

Automatic Paid Charging System

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Abstract

As our world is facing the problem of charging the mobile phones, laptops and many electronic gadgets. Many times when we are at public place like Bus stand and railway station we often face a problem of battery failure and became in a condition of missing the important calls. All wants to charge their cell phone or laptop as well at any cost but because of unavailability of power we often became disappoint .The project satisfies the today's era's people demand. By installing this project which provides facility after paying, the government as well as the common public will be highly comfortable because the government needs finance and the common people need fulfillment of demand. The Heart of the above project is AT89S52 microcontroller. Totally the project is based on microcontroller and coin system. The user has to put a coin of 1 Rs. in this machine to get the charging facility for their accessories. For this project the work already has been done that some of the adaptors are made but they can also loose their charging at any time. This project finds application at all the public places where people generally need the service of charging their accessories. The system can be installed anywhere with a little modification where we need service in response of paid money.

Keywords: Automatic, AT-89S52, Mobile –Phones.

Introduction

Automation is the use of control systems and information technologies to reduce the need for human work in the production of goods and services. Mobile phones are becoming most essential in this era for multiple purposes. This enhances the uses of mobile phones and multiple gadgets and their demand in the society. More we use these mobile phones more the usage of energy requiring frequent charging. Tourists, students, citizens etc. are using public transportation which become the eventual customers for mobile phone charger service. Automatic paid charging system which is based on coin system brings a useful solution for travellers who need to charge their mobile phones immediately [1]. This time can be a wonderful utilization of charging mobile phones with the help of coin insert mobile charger with high security and efficient charging. The customers have to set the time for which they need to charge their phones and pay the coin accordingly [2]. This technique can be use in many areas like bus stands, market, colleges, airports, stations, etc. Programming of Arduino is completed in Arduino IDE[3]. A convenient microcontroller is programmed for all the applications like controlling, insertion, charging, etc. The primary source for giving charging is obtained from direct power source and can be solar energy in case of unavailability of power[4].

How to charge mobile

In this system we have to put a coin in the machine which will be installed at the public places. It has multi-pin charger point. When we put a coin it will be detect by an IR sensor which is infrared sensor. The IR sensor pair plays an important role in the sensing unit mechanism. Then by sensing of that coin the power will be supplied to that charging port for some duration of time[5]. We can charge our any mobile it also has a facility to charge the machine like laptop. Whenever the coin is inserted in the machine the IR sensor in which one is transmitter and the other is receiver sense the coin and it automatically will give signal to the microcontroller and microcontroller in turn will activate the relay so that it can make the connection for the ac voltage. The ac voltage will turn on the charging the device at the end point may be it is mobile phone or laptop [1].

