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DESIGN AND FABRICATION OF WATER SURFACE CLEANING BOAT USING SOLAR PANEL.

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Abstract:

In India water pollution is increasing day by day so this is often becoming a significant issue for rivers, ponds etc. This mainly consists of impurities like wastewater debris, plastics, garbage on floating water surfaces. These impurities mainly affect the health of people and also affect the life of aquatic animals. Normally this project is based on renewable energy sources, so there's reduction in use of non renewable energy sources like oil, petroleum, electricity and all types of mineral sources. So by this non renewable energy sources are saved. So this project helps to reduce the water pollution on floating bodies. This project focuses more on "Remote Controlled Unmanned River Cleaning Bot".

Keywords — **non renewable energy sources, Unmanned River Cleaning Bot**

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I. INTRODUCTION

Generally, conventional method based on manual basis and it's used for collection of water debris, trash, plastic and all other sorts of impurities which is floating on water bodies or by collecting this impurity by means of boat, thrash skimmer etc. And removed this impurity near the river shore and disposed of it. But this conventional method requires more manpower; hence this is often a risky, costly and time consuming method. By considering this all remote operated floating river cleaning machines are more efficient than conventional methods and also this is effective and eco-friendly

This machine is remote operated so manpower isn't required at all. So this machine is really advantageous for reducing the pollution on Ganga river which is caused by 'Kumbh Mela' And also Government of India has taken charge to wash river and pond thanks to increasing water pollution , then that they invest huge capital for several river cleaning project like 'Namami Ganga', 'Narmada bachao'. And also developed many projects in various cities like Ahmedabad, Varanasi etc. By taking into consideration, this Remote operated river cleaning machine has been designed to clean river floating surfaces.

II . PROPOSED SYSTEM

The "Wireless River Cleaning Boat" is a novel and innovative solution designed to address the growing concern of water pollution in rivers and water bodies. This project presents a cost-effective and eco-friendly approach to river cleaning by utilizing a remotely operated boat that is controlled via Bluetooth technology. The core functionality of this system is centred on its ability to be controlled wirelessly using a mobile device through Bluetooth connectivity. Users can remotely navigate the boat within the water body, enabling precise targeting of polluted areas. The cleaning mechanism consists of waste collecting tray and waste storing net. The collected waste is securely stored on the boat for

later disposal, ensuring the efficient and responsible management of river clean up

III. SYSTEM DESCRIPTION

We know that solar panels convert light energy into electrical energy which is DC in nature. Solar panel output energy is given to the charge controller that controls DC output of solar which is pulsating in nature and fed pure DC to charge the battery. As we know that battery is used to store the energy. This stored energy is given to all this circuitry for overall operation. This circuitry consists of a controller, level sensor, photodiodes, Bluetooth, conveyor system, propeller, buzzer, and servo motor. In this system controller is a main part it's having input like photodiode, Bluetooth, level sensor and output consist of conveyor system, propeller, buzzer, and servo motor. Android app is used for overall remote controlling purposes.

IV. Technical Specifications:

Hardware:

Microcontroller : Arduino microcontroller
Crystal : 16 MHz
LCD : 16×2 LCD display
H-Bridge : L293D
Motors : DC motors
Bluetooth : HC-05
Power Source : 12V 1 amp DC battery

Software: Arduino IDE INTERFACES

V.WORKING PRINCIPLE

In this project the foremost aim of this machine is to lift waste debris from the water surface and dispose of it within the tray. It consists of an arrangement of conveyor which is placed on the shaft of the motor. Due rotation of motor conveyor rotated. Because the conveyor is moved, it collects water debris, waste garbage and plastics from water bodies. because the machine is placed within the water the waste debris in water will get lifted and it moves in an upward direction. because the waste debris reaches the upper extreme position it'll get dropped within the tray. Hence this will end in cleaning of water surfaces and safe collection of waste debris from water. Propeller is used to drive the machine on the river and run with the help of a DC motor. The total electrical devices are controlled by an Bluetooth transmitter and receiver which are used to manage the machine remotely. Water wheel is bolted on a shaft which is placed aboard the frame. The aim of a water wheel (propeller) is to maneuver the machine forward or backward on water. Motor is used to rotate the water wheel with the assistance of a coupling drive mechanism. In this project solar system is additionally implemented which is helpful to supply of electrical energy with reference to sunrays.

