PERFORMANCE EVALUATION OF PEDAL AND COMPRESSED AIR POWERED CENTRIFUGAL PUMP

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INTRODUCTION:

Pedal power generation is the method of generating electrical power from mechanical pedaling. It is a eco-friendly activity that causes no harm to the environment. This technique, which has been influenced by bicycle pedaling, is the most resilient and robust source of energy through all ages. With the emergence of modern electric powered technologies, the use of pedal power has been sidelined and very rarely used to generate electric power. With an efficiency of 97%, bicycle technology is nearly perfect. There are a few inventors in India who have been innovating to utilize this power to substitute the requirement of electric power for many other human activities.

By using electric operated Centrifugal pumps we can pump the water at a sub class of dynamic Axis symmetric work absorbing machinery. Electrical operated Centrifugal pumps are used to convert rotational kinetic energy to the Hydrodynamic energy of the liquid flow. The rotational energy comes from electric device like motor. The fluid enters the pump impeller along to the rotating axis and is accelerated by the impeller, flowing radials in chamber outward into volute chamber, from where it exits. Common uses include petroleum, water bodies, and petrochemical pumping. The function of the centrifugal pump is converting potential energy of water pressure into mechanical rotational energy.

The cycle operated mechanism consists of single centrifugal pump which is fixed on the rear wheel bicycle. Paddling for few minute to pump 30-40 liters of water to a height of 30 feet. Our project helpful for rural areas. Which are facing electric problem? It can be used mainly for water lifting from wells and other water bodies. By cycle operated centrifugal water pump which is run by rotating the pedal of a cycle. The system activated a bicycle, rim, impeller, pulley and inlet and delivery pipes. Centrifugal pump is mounted on Rear wheel of cycle which is operated due to the rotation of wheel which creates the vacuumed in pump.

OBJECTIVES:

1. To design and development of the working of pedal and compressed air powered centrifugal pump. At primarily we have design all necessary components like driving mechanism (air compressor and bicycle driven mechanism), stand for centrifugal pump etc as per requirement. This can be design like portable one.
2. Fabricate all the necessary components. In this we have fabricate compressor driving mechanism to bicycle, stand for pump, etc as per design requirement.
3. Use the man power (manually operated) and Air Compressed driving mechanism. Pedaling is the most efficient way of utilizing power from human muscles.
4. Elimination of electricity usage in pumping of water. The motor can be run by electricity that can coupled with pump and then pumping of water will be takes place.
The eliminating electricity and give rotation to pump by human operated pedal then pumping of water will be takes place.
5. To obtain maximum discharge for the power input. In this we are given human operated pedal and Compressed Air powered rotation is input and getting maximum output as a discharge of water with respective power input.

**METHODOLOGY:**

1. Identify the problems facing the peoples in society.
2. Survey of the literatures previously studying in that project.
3. The next step of making “Pedal and Compressed Air Powered Centrifugal Pump” is the preparation of the stand. GI square pipes are made into sufficient pieces and are welded together to get the stand.
4. The stand is then connected with the back wheel of the bicycle.
5. By considering the wheel and rotor shaft space the centrifugal pump is connected with the stand by using the nut and bolts.
6. The suction and delivery pipes are then connected to the suction and delivery ports respectively manual priming of the centrifugal pump is done next.
   By pedaling and compressed air power given to the rear wheel of the bicycle then rpm of the rotor shaft is measured using tachometer. The flow rate of water is measured by using measuring tank and stop watch.
RESULT:
1. The discharge from the pump of about 0.00025 m³/s can be obtained at 140 rpm.
2. The discharge head obtained from the pump is about 6.75 m.
3. A pump can operate as per the requirement.
4. Electricity generated can be stored in the battery and may be used for different applications like mobile charger, operating PC, biometric unit, Lamps, etc.
5. The operation is economical.

CONCLUSION:
As per the study over the topic that the bicycle and compressed air powered water pump is a very advantageous especially for rural areas. The problem of energy is very big in India and many rural powered water pump by use of this project we save electric power and we will operate a water pump by using bicycle operated mechanism in the project and we can lift the water. When we giving rotation from pedal compressed air power drive the rare wheel of bicycle rotate and coupled with pump shaft the impeller is rotate due to rotating of wheel. So we operate the pump and lift the water at a particular head this project is installed any of the place where water bodies. It can also be placed in garden, both gardening & cycling can do simultaneously. The lifting water from different kinds of water bodies like river, ponds, wells etc. The irrigation takes place in remote areas where electricity is not available.
FUTURE SCOPE:

Power generation

Electricity generated can be stored in the battery and may be used for different applications like mobile charger, operating PC, biometric unit, Lamps, etc.

Sprinkler arrangement for gardening.

By replacing reciprocating pump instead of centrifugal pump use for sprinkler irrigation in garden.

Flour mill grinder.

By pedal and compressed air power we can operate flour mill grinder.