



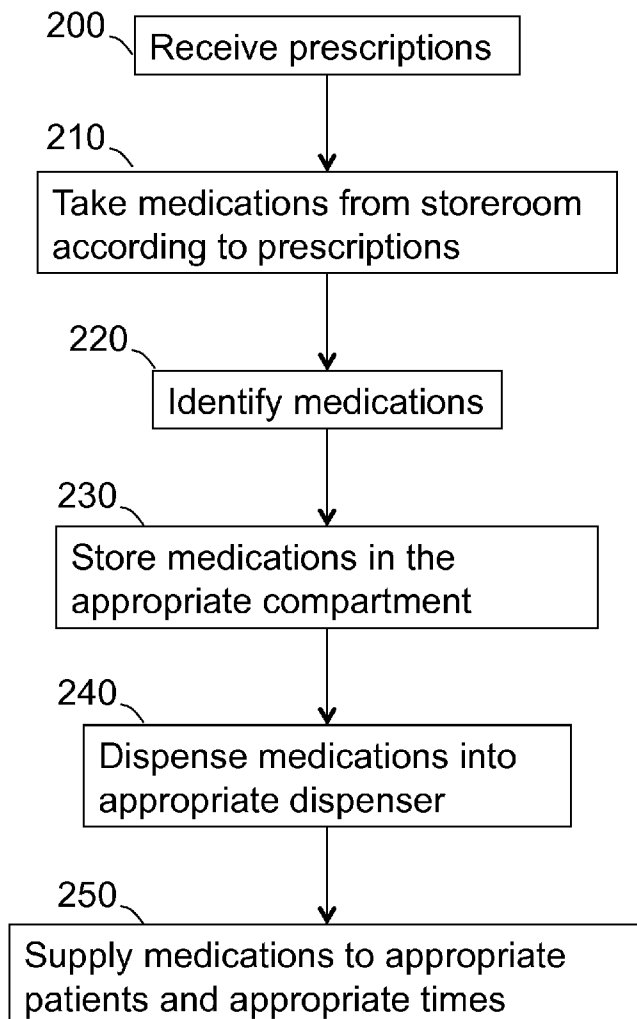
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(19) **United States**(12) **Patent Application Publication**
Ben-Dor(10) **Pub. No.: US 2010/0176146 A1**(43) **Pub. Date: Jul. 15, 2010**(54) **DISTRIBUTING PRESCRIBED
MEDICATIONS**(52) **U.S. Cl. 221/97; 221/1**(75) **Inventor: Shimon Ben-Dor, Kfar Edumim
(IL)**(57) **ABSTRACT**

Correspondence Address:

The Law Office of Michael E. Kondoudis
888 16th Street, N.W., Suite 800
Washington, DC 20006 (US)(73) **Assignees: Shimon Ben-Dor, Kfar Edumim
(IL); Eduardo Bradman Gonzalez,**
Rishon LeZion (IL); Boaz
Elmakiss, Rishon LeZion (IL)(21) **Appl. No.: 12/352,165**(22) **Filed: Jan. 12, 2009****Publication Classification**(51) **Int. Cl.**
B65D 83/04 (2006.01)

A physical distribution system for distributing prescribed medications ordered by physicians from a storeroom via a pharmacy to patients in a hospital department in a secure and reliable manner. The physical distribution system comprises a container with compartments, and dispensers. Each of the compartments is associated with an electronic lock associated with an opening code uniquely associated with a physician, a patient and prescription data. Each of the plurality of dispensers is associated with a unique patient related code. Each electronic lock is arranged to enable entering the prescribed medications into the associated compartment upon identification of the associate opening code. Each electronic lock is arranged to enable disposing prescribed medications from compartments into the dispenser upon identification of a patient related code on the dispenser corresponding to patient data in the opening code. The prescribed medications are associated with their prescription data.



