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Medicine Caretaking Device

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Abstract: ***This paper purpose the study of device which aims to provide proper and regular medication reminder to patients. It is very essential and necessary to provide medication at time, specifically the aged. This project is essential and useful for the people who don't take medication on time and take it without any close professional supervision. It is a great relief for users who don't tend to take medication on time. The major component of this project is arduino uno, buzzer, RTC, keypad and power supply. The overall operation is to facilitate the user to set the timings to dispense multiple pills at required timings. The Alarm system is designed in such a way so that it can provide two types of indications – one by lighting an LED and the other by providing a beep sound to bring in to notice of the user. The user is then required to press the button to get the pill and reset the alarm button. The major objective is to keep the device simple and cost efficient. The software used is reliable and stable. Elder and old people are highly relieved from this device as it avoids expensive in-home medical care. This system is designed with a motive that it helps to ensure that medications and vitamins are taken properly and on time. This project can create new pathways between Local Authorities, Hospitals and Community Pharmacies to ease the way of medication consumption for patients who have to deal with complex medicine timetables.***

Keywords: Arduino uno, RTC DS1302, buzzer, keypad, power supply, LED

1. Introduction

Well, everyone do forget to take their medicines on time at some or the other point in their life and it is very important to take all the medicines properly and on time or else taking medicine on wrong intervals may lead to some severe side effects. For those who have been prescribed some serious medications cannot afford to compromise with their medicines. So it becomes even more necessary for elderly people and those on serious prescriptions to take their medicines on proper and regular intervals. The National Health Service (NHS) spends almost about £9 billion on medicines, issuing 927 million prescriptions, and it is estimated that we return more than £100 million in unused drugs, which are then destroyed. In 2015-16 the cost of hospital admission in the United Kingdom which resulted from patients who do not take their prescribedmedicine properly was estimated to be between £36m and £197m which is indeed huge.Since the prize of medicines constantly rises, it is even more important for people to take their medicines properly which can avoid its wastage that is caused by not using it effectively.This device is user friendly as it cut down the expensive prizes of an attendant. This device will allow people to take their medicines at properinterval by indicating the proper team by an alarm and led light in the respective compartment. Hence it will constantly supervise the patient atintervals. Typical and useful features onthese device include automatic pill dispensing at regular intervals, audible warnings, as well as a connection to either a phone line or the internet for monitoring purposes by the medical care provider. In section 2 Design is discussed. Furthermore in sections 3, 4, 5, 6, 7 proposed methodology , results and discussion, future scope, conclusion and references are discussed.

2. Design

The device is designed in such a way so that it can alert the patient through buzzer and LED when it is required to take medicine.[2]

2.1 Hardware

The hardware utilizations in this project are buzzer, LED, arduino uno, RTC module DS 1302, LCD, keypad.

2.2 Software

The software utilization in this project is Adafruit.

2.3 Block Diagram

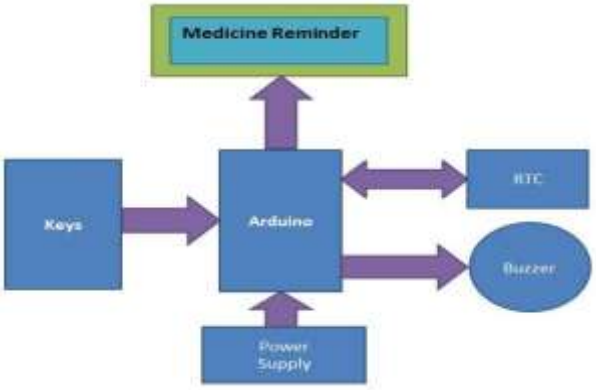


Figure 1: Block diagram for the device.

2.4 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 used to view the time. It allows user to keep a track over the time. It allows user to set or reset time.



Figure 2: 16 key alphanumeric keypad

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2.5 Pill Container and Dispenser

The pill/capsule container is designed in such a way that it will have 3 or even more slots available for medications depending upon the use. The 3 slots will be labelled. Labelling will help the caretaker to identify the respective slots and can ensure setting the alarm for the correct slot.

