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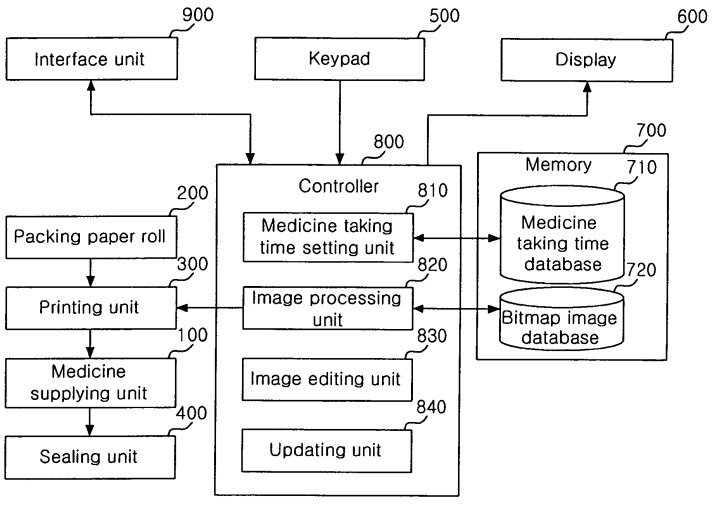
(54) Automatic medicine packing apparatus with bitmap image printing function and method for printing bitmap image by using the same

(57) The present invention relates to an automatic medicine packing apparatus with bitmap image printing function capable of printing a company logo, a time to take medicine, or the like in the form of a bitmap image onto a medicine packing paper, thereby allowing a variety of images to be represented thereon, and a method for printing a bitmap image using the automatic medicine packing apparatus. To this end, there is provided an automatic medicine packing apparatus for automatically packing dispensed medicines, comprising: a keypad having a plurality of key buttons and receiving operational instructions from a user; a display for displaying a menu and an operational state; a memory for having a database storing at least one bitmap image for indicating a medicine taking time; a packing paper roll in which a medicine packing paper is wound; a printing unit for printing the bitmap image read from the database on the medicine packing paper supplied from the packing paper roll; a medicine supplying unit for supplying the dispensed medicines; a sealing unit for thermal bonding and sealing the medicine packing paper in which the medicines supplied by the medicine supplying unit are accommodated; and a controller for reading the bitmap image for indicating a medicine taking time set according to user's request for setting a medicine taking time from the database to transmit the read bitmap image to the printing unit.

Fig. 2



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Description

BACKGROUND OF THE INVENTION

1. Field of Invention

[0001] The present invention relates to an automatic medicine packing apparatus with bitmap image printing function and a method for printing a bitmap image by using the same, and more particularly, to an automatic medicine packing apparatus with bitmap image printing function capable of printing a company logo, a time to take medicine, or the like in the form of a bitmap image onto a medicine packing paper, thereby allowing a variety of images to be represented thereon, and a method for printing a bitmap image using the automatic medicine packing apparatus.

2. Description of the Prior Art

[0002] Generally, an automatic medicine packing apparatus is an apparatus which is equipped in a hospital or pharmacy to automatically pack medicines as a dose dispensed by a pharmacist according to each prescription.

[0003] Currently, the automatic medicine packing apparatus prints items, such as a serial number of a medicine packing paper, a time to take the packed medicines, a pharmacy name and a telephone number of the pharmacy, on the medicine packing paper with characters using some fonts.

[0004] However, such an automatic medicine packing apparatus cannot represent a variety of images, which a user desires, on the medicine packing paper, because it uses only font as a element for indicating a printing item.

SUMMARY OF THE INVENTION

[0005] The present invention is conceived to solve the aforementioned problem in the prior art. Accordingly, an object of the present invention is to provide an automatic medicine packing apparatus with bitmap image printing function capable of printing a company logo, a time to take medicine, or the like in the form of a bitmap image onto a medicine packing paper, thereby allowing a variety of images to be represented thereon, and a method for printing a bitmap image using the automatic medicine packing apparatus.

[0006] According to an aspect of the present invention for achieving the objects, there is provided an automatic medicine packing apparatus for automatically packing dispensed medicines, comprising: a keypad having a plurality of key buttons and receiving operational instructions from a user; a display for displaying a menu and an operational state; a memory for having a database storing at least one bitmap image for indicating a medicine taking time; a packing paper roll in which a medicine packing paper is wound; a printing unit for printing the bitmap image read from the database on the medicine packing paper supplied from the packing paper roll; a medicine supplying unit for supplying the dispensed medicines; a sealing unit for thermal bonding and sealing the medicine packing paper in which the medicines supplied by the medicine supplying unit are accommodated; and a controller for reading the bitmap image for indicating a medicine taking time set according to user's request for setting a medicine taking time from the database to transmit the read bitmap image to the printing unit.

