FORM 2

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COMPLETE SPECIFICATION

(See Section 10; rule 13)

AUTOMATED SMART MEDICATION DISPENSING SYSTEM WITH INTEGRATED WATER AND EMERGENCY ASSISTANCE FEATURES

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The following specification particularly describes the invention, and the manner in which it is to be performed.

FIELD OF THE INVENTION

The present invention relates to the field of healthcare technology, more particularly to an automated medication dispensing system. The invention provides a smart, user-friendly, and reliable solution for ensuring medication adherence through automated dispensing, integrated reminders, user authentication, water delivery, and emergency assistance mechanisms.

BACKGROUND OF THE INVENTION

Medication non-adherence is a global health concern, especially among elderly individuals and patients suffering from chronic illnesses. Existing solutions such as manual pill boxes and reminder alarms are limited in efficiency and prone to human error. Digital pill dispensers have improved adherence but still lack full automation, seamless integration with healthcare systems, and comprehensive features for user convenience.

Some systems employ cartridges for dispensing, but these are not user-friendly for all patients. Others rely heavily on mobile applications, which require manual intervention and do not automate the entire dispensing process. Moreover, prior systems often do not include integrated features such as water dispensing or emergency support mechanisms.

The present invention addresses these gaps by providing a fully automated system that not only ensures accurate and timely dispensing of prescribed medication but also incorporates user identification, smart reminders with multi-language support, integrated water delivery, and an SOS emergency button. This holistic design improves accessibility, reliability, and safety while reducing the burden on caregivers and healthcare professionals.

OBJECTS OF THE INVENTION

The primary object of the invention is to provide a comprehensive smart medication dispensing system that ensures correct dosage at the prescribed time, thereby improving adherence and reducing health risks associated with missed or incorrect doses.

Another object of the invention is to integrate automated dispensing with user identification to ensure that the medication reaches the intended individual.

A further object of the invention is to include a water dispensing mechanism for ease of medication intake, especially for individuals who may face difficulty in swallowing pills.

Yet another object of the invention is to provide a built-in alarm system with customizable, multi-language reminders that improve accessibility across diverse populations.

A still further object of the invention is to integrate an emergency SOS button to enable immediate assistance in case of medical emergencies.

Another object of the invention is to provide eco-friendly, sustainable, and compact design suitable for both household and institutional healthcare environments.

SUMMARY OF THE INVENTION

The invention provides MEDICHUM, an automated smart medication dispensing system designed to tackle the problem of medication non-adherence. The system comprises modules for automated dispensing, a user interface for scheduling, a reminder alarm with light and sound signals, and a user authentication mechanism.

The system further incorporates a water dispensing unit to facilitate medicine intake and a stock monitoring module to alert caregivers in case of low supply. An activity log records dispensing actions for compliance monitoring, while an SOS button provides emergency alerts.

The embedded software integrates hardware modules, monitors user interaction, triggers alarms, manages dispensing, and communicates with caregivers through external communication devices. This provides a seamless workflow that ensures reliability, accuracy, and safety in medication management.

By combining automation, accessibility, and safety features, the invention offers a scalable, sustainable, and practical solution for home and healthcare use.

BRIEF DESCRIPTION OF THE DRAWINGS

These, and other features, aspects, and advantages of the present invention that become better understood through the following description, appended claims, and accompanying drawings:

FIG 1: Schematically depicts the system architecture, workflow, and device components.

DETAILED DESCRIPTION OF THE INVENTION

The present invention has been particularly shown, and described concerning certain preferred embodiment, and specific features thereof. The embodiments set forth herein below are to be taken as illustrative rather than limiting.

The following description includes the preferred best mode of one embodiment of the present invention. It is clear from this description of the invention that the invention is not limited to these illustrated embodiments but that the invention also includes a variety of modifications, and embodiments thereto. Therefore, the present description has been seen as illustrative, and not limiting.

While the invention is susceptible to various modifications, and alternative constructions, it has been understood, that there is no intention to limit the invention to the specific form disclosed, but, on the contrary, the invention is to cover all modifications, alternative constructions, and equivalents falling within the spirit, and scope of the invention as defined in the claims.

In any embodiment described herein, the open-ended terms "comprising," "comprises,", and the like (that are synonymous with "including," "having", and "characterized by") be replaced by the respective partially closed phrases "consisting essentially of," consists essentially of, ", and the like or the respective closed phrases "consisting of," "consists of, the like.

As used herein, the singular forms "a," "an,", and "the" designate both the singular, and the plural, unless expressly stated to designate the singular only.

The present invention, MEDICHUM, is an automated smart medication dispensing system that integrates multiple functional modules to ensure accurate, reliable, and user-friendly medication management. The system has been designed to address the critical issue of non-adherence to prescribed medication, particularly among elderly individuals and patients with chronic illnesses, by providing a comprehensive solution that combines dispensing automation, user identification, reminders, hydration support, and emergency assistance within a compact and sustainable device.

At the core of the invention is the automated dispensing mechanism, which is capable of releasing the correct dosage of medication at pre-programmed times. This mechanism is supported by an embedded software module that coordinates the operation of hardware components and ensures precision in dosage delivery. The dispensing process is initiated once the system detects user acknowledgment of a scheduled reminder, thereby eliminating the risk of missed or incorrect doses. The mechanism directs the medication into a designated compartment, making it accessible in a convenient and error-free manner.