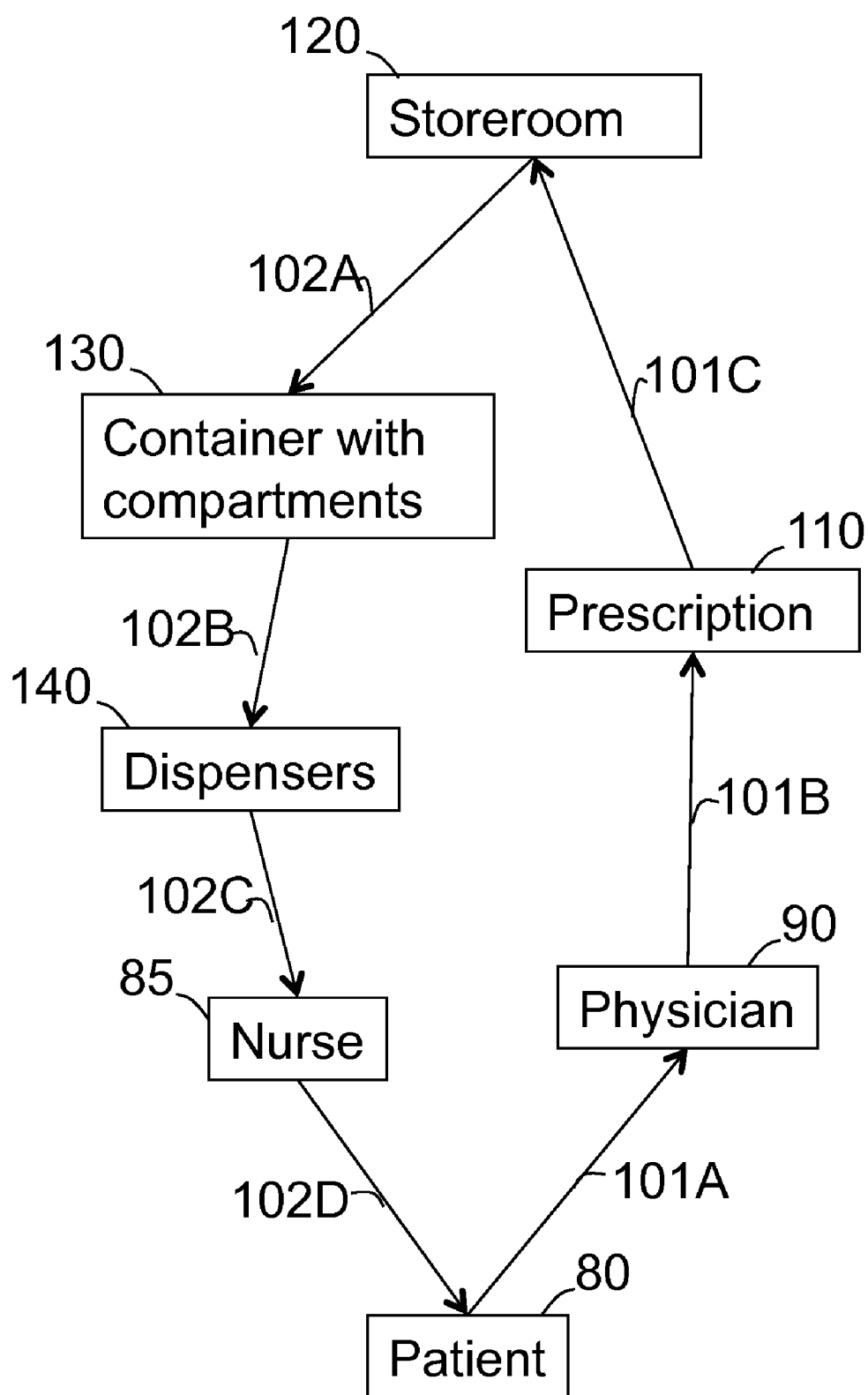