[0007] Preferably, the database further stores a bitmap image for indicating a company logo, and the controller transmits the bitmap image for indicating a company logo stored in the database to the printing unit.

[0008] More preferably, the controller edits the bitmap image stored in the database according to the operational instructions input through the keypad and transmits the edited bitmap image to the printing unit.

[0009] Still more preferably, the automatic medicine packing apparatus further comprises an interface unit communicating with a user computer, the bitmap image is received and transmitted through the interface unit.

[0010] Still more preferably, the controller updates the database with the bitmap image received from the interface unit.

[0011] According to another aspect of the present invention, there is provided a method of printing a bitmap image in an automatic medicine packing apparatus for automatically packing distributed medicines. The method comprises the steps of: preparing a bitmap image to be printed on a medicine packing paper; transmitting the prepared bitmap image to a printing unit; printing the transmitted bitmap image on the medicine packing paper; and receiving the medicines discharged through a hopper and packing the medicines with the medicine packing paper on which the bitmap image is printed.

[0012] Preferably, the preparing step includes the steps of: receiving the bitmap image from a user computer; and storing and managing the received bitmap image in a database.

BRIEF DESCRIPTION OF THE DRAWINGS

[0013] The above and other objects, features and advantages of the present invention will become apparent from the following description of a preferred embodiment given in conjunction with the accompanying drawings, in which:

Fig. 1 is a front sectional view schematically showing an automatic medicine packing apparatus with bitmap image printing function according to an embodiment of the present invention;

Fig. 2 is a block diagram illustrating the automatic medicine packing apparatus shown in Fig. 1;

Fig. 3 shows exemplary bitmap images printed onto a medicine packing paper; and

Fig. 4 is an operational flow chart illustrating a bitmap

image printing method in the automatic medicine packing apparatus according to the embodiment of the present invention.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

[0014] Hereinafter, a preferred embodiment of the present invention will be described in detail with reference to the accompanying drawings.

[0015] An automatic medicine packing apparatus with bitmap image printing function according to an embodiment of the present invention will be described in detail with reference to Figs. 1 and 2, as follows.

[0016] Fig. 1 is a front sectional view schematically showing an automatic medicine packing apparatus with bitmap image printing function according to an embodiment of the present invention, and Fig. 2 is a block diagram illustrating the automatic medicine packing apparatus shown in Fig. 1.

[0017] Referring to Fig. 1, an automatic medicine packing apparatus 1 with bitmap image printing function according to the present invention comprises a plurality of tablet cassettes and cartridges 4 and 5 which are positioned on shelves provided in an upper portion of the medicine packing apparatus, a delivery tray 3 installed under the tablet cassettes and cartridges 4 and 5, and a hopper 2, a printing unit 300 and a sealing unit 400 which are provided under the delivery tray 3.

[0018] The automatic medicine packing apparatus 1 having the aforementioned configuration dispenses tablets from the tablet cassettes 4 to the delivery tray 3 according to a prescription transmitted from a server, so that the delivery tray 3 drops the tablets to the hopper 2 dose by dose.

[0019] The tablets dropped to the hopper 2 are put in a packing paper on which a bitmap image is printed in the printing unit 300, and then, the packing paper is thermally bonded in the sealing unit 400, thereby continually packing the tablets dose by dose.

[0020] Herein, a bitmap image is an image represented by an aggregate of small-sized square pixels, wherein an RGB color number, i.e., 1 to 255 is assigned to each pixel in order to define color for each pixel.

[0021] Such a bitmap image includes an image predefined by a pharmacy or hospital, and an image formed by a user.

