

AUTOMATIC PILLS VENDING MACHINE

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Abstract— It is necessary to provide medication to the aged person in time. Automatic pills vending machine is designed specifically for users who take medications without close professional supervision. It relieves the user of the error-prone tasks of administering wrong medicine at wrong time. The major components of this medication dispenser are a microcontroller interfaced with a Motor Controller, an Alarm system, a multiple pill dispenser. The major objective is to keep the device simple and cost efficient. The software used is reliable and stable. Elderly population can benefit from this device as it avoids expensive in home medical care.

Keywords— *Dispenser, microcontroller, motor controller, IR Sensor.*

INTRODUCTION

Caring of the aged is of a serious concern in the developing countries. Family members are responsible for the care and management of the old aged person. In the modern age it is difficult for family members to be available all the time to support the aged people. Today, in our society most families are nuclear. Elderly would prefer to remain independent and their desire for independence in natural, but it is a worry for their children. Sometimes despite their best effort, the aged fail to remember to take their medication on time. Automatic pills vending machine is one such approach to help them take their medicines efficiently. As the cost of in home medical care rises, it has become more and more incumbent among individuals to opt for a device that effectively takes care of their medications. The automatic medicine dispenser serves the purpose.

METHODOLOGY AND IMPLEMENTATION

Details about the design of the automatic pills vending machine 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 pills vending machine. The Programmable automatic pills vending machine designed allows the care taker to reliably administer medications to the patient without needing to be present every time the medication is scheduled. This 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.

PROJECT DESCRIPTION

The proposed project uses electrical and electronic materials such as IR sensors, gear motor, RTC module, battery. This concept is composed of a microcontroller. It is a computer on a chip that is optimized to control the electronic circuitry. It also acts as the brain of the system. A sensor converts a physical parameter into a signal that can be measured electronically. It sends a signal to the microcontroller when a specified condition is encountered. The study is focused on the design and development of an automated drug dispenser. It can only dispense the number of pills based on the program built with an microcontroller. The machine automatically detects if the container of medicine is empty and alarms until the medicines taken from the slot. The system will focus only on the technological concept.

AUTOMATION

The term automation refers to a wide variety of systems and processors that operate with little or no human intervention. In modern automation systems, control is exercised by the system itself, through control devices that can sense changes in such conditions a rate flow and volume. It then commands

the system to make the adjustments to compensate for these changes. Most modern industrial operations are too complex to be handled manually or even machines under manual control. Automation developed as a result of advantages in the design of a machine. According to the International News Organization, although early machines were often complicated, most were designed to operate under a specific set of conditions. When these conditions changed, a manual adjustment was necessary to assure proper operation. This was not a major shortcoming since machines operated at relatively low speeds. During the Industrial Revolution, more sophisticated machines were developed and applied to situations requiring a faster response that was possible with manual adjustment. This led to the concept of automation.

MICROCONTROLLER UNIT.

A Microcontroller is a stand-alone single-chip IC that contains a CPU, read-only memory to store the program, RAM to store variables used in the execution of the program and various I/O buses to connect to the outside world such as SPI, I2C, and UART. It has to be programmed via an external interface to a PC. Arduino is a small microcontroller board with a USB plug to connect to the computer together with a number of connection sockets that can be wired up to external electronics, such as motors, relays, light sensors, laser diodes, loudspeakers, converters, transformers and RTC module. They can either be powered through the USB connection from the computer or from a 12V battery. They can also be controlled from the computer or programmed by the computer and then disconnected and allowed to work independently.

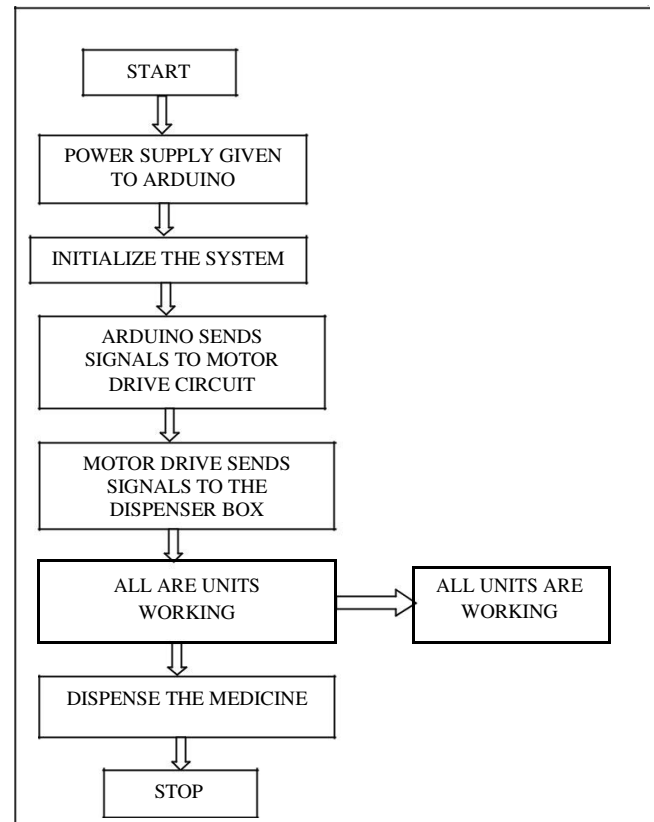
IR SENSOR

It consists of transmitter and receiver to detect the object according to adjustment of sensitivity. Transmitted light is received by receiver after reflection through an object. It works based on the reflected light incident on reverse biased IR sensor. When photons are incident on reverse biased junction of this diode, electron hole pairs are generated. As a result reverse leakage current is found. This IR sensor is also used for detecting the motor rotation, according to selection of an item and also the amount of an item.

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.

FLOW CHART



POWER SUPPLY

The power supply circuit will provide necessary power requirements for the Automatic pills vending machine. Design requirement is 12V DC for the microcontroller and converters. 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 2000mA. Also, the power supply may require battery backup to avoid loss of user input selections and time keeping functions.

PRODUCT EXCEPTIONATIONS

- i. An audio and visual alarm to notify patient that medication has been delivered.
- ii. A microprocessor controlled system that will automatically deliver medications at the preset time of a month.
- iii. Software that will monitor and record the time that medications have been taken by the patient.

- iv. Software that will automatically adjust future medication dispensation based on when the medication was taken by the patient.
- v. An Alarm system that will give permanent instructions about the medication to the patient.

CONCLUSION

The aim of the project was to test the effectiveness of the automatic pills vending machine in supporting peoples towards better self management of medication. It has been found that the dispenser can be programmed for 31 days for 21 different medicines. It is designed to send alarm whenever the patient requires medicine. It is possible programmable to dynamically change the number of times and the number of pills to be picked as per requirement. This would be evidenced by

- i. Improved quality of the life for people and their cares.

- ii. Increased capacity to remain independent at home and
- iii. Reduced reliance on health and social care services.

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