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SMART POWER GENERATOR

SAYALI KULKARNI¹, NIDHEE KUMARI², IRFAN SHAIKH³ & PROF. SEEMA PATIL⁴

¹²³⁴ Department of E & TC, Nutan Maharashtra Institute of Engineering and Technology, Talegaon, India.

ABSTRACT- Renewable energy solutions are becoming increasingly popular. Maximizing power output from the solar system is desirable to increase efficiency. In order to maximize power output from solar panels, one needs to keep the panels aligned with the sun. As such, a means of tracking the sun is required. Here, a prototype for a microcontroller – based multi - function solar tracking system is presented, which will keep the solar panel align technique will help conserve our natural resources.. As the conventional sources are depleting very fast, it's high time to think of alternative resources. We got to save the power gained from the conventional sources for efficient use. So this idea not only provides alternative but also adds to the economy of the country.

Keywords- Mobile, Solar Energy, Speed breaker. Solar panel, Battery, Microcontroller, LCD.

INTRODUCTION

The growth of mobile phone market is phenomenal in recent years and the need for charging the mobile battery is required. In many rural areas the power is not available for few hours to several hours while in urban areas the batteries get drained at the end of the day .A coin based universal mobile battery charger is designed and developed in this paper. Solar chargers convert light energy into DC current for a range of voltage that can be used for

charging the battery. They are generally portable but can also be mounted. In this project, the design and development of a coin based universal mobile battery charger based on main power and solar power is discussed and this is primarily for rural areas where the mobiles are basic needs for the people.

The coin-based mobile battery charger developed in this paper is providing a unique service to the rural public where grid power is not available for partial/full daytime and a source of revenue for site providers. The coin-based mobile battery charger can be quickly and easily installed outside any business premises.

The mobile phone market is a vast industry, and has spread into rural areas as an essential means of communication. While the urban population uses more sophisticated mobiles with good power batteries lasting for several days, the rural populations buy the pre-owned mobile phones that require charging frequently.

Many times battery becomes flat in the middle of conversation particularly at inconvenient times when access to a standard charger isn't possible. The coin-based mobile battery chargers are designed to solve this problem. The user has to plug the mobile phone into one of the adapters and insert a coin; the phone will then be given a micro-pulse for charging. It does not bring a mobile from 'dead' to fully charged state.

A. Objective of the Project

- i. Provides a public mobile charging service.
- ii. Use of non-conventional energy.
- iii. Less energy consumption.

PROPOSED PROJECT

A. Description

The mobile battery charger starts charging a mobile connected to it when a coin is inserted at the coin insertion slot at the input stage. The type of coin and the size will be displayed at the LCD display for the user so as to ensure correct coin insertion. Any other coin, if inserted in the slot will be returned to refund box. A sensor attached to the coin insertion slot accepts the coin into the battery charging unit and start charging the mobile battery for a specific period controlled by the software of the microcontroller. The resistance of the sensor decreases when IR (infrared) light falls on it. When the coins obstruct the IR light falling on a sensor, it sends a pulse to the control unit authorizing the start of charging the mobile battery connected to the device. Two IR sensors are used for positive authentication of the charging process.

B. Hardware Description

The hardware components required are micro controllers, lcd, relay, motor driver IC, battery, solar panel, voltage regulator, motor, load.

1) **Microcontroller:** PIC is a family of modified Harvard architecture micro-controllers made by Microchip Technology, derived from the PIC1650. All current models use Flash memory for program storage, and newer models allow the PIC to reprogram itself. Program memory and data memory are separated. Data memory is 8-bit, 16-bit and in latest models, 32-bit wide. Program instructions vary in bit-count by family of PIC, and may be 12, 14, 16, or 24 bits long. The instruction set also varies by model, with more powerful chips adding instructions for digital signal processing functions. The hardware capabilities of PIC devices range from 8-pin DIP chips up to 100-pin SMD chips, with discrete I/O pins, ADC and DAC modules, and communications ports such as UART, I2C, CAN, and even USB. Low-power and high-speed variations exist for many types.

2) **Relay**

Relay is auto switching device. It is used to charge mobile when coin insert in box.

3) **Rectifier**

A rectifier is an electrical device that converts AC to DC, which flows in only one direction. The process is known as rectification. Semiconductor diodes silicon controlled rectifier and other silicon based semiconductors switches. Rectifier is many uses DC power supplies and high voltage direct current power transmission system.

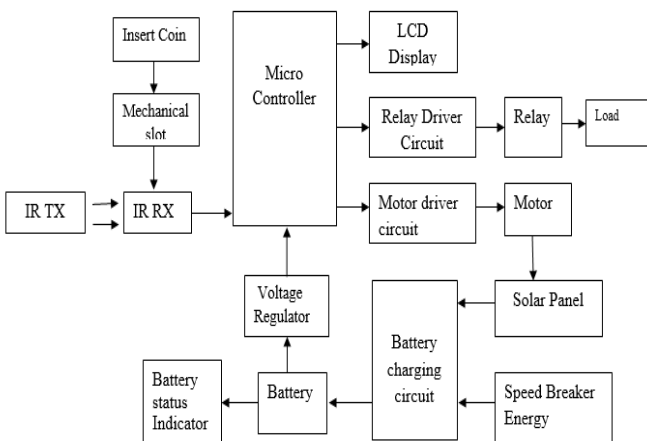


Fig.1. Detailed Block Diagram

4) Regulator

Regulator is a device used to control the speed by varying the input voltages.

