

A PHARMACEUTICAL DISPENSING SYSTEM

FIELD OF THE INVENTION

This invention relates to a pharmaceutical dispensing system, and to a method of dispensing pharmaceutical products.

BACKGROUND TO THE INVENTION

A problem with current systems for dispensing pharmaceuticals is that they usually involve waiting times, queues, and limited operating hours of clinics. As a result, unnecessary traffic is driven to the accident and emergency departments of hospitals.

Corona virus disease (COVID 19) appears to be established and this is driving a demand of self-medication to avoid physical contact with staff and personnel usually involved in the dispensation of pharmaceuticals.

There is a growing acceptance of digital tools, such as telemedicine and kiosk machines. This has led to increased openness to, and acceptance of, self-medication.

Particularly in the First World, there is a growing aging population and a rising demand for pharmaceuticals that treat ailments such as coughs and colds.

It follows that there is a need for an efficient manner for dispensing pharmaceuticals.

SUMMARY OF THE INVENTION

According to as aspect of the invention, there is provide a method of dispensing pharmaceutical products, the method comprising the steps of:

- establishing a remote electronic connection between a vending machine in which the pharmaceutical products are stored and a data processing apparatus of an authorised person, the remote electronic connection being configured so that a customer at the vending machine can communicate with the authorised person via an interface of the vending machine;

- establishing a remote electronic connection between the vending machine and a data processing apparatus of a financial institution to generate a payment portal such that the customer can make a payment to a predetermined recipient via the interface; and

dispensing or more of the pharmaceutical products to the customer with the vending machine, subsequent to payment.

According to an aspect of the invention, there is provided a system of dispensing pharmaceutical products, the system comprising:

a vending machine that is configured for:

establishing a remote electronic connection with a data processing apparatus of an authorised person, the remote electronic connection being configured so that a customer at the vending machine can communicate with the authorised person via an interface of the vending machine;

establishing of a remote electronic connection with a data processing apparatus of a financial institution to generate a payment portal such that the customer can make a payment to a predetermined recipient via the interface; and

dispensing one or more of the pharmaceutical products to the customer with the vending machine, subsequent to payment.

BRIEF DESCRIPTION OF THE DRAWINGS

Figures 1A and 1B show a flowchart of one embodiment of a process of dispensing pharmaceuticals, in accordance with the invention.

DETAILED DESCRIPTION

Broadly, the system and method of embodiments of the invention allow a customer or patient to have a remote meeting with either a pharmacist or a doctor, via an electronic, real-time, meeting. The embodiments of the invention have application to systems in which authorised persons, such as healthcare professionals, doctors, and pharmacists, prescribe or dispense medication.

For example, during a consultation or meeting, a pharmacist can escalate to a doctor to continue the consultation process if the required services are beyond the scope of services that can be provided by a pharmacist. This provides the customer with flexibility without the need for repeating rounds of registration.

The following is an overview of the categories of products that may be dispensed using the embodiments of the invention:

Types of Products	Description	Issued by Doctor?	Issued by Pharmacist?
POM	Prescription only medicines	YES	NO
PMed	Pharmacy only medicines	YES	YES
OTC	Over the counter products	YES	YES

The types of licensing from the respective regulatory authority are as follows:

Type	Description	Regulatory Authority
Telemedicine	Teleconsultation by a Doctor	Ministry of Health
Telepharmacy	Teleconsultation by a Pharmacist	Health Science Authority of Singapore

The various embodiments of the system and method of the invention target the following, non-limited, class of ailments and is not meant to dispense pharmaceuticals that may be used for life-threatening types of illnesses. Set out below is an example of several types of indications targeted by the embodiments of the system and method.

Type of Ailments	Indications
Cough & Cold	Chesty cough, Dry cough, Fever, Headache, Migraine, Nasal, Congestion, Pharyngitis, Phlegm, Sinusitis
Gastrointestinal	Abdominal Cramps, Bloating stomach, Constipation, Dehydration, Diarrhoea, Food poisoning, GERD, Indigestion, Nausea, Vomiting.
Muscle Related	Gouty arthritis, Joint Pain & Inflammation, Muscle ache, Osteoarthritis, Period pain, Pre-menstrual syndrome
Skin Related	Atopic dermatitis, Cold sore, Eczema, Fungal Infections, Skin Inflammation, Skin Itch, Oral Ulcers

Allergy	Allergic conjunctivitis, Allergic rhinitis, Urticaria
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Features of embodiments of the system include:

- a) A vending machine of the type used to vend or dispense products. The vending machine is configured to combine part of the services of a clinic and a pharmacy into a single platform.
- b) The ability to collect medication immediately, without the need to visit a clinic or a pharmacy.
- c) The ability to consult remotely with a doctor or a pharmacist.
- d) The issuance of an e-medical certificate that can be sent to a customer via email or other electronic means.
- e) The issuance of receipts through one or more of the following methods:
 - Email.
 - QR Code. The customer can scan the QR code that is displayed on the screen of the vending machine to download the e-receipt immediately to a mobile device.
- f) The handling of dosage instructions in the following manner:
 - All products (POM, PMed, and OTC) are pre-labelled with medication dosage instructions.
 - Dosage instructions are sent electronically to the customer, for example, by email. These instructions can include advice that they are so supersede the standard instructions on the packaging of the products.
 - The dosage instructions include a picture for each medication and the dosage instructions for that medication such that the customer is given visibility and clarity on the instructions that supersede those on the packaging.

The embodiments of the system and method operate using an on-demand model. Thus, the doctor or pharmacist who has subscribed to the system and who accepts a call from the system first is assigned the associated task.

