

# Automatic Charging Of Wireless Mouse

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**Abstract-** Lifetime of Wireless Mouse depends upon power consumed from resources *viz.* battery energy. Energy is consumed on transmission and receiving of data or communication. The main problem lies in changing and replacing the battery of the mouse which is not available all time near around or even its rechargeable then it requires time to charge around 5/6 hours. So to overcome the battery replacement problem this project is approached to use 3 techniques to charge the battery by Inductive charging, Dynamo/D.C generator and Piezoelectric Crystals, as the battery drains it will keep on charging the battery. There are many solutions for each problem. Here we give a survey on best reliable solution for each problem.

## I. INTRODUCTION:

Wireless mice use radio frequency (RF) technology to communicate information to your computer. Being radio-based, RF devices require two main components: a transmitter and a receiver.

a) The transmitter is in the mouse. It sends an electromagnetic (radio) signal that encodes the information about the mouse's movements and the buttons you click.

b) The receiver, which is connected to the computer, accepts the signal, decodes it and passes it on to the mouse driver software and computer's operating system.

The receiver can be a separate device that plugs into your computer, a special card that you place in an expansion slot, or a built-in component.

Bluetooth operates in the 2.4 GHz range using RF technology. It avoids interference among multiple Bluetooth peripherals through a technique called spread-spectrum frequency hopping Bluetooth devices have a range of about 33 feet (10 meters). Bluetooth is also known as a personal area network (PAN).

## II. PROBLEMS:

The wireless mouse operates on batteries, the main problem lies is the batteries become dead as it is used for powering the transmitter. Therefore the main problem is replacing the batteries of the mouse which is not available all time near around or even its rechargeable then it requires time to charge around 5/6 hours. So to overcome the battery replacement problem this paper aims to use 3 techniques to permanently charge the battery, so that it's easy for the user to use the mouse hassle free.

## III. SOLUTIONS:

Here we are using 3 simple techniques to charge the battery which will further be used for powering the mouse, the working principles are as follows:

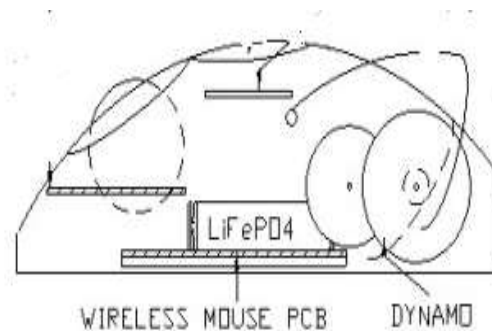
A.: Induction Pad/Induction Coil

The coil consists of both primary and secondary coils. The secondary coil is wound inside the mouse body, whereas primary coil is kept below the scratch pad. Wireless charging is based on the principle of magnetic resonance, or Inductive Power Transfer (IPT). This is the process of transferring an electrical current between two objects through the use of coils to induce an electromagnetic field. We use "Resonant inductive charging" The primary coil and secondary coil has almost same number of turns.



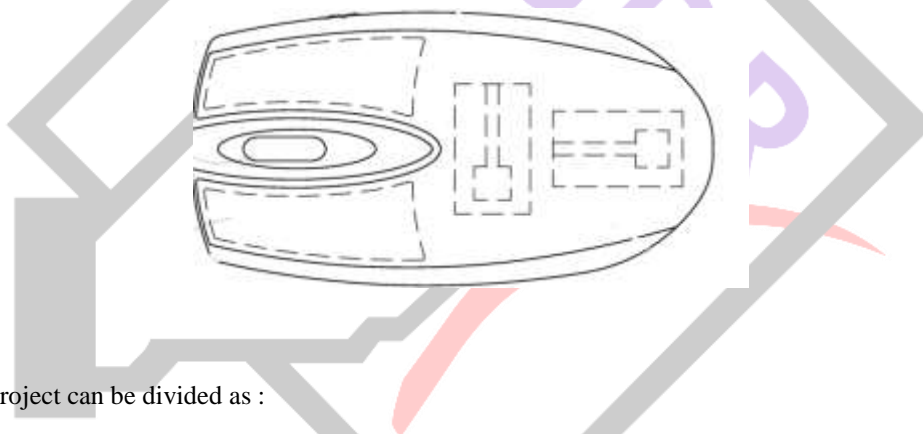
### B. Dynamo:

