



Design & Fabrication of Portable Surface Water Cleaning Machine

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ABSTRACT:-

This project is on the design and fabrication of the surface water cleaning machine. The project has done looking at the present situation of the lakes, ponds which are covered with the lot of garbage and waste plastic materials, debris etc. The state & central governments are taking charge to clean rivers, ponds and investing huge in many river cleaning projects and a various projects in various cities like taking into consideration, this machine has designed to clean river, pond surface water.

Nowadays, many projects are being done for cleaning of the water surfaces and it may be heavy machinery and it's difficult to operate frequently. The main aim of our project is to reduce the human effort and, time taken for cleaning the surface water. In this project we have installed the bluetooth operation for the surface cleaning with help of a dc motors and belt drive arrangement. Some of the requirements are mentioned below. Here we are using Bluetooth to control the machine.

Keywords:- DC Motors, Chain Drive, Propeller, Sprockets, Battery, Conveyor Belt, Collector, Bluetooth.

1. INTRODUCTION

When there is waste debris in the water body that needs to be removed, the River Cleanup Machine is utilized, which collect & remove the wastage, garbage & plastic wastages from water bodies. Collection of debris becomes less difficult due to this. Waste surface debris will be removed from the water bodies by a machine, The reduction in water pollution will ultimately lead to a decrease in the death of aquatic animals due to these problems. It consists of a belt drive mechanism that lifts debris from the water. This project will be utilized in rivers, ponds, lakes, and other water bodies to remove surface water debris from bodies. Similarly, there are many problems with water pollution under the Chitravathi River, Nowadays, even though automation plays a vital role in all industrial applications in the proper disposal of wastages from industries and wastage cleaning is still a challenging task. Drainage pipes are used for the disposal of wastage and unfortunately sometimes there will may be loss of workers while cleaning the blockages in the drainages. The municipality workers are only responsible to ensure that the wastage is clean or not.

2. LITERATURE REVIEW

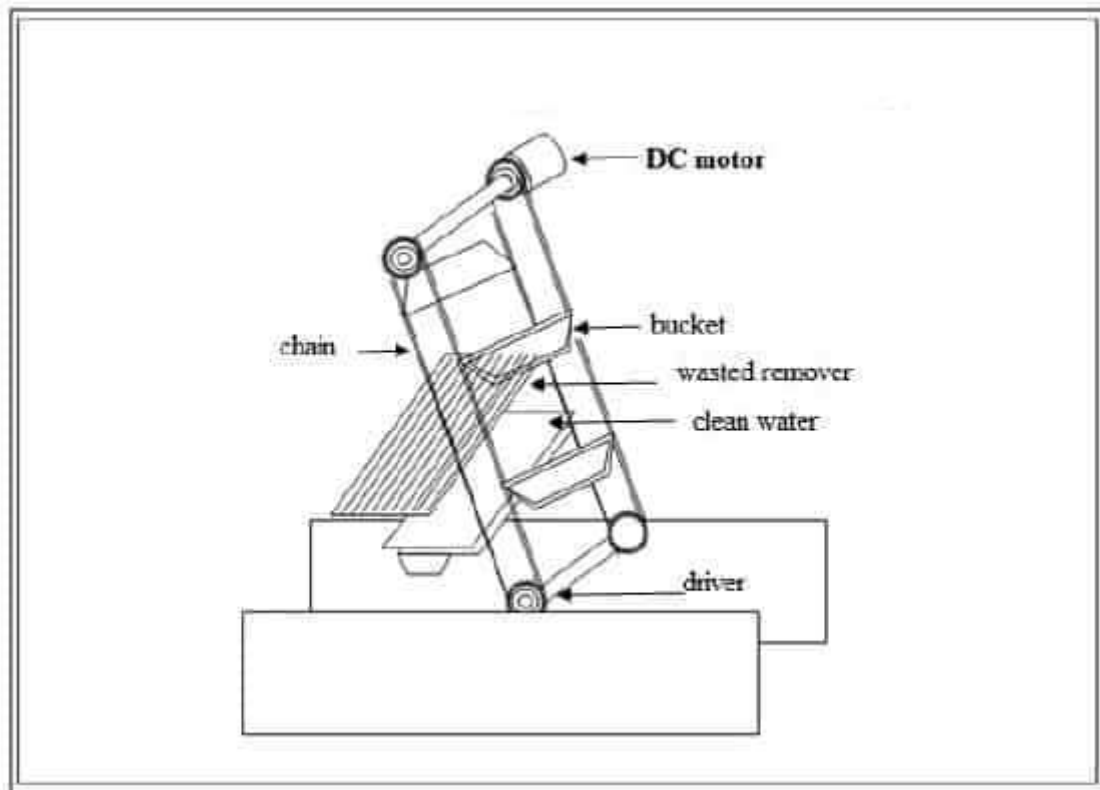
The aim of the project is to automate the sewage cleaning process in drainage to reduce the spread of diseases to humans. Pest infestations can be prevented by the black water cleaning process, which reduces residues that can attract and support them. This enhances the shelf life and sensory quality of food products.