A useful feature of embodiments of the system and method is that it can offer both medical and pharmacy services via a single dispenser or kiosk. Furthermore, existing vending machines or kiosks in Singapore only dispense OTC products. Embodiments of the system and method are capable of dispensing or supplying POM, Pmed, and OTC products. This is facilitated by the establishment of a remote electron connection between the vending machine and a data processing apparatus of an authorised person such as a doctor or pharmacist, such that the customer can communicate with the authorised person via an interface of the vending machine.

The steps of validating a customer that is to make use of embodiments of the system and method are set out below.

- a) Customer identity details are input via a graphic user interface of the vending machine. This can include scanning the National Registration Identity Card (NRIC) or some other form of identification. These details can be communicated to the data processing apparatus of the authorised person.
- b) For new customers, the graphic user interface provides a registration interface that is displayed to facilitate the input of information such as:
 - Customer full name
 - Customer email address
 - Customer mobile phone number
 - Customer gender
- c) Connection to an authorised person such as an on-duty pharmacist or doctor and the initiation of a video conference that can show the face of the pharmacist or doctor.
- d) The pharmacist or doctor carries out the customer identity validation process by verifying the image of the NRIC by checking the number, name, and physical appearance of the customer.

The steps of carrying out the consultation and payment process using embodiments of the system and method are set out below.

- a) Subsequent to validation as set out above, the pharmacist or doctor can start the consultation process to assess the customer's conditions and input the findings into embodiments of the system. A number of standard questions can be asked to initiate the assessment process, such as:
 - a. What are your symptoms?
 - b. Who is suffering from these symptoms you described?
 - c. For how long have you had these symptoms?
 - d. Are your symptoms improving or getting worse?
 - e. Do you have any drug allergies?
 - f. Do you have any medical conditions?
 - g. Are you taking any other medications, health, or herbal supplements?
- b) The pharmacist or doctor offers to recommend or prescribe products to treat the specific ailments. The recommended products and prices are then shown on an interface, such as a screen of the kiosk. The customer can agree or disagree with the doctor or pharmacist and make use of the interface to add, change, or delete the medications or products as required.
- c) Once the customer has agreed with the recommended medications and price, the customer can proceed with payment with a payment portal to a financial institution with which the vending machine has established a remote electronic connection. Payment instructions are shown on the graphic user interface to guide the customer to make payment.
- d) Upon successful payment, a notification of payment status will be shown on the screen and a receipt is sent to the customer via email. Customers can also opt to scan the QR code to download the receipt into their mobile device.

The steps of dispensing and collecting medications are set out below.

- a) After successful payment, the vending machine dispenses the medications one product at a time based on the selected product that the pharmacist or doctor has recommended or prescribed.
- b) Embodiments of the system are configured to guide a conveying means, such as an internal conveyor belt to the respective bin location in the vending machine, which is predetermined, to allow retrieval of the product.

- c) At the time of retrieval, a photograph of the product is taken and communicated to the doctor or pharmacist, to allow the product to be validated and checked.
- d) The pharmacist or doctor validates the correctness of the product by selecting a "Validated" option in a user interface made available to the pharmacist or doctor as part of embodiments of the system.
- e) Upon the product being validated, the vending machine dispenses the product to a collection mechanism, such as a collection box, of the vending machine. This process repeats until the last product has been dispensed.
- f) At the end of the dispensation process, another photograph of all the products being dispensed into the collection box are taken for the pharmacist to validate one more time the accuracy of the dispensed drugs. Stocks will be deducted from the system at this stage.
- g) Once final validation has been done, the pharmacist inputs commands via a graphic user interface that instruct the system to open the collection door. A message is displayed on a screen of the vending machine to instruct the customer to collect the goods.
- h) After the customer collects all the products from the collection box, the collection door will be closed based on one of the following protocols.
 - a. Pharmacist inputs commands via the graphic user interface that instruct the system to close the collection door immediately.
 - b. The system is configured to close the collection door automatically after a period of 30 seconds from the products being dispensed.
- i) Once the collection door is closed, any uncollected products are moved to an uncollected bin and the system reinitiates itself for a new session.

The appended claims are to be considered as incorporated into the above description.

Throughout this specification, reference to any advantages, promises, objects or the like should not be regarded as cumulative, composite, and/or collective and should be regarded as preferable or desirable rather than stated as a warranty.

Throughout this specification, unless otherwise indicated, "comprise," "comprises," and "comprising," (and variants thereof) or related terms such as "includes" (and

variants thereof)," are used inclusively rather than exclusively, so that a stated integer or group of integers may include one or more other non-stated integers or groups of integers.

When any number or range is described herein, unless clearly stated otherwise, that number or range is approximate. Recitation of ranges of values herein are intended to serve as a shorthand method of referring individually to each separate value falling within the range, unless otherwise indicated herein, and each separate value and each separate subrange defined by such separate values is incorporated into the specification as if it were individually recited herein.

Features which are described in the context of separate aspects and embodiments of the invention may be used together and/or be interchangeable. Similarly, features described in the context of a single embodiment may also be provided separately or in any suitable sub-combination.

It is to be understood that the terminology employed above is for the purpose of description and should not be regarded as limiting. The described embodiments are intended to be illustrative of the invention, without limiting the scope thereof. The invention is capable of being practised with various modifications and additions as will readily occur to those skilled in the art.

CLAIMS

1. A method of dispensing pharmaceutical products, the method comprising the steps of:

establishing a remote electronic connection between a vending machine in which the pharmaceutical products are stored and a data processing apparatus of an authorised person, the remote electronic connection being configured so that a customer at the vending machine can communicate with the authorised person via an interface of the vending machine;

establishing a remote electronic connection between the vending machine and a data processing apparatus of a financial institution to generate a payment portal such that the customer can make a payment to a predetermined recipient via the interface; and

dispensing or more of the pharmaceutical products to the customer with the vending machine, subsequent to payment.