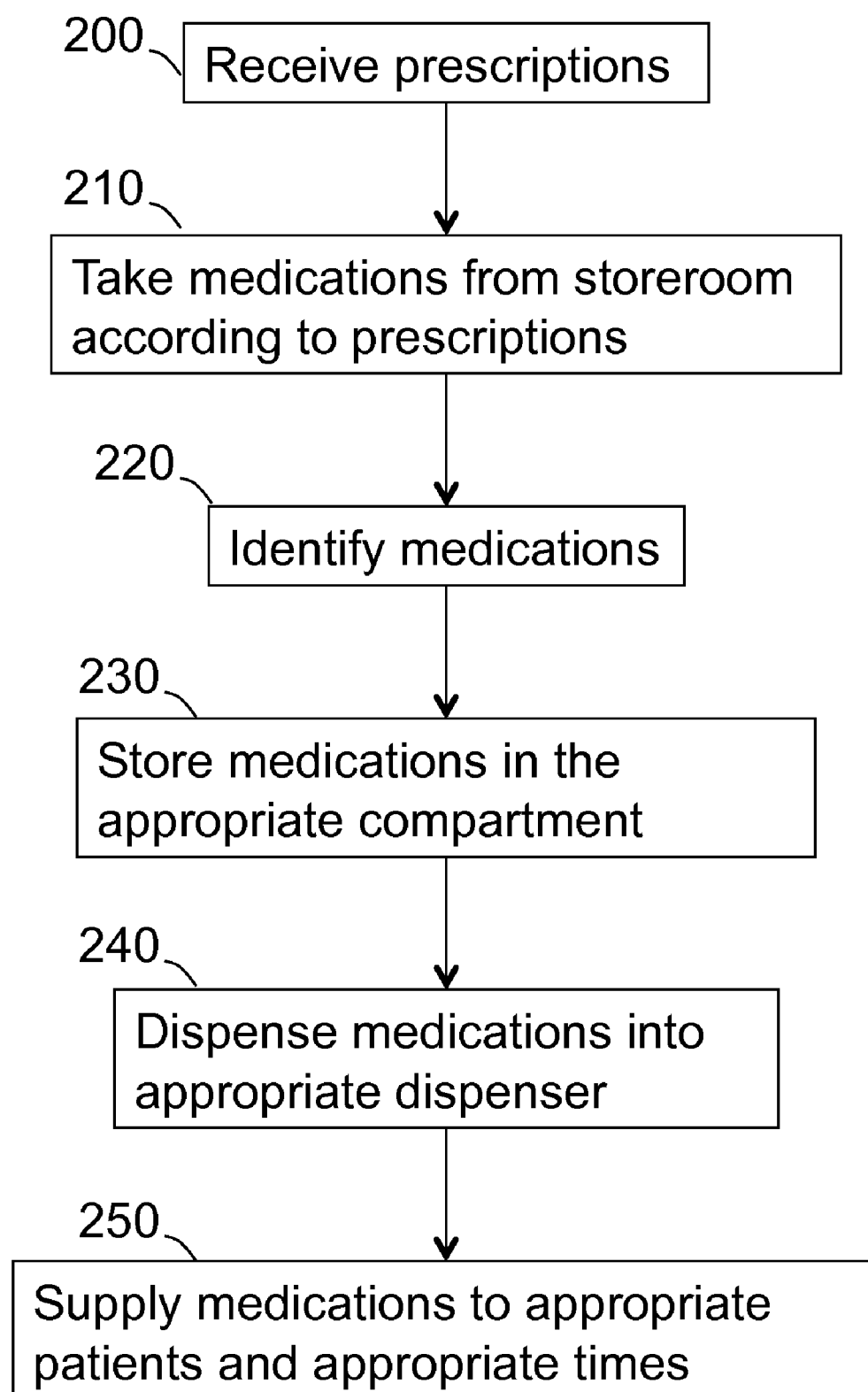


