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Design and Fabrication of Project on Water Bodies Cleaning Robot

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ABSTRACT

This project emphasis on design and fabrication of the river waste cleaning machine. The work has done looking at the current situation of our national rivers which are dump with crore liters of sewage and loaded with pollutants, toxic materials, debris etc. The government of India has taken charge to clean rivers and invest huge capital in many river cleaning projects like "Namami Gange", ''Narmada Bachao'' and many major and medium projects in various cities like Ahmadabad, Varanasi etc. By taking this into consideration, this machine has designed to clean river water surface.

Nowadays almost all the manufacturing process is being atomized in order to deliver the products at a faster rate. Automation plays an important role in mass production. In this project we have fabricated the remote operated river cleaning machine. The main aim of the project is to reduce the man power, time consumption for cleaning the river. In this project we have automated the operation of river cleaning with help of a motor and chain drive arrangement. Some needs of automation are described below. Here using RF transmitter and receiver are to control the cleaning machine. Automation can be achieved through computers, hydraulics, pneumatics, robotics, etc., of these sources, pneumatics form an attractive medium for low cost automation.

Keywords-- Motor, Chain drive, Collector, RF transmitter, Receiver

I. INTRODUCTION

The "River cleanup machine" used in that places where there is waste debris in the water body which are to be removed. This machine is consists of waterwheel driven conveyer mechanism which collect & remove the wastage, garbage & plastic wastages from water bodies. This also reduce the difficulties which we face when collection of debris take place. A machine will lift the waste surface debris from the water bodies, this will ultimately result in reduction of water pollution and lastly the aquatic animal's death to these problems will be reduced. It consists of Belt drive mechanism which lifts the debris from the water. 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. Similarly they are lots of problems of water pollution under Godavari River, Nasik which affect the acoustic, human life & beauty of Godavari River. The some photo graphs are shows the water pollution near Godavari River Nasik.

II. CONSTRUCTION

The project consists of a motor operated water wheel to run the project. It has four DC Motor of 12V, 7.6 Ampere. The device which is running the project is chain drive coupled having collecting plate. The project consists of two main shafts balancing and hoisting the sprocket of chain drive. The components are rest on frame serve as main body of the project. The steel pipe with pressurize air generates pressure head to run the project on water surface. The fabricated storage tank is used to store the waste fulfilling the purpose of the project.

Specifications

1) Length= 1220mm Width= 480mm Square pipe of 20mm Thickness= 2m
2) L-section*04: Height= 8inch (203mm) Width= 7.5inch (190.5mm) Plates of 1 inch (25.4mm) Mounted at 230mm from ends
3) Stand: Height= 520mm Fixed at 500mm from 1 side
4) L – support at a height of 40 inch to main end
5) Motor support: Fixed at the height of 340mm Length= 10cm Width= 1cm
6) Dc motor Rpm= 30 Shaft= 20mm
7) Main shaft: Diameter= 25.4mm

Working

In this project the main aim of this machine is to lift

the waste debris from the water surface and dispose them in the tray. Here we are fabricating the remote operated river cleaning machine. The collecting plate and chain drives are rotating continuously by the motor. The collecting plate is coupled between the two chain drives for collect the waste materials from river. The collected wastages are thrown on the collecting tray with the help of conveyer. Our project is having propeller which is used to drive the machine on the river. The propeller is run with the help of two PMDC motor. The total electrical device is controlled by RF transmitter and receiver which use to control the machine remotely.

III. PROBLEM IDENTIFICATION

A. Motivation and objective

The problem of water logging due to plastic, thermocole and metal leads to pest growth and it favors diseases like malaria, typhoid etc. This is unsafe for human life and hence the idea of this project emerged. The objective of the proposed project is to design and fabricate an automated machine for drainage cleaning in order to prevent humans from getting affected by various diseases from the infectious microbes present in the sewage while cleaning manually. This proposed system is to minimize or overcome the problem faced while using man operated machine and to minimize the increased dumping rate of waste.

B. Existing method

The existing system is completely a mechanical based project. It is a stationary system, simply kept in the sewage area to collect the wastes passing over it. The chain and sprocket is used for rims movement, which has fitted fins to collect the wastes from the sewage. The rotation of the chain along with the rims will push the boat in forward direction, the floating wastes are collected between different sizes of fins and put off the wastes in the bin that is placed at the backside of the system.

IV. CONSTRUCTION AND WORKING PRINCIPLE

A. Construction

The project consist of different types of fins attached at both side. The component which is running the project is Chain and Sprocket assembly and two rims. On the spokes of Rims we are going to fix curvature cross-section due to which when rims are rotating on the surface of river it pushes the water in opposite direction and boat moves in forward direction. In this project Fins are fixed at one side and another side is moving, on moving side copper wire is fixed and this wires rolls on pulley connected with servo motor. Servo motor connected with 9V battery to pull the fins upward.

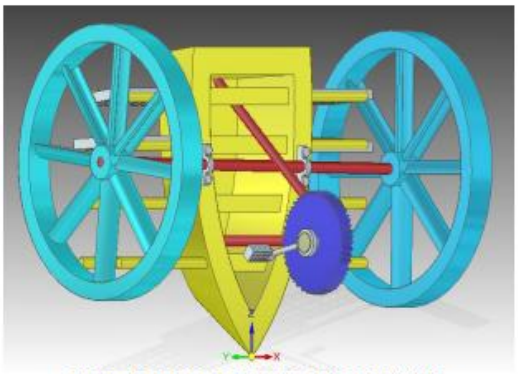

FIG:- 1 RIVER WASTE COLLECTOR

B. Working Principle

In general terms, the present invention relates to a stationary, Solid waste Screening or skimming vessel for collecting waste from flowing waterways by means of using four different types of Fins. The Fins are connected with Rod with the help of Hook at outside of the Boat. The flowing of water from Fins collects the floating solid waste. After collecting solid waste between Fins all the waste are Transferred into Last section by Lifting the fins with the help of Servo Motor. Fins are Hanging from one point and another point is connected with metal wire and Metal wire is connected with Servo motor. Servo motor is connected with 9V Battery. This Boat can run by using manually operated Link (Chain and Sprocket Assembly) or else different types of Engines which are used in boats. As noted above, the device of the present invention will preferably be used to collect floating or partially sub merged trash and debris from waterways (e.g., streams, harbors, rivers, lakes, and the like). It is adapted to being moved to different locations. Accordingly, it is a principal object of the present invention to provide a solid waste collection system for collecting Solid waste in a body of flowing water. It is another object of the present invention to provide a solid waste collection system that is simple to operate, requires minimum maintenance. Briefly described, those and other objects and features of the present invention may be accomplished, as embodied and fully described herein, by a solid waste collection system for collecting Solid waste in a body of flowing water that has a flotation platform adapted to being securely positioned in and floating on the flowing water, a Solid waste collection section mounted on the platform having, on one end. Two rod attached to and extending outward from the upstream end of the platform used to connect the fins with Boat. This section can be attached with boat using hooks and if this containers are filled with waste then it can be replaced with another one or else by detaching the container this boat can be used for Transportation

V. CONCLUSION

This project is fabricated on the basis of literature and research on different journal and paper relevantly available and fabricated in accordance so it can provides flexibility in

operation. This innovation is easy and less costly and has lot of room to grow more economical. This project "Remote Operated River Cleaning Machine" is designed with the hope that it is very much economical and helpful to river and Pond cleaning. On the basis of it design and estimating cost and availability it is very cheap and very useful for the society.

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