[0022] The automatic medicine packing apparatus 1 for packing tablets dose by dose as described above will be further described with reference to Fig. 2. The automatic medicine packing apparatus 1 with bitmap image printing function according to the present invention comprises a keypad 500 having a plurality of key buttons through which operational instructions from a user are input, a display 600 for displaying a menu and an operational state, a memory 700 which stores an operation program for operating the automatic medicine packing apparatus 1 and has a medicine taking time database 710 for storing at least one medicine taking time and a bitmap image database 720 for storing bitmap images according to the medicine taking time, a packing paper roll 200 in which a medicine packing paper is wound, the printing unit 300 for printing an bitmap image according to a company logo or a medicine taking time on the medicine packing paper supplied from the packing paper roll 200, a medicine supplying unit 100 for supplying the dispensed medicines along a predetermined medicine supplying direction, the sealing unit 400 for thermal bonding and sealing the medicine packing paper in which the medicines are accommodated, and a controller 800 for controlling the functions assigned to the respective units and for reading from the bitmap image database 720 a bitmap image according to medicine taking time selection information input through the keypad 500 to provide the printing unit 300 with the read bitmap image. The medicine supplying unit 100 is comprised of the hopper 2 and the delivery tray 3.

[0023] At this time, the controller 800 provides the printing unit 300 with the bitmap image for indicating a predetermined company logo as well as a bitmap image according to a medicine taking time.

[0024] Further, the automatic medicine packing apparatus 1 with bitmap image printing function according to the present invention further comprises an interface unit 900 which is connected to a user's computer (not shown), for example, through a wire communication such as a serial communication, and receives and transmits data. This interface unit 900 is a kind of serial port which is in data communication with the user's computer.

[0025] At this time, since an editing program is loaded in the user's computer, the user may edit the bitmap image for indicating a medicine taking time and a company logo, and the edited bitmap image is transmitted to the automatic medicine packing apparatus 1. Then, the automatic medicine packing apparatus 1 allows the bitmap image received from the user's computer to be stored in the bitmap image database 720 and to be managed.

[0026] It is described in the present embodiment that the bitmap image database 720 is provided in the automatic medicine packing apparatus 1, but the present invention is not limited thereto. That is, the bitmap image database 720 may be provided in the user's computer. As such, the automatic medicine packing apparatus 1 may receive the bitmap image from the user's computer to print the received bitmap image on the medicine packing paper.

[0027] The keypad 500 is composed of a plurality of number keys and function keys and receives the operational instructions input from the user to forward them to the controller 800. Specifically, the keypad 500 receives the medicine taking time selection information from the user to forward it to the controller 800.

[0028] The display 600, which is a display means such as a general liquid crystal display, displays the menu and the operational state of the automatic medicine packing apparatus 1.

[0029] The keypad 500 and the display 600 may comprise conventional and well-known configurations. Furthermore, the keypad 500 and the display 600 may be implemented by a touch panel through which the input and the display are simultaneously implemented.

[0030] The memory 700 comprises a flash memory, i.e., a nonvolatile memory which makes it possible to read and write data. Furthermore, the memory 700 may be a storage device with large capacity such as a hard disk drive used in the computer when large data need to be stored.

[0031] Furthermore, the memory 700 includes the medicine taking time database 710 for storing at least one medicine taking time and the bitmap image database 720 for storing the bitmap image for indicating a company logo and the bitmap image for indicating a medicine taking time, which are printed on the medicine packing paper. At this time, it is preferable that the bitmap image be compressed through a predetermined compression method and stored in the bitmap image database 720.

[0032] Furthermore, the memory 700 stores the operational program for operating the automatic medicine packing apparatus 1.

[0033] It is described in the present embodiment that the medicine taking time database 710 for storing a medicine taking time and the bitmap image database 720 for storing the bitmap image for indicating a company logo and the bitmap image for indicating a medicine taking time are separately provided, but the present invention is not limited thereto.

[0034] The medicine packing paper for packing medicines is wound in the packing paper roll 200, which supplies the medicine packing paper to the printing unit 300.

[0035] The printing unit 300, which, for example, is a small-sized printer, prints the bitmap images for indicating a company logo and a medicine taking time on the medicine packing paper supplied from the packing paper roll 200. As such, a variety of images may be represented on the medicine packing paper, and anyone could easily notice a medicine taking time by looking at the bitmap image printed on the medicine packing paper.

[0036] The medicine supplying unit 100 supplies medicines along a predetermined medicine supplying direction.

[0037] The sealing unit 400, which is a kind of heater, thermally bonds and seals the medicine packing paper in which the medicines supplied from the medicine supplying unit 100 are accommodated. At this time, the medicine packing paper is in a state where the bitmap images corresponding to a company logo and a medicine taking time are printed thereon.

