

MEDICINE VENDING MACHINE

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Abstract — In India there are still some rural areas, where there are no hospitals or medical facilities available. As we cannot put them behind in our advancing world, using today's technology we can help them to take care of themselves for small diseases without doctor's presence. Also when one journeys from long routes trains and highways and if suddenly his health condition becomes worse and there will be no hospitals or medical facilities available at such places. There are many medicines available in a market which can help in such situation but due to non-available to one at time of need, may cause a loss of life. Our system covers the development of a medicine vending machine intended for use in remote areas which provides basic medicine on the basis of symptoms. This system also provides information on the availability of medicines to the operator through SMS using GSM. This paper describes the design and implementation of medicine vending machine which takes the inputs from the keyboard and a medicine outlet mechanism using motors. The software will be programmed such as when the patient select's a particular option the person will be provided with that required option.

Key Words: Vending Machine, Global System for Mobile communication(GSM), Short Message Service(SMS)

1. INTRODUCTION

This Degrees of social status are closely linked to health inequalities. Those with poor health tend to fall into poverty and the poor tend to have poor health. According to the World Health Organization, within countries those of lower socioeconomic strata have the worst health outcomes. Health also appears to have a strong social component linking it to education and access to information. In terms of health, poverty includes low income, low education, social exclusion and environmental decay. The poor within most countries are trapped in a cycle in which poverty breeds ill health and ill health leads to poverty. Our project although may not be an out of the box idea in its entirety, it still could prove useful. Especially in developing countries like India where there are innumerable numbers of people who are unable to avail medicines. In this project the system will contain three medicines like medicines for fever, cold, headache.

Now-a-days in this fast moving world, appliances which are completely automatic are preferred. The system is fully controlled by a microcontroller. The microcontroller used in our project is Arduino Mega. The components used to build this machine are IR sensor which identifies when human walks in and then the voice module addresses them in their native language. LCD display is used to display details, a keypad 3 X 1 is used to select options. An Arduino Mega is used for all computations. Fingerprint sensor R305 is used for personal identification and also to finalize the medicines. GSM SIM 900 is used to indicate and report if the machine is about to run out of medicines.

In this project a kit will be provided with a keypad which inputs the sickness and age of the person to the micro controller. This micro controller (Arduino Mega) decides the medication for the person based on the inputs given by the person. Tablet delivering system is formulated by a Motor driver (L293D) and delivered using motors. Fingerprint of the person will be taken using biometric which provides data to doctors or pharmacist using GSM SIM900 if the same person is taking pills regularly and also informs them by sending SMS if medicines are about to finish. Please do not revise any of the current designations.

2. LITERATURE SURVEY

Automatic Medicine Vending Machine [1] proposed dispensing of medicines as per the user's requirements. A smart card reader was used as an input sensor. The input provided by the user through the keypad is then forwarded to the Microcontroller for processing and for taking the required decisions in order to proceed forward. The Microcontroller, with the help of the motor drivers, drives the concerned medicine cabinet having the medicine that the user needs.

Medicine Dispensing Machine [2] proposed the method of using the machine using a RFID tag. Then person have to put the tag in front of machine RFID reader then it will detect the RFID code of the person. When the code of both the tag matches then it will ask for quantities of the tablet or pills, then user have to put number for the pills

Automatic Medicine Vending Machine [3] used PIC micro controller. Dispenser box is made up of number of drawers which stored the medicine and drawer moves with the help of stepper motor. They used NFC card to store the data. First the user or patient have RFID tag, then person have to put the tag in front of machine RFID reader then it will detect the RFID code of the person. When the code of both the tag matches then it will ask for quantities of the tablet or pills, then user have to put number for the pills .this machine is basically offer for quantity of 2 tablets. when person enter the 1 or 2 pills quantity then motor driver will drive the two motors and from the pill box pills will come out.

Touch Screen Based Automated Medical Vending Machine[4] used a touch screen that enables the user to interact directly with what is displayed, rather than using a mouse touch pad or any other intermediate. IR Standard Technology was used in this project.