The dynamo works on the principle is based on the principle of production of dynamically (or motionally) induced e.m.f (Electromotive Force). Whenever a conductor cuts magnetic flux, dynamically induced e.m.f. is produced in it according to Faraday's Laws of Electromagnetic Induction. This e.m.f. causes a current to flow if the conductor circuit is closed.



### C Piezoelectric crystals/Piezoelectricity:

Piezoelectric Effect is the ability of certain materials to generate an electric charge in response to applied mechanical stress/pressure.



## IV. WORKING:

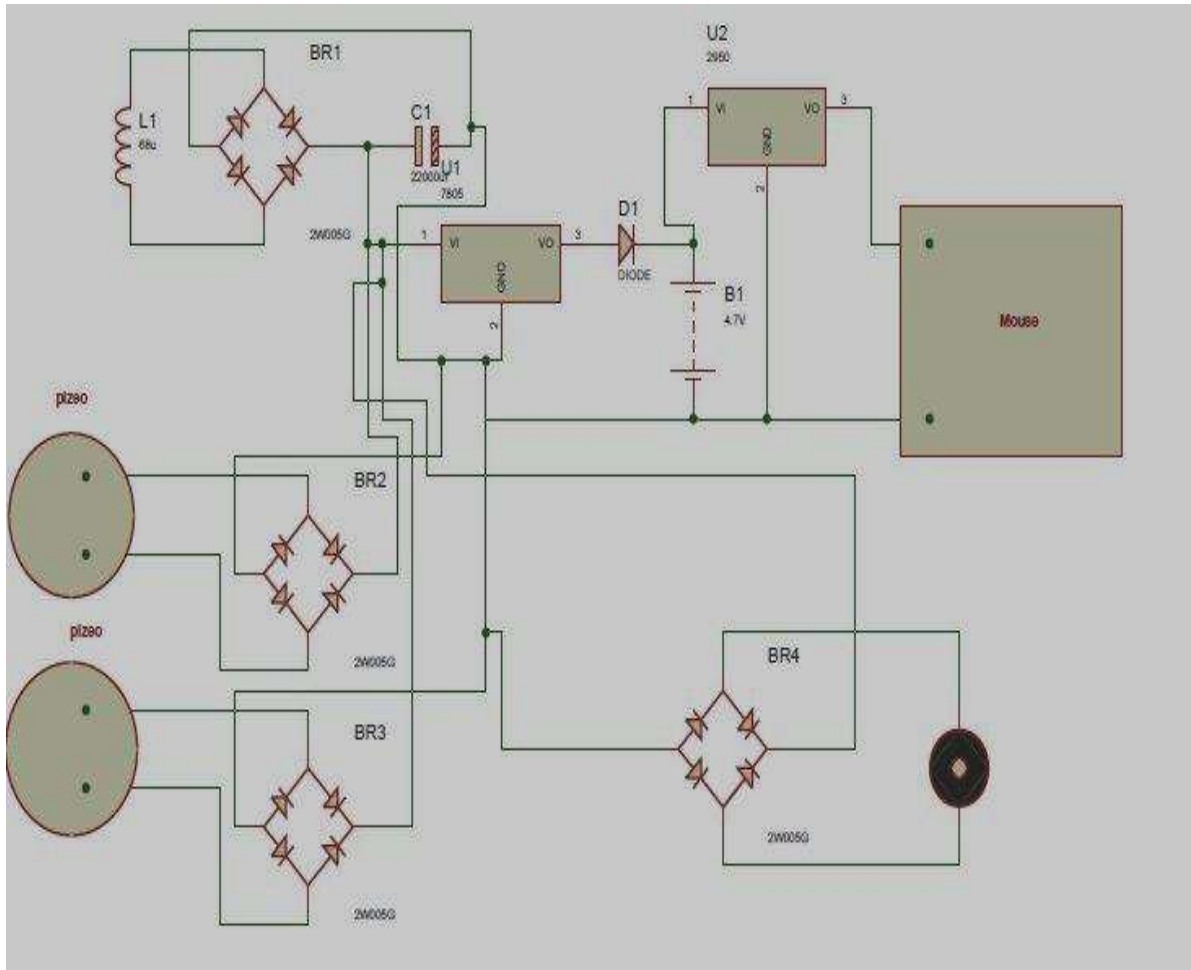
The working of the project can be divided as :

