MANTECH Publications

Journal of Modern Mechanical Systems and Machining
Volume 4, Issue 1, January-June 2021

Water Surface Waste Removal Machine

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Abstract

In India there are several rituals river where India's people clean their cloths and bath daily and leave some waste. On the festivals like Durga pooja, Ganesh Chathurthi, Chatthpooja, their statues and discharge waste is immersed in these rivers or lakes by which plastic waste floats on the surface of water. This polluted water destroys the lives of aquatic insects and nearby resident people. Human lives suffer by such type of diseases like Cholera, Diarrhoea, Dysentery, hepatitis etc. As there are also conventional machines available in the market have high cost and not so much effective cleaning water is our main purpose. The conventional machine which can be operated through mobile phone from a long distance and can easily remove waste material from the surface of water is made up of DC motors, PVC pipes, propeller, conveyor, NODE MCU, Battery. Conveyor attach to DC motors for collecting garbage waste from water.

Keywords: *Waste Removal Machine, DC motors, clean water, Conveyor*

INTRODUCTION

There are different types of machines are used to clean water. Pollution of water is going to be increasing throughout the world. A study in 2007 study found that discharging unprocessed waste is the sole most vital supply of pollution on surface and spring water in India. There's a big gap between generation and treatment of domestic waste water in our country. The matter is not only that India lacks enough treatment capability however additionally that the existing waste treatment plants don't work and maintenance does not seem

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to be good enough. Due to our poor management and lazy work system no one wants to do work properly even they all have resources. So we made a device which can be operated through a long distance having following parts.

SELECTION OF COMPONENTS

1. **DC MOTORS:** It is used to convert electrical energy into mechanical energy by applying electric current through the wire winding of DC motor by which torque is produce on the shaft of motor

2. **Propeller:** In propeller is a rotating hub and radiating blades that is used to convert rotatory motion into linear motion when working in the fluid.

3. **Conveyor Belt:** Belt is made of rubber which is elastic it used to collect waste garbage from water through belt and store it in collecting box.

4. **Base frame:** It consists of hollow plastic pipes. These four pipes are arranged together in line horizontally with the help of low weight it help to float on the water surface.

5. **Lead Acid Battery:** IN lead acid battery there is conversion of chemical energy into electrical energy takes place which uses lead and lead peroxide. This battery can be recharged again and again. This supply of current is sufficient for this prototype model not for project.

6. **Node MCU:** It is a device which is use to access different things through Internet. It also has a WiFi module inbuit. Node MCU integrated characteristics of wireless fidelity approaches mark, base & microcontroller.

7. **Blynk App:** It can be defined as a recent platform which acknowledgement us to faster make interface project from your IOS & Smart phone. When we downloaded blynk app we can make envision splasher and arranged button.

METHODOLOGY

A. **Data Analysis methodology:** While conducting study the problems arises i.e. cost of machinery is just too high. There are numerous methods used for the gathering of waste floating on river or lacks manually, by using boat, thrash skimmers etc. which deposited to the shore of rivers. The methods used are costly, risky, and time taking.

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By considering all the parameters of river surface cleaning and eliminating the disadvantage of the methods used earlier, the planning of the remote operated river cleaning machine which can help in river surface cleaning effectively, efficiently and eco-friendly is proposed. Several companies offer equipment to wash river, lakes and harbors. The remote operated river surface cleaning machine can add river or lake. It can collect the floating garbage by conveyer belt system and stores during a tank provided on the machine. This is often really an honest solution for the aquatic solid waste management. This machine is remotely operated and cleans the waste present within the water bodies. during this machine, the conveyor collect the waste present in lake then collect it in box like structure called tank present in back side of the machine. It collects the waste like polythene, food material, and therefore the waste occurs thanks to religious festivals.

B. Proposed Solution methodology: Hence the designing and creation of the remotely operated water cleaning machine is proposed by us. The machine consists of conveyor belt and DC motors, are rotating continuously by the battery. The collecting conveyor is coupled between the 2 motors to collect the waste materials from river then the collected waste is thrown on the collecting panel. The propeller is used to supply motion to the machine to drive the machine on the water. The propeller runs with help of DC motor. The entire electrical devices are controlled by NODE MCU and receiver i.e. NODE MCU which use to regulate the machine remotely.

Construction procedure of machine:

1. Assemble four hollow plastic pipes for providing strength to the base.
2. 4 DC motor are assembled at different locations according to balancing or controlling.
3. 2 DC motor or connect with wheels of the boat.
4. Number of wheels 2.
5. Conveyor belt which is connected with two shafts one is connected with two DC motors while another is free.
6. Two rods perpendicular to the base and two rods parallely to conveyor belt connected to provide strength to conveyor belt.
7. Boat base contain a electric board having different kind of sensors which controls power which is to be provided to different DC motors.

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8. Circuit connect hotspot network to controlling the circuit with mobile.
9. A app installed from play store which have controlling all IOT programs.
10. According to requirements of connection, we use screw

WORKING PRINCIPLE

1. Assembly of four hollow pipes make the boat floatable, which contains pour inside the pipes.

2. DC motors connected with base and rotating shaft with wheels, which provides direction or turn of floating boat i.e. forward, reverse, right and left or it makes the boat moveable in 360 degree rotation.

