Design And Fabrication Of Hydrowaste Harvester Machine

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Abstract

Water is the basic need for all Mankind. However, in recent years various water bodies are being polluted due various causes. Either it may be due human waste or in certain cases; it may be due to the natural waste. These water bodies are polluted and cannot be used directly. The government has taken up various efforts to clean these water bodies. Huge capital investment has been made for the clean-up purpose. By considering this, the project has been made in order to minimize the government cost in cleaning the lake. The amount can be used elsewhere for the benefit of the country and its people. This project will encourage the tourist who while be visiting Rivers and Lakes to ride the boat across the water body and simultaneously clean the lake.

1. Introduction:-

Water resources are natural resources of water that are potentially useful. Uses of water include agricultural, industrial, household, recreational and environmental activities. All living things require water to grow and reproduce. Water bodies such as pond, lake are the important water source for human life they help underground water level. It is very important to maintain this source a very clean so we can stop flowing of chemical from varies industries and household materials, street garbage to the river and ponds. However, floating waste is to be removed by machines or by manually. Now a day's labor available is less so we are planning for semi auto mated machine to remove floating water. It also can be upgraded and can convert it into a fully automatic machine.

Now a day's even through automation plays a vital role in all industrial applications in the proper disposal of sewages from industries and commercials are still a challenging task. During manual cleaning sometime, there will be a threat to human life. Water is the basic need for the existence of life on earth. In spite of 70%, water on earth majority of water is not suitable for drinking purpose. There is a huge demand of clean water as it is used for a variety of purpose such as drinking, bathing, cleaning, cooking etc.

Water is a necessity of human and living beings. There is a plenty of water on earth that is not suitable for human use. The impurities present in water can cause hazardous diseases. The use of this project will be made in rivers, ponds, lakes and other water bodies for to clean the surface water debris from bodies. This cleaning system is easy to operate and cheap to fix the drainage problems. In addition, there is a reduction of labor-oriented method of cleaning, thus upgrading dignity of labor.

2. Previous Works:-

Harshvardhan Baria, Mackwan Akash, Nirav Makwana, Raj Parmar, Mr. Sharad Chhantbar "Review Paper On Automated Drainage Cleaning System", they a made a System which collects the floating waste from the drainage without any human assistances.

Manoj Rathod, Vasant Pund, Rahul Pungle, Jiwan Rathod "Automatic Floating Waste Collector" have prepared a machine to minimize the manual effort to clean the lakes and use automated system.

Mahto Ravishankarkumar Ravindrabhai, Dehadray Vaibhav, Kaka Smit, Prof. Ankur Joshi "Design And Fabrication Of River Waste Collector" they modified the boat and converted it into a floating waste collector for rivers.

Prof. N.G.Jogi, Akash Dambhare, Kundan Golekar, Akshay Giri, Shubham Take "Efficient Lake Garbage Collector By Using Pedal Operated Boat" they have made a pedal boat with a conveyor system on it which collects and dumps the floating waste into the tank.

Sheikh Md, Shahid Md Rafique, Dr. Akash Langde "Design and Fabrication of River Cleaning Machine" their project is been made looking after the situation of rivers which are filled with sewage and plastics wastes.

Madhavi N.Wagh, Kashinath Munde "Design and Analysis of River Water Cleaning Machine" their project focuses on improving the government efforts for cleaning the Lakes and River.

Ganesh S. Patil, Rahul A. Pawar, Manish D. Borole, Shubham G. Ahire, Ajay L. Krishnani, Amit H. Karwande "Review Paper on Drainage Water Cleaner Machine" they made a machine which will clean the drainage without human intervention and also prevent blockage in the drain.

Pranay Agrawal, Bishakh Bhattacharya "Aquatic Multi-Robot System for Lake Cleaning" this project is an automatic aquatic vehicle which can be remotely operated for the purpose of cleaning the water bodies.

3. Objective:-

The main objective of this project is to minimize the problem of manual labor used for cleaning the lakes also to encourage the tourists in cleaning the lakes and river. The purpose of selecting the floating waste collector is follow

- Simplicity of Design and Control.
- Easy to operate and less time consuming.
- To clean the garbage present in small and big lake.
- To tackle the problems regarding wastage, food material, plastics present in the lake.
- To clean the polluted water due to which save the aquatic animal.
- To prevent the usage of gasoline powered vehicles for cleaning lakes.

