"An