Peddle Power Washing Machine

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Abstract. Peddle power washing machine is specially made for the purpose of its utilization to wash and dry the cloth by means of applying pedal. Today due to non-renewable energy cries its basic need to utilize the energy from other way or save the energy. This project includes the construction and utilization of the peddle power washing machine which can with any amount of requirement. This machine can help us by two ways, first as a washing machine and second as an exercise machine.

Keywords : peddle; washing machine; pulley.

1. INTRODUCTION

Pedal power washing machine means applying the pedal to rotate the drum attached with the shaft by means of chain drive and create the resistance (turbulence) between inside drum water, cloth and powder to wash the cloth."To support the basic family economy, through the design and distribution of bicycle machines, providing an efficient alternative for the rural development of India." Women in INDIA wash clothes manually, but the detergents are chemically harmful to their hands, and the motion of scrubbing is straining to the muscles. Our goal is to design an inexpensive and durable pedal-powered washing machine for use in rural areas to gently wash clothes. Due to cost constraints, the washing machine is to be shared among several families or can be used by a local entrepreneur to run a laundering service.The washing machine must be easy to build and maintain locally with local materials, easy to operate (minimal required steps), and easy to power by women or children. It must also be more comfortable to use than manual methods and culturally acceptable in INDIA.

2. ELCTRIC WASHING MACHINE

Although the breakthrough technology of the different brands turns each washing machine into a unique device, we can define the minimum and basic function of a washing machine. The washing machine has a central loading cylinder with holes and a spinning system on its own axis. Once it is filled with water, the process ends and throws the machine contents out. Its function is based on a spinning movement over a container, generally of cylindrical shape. Inside of it, water, detergent

and dirty clothes are mixed. This movement mixes the detergent with dirtiness and the relative movement between water and clothes, which develops the cleaning process. Automatic washing machines have a program system that allows the machine to perform different cleaning processes. According to the one you chose, spinning speeds vary as well as the time and the chosen temperature.The basic components of the machine are

- An electric engine which transmits movement to the cylinder so that it spins in the right way.
- A microprocessor that controls the function of the different cleaning choices as well as the programs. This device orders the priorities.
- A cylinder or tube which mixes the clothes, water and detergent and which acts as a container for the elements.
- A small vat which protects and supports the tube or cylinder, allows water and temperature changes, and supports all the elements while the process changes.
- A housing which supports the small vat and muffles the cylinder's vibrations.
- A couple of buffers which help support the cylinder's weight and muffle the vibrations.
- A resistance system in charge of heating water.
- Water inputs which transport and evacuate clean water.
- A filter, which chooses the conduct's content avoiding the obstruction of the drain pipe.
- A belt which transmits the engine's movement to the sheave.
- A blocking automatic system which does not allow the door to open while functioning.

3. SYSTEM DESCRIPTION OF PEDAL POWER WASHINF MACHINE

The pedal power washing machine consist different parts which group together make possible of working of this machine.

3.1) IRON BARS:

Fig. 1 mild steel iron bar

In this project we use different kind of hollow and solid iron bar or rod for different purpose these are

a) 25 mm dia. solid mild steel rod for making supporting structure for gear and pulley.

b) 20 mm dia. Solid mild steel rod for making supporting structure for gear and pulley.

c) 25 mm outer dia. Hollow mild steel pipe for making cycle frame and their support. We also use this hollow pipe for make shaft for cycle flywheel.

3.2) GEARS

We used two kind of gears for our mechanism

a) **Spur gears**: the spur gears are used to transmit the torque from pulley to rack, the specification of spur gear are

No. of teeth- 40

Addendum circle dia. - 60mm;

Dedendum circle dia. - 40mm

(b) **Bevel gears**: we used a pair of bevel gears for converting horizontal axial rotatory motion to vertical axial rotatory motion and both have equal no. of teeth.

Fig. 2 cast iron spur gear

Fig. 3 Plastic Pulley

3.3 PULLEY

We use four pulley in which 3 have same specification and forth one have different specification as per there uses.

a) 125mm dia. Pulley are used to transmit power from one point to another with any change in speed or torque

b) 63mm dia. Pulley are used increase the speed of washing machine by reducing the diameter ratio (i.e., more the ratio of difference higher in the variation of speed in two pulley)

3.4 BEARING

Bearing are used as a mechanical component to transfer the power and to move a certain part, and is done by utilizing the small frictional forces of the bearing, which makes rotates easily withstanding the force and weight load acting against them.

3.5 FLYWHEEL

Here we are using a 20 teeth back wheel of the cycle flywheel. It is attached with the shafting and another end with the cycle big flywheel by means of chain drive

Fig. 4 Flywheel

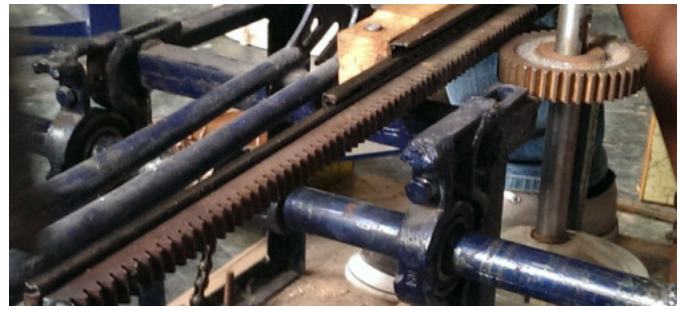

Fig. 5 rack and pinion setup

3.6 RACK AND PINION

A rack and pinion is a type of linear actuator that comprises a pair of gears which convert rotational motion into linear motion. A circular gear called "the pinion" engages teeth on a linear "gear" bar called "the rack"; rotational motion applied to the pinion causes the rack to move, thereby translating the rotational motion of the pinion into the linear motion of the rack.

4. WORKING MECHANISM

Our pedal power washing machine consist two major mechanism on which our washing and drying cycle work.

The two different mechanism are

a) CRANK-SLIDING MECHANISM

We used this mechanism to get to and fro motion at agitator which we used during washing cycle.

In this mechanism pedal play the role of crank and we used rectangular solid mild-steel rod as connecting rod and in place of slider we put rack which gives linear motion at output and this linear motion is utilized for rotating of pinion.

The pinion and pulley are mounted on a same shaft therefore when gear rotate the pulleyis also rotate with same rpm, this pulley have 125mm diameter which rotate the washing machine pulley of 62.5mm diameter thus on one rotation of gear we get two complete rotation on washing machine and in washing machine we also add 1.5 ratio gear box to reduce the effort given by the driver.

b) Simple Rotating Motion

In this mechanism we disable the crank slider mechanism and the pedal power is transmitted to rear flywheel which is mounted on a 25mm diameter hollow rod, at the end of this rod we welded bevel gear and another bevel gear is mounted on the solid mild-steel rod thus when we peddling the cycle it rotate the rear flywheel and get the ratio of 1:3.5 thus in one rotation of pedal we get 3.5 rotation at the bevel gear and this motion is transmitted to washing machine by help of two pulley which having 1:2 ratio and also there is gear box installed in the washing machine.

This above mechanism is used for drying cycle

5. CONCLUSION

From the above project, it can be concluded that the "pedal power washing machine" is a very simple yet very powerful design of washing cloth which if brought into application in the rural areas of the developing countries can aid a lot of plight and the suffering of the poor peoples who find it very difficult to wash cloth by means of hand. Thus it is used as an application keeping in mind the social welfare of the peoples of the rural areas. Also it is safe in working condition and hence it does not require any safety guards during operation. The cost of maintenance is a low and it has a long life.

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