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DRUG DISPENSER

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Abstract:

Drug Dispenser is designed by using Embedded Systems for many people who may skip their medicine with in the time. Many old people have the tendency of missing the medicines or taking the medicines at wrong time. Often, they require someone to give them the medicines. Also, people who are illiterate cannot understand to which medicine has to be taken at that time. Hence it is required to design a Medication Reminder Device that can help old people and many other patients to take the correct medication on schedule.

In situations like the COVID-19 pandemic there is no physical contact between the patient and the care-takers, doctors. So, the device is designed which can deliver the right medicine at prescribed time in which care-taker of the patient can store medicine in small boxes which will drop out according to the time. Arduino IDE software platform and Arduino Mega along with RTC, servo motors, LCD, MP3 player, LED, Rotary Encoder with push button, IR sensor as hardware are used to build this project.

Keywords:

RTC- Real Time Clock, LCD – Liquid Crystal Display, IR Sensor - Infrared Sensor used for detecting objects.

1.Introduction:

The system relates to controlled dispensing and storing medication through a programmed Arduino module according to the patient's requirement in an efficient and accurate manner. Ina hospital, multiple patients require many different types of medications throughout the day at various intervals and all this mundane job must be done by the caretakers.

Also, in a hospital there are different levels of communications as to who and when must give medications to the patient which are changed variedly often as per the doctor's prescription. With many patients and most probably short amount of time for each patient the caretakers have a very tedious job to behold. All the abovenoted crisis are to be faced almost every day at hospitals which increase the risk of human error as to proper storage, allotment and delivery of proper medication and dosage to the concerned patients.

As well as the caretakers are exhausted and leaden at the end of the day. To overcome all these problems on everyday basis this 'Automated Medicine Reminder' could be immensely beneficial. According to its working, once the system is set by the caretaker as per the prescribed medication schedule for given number of days and the dosage is filled into the drawers the job of caretake.

Then the system gives the voice command at estimated time and the drawer with specific medicine opens the patient must take the dosage and the drawer automatically closes in

sometime (as the closing time period for the drawer is pre- programmed) or press the push button to close the drawer manually. both the methods are equally effective to carry out the given function. This ensures that person has taken the medicine.

The old age people, bed-ridden people, hospitalized people, and illiterate people could be very beneficial with this system. This reduces stress of the caretakers. The patients become self-reliant. Direct assurance of consumption of medication on time.

An embedded system is instrumental in solving any problems related to human, thus Health Care departments are constantly working on the methods to improvethe quality of health services provided. Good Health is important for a good life andit is quite necessary to give priority to health-related issues which can be solved by digitalization using a variety of devices. Currently there is not a fully functional embedded system in the market that provides the options to fill the medicine and the reminder(dose) times.

Medicines are one of the greatest achievements in human history. But they work only if they are taken properly on time. There is no cure for COVID-19 yet, althoughpatients are given some medicines by nurses and doctors to ease the pain, increase immunity, and reduce symptoms. But this puts our Healthcare warriors at risk when theygive the medicine to patients, thus we have developed a machine that can take in the Medicine Doses of an Entire week, store them and supply them to the patient at the timeset by the doctor or care-taker once, at the start-up of the machine. This will ensure distancing from patients and nurses will not have to risk their lives to go and give medicineto the infected patient. Hence reducing human efforts required in giving the medicines. Once the medicine is on the given rack from where the patient can take it, he/she is alerted via a speaker on the system to take the medicine. The data of when the medicineis taken is stored in an SD card for further reference by doctors to monitor the effect on symptoms by the given doze.

2.Related Works:

Gomathi et al [1] introduced a paper, the objective of this undertaking is to help the patients for the confirmation of prescriptions at the ideal time. In this paper the time and drug names are changed by the patients through the keypad associated. The rundown of medications must be taken by the patient at the endorsed time is shown on Character Liquid Crystal Display (LCD) and the time is shown on seven fragment show.So, in this manner the status of the patients can be effortlessly observed by the doctors. This is actualized utilizing Unified Technology Learning Platform. In this framework, Advance Risk Machine (ARM) cortex processor is utilized which depends on ARM form7 engineering the fundamental purpose for utilizing this processor is because of elite and power proficiency.