FIG. 1

**FIG. 2**

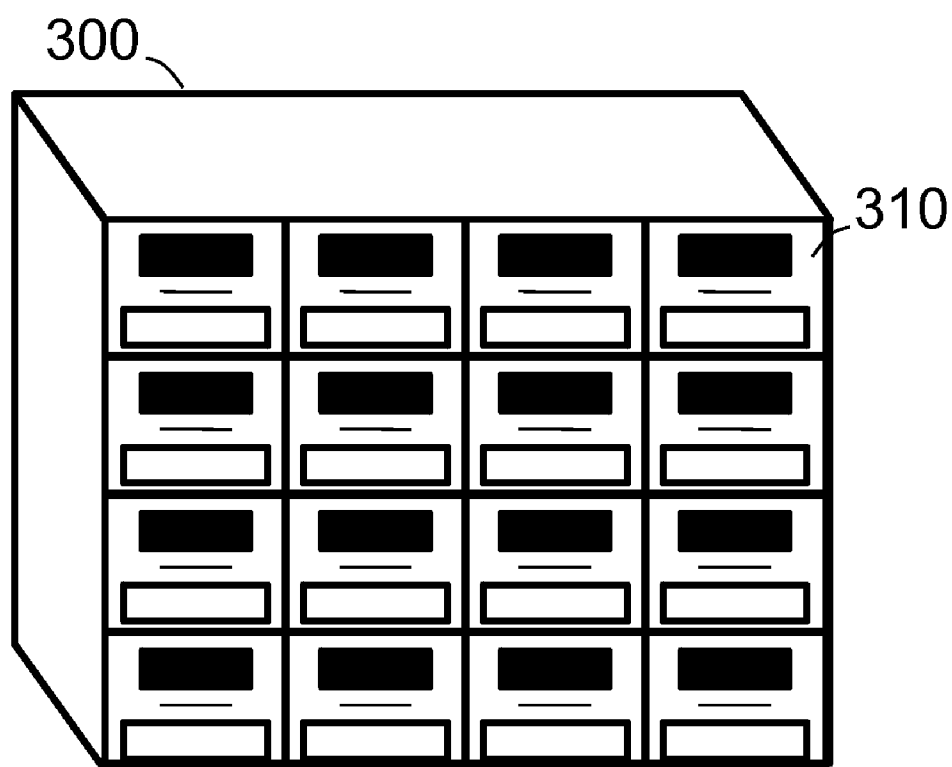


FIG. 3A

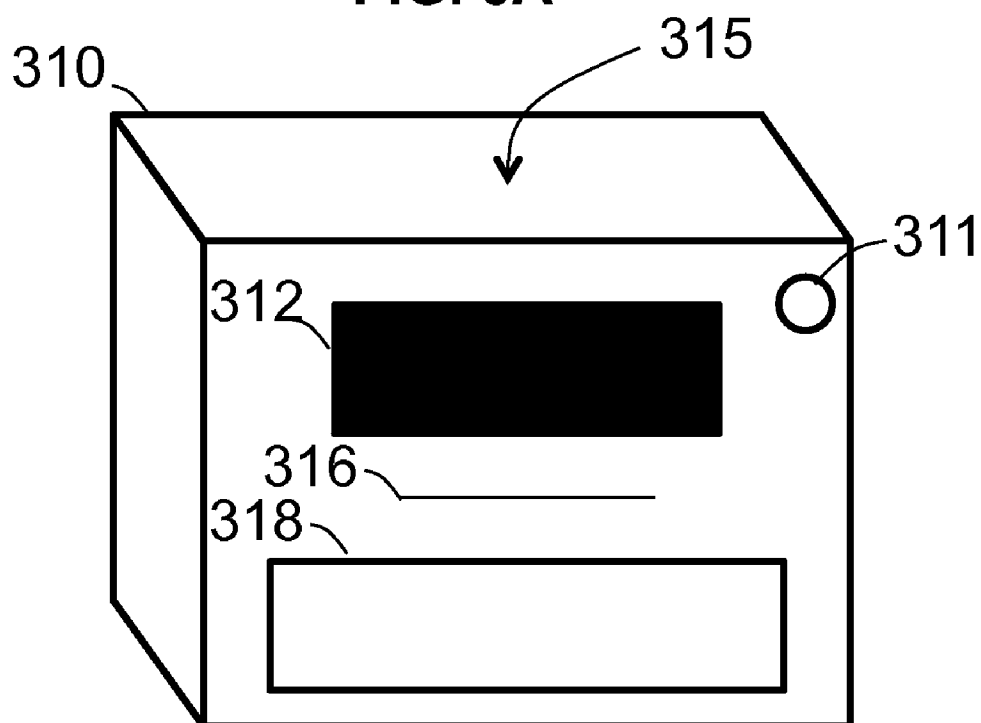


FIG. 3B

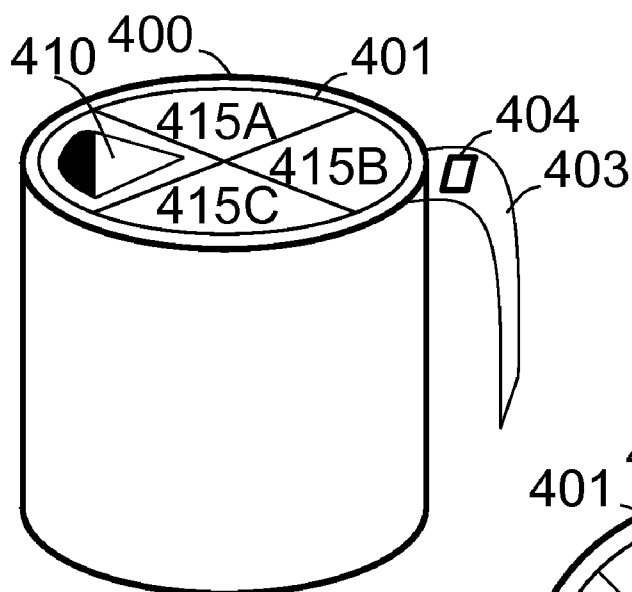


FIG. 4A

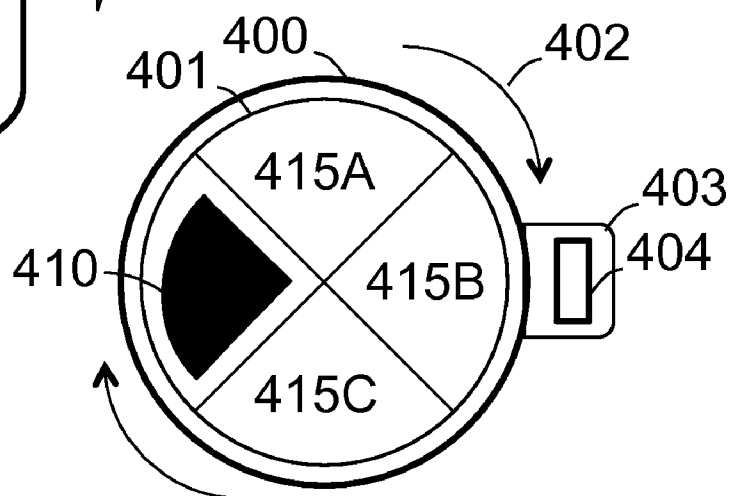


FIG. 4B

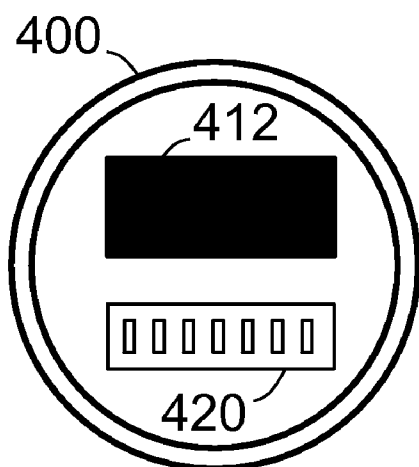


FIG. 4C

DISTRIBUTING PRESCRIBED MEDICATIONS

BACKGROUND

[0001] 1. Technical Field

[0002] The present invention generally relates to the field of medications. More particularly, the present invention relates to distributing medications reliably.

[0003] 2. Discussion of Related Art

[0004] It is crucial that appropriate medication prescribed by physician will be applied to patients at the correct dose and time, even in a hospital dealing with many physicians, many patients and very many prescriptions.

[0005] The following patents and patent applications are incorporated herein by reference in their entirety: WIPO Publication No. WO2007008720, which discloses a biometric medication container with a locked medication container that can be unlocked opened in response to a person's matching biometric characteristic and satisfaction of pre-established rules of access relating to day and time; U.S. Patent Publication No. US20030179073, which discloses an electronic secure locking system for inhibiting unauthorized utilization of a protected device, such as a container with electronic locking mechanism installed in the inner side of a container doors; WIPO Publication No. WO2006016150, which discloses an improved secure dispensing system; U.S. Patent Publication No. US2006255912, which discloses a locked storage container connected to remote computers such that access for particular delivery persons or companies is authorized when the owner of the appliance has placed an order; U.S. Pat. No. 7,063,252, which discloses an electronic lock and money control system capable of single unit stand-alone operation, as well as expandability to a network of multiple units having one of the units operate as a centralized network controller; and WIPO Publication No. WO9740250, which discloses a safe device comprising a number of safe-deposit boxes each lockable by an individual door.

BRIEF SUMMARY

[0006] Embodiments of the present invention provide a physical distribution system for distributing prescribed medications ordered by physicians from a storeroom via a pharmacy to patients in a hospital department in a secure and reliable manner. The physical distribution system comprises at least one container comprising a plurality compartments, and a plurality of dispensers. Each of the plurality of compartments is operatively associated with an electronic lock associated with an opening code uniquely associated with a physician, a patient and prescription data. Each of the plurality of dispensers is associated with a unique patient related code. Each electronic lock is arranged to enable entering the prescribed medications into the associated compartment upon identification of the associate opening code. Each electronic lock is arranged to enable disposing prescribed medications from at least one compartment into at least one dispenser upon identification of a patient related code on the dispenser corresponding to patient data in the opening code. The prescribed medications are associated with their prescription data.

[0007] In embodiments, opening code and the patient related code comprise barcodes and the electronic lock comprises a barcode reader, such that all information about the prescribed medication is associated with the barcodes.

[0008] These, additional, and/or other aspects and/or advantages of the present invention are: set forth in the detailed description which follows; possibly inferable from the detailed description; and/or learnable by practice of the present invention.

