected the third movement.

[0078] The enter button **705** is to be touched by the user in order to confirm a list displayed on the list display section **710** as the list LF of the food recommended for the user to purchase. The update section **506** also updates the list LF in response to the detection section **604** detecting a fourth

movement of the user. The fourth movement is for example to move the wearable terminal device **200** leftward.

[0079] Specifically, the acceleration sensor **66** detects leftward acceleration when the wearable terminal device **200** is moved leftward. The detection section **604** detects the fourth movement of the user through the acceleration sensor **66** detecting the leftward acceleration. Accordingly, information indicating that the detection section **604** has detected the fourth movement is transmitted to the first controller **5** via the second communication device **63** and the first communication device **53**. The update section **506** updates the list LF in response to the transmission the information indicating that the detection section **604** has detected the fourth movement.

[0080] Once the update section **506** has updated the list LF, the transmission section **507** transmits the list LF to the wearable terminal device **200**.

[0081] According to the embodiment of the present disclosure, as described above with reference to FIGS. **2** to **5**, the display section **505** displays the list LF of the food recommended for the user to purchase on the touch panel **41** as soon as the first communication device **53** and the second communication device **63** are ready for communication with each other. The user can therefore immediately check the list LF of the food recommended to purchase. Thus, user convenience is enhanced.

[0082] The update section **506** updates the list LF based on an operation of the wearable terminal device **200**. It is therefore possible to update the list LF without operating the operation panel **4**. Thus, user convenience is enhanced.

[0083] Furthermore, the transmission section **507** transmits the information indicating the list LF to the wearable terminal device **200**. The user can therefore check the list LF on the wearable terminal device **200**. For example, the user can check the list LF by displaying the list LF on the display **64**. Thus, user convenience is enhanced.

[0084] The following describes a process performed by the second controller **6** of the wearable terminal device **200**, and the third communication device **301** and the third storage **302** on the grocery shelving unit **300** with reference to FIGS. **2** to **6**. FIG. **6** is a diagram illustrating an example of the grocery shelving unit **300**.

[0085] As illustrated in FIG. **6**, a user US is wearing the wearable terminal device **200** on an arm.

[0086] The grocery shelving unit **300** includes three shelves, among which a top shelf is provided with a third communication device **301***a* and third storage **302***a*. First food FD**1** is placed on the top shelf. The food information FJ indicating the first food FD**1** is stored in the third storage **302***a*. The third communication device **301***a* transmits the food information FJ indicating the first food FD**1** to the wearable terminal device **200** once the third communication device **301***a* is ready for communication with the wearable terminal device **200**.

[0087] A middle shelf of the grocery shelving unit **300** is provided with a third communication device **301***b* and third storage **302***b*. Second food FD**2** is placed on the middle shelf. The food information FJ indicating the second food FD**2** is stored in the third storage **302***b*. The third communication device **301***b* transmits the food information FJ indicating the second food FD**2** to the wearable terminal device **200** once the third communication device **301***b* is ready for communication with the wearable terminal device **200**.

[0088] A lower shelf of the grocery shelving unit **300** is provided with a third communication device **301***c* and third storage **302***c*. Third food FD**3** is placed on the lower shelf. The food information FJ indicating the third food FD**3** is stored in the third storage **302***c*. The third communication device **301***c* transmits the food information FJ indicating the third food FD**3** to the wearable terminal device **200** once the third communication device **301***c* is ready for communication with the wearable terminal device **200**.

[0089] The determination section **602** of the second controller **6** of the wearable terminal device **200** performs the following process. That is, the determination section **602** receives the food information FJ from the third communication device **301** on the grocery shelving unit **300** and determines whether or not the food indicated by the food information FJ is included in the list LF. Specifically, the determination section **602** receives the food information FJ indicating the first food FD**1** from the third communication device **301***a*, receives the food information FJ indicating the second food FD**2** from the third communication device **301***b*, and receives the food information FJ indicating the third food FD**3** from the third communication device **301***c*.

[0090] The notification section **603** notifies the user US of a result of the determination by the determination section **602**. Specifically, upon the determination section **602** determining that the food indicated by the food information FJ from the third communication device **301** on the grocery shelving unit **300** is included in the list LF, the notification section **603** performs the following process. That is, the notification section **603** notifies the user US of a result of the determination by the determination section **602**. Specifically, the notification section **603** causes the vibratory motor **65** to produce a vibration and displays, on the display **64**, information indicating that the food indicated by the food information FJ is included in the list LF.

