

Design and Development of Swing Irrigation Pump

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ABSTRACT

India is a vast country based on agriculture and irrigation is the most important factor for agriculture. In India there are many sources provide for irrigation. Every day new technologies are emerged in the world which brings a revolutionary change in the nature of this world. day by day the energy resources used by the large population of this world are coming on the last stage This project give the idea that how the other different form of energy can be used and implemented efficiently to overcome from this problem The aim of this project is to achieve the objective of energy lasting problem which is likely to be faced over in coming decades. Energy lasting is a big problem in India. This is faced by every people, who live in the country. Swing energy is the form of energy. In this paper we have represented the methodology of swing energy using for rural area of application. This paper is all about Swing Set Water Pump in which the water pump will execute with the help of a swing set of canopy type. As we need a motor to operate the water pump but in this project we use the swing in the place of motor and we use oscillatory motion of swing in the place of rotating motion of a motor. Everybody has needed the energy at an increasing rate, ever since he came on the Earth. Because of this lot of energy has been exhausted and wasted.

Keywords: - Reciprocating pump, Swing motion and Mechanical properties.

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I. INTRODUCTION

The ever increasing demand for energy has led to the formation of various advanced resources which produces a certain part of the required energy. One principal consumer of a large amount of energy is our household itself. Large amount of electrical energy is wasted in pumping water, Irrigation purposes etc. It is in this context the importance of gator pump arises, by the use of which a large amount of energy can be conserved and the conserved energy can be used for various other purposes. A pump is a device that can be used to raise or transfer fluids. Pumps are selected for processes not only to raise and transfer fluids from one

point to another, but also to meet some other criterion. This other criteria may be to obtain a constant flow rate or constant pressure according to the requirement. The main importance of a gator pump is that the initiation energy for starting the process of pumping, swinging of the pendulum, is considerably minimum when compared with the work required to operate hand pumps. Typical hand pumps require sufficiently large effort and an average person can use the pump continuously only for a short time, but the pendulum pump requires only minimum of the effort, because it is only required to oscillate the pendulum and can maintain these oscillation for several hours, without any fatigue.

II. PROBLEM STATEMENTS

Today, not only do we need inventive techniques which are environment friendly but also cost effective and easy to install, these to overcome a design and development of park irrigation system using swing pump.

III. LITERATURE SURVEY

[1] Rony K Placid, Steffin George Sam, Amal .R: which is a supplementary device for pumping water and is made to replace hand pumps. One important feature of a pump with a pendulum is that the work is alleviated or in simple terms it makes work rather easier when is compared with a traditional hand water pump. It is due to this underlined feature which enables the pendulum pump to be used as an efficient mode in the irrigation of smaller lots, water-wells and can also be used in extinguishing fires even by old people and children. By the use of pendulum based water pumping system we can increase the efficiency of the plant and reduce the effort, cost of production, production time, man power requirement discussed the pendulum pump. Finally they concluded that the system is practically possible.

[2] M. Sudhagar¹, N. Prakash², Ribin Babu³, S.G. Rangis⁴, N. Santhosh Kumar⁵: This paper work describes about lifting the water from some height for the irrigation, smaller lots and small scale of agricultural purposes. In day to day life there are much more wastage of energy due to swing. we use this wastage energy for lifting the water in a reservoir and connecting with single acting reciprocating pump. Existing pendulum pump water flow happens due to the suction of water from the base by the help of dead weight placed on one end of the system and the dead weight will makes swing motion, water flow will occur. By considering the pendulum pump we analysis that the main problem in the pump is less efficiency when compared to other device and Air leakage can affect the entire working of the unit, also it may not be given a continues discharge of flow. To overcome the problems by reciprocating pump driven by swing motion. The main profit of the project gives good efficiency and better discharge at minimum swing angle. The delivery of water will dependent upon the

weight of the body who makes the swing in the desired system.