[0038] If power is supplied, the controller 800 reads and operates the operational program stored in the memory 700, and thus, generally controls the automatic medicine packing apparatus 1.

[0039] Furthermore, the controller 800 includes a medicine taking time setting unit 810, an image processing unit 820, an image editing unit 830 and an updating unit 840.

[0040] The medicine taking time setting unit 810 provides a screen with a list of at least one medicine taking time stored in the medicine taking time database 710 according to user's request for setting a medicine taking time, and sets a medicine taking time selected in the list to be its corresponding medicine taking time. At this time, the medicine taking time setting unit 810 may set a medicine taking time directly input from the user to be its corresponding medicine taking time.

[0041] If the corresponding medicine taking time is set in the medicine taking time setting unit 810 as described above, the image processing unit 820 reads the bitmap image for indicating the corresponding medicine taking time from the bitmap image database 720 and transmits the read bitmap image to the printing unit 300. Then, the printing unit 300 outputs the received bitmap image to the medicine packing paper.

[0042] The bitmap image stored in the bitmap image database 720 includes the bitmap image for indicating a company logo and the bitmap image for indicating a medicine taking time such as on an empty stomach, 30 minutes before each meal, 30 minutes after each meal, before each sleep, during each meal, or the like.

[0043] Herein, the bitmap image for indicating that the medicine taking time is on an empty stomach is shown in Fig. 3 (a), the bitmap image for indicating that the medicine taking time is 30 minutes after each meal is shown in Fig. 3 (b), and the bitmap image for indicating that the medicine taking time is before each sleep is shown in Fig. 3 (c).

[0044] The exemplary images shown in Fig. 3 illustrates that the bitmap image for indicating a medicine taking time is printed on the medicine packing paper. Although not shown in the figure, the bitmap image for indicating a company logo may also be printed on a predetermined printing region of the corresponding medicine packing paper.

[0045] The image editing unit 830 edits the bitmap image to be printed on the medicine packing paper according to the operational instructions input through the keypad 500. The bitmap image edited as described above is output to the printing unit 300, so that the edited bitmap image may be printed on the medicine packing paper.

[0046] The updating unit 840 updates the bitmap image database 720 with the bitmap image received from the interface unit 900 which communicates with the user's computer and receives and transmits data.

[0047] As such, the bitmap image according to the recently updated medicine taking time can be printed on the medicine packing paper. Furthermore, although the bitmap image for indicating a medicine taking time is changed, the bitmap image database 720 can be easily updated with the changed bitmap image through the user's computer which communicates with the automatic medicine packing apparatus 1.

[0048] The printing unit 300 receives the bitmap image from the image processing unit 820 and then prints the

received bitmap image on the predetermined region of the medicine packing paper.

[0049] That is, the printing unit 300 prints the bitmap image for indicating a medicine taking time on a first predetermined region of the medicine packing paper and the bitmap image for indicating a company logo on a second predetermined region of the medicine packing paper.

[0050] A method of printing a bitmap image in the automatic medicine packing apparatus so configured will be described with reference to Fig. 4 as follows.

[0051] Referring to Fig. 4, the controller 800 prepares a bitmap image to be printed on the medicine packing paper (S100). At this time, the bitmap image to be printed on the medicine packing paper includes a company logo, a medicine taking time or the like.

[0052] This bitmap image is received from the user's computer through the communication with the user's computer and then the received bitmap image is stored in the bitmap image database 720. As such, a user can print easily a variety of bitmap images on the medicine packing paper.

[0053] Then, the controller 800 receives a medicine taking time from the user (S200).

[0054] At this time, the at least medicine taking time stored in the medicine taking time database 710 is provided in the form of a list and selected from the list, or directly received from the user.

[0055] Then, the controller 800 reads from the bitmap image database 720 the bitmap image according to the medicine taking time input by the user, and transmits the read bitmap image to the printing unit 300 (S300). Furthermore, the controller 800 reads the bitmap image for indicating a predetermined company logo to be printed on the medicine packing paper from the bitmap image database 720, and transmits the read bitmap image to the printing unit 300.

[0056] At this time, the controller 800 displays on the display 600 the bitmap image for indicating a company logo transmitted to the printing unit 300 and/or the bitmap image for indicating a medicine taking time. As such, it is possible to confirm whether or not the user exactly selects the medicine taking time to be printed on the medicine packing paper.

