Multiway Mobile Charging

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Abstract— We all know everywhere there is huge scarcity of energy and for running most of our appliances and to carry out daily work we need electricity. It is really very difficult to imagine our life without electricity, our life would really stop so there is high need to produce electricity at faster rate and find some other feasible method to produce electric energy. On the other hand we see that in this modern world there is lot of noise pollution in roads, airports, industries. Thus to convert this noise pollution into electric energy in our project we have decided to develop new method for generating electricity i.e. generates electricity form sound, pressure and from radiated light and generated energy is stored in battery .we can use this stored energy for any application like mobile charging etc.

Keywords -– piezoelectric sensor, photovoltaic sensor, pressure sensor, microcontroller, battery, mobile charging unit.

I. INTRODUCTION

IN our project we have decided to develop new method for generating electricity i.e. generates electricity form sound, pressure and from radiated light.

A. CONVERTING SOUND ENERGY TO ELECTRIC ENERGY

Sound is a mechanical form of energy which travel in the form of wave, mechanical wave that is an oscillation of pressure this pressure created by the sound could be used to convert it into electric energy or other form of energy. Also according to law of thermodynamics mechanical energy could be converted into electricity. Piezo material converts mechanical strain into electric energy this property of piezo material could be used to make a device which would be able to sustainably convert the sound energy to electric energy as piezo material convert sound energy to electric energy.

Transducer is also used to convert Mechanical energy to electric energy i.e. it can convert sound energy to electric energy the simple e.g. of use of transducer to convert sound to electric and vice versa is in speakers, headset...also it could be converted into electric energy by other methods which we will see in the paper.[5]

B. CONVERTING RADIATED LIGHT ENERGY TO ELECTRIC ENERGY

A typical silicon PV cell is composed of a thin wafer consisting of an ultra-thin layer of phosphorus-doped (N-type) silicon on top of a thicker layer of boron-doped (P-type) silicon. An electrical field is created near the top surface of the cell where these two materials are in contact, called the P-N junction. When sunlight strikes the surface of a PV cell, this electrical field provides momentum and direction to light-stimulated electrons, resulting in a flow of current when the solar cell is connected to an electrical load.

### C. CONVERTING PRESSURE ENERGY TO ELECTRIC ENERGY

When the flooring is engineered with piezo electric technology, the electrical energy produced by the pressure is captured by pressure sensors and converted to an electrical charge by piezo transducers, then stored and used as a power source. And this power source has many applications as in agriculture, home application and street lighting and as energy source for sensors in remote locations.[3]

At the output of these three sensor we get electric energy which is not in proper amount .So by connecting signal conditioner at the output of this three sensor only 5volt is given to microcontroller and remaining voltage which is produce by sensor is given to battery.

II. DESIGN OF MOBILE CHARGING SYSTEM

The following are the important elements in the block diagram:-
- Microcontroller
- Power supply
- Piezoelectric sound sensor
- Photo voltaic electric sensor
- Pressure sensor
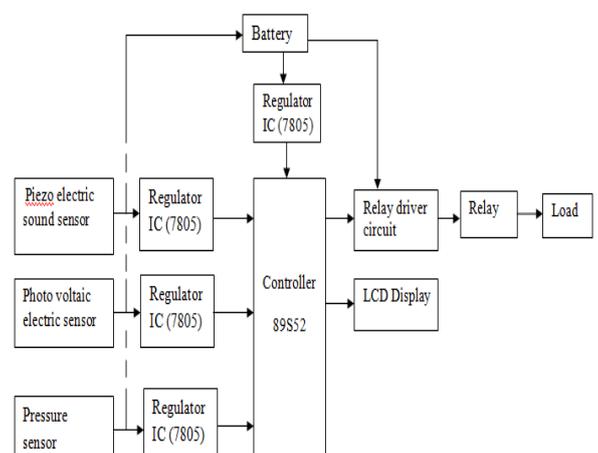
III. WORKING