BRIEF DESCRIPTION OF THE DRAWINGS

[0009] The present invention will be more readily understood from the detailed description of embodiments thereof made in conjunction with the accompanying drawings of which:

[0010] FIG. 1 is a diagram illustrating of a physical distribution system, according to some embodiments of the invention;

[0011] FIG. 2 is a flowchart illustrating a method of distributing prescribed medications ordered by physicians from a storeroom via a pharmacy to patients in a hospital department in a secure and reliable manner, according to some embodiments of the invention;

[0012] FIG. 3A and FIG. 3B are illustrations of a container comprising a plurality compartments for storing and distributing medications, according to some embodiments of the invention; and

[0013] FIGS. 4A, 4B and 4C are illustrations of a dispenser for distributing medications, according to some embodiments of the invention.

DETAILED DESCRIPTION

[0014] Before explaining at least one embodiment of the invention in detail, it is to be understood that the invention is not limited in its application to the details of construction and the arrangement of the components set forth in the following description or illustrated in the drawings. The invention is applicable to other embodiments or of being practiced or carried out in various ways. Also, it is to be understood that the phraseology and terminology employed herein is for the purpose of description and should not be regarded as limiting.

[0015] FIG. 1 is a diagram illustrating of a physical distribution system, according to some embodiments of the invention. The physical distribution system comprises at least one container 130 comprising a plurality compartments and a plurality of dispensers 140. The physical distribution system supports distributing prescribed medications (102) ordered by physicians 90 (101A, 101B and 101C) from a storeroom 120 via a pharmacy to patients 80 in a hospital department in a secure and reliable manner. Upon checking (101A) patient 80 by physician 90, physician 90 issues (101B) a prescription 110 sent (101C) to storeroom 120. Storeroom 120 delivers (102A) the prescribed medications to the pharmacy, where these are stored in corresponding compartments in container 130. Each compartment is operatively associated with an electronic lock associated with an opening code uniquely associated with physician 90, patient 80 and prescription 110 data. Each electronic lock is arranged to enable entering the prescribed medications into the associated compartment upon identification of the associate opening code. Medications are taken out (102B) of container 130 by using dispensers 140. Dispensers 140 are associated with a unique patient related code, and each electronic lock is arranged to enable disposing prescribed medications from the appropriate compartments in container 130 into dispenser 140 upon identification of a patient related code on the dispenser corresponding to patient data in the opening code. Dispensers 140 may

be then used (102C) by, for example, a nurse **85** to deliver (102D) the prescribed medications to patient **80**. The prescribed medications are associated with their prescription data via data related to dispenser **140** or the patient related code.

[0016] According to some embodiments of the invention, the opening code and the patient related code may comprise barcodes and the electronic lock may comprise a barcode reader, such that all information about the prescribed medication (e.g. patient **80**, physician **90**, names of medications, prescribed dose and application times etc.) is associated with the barcodes.

[0017] FIG. 2 is a flowchart illustrating a method of distributing prescribed medications ordered by physicians from a storeroom via a pharmacy to patients in a hospital department in a secure and reliable manner, according to some embodiments of the invention. The method comprises the stages: Receiving prescriptions (stage **200**) from, for example, physicians or a hospital's computerized system. The prescriptions are associated with: opening codes and patient related code as prescribed by physicians to patients; taking medications from storeroom according to prescriptions (stage **210**); identifying medications (stage **220**) according to an opening code associated with the prescribed medications; storing medications in the appropriate compartment (stage **230**); dispensing medications into appropriate dispenser (stage **240**) according to a unique patient related code associated with the dispenser; and supplying medications to appropriate patients and appropriate times (stage **250**) according to information related to the unique patient code associated with the dispenser.

[0018] FIG. 3A and FIG. 3B are illustrations of a container **300** comprising a plurality compartments **310** for storing and distributing medications, according to some embodiments of the invention. FIG. 3A illustrates container **300**. FIG. 3B illustrates compartment **310**. Each compartment **310** comprises an opening **315**, a handle **316** for opening compartment **310**, a description **318** of the content of compartment **310**, an indicator **311** of the state of compartment **310** (e.g. empty, full, locked, open) as well as an electronic lock **312** associated with an opening code uniquely associated with physician **90**, patient **80** and prescription **110** data. Each electronic lock **312** is arranged to enable entering the prescribed medications into the associated compartment **310** upon identification of the associate opening code. Electronic lock **312** may e.g. comprise a barcode reader for identifying medications and prescriptions, dispensers **140** may be labeled with a barcode.