DESIGN CALCULATIONS:

Battery-8V/2Amp Panel-12V/3watt

Current (I) = P/V I = 3/12 I = 0.25Amp

Charging Voltage = 9V/250mA

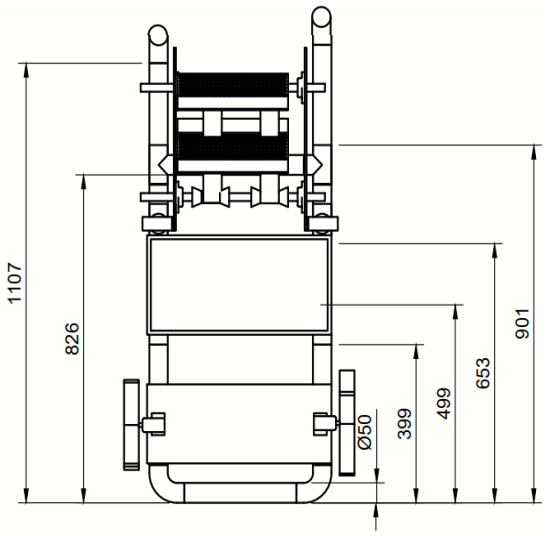
Charging Time = (Battery Watt/Panel Watt)*2

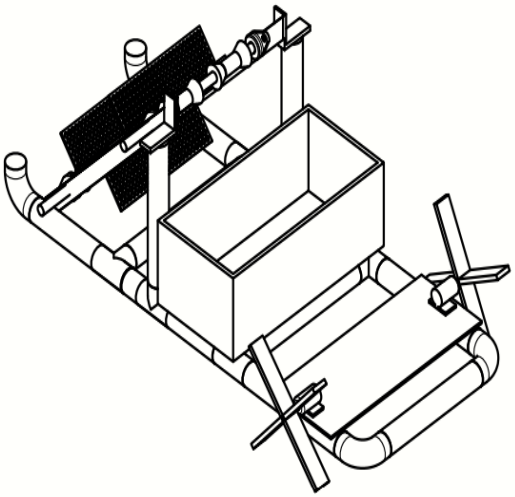
= (16/2.25)*2 = 14.22hrs

Discharge Time = (Battery Amp Hr/Total current

Consumed) = 2000mA/1270 =1.57hrs

A. CREO DESIGN DIAGRAM





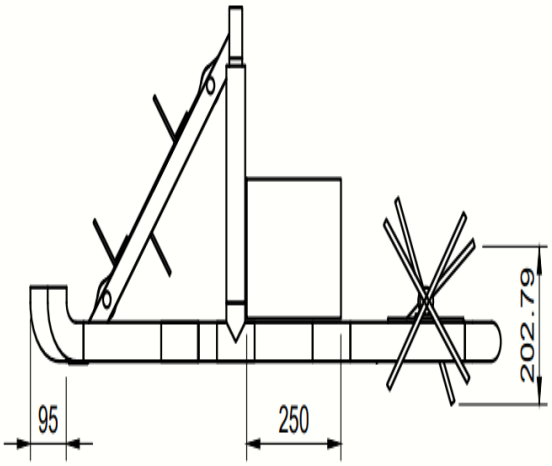


Fig. 2 Proposed Creo Design of Water surface cleaning Boat

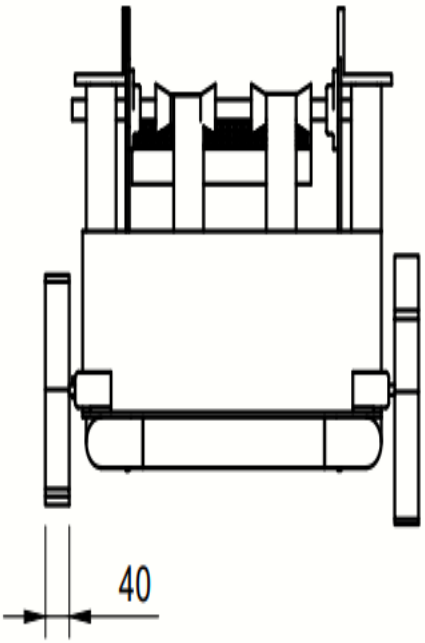


Fig. 2 Proposed Model of Water surface cleaning Boat

VI.CONCLUSION

This project emphasizes supply flexibility in operation. This is often easy to operate and the price of maintenance is low. Hence this project "Remote Controlled Unmanned Floating River Cleaning Machine" is usually designed to form a system considerably economical and helpful to get rid of water impurities like plastics, trashes, water debris which is floating on river and pond surface.This is mainly very useful maintaining human health and for increasing the lifetime of aquatic animals. In future this remote operated floating river cleaning machine has more scope to remove large capacity of garbage automatically as fast as possible.

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