The piezoelectric material converts the pressure applied to it into electrical energy. The source of pressure can be either from the weight of the moving vehicles or from the weight of the people walking over it. The output dc voltage is then stored in a rechargeable battery. As the power output from a single piezo-film was extremely low, combination of few Piezo films was investigated. With series connection, additional piezo-film results in increased of voltage output but not in linear proportion. So we are using series connection of piezo-films. The photovoltaic sensor is also use to convert radiated light energy Example Street light or tube light use in homes into electrical energy. Sound energy is also converting to electric energy by using piezoelectric sensor. We are taking Piezo electric sensor having a high sensibility as compare to piezoelectric sensor use in converting pressure. So proper amount of sound or noise, radiated light and pressure is applied to respective so at output we get electric energy. At the output of these three sensor we get electric energy which is not in proper amount .So by connecting signal conditioner(IC7805) at the output of this three sensor only 5volt is given to microcontroller and remaining voltage which is produce by sensor is given to battery. At the output of battery we are using IC7805 to drive the micro-controller.

Mainly microcontroller is use only for switching purpose and also to display that which sensor is use to charge the battery or given to microcontroller. IC89S52 will drive the relay driving only when the input is applied to sensors. At the output of really driving circuit relay is use which is act as a switch. We are using single pole double through (SPDT) relay as a switch. At the output of relay we are connecting a load that means mobile. In this way we can charge our mobile from waste of energy sources.
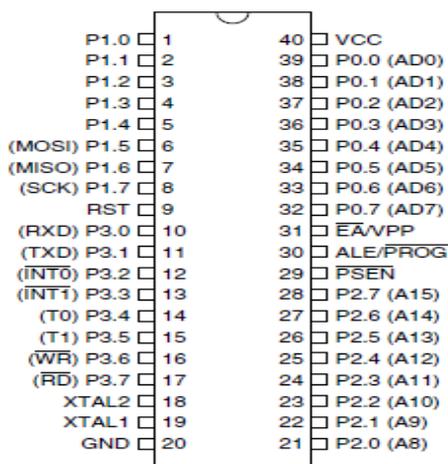
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         ┌──────∪──────┐
    P1.0 ┤1          40├ VCC
    P1.1 ┤2          39├ P0.0 (AD0)
    P1.2 ┤3          38├ P0.1 (AD1)
    P1.3 ┤4          37├ P0.2 (AD2)
    P1.4 ┤5          36├ P0.3 (AD3)
(MOSI) P1.5 ┤6        35├ P0.4 (AD4)
(MISO) P1.6 ┤7        34├ P0.5 (AD5)
 (SCK) P1.7 ┤8        33├ P0.6 (AD6)
     RST ┤9          32├ P0.7 (AD7)
(RXD) P3.0 ┤10        31├ EA/VPP
(TXD) P3.1 ┤11        30├ ALE/PROG
(INT0) P3.2 ┤12       29├ PSEN
(INT1) P3.3 ┤13       28├ P2.7 (A15)
  (T0) P3.4 ┤14       27├ P2.6 (A14)
  (T1) P3.5 ┤15       26├ P2.5 (A13)
  (WR) P3.6 ┤16       25├ P2.4 (A12)
  (RD) P3.7 ┤17       24├ P2.3 (A11)
   XTAL2 ┤18          23├ P2.2 (A10)
   XTAL1 ┤19          22├ P2.1 (A9)
     GND ┤20          21├ P2.0 (A8)
         └─────────────┘
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Fig.1. 40 lead microcontroller IC 89S52

Specifications of microcontroller
- 8 Bit Microcontroller
- Fully Static Operation:0Hz to 24 MHz
- 4K Bytes of flash memory
- 128×8 Bit Internal RAM
- 32 Programmable I/O Pins

- Six Interrupt Sources
- Supply Voltage 5V
- Maximum Operating Voltage 6.6V
- Output Current 15mA

Specification of Signal conditioner
- 4K Bytes of flash memory
- 128×8 Bit Internal RAM
- 32 Programmable I/O Pins
- Six Interrupt Sources
- Supply Voltage 5V
- Maximum Operating Voltage 6.6V
- Output Current 15mA

Specification of sensors
- Sound sensor output voltage 5-12 volt.
- Pressure sensor output voltage 12-18volt.
- Solar sensor if full intensity of light is given then we get 12 volt.

IV. SENSORS

A. PIEZO ELECTRIC SENSOR FOR SOUND

Next to determine the kind of connection that gives appreciable voltage and current necessary, three PZT are connected in series.