The user interface forms an essential part of the system and allows patients, caregivers, or healthcare professionals to input medication schedules, customize reminders, and manage settings according to individual needs. It is designed to be simple and intuitive, catering especially to elderly users or those with limited technological proficiency. The interface works in conjunction with an alarm system that provides both visual and auditory alerts at prescribed times. These alerts are customizable and can be delivered in multiple languages, ensuring that the system is accessible to a diverse user population and suitable for use across various geographical regions.

An assessment module is integrated to monitor the user’s response to reminders. If the user acknowledges the alert within a defined time window, the system proceeds to dispense the medication automatically. If no response is detected, the system escalates the reminder process by transmitting notifications to caregivers or healthcare providers through an external communication device. This ensures that critical doses are not overlooked, and interventions can be made in a timely manner.

To further improve medication intake, the invention incorporates a water delivery system that supplies water simultaneously or immediately after dispensing the medication. This integrated feature is particularly valuable for users who face difficulty in swallowing pills, ensuring ease of intake and promoting better adherence. Alongside this, a medicine supply check module continuously monitors the stock levels within the device. If the system detects that the supply is running low, it sends a notification to caregivers or healthcare providers, thereby preventing interruption of therapy and reducing the burden of manual inventory management.

The system is also equipped with an activity logging module that records every operational detail, including alarm activation, user responses, medication dispensing events, and stock

updates. These records can be accessed by caregivers or healthcare professionals to track compliance with prescribed schedules, evaluate adherence trends, and adjust medical interventions accordingly. Such monitoring capabilities enhance transparency in treatment management and provide reliable data for healthcare oversight.

A distinctive feature of MEDICHUM is the inclusion of an emergency SOS button that enables users to immediately seek assistance during critical health situations. When activated, the SOS button triggers an alert through the external communication device, notifying caregivers or emergency services without delay. This feature ensures that users have a safety net in emergencies, thereby increasing confidence in independent medication management.

The embedded software within the system orchestrates the seamless functioning of all hardware modules. When the device is powered on, the software initializes the system and ensures readiness for operation. At scheduled times, alarms are triggered to prompt the user, and the system monitors the response through the assessment module. Upon acknowledgment, the software activates the dispensing mechanism and coordinates the simultaneous delivery of water. It further oversees the stock monitoring process, ensures that alerts are sent when replenishment is needed, and records all actions in the activity log. In case of an emergency, the software prioritizes SOS alerts and communicates directly with external systems.

The invention thus provides a fully integrated and reliable solution to the problem of medication non-adherence. Unlike traditional pill boxes or limited digital dispensers, MEDICHUM automates the entire cycle of medication management while ensuring accessibility, safety, and convenience. Its eco-friendly and compact design makes it adaptable to both home and healthcare environments, and its scalable architecture allows integration into broader healthcare systems. By offering an automated medication dispensing system with user identification, multi-language reminders, hydration support, stock monitoring, and emergency assistance, the invention represents a significant advancement in the field of medical technology and addresses an urgent healthcare need.

We Claim:

1. An automated medication dispensing system comprising:

- an external communication device;
- a user interface for scheduling and customization;
- an alarm system configured to provide reminders;
- an assessment module for detecting user acknowledgment;
- an automated medication dispensing mechanism;
- a water dispensing unit;
- a medicine supply check module;
- an activity logging module; and
- an emergency SOS button for immediate alerts.

2. The system as claimed in claim 1, wherein the dispensing mechanism is configured to release a precise dosage based on pre-programmed schedules.

3. The system as claimed in claim 1, wherein the alarm system includes light and sound alerts with multi-language support.

4. The system as claimed in claim 1, wherein the water dispensing unit is activated simultaneously or immediately after dispensing medication.

5. The system as claimed in claim 1, wherein the medicine supply check module is configured to monitor stock levels and transmit low-stock alerts via the external communication device.

6. The system as claimed in claim 1, wherein the activity log module records dispensing operations, stock updates, and user interactions.

7. The system as claimed in claim 1, wherein the emergency SOS button is configured to transmit immediate alerts to caregivers or emergency services.

8. The system as claimed in claim 1, wherein the device is portable, compact, and designed using eco-friendly materials.

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ABSTRACT

AUTOMATED SMART MEDICATION DISPENSING SYSTEM WITH INTEGRATED WATER AND EMERGENCY ASSISTANCE FEATURES

The invention relates to an automated smart medication dispensing system named MEDICHUM. The system ensures medication adherence by dispensing the correct dosage at scheduled times while integrating features such as an alarm system with sound and light reminders, a user identification mechanism, a water dispensing unit, and an SOS emergency button. A medicine supply check module monitors stock and notifies caregivers when replenishment is required. An external communication device facilitates connectivity with caregivers and healthcare networks. Activity logs record all user interactions and dispensing actions for monitoring adherence. The embedded software integrates these modules, ensuring seamless operation. The system's compact, sustainable design makes it suitable for both domestic and institutional healthcare environments.