[0091] According to the embodiment of the present disclosure, as described above with reference to FIGS. **2** to **6**, the determination section **602** receives the food information FJ from the third communication device **301** on the grocery shelving unit **300** and determines whether or not the food indicated by the food information FJ is included in the list LF. Furthermore, the notification section **603** notifies the user US of a result of the determination by the determination section **602**. The user US can therefore immediately know whether or not the food indicated by the food information FJ is included in the list LF. Thus, convenience of the user US is enhanced.

[0092] Since the notification section **603** causes the vibratory motor **65** to produce a vibration upon the determination section **602** determining that the food indicated by the food information FJ from the third communication device **301** is included in the list LF, the user US need not see the display **64** of the wearable terminal device **200**. The user US can therefore reliably know that the food indicated by the food information FJ is included in the list LF. Thus, convenience of the user US is enhanced.

[0093] Furthermore, upon the determination section **602** determining that the food indicated by the food information FJ from the third communication device **301** is included in the list LF, the notification section **603** displays, on the display **64**, information indicating that the food indicated by the food information FJ is included in the list LF. The user US can therefore check the food information FJ of the food determined to be included in the list LF.

[0094] The following describes a process performed by the first controller **5** in the image forming apparatus **100** with reference to FIGS. **2** to **8**. FIGS. **7** and **8** are flowcharts illustrating an example of the process performed by the first controller **5**.

[0095] First, in Step S**101** as illustrated in FIG. **7**, the communication control section **501** determines whether or not the first communication device **53** is ready for communication with the wearable terminal device **200** (the second communication device **63**).

[0096] Upon the communication control section **501** determining that the first communication device **53** is not ready for communication with the wearable terminal device **200** (NO in step S**101**), the process is put into a standby state. Upon the communication control section **501** determining that the first communication device **53** is ready for communication with the wearable terminal device **200** (YES in step S**101**), the process advances to step S**103**.

[0097] Next, in step S**103**, the acquisition section **502** acquires the measurement value HM from the wearable terminal device **200** and acquires the target value HT from the server **500**.

[0098] Next, in step S**105**, the determination section **503** determines the food ingredient FC recommended for the user to ingest based on the target value HT and the measurement value HM.

[0099] Next, in step S**107**, the generation section **504** generates the list LF of food recommended for the user to purchase based on the food ingredient FC.

[0100] Next, in step S**109**, the display section **505** displays the list LF on the touch panel **41**.

[0101] Next, in step S**111**, the update section **506** determines whether or not an update operation has been received from the wearable terminal device **200** or the touch panel **41**. The update operation is an operation to update the list LF.

[0102] Upon the update section **506** determining that the update operation has not been received (NO in step S**111**), the process advances to step S**115**. Upon the update section **506** determining that the update operation has been received (YES in step S**111**), the process advances to step S**113**.

[0103] Next, in step S**113**, the update section **506** updates the list LF in accordance with the update operation.

[0104] Next, in step S**115**, the update section **506** determines whether or not a confirmation operation has been received from the wearable terminal device **200** or the touch panel **41**. The confirmation operation is an operation to confirm the list LF.

[0105] Upon the update section **506** determining that the confirmation operation has not been received (NO in step S**115**), the process returns to step S**111**. Upon the update section **506** determining that the confirmation operation has been received (YES in step S**115**), the process advances to step S**117**.

[0106] Next, in step S**117**, the update section **506** confirms the list LF.

[0107] Next, in step S**119** as illustrated in FIG. **8**, the transmission section **507** transmits information indicating the list LF to the wearable terminal device **200**.

[0108] Next, in step S**121**, the instruction section **508** determines whether or not to print the list LF.

[0109] Upon the instruction section **508** determining not to print the list LF (NO in step S**121**), the process ends. Upon the instruction section **508** determining to print the list LF (YES in step S**121**), the process advances to step S**123**.

[0110] Next, in step S**123**, the image forming device **14** forms an image exhibiting the list LF on the paper P in accordance with the instruction by the instruction section **508**, and the process ends.

