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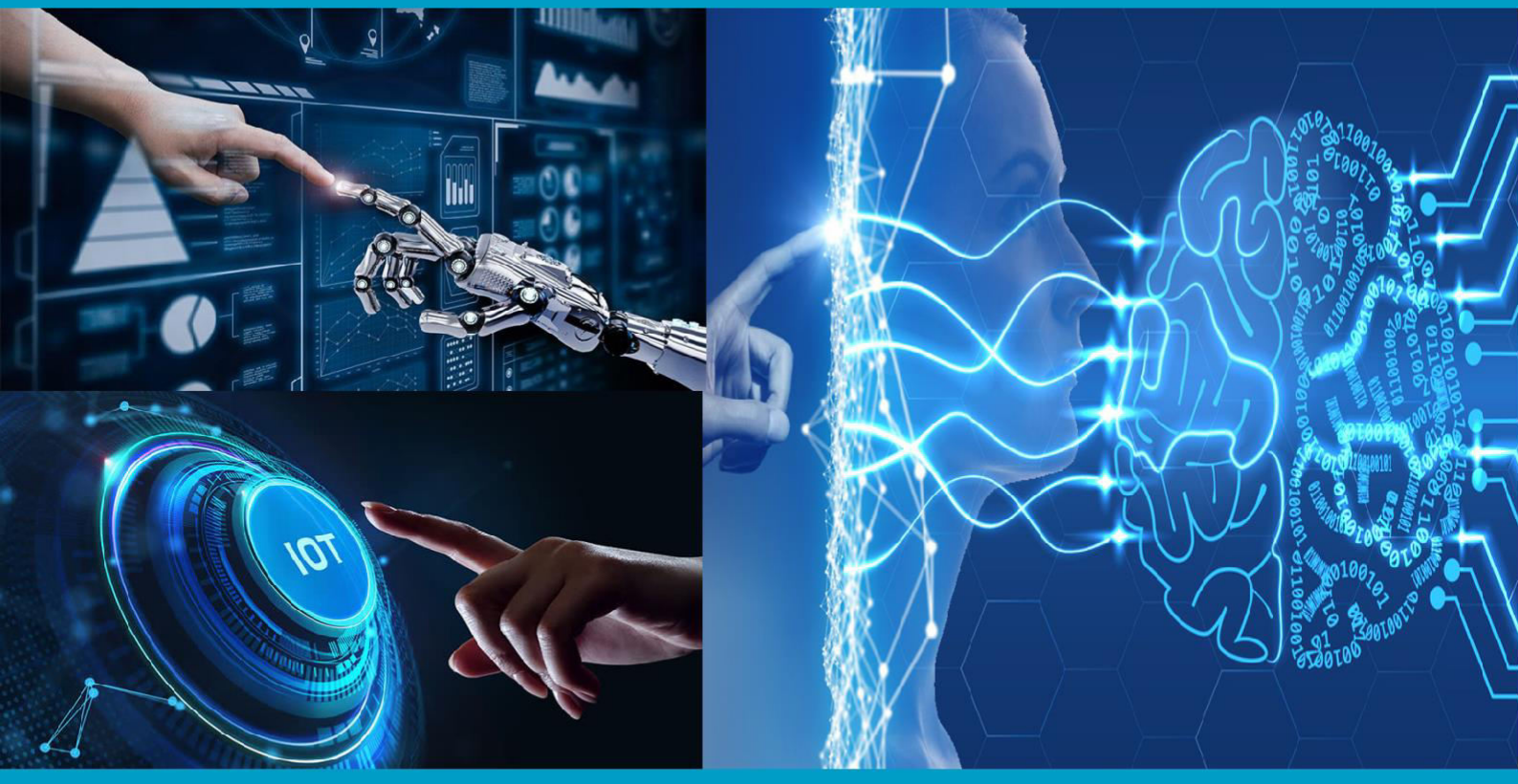

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Road Hump Power Generation for Street Light Control by Using Rock and pinion Mechanism

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ASTRACT: Creating pollution-free renewable energy is the main goal of the research community. One of the many proposed systems is the road hump power generation, which generates electricity by harnessing the power of vehicles traveling on highways, boulevards, and roads. The system flips vertically as the vehicle passes through the road hump power generation system. Thus, kinetic Energy is produced and converted into electrical energy. The rack and pinion systems are tested. The results show that when using a weight of 80 kg for the determination of road hump power Generation, an electrical power of up to 45 W is produced. Extrapolation of the results confirms that about 0.56 kW of power can be produced when several vehicles from different groups pass over the bumps. The main goal is to overcome the global energy problem, although this is not Enough to meet the excess electricity demand, it will be able to change and reduce the Dependence on traditional electricity generation methods.

KEYWORDS: Power Generation,Street Light, Rack and Pinion, Rotation, Mechanism, Electricity.

