

# AUTOMATIC PILLS DISPENSER

Abhishek Kumar, Abhishek Kumar, Anurag Tiwari, Ashutosh Ranjan

<sup>1</sup> Student, Electronic and communication, SRM institute science and technology, Tamil Nadu, India

<sup>2</sup> Student, Electronic and communication, SRM institute science and technology, Tamil Nadu, India

<sup>3</sup> Student, Electronic and communication, SRM institute science and technology, Tamil Nadu, India

<sup>4</sup> Student, Electronic and communication, SRM institute science and technology, Tamil Nadu, India

## ABSTRACT

*To design or study the idea of paper present of the architecture and implementation of an automatics medication dispenser for user who take medication at regularly and an interval of time. By relieving the user from the error-prone tasks of interpreting medication direction and administrating medication accordingly, this device improves the rigor in compliance and prevent serious medication error. If we keep a note of each and every medication and start taking it will be sometime be difficult to look for the medication and have it. But by taking advantage of scheduling flexibility provided by medication direction, the device makes the user's medication schedule easy to adhere and tolerant to tardiness whenever possible. The medication scheduler and dispenser controller do this work collaboratively in an action-oriented manner. An advantage of the design is that new function can be added and existing ones removed or revised with little or no need to modify the dispenser control structure.*

## 1. Introduction

Advance in medical and pharmaceutical technologies over the year led to more and more drugs that can cure or control fatal diseases and help people live actively for decades longer. The benefit of the drugs would be even more wondrous were it not for the high rate of preventable medication error. As the people is getting busier day by day in their life so they forget to take medicine on time. As well as for the older people those who have been prescribed with the whole lot of medicine and which they have to take on time and right amount of the prescribed medicine. This small machine medicine dispenser will be remained them and also suggest them to take correct amount of the prescribed medicine

### 1.1 Literature Survey:

There is a large variety of pills for the patients for those who takes daily dozes. Even they get confused with the colors of the tablet. This machine will be helpful to the old people which will make it easy to have the pills when ever they required to take. There are many such machines which contain large variety of pills, without any information regarding that pills which can be said that it's a manual. But the new concept is that which can be implemented in the machine is that it will be programmed according to the prescribed tablet, doctor must suggest the patients who have to take good number of tablets, they must take automatics pills dispenser which will be really helpful and it will be programed with the alarm or the remainder system.

## 2. METHODOLOGY AND IMPLEMENTATION:

Details about the design of the automatic medicine dispenser (AMD) are included in the paper. Initially the requirements to design this device are collected and then design consideration is taken care. Finally, a design process is suggested to design automatic medicine dispenser. The Programmable automatic medicine dispenser designed allows the care taker to reliably administer medications to a patient without needing to be present every time the medication is scheduled. The caretaker pre-programs the AMD that allows it to set up to 21 medications does through an ergonomically designed interface, utilizing an alphanumeric keypad and LCD display. The AMD can be pre-programmed to repeat the same cycle for one month. An alarm is provided to load the medicine if the number of pills/capsules falls below a threshold value that can be fixed by the owner.

## 2.1 Customer Requirement:

The main and important thing that have to keep in mind while making for the customer is that it should be in light in weight, not so heavy and it must be long durable and the should be easy to reset.

The product automatic pills dispenser has a long life and is easy to repair. It will be reprogramed accordingly to the need.

## 3. Design:

The construction of dispenser will be in any shape but it should be having proper dimension that will allow the pills to dispense to the patient. software has to be reliable and enable recording current medication and future medication dispensation. A mechanical lock is to be provided to secure and make it tamper proof.

A led display is to be provided to indicate the working and to provide pertinent instructions. Microcontroller interface with led, stepper motor for the in/out of the box, alarm, LCD to display, speaker is to be designed. Proper pills storage also must be ensured during designing.

## 4. Hardware required:

### Power supply:

The power supply circuit will provide necessary power requirements for the AMD. Design requirement is 5 VDC for the microcontroller and motor controller. Additionally, 12V is necessary for the motor. Current requirements will be dictated mainly by the motor controller design; while the current requirement for the microcontroller is in the range of 100mA. Also, the power supply may require battery backup to avoid loss of user input selections and time keeping functions.

### Keypad and Display:

The keypad input is a standard 16 key alphanumeric keypad. It enables the user to program the system. The alpha numeric display unit is for the user to view the time set or reset operation. It provides the user visual representation of the contents of the container. The same unit may be used for providing the warning when it is required.

### Speaker:

The Speaker is provided to give a beep sound to warn the patient regarding the time to take the tablet. The same speaker is also use to call the name of the patient which provides the information regarding the updating the pills/capsules into the container. This facility helps the blind to interact with AMD.

### Pill Container and Dispenser:

The pill/capsule container design will have 30 slots with 21 available for medications. The 21 slots will be labelled so that the caregiver can ensure setting the alarm for the correct slot. Additionally, the pill container will incorporate interlock sensors to protect the caregiver and user from harm. Finally, the sensors will provide input to the microcontroller for determining access doors status, medication slot positioning and time feedback of the patient accessing the medications.