[0111] According to the embodiment of the present disclosure, as described above with reference to FIGS. **2** to **8**, the image forming device **14** forms the image exhibiting the list LF on the paper P. The user can therefore readily check the list LF. Thus, user convenience is enhanced.

[0112] The following describes a process performed by the second controller **6** in the wearable terminal device **200** with reference to FIGS. **2** to **6**, **9**, and **10**. FIGS. **9** and **10** are flowcharts illustrating an example of the process performed by the second controller **6**.

[0113] First, in step S**201** as illustrated in FIG. **9**, the measurement control section **605** performs measurement to obtain the measurement value HM. Specifically, the measurement control section **605** measures a blood pressure level of the user using the pressure sensor **67** and the pressurization mechanism **68**.

[0114] Next, in step S**203**, the communication control section **601** determines whether or not the wearable terminal device **200** is ready for communication with the image forming apparatus **100**. Specifically, the communication control section **601** determines whether or not the second communication device **63** is ready for communication with the first communication device **53**.

[0115] Upon the communication control section **601** determining that the wearable terminal device **200** is not ready for communication with the image forming apparatus **100** (NO in step S**203**), the process returns to step S**201**. Upon the communication control section **601** determining that the wearable terminal device **200** is ready for communication with the image forming apparatus **100** (YES in step S**203**), the process advances to step S**205**.

[0116] Next, in step S**205**, the communication control section **601** transmits the information indicating the measurement value HM to the image forming apparatus **100**.

[0117] Next, in step S**207**, the communication control section **601** determines whether or not the information indicating the list LF has been received from the image forming apparatus **100**.

[0118] Upon the communication control section **601** determining that the information indicating the list LF has not been received from the image forming apparatus **100** (NO in step S**207**), the process is put into a standby state. Upon the communication control section **601** determining that the information indicating the list LF has been received from the image forming apparatus **100** (YES in step S**207**), the process advances to step S**209**.

[0119] Next, in step S**209**, the communication control section **601** determines whether or not the food information FJ has been received from the third communication device **301** on the grocery shelving unit **300**.

[0120] Upon the communication control section **601** determining that the food information FJ has not been received (NO in step S**209**), the process is put into a standby state. Upon the communication control section **601** determining that the food information FJ has been received (YES in step S**209**), the process advances to step S**211**.

[0121] Next, in step S**211**, the determination section **602** determines whether or not the food indicated by the food information FJ is included in the list LF.

[0122] Upon the determination section **602** determining that the food indicated by the food information FJ is not included in the list LF (NO in step S**211**), the process advances to step S**217** in FIG. **10**. Upon the determination section **602** determining that the food indicated by the food information FJ is included in the list LF (YES in step S**211**), the process advances to step S**213**.

[0123] Next, in step S**213**, the determination section **602** determines whether or not the food indicated by the food information FJ has been picked. "Food being picked" means that food FD has been picked from the grocery shelving unit **300**.

[0124] Upon the determination section **602** determining that the food indicated by the food information FJ has been picked (YES in step S**213**), the process advances to step S**217** in FIG. **10**. Upon the determination section **602** determining that the food indicated by the food information FJ has not been picked (NO in step S**213**), the process advances to step S**215**.

[0125] Next, in step S**215**, the notification section **603** notifies the user of a result of the determination by the determination section **602**. Specifically, the notification section **603** causes the vibratory motor **65** to produce a vibration and displays, on the display **64**, information indicating that the food indicated by the food information FJ is included in the list LF.

[0126] Next, in step S**217** as illustrated in FIG. **10**, the detection section **604** determines whether or not a picking operation has been detected. The "picking operation" means an operation to pick the food FD from the grocery shelving unit **300**.

[0127] Upon the detection section **604** determining that the picking operation has not been detected (NO in step S**217**), the process advances to step S**221**. Upon the detection section **604** determining that the picking operation has been detected (YES in step S**217**), the process advances to step S**219**.

[0128] Next, in step S**219**, the second controller **6** updates the list LF. Specifically, the second controller **6** adds the information indicating that the food FD has been picked to the list LF. The food FD means the food for which the picking operation has been detected by the detection section **604**.

[0129] Next, in step S**221**, the second controller **6** determines whether or not a settlement process performed by the POS terminal device **400** has been received. Specifically, the second controller **6** determines that the settlement process performed by the POS terminal device **400** has been received when the wearable terminal device **200** is ready for communication with the POS terminal device **400** and receives the food information FJ indicating the purchased food FD from the POS terminal device **400**.

