

DESIGN AND FABRICATION OF POND CLEANING SYSTEM

¹J. Gnanaraj, ²S. Elavalanathan, ³R. Naveen Kumar, ⁴M. Nelson Fleming

¹Assistance professor, ^{2,3,4}Student, Loyola Institute of Technology, Chennai, India.

¹gnanarajjames1978@gmail.com, ²solucisvalan@gmail.com, ³sknaveen114@gmail.com,

⁴nelsonfleming17@gmail.com

Abstract: This paper explains India is holey country. There is lots of water pollution of Godavari River at Nasik. The water pollution is very important problem in rivers, ponds and water bodies near Godavari River at Nasik. Due to increase in water pollution in the form to waste debris; it is hampering the life of aquatic animal and make their life in danger. Similarly, sometimes the aquatic animal tends to eats surface waste debris considering it as a food; which ultimately cause the death of animals. Due to polluted water is are many skin diseases to human kind are observed. So that to reduce the water pollution we are trying to make pond cleaning robot. "Pond Cleaning Robot" a device which involves the removing the waste debris from water surface and safely dispose from the water body. The pond cleaning robot works on Bluetooth to extract waste water debris, plastics & garbage from Godavari River at Nasik. We have got this idea from these important problems and created a more affordable device which can be used to clean all types of ponds, lake, drainage and river. We have worked to create a cheaper version of other existing water bodies cleaning system.

Keywords —cleaning, water, pollution.

I. INTRODUCTION

In this project, we will design a pond cleaning machine that could clean and unclog open drains easily. This machine is the combination of the conservative brush which is used to clean drain and a water jet. A rotating brush is inserted to ensure efficient cleaning impact to the drain compare to one direction of normal brush and also break any obstacle that clog the drain. High pressured water is use to break any accumulated clog that prevent water to flow. By this action, we do not need to take out the sludge in the drain. Therefore, our machine is different from any pond cleaning machine in the market. There are few aspects that we analyzed in making this machine such as: The depth and width of the drain – this is to ensure that the brush can be rotated perfectly. The motor speed, torque, and horse power – to ensure the speed of brush is bigger than friction force as it will affect the effectiveness of the brush. With the invention of this pond cleaning machine with water jet, it will give advantages to society especially whose dealing with this business. Cleaning drain is not a difficult task anymore for human.

II. METHODOLOGY

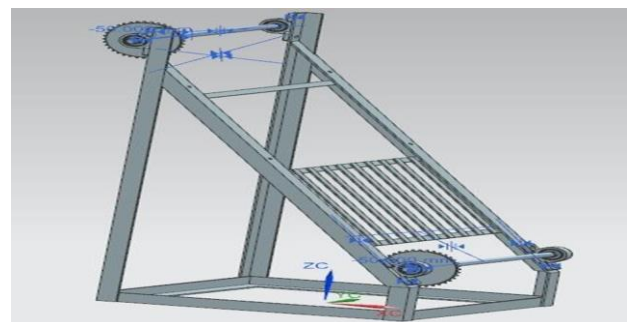
The device is place across a boat so that only water flows through the lower basement of the boat is cleaned. Floating waste like bottles, plastic cans, covers.....etc. is lifted by lifters. These lifters are made up of plastic in order to reduce the weight. The lifters are connected to the chain. We have selected chain drive in this project since belt drive

can be slippery in wet conditions. The chain revolves with the sprocket wheel which is driven by the motor which is connected to the shaft and the shaft is made up of mild steel.

We have chosen mild steel for more availability of the material and corrosion resistant. The energy provided to the motor is electrical energy. When motor runs the chain starts to circulate making the lifter to lift up. The wastage material is lifted by lifter teeth and stored in storage or collecting bin. Once the collecting bin is full, the waste materials are removed from the bin.

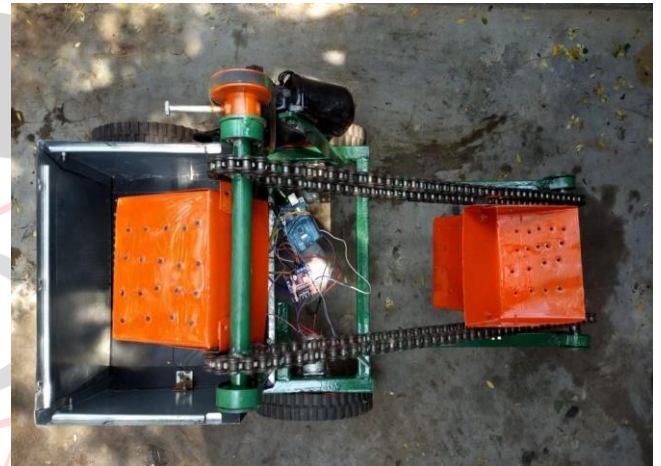
III. PROPOSED SYSTEM

The devices are place across drain so that only water flow through lower grids, waste like bottle, Etc. Floating in drain are lifted by teeth which is connected to chain. This chain is attached by gear driven by motor. When motor runs the chain starts to circulate making teeth to lift up. The waste materials are lifted by teeth and are stored in waste storage tank.



IV. FABRICATION PROCEDURE

Basically, during fabrication of the model, the basement part is prepared by welding the metal bars by electric welding. Then the supporting rods are welded at an angle of 90 degree from the basement, the pillow block bearings are fixed to the supporting rod and the front part of the basement. Hollow cylindrical shafts are fixed to the bearings and also chain drive is also fixed to the shaft in order to fix the shafts the factor of safety of the chain is calculated. The lifters are fixed to the chain by gas welding at an equal distance from each.



V. CONCLUSION

This pond cleaning machine uses two 12V rechargeable batteries which can stay about 3 hours for combination of brushing and water jet. By using battery that can stay longer much better for this machine such as 2 24V rechargeable batteries or more than that to make it portable and stay longer. For the shaft's casing and backpack frame, we used hollow square bar which is heavier. We suggesting that aluminium is used for lighter material that increased the handling also to overcome the torque steer. Since our project used limited amount of water which is 5.5L, for better future we recommend continuously water supply that make the flow rate moves continuously and reduce the weight of the machine. Meanwhile in order to get the variable speed of power window rotation, servo motor is suggested because we used constant speed for power window which is 6.04 rad/s. Furthermore, by using other means such as solar power to run the system would be more eco-friendly.

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