3. BLOCK DIAGRAM

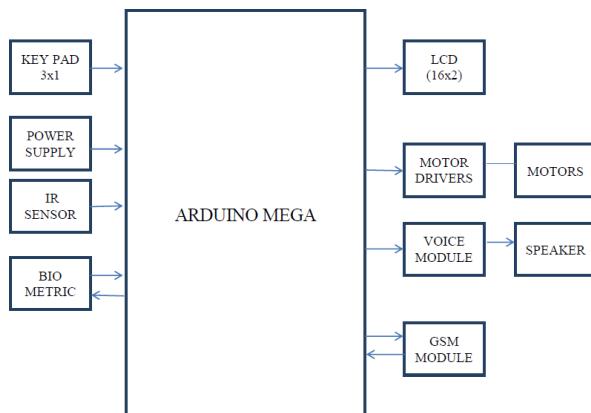


Fig.1. Block Diagram for Medicine vending Machine

Hardware Requirements:

- 1) Arduino Mega
- 2) L239D Motor Driver
- 3) GSM SIM 900
- 4) Biometric
- 5) Key Pad 3x1
- 6) IR Sensor
- 7) LCD
- 8) Speakers
- 9) Motors
- 10) Power Supply

ARDIUNO MEGA

The Arduino Mega is a microcontroller board which is based on the ATmega328. The Arduino is designed by taking the Mega and version 1.0 as the reference. The Mega is the updated in a series of USB Arduino boards.

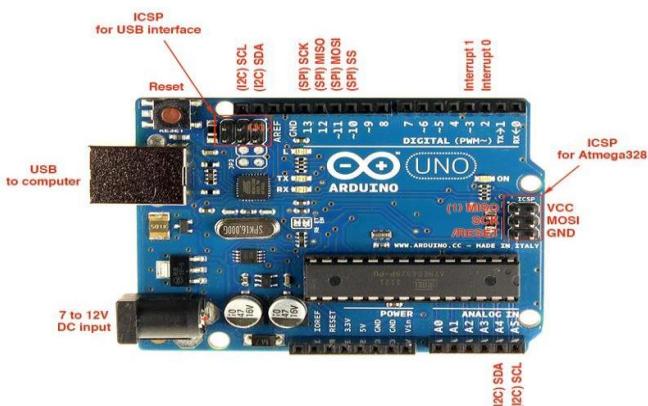


Fig.2. Arduino Mega

The Arduino Mega 2560 is a microcontroller board based on the ATmega2560. It has 54 digital input/output pins (of which 14 can be used as PWM outputs), 16 analog inputs, 4 UARTs (hardware serial ports), a 16 MHz crystal oscillator, a USB connection, a power jack, an ICSP header, and a reset button. It is inbuilt with all the necessary things required by a microcontroller. It can be used by connecting it to a computer or a laptop using a USB cable or else battery to start. We can also supply power using a AC-to- DC adaptor. 6 to 20 volts external supply can be given for the board but the recommended range is 7 to 12 volts.

L239D Motor Driver

L293D is a typical Motor driver or Motor Driver IC which allows DC motor to drive on either direction. L293D is a 16-pin IC which can control a set of two DC motors simultaneously in any direction. It means that you can control two DC motor with a single L293D IC.

GSM SIM 900

The SIM900 is a complete Quad-band GSM/GPRS solution in a SMT module which can be embedded in the customer applications.

Featuring an industry-standard interface, the SIM900 delivers GSM/GPRS 850/900/1800/1900MHz performance for voice, SMS, Data, and Fax in a small form factor and with low power consumption.

Biometric

This is a fingerprint sensor module with TTL UART interface for direct connections to microcontroller UART or to PC through MAX232 / USB-Serial adapter. The user can store the finger print data in the module and can configure it in 1:1 or 1:N mode for identifying the person. The FP module can directly interface with 3v or 5v Microcontroller. A level converter (like MAX232) is required for interfacing with PC serial port.

Key Pad 3x1

As three medicines are being provided by our system a 3x1 keypad is required.