[0019] According to some embodiments of the invention, container **300** may stand alone at a pharmacy, wherein medications may be entered into appropriate compartments **310** after barcode identification, related to the medication and possibly to patient data. Medications may be taken out of compartment **310** following a patient identification.

[0020] According to some embodiments of the invention, container **300** may stand alone at a hospital department. Responsible personnel may enter medications into the appropriate compartments and container **300** may be programmed to indicate time and doses of medicaments in relation to patients, according to inputted prescription data.

[0021] FIGS. 4A, 4B and 4C are illustrations of a dispenser **400** for distributing medications, according to some embodiments of the invention. FIG. 4A is a perspective view. FIG. 4B is a top view. FIG. 4C is a bottom view. Dispenser **400** comprises several receptacles and a rotatable cover **401**.

Rotatable cover **401** is divided into several sectors **415** corresponding to receptacles beneath them. One sector **410** may be open, whereas the other sectors **415A**, **415B**, **415C** may be marked according to the content of the receptacles. Cover **401** may be rotatable **402** manually or electronically such that each receptacle may get under open sector **410**. Dispenser **400** may further comprise a handle **403** with a code trigger **404** and a power and data connector **420**. Dispenser **140** is associated with a unique patient related code. According to some embodiments of the invention, dispenser **140** further comprises a code reader **412** for identifying a unique patient related code.

[0022] According to some embodiments of the invention, prescribed medications may be disposed from the appropriate compartments in container **130** into dispenser **400** upon identification of a patient related code on dispenser **400** corresponding to patient data in the opening code (e.g. operated by code trigger **404**). Patient data itself may be read by code reader **412**. Dispenser **400** may be then used by a nurse **85** to deliver the prescribed medications to patient **80**, where affirmation of patient code may be carried out by code trigger **404**. The prescribed medications are associated with their prescription data via data related to dispenser **400** or the patient related code.

[0023] According to some embodiments of the invention, dispenser **400** or container **300** may stand alone and be programmable to open at predefined times relating to prescription inputted electronically or manually (e.g. by reading the barcodes of prescriptions at the time of entering the medications). Compartments **310** or the receptacles may open automatically at predefined times or just indicated that due times have come to provide patients with medications. Indication of concrete patient names, medications and doses may be further supplied by either dispenser **400** or container **300**.

[0024] In the above description, an embodiment is an example or implementation of the inventions. The various appearances of "one embodiment," "an embodiment" or "some embodiments" do not necessarily all refer to the same embodiments.

[0025] Although various features of the invention may be described in the context of a single embodiment, the features may also be provided separately or in any suitable combination. Conversely, although the invention may be described herein in the context of separate embodiments for clarity, the invention may also be implemented in a single embodiment.

[0026] Reference in the specification to "some embodiments", "an embodiment", "one embodiment" or "other embodiments" means that a particular feature, structure, or characteristic described in connection with the embodiments is included in at least some embodiments, but not necessarily all embodiments, of the inventions.

[0027] It is understood that the phraseology and terminology employed herein is not to be construed as limiting and are for descriptive purpose only.

[0028] The principles and uses of the teachings of the present invention may be better understood with reference to the accompanying description, figures and examples.

[0029] It is to be understood that the details set forth herein do not construe a limitation to an application of the invention.

[0030] Furthermore, it is to be understood that the invention can be carried out or practiced in various ways and that the invention can be implemented in embodiments other than the ones outlined in the description above.

[0031] It is to be understood that where the claims or specification refer to “a” or “an” element, such reference is not to be construed that there is only one of that element.

[0032] It is to be understood that where the specification states that a component, feature, structure, or characteristic “may”, “might”, “can” or “could” be included, that particular component, feature, structure, or characteristic is not required to be included.

[0033] Where applicable, although state diagrams, flow diagrams or both may be used to describe embodiments, the invention is not limited to those diagrams or to the corresponding descriptions. For example, flow need not move through each illustrated box or state, or in exactly the same order as illustrated and described.

[0034] Methods of the present invention may be implemented by performing or completing manually, automatically, or a combination thereof, selected steps or tasks.

[0035] The term “method” may refer to manners, means, techniques and procedures for accomplishing a given task including, but not limited to, those manners, means, techniques and procedures either known to, or readily developed from known manners, means, techniques and procedures by practitioners of the art to which the invention belongs.

