

Water Lifting using Lift's Energy

Gaikwad P. M¹ Shaikh A. A² Tapase N. B³ Bankar K. R⁴ Prof. Jadhav B.S⁵

^{1,2,3,4}Student ⁵Assistant Professor

^{1,2,3,4,5}Department of Mechanical Engineering

^{1,2,3,4,5}S.C.S.C.O.E, Shrishivajinagar, Rahuri, Maharashtra, India

Abstract— The various development in the industrial sectors and in our daily life is increasing hence we have also tried to modify the systems which are used in our daily working areas to save the electrical energy and it is environment friendly. In our daily life we are used electrical lift for going up and down to reduce human effort. By using this electric lift we save the electric energy by the lift on solar energy. For using the lifts kinetic energy which is up and down motion we lift's the water from lower tank to upper tank. In this project we save power consumption and effective utilization of energy takes place.

Key words: Solar Plate, Battery, Motor, Sprocket, Chain Shaft, Lift

I. INTRODUCTION

Now a day, there is a lot of competition in the market .So there is a need of developing a new method or process for effective use of daily equipment's. That processes or methods should full fill the requirement and needs of the society about accuracy, productivity, cost, profit, etc.

It is necessary to reduce the human effort and profit to society without any loss by using the wasted energy. There are various methods or ways by which we are minimize the human efforts. In industrial sectors and at working time there is a time criteria is very important. In within small time criteria we completed process or it is continuous.

In this project, allowed specification of equipment that way developed in accordance with our forecast.

The water pumping project is mainly divided into two main parts:

- Solar Operated Lift
- Lift Operated Water Pump

The both operations are depends upon each other.

We have to basically introduce the attachment of the parts of this system used for to pump the water and save the electrical energy.

First we introduce the solar operated lift which is operated on solar energy. In our daily use like in hospitals, apartments and in industrial sectors we are using the lift for reducing the human effort.

Second we introduce lift operated water pump. The water pump is used for pumping the water from lower side of building to the upper side of the building. This system is used for to save the electricity which generally used for water pumping. This system consists o

- 1) Lift
- 2) Shaft
- 3) Pum
- 4) Water Tank
- 5) Pipe

We can use both solar energy and also electrical energy for working lift up and down.

II. LITERATURE SURVEY

Katan et al. analyze the act of a solar water pump system consisting of a PV array, sun-tracker, a permanent-magnet (PM) DC motor, a helical rotor pump and establish that the act of the system is better when maximum power point follower (MPPF) and a sun- follower are added to the system. The analysis of the PV array was carried out using PSPICE software. Theoretical results are verified by field tests.

Loxsom and Verroj developed and tested an algorithm to estimate the long term monthly performance of a solar photo- voltaic water pumping system without any battery storage system for four locations in USA by using average monthly solar insulation input data and estimated the total monthly volume of water pumped with hourly simulation.

III. CONSTRUCTION PARTS

- Solar Plate
- Battery
- Motor
- Lift
- Sprocket and chain
- Shaft
- Bearing
- Pump
- Tank, pipe

A. Solar Plate

Solar energy is created using the energy which has been generated by the sun. A solar power panel is able to purpose using the solar energy which is unoriginal from the sun. A huge number of solar cells will be found in every solar power panel. The energy from the sun will be engaged by these solar cell. This solar energy resultant from the sun will be changed into electricity with the help of a solar power panel.

B. Battery

The battery supplies current to accessories which operate electrically. It stores the electrical energy and control the voltage regulation of electrical system.

C. Motor

The function of an electric motor is to convert electrical energy to mechanical energy for the purpose of doing work. An electric motor is an electric machine that converts electrical energy into mechanical energy.

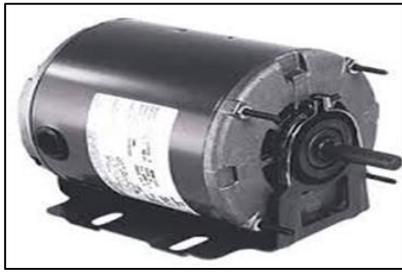


Fig. 3: Motor

D. Lift

Lift is used for to reduce the human efforts. The main function of lift is that it used for going up and down. It having a linear motion it means kinetic energy is present on here. For save the time the lift is used in hospitals, or in industrial areas

E. Sprocket & Chain



Fig. 5: Sprocket and Chain

The use of sprocket and chain is to transmit the power. The small sprocket is the drive sprocket and big sprocket is driven sprocket. The sprocket chain is endless chain.

