

# DESIGN AND FABRICATION OF PEDAL OPERATED CENTRIFUGAL PUMP

<sup>1</sup> R.Venkateshwara Reddy, <sup>2</sup> T.Rajesh, <sup>3</sup>Asma.

<sup>1</sup>Asst. Prof, IT Department, CMR College of Engineering & Technology

<sup>2</sup>Asst. Prof IT Department, CMR College of Engineering & Technology

<sup>3</sup>Asst. Prof IT Department, CMR College of Engineering & Technology

## Abstract

The main aim is to do this project to provide easy irrigation facility and agricultural purposes where there is difficult to use the water facility . It provides irrigation and drinking water where electricity is not available . it can be built by locally available materials and can be easily adapted to suit the needs of local people .It frees the user from raising energy costs, can be used any where, produce no pollution and provide healthy exercise. PPWP consists of a regenerative turbine pump operated by pedal power. The regenerative turbine pump is positioned on its stand and the driven shaft of the regenerative turbine pump is connected to the bicycle wheel with the help of belt. By pedaling the bicycle, the bicycle wheel rotates, thereby rotating the centrifugal pump which in turns discharges water from the sump.

## 1. INTRODUCTION

Pedal powered water pump (PPWP) is an Eco friendly water pump system. the PPWP works on mechanical energy without electricity.pedal power water pump provides drinking water and irrigation in remote areas where electricity is not available. Pedal power eater pump is not only free from pollution but also provide healthy exercise. Pedal power water pump reduces the rising energy costs.pedal power water pump consists of a regenerative turbine pump operated by pedal power. the regenerative turbine pump is positioned on its stand and the driven shaft of the regenerative turbine pump is connected to the bicycle wheel

with the help of belt. by pedaling the bicycle, the bicycle wheel rotates, thereby rotating the centrifugal pump which in turns discharges water from the sump.

## 2. RELATED WORK

Pedal operated corn grinder:

pedal operated corn grinder is an existing solution for this project which works on the principle of pedaling by man power . by pedaling we can grind corn. instead of using machines Pedal operated nut seller is an existing solution for this project. Which works on the principle of pedal operated by man power .by pedaling we can peel the nut shell of any beans. Community interaction with the concerned project team: On behalf of community visit, we

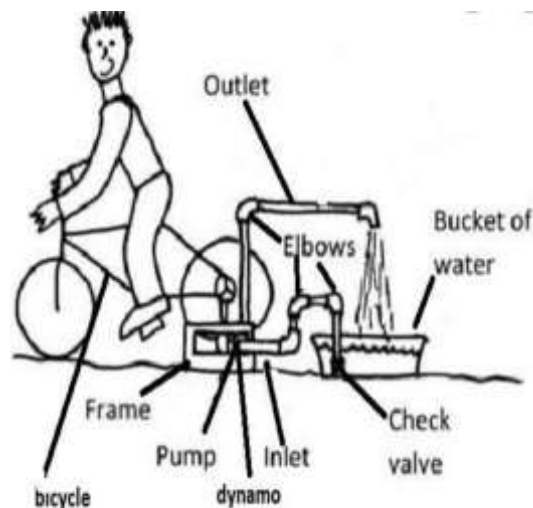
have visited a village near to our college. There we have identified many problems like no proper electricity, water lifting problems, no proper , problem faced by the people while lifting the water etc., Out of all these problems we have decided and chose to make a pedal operated centrifugal pump. Our problem is to design a pump with motor which can be used as pedal operated centrifugal pump and also can be used by everyone. We designed a pedal operated centrifugal pump such that it can be replaced according to our convenience i.e., if we want to change we can change.

### 3. IMPLEMENTATION

As we have gone with the need statement, we gone through a literature review so that we can know what exactly our prototype must contain, what kind of updates it should have. While going through this process we came across constraints like:

- 1.it should be easy access.
- 2.It should be portable.
3. It should have an adjustable distance from where hand should be shown.
4. Easily used by elders.

Our problem is to design a pump with motor which can be used as pedal operated centrifugal pump and also can be used by everyone. We designed a pedal operated centrifugal pump such that it can be replaced according to our convenience i.e., if we want to change we can change.



### Block Diagram

#### 4. EXPERIMENTAL RESULTS

Our design includes very simple mechanism. The design of the prototype is as shown below in the figure:



Make a pedal operated centrifugal pump, where the pump will work on the principle of pedaling .The other important components used to make this pedal operated centrifugal pump is centrifugal pump,cycle rim,nuts and bolts, v-belt,square shape rods,chain pedal .

1. The first step of making power operated water pump is the preparation of the stand.
2. Scarp mild steel pipes are made into sufficient pieces and are welded together to get the stand.
3. The stand is then connected with the back wheel of the bicycle.
4. By considering the wheel and rotor shaft space the regenerative turbine pump is connected with the stand by using the nut and bolts.
5. The suction and delivery pipes are then connected to the suction and delivery ports respectively.
6. Manual priming of the centrifugal pump is done next.

