

MOBILE CHARGER USING COIN INSERTION**¹Ms. Kalaburgi V.S., ²Mr. Ghanshyam Waghmode, ³Mr. Kalaburgi Samarth**

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kalaburgivaisha@gmail.com**ABSTRACT**

Mobile phones have become one of the most important communication devices in modern society. People use mobile phones for communication, internet access, online banking, education, entertainment, emergency services, and many other daily activities. Due to continuous usage, mobile batteries discharge quickly and require frequent charging. In many public places such as railway stations, bus stands, airports, hospitals, shopping malls, colleges, and tourist locations, users often face difficulties in finding charging facilities during emergencies. To overcome this problem, the project titled "Mobile Charger Using Coin Insertion" is proposed.

The proposed system is an automated mobile charging station that allows users to charge their mobile phones by inserting coins into the machine. The system is designed using embedded system technology, microcontrollers, power supply units, relay circuits, coin acceptor modules, charging ports, timer circuits, and display units. The charging process begins when a user inserts a valid coin into the coin acceptor mechanism. The coin acceptor validates the coin and sends signals to the microcontroller. After successful validation, the controller activates the relay circuit and enables the charging ports for a predefined time duration.

The system provides a regulated power supply suitable for charging various mobile devices safely. Different charging durations can be assigned according to the inserted coin value. The timer circuit continuously monitors charging time and automatically disconnects the power supply after the specified duration is completed. This automated operation reduces power wastage and improves charging safety.

The proposed system offers many advantages such as low power consumption, easy operation, reduced human effort, automatic charging control, portability, and cost effectiveness. The system is especially useful in public utility applications where people require temporary charging support during travel or emergency situations. The charging station can support Android mobile phones, USB-powered devices, and other rechargeable electronic gadgets.

The implementation of the system combines both hardware and software technologies. The hardware section consists of coin acceptor modules, relay drivers, regulated power supply circuits, charging ports, microcontrollers, display units, and protection circuits. The software section controls timing operations, relay activation, charging duration, and system monitoring functions.

INTRODUCTION

A Mobile Charger Using Coin Insertion System: The coin-based mobile charging system is designed to provide automated charging services for mobile phones in public places. The system acts as a self-service charging station capable of charging mobile devices after coin validation.

The charging system consists of a coin acceptor unit, microcontroller, timer circuit, charging ports, display unit, and regulated power supply. The coin acceptor detects valid coins and sends signals to the controller. The microcontroller activates the charging system for a fixed duration based on the inserted coin value.

The recent advancements in embedded systems and automation technologies have facilitated the development of smart public utility systems. Coin-operated charging systems help users charge mobile devices during emergencies or travel situations.

The mobile charging system plays an important role in public service applications. The system allows users to charge different types of mobile phones without requiring human supervision. The automated charging mechanism improves service efficiency and reduces operational costs.

The mobile charging system is challenging because it requires synchronization of coin detection units, charging circuits, timer control systems, and protection circuits. The system should provide safe charging operation and prevent electrical overload conditions. Despite these challenges, modern microcontroller technologies have made automated charging systems highly efficient and reliable.

LITERATURE SURVEY

Coin-operated systems are widely used in vending machines, ticket machines, public utility systems, and charging applications. Researchers have proposed different coin-based charging systems capable of providing automated mobile charging services.

Some researchers developed coin-operated mobile charging systems using Arduino and microcontroller technologies for public applications. These systems provide charging facilities with low power consumption and efficient timing control.

Other researchers proposed smart charging systems integrated with GSM and IoT technologies. These systems help users monitor charging duration and system status remotely.

Researchers also developed coin validation systems using sensors and coin acceptor modules that identify valid and invalid coins accurately. The systems provide automatic charging activation after successful coin detection. Several charging systems are developed using timer circuits and relay modules to improve charging safety and control charging duration. These systems help users charge devices efficiently and securely.

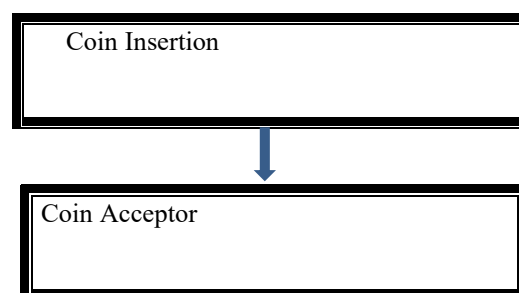
Embedded systems and automation technologies are increasingly used in mobile charging applications. Microcontrollers and power management systems help the charging system operate automatically and provide regulated charging output.