Fig. 2 series connected pressure sensors

A force sensor and voltmeter is connected to this series combination. As varying forces are applied on this connection, corresponding voltages are noted. Also the voltage generated across the series connection and the current is measured. Similarly the connections are done for parallel and series-parallel connections are done.

B. PHOTOVOLTAIC SENSOR

The most common photovoltaic light sensor is a solar cell that converts light energy into DC electrical energy in voltage or current. Photovoltaic cells work best using the Made from single-crystal silicon PN junctions, a photovoltaic cell has a very large light sensitive region. Light energy causes electrons to flow through the PN junction. An individual solar cell can generate an open circuit voltage of approximately 0.48 V. The amount of available current from a solar cell depends on the light intensity, the size of the cell, and the cell's efficiency. Using polycrystalline silicon or amorphous silicon increases efficiency. These devices are used for charging various battery-powered and handheld consumer

products such as mobile phones, cameras, and power backup for UPS, sensors, and wearable's. Industrial applications include usage in wireless sensors, portable instruments, and backup-battery charging.
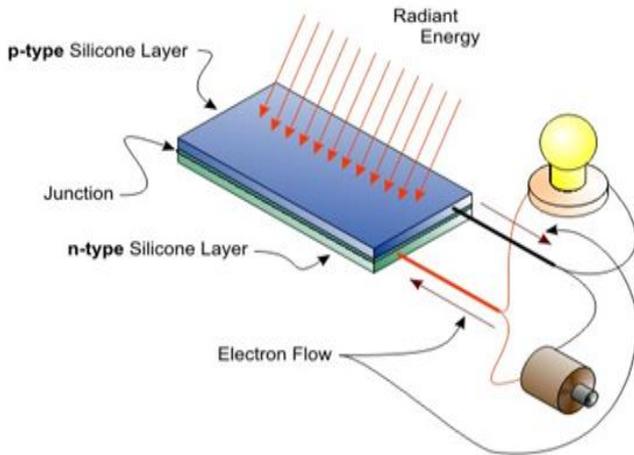

Fig 3. Photovoltaic Sensor

C. PIEZO ELECTRIC PRESSURE SENSOR

This sensor consists of a piezoelectric crystal (made from quartz) which functions as a force-sensitive voltage source where the piezoelectric will be in between two plates. Pressure exerted on the crystal surface is proportionate to the voltage produced by the crystal. This sensor does not require any voltage supply. This sensor is suitable for fast changing pressure measurement.
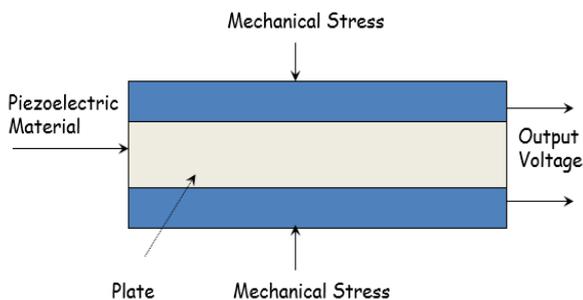

Fig 4. Piezoelectric Pressure Sensor

V. ADVANTAGES

- Sensors used have high sensitivity and are easy to handle.
- Low cost system, providing maximum automation.
- Low maintenance and low power consumption.
- The system is more compact compared to the existing ones. Provides a user-friendly interface hence will have a greater acceptance by the technologically unskilled workers.
- No fuel transportation required.
- No external source is needed for power generation.

VI. APPLICATIONS

- The noise pollution in the road would be able to convert into electric energy and lights the street lightning, signals and various other electrical appliances.
- The noise pollution in runway could be used to produce electricity.
- The electricity produce in nuclear power station could increase as the sound produce during nuclear fission also could be used to get more electric energy.
- The noise pollution in industries could be used to produce electricity and work certain low voltage machine.
- The radiated light example street light of tube light use in home is reuse by photovoltaic cell to generate electricity.

VII. CONCLUSION

The result of our project is, we are generating a electrical energy which is free of cost that means waste of energy sources is reused to generate electricity to charge our mobile. Hence by using photovoltaic and piezoelectric sensor we generate a electricity which is economically free.

VIII. FUTURE SCOPE

1. These Power source can also implement in agriculture Field, home application and street lighting and as energy source for sensors in remote locations.
2. By using the multi pin charger, we can also connect more than one mobile for charging.

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