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MANUFACTURING OF HUMAN POWERED OPERATED WASHING MACHINE

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Abstract : *The MANUFACTURING OF HUMAN POWERED OPERATED WASHING MACHINE is a venture, which is under taken to take care of the issue of electric stockpile of individuals. At town, to run clothes washer wellspring of intensity is power. In India the majority of town is experiencing lack of power. So to defeat above issue we select the clothes washer, which is worked physically. It required no force supply or diesel supply. This task is low weight and versatile can be effectively shipped. We utilize basic cycling component to run the clothes washer shaft.*

Key Words: Human Power, Washing machine, Design, Fabrication

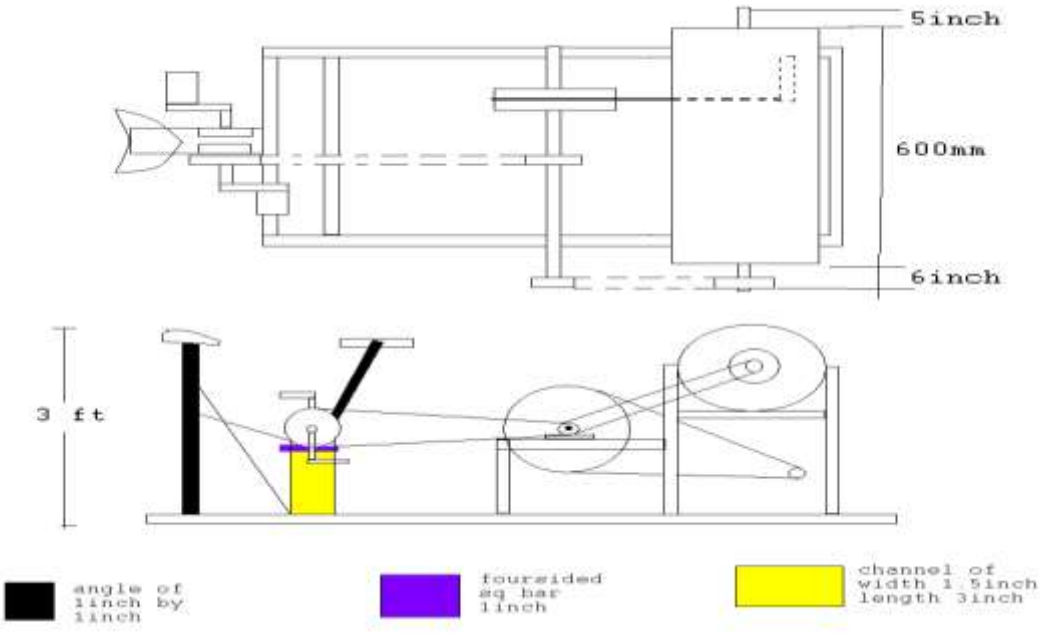
1. INTRODUCTION:

A clothes washer, garments washer, or just washer, is a machine intended to wash clothing, for example, dress, towels and sheets. The term is for the most part applied uniquely to machines that utilization water as the cleaning arrangement, rather than cleaning (which utilizes elective cleaning liquids, and is performed by master organizations) or even ultrasonic cleaners. All washer machines work by utilizing mechanical vitality, warm vitality, and substance activity. Mechanical vitality is granted to the garments load by the turn of the fomenter in top loaders, or by the tumbling activity of the drum in front loaders. Warm vitality is provided by the temperature of the wash shower. The turn speed in these machines can fluctuate from 500 to 1600rpm.

The parts can be produce in our school. Its subcomponent cost is likewise less, however its assembling requires kind of aptitude. This undertaking gives us information, experience aptitude and new thoughts of assembling. It is a working undertaking and having assurance of progress. This task can be made in less time; thus we have chosen this undertaking

1.1 PRINCIPLE:

The machine entitled — HUMAN POWERED OPERATED WASHING MACHINE|| Works on the rule of turning impeller by rowing and causes to washing fabrics. The fundamental thought is to utilize a stationary bike remain as the force source, and utilize a get together of chain drive to associate it to an old, rescued clothes washer tub.