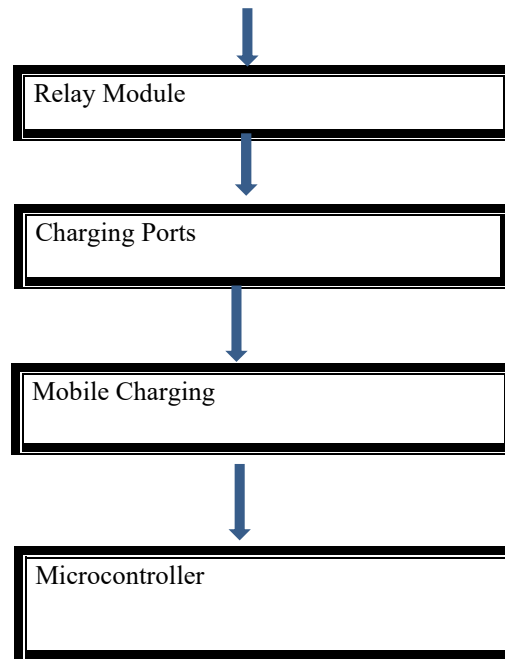
From the literature survey, it is observed that coin-operated charging systems are becoming important in public utility applications. These systems provide smart charging solutions, reduce manual operations, and improve service availability.

IMPLEMENTATION & WORKING

The below figure shows the complete block diagram of the Mobile Charger Using Coin Insertion System including components like coin acceptor, microcontroller, relay module, charging ports, power supply, and display unit.

Block Diagram





The mobile charger using coin insertion system works by detecting coins inserted into the coin acceptor module.

The microcontroller receives the signal from the coin acceptor and activates the charging circuit.

The charging duration depends on the inserted coin value. The relay module controls power supply to the charging ports. After completion of the predefined charging time, the system automatically disconnects the charging supply.

The charging system can support:

- Android mobile charging
- USB charging devices
- Emergency charging applications
- Public utility charging stations

The system continuously monitors charging operation and timer conditions.

METHODOLOGY

Public charging systems have become important in modern electronic and communication applications. With the advancement of embedded systems and automation technologies, coin-operated charging systems are increasingly used in public places. The Mobile Charger Using Coin Insertion system is designed to provide automated charging services through coin validation mechanisms.

The charging system uses coin acceptor modules, microcontrollers, relay units, timer circuits, and regulated power supplies to provide controlled mobile charging services. The microcontroller stores charging duration information and controls charging operation automatically.

The charging process is controlled using programmed timing sequences. The controller continuously monitors the inserted coin value and activates the charging ports accordingly. Protection circuits are used to provide safe charging operations.

Now the charging system starts providing charging supply according to predefined timing instructions. The charging ports provide regulated voltage and current for mobile devices.

Step 1 : The microcontroller initializes all charging ports, relay modules, and coin acceptor systems.

Step 2 : The user inserts a valid coin into the coin acceptor module.

Step 3 : The coin acceptor validates the inserted coin and sends signals to the controller.

Step 4 : The controller activates the relay module and enables charging ports.

Step 5 : The charging timer starts counting predefined charging duration.

Step 6 : The mobile device receives charging supply through USB charging ports.

Step 7 : After completion of charging duration, the controller disconnects the charging supply automatically.



Fig : Mobile Charger Using Coin Insertion

CONCLUSION & RESULT

This demonstrates that the Mobile Charger Using Coin Insertion system is efficient, reliable, and user-friendly. The system can be used in railway stations, bus stands, shopping malls, hospitals, colleges, and public utility applications.

The mobile charging system successfully provides charging facilities after valid coin insertion and provides safe charging operation. The system provides automatic timing control and efficient charging performance.

By successful completion of this work, it was concluded that embedded systems and automation technologies can significantly improve public utility systems. Coin-operated charging systems can assist users in charging mobile devices conveniently without human supervision.

The system worked well in local environments and responded according to expectations. The implemented system uses coin acceptor modules, relay units, charging circuits, microcontrollers, and power management systems to create a smart charging solution.

Charging system technology can be further improved using digital payment systems, IoT technologies, mobile applications, and wireless charging systems. The proposed system contributes toward the development of intelligent automated public utility systems.

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