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Design and Fabrication of Compress Air Generation by See Saw Mechanism

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ABSTRACT

In today automobile and industrial world, Pneumatic system play a vital role, it is actually and arrangement of different elements in order to regulate, direct, sense and command itself to achieve the desired result. In Pneumatic system working media is fluid power. The term fluid power related to the employment of fluid media under control conditions to perform some useful work. Fluid power in industries has been important in the development of automatic machinery and equipment for the use in industrial plants. The fluid media for power transmission has many advantages over the media of power transmission. As a part of literature review different total presentation have been collected from the journals. This paper have been found to the co-related to project topic. In this project we are collecting air from the cylinder and store this energy to the compressor tank as nonconventional method by simply driving the see saw. Non- conventional energy system is very essential at this time to our nation .So we are focusing on pneumatic type of energy for this project. "Compressed Air Production Using seesaw" needs no fuel input power to produce the output of the air. This system gives smooth operation and smooth movement for vehicle. Compress air generation system during the time of playing of children move up and down. Then this compressed air can be used for further application.

INTRODUCTION

A method is proposed for harnessing of human power based on children's play in playground and public places, on devices such as the seesaw, merry-go-round and swing. When large numbers of children play in a playground, part of the power of their play can be usefully harnessed resulting in significant energy storage. This stored energy can then be converted to electricity also for powering basic, low-power appliances such as lights, fans, communications equipment, and so on. The method provides a low-cost, low-resource means of generation of electricity, especially for use in developing countries. The paper discusses the basic theory behind the method. Results of experiments on a laboratory prototype compressed air human power conversion system using a teeter-totter are presented to illustrate the practical effectiveness of the proposed method. Many attempt had been performed by different people from different region to overcome this problem by developing hand operated pump, foot operated pump, etc. Studying and analyzing different model our group decided to develop reciprocating pump which can run by the utilization of see saw. Here we try to represent a 'CONCEPT MODEL COMPRESS AIR GENERATION BY SEE SAW'. Many people child enjoy the see saw. The manual power i.e. operating the see saw by the child is transferred to the reciprocating movement of piston of pump. In this model we provide the piston pump mounted on one side of the see saw arm.

OBJECTIVES

The main objective of our project is to design and fabricate a see saw operated compress pump System model.

- Besides the main objective, following are our secondary objectives:
- To understand project planning and execution
- To understand the fabrication techniques in a mechanical workshop
- To understand the usage of various mechanical machine tools and also measuring tools
- To make day to day human life more easier by proper use of technology
- To make use of manual effort for water lifting in garden.
- To prepare and efficient and cost effective system
- To use new source of energy i.e. Alternative energy, where problem of electricity is occurring.
- To improve the efficiency of pump by using spring and mass system with minimum input gives maximum output.

WORKING PRINCIPLE

The concepts behind this see saw pump is to compress the atmospheric air with the help of pendulum, which is attached to the fulcrum. The pump used in this prototype converts the oscillatory motion into the reciprocating motion, and henceforth compress the atmospheric air to the desired pressure. The pump is made of pendulum, and cylinder with the piston which pumps the compress air. Oscillation of the pendulum is maintained by periodical action of the human arm as shown in Fig.1. Oscillation period of the pendulum is twice bigger than the period of the lever oscillation. Piston of the pump has reverse effect on the lever and damps its oscillation. Equilibrium position of the lever is horizontal, and the equilibrium position of the pendulum is vertical. Oscillation of the lever and the pendulum takes place in the same plane, vertical in reference to the ground. The gravity effect can be created by using rotation and inertia. In this, the pendulum represents the gravity shield, such that its energy varies from horizontal to vertical axis. The work done by total vertical force acting at pivot point of the pendulum when the pendulum is at vertical axis is passed to the left side of the lever and this work is used to increase potential energy of mass on the other side of the lever as it goes in upward direction. As the pendulum is attached to the fulcrum perpendicularly, its oscillating motion is converted into the reciprocating motion of fulcrum. Later, this reciprocating motion of fulcrum is damped by springs, which are attached to the base and fulcrum. This damping motion of springs provides reciprocating motion to the pump and hence lifts up the water.

The main advantage of hand water pump is to avoid human strain. It also helps us for the easy way for pumping water. The cost required to implement this is comparatively low Hand water pump with is more efficient when compared to normal hand water pump as the water flow is high. The main advantage of this pump is that they are one of most economical and simple solution for providing collective supply of drinking water. The main limitation is the reciprocating pump initially needs priming so it lifts water at desired level. As the design is simple the links are simple and long hence system becomes bulky. A pump requires regular maintenance which must be carried out if pump is to be use on a sustainable basis. Water pump with pendulum can be widely used in rural areas. As the installation cost of water pump with pendulum is low it is useful for poor people. It can be installed in all the public places. It can be operated by children or old people as the force required by the pump is low.



RESULT AND DISCUSSION

The whole work took place in this paper heading towards trying to avoid accidents and reduce the number of fatalities in the field of railway transportation system. Thus basically paper concept through a stone to avoid a two barriers, those of firstly, Replacing manned type by adopting unmanned type i.e. fully automatic microcontroller based system, this helps in preventing the death caused near level crossing, also decline the time for which the people wait near the level crossing and completely prevent error that has done by gate keeper.

ADVANTAGES

- In this mechanism, no pollution is created.
- In power plants there is fossil fuel is used i.e. coal, diesel, gas, etc. but in this mechanism, no fuel is used.
- Less maintenance is required for this system.
- The main advantage of this mechanism is there are no any rotational parts like crank shaft mechanism and rack and pinion mechanism also no gear is required. So, it requires less maintenance.
- The operation is very easy and simple to understand so less operating staff is required.
- There is also no need for 24-hour observation. Here we can also use adjustable speed bumps so it can easily move and transport to any location, so that site selection problem is not so much important.
- Running cost is free because there is no fuel is used, and also less installation cost is required, less maintenance cost, so all over cost is less. Energy available all year around.

APPLICATION

- In school, in public place garden.
- This model is useful in the areas or regions where electricity.
- Availability is in fewer amounts.

FUTURE SCOPE

Our project "SeeSaw power generation" is mainly intended to generate electrical power as non-conventional method by simply walking or running with knee strap using spur gear mechanism. Non-conventional energy using spur gear mechanism is converting mechanical energy into the electrical energy. For this project the conversion of the force energy in to electrical energy. The control mechanism carries the spur gear mechanism, D.C generator, battery and charging circuit. We have discussed the various applications and further extension also. The D.C generator used in this project is Permanente Magnet D.C generator. The Generator is coupled to the fly wheel Shaft with the help of Spur Gear Mechanism. We can extend the project by adding rack and pinion mechanism and also using other gear mechanism. We can even add inverter circuit for conversion of DEC to AC power for electrical appliances control.

CONCLUSION

Integrating features of all the hardware components used have been developed in it. Presence of every module has been reasoned out and placed carefully, thus contributing to the best working of the unit. Secondly, using highly advanced IC's with the help of growing technology, the project has been successfully implemented. Thus the project has been successfully designed and tested.

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