

Pedaling Dress Washing Machine: A Review Study

Prof. Kalpesh Chavda¹ Goyal Janam S² Shah Kushal O³ Patel Krunal C⁴ Patel Akash N⁵

¹Professor ^{2,3,4,5}Student

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

^{1,2,3,4,5}Shankersinh Vaghela Bapu Institute of Technology, Vasan

Abstract— Nowadays in the developing countries technology is widely versed So we all know that Powered washing machine exist of varied range of costs starting from 10,000 to 50,000, but they are impractical in rural areas because running automatic washing machines are expensive or unavailable for them. Several groups tried to build a machine for the regions but they have been unsuccessful in giving the required low cost Washing machine. Now we are developing the Pedaling Dress Washing Machine that is economical in rural areas. In PDWM we are using bicycle, Water Drum (40 liters), Flywheel (D=420mm), Connecting Rods, Pulley (Do=80mm, Di=50mm) etc.

Key words: Pedaling Cycle, Washing Machine

I. INTRODUCTION

The first washing machine was called as the scrub board and was invented in the year 1797. In 1851, American James King discovered and patented the first washing machine to use a drum. However it was still hand powered and did not work by itself.

Then in 1858, William Blackstone of Indiana built a washing machine for his wife. This washing machine removed and washed away dirt from the clothes. This was the first official washing machine that could be used at home.

In 1908, Hurlley Machine Company of Chicago invented the Thor machine. This was the first washing machine that was electric-powered and had a galvanized tub and an electric motor. The earlier washing machines had heavy, cast-iron mechanism mounted on the tub lid. This made the washing machine heavier and bulky.

Slowly, more features were added and today we have a variety of washing machines with different features and styles to help us out and make life simpler and easier

II. INTRODUCTION

Earlier, people had to soak their clothes in soap water for hours together, then scrub the stubborn dirt, rinse and then dry the clothes. Drying also took days together. However, with the introduction of washing machines, washing the clothes became easier. The machines would dry the clothes at least 70 to 80 per cent and the already half dried clothes would be done in no time.

Earlier, people used to clean their clothes by pounding them on hard rocks or scrubbing them with abrasive sands and wash away the dirt in rivers or lakes. In Rome, people used to clean their clothes using the fat found in the ashes of sacrificial animals as soap.

III. WORKING PROCEDURE

When we apply force in pedaling the cycle, The Power is generated in the Cycle which is transferred from the Large Sprocket to Ratchet, Which is connected to the Flywheel with the help of Shaft.

The Flywheel is further connected to the Pulley by the virtue of Transmission belt. The pulley is connected to the washing drum which will wash & rinse the Clothes added to the Washing Drum.

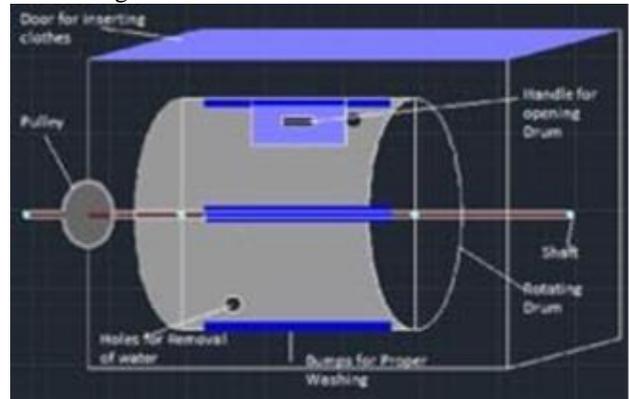


Fig. 1: Washing Drum

IV. METHODOLOGY

A. Step 1: Remove unwanted parts from the bicycle

- After buying the bicycle from the market we will remove all the unwanted parts from the bicycle.
- After removing unwanted parts we will oil and inspect remaining required parts for the flexible movement.

B. Step 2: Build Stand

- We will do cutting Operation for developing the Stand from the large rod.
- After cutting the rod we will weld the cutted rods according to our designing structure.
- After Welding Operation we will Drill hole at two points for removal of water.