4. Problem Statement:-

India is blessed with lots of water bodies in the form of Rivers, Lakes, Seas, etc. Nevertheless, these water bodies are not been maintained by the people or government of India. People throw wastes such as household garbage; some of them wash clothes in rivers so the dye of cloths also soap water causes the water body to be pollute. Ganga is the Holy River of India People over there give their offerings to God by putting flowers in to the water. Many Lakes are tourist places which means tourist may liter around the lake. The floating wastes blocks or obstructs the flow also, it tends to cut off the supply of external oxygen to the Lakes. This leads to degradation of aquatic life. Plastic wastes do not decompose.

5. Construction and Working Principle:-

i. Schematic Design Model

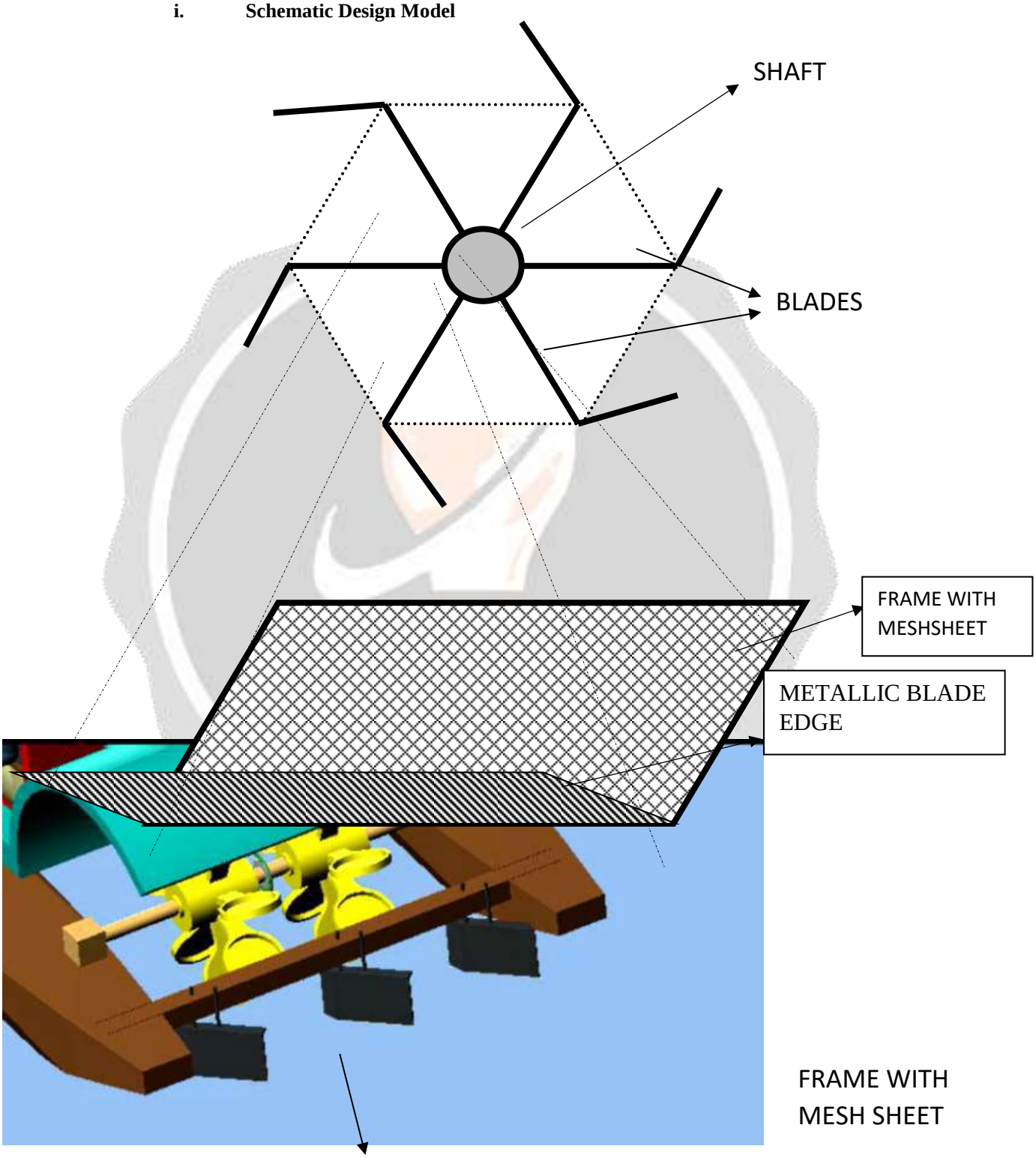

Fig. Rudder and Propellers

STRUCTURE OF CUTTER BLADES

ii. Construction

The project consists of a base frame made with a MS 25X25X2.5 mm bar. The base frame is been mounted over the Polyvinyl Chloride (PVC) pipes. We have use four pipes on each sides of the base frame. This is to ensure that the frame will float over under any load. Ahead of the boat, we have attached the blades in a hexagonal shape when looked from a side. These blades will make sure that the floating wastes is been collected. In addition, if the lake is containing certain wild plants such as water hyacinths, which are natural, waste we can easily uproot them with the machine. This boat is pedal operated. Therefore, we are making a seat by using sheet metal, which bent into an S shaped curve. The propeller are in spoon shaped due this action our boat is able to propel ahead and cancel out the opposing forces from the blades rotating action.

iii. Working Principle

In the project our main is to fabricated, a new design of a tourist boat, which pedal, operated which can also be used for cleaning purpose. Therefore, this boat is similar to any other pedal operated boats. The operator has to just keep pedaling the boat forward or reverse direction as per there use. The boat can be steered using the rudder this can be controlled using the handle provided near the seat. Ahead of the boat there are blades attached. These blades are rotated with the help of an electric motor. There a small battery unit provided. There operator can easily on and off the blades rotation using a simple on/off switch which is located near the seat. As our project is mainly focusing on tourist boats, we are providing the low powered battery. As per the theoretical calculation, the motor should run for 1hr 12min. but practically it runs for 50 mins.