[0036] The descriptions, examples, methods and materials presented in the claims and the specification are not to be construed as limiting but rather as illustrative only.

[0037] Meanings of technical and scientific terms used herein are to be commonly understood as by one of ordinary skill in the art to which the invention belongs, unless otherwise defined.

[0038] The present invention can be implemented in the testing or practice with methods and materials equivalent or similar to those described herein.

[0039] While the invention has been described with respect to a limited number of embodiments, these should not be construed as limitations on the scope of the invention, but rather as exemplifications of some of the preferred embodiments. Those skilled in the art will envision other possible variations, modifications, and applications that are also within the scope of the invention. Accordingly, the scope of the invention should not be limited by what has thus far been described, but by the appended claims and their legal equivalents.

What is claimed is:

1. A physical distribution system for distributing prescribed medications, ordered by physicians, from a storeroom via a pharmacy to patients in a hospital department in a secure and reliable manner, the physical distribution system comprising:

at least one container comprising a plurality of compartments; and

a plurality of dispensers,

wherein each of the plurality of compartments is operatively associated with an electronic lock associated with an opening code uniquely associated with a physician, a patient and prescription data,

wherein each of the plurality of dispensers is associated with a unique patient related code,

wherein each electronic lock is arranged to enable entering the prescribed medications into the associated compartment upon identification of the associated opening code,

wherein each electronic lock is arranged to enable dispensing prescribed medications from at least one compartment into at least one dispenser upon identification of a

patient related code on the dispenser corresponding to patient data in the opening code, and

wherein the prescribed medications are associated with their prescription data.

2. The physical distribution system of claim 1, wherein the opening code and the patient related code both comprise barcodes, wherein the electronic lock comprises a barcode reader, and wherein information related to the prescribed medications is associated with the barcodes.

3. The physical distribution system of claim 2, wherein the information comprises at least one of: patient data, physician data, names of medications, a prescribed dose, and application times.

4. The physical distribution system of claim 1, wherein each compartment comprises:

an opening;

a handle for opening the compartment;

a description of the content of the compartment; and

an indicator of the state of compartment.

5. The physical distribution system of claim 1, wherein each dispenser comprises:

a plurality of receptacles; and

a rotatable cover divided into several sectors corresponding to the receptacles beneath them, wherein one sector is open,

wherein prescribed medications are dispensed from the appropriate compartments in container into the corresponding receptacle in the dispenser upon identification of a patient related code on the dispenser corresponding to patient data in the opening code.

6. The physical distribution system of claim 1, wherein each dispenser comprises:

a handle with a code trigger; and

a code reader for identifying a unique patient related code; and

a power and data connector,

wherein code reader is arranged to read patient data, and

wherein code trigger is arranged to enable affirmation of the patient code.

7. The physical distribution system of claim 1, wherein at least one of: the dispenser; and the container, is programmable to open at predefined times according to a prescription inputted in a mode that is at least one of: electronic, and manual.

8. The physical distribution system of claim 1, wherein at least one of: the dispenser; and the container, comprises an indication of at least one of: patient data; medication data; prescription data, in relation to the content of the at least one of: the dispenser; and the container.

9. A method of distributing prescribed medications ordered by physicians from a storeroom via a pharmacy to patients in a hospital department in a secure and reliable manner, the method comprising:

taking the prescribed medications from the storeroom;

identifying the prescribed medications;

storing the prescribed medications in at least one compartment;

dispensing the prescribed medications into at least one dispenser; and

supplying medications to the patients at prescribed times; wherein the identifying the prescribed medications is carried out according to an opening code associated with the prescribed medications,

wherein the dispensing the prescribed medications is carried out according to patient related code associated with the at least one dispenser, and

wherein the opening code and the patient related code are according to patients related prescription from the physicians.

10. The method of claim **9**, further comprising receiving prescriptions and associating prescriptions with opening codes and patient related codes.

11. A distribution system for distributing prescribed medications, comprising:

a container with a plurality compartments, each compartment operatively associated with an electronic lock openable upon receipt of an opening code uniquely asso-

ciated with a physician, a patient and prescription data, each electronic lock configured to receive prescribed medication into the associated compartment upon identification of the associated opening code; and
a plurality of dispensers, each dispenser associated with a unique patient related code,

wherein each electronic lock permits dispensing of a prescribed medication from the associated compartment into at least one dispenser upon identification of a patient related code on the dispenser corresponding to patient data in the opening code, and

wherein the prescribed medications are associated with their prescription data.

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