Automatic Water Dispenser Along With Mobile Charging

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ABSTRACT

This paper describes Liquid dispenser machine which is meant to be operated with IR coin module and mobile charging using RFID interfacing. The main part is control system which includes C programming in Arduino ATMEGA 328 microcontroller to control various components in system, a 28 pin microcontroller with LCD display. This project is very useful to people who are all using mobile phone without charging condition in public places so that they can re-activate a low battery or dead battery by simply plug in & charge it for one rupee. We are designing coin based dispenser machine which is going to dispense water according to the required amount and is turn off immediately, the major advantage here is there is no need for any mandatory person to take care about the system. This system can be placed at Hotels, Conference centers, Exhibition   halls, service offices, Shopping malls, Airports, Train terminals, etc.

Keywords : ATMEGA 328 Microcontroller, LCD Display, RFID, Coin Box, Motor Driver.

I.   INTRODUCTION

With the advancement in the technology, devices and machines that are useful to the mankind. One of them is coin operated telephone. As we know the function of it and it's working. With the same concept we are going to design a project based on liquid (water, cold drinks).Coin Operated Water Dispensing System as the name indicates it is based on COIN operation. This system is based on micro controller. Coin detecting mechanism is used to detect the coin when inserted and sent a corresponding signal to signal conditioning unit that converts the incoming signal into square pulse and then given to microcontroller.

In the RFID based charger the user has to plug in the phone into one of the adapters and swap RFID card for charging at constant current for a definite time period. The microcontroller used is ATMEGA 328 which is a type of reprogrammable micro-controller programmed. Driver   circuit consists relay, which acts as a switch to turn ON and OFF .The relay output is directly given to the mobile charger pin. The different mobile charger requires different pin size. This project is divided into two major parts; hardware and software. Hardware part includes   the electronic circuit the software part includes the programs written in the embedded C.

BLOCK DIAGRAM
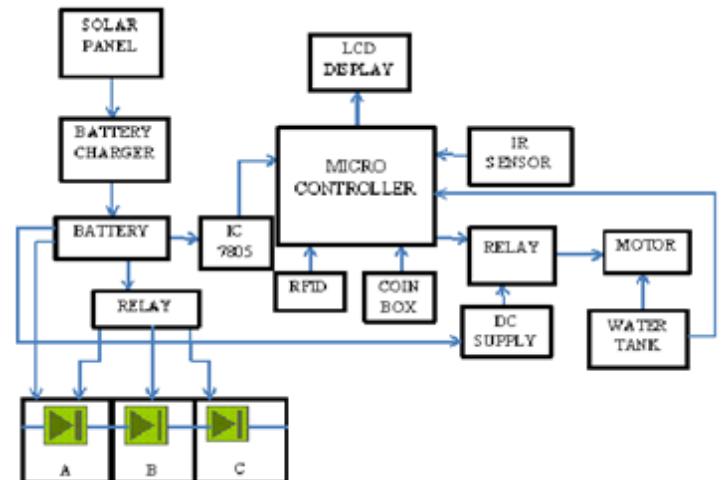
Figure 1. Block Diagram

Block diagram description-

Above block diagram shows the Coin Based Water dispenser and Mobile Charger using RFID.

POWER SUPPLY

SOLAR PANEL

To provide power supply regularly, we are using Solar Panel, DC Power Supply, and Battery. Solar Panel provide DC power supply to charge the rechargeable battery otherwise Grid supply provides DC 12V to charge the battery which means two standby power supplies are used here.

INPUT

When a coin is inserted in a coin box made up of one transmitter and receiver, the interruption occurs in the sensor mechanism then command signal will be send to the microcontroller.

Also when the card is swapped, it is detected by microcontroller and then the signal is sent to relay for mobile charging.

RFID is a radio frequency identification that uses electro-magnetic energy as a medium for communication purpose. The basic components reader and transponder are connected to microcontroller. Transponder receives a radio signal and automatically transmits different signal. When the transponder receives a signal from reader unit, it responds by transmitting its unique identification code.

CONTROLLER

Microcontroller works only when the command is received from RFID card or coin box. LCD displays the content given by microcontroller. Controller gives command signal to relay to switch ON or OFF.

OUTPUT

The supply from relay is given to the motor driver which sends signal to water tank. When the bottle is sensed by the IR sensor water starts flowing. Even if we insert coin and the bottle is not placed we will not get any output (water).

The supply from relay is given to the mobile charger pin and the charger will be ON only when the RFID card is swapped. It gives 4.8V & 1500 mA power to the mobile battery.

