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Energy Generation from Crane

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ABSTRACT

The aim of our project is to generate energy from crane. In crane, while bringing down a weight the pulley will rotate, due to this process mechanical energy will be produced then mechanical energy can be converted into electrical energy. This project focuses on load deflection considering boom gap. The experimental prototype includes gravity pulley setup for standalone power generation which gets connected to the controller unit as power supply. The energy generated from the pulley is stored in battery for driving a dc load. The energy which is generated during this process can be utilized while lifting an object.

Keywords: Energy, Crane, Pulley and Battery.

1. INTRODUCTION

To further help the environment and secure the future of the planet, we need to move to renewable sources for our energy generation. Lifting machinery is one of the indispensable equipment for the modern production. It can effectively reduce the labor force, improve production efficiency and speed up the automation construction of the world. The boom deflection has a great influence on the lifting in the process of the lifting operations, especially when the load is large tonnage. Boom deflection refers to the linear displacement along the vertical direction of the center axis of the boom, when the boom begins to deform.

This project put forward towards energy can be generated from the working operation of crane. While bringing down a weight the pulley will rotate, due this process mechanical energy will be produced then the mechanical energy can be converted into electrical energy. This new design is specific to the regenerate the electrical energy from mechanical energy.

The experimental prototype includes gravity pulley setup for standalone power generation which gets connected to the controller unit as power supply. The energy generated from the pulley is stored in battery for driving a dc load.

The energy which is generated during this process can be utilized while lifting an object. Microcontroller is used to control the entire system. LCD is placed to make sure that power generation take place during rotation of pulley. When power is generated LCD will turn on. Analog to digital converter is used to convert the analog signal into digital signal. The generated energy is stored in the battery which can be then utilized to lift the heavy weight.

This type of energy is a renewable source of energy. It is a type of non-conventional energy which will not cause any harm to the environment. Even though there is some power loss during energy generation maximum output power can be obtained.

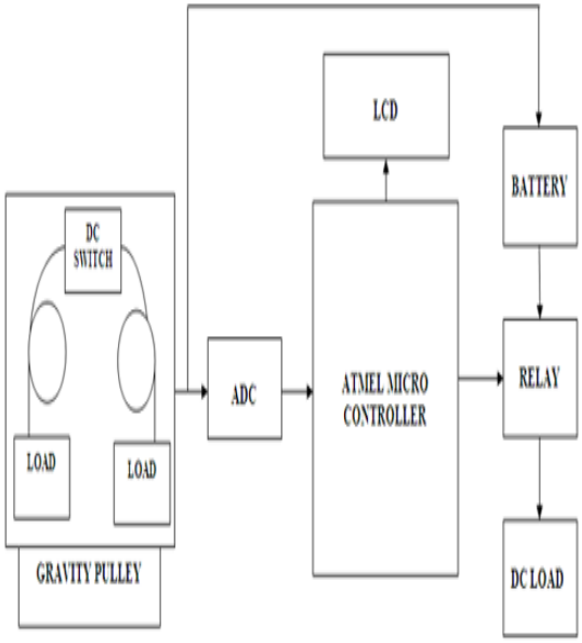
As lifting machinery is one of the indispensable equipment for the modern production this project will be more useful. Energy which is used for lifting the weight is eliminated instead of that we can use the power which is generated during weight bringing down operation.

Pulley

A pulley is simply a collection of one or more wheels over which you loop a rope to make it easier to lift things. Pulleys are examples of what scientists call simple machines. That doesn't mean they're packed with engines and gears; it just means they help us multiply forces. If you want to lift a really heavy weight, there's only so much force your muscles can supply, even if you are the world's strongest man. But use a simple machine such as a pulley and you can effectively multiply the force your body produces. A pulley is a wheel on an axle or shaft this is designed to guide movement and exchange of course of a taut cable, helping shell is referred to

as a "block." A pulley can also be known as a sheave or drum and can have a groove or grooves among flanges around its circumference. The power detail of a pulley machine can be a rope, cable, belt, or chain that runs over the pulley in the groove or grooves.

Block Diagram



Working principle

The pulley starts to rotate will bringing down a weight. The mechanical energy will be developed due to the rotation of pulley. Then the mechanical energy will be converted into electrical energy by the generator.

The generator is connected with the battery. The energy will be stored in the battery. The stored energy can be utilized while lifting the weight. Relay is connected with the battery and with the operating switch.

The relay is used to turn ON and OFF the operating switch. Microcontroller is connected with the generator. The generated energy will be displayed in the analog to digital converter. The energy generation will depend upon the weight and the rotation of the pulley. As we are using analog to digital converter the energy generated will showed then and there.

Purpose of using 8051 Microcontroller

Easy to use, low power consumption, performance is good. It use on chip flash memory for program storage. Program instruction are stored in non-volatile flash memory.

2. RESULT AND CONCLUSION

Nowadays many industries are taking many steps for saving power through renewable source and by regenerative source of power generation. Our project is power saving one by regenerative method. Our project is to generate energy from crane. The energy which is generated during this process can be utilized for weight lifting operation in crane. The energy generated from the pulley is stored in battery for driving a dc load. Energy generation depends upon the rotation of pulley. Energy generation can't be same at all time because energy generation depends upon the weight and the rotation of the pulley. In our project, we are getting 4.9 output voltage. If this method is used in large cranes which is used for lifting heavy loads in industries and in harbor this project plays an important role in power saving process.

3. FUTURE SCOPE

- This project will play an important role in many industries which uses large cranes for their manufacturing work.
- As the world now move more towards renewable and regenerative method our project will be more useful in future.
- Many industries are taking many steps for saving power so our project will be used in many industries.

Advantage

- It will cause any harm
- Power can be saved because it is regenerative method
- It will not affect our environment
- It can be used in industries where cranes are used for lifting heavy loads.

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