[0057] Then, the printing unit 300 prints the bitmap image for indicating a company logo and/or a medicine taking time received from the controller 800 on the predetermined region of the medicine packing paper (S400).

[0058] Then, the sealing unit 400 thermally bonds the medicine packing paper in which the medicines are accommodated, so that the medicine packing paper is continually packed dose by dose (S500). At this time, the medicine packing paper is a packing paper on which the bitmap image for indicating a company logo and/or a medicine taking time is printed.

[0059] Accordingly, a variety of images required by a user or a company logo can be printed on the medicine packing paper so that the user's requirement can be satisfied.

[0060] It is described in the present embodiment that a medicine taking time is input and then the bitmap image for indicating the medicine taking time is transmitted to the printing unit, but the present invention is not limited thereto. Specifically, in another embodiment, the bitmap image according to a medicine taking time may be selected and then the selected bitmap image may be transmitted to the printing unit.

[0061] According to the present invention, a bitmap image for indicating a company logo and a medicine taking time is printed on the medicine packing paper, whereby a variety of images required by a user can be implemented and thus the user's requirements can be satisfied.

[0062] As such, although illiterate, anyone could notice exactly the medicine taking time by looking at the bitmap image according to a medicine taking time which is printed on the medicine packing paper. Furthermore, since a user come in contact with the bitmap image for indicating a company logo printed on the medicine packing paper, the user can be exposed to the advertisement of the company.

[0063] In addition, according to the present invention, the bitmap image is received from a user's computer to update a bitmap image database with the received bitmap image, so that the recently updated bitmap image can be reflected on a medicine packing paper. Furthermore, if an image predetermined in a pharmacy and a hospital is changed, the database can be easily updated with the changed bitmap image from the user's computer which communicates with an interface unit.

[0064] The scope of the present invention is not limited to the embodiment described. It will be apparent that those skilled in the art can make various modifications and changes thereto. The modifications and changes are contained in the spirit and scope of the present invention defined by the appended claims.

Claims

1. An automatic medicine packing apparatus for automatically packing dispensed medicines, comprising:

a keypad having a plurality of key buttons and receiving operational instructions from a user;
a display for displaying a menu and an operational state;
a memory for having a database storing at least one bitmap image for indicating a medicine taking time;
a packing paper roll in which a medicine packing paper is wound;
a printing unit for printing the bitmap image read from the database on the medicine packing paper supplied from the packing paper roll;
a medicine supplying unit for supplying the dispensed medicines;
a sealing unit for thermal bonding and sealing

the medicine packing paper in which the medicines supplied by the medicine supplying unit are accommodated; and

a controller for reading the bitmap image for indicating a medicine taking time set according to user's request for setting a medicine taking time from the database to transmit the read bitmap image to the printing unit.

2. The automatic medicine packing apparatus as claimed in claim 1, wherein the database further stores a bitmap image for indicating a company logo, and the controller transmits the bitmap image for indicating a company logo stored in the database to the printing unit.

3. The automatic medicine packing apparatus as claimed in claim 1, wherein the controller edits the bitmap image stored in the database according to the operational instructions input through the keypad and transmits the edited bitmap image to the printing unit.

4. The automatic medicine packing apparatus as claimed in claim 1, further comprising an interface unit communicating with a user computer, the bitmap image is received and transmitted through the interface unit.

5. The automatic medicine packing apparatus as claimed in claim 4, wherein the controller updates the database with the bitmap image received from the interface unit.

6. A method of printing a bitmap image in an automatic medicine packing apparatus for automatically packing distributed medicines, the method comprising the steps of:

preparing a bitmap image to be printed on a medicine packing paper;

transmitting the prepared bitmap image to a printing unit;

printing the transmitted bitmap image on the medicine packing paper; and

receiving the medicines discharged through a hopper and packing the medicines with the medicine packing paper on which the bitmap image is printed.

7. The bitmap image printing method as claimed in claim 6, wherein the preparing step includes the steps of: receiving the bitmap image from a user computer; and storing and managing the received bitmap image in a database.