1.2 OPERATING PROCEDURE

In paddle turns the rotor of clothes washer. A two arrangement of chain is fixed on clothes washer shaft is turned by methods for hawking. The oar sprocket is connected with substantial flywheel which store vitality and transmit it when required.

There are a few advantages to this framework, notwithstanding the power reserve funds. The dark water from this washing can be reused for filling can tanks or for watering plants. It places dampness into the air, which is particularly acceptable in the wintertime. It likewise gives a high-impact exercise to the rider, which likewise puts warmth (and some extra dampness) into the air, which is additionally something to be thankful for in the wintertime.

'Many years back now, we heard a radio report on a person who had constructed his own pedal-controlled clothes washer. We both concluded that once our own electrically-controlled machine built up an unsalvageable deficiency, we would change over it. Actually, this is the thing that we have been doing methodicallly with all our electrical machines, as they breakdown. We partition them into pointless, (the instance of the hair-dryer is a genuine case of this, its lone capacity being an additional guide to warm up chilly child pigeons) or we convert them to human-fueled. The accompanying apparatus has now been running physically (or rather, by being accelerated), for more than four years and we would prescribe the change to any individual who needs clean garments, sound exercise, a well-watered flowerbed and help in getting off the framework.

If it's not too much trouble note in this improved form of our pedal-fueled machine there is some welding included, both for the pinion and the bike underpins. In any case, in Part Two, (the altered variant), the transmission design doesn't require any welding and the bicycle supports could obviously be manufactured from timber. In actuality, the adjusted variant worked better however the entirety of the means expected to finish the undertaking, aside from the transmission, are contained inside the accompanying. I likewise needed to show how I built up the thought, I think it is a valuable exercise both for myself and to impart to others that I show how the structure procedure functions. In the occasion, with this first form I got the vibe for the impact of a full washing burden versus the exertion required to pedal.

The electronic flaw that emerged in our programmed clothes washer rendered it futile - an incredibly baffling yet visit issue in this day and age. I realized that the machine was watertight and that there was no issue with the remainder of its mechanics and thus I began to consider doing endlessly completely with the electric engine and all the extravagant siphons and stuff and changing over the machine to human force.

Pedal force was the perfect decision as the clothes washer worked by the drum pivoting with the clothing, water and cleanser inside it and leg power was a lot more noteworthy than arm power - and could prop up longer. The turning movement of a bike was flawlessly fit to this prerequisite.

2. METHODOLOGY

Change of a messed up clothes washer The initial step I made after I had moved the machine into a storehouse was to explore the design of its moving parts. This I did by expelling the back board where the engine, pulleys and level drive belt could be obviously observed.

At the hour of expelling the back board I chose to likewise evacuate the gigantic counterweight loads (see over) that were darted to the machine; these are fitted to help ingest vibrations brought about by askew loads in the machine particularly during the turn drying cycles. I additionally lifted off the highest point of the machine with the goal that I could take out some other unnecessary things.

Clothes washer transformation to pedal force pinion and belt drive I chose to keep everything as straightforward as conceivable deciding to weld a little apparatus from the back center point of a bike as far as possible of the electric engine shaft, a chain would then associate this rigging to that of the pedal wrench of the bike and the first pulley/level belt transmission would remain.

Changing over a messed up clothes washer to bicycle power I needed the two machines to be on a typical base and this I decided to be a wooden bed (obviously) this was a non-standard estimated one of 140cm x 80cm (55" x 31").

I could fit the two machines on this bed since I'd concluded that the chain from the pedal wrench would go ahead to a rigging on the electric engine shaft, the restricting component turned into that of the closeness of the pedals to the side of the clothes washer. I set up that I required a leeway of 75mm (3") between the pedal at its nearest approach. to the machine to permit me an unhindered pedal activity.