[0130] Upon the second controller **6** determining that the settlement process performed by the POS terminal device **400** has not been received (NO in step S**221**), the process returns to step S**209** in FIG. **9**. Upon the second controller **6** determining that the settlement process performed by the POS terminal device **400** has been received (YES in step S**221**), the process advances to step S**223**.

[0131] Next, in step S**223**, the determination section **602** determines whether or not there is any food yet to be purchased. "Food yet to be purchased" means food that is included in the list LF but is not included in the food purchased. That is, "food yet to be purchased" means food FD recommended for the user to purchase but not yet purchased by the user.

[0132] Upon the determination section **602** determining that there is no food yet to be purchased (NO in step S**223**), the process advances to step S**227**. Upon the determination section **602** determining that there is food yet to be purchased (YES in step S**223**), the process advances to step S**225**.

[0133] Next, in step S**225**, the notification section **603** notifies the user that there is food yet to be purchased. Specifically, the notification section **603** causes the vibratory motor **65** to produce a vibration and displays, on the display **64**, information indicating that there is food yet to be purchased.

[0134] Next, in step S**227**, the determination section **602** determines whether or not there is any food needlessly purchased. "Food needlessly purchased" means food that has been purchased even though the food is not included in the list LF. That is, "food needlessly purchased" means food that has been purchased by the user but that should not have been purchased by the user.

[0135] Upon the determination section **602** determining that there is no food needlessly purchased (NO in step S**227**), the process ends. Upon the determination section **602** determining that there is food needlessly purchased (YES in step S**227**), the process advances to step S**229**.

[0136] Next, in step S**229**, the notification section **603** notifies the user that there is food needlessly purchased. Specifically, the notification section **603** causes the vibratory motor **65** to produce a vibration and displays, on the display **64**, information indicating that there is food needlessly purchased. Thereafter, the process ends.

[0137] According to the embodiment of the present disclosure, as described above with reference to FIGS. **2** to **6**, **9**, and **10**, the wearable terminal device **200** performs measurement to obtain the measurement value HM. It is therefore possible to frequently update the measurement value HM. Accordingly, it is possible to reliably generate the list LF suitable for the latest health status of the user.

[0138] The wearable terminal device **200** measures a blood pressure level of the user. It is therefore possible to frequently update the measurement value for blood pressure. Accordingly, it is possible to generate the list LF suitable for the latest blood pressure of the user.

[0139] The notification section **603** notifies the user that there is food yet to be purchased upon the determination section **602** determining that there is food yet to be purchased. The user can therefore readily know that there is food yet to be purchased. Thus, user convenience is enhanced.

[0140] The notification section **603** also notifies the user that there is food needlessly purchased upon the determination section **602** determining that there is food needlessly purchased. The user can therefore readily know that there is food needlessly purchased. Thus, user convenience is enhanced.

[0141] Through the above, an embodiment of the present disclosure has been described with reference to the drawings. However, the present disclosure is not limited to the above embodiment and may be implemented in various different forms that do not deviate from the essence of the present disclosure (for example, as described below in (1) to (3)). The drawings schematically illustrate elements of con-

figuration in order to facilitate understanding and properties of elements of configuration illustrated in the drawings, such as thickness, length, and number thereof, may differ from actual properties thereof in order to facilitate preparation of the drawings. Furthermore, properties of elements of configuration described in the above embodiment, such as shape and dimensions, are merely examples and are not intended as specific limitations. Various alterations may be made so long as there is no substantial deviation from the configuration of the present disclosure.

[0142] (1) According to the embodiment of the present disclosure, as described above with reference to FIG. **3**, the wearable terminal device **200** is for the user to wear on an arm. However, the present disclosure is not limited to such an embodiment. The wearable terminal device may be in any form so long as the user can wear the wearable terminal device on a body thereof. For example, the wearable terminal device may be for the user to wear on a wrist. For another example, the wearable terminal device may be for the user to wear on a head.

[0143] (2) According to the embodiment of the present disclosure, as described above with reference to FIG. **3**, the wearable terminal device **200** measures a blood pressure level of the user. However, the present disclosure is not limited to such an embodiment. The wearable terminal device may measure any indicator so long as the wearable terminal device obtains the measurement value HM. For example, the wearable terminal device may measure heart rate. For another example, the wearable terminal device may measure a blood sugar level.