I. INTRODUCTION

This research shows that the force exerted by the feet on the ground produces electricity. Today, Renewable energy and renewable energy are considered the best strategies to reduce the economic and environmental consequences of overuse of fossil fuels. However, most research has focused on solar, wind and wave energy. On the other hand, the operation of many machines in use is not good enough. This indicates that there is still a lot of energy wasted and possibly returned. Energy can be recovered from many existing systems, such as cogeneration systems, where waste gas can be recovered and used for various purposes.

In addition, the heat from the HVAC condenser can be used as a heating source. Admittedly, many apps can be considered strengths. Accelerators are systems that receive kinematics from Vehicles passing through them and convert the kinetic and potential energy produced into Electrical energy. Acceleration machines define the vertical line, the mass of the car goes beyondThe vertical translation creating potential and kinetic energy. The fast pack is a great solution for Power restoration in countries like Lebanon where electricity is scarce. Lebanon has some natural Resources. Street lighting at night is a secondary priority for local authorities, as street lighting requires a lot of electricity. In this context, the present study includes an experimental study of Physical activity as well as the rapid acceleration model. But the space is fixed under the mat. A Connection is made to complete the installation task; the household appliances are powered by AC output voltage. Instead, the task is to charge the battery with the help of direct current and then use the inverter to convert the electricity into a direct current switch for normal use. Finally, It is very important to generate this type of electricity compared to the energy needs of the entire World. Background most researchers have focused on converting renewable energy into useful Electrical energy for personal mobility. The reverse electrowetting technique is used, in which the Liquid flows over the dielectric material. The electric current is produced by a conductive Substrate.

II. RELATED WORK

Padma Rao etal.the Author Described Renewable source of energy suitable and compact mechanisms to enhance efficiency. The generated power can be used for the lamps near the speed breakers and this will be a great boon for the rural villages too. He mainly focused on the principle of"Potential Energy to Electrical Energy Conversion". Rack and pinions are commonly used in the steering system of cars to convert the rotary motion of the steering wheel to the side to side Motion in the wheels. A Street light, lamppost, street lamp, light standard, or Lamp standard is a raised source of light on the edge of a Road or walkway, which is turned on or lit at a certain time every night. Modern lamps may also have light-sensitive Photocells to turn them on at dusk, off at dawn, or activate automatically in dark weather [1].

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He. Zhang et al. propose a renewable non-Conventional energy source based on speed breaker mechanism. A non-conventional power generating system Based on speed breaker mechanism which generates electricity without using any commercial fossil fuels, which is not Producing any polluting products..our aim is to conserve the kinetic energy which converts into electricity That gone wasted, while vehicles move[2].

M.Sailaja at al. describes the project that made to generate power using speed Breakers through rack and pinion mechanism by tapping the Energy and utilizing it for various purposes such as lightening the street lights, etc.To improve the power generation Technologies and to make them more sustainable, non –Conventional technologies have been discovered.Surveillance Alarm: When the person Steps on the device, the alarm turns on[3].

Fayeqnajuibat al. presents need to develop non-conventional Sources for power generation due to the reason that our conventional sources of power are getting scarcer by the day. Both mechanical technologies and electrical techniques for the power generation and its storage are used [4].

The rack is driven in a linear direction when the pinion is rotated. The pinion will rotate if the rack is driven linearly. Both straight and helical gears can be employed in a Rack and pinion drive [5].

III. METHODOLOGY

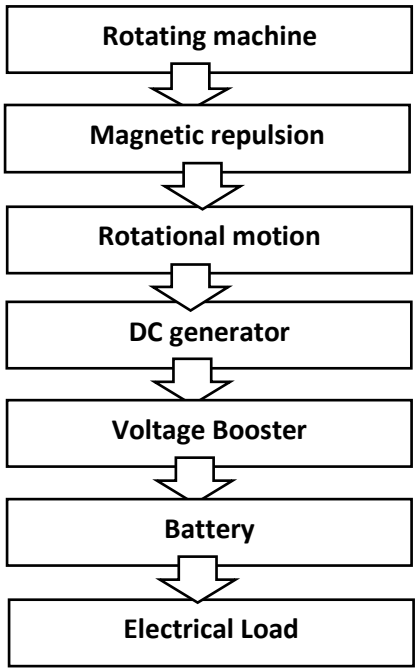

Fig. 3.1: process flow of the project

From the about Fig.3.1 shows process flow of the project.Rotating apparatus is produce to rotary motion due to magnetic repulsive force. The rotary motion is transmitted to generator through spur gear. Generator is used for convert mechanical energy to electrical energy the converted electrical energy which is booster up by voltage booster and then stored into the battery. The inverter is connected with battery for convert the DC into AC.
Aruduinois the microcontroller. It has so many applications, It is easy to use and handle. Is is both hardware and software components, we use aruduino IDE software to simulate our project. Prof Dr. Nabeel Kadin Abide AI. Sahib at al. Arduino IDE: Arduino hardware is programmed using a Wiring based language (syntax and libraries), Similar to C++ with some slight simplifications and modifications, and a Processing-based integrated Development environment. Arduino is programmed using Arduino IDE that has been developing using Java and Other open source software[6].
T. Sudheer kumarat al. As stated before, 20 of the pins function as I/O ports. This means they can functionasAn input to the circuit or as output. Whether they are input or output is set in the software.14 of the pins are digital pins, of which 6 can function to give PWM output. 6 of the pinsAre for analog input/output. Two of the pins are for the crystal oscillator, this is to provideA clock pulse for the Atmega chip[7].

