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IoT Based Health Assistant for the Elderly

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ABSTRACT: One of the major issues today causing various deaths is the improper medication taken by the elderly (or the old age people) and the improper care given to them. Also referred to as "medication errors"; these add up to the maximum percentage (around 40% to 75%) of loss of live of the senior citizens.Dementia or Alzheimer's, Poor eyesight are the major contributors for medicine consumption errors such as misdosage in the elderly. Medicine distribution for the elderly in urban as well as rural and remote areas such as deserts, high altitude residential areas, tribal areas, etc. is also a challenging aspect in today's world for the government as well as the age group. So to aid to resolve the above requirement, the health assistant for elderly would help the elderly dispense proper medicines at proper durations according to requirement to assist the ease in medication. It is a microcontroller i.e. Arduino and a stepper motor based system to dispense the medicines on proper time. To avoid double doses the project is also built in with a automated movable tray using servo motor. Also equipped with LCD and GSM at its output it helps informing the relatives of the patient as well as the patient himself about the status of the medicine taken or not.

KEYWORDS: IoT, Arduino, Microcontroller, Medicine Dispensing.

I. INTRODUCTION

The idea of requirement of a health assistant for the elderly comes from grandparents in a family when asked by the relatives weren't able to answer the question whether they have taken their medicine of a long term treatment disorder or not. They weren't able to segregate the medicines as it makes hard for them to read the content on the tablets because of Poor Eyesight due to old age. Which also had let to double dosage most of the times. Such a small 'medication error' could also lead to difficult conditions on the health of elderly. This is termed as 'drug noncompliance'. Overuse, forgetfulness, and self-alteration of doses are some common forms of drug noncompliance found. Thus the elderly is in an earliest need of a medicine dispenser as well as a device that can keep the track of their medicines as well as inform it to their relatives if not taken on time. This could be achieved by having a microcontroller i.e. Arduino in our case, different types of motors for dispensing pillsand automating the dispensing tray which could be taken by the respective old person. This could help in minimizing the medication errors as well as make a safer, reliable and a trustworthy source of medication.

II. LITERATURE SURVEY

In [1] the author presents a robotic application referred as M3DITRACK3R that is able to track the location of patient using the infrared sensor and dispense medicine at the right dosage and at the right time. The advantages include less efforts to the elderly whereas one of the disadvantages is its complexity.

In [2] a machine is designed to provide such healthcare at areas where having a medical store may not be feasible or possible. It allows the user to select a medicine, pay the required amount after which it verifies the amount received and dispenses the medicine.

In [3] the author provides a machine that can dispense the medicine(s) at present time intervals and in the prescribed dosages, which can be programmed through a simple interface. It also provides alerts for emergencies. It includes features like stock checking, daily reminders etc.

In [4] the paper proposes a design of medication reminder machine, the methodology proposed in this paper inspired to establish an auto reminder mechanism to the organizers when the medicines in the slot were gone empty.

III. METHODOLOGY

Here we mainly have used 3 stepper motors for dispensing the medicines as per morning, afternoon and evening. The stepper motors have been connected to a wheel of 8 compartments each of angle 45 degrees where the medicines will be stored according to the days. Before dispensing the medicines in the part of the collection tray we have automated the system by adding a robotic arm using a servo motor which would move 180 degrees before dispensing leading to trashing of medicines which have been missed and then returning back to its normal position where the

medicines would be dispensed. After the stepper motor rotates and medicines dispensed, the collection tray would move forward for the user to take the medicines taking the servo to 0 degrees and after a delay would return back to its original position.

Step 1: The tray would be trashed for remaining medicines of misdosage.

Step 2: Medicines would be dispensed by Stepper motor rotation.

Step 3: The collection tray would move forward for the ease of the user.

Step 4: Here the user has to push a pushbutton confirming he took the medicines.

Step 5: If no confirmation, the patient's relative would be sent a message via GSM.

IV.   RESULTS

The results show that medicine is dispensed on time and respective compartment of medicines rotate on the exact time by putting up a delay. Medicine taking has been made error free for the elderly as the process involves total automation. Using the stepper motors the result has been fruitful and the medicine comes out exactly on the required time.
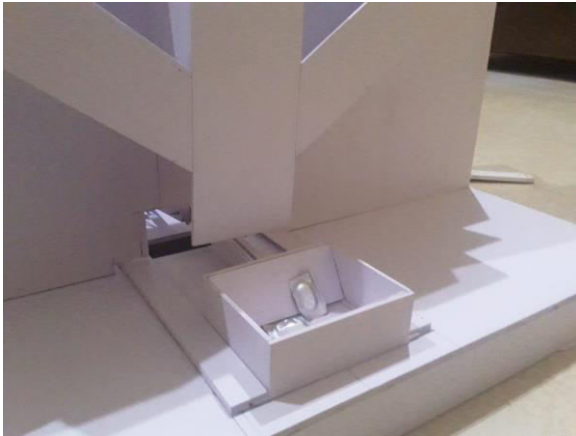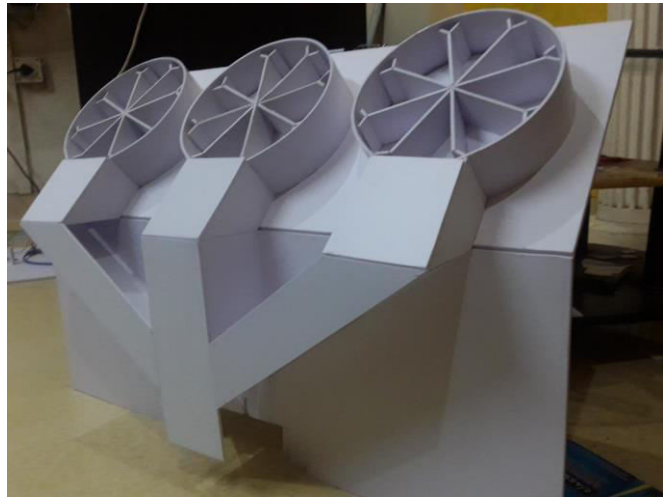

Fig 1: Required Medicines Dispensed   Fig 2: Respective Medicine Compartments

V.   CONCLUSION

The IoT based health assistant for the elderly has been a successful put up in reducing the medication errors of the elderly. The guardians of the patients can also be relieved by the trusted error free process of taking the medicines using the IoT based health assistant for the elderly. By adding health monitoring as well as AI to track the real time statistics of the medicines, this project has a good future scope in the healthcare sector.

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