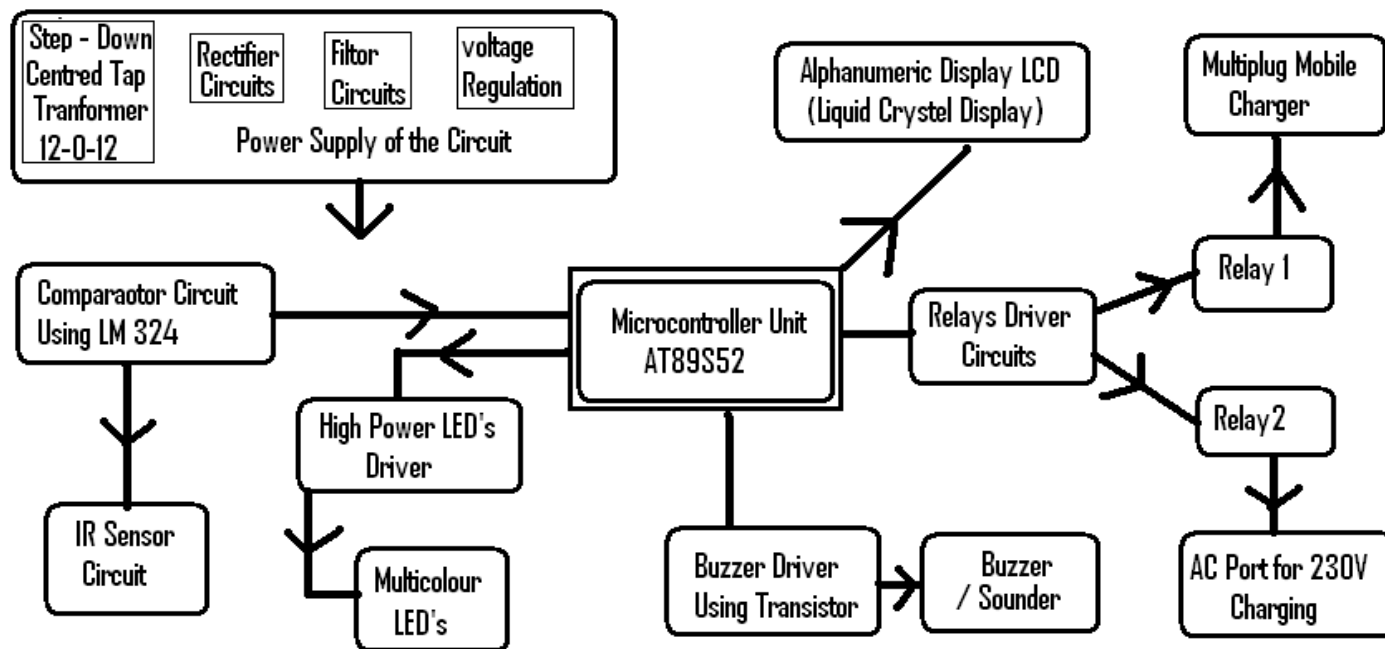


Fig. 1 : Block diagram

Implementation and simulation results

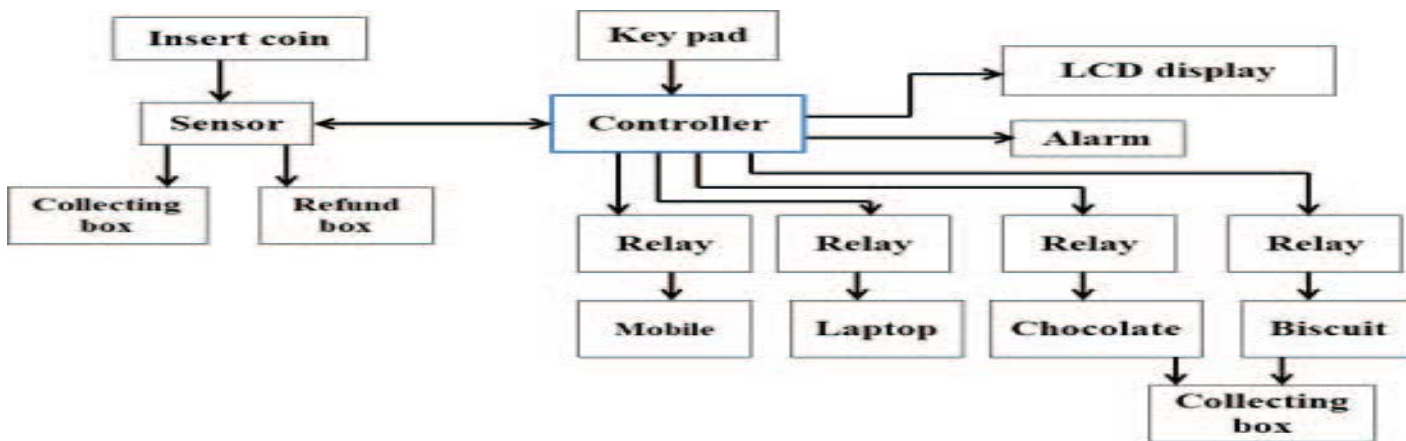


Fig. 2 : Block diagram

- Block diagram is consist of three parts:-
- Input and controller

- Display and alarm
- Output unit

1) Input and controller

In the input part the sensor controller, keypad, collector and refund box are connected. Firstly customer inserts the coin and it will be checked by the sensor. In actual sensor is nothing but a load cell which is used for digital wait machine. This cell detects the weight of Rs.5 coin and produces some amount in voltage [5]. His cell detects the weight of Rs.5 coin and produces some amount in voltage [5].

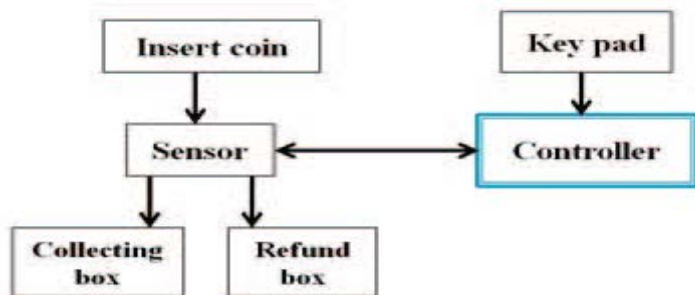


Fig.3: Input and controller part

This system is totally based on AT89S52 microcontroller and coin system. Controller is top most part of our project. It used to control relay by applying gate pulse.

2) Display and alarm

The LCD display used is of 8x2 in measurement. All the required messages are displayed on LCD display. This display like “put a coin”, “times starts” and “time elapse” act. All the displayed messages are preprogram on controller and work as per the requirement[5]. To ensure security purpose alarm is used whenever there is any redundancy in coin the alarm badged and after the completion of charging too[5].