5) Battery

Batteries store energy being produced by given generating source and when this source is unavailable this energy can be used by loads. The inclusion of storage in any energy generating system will increase the availability of the energy.



Fig.2. Battery

C. Software Description

Proteus 8 is best simulation software for various designs with microcontroller. It is mainly popular because of availability of almost all microcontrollers in it. So it is a handy tool to test programs and embedded designs for electronic people. You can simulate your programming of micro controller in Proteus 8 software.

D. Flow of Project

1. Generate energy from solar and speed breaker.
2. Store the energy into battery.

3. Battery output is given as the input to microcontroller.

4. Detect the coin through IR sensor.

5. After detection of coin charge the mobile for 60 seconds.

E. Specifications of the Project

The hardware and software used in the project and its specifications are described as follows.

1. Supply voltage = 12v
2. Current = 500ma approx.
3. Power consumption = Depends upon load

PROPOSED WORKING

A. Concept of Solar Panel

Solar panels are devices that convert light into electricity. They are called solar after the sun or "Sol" because the sun is the most powerful source of the light available for use. They are sometimes called photovoltaic which means "light electricity".

Each solar cell provides a relatively small amount of power, many solar cells spread over a large area can provide enough power to be useful. To get the most powerful, solar panels have to be pointed directly at the sun. Solar cells or photovoltaic cells rely on the photovoltaic effect to absorb the energy of the sun and cause current to flow between two oppositely charge layers.

B. Coin Based Mobile Charger

The mobile battery charger starts charging a mobile connected to it, when a coin is inserted at the coin insertion slot at the input stage. The type of coin and the size will be displayed at the LCD display for the user, so as to ensure correct coin insertion. Any other coin, if inserted in the slot will be returned to refund box. A mechanical slot is attached with electrical

triggering in coin insertion slot, if the correct coin is inserted; it sends a pulse to the control unit authorizing the start of charging the mobile battery connected to the device. Then the coin insertion slot accepts the coin into the battery charging unit and start charging the mobile battery for a specific period controlled by the software of the microcontroller

C. Concept of Speed Breaker.

In this the mechanism of electricity generation from speed breakers. The friction force due to vehicle movement acted upon the speed breaker system is transmitted to chain sprocket arrangements. The sprocket arrangement is made of two sprockets. One of the sprocket is larger in dimension than the other sprocket. Both the sprockets are connected with chain which transmits the power from the larger sprocket to the smaller sprocket. As the power is transmitted from the larger sprocket to the smaller sprocket, the speed that is available at the larger sprocket is relatively multiplied at the rotation of the smaller sprocket. The axis of the smaller sprocket is coupled to a gear arrangement. Here we have two gears with different dimensions. The gear wheel with the larger diameter is coupled to the axis of the smaller sprocket. Hence, the speed that has been increased at the smaller sprocket wheel is passed on to this gear wheel of larger diameter. The smaller gear is coupled to the larger gear. Therefore, as the larger gear rotates it increases the speed of the smaller gear which is following the larger gear and multiplies the speed to more intensity. Though the speed due to the rotary motion achieved at the larger sprocket wheel is less, as the power is transmitted to gears, the final speed achieved is high. This speed is sufficient to rotate the rotor of a generator and is fed into the rotor of a generator. The rotor which rotates within a static magnetic stator cuts the magnetic flux surrounding it, thus producing the electric motive force (emf). This generated emf is then sent to an inverter, where the generated emf is regulated. This

regulated emf is now sent to the storage battery where it is stored during the day time and can be used in night time for providing power to street lights.

RESULTS

In this paper a novel method of charging mobile batteries of different manufacturer using solar power has been designed for rural and remote areas where the current supply is not at all available all the time. In this paper we represent mobile battery charging using solar power for rural & remote areas where the Grid power supply is unavailable. This paper is very useful in day to day life because now-a-days every person wants to connected 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. Hence with the help of switching we can charge our battery either with solar or by speed breakers. The switching is done manually.

CONCLUSION

We can conclude that this system is effectively used for charging of mobile phones having low cost. We can use this system at any public place. This system can be more useful in rural areas which are suffered because of electricity problems. In this project we discover technology to generate electricity from speed breakers in which the system used is reliable and this technique will help conserve our natural resources. In coming days, this will prove a great boon to the world, since it will save a lot of electricity of power plants that gets wasted in illuminating the street lights. As the conventional sources are depleting very fast, it's high time to think of alternative resources.

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**Address:- Dr. Ashak Hussain Malik House No-221, Gangoo Pulwama - 192301
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Ph No: 01933212815**

**Email:- nairjc5@gmail.com, nairjc@nairjc.com , info@nairjc.com
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