2.6 Arduino

The Arduino is the major part of the device. It is responsible for performing all the functions and commands of the device. The basic requirements and use of the arduino is to interface the keyboard, display unit, motor, and speaker. When the user will press the command key, it will enable the user to program the timing. Arduino is sufficiently enough and it does not require additional external peripheral chips and memory.



Figure 3: Arduino Uno

2.7 Buzzer

The alarm module or buzzer will provide an audible alarm tone to notify the user that it's time for medication. This facility will also help the blind to interact with the device



Figure 4: Buzzer

2.8 LED

The Light emitting diode display will notify the user regarding the medication.LED will glow red simultaneously as the buzzer beeps for a better understanding of the compartment allotted to the respective medicine.

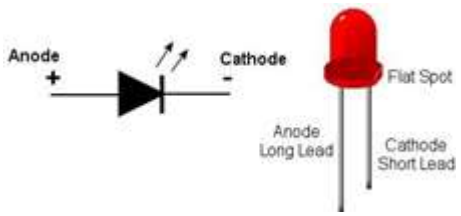


Figure 5: LED

3. Proposed Methodology

This project requires a arduino uno , keypad , buzzer , LED , RTC, and power supply. The basic idea of this project is to remind people to take their medicines on time by allerting them through a buzzer and LED when its time for them to take the medecine. LED will be inserted in several compartments of medicine. It will function according to timer. Respective time according to prescription will be set for each compartment and the compartment will glow through LED when the respective time arrives. Simultaneously a buzzer will sound along with the LED to alert the people regarding their medications. Also this device will allow to edit and insert time using RTC and keypad.

3.1 Algorithm

The following steps discuss about the mentioned method's implementation

1) Switch on the device.
2) Do the required coding for buzzer, RTC, keypad with the help of adafruit software.
3) Interface arduino with buzzer, RTC, keypad.
4) Prepare compartments for medicine taking presentation in to consideration.
5) Arrange the components in the medicine box.
6) Implement

4. Results and Discussion

4.1 Significance and Features

Light in weight, Small dimensions, Ability to reset the system, Processor controlled automation for pill dispensing, Audio and visual alarm, LED display for patient notification/instructions.

4.2 Application

It can be used as a medicine guide reminding people to take their medicines on proper time. It can be used by people of any age for various time based operations. It can be installed in hospitals which will eliminate the use of an attendant or caretaker at least for the purpose of respective medication.

4.3 Outcome

The major objective of this project is to comfort people who are prescribed on several medications allowing them to take their medicines on their time without the help of an attendant. It will allow people to take their medicines on proper interval leading towards a speedy recovery.

4.4 Output

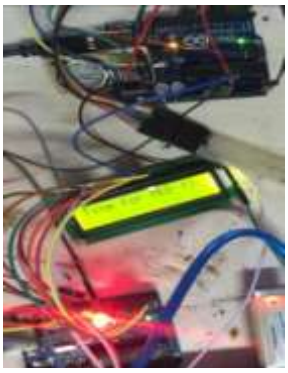


Figure: Output

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5. Future Scope

The possible future scope for this project is to design a notification system that would inform the caretaker of the regular scheduled medicine consumption by the patient by either phone, e-mail, or both that the patient received their medication within a timely manner. Thus a record or log of the timings of medicine consumption can be prepared daily for future reference and any irregularities can be noted too. Similarly, any irregularity by the patient can also be informed right away to the caretaker by means of message or email or any other preferred social media platform.To make the device more secure for the user locks can be installed to every medicine tray so that any mix up of medicine consumption remains out of the picture. In that case, the medicine tray containing the medicine scheduled for the present time will be unlocked and rest all medicine trays shall remain locked. Thus any mistake from the user's end can be avoided.

6. Conclusion

Medication can both prolong life and enable people to live independently in the Community. However, medication regimes for many people can become complex and overwhelming. Poor medication can have some severe effects. Health and social care agencies must intervene and help people at the right time before complex, costly and intensive interventions like hospital admission become necessary. This device will help patients take good care of themselves and head towards a speedy recovery by taking their medicines on time as prescribed. With some additional features like led light and buzzer, it even becomes more handy and useful. It is a user friendly device since it is cost efficient and will satisfy even the minimum budget. It will be a great relief to elderly people who very often tends to forget their medications. It will ensure that the health of patients won't degrade any further atleast due to lack of following proper prescriptions.

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