FLOW CHART
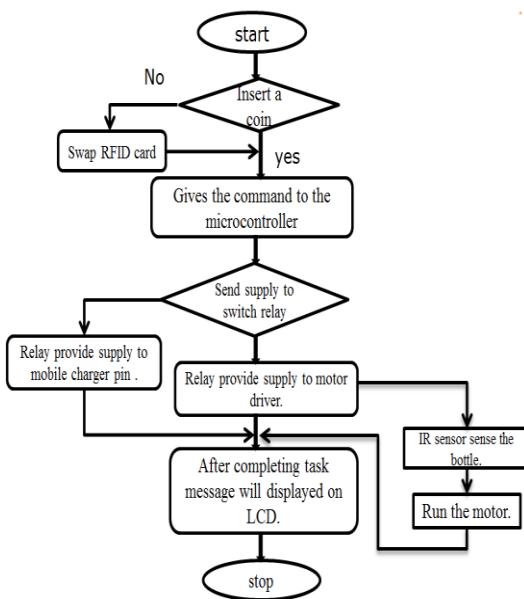
Figure 2. Flow Chart

COMPONENTS

ARDUINO ATMEGA 328

Arduino/Genuino Uno is a microcontroller board based on the ATMEGA 328P. It has digital input/output pins, 6 analog inputs a 16 MHz quartz crystal, a USB connection, a power jack, an ICSP header and a reset button.To support the microcontroller it contains everything needed, simply connecting it to a computer with a USB cable or power it with an AC-to-DC adapter or battery to get started. You can thinker with your UNO without worrying too much about doing something wrong, worst case scenario you can replace the chip for a few dollars and start over again.
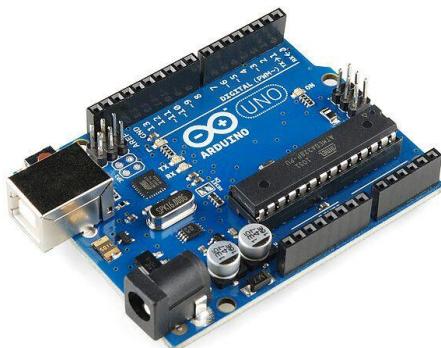
Figure 3. Arduino ATMEGA 328 kit

LCD DISPLAY

The system uses 2-line, 16 character LCD display as shown in figure 4. It has 4 bit interface. It is relatively easy to use once you have it mapped into your processor's memory mapped I/O. Then Characters need to send to display; they show it up on the screen.

Figure 4. LCD Display

RELAY

A relay as shown in figure 5 is an electrically operated switch. An electromagnet is used in relays to operate a switch mechanically, but also other operating principles such as solid state relays are used. Relays are used where it is necessary to control a circuit by a low-power signal. The first relays were used in long distance telegraph circuits as amplifiers; they repeated the signal coming from one circuit and re-transmitted on other circuit. Relays were used extensively in telephone exchanges and in early computers to perform logical operations.

Figure 5. Relay

IR SENSOR

An Infrared sensor as shown in figure 6 is a sensor which is able to detect the presence of nearby objects without any physical contact.

An Infrared sensor emits an infrared signal or an electromagnetic radiation (infrared) and looks for a change in the field. The object being sensed is often referred to as the Infrared sensors target that demands different sensors. For example, a capacitive or photoelectric sensor are suitable for a plastic target; an inductive proximity sensor always requires a metal target. The maximum distance the sensor can detect is called as "nominal range". Some sensors have adjustments of the nominal range or means to report a graduated detection distance. With the absence of mechanical parts and lack of physical contact between sensor and the sensed object, infrared sensors may have high reliability and long functional1 life.
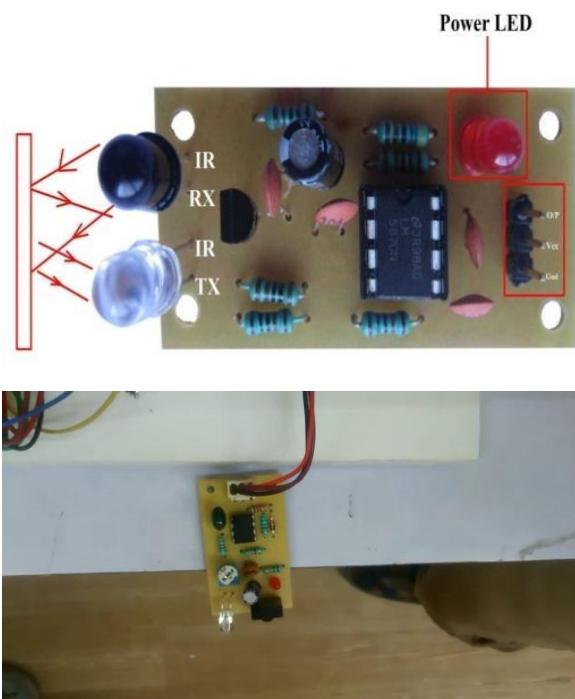

Figure 6. IR sensor

II. RESULT

In this paper we represent mobile battery charging using solar power for rural & semi urban areas where the Grid power supply is not easily available. This paper is very useful in day to day life because nowadays every person wants to be in connection with each other. But every time we cannot carry charger with us or we may forget to carry mobile charger for long drive. Then this device is very useful.

Also one can get water easily through water dispenser available at public places such as Railway Stations, Bus Stands, Airports, etc.

III. CONCLUSION

Thus we have worked on the project coin based water dispenser and RFID based mobile charging as per above algorithm and block diagram shown.

IV. REFERENCES

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