[3] Sadashiv Bellubbi¹, Pramodkumar B², Yogendra S³, PoojariNagaraj Mahadev⁴, Naveena⁵: This project work describes about lifting the water for the irrigation purpose & generating the power. In day to day life there is a much more use of swing cradle by children, in the swing cradle energy is created through swing action that energy can be used for lifting the water in village area as well as in gardens. To lift the water, system used is double acting reciprocating pump. The use of swing cradle reduces the cost of centrifugal pump installation. This work proposes the implementation of water lifting and power generation in swing cradle mechanism. When the seating of the swing set moves forward & backward some torque is induced in the shaft by the holding bars of swing set. This torque displaces the larger sprocket which is pivoted over axis of shaft, causing the angular displacement. This angular movement is converted to rotational motion which is connected to smaller sprocket by chain attachment. The sprocket rotates the spur gear arrangement which runs the dynamo to generate the electricity this set up is done at one side of shaft in swing cradle. Lifting water is done in other side of the shaft is connected to connecting rod and this connecting rod is further connected with reciprocating pump through which water is pumped. This project work is eco-friendly, pollution free; the maintenance cost is less and requires less human efforts.

[4] Ayneendra B¹, Vishwanath A V², Tejus Kumar R³, Hemanth P⁴: Energy need of the world is growing day by day because of consumption of energy at a larger extent with the population growth. This paper is about generating power by using a swing in such a way that when it swings the mechanical energy is generated and it is converted into electrical energy by a commutator and is stored in a battery. The construction is such a way that, the swinging action makes the horizontal beam rotating through an angle. This shaft is connected to a sprocket to transfer the motion to the free wheel which rotates proportionally with respect to the angle of motion of the swing. The angular movement is converted into a complete rotation with the help of a chain drive connecting both sprocket and free wheel. The free wheel is connected

to a shaft which in turn rotates the spur gear and dynamo arrangement to generate electricity.

IV. METHODOLOGY

The objectives identified to accomplish the goal were:

- Studying and identifying the present mechanisms
- Identifying the potential problem through abstraction.
- Collecting useful data.
- Interpreting data as the problem definition
- Developing conceptual design and selecting based on the waste energy management approach procedure of product design and development.
- Finally preparing the embodiment design of the product.

V. COMPONENT AND DESIGN

Swing Frame

It is the main component of the pump system and is made up of steel. The principal mechanism used for the construction of the pendulum pump is the slider crank mechanism and the frame converts the oscillating movement of the pendulum on one side to the reciprocating motion of the piston to the other side. The cycle frame consists of seven rigid links which converts the pendulum movement into the piston movement. Tension and compression springs are properly fixed to the frame.

Gator Pump

It is a positive displacement pump. It operates on the principle of actual displacement or 'pushing' of liquid by a piston or a plunger that executes a reciprocating motion in a closely fitting cylinder.

Hose Collar

A hose collar is used to connect a hose to any other valves or openings. Here it is used to connect the hose to the non-return valves at the suction and delivery sides. A hose clamp or is simply called a clip which is used to attach and seal a hose onto a fitting such as a barb or nipple.

Non Return Valve

A non-return valve or a check valve or one-way valve is a valve that normally allows fluid (liquid or gas) to flow through it in only one direction.

Weight Hanger

The weight hanger is used to hold the weights and it is the oscillating part of the system and thus it acts like a pendulum.

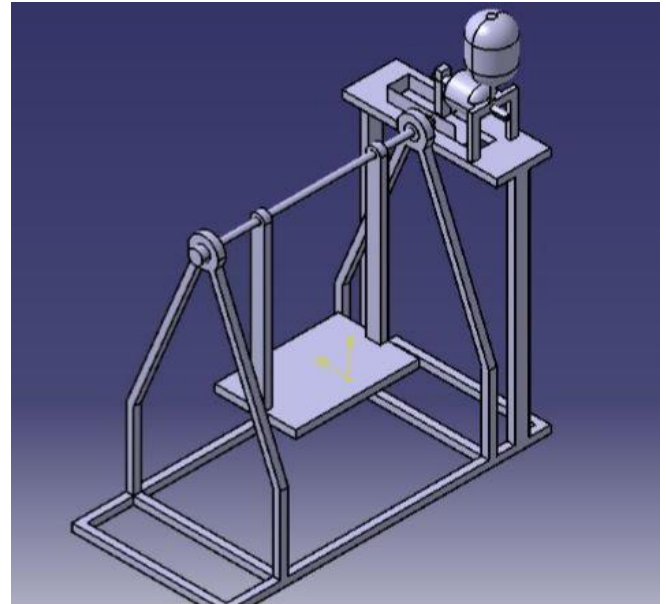


Fig : System Design

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