C. Step 3: Arrangements of Mechanisms

- We will connect the large Sprocket to ratchet sprocket with the help of chain.
- We will mount ratchet sprocket on the shaft.
- With the help of shaft we will connect the ratchet sprocket with the flywheel by using nut & bolts.

D. Step 4: Manufacture the Washing Drum

- We will cut the small rectangular section from the drum for the addition of washing powder, Clothes & water.
- We will drill holes in the drum for the removal of water.
- We will cover the drum with the rectangular box from where the water will be removed, after the clothes are washed.
- For better rotations of Washing Drum the bearings will be attached on both the sides of the shaft on which we will mount the Washing Drum.



Fig. 2: Screenshot

E. Step 5: Mounting the Washing Drum with stand and Assembling of all the Parts.

- We will connect the washing Drum part with the shaft that is connected with the pulley.
- Now pulley will be connected to the flywheel with the help of Transmission Belt.
- Now the whole assembly is connected and the Pedaling Dress Washing Machine is ready to wash



Fig. 3: Pedaling Dress Washing Machine

V. COMPONENT & SPECIFICATION

Sr. No.	Name of the Component	Specification	Material	Qty.
01.	Shaft	L = 900	M.S.	01
02.	Sprocket	D = 200 mm	S.S.	01
03.	Small Sprocket	D = 110	M.S.	01
03.	Flywheel	D = 420	M.S.	01
04.	Chain	L = 610 mm	C.S.	01
05.	Drum	Cap. = 40	PVC	02
06.	Pulley	D = 80 mm	M.S.	01
07.	Belt	L = 1550	Rubber	01
08.	Bearing	D = 60 mm	C.L.	02
09.	Brake	—	—	01

Table 1: Component & Specification

VI. FUTURE SCOPE

- Following future scopes are possible of this project work.
- It can be further studied by using the dynamo to produce electricity while pedaling the cycle.
- It can be further studied with the help of another simple arrangements to be made in mechanisms of the cycle and developing the required washing machine providing sensor and semi automation.

VII. CONCLUSION

- From all the work we have concluded that the PDWM is cost-effective, Eco-Friendly, low maintenance Washing Machine that Satisfies the needs of Washing, Drying & Rinsing of clothes. It can remove tough stains to some Extent. It can be flexible as per our requirements.
- From all the work we have done, we have satisfied the objective of PDWM. We have kept the economic factor in mind from the starting while designing the PDWM as we know that rural areas are surplus of second handed parts of bicycle so they can manufacture it at home and it's easy to operate.

REFERENCES

- [1] H. J. Hopfen (1969): Farm Implements for Arid and Tropical Regions Published by Food and Agriculture Organization of the United Nations, Via delle Terme di Caracalla 00100 Rome, Italy. Published in AT Microfiche Reference Library, pp.150
- [2] David Gordon Wilson (1986): Understanding Pedal Power, A Technical Paper-51, Published in Volunteers in Technical Assistance, ISBN: 0-86619-268-9, Published by VITA, 1600 Wilson Boulevard, Suite 500, Arlington, Virginia-22209 USA.
- [3] J. P. Modak (1982): Manufacture of Lime- Flyash-Sand Bricks using Manually Driven Brick Making Machine, Project Report, Project sponsored by MHADA, Mumbai, Emeritus Professor of Mechanical Engineering and Dean (R&D) Priyadarshini College of Engineering, Near Central Reserve Police Force Campus, Hingna Road, MIDC, NAGPUR 440019 (INDIA), pp 1-50.
- [4] [http://en.wikipedia.org/washing mc/pedal-powered-washing-machine.htm](http://en.wikipedia.org/washing_mc/pedal-powered-washing-machine.htm).
- [5] [http://en.wikipedia.org/wiki/Washing machine](http://en.wikipedia.org/wiki/Washing_machine).
- [6] <http://www.ideafinder.htm>
- [7] <http://www.svtc.org/listserv/letter21.htm>
- [8] <http://www.svtc.org/listserv/letter22.htm>