Fig. 1

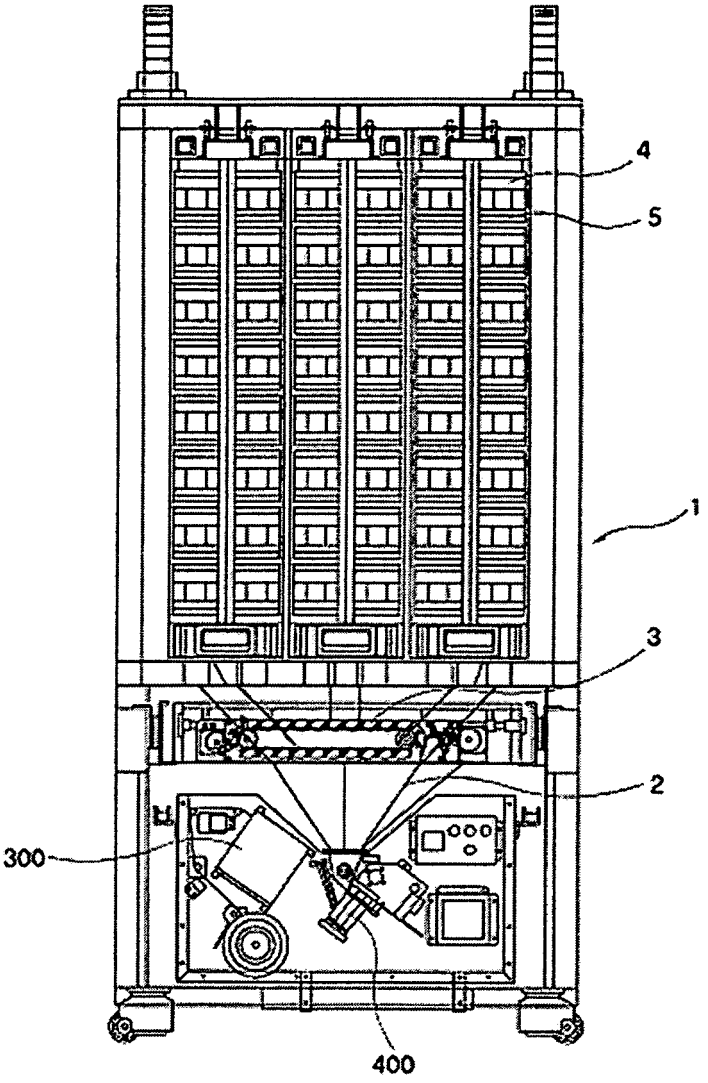


Fig. 2

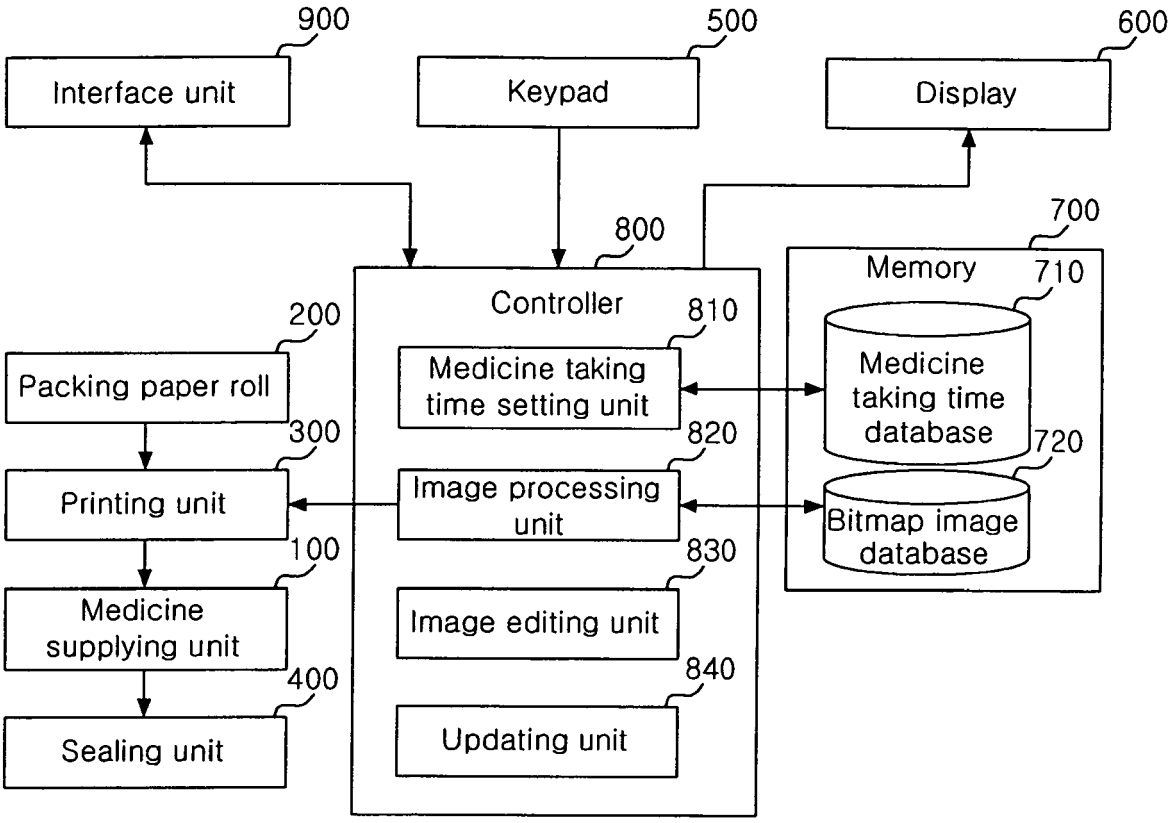

900
Interface unit
500
Keypad
600
Display
800
Controller
700
Memory
710
810
Medicine taking time setting unit
Medicine taking time database
720
820
Image processing unit
Bitmap image database
830
Image editing unit
840
Updating unit