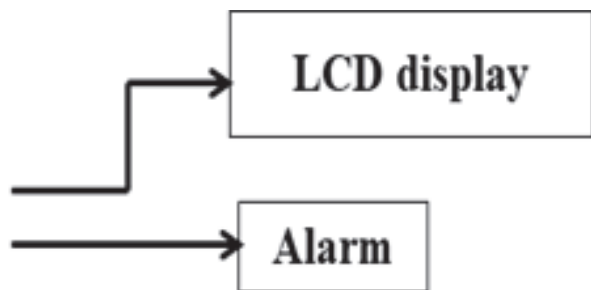


Fig. 4: Display and alarm

3) Output unit

The output unit includes the charging probes and collecting and refunding box. After the detection of coin user have to select any option. If user selects any of the buttons the conversion ac into dc takes place which is used to give the power to charging[5].

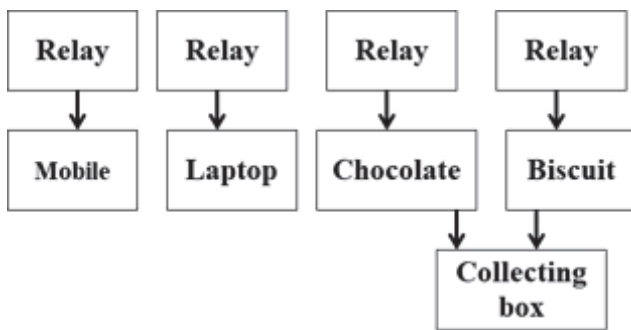


Fig. 5: Output Unit

Components

1) AT89S52 Microcontroller

This microcontroller is also known as 8085 microcontroller. 8085 is an 8 bit microprocessor, design by intel with the help of ANMOS technology. It is consist of accumulator, arithmetic and logical unit, general purpose register, program counter, stack counter, temporary register, flag register, timing and control unit, instruction register and decoder,interrupt control, serial input/output control address bus and data bus etc.

2) Step down transformer

This step down transformer is used to step down the 230V to 5V. As we know that the all the electronic equipment could not work on 230V as it is so high so we use step down transformer for 5V AC

3) AC to DC converter

The current will enter in the primary of transformer and induces the current in secondary coil which has small no of coil and results into lower voltage. In this process little amount of power is lost because the amperage increases with decrees in voltage. This rectifier usually consists of four diodes bridge rectifier mannered in diamond shape. This diode allows only current to following one direction. Two diodes are used to pass positive half cycle and two diode are used to pass negative half cycle. The output of smoothing capacitor connected to this rectifier is some what study voltage will ripples.

4) Relay

In our project charging system the relay used when there is time elapse after completion of one time charging. In other word we can say when charging is completed by one customer the relay will trip and the circuit is break with charging port.

5) Crystal oscillator

Crystal oscillator is used because microcontroller one pin is connected to oscillator.

Working of automatic paid charging system

The automatic paid charging system which is based on coin insertion has two components which function has heart and brain of the system. AT89S52microcontroller is brain of the system and is interfaced with all the components via its 40pins. This microcontroller is programmed in way so it takes input from the coin insertion equipment and on the bases of that insertion of coin it defines time for which the mobile phone will be charged[2].

When we put coin in the insertion machine the LCD shows the message to charge the phone. The coin insertion machine is totally based on image processing principle. Once the customer insert a coin for specific time it will be sensed by IR

sensor and it will be give the message to the microcontroller to control the whole process of charging. Hence the whole system of charging works reliably and efficiently with the use of all these principles and concept[2].

Application

- 1) It has wide range of application on railway station, bus stops, toll nakas and metro stations[3].
- 2) It should be implemented in villages which are suffering from power cut off[3].
- 3) This machine can also use as vending machine[5].

Advantage

- 1) It is reliable, less expensive, reduced man power, and simple in use[4].
- 2) It is more useful to save energy from sun light and can intelligently track solar energy[4].
- 3) This system of mobile battery charger can conveniently install outside the business premises[3].

Conclusion

In our project, a best method of charging mobile phones of different manufacture using microcontroller design for both rural and remote areas where supplement of electric power not sufficiently available[4]. Different stages were planned for the system and finally the system was implemented with the help of this coin based charging system various sub goals achieved like communication between numerous components, detection of coin charging of phones etc.

Future scope

As we have discussed in earlier sections there is need of different enhancements which leads to future scope of respective system . Different sensor has been implemented for particular type of coin and it will be useful for many areas. This system is very useful in many areas that can be rural or remote areas.

References

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