Presently I had acquired the format and places of the two machines regarding one another, I needed to choose a methods for supporting the wheel-less bike. As it would turn out, one of the shops that outfit me with wooden beds had quite recently tossed out a steel encircled, wheeled dolly used to ship a ride-on lawnmower box. This I slice up in the workshop to outfit me with the essential steel plot for the help casings and four castors which I along these lines utilized in the manufacture of my cross-cut saw table. (interface at end of post).

I welded two supports from the steel edge to help the bike at the front and back dropouts (the focuses where the wheels fit). The back support was a right-calculated triangular edge and the front support included two vertical cylinders welded to a base edge both had a 10mm strung bar welded at the support top to fit into the dropout. The supports were fastened spot to the bed, the basic situations for these supports were at the best possible separation between the front and back dropouts and at the right parallel situation for the bike's pedal wrench to line up with the apparatus on the engine shaft.

Changing over a messed up clothes washer to pedal force When the bike had been brought down onto the strung bar 'axles', it was verified to the supports utilizing 10mm nuts, I thought that it was important to put a spacer tube between the back dropouts to give the nuts something to take care of to, generally the way toward fixing would crush the casing/fork tubes flabby as opposed to cinching them.

The drive chain could then be appended.

Pedal fueled clothes washer transmission. I had just noticed that the power from the drive chain was curving the drum on its help springs thus, to keep away from the issue of the chain falling off, I constrained two wooden wedges between inverse sides of the drum and the external dividers of the machine.

After a fast pedal to check whether it worked I arranged for the principal wash.

The Wash Cycle (play on words expected)

Pedal controlled clothes washer gulf It was just when I began to place the water into the machine for the primary wash that I understood the requirement for an alteration, that being the way that emptying in water into the machine by means of the cabinet bound for the powder was excessively moderate - on the off chance that I went too rapidly the water just flooded out of it. As the highest point of the machine was never again set up, I sawed the top off the cabinet compartment allowing a bigger opening for the water. I was astonished at the fact that it was so natural to pedal the full machine. Actually, it was excessively simple because of the speed decrease of the belt drive between the engine shaft and the pulley on the drum. The decrease implied that: at typical accelerating speeds the drum was moving gradually and I thought that it was difficult to pedal when there was practically no obstruction. By and by, the underlying clothing results were acceptable thus the consistent advance was to modify the outfitting to an increasingly practicable level.

2.1 EMPTYING THE MACHINE

Ordinarily, an electric siphon exhausts the water from the machine and releases it by means of an adaptable hose down the channel. Clothes washer siphons are of the outward sort, a vanned pivoting impeller pushes the water up the funnel. On the off chance that one brings down the channel to beneath that of the water in the drum then the water will stream out, just by the impact of gravity. I, in this manner, utilized this straightforward method, the extra stature because of the machine being sited on the bed made it simpler for it to be totally purged. I utilized the waste water on the blossom outskirts before the house so I gathered the water in watering jars and pails.

Utilizing clothes washer water for blossom beds There you have it, Mark One of our pedal-fueled clothes washer. We kept utilizing this organization for two washes each until we got a decent vibe of what I expected to change. In Part Two I will take a gander at the extra adjustments for this essential machine, which both made it simpler to pedal and gave us something of a 'turn cycle'.

2.2 How to Convert your Washing Machine to Pedal Power 2 - Modifications

On the off chance that you have recently landed at this venture, at that point you should return to Part One which can be found here, this will give you the means expected to accomplish your essential bike washer. The accompanying shows the alterations I made to consummate the machine, making it simpler to pedal and furthermore giving us some 'turn cycle' as well!

Aside from the numerous different favorable circumstances of a pedal clothes washer - saving money on bills and vitality utilization, wellness, fun, and time to peruse... everybody needs to do your clothing. Family, here on an extended get-away, including the kids, really request that we set aside some washing! In any event, spending occasion producers stop and request to have a go accelerating. What could be superior to give them pleasure and complete your clothing for sure.