- The first technique is charging the battery using an inductive coil. There are 2 sets of coil primary and secondary. Here we use a pair of coils to charge the battery. The coil works on the principle of inductive power transfer, i.e., transferring of power through coils inducing an electromagnetic field. We use "Resonant inductive charging". The output voltage from the secondary coil (inside the mouse) is taken to a bridge rectifier and then passed through a capacitor which is used for smoothing the pulsating DC output. The smoothing capacitor converts the full-wave rippled output of the rectifier into a smooth DC output voltage. Generally, for DC power supply circuits, the smoothing capacitor is an electrolytic type that has a capacitance value of 100µF or more with repeated DC voltage pulses from the rectifier charging up the capacitor to peak voltage.
- The second technique used is to charge using a dynamo. A dynamo is an electrical generator that produces direct current with the use of a commutator. The electric dynamo uses rotating coils of wire and magnetic fields to convert mechanical rotation into a pulsing direct electric current through Faraday's law of induction. A dynamo machine consists of a stationary structure, called the stator, which provides a constant magnetic field, and a set of rotating windings called the armature which turn within that field. The motion of the wire within the magnetic field causes the field to push on the electrons in the metal, creating an electric current in the wire. On small machines, the constant magnetic field may be provided by one or more permanent magnets. Thus, the current produced is passed through the bridge rectifier connected to the 100 µF capacitor for producing a smooth DC rippled output.
- The third and the last technique is charging using piezoelectric crystals. The word piezoelectricity means electricity resulting from pressure. We have used 2 piezoelectric crystals below the two buttons of the mouse, as soon as we press those buttons while clicking on the screen, we immediately get a spike of voltage from those crystals (say 3 clicks generate one proper spike) which is in turn passed through the bridge rectifier in turn through a capacitor so as to get a smooth pulsating DC output.