F. Shaft

In this metal shaft are used to transmit motor power. The big pulley are mounted on shaft. The shaft metal is mild steel. A shaft is a rotating machine element which is use to transmit the power from one place to another place the power is delivered to the shaft by some tangential force and resultant torque or twisting moment set up within the shaft permit the power to be transferred.



Fig. 6: Shaft

1) Properties

- It should have good machinability.
- It should have low notch sensitivity factor.
- It should have good heat treatment properties.

G. Bearing



Fig. 7: Bearing

The ball bearing consist of an inner race which is mounted on the shaft or journal and on outer race which is carried by

the housing and casing in between the inner and outer race there are balls a number of balls are used and these are held at proper distance by retainers so that they do not touch each other the retainer are thin strips and is usually in two parts which are assembled after the balls have properly spaced.

H. Reciprocating Pump

The function of reciprocating pump is to lift water. The rotating motion is converted into reciprocating motion and hence water is lifted. When pumping of water is carried out with the help of reciprocating piston in a cylinder, it is called as "Reciprocating Pump". It works on principle of reciprocating moment of piston.

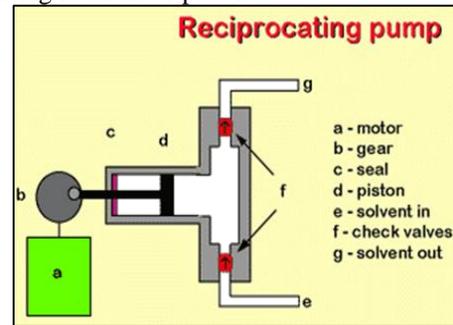


Fig. 8: Reciprocating Pump

I. Water Tank & Pipes

The water tank is provided for to store the water. The water tank having material like plastic, steel, etc.

Pipes are used for carring water and transferring water from one station to another. We are using material for pipe is polyamide. There are two types of pipes we are using,

- Suction Pipe
- Delievery. Pipe

IV. WORKING

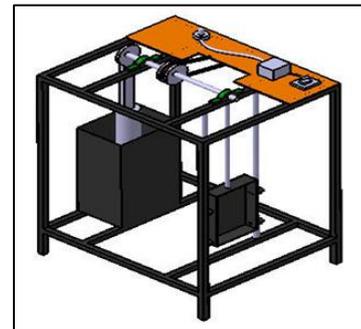


Fig. 9: Working Diagram

Electric motor is operated by means of electric supply. By using this motor we give the up down motion to the lift. The motor is connected to first sprocket through shaft. The motor is placed at board. When motor gives energy to the lift then the chain drive is operate. Then lift is moving up and down and this energy of lift's is transmitted to first and second sprocket.

The chain drive is mounted on this sprocket to gives motion.

The chain drive is mounted on the sprocket. When the 1st sprocket is rotates, is transmitted the power to the shaft.

We are placing the shaft to increase the speed. The tank is placed at ground.

When the shaft is transmitted power to pump, the pump lift's the water from lower tank. It having a suction pipe to lift's the water. The delivery pipe is placed in between reciprocating pump and upper tank. The water is lift through the reciprocating pump from lower tank to the upper tank.

In this project we see that we are using energy of lift to lift the water.

V. ADVANTAGES

- Waste energy is used.
- It saves electricity.
- Use of renewable energy source.
- Simplicity and reliability give a low maintenance.

VI. DISADVANTAGES

- Applications are limited.
- This is only applicable in hospitals & building.
- Initial cost is high.
- Construction is complicated.

VII. APPLICATIONS

- Industrial sector-In industries were lift is used for going up and down purpose. This project is implement for the industrial purpose.
- In domestic application-In domestic works, in hospitals, building this project is used for saving the electricity and dual purpose.
- For saving the electricity and dual purpose (water pumping and also for lift) is used.

VIII. CONCLUSION

Now a day our markets demand is increased for automation. For the automation we can develop the machine tool which will meet these requirements. This development will be used in industrial sectors & market which reduce the cost of many components.

Also this can modernized by using hydraulic components. We can eliminate many manual operations & also we can control many processes.

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