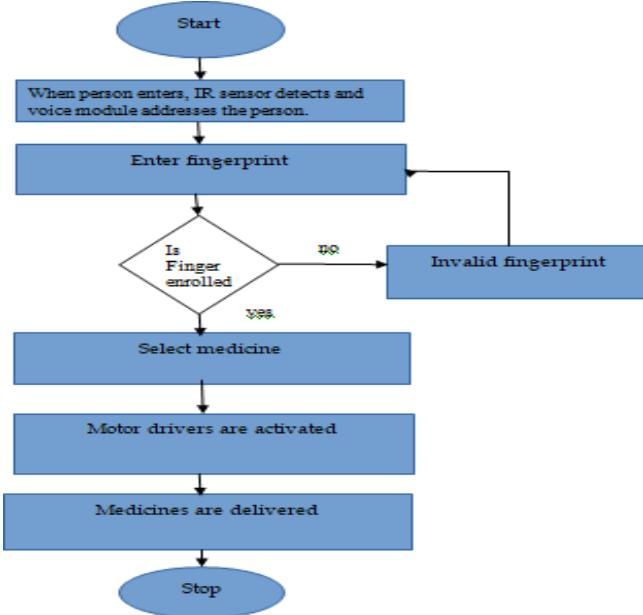
IR Sensor

Infrared Obstacle Sensor Module has built in IR transmitter and IR receiver that sends out IR energy and looks for reflected IR energy to detect presence of any obstacle in front of the sensor module. The module has on board potentiometer that lets user adjust detection range. The sensor has very good and stable response even in ambient light or in complete darkness.

LCD

A liquid-crystal display (LCD) is a flat-panel display or other electronically modulated optical device that uses the light-modulating properties of liquid crystals. In this project LCD is used to display the options to be selected by the customer.

4. FLOW CHARTS



5. HARDWARE RESULTS

It shows the schematic view of project titled "Medicine Vending Machine" which takes inputs from the users and delivers appropriate medicines. All the hardware components are interfaced as shown in figure below



Fig.3. Over view of Medicine Vending Machine

When power supply is given then the kit is on. The code required to detect the output is written in Arduino Mega IDE software. Due to the communication link between the Arduino Mega and IDE software the code is dumped into the Arduino Mega. When the power supply reaches the Arduino Mega and sensors then it wait for inputs from the user and works according to the input given by the user.

IR sensor detects when the person enters and voice module addresses the user as "Welcome to medicine vending machine".



Fig.4. Medicine Vending machine Display

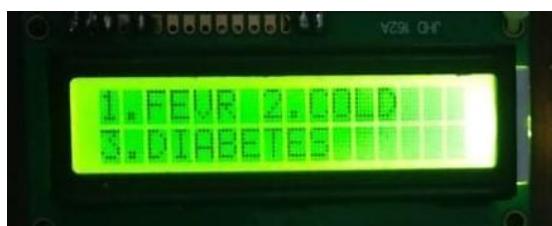


Fig.5. LCD displaying options

Then user is prompted to enter their fingerprint by pressing Key1. Then user will be asked to select one among the three options "Fever, Cold, headache". Then user will select one of the given options. Then motor driver according to selected option will rotate and dispense appropriate medicines.



Fig.6. LCD displaying selected options

6. CONCLUSIONS

As Result of this project people would be able to access the medicine vending machine 24x7. The Medicine Vending Machine provides medicine for general symptoms like fever, cold, headache. This machine can be installed at bus stations, railway stations and streets of the city. Drugs can be made available at any time. Each person accessing the machine would be given a unique ID using which the user can be identified. Unique ID is their finger print which is taken and recorded using fingerprint sensor. If medicines are about to finish then the machine will inform the pharmacist about it so that they can fill the machine with medicines. If the machine is used several times by a single person then information about that person will be sent to pharmacist so that misuse of machine can be avoided. Thus this vending machine will overcome the problem of unavailability of medical facilities at long routes train, highways, rural area etc. It can also be implemented at bus depots, railway station, and petrol pumps.

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