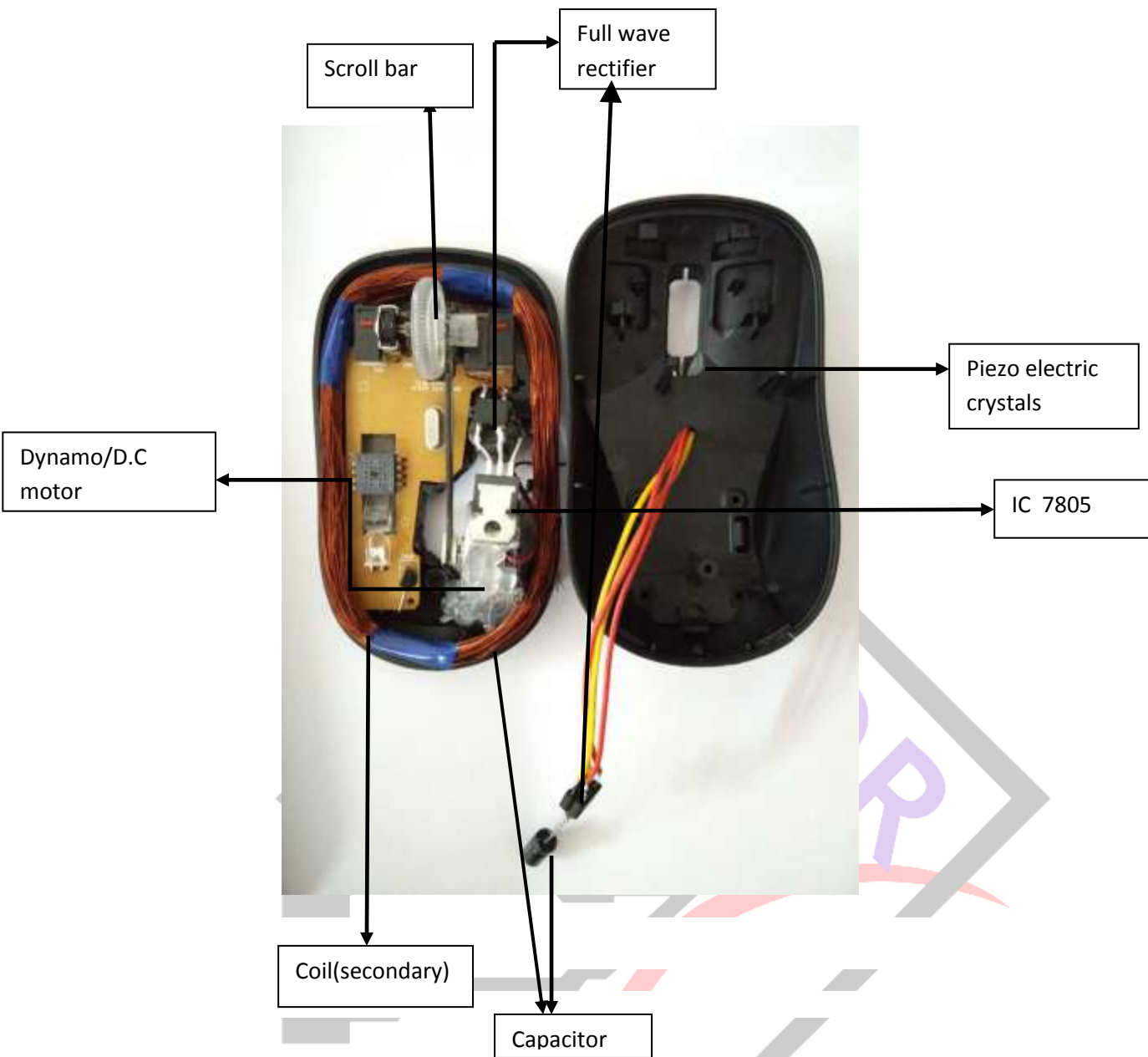
d) The voltage/current generated from all the three techniques which in then passed through IC 7805 which is used , so that we get an output of 5 volts. This 5 volts is passed through the battery via Diode so that current doesn't flow back (for the forward flow of the current/unidirectional flow)

At last this output from the battery is passed through IC 2950 , which gives output as 3 volts , so that mouse can easily work.

**V.BLOCK DIAGRAM:**



1. The working and block diagram for the charging of mouse



2. Working Model

**VI. APPLICATION :**

- 1. Used for heavy purpose mouse application ( eg : Gaming Mouse)
- 2. Used in those areas where availability of batterie Is not in vicinity.

**VII. CONCLUSION:**

This paper has presented a functional, low cost and low complexity charging of the battery of the mouse. To end it on a positive note , this project i.e Automatic Charging of Wireless Mouse can be pretty helpful in our daily life. It can help common as well as differently abled people and save their time .As it will overcome the problem of changing batteries , making it less time consuming ,problem free and effecient use of the mouse. With Improving technology in wireless charging it can prove to be a boon integrating it in the mouse.As the natural resources are depleting we need to convert different forms of energy efficiently so as to getr maximum output.

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