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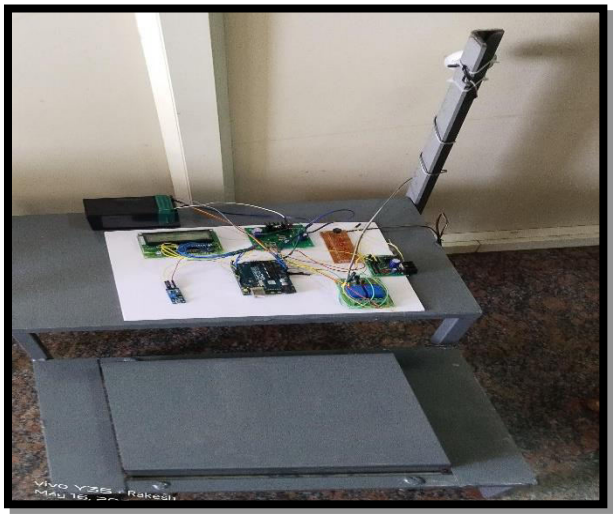
IV. EXPERIMENTAL RESULT



Fig, 4.1 complete project model

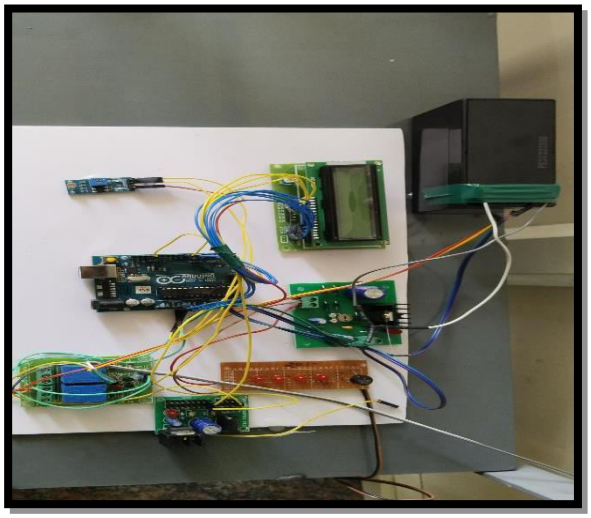


Fig. 4.2 Top view of the model

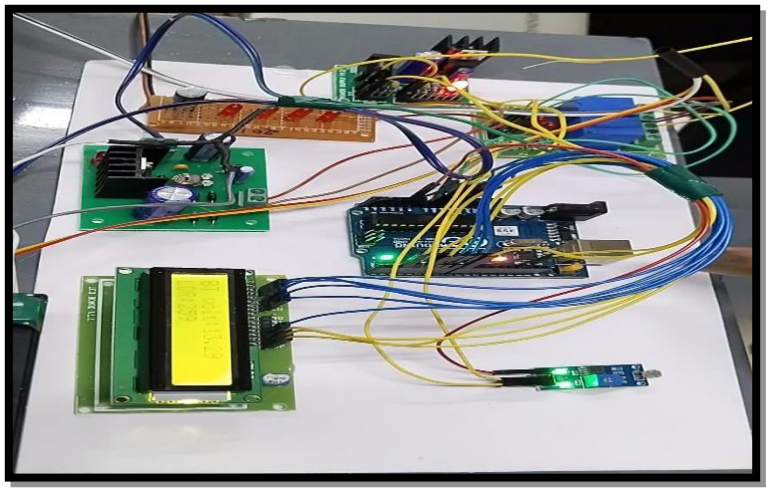


Fig. 4.3 Simulation of the model

In our project we use Renewablesource of energy to generate Electricity by converting mechanical energy into electrical energy. By using rack and pinion mechanism we obtain expected result of our project. Fig 4.1 shows the complete project model, top view of the project is depicted in Fig 4.2 and simulation of the model is as shown in Fig 4.3

V. CONCLUSION AND FUTURE WORK

Road hump power generation projects offer a promising and sustainable solution for harnessing energy from road infrastructure. These projects have the potential to generate Electricity, reduce carbon emissions, promote renewable energy, and contribute to the Transition towards a more sustainable transportation system. With advancements in Technology, expanding applications, integration with smart cities, adoption in developing Countries, public-private partnerships, supportive policies, and public awareness, the future Scope of road hump power generation projects is bright. Implementing such projects can create a positive impact on energy generation, environmental sustainability, and community Development.

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