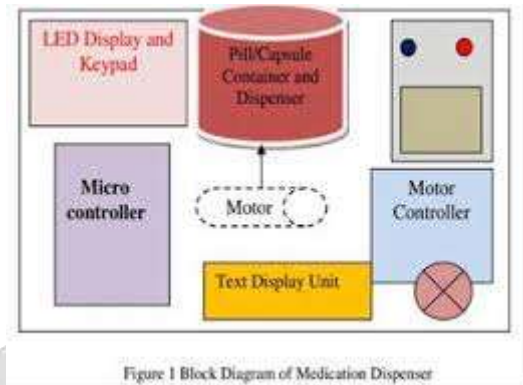
### Microcontroller:

The microcontroller is the main part of the AMD. It is responsible for performing all the functions and commands of the medicine box. The microcontroller is selected to meet the required functionality of the AMD without wasting money on unneeded features. The basic requirements of the microcontroller are a few Input output ports to interface the keyboard, display unit, motor, and speaker. Interrupts are used to enable the user to interact with the system for programming. When the user presses the command key, it enables the user to program the timing and set the required pills to be available in the output poach. The command key also allows the user to program the number of minimum pills/capsules that must be made available before a warning signal is provided. The Microcontroller is so chosen that the system does not require additional external peripheral chips and memory. The memory requirement is 2K of READ Only memory and 8K of Read writes memory.

### Alarm Module:

The alarm module will provide an audible alarm tone. This module is designed to send a pattern of audible sounds through the speaker till the patient responds by pressing the button to access the poach for the pills/capsules. An LED is also provided to blink during the alarm process. A visual display string is provided for the user to read the

instruction. A second alarm is provided to prompt the caretaker to load the pills/capsules when the number of pills/capsules in the storage unit falls below the threshold value. The number of pills/capsules threshold value is also programmable. This alarm does not provide audio but gives a warning by blinking.



**Motor Controller:**

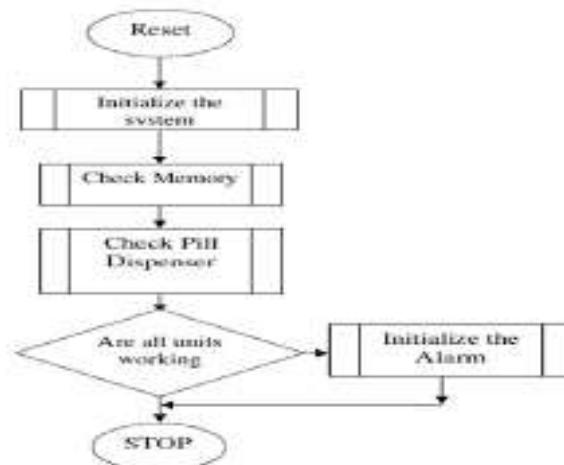
All motors have a control device called a motor controller to start and stop the motor called a motor controller. It is the actual device that energizes and de-energizes the circuit of the motor so that it can start or stop. The design of the motor controller will be determined by the current requirement of the stepper motor selected. The motor controller takes logic inputs from the microcontroller and supply enough current to the stepper motor to meet maximum torque requirements.

**LED:**

The Light emitting diode display will be a simple red light; it provides information such as power on, flashing as he speaker beeps to have the attention of the user and emergency indication. It also provides pre-selected precautions to the patient concerning the medications being currently dispensed.

**Complete Design Concept**

Process when the system in RESET This includes both the hardware and software concept design. It contains the Microcontroller which is the heart of the system managing the overall operation of the system. It provides LED display and the Keypad interface to interact with the external world. The text display provides information of the settings and also displays the present setting operation. The Program is written to help the user use the system effectively directing them to use the system without any problem. Reset Initialize the system Check Memory Check Pill Dispenser Initialize the Alarm Are all units working STOP.



## 5. CONCLUSIONS:

The automatic pills dispenser is working for the pills and capsule of any size. It has been found that the dispenser can be programmed for 31 days and approx. for 20 medicine. It is possible programmable dynamically change the number of times and the pills to be picked as per requirement.

## 6. REFERENCES

- [1]. "Med-e-lert Medication Pill Box Reminder Dispenser", <http://www.amazon.com/Med-E-LertMedication-Pill-Reminder-Dispenser/dp/B0029K0318>.
- [2]. "Alarm Pill Box Pill Mate Event Reminder", <http://www.amazon.com/Alarm-Pill-Mate-EventReminder/dp/B000R3EETI>.
- [3]. Tsai, P. H., C. S. Shih, and J. W. S. Liu, "Algorithms for scheduling multiple interacting medications," Institute of Information Science, Academia Sinica, Taiwan, Technical Report TR-IIS08-001, April 2008 Pei Hseun Tseui, "Smart Medication Dispenser: "Design, Architecture and implementation", IEEE journal, Vol-5, March-2011.
- [4]. Tsai, P. H., C. S. Shih, and J. W. S. Liu, "Algorithms for scheduling multiple interacting medications," Institute of Information Science, Academia Sinica, Taiwan, Technical Report TR-IIS08-001, April 2008 Pei Hseun Tseui, "Smart Medication Dispenser: "Design, Architecture and implementation", IEEE journal, Vol-5, March-2011