200
Packing paper roll
300
Printing unit
100
Medicine supplying unit
400
Sealing unit

Fig. 3

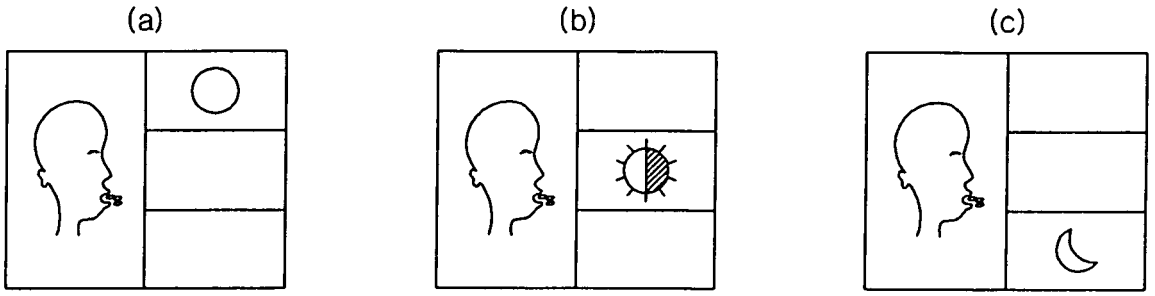
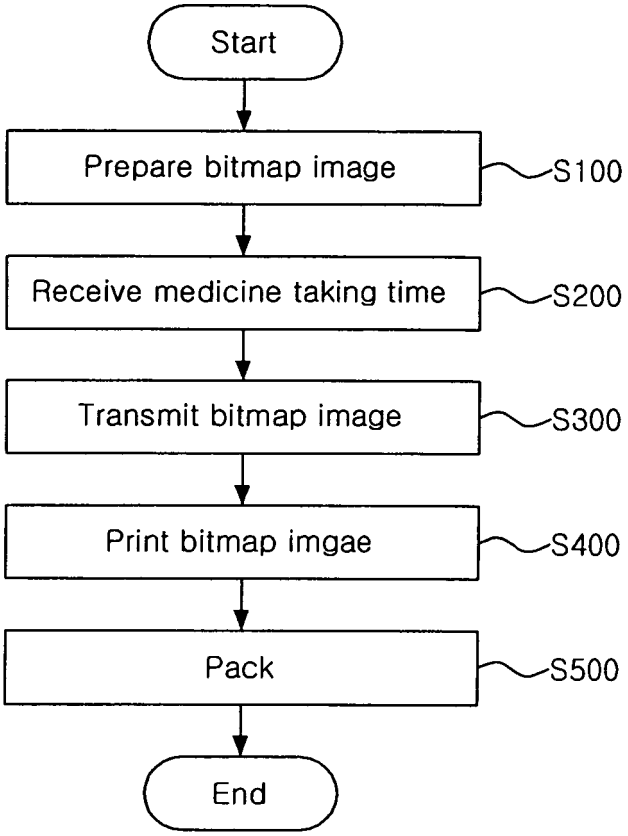

(a)
(b)
(c)

Fig. 4


Start
Prepare bitmap image
S100
Receive medicine taking time
S200
Transmit bitmap image
S300
Print bitmap imgae
S400
Pack
S500
End