POWER GENERATION THROUGH PIEZOELECTRIC BRAKERS

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***Abstract*—In this paper we have proposed a method of power generation which is different from the previous methods , which are being used for power generation . In this method we use Piezoelectric sensor which is also commonly known as stress strain sensor which generate power when exposed to stress or strain . Through sensor we are generating power from the mechanical stress that are been produce on the road while the vehicle pass through the speed breakers which are there for lowering the speed of the vehicle**

The major advantage of using Piezoelectric sensor is that this part device does not contain anymore part it generate power only through passing vehicle on it and it is a rough and tuff material so it may be long lasting you can produce free power which will help in lowering the use of natural resources

Keywords— Piezoelectric , Power , storage , sensor

I. INTRODUCTION

Today in the modern age of technology the demand of power is day by day increasing but due to high demand in power the use of natural resources like fossil fuels and minerals are increasing which when burnt in the present of oxygen produce greenhouse gases like carbon dioxide carbon monoxide , aside keep on mining of this resources also put question till when they would last so the need of the extra source of power. Renewal source of power keep on increasing going through this way we have proposed a method through which we can generate power through the mechanical stress which is being grounded regularly and there is no use of it . While passing on a road you have seen speed breakers on the road and the question must had arised in your mind why they are here ?. So there work is to lower the speed of the vehicles which passes through them but how is this going to happen ? When a vehicle passed through the breaker velocity of the vehicle is converted into mechanical stress which is grounded to the breaker and the energy lost due to which speed of the vehicle decreases but now through a propose solution we can use this mechanical energy to generate power

But how so there is a transducer named as Piezoelectric transducer on which when we apply stress or strain it produce a electric charge on both of the slides which is connected through electric conducting plates . This charge is very high and for very short time so our proposed method is to store the charge and use it for the for daily uses

II. DESIGN

DESIGN A REGULAR ARE PROPOSED DESIGN IS MUCH MORE SIMILAR TO THE PAST BREAKERS BUT THEY ARE ITSELF SMART AS THEY CONTAIN IN A MECHANISM OF POWER GENERATION TOOL THERE ARE SERIES OF VISUAL ELECTRIC DEVICES WHICH ARE BEEN FITTED AND VARIOUS POSITIONS WHICH CONVERT MECHANICAL ENERGY OF THE PASSING VEHICLES AND TWO ELECTRIC ENERGY ONCE THE ENERGY IS GENERATED AT THE BOAT CONNECTING PLATE OF DEVICE THE CIRCUIT COLLECT THE ENERGY AND SEND ONCE THE ENERGY STORED IT IS AVAILABLE FOR THE USE

III. THEORY

The proposed method is can be used for generating electricity the generated electricity can be used for the different purposes like street lights on road ,charging points the energy sorting technique will be discussed

The piezoelectric equation [1]is stated as

$$Di= dij\ \sigma j=dij.\ F/A \quad (1)$$

Where,

Di=Electric Displacement;

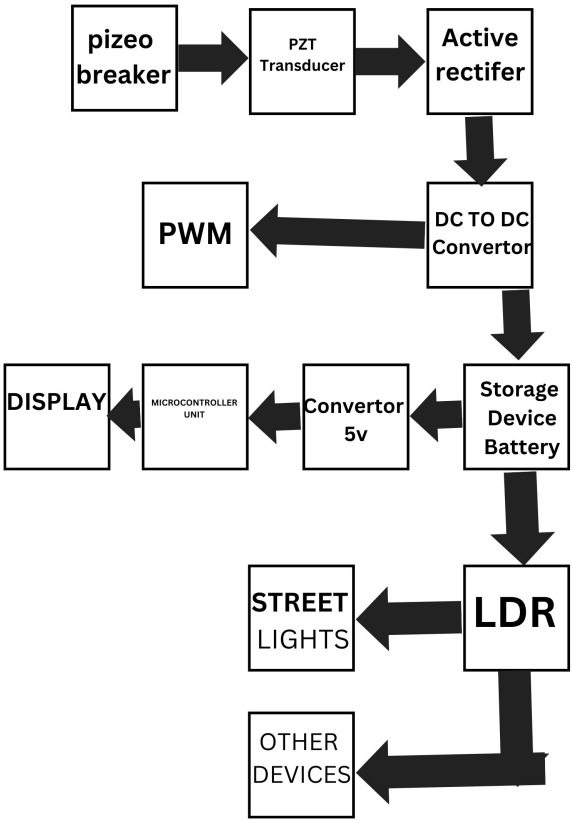
dij=Piezoelectric Constant

σj= Mechanical Stress;