[0144] (3) According to the embodiment of the present disclosure, as described above with reference to FIG. **6**, the third communication device **301** and the third storage **302** are provided on the grocery shelving unit **300**. However, the present disclosure is not limited to such an embodiment. The wearable terminal device **200** may acquire the food information FJ of the food placed on the grocery shelving unit **300** by any means. An IC tag may be attached to the food, and the wearable terminal device **200** may acquire the food information FJ from the IC tag.

What is claimed is:

1. A food purchase supporting system comprising:

a wearable terminal device for a user to wear on a body thereof; and

an image forming apparatus communicatively connected to the wearable terminal device, wherein

the wearable terminal device stores a measurement value with respect to an indicator for management of health of the user, and

the image forming apparatus includes:

a communication device that communicates with the wearable terminal device;

an acquisition section configured to acquire the measurement value from the wearable terminal device via the communication device;

a determination section configured to determine a food ingredient recommended for the user to ingest based on the measurement value and a target value with respect to the indicator; and

a generation section configured to generate a list of food recommended for the user to purchase based on the food ingredient.

2. The food purchase supporting system according to claim **1**, wherein

the image forming apparatus further includes:

an operation panel having a display; and

a display section configured to display the list on the display.

3. The food purchase supporting system according to claim **2**, wherein

the image forming apparatus further includes an update section configured to update the list, and

the update section updates the list based on an operation of the wearable terminal device.

4. The food purchase supporting system according to claim **3**, wherein

the wearable terminal device includes:

an acceleration sensor; and

a detection section configured to detect movement of the user based on a result of detection by the acceleration sensor, and

the update section updates the list based on a result of detection by the detection section.

5. The food purchase supporting system according to claim **1**, wherein

the image forming apparatus further includes a transmission section configured to transmit information indicating the list to the wearable terminal device.

6. The food purchase supporting system according to claim **5**, further comprising:

a communication device that communicates with the wearable terminal device and provided on a grocery shelving unit on which food is placed; and

storage that stores therein food information indicating a type of food placed on the grocery shelving unit, wherein

the wearable terminal device includes:

a first determination section configured to receive the food information and determine whether or not the food indicated by the food information is included in the list; and

a first notification section configured to notify the user of a result of determination by the first determination section.

7. The food purchase supporting system according to claim **5**, further comprising

a point of sale (POS) terminal device communicatively connected to the wearable terminal device, wherein

the POS terminal device transmits food information indicating a type of food purchased by the user, and

the wearable terminal device includes:

a second determination section configured to receive the food information and determine whether or not the food indicated by the food information is included in the list; and

a second notification section configured to notify the user of a result of determination by the second determination section.

8. The food purchase supporting system according to claim **1**, wherein

the wearable terminal device includes a measurement device that performs measurement to obtain the measurement value.

9. The food purchase supporting system according to claim **8**, wherein

the measurement device measures blood pressure of the user.

10. An image forming apparatus for communicative connection to a wearable terminal device for a user to wear on a body thereof, the image forming apparatus comprising:

a communication device that communicates with the wearable terminal device;

an acquisition section configured to acquire a measurement value with respect to an indicator for management of health of the user from the wearable terminal device;

a determination section configured to determine a food ingredient recommended for the user to ingest based on the measurement value and a target value with respect to the indicator; and

a generation section configured to generate a list of food recommended for the user to purchase based on the food ingredient.

11. The image forming apparatus according to claim **10**, further comprising

an image forming device that forms an image on a recording medium, wherein

the image forming device forms an image exhibiting the list on the recording medium.

* * * * *

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[标]发明人	NAKAO YUKIHIRO		
发明人	NAKAO, YUKIHIRO		
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摘要(译)

食品购买支持系统包括可穿戴终端设备和图像形成设备。可穿戴终端设备存储关于用于管理用户健康的指示符的测量值。图像形成装置包括第一通信设备，获取部分，确定部分和生成部分。第一通信设备与可穿戴终端设备通信。获取部分经由第一通信设备从可穿戴终端设备获取测量值。确定部分基于测量值和关于用户健康管理指标的目标值，确定推荐给用户的食物成分。生成部分基于食物成分生成推荐给用户购买的食物列表。