2.3 MODIFICATIONS

The principal game plan had a 1:3.3 proportion from the bike pedal wrench wheel to the rigging on the engine shaft and between the engine and the drum pulley a proportion of 14:1. In this manner giving a general apparatus proportion of: 4.2:1 for example a little more than 4 pivots of the pedal wrench to get 1 upset of the drum. No big surprise 1 felt next to no obstruction while accelerating..

Fig. MODEL

I felt that the outfitting proportion ought to be in any event 1:1 that is one insurgency of the wrench would deliver one upheaval of the machine drum. To this end, I detached the drive belt and screwed to the substance of the huge pulley wheel a pedal wrench wheel from another bike. The drive anchor was joined to this wrench wheel, I needed to build the chain length by around 6-8 connects to get it to fit.

I had decided this to be the base proportion as I thought accelerating/drum rates of around 40-50 rpm enabled the substance to be adequately upset for successful washing. At this speed, one could feel the heap changing as the wet clothing was gotten in the drum by the oars and afterward let fall back to the base of the drum because of gravity. This rhythm was anything but difficult to keep up in any event, when the course of accelerating was switched. Not at all like with the first profoundly outfitted course of action I had, the heap gave a protection from the accelerating which really made it simpler to do.

Fig. power transmission

2.4 SURPLUS WATER REMOVAL (SPIN DRYING)

We've shown this machine on numerous events and the most successive remark from observers has been 'how about we see you turn dry at this point!'. Present day clothes washers have high turn speeds (in the locale of 1200 rpm or significantly more noteworthy). The requirement for these inexorably higher paces is faulty as the extra measure of water removed is generally little. (See end of article for connects to 'The Great Spin Debate'). Perusing it, it appears that so much, if not all, the raising paces are just deals contrivances and may bring about harm to the clothing.

By the by, having the option to evacuate some water preceding expulsion from the machine was attractive so I begun by computing what sort of drum speeds were important to keep the substance held against the drum divider for the total cycle for example drum speed expected to beat the increasing speed because of gravity. Clearly this rotational speed changes with drum width and I've included toward the finish of this article a connect to decide G powers.

With adequate power holding the articles of clothing to the drum dividers the water can escape through the openings in the drum. Higher rotational speed will clearly build the pace of water misfortune.

Fig. Model

For our drum of 46cm breadth, a determined speed of 62.3 rpm would mean the substance would encounter a power of 1g. Quick accelerating I could accomplish a steady speed of 100rpm delivering a power of 2.6g be that as it may, on the off chance that I got off and turned the pedal by hand I could accomplish 170rpm creating a power of 7.4g. Such an activity created a critical increment in the progression of water leaving the drum yet it was impractical to keep up this speed for over 60 seconds or somewhere in the vicinity. On expelling the articles of clothing there was as yet a significant amount of water in every thing which could be separated by wringing by hand.

2.5 FURTHER MODIFICATIONS AND IMPROVEMENTS

2.5.1 PUMP REMOVAL

In the wake of utilizing the machine in this plan for year and a half or so I found a hole had created in one of the adaptable hoses associated with the siphon. The final product was I thought that it was simpler to expel the hoses from the siphon cut out the died part of the cylinder and re-interface them by means of some inflexible pvc pipe, bypassing the siphon totally.

2.5.2 SPIN DRYING AND THE FUTURE OF OUR LAUNDRY NEEDS

Beyond question expelling abundance water toward the finish of the procedure is the most noteworthy improvement to make. To this end I have acquired from my nearby dump another non-electronically-working clothes washer. I propose to set this up as the bike fueled clothes washer and to change over the current machine to a progressively productive turn drier by modifying the apparatus proportion.

When setting up this next machine I will try to fix the drum all the more safely to the machine outline. This, I currently acknowledge, would be a perfect use for the sections regularly provided by the producers explicitly for moving the clothes washer.