Priyadarshini et al [2] proposed a paper on automatic medication reminder, this novel idea provides information to patients to take the right dosages at right time. Itis necessary to the patient to take correct medicines at right quantity and time. A novel Automatic Medication Reminder (AMR) system is proposed in the paper. The proposed system is used to give information to patients automatically for taking proper dosage ataccurate time which is mentioned in the prescription schedule. All the above details are done with the help of Master IC, keypad, LCD display. After that the controller is interfaced with RTC module to track the current time. All the three commands including Number of Tablets, set time, Current time are displayed with the help of LCD display. LED indications and beep sound will be happened at corresponding medicine (tablet) container boxes. Similarly, it can give the information for noon and night time also. This novel device is economical, smaller in size, better accuracy and less complexity in operation.

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Lavima et al [3] presented a paper in which an embedded system can take care of the patients from all aspects. This project gives an experimental idea of patient's health condition and monitor environmental conditions. This system is designed using Zigbee and wireless sensor network to monitor and evaluate patient's health condition. The Wireless Sensor Network (WSN) setup used for monitoring smart home consists of fabricated electrical sensing units. These are installed at an elderly home to monitor patients daily activity in terms of object usage and execute effectively process. The electrical sensing units connected to various household appliances in this proposed system implemented a health monitoring platform such as temperature heartbeat fall occurrence and in addition to these gives an alert message to caring person or hospitals by using GSM technology.

Sharma et al [4] presented a paper on Medicine Reminder Application using Android. This paper focuses on the development of a mobile application to help to provide an effective healthcare system. This is an android based application in which alarm is used which may be closed by tapping the close alarm button under the image ofthe medicine which is to be taken at that particular time. In this Android application named Salburity, whose objective is to remind the patients of their dosage timings through alarm ringing system so that they can be healthy. Through the image popping with the alarm, they may remember which medicine is to be taken. It allows users to setan alarm along with the fields of date and time which allow them to set alarm for multiplemedicines at different intervals. Android is Linux- based operating system designed mainly for touch screen mobile devices. The application intakes the input to the systemas a information entered by the patient which includes date, time and medicine's image. The output of the system focuses on "Medication Adherence". Medication adherence usually refers to whether the patients take their medications properly. After saving the name of medicine, alarm rings on its respective time. The application also provides the health related quotes and the list of doctors along with their names, their specializations and their contact details.

3.Proposed System:

The concept behind this model is dispensing medicine by avoiding contact between the machine and the patient. Here we have a sample of container whose inside is coated or made up of thermoformed plastic which is used in the packaging of tablets.Below the container, a disc mounted with motor and shaft is present. The disc consists of a hollow region having the same dimensions as of the medicine. When the hollow region of the disc comes in contact with the opening of the container, the pill dispensesand the disc rotates so that the ill falls down into the up placed down. In this method, thedata of prescription of tablets to every patient is feed to the microcontroller's memory. By using the concept of line follower robot, the dispenser moves in the line put across the patient's bed, it stops at each cot. When the patient scans their tag in the RFID reader,the pills prescribed for the patients fall into the holder. Many dry pharmaceuticals are sensitive to moisture. Tablets may become unstable and they tend to degrade. High barrier packaging is necessary but, by itself, is often not enough. Shelf life of a drug canbe extended by means of desiccants. Several types of desiccants are available; the type and quantity need to be matched to the drug and package. One common method is to include a small packet of desiccant in a bottle.

3.1.1 Working:

The system gives the voice command at estimated time and the drawer with specific medicine opens. The patient has to take the dosage and the drawer automatically closes sometime(as the closing time for the drawer is pre-programmed) or press the push button to close the drawer manually .Both methods are equally effective to carry out the given function This ensures that person has taken the medicine.

The old age people, bedridden people, hospitaliz ed people, and illiterate people could very

beneficial with this system. This reduces the dependence on care taker.

4.Results and Discussion:

The device helps in keeping track of regular medicine intake activities and reduces manual supervision and human effort. The time at which the patient is supposed to take his/her medicine dose can be calibrated and manually set. The time at which the patient is supposed to take his/her medicine and the time at which he/she is actually taking the medicine can be compared. The data is to be stored in an SD card and can be easily accessed. The device also records the time and date of taking pills as a useful database for future medical consultant

5.Conclusion:

With this system, the chances of missing medicine are reduced. The doctors can easily monitor and thus interpret the results of tests of the patient according to the record of patient. This product can be easily replicated and placed in Covid-19 Quarantine centers next to patient beds to give them their medication on time. Using this product will ensure safety to healthcare workers who provide medicines, by keeping them at distance from the infected person. This easy-to-use device where no prior training is required can be a convenient option for households where family members have work-hour compulsions or are compelled to keep a nurse for the member with medical complications.

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