F=Force;

A=Area

When a force is applied on a piezoelectric material the combination of both negative and positive charge produce a power any change in the structure of piezoelectric material results in voltage generation and electric potential is produced across the terminals or we can say plates which are attached to the electric material whenever there is force applied on a piezoelectric material current is generated across
When a vehicle which will pass through the breaker which would have piezoelectric devices due to mechanical energy which will be applied on breakers by the vehicle passing through them will produce amount of charge in the electric device



Iç. WORKING METHOLOGY

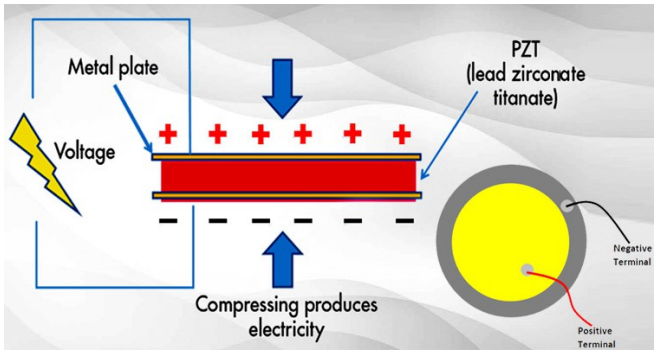
There are several part in the proposed system which are being used in our system

we have demonstrated various parts through the block diagram

1. PIZEOELECTRIC TRANSDUCER
2. CIRCUIT
3. STORAGE COMPONENTS
4. DISTRIBUATION

A. PIZEOELECTRIC COMPONENTS

A piezoelectric transducer which is also known as piezoelectric sensor that use piezo electric effect to convert one form of energy into another form that can also use for measuring pressure acceleration temperature force or strain by converting energy into electric form Transducer is a kind of device which convert one form of energy into another form piezoelectric material is one kind of transducer which when we apply pressure on electric material any force which convert this form of energy into voltage or current .



The generated voltage can be measured by any voltage measuring instrument since produce voltage is directly proportional to the applied force or pressure in this way we can control the produce energy as this device is used in several weight calculating machines we are trying to this use this device in a different way for generating power

B. ACTIVE RECTFIER

Active rectifier which are also known as synchronous rectifier this method use to improve the efficiency of the rectifier why replacing diode with power MOSFET or bipolar junction transistor BJT as transistors normal semi conductor diode have a high voltage drop of around 0.5 volt 1 volt active rectifier have low voltage drops[4]

C. DC TO DC CONVERTOR

DC to DC converter this is nothing but an electronics circuit which convert one range of direct current to another range usually to a highvoltage range. It is a type of electric power converter that convert power small power range to high.

Pwm or pulse width modulation is a technique of getting analoge result with digital signals or digital means .Digital control is used to create a square or signal switch between on and off

V. CONCLUSION

In this paper we have gone through a different method through which we can generate electricity with out effecting our environment or producing any greenhouse effect gas through this method we can generate electricity without effecting our daily routine once we are had generated electricity we can go with the uses of electric city on road charging stations and street lights and many others have

users we have used piezoelectric material because of it's nature . In this proposed idea we have use several components like piezoelectric transducer in which we have use quartz crystal, active rectifier in which we have use MOSFET, a DC to DC boost converter which will give us the high voltage, pulse modulation system ,storage system and the distribution network

SI N.O	ATTEMPTS	O/P VOLTAGE	O/P CURRENT	O/P POWER
1	I	3.15	0.21	0.6615
2	II	3.2	0.22	0.704
3	III	2.9	0.2	0.58
4	IV	3.5	0.29	1.015
5	V	3.46	0.3	1.038
6	VI	4.1	0.31	1.271

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