iv. Specifications of Materials

Sr. No	Name of Material	Specification of Material
1	Square Bar	Material: MS Dimensions: 25 mm x 25 mm x 20ft Thickness: 2mm
2	M S Sheet	Material: M S BRIGHT Dimensions: 800 mm x 400 mm Thickness: 2 mm
3	Hollow Pipes	Material:- Poly Vinyl Chloride Dimensions:- 20mm x 10ft Quantity:- 2
4	Pedestal	UCP- 204 ID: 20 mm
5	Chain	Pitch: 5 mm Length: 1200 mm
6	Welded Mesh	Material:- Stainless Steel
7	Sprocket	Teeth: 27 & 24

6. **Advantages & Limitations:-**

Advantages

- Minimizes the labor
- Cleaner method of cleaning lakes
- Encourages tourists to clean lakes
- Low cost simple design
- Low maintenance and easy use

Limitation

- The waste collecting capacity of machine is limited at a time.
- This machine is able to collect the waste, which is only floating, on water level.
- The waste collecting capacity of machine is limited at a time.
- Difficult to clean in rainy season.
- For stable water, only we can run this machine not on wavy water surface.

7. Conclusion:-

As it is semi-automated it also can improve and made as fully automated it is a future best sewage cleaning technology. Compared to other it is cheap working cost, initial cost may high. This innovation is easy and less costly and has lots of more future scope. Based on its design and estimating cost and availability it is very cheap and very useful for the society. It mainly reduces manual stress. Modern services are becoming polarized. With the emergence of more and more automatic terminal services, modern services are also gradually becoming unmanned. Thus, this semi-automated sewage cleaning system helps in cleaning the sewage automatically and helps in decreasing the spread of diseases due to direct human intervention into the sewage.

8. Scope Of Work

- The machine can be designed for deep cleaning
- Solar panel can be used for providing power to the machine and engine can be used
- Capacity of the machine can be increased for cleaning big rivers and lakes.
- Remote controlling can be done
- It is a semi-automated machine and can be made it as fully auto mated one.
- Electric battery and motor can be attach and can made is as faster one.
- Hydraulic lift can be attached in smaller scale.
- It is also grate help in tourism

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