3. FUTURE PROJECTS - MARK 3 LAUNDRY

One year from now I plan to structure and make a sun oriented water warming framework which will connect legitimately to the machine. This will block the requirement for the option high temp water sources, we use right now, viz water warmed on our wood cooker and in Summer, by methods for several plastic bramble shower packs.

SELECTED MATERIALS

SR.NO.	NAME OF THE COMPONENT	SPECIFICATION	MATERIAL	QTY
1	ANGLE FRAME	40 X40 X4	MS	01
2	CHAIN	□ INCH PITCH	CARBON STEEL	2
3	SPROKET	□ INCH PITCH	MS	4 NOS
4	SHAFT	20 MM DIA	M.S.	4 NOS
5	BEARINGS –	P 204	CI	8
5	WASH TUB	300 X 350 X 700 MM	MS	1
6	FLYWHEEL	350 MM DIA	MS	1
7	HANDLE		MS	1
8	PADDLE			1
9	GEAR	260 DIA	M S	2
10	GEAR BOX	1:1	AL	1
11	LOB	8 INCH DIA	PVC	2
12	SEAT			1

GENERAL ASSUMPTION IN DESIGN OF MACHINE

- Output rpm of washing machine is 800 rpm
- Load of person sitting on machine = 100 Kg = 100 X 9.81 =980 = 1000 N
- Normal paddling RPM = 100 rpm

- Force applied at paddling = 50 kg = 5 x 9.81 = 49.05 = 50 N
- As we know a normal person can apply 100 rpm in normal working condition. As per this assumption we design transmission of system
- N big sprocket D small sprocket
- = ——————— ———————
- N small sprocket D big sprocket

$$x = \frac{100 \times 170}{80}$$

$$x = 212 \text{ rpm}$$

- N small sprocket = 212 rpm
- The flywheel is rigidly fixed with small sprocket shaft flywheel increase rpm of wash drum so resultant rpm of wash drum is magnify. The resultant rpm of washing mc is
- N washing machine shaft = 800 rpm
- As design washing machine rpm is sufficient to to run the machine.
- $\frac{212}{x} = \frac{20}{410}$
- $x = \frac{212\ x\ 410}{20}$
-
- x = 4346 rpm N dynamo = 4346 rpm
- As design washing machine rpm dynamo rpm is sufficient to run the machine and power generation.

4. CONCLUSION

The machine must be economical and simple to manufacture on the off chance that it will be embraced into the network. We perceived this need and planned the machine from the beginning in view of ease. The machine will just contain parts that are promptly accessible in rustic zones. This disposes of the need to request or import segments only for the clothes washer. The machine additionally utilizes bike parts for all the exactness parts. These parts are cheap on the grounds that rustic regions have an overflow of unused bike parts. The pedal-controlled clothes washer is very not the same as the network's present technique for washing garments; the network might be hesitant to attempt the new machine. To help support the appropriation of the clothes washer, we will run numerous preliminaries with neighborhood ladies so we can change the structure to address their issues. We will run the times for testing with bunches like the ladies' helpful who are as of now acquainted with pedal controlled machines; they have just demonstrated they are happy to attempt new innovations. In the event that ladies in the agreeable acknowledge and utilize the machines, at that point they will fill in as spokes-individuals for the new machine in their nearby network. Their help will significantly build the believability of the machine with the goal that nearby individuals will attempt it. We accomplished what we wanted for example to assemble a physically determined pedal fueled minimal effort clothes washer utilizing locally accessible materials and performing vital capacity of washing and flushing easily. Our clothes washer doesn't expend power. The clothes washer can be utilized by the urban individuals additionally while exercise and activities. It can fill double needs. While cycling, the garments can be washed using the accelerating of the person. On the off chance that the creation of this clothes washer is done at business scale, at that point the complete generation cost of the machine can be diminished to 40% of evaluated cost.

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