## 5. CONCLUSION

The pedal operated centrifugal pump can be used in the following areas which helps lot of people with less effort and in less time and with easy process:

1. Agriculture
2. Tribal Areas
3. Gardens
4. House holds

Here by we conclude that our pedal operated centrifugal pump is a helps in lifting the water with less effort and without any electricity and reduces the use of electricity.

## 6. REFERENCE

1. Priyanka, P., Muthubalaji, S., "A single input dual output multiport DC-DC

- converter with minimal switches", International Journal of Recent Technology and Engineering, 2019, Vol. 8-Issue 2 Special Issue 8, PP-1118-1123.
2. Khare, V., Srinivasa Rao, D., "A research on QoS optimization in 4G cellular networks", International Journal of Recent Technology and Engineering, 2019, Vol. 8-Issue 2 Special Issue 8, PP-894-899.
3. Gunde, A., Devadasu, G., Vijayasaanthi, M., "Design of hybrid fuzzy-PI controller for sensorless speed control of separately excited DC motor drive", International Journal of Recent Technology and Engineering, 2019, Vol. 8-Issue 2 Special Issue 8, PP-1189-1192.
4. Durga Bhavani, R., Rao, G.S., "Fuzzy controlled single-stage converter fed PV system", International Journal of Recent Technology and Engineering, 2019, Vol. 8-Issue 2 Special Issue 8, PP-1104-1110.
5. Srinivasan, S., Muthubalaji, S., Devadasu, G., Anand, R., "Bat algorithm based selective harmonic elimination PWM for an eleven level inverter", International Journal of Recent Technology and Engineering, 2019, Vol. 8-Issue 2 Special Issue 8, PP-1164-1169.
6. Sangeetha, S., Venkatakrishnan, P., Shirisha, R., "Research of harmonics in power system signal using gaussian's distribution overlapping by receiver operating characteristics (Roc) curve", International Journal of Recent Technology and Engineering, 2019, Vol. 8-Issue 2 Special Issue 8, PP-1087-1091.
7. Sarath Kumar Reddy, B., Balasubramanyam, P.V., "A new topology of interleaved boost

8. converter for electric vehicle applications”, International Journal of Recent Technology and Engineering, 2019, Vol. 8-Issue 2 Special Issue 8, PP-1058-1062.
9. Rao, G.S., Sathish, V., “Synthesized multilayer power converter for wind power energy conversion”, International Journal of Recent Technology and Engineering, 2019, Vol. 8-Issue 2 Special Issue 8, PP-1098-1103.
10. Kumar, B.A., Anand, R., “Performance research of seven level multi-level inverter with reduced switches using various PWM techniques”, International Journal of Recent Technology and Engineering, 2019, Vol. 8-Issue 2 Special Issue 8, PP-1149-1154.
11. Suresh Kumar Budi, S., Suneel Kumar, M., “Matrix converter control strategies and modulation techniques”, International Journal of Recent Technology and Engineering, 2019, Vol. 8-Issue 2 Special Issue 8, PP-1176-1182.
12. [https://www.google.com/url?sa=t&source=web&rct=j&url=https://www.researchgate.net/publication/317521302\\_DESIGN\\_AND\\_FABRICATION\\_OF\\_PEDAL\\_OPERATOR\\_CENTRIFUGAL\\_PUMP&ved=2ahUKEwjG16myser1AhVUIqYKHeeYC9UQFnoECAwQAQ&usg=AOvVaw1NQ4AZFpozWmNHWVbpdLUD](https://www.google.com/url?sa=t&source=web&rct=j&url=https://www.researchgate.net/publication/317521302_DESIGN_AND_FABRICATION_OF_PEDAL_OPERATOR_CENTRIFUGAL_PUMP&ved=2ahUKEwjG16myser1AhVUIqYKHeeYC9UQFnoECAwQAQ&usg=AOvVaw1NQ4AZFpozWmNHWVbpdLUD)
13. <https://www.google.com/url?sa=t&source=web&rct=j&url=https://www.researchgate.net/publication/340>

[629473\\_Development\\_of\\_a\\_Pedal\\_Powered\\_Centrifugal\\_Pump\\_for\\_Rural\\_Use&ved=2ahUKEwjG16myser1AhVUIqYKHeeYC9UQFnoECAwQAQ&usg=AOvVaw0HqzXmE1MDG3egGeSlK1mG](https://www.google.com/url?sa=t&source=web&rct=j&url=https://www.researchgate.net/publication/317521302_DESIGN_AND_FABRICATION_OF_PEDAL_OPERATOR_CENTRIFUGAL_PUMP&ved=2ahUKEwjG16myser1AhVUIqYKHeeYC9UQFnoECAwQAQ&usg=AOvVaw0HqzXmE1MDG3egGeSlK1mG)