The remote operation of the machine in the proposed system results in sewage cleaning.

The generation of mosquitoes is prevented from being wasted through this. The system's wiper motor starts running when the setup is switched on. The remote control setup is used to drive the wheel with the help of two power window motors connected to it. The process begins by collecting sewage wastes with the arm and throwing them back into the bin located at the bottom of the machine. The sewage is lifted by an arm and then collected in a bucket. Wastes that float on the water surface can be collected by the setup even in sewage areas with water. Garbage that affects the drainage is also taken care of by collecting and removing it.

3. CONSTRUCTION

Model of river cleaning machine:



The project involves a water wheel that is powered by a motor. Four DC motors provide a 12V DC output of 7.6 Amperes. The device that is running the project is a chain drive coupled with a collecting plate. Two main shafts are necessary for the project to balance and hoist the chain drive sprocket. The main body of the project is the frame that holds up the components. The frame, which is the main body of the project, holds the components in place. A pressure head is generated by the steel pipe with pressurized air to run the project on the water surface. The purpose of the project is fulfilled by the use of the fabricated storage tank to store waste.

4. WORKING PRINCIPLE

The primary objective of this machine is to lift waste debris from the water surface and dispose of it in a tray for this project. The remote operated river cleaning machine is what we are fabricating here. The collecting plate and chain drives are rotated continuously by the motor. The collection plate is coupled between the two chain drives for collecting the waste materials from river. A conveyer is used to throw the collected wastages onto the collecting tray. Our project involves a propeller that is used to drive the machine on the river. Two DC motors are used to run the propeller. Remote control of the machine is achieved by using an Bluetooth transmitter and receiver to control the complete electrical device.

5. ASSEMBLY OF MACHINE

Base Parts:

- 1) Base Frame
- 2) Hollow Pipe 2
- 3) Shaft 2
- 4) Motor 3
- 5) Gear 4
- 6) Collecting Mechanism
- 7) Chain 2
- 8) Water Wheel 2
- 9) Battery
- 10) Nut and Bolt

- 11) Connecting Tank
- 12) Bearings

Assembling Procedure of Machine:

The assembly procedure for a portable surface water cleaning machine involves the following steps:

- Carefully unpack all components carefully.
- Assemble or Weld the various components of the machine, such as the filtration unit, pump, and power source.
- Properly connect all fittings according to the requirements.
- For battery-powered machines, ensure that the batteries are fully charged or replaced as needed.
- Before using the machine for actual water cleaning, perform a test run.
- Pay attention to any specific operating procedures.
- Regular maintenance is crucial for the optimal performance and longevity of the machine.
- Always prioritize safety when using the machine, especially when dealing with water and electrical components.
- When not in use, properly store it in a clean and dry location to prevent damage and ensure longevity.

6. ADVANTAGES

- It is a battery based river cleaning system.
- It's initial & maintenance cost is low.
- Skilled Worker is not required to operate the system.
- Eco friendly system.
- Easy to operate.

7. APPLICATIONS

- It is applicable to reduce water pollution in rivers, ponds & lakes.
- It is useful to remove the debris present on the water pool to keep it clean

9. CONCLUSION

This project is fabricated on the basis of literature and research on different journal and paper relevantly available and fabricated in according, so it can provides free environment in operation. This innovation or invention is very easy to operate and low cost. This project "DESIGN & FABRICATION OF PORTABLE SURFACE WATER CLEANING MACHINE " is designed with a hope that it is very much eco-friendly and helpful to river, Pond & lakes cleaning. On the basis of it design and estimating cost and availability it is very cheap and very useful for the society.

On Calculating and Experimenting the result is very satisfactory. As the whole equipment works on battery based power, so we should recharge the battery after 1 tor 2 hours based on the usage. As we can say, that the efficiency is almost between 50% to 70% by taking working time of the project from its design.

On the basis of these result we can conclude that it is an innovative method of minimizing man power and thus very use in the ponds, lakes & rivers. The project done by us made an impressing look in the environmental aspects and it is very useful for the small works. Although this system able to collect the debris from the lakes, rivers & ponds with human efforts. The objective of the project was successfully achieved.

10. FUTURE SCOPE

The future scope of a portable surface water cleaning machine is promising, given the increasing awareness of environmental issues like water pollution. Advancements in technology could lead to more efficient and compact designs, making such machines more accessible and widely used. Additionally, incorporating renewable energy sources or innovative filtration methods could further enhance their effectiveness and sustainability. As global water scarcity becomes more critical, the demand for solutions like portable water cleaning machines is likely to grow.

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