3. Four rods connected with two different shafts one is free while another connected with two dc motors having same rpm which makes connecting rods moveable.

4. The belt made of rubber due to more elasticity and less weight, connected over both of the shafts and moves according to movement of connected shaft, free shaft only maintain the distance of belt which is known as conveyor belt.

5. Electric board on the base of the boat signaled through the mobile which is connected with IOT system and makes the boat as controlling by mobile.

6. The controlling system programming feed in program form by this it connected with the help of hotspot to the mobile and controlled by blynk app, which controls device from a long distance without any lagging situation.

7. In blynk app we make the controlling key according to our requirements.

8. According to passing signal through mobile, its transfer electrical energy to de motors and makes controlling so easy.

9. After passing electrical energy all moveable parts of machine are in working condition.

10. Half part of conveyor belt merge inside the water and conveyor belt rotates the floating debris comes in contact of conveyor belt or on the conveyor belt, all wastes travel on conveyor belt and then store in container which we attached on the base of the boat.

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11. This waste can remove from the boat taking the boat near bank of the river or pond.

12. Maximum parts of the boat made by plastic due to less weight compare with metals or other particles.

13. Plastic is generally not affected by the water.

Dimensions of the Component:

DC Motor

Shaft Length = 38mm

Shaft Diameter = 2mm

Rpm = 9000

Length = 27.5mm

Width = 20mm

Height =15mm

Base Frame Pipes

Length = 40cm

Diameter = 5.20cm

Conveyor Belt

Length =28.84cm

Width =19.99cm

Battery

Length = 10cm

Width = 4cm

Height =5cm

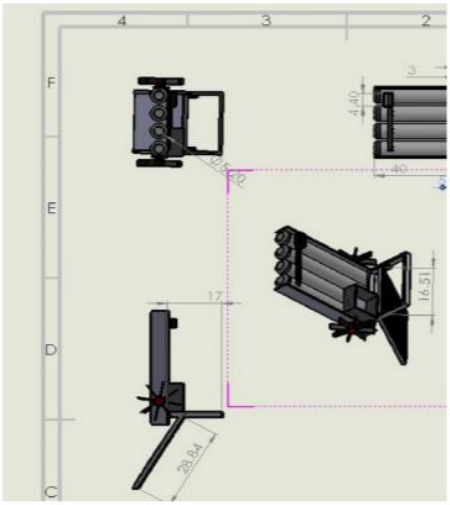
Voltage = 9volt

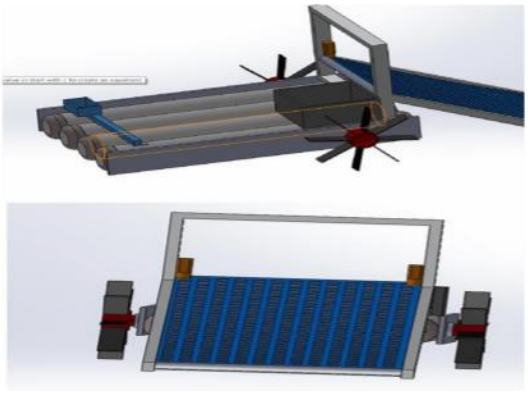
Propellor

Diameter =10cm

Pitch =90 Degree

Model Design:







RESULTS AND DISCUSSION

While conducting study from newspaper articles, news reports, observations and

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literature review of existing projects, the problems faced during tackling the issues of cleaning surface of water from water reservoirs. The matter s were identified and studied with the assistance of knowledge collected during the study and applying the essential knowledge of engineering for overcoming the problem. Finally it came up with a machine with organized simple mechanism and therefore the final product is shown. It reduces the pollution. It's non-conventional river cleaning system. Less maintenance, there's no such system where regular maintenance is required. It's very beneficial for little also as big lake, where garbage is present in great deal; it can collect this garbage as clean the lake. Its initial cost is a smaller amount. No consumption of fuels, as fuels like petrol and diesel are often saved due to battery operates.

CONCLUSION

While conducting study from newspaper articles, news reports, observations and literature review of existing projects, the problems faced during tackling the issues of cleaning surface of water from water reservoirs. The matters were identified and studied with the assistance of knowledge collected during the study and applying the essential knowledge of engineering for overcoming the problem. Finally it came up with a machine with organized simple mechanism and therefore the final product is shown. It reduces the pollution . it's non-conventional river cleaning system. Less maintenance, there's no such system where regular maintenance is required. it's very beneficial for little also as big lake, where garbage is present in great deal , it can collect this garbage as clean the lake. Its initial cost is a smaller amount. No consumption of fuels, as fuels like petrol and diesel are often saved due to battery operates.

FUTURE SCOPE

To control device from a long distance, we will use camera at top of the project which displays the belt condition, also direction of boat. By camera we see the direction of boats, therefore the accuracy of cleaning the water increased. To scale back the matter of recharging the battery, we will use solar panel which directly connect with battery and recharge it continuously. Through this recharging of battery, problem is often eliminated. Or in future to extend battery life lithium ion batteries will be oftenly used, in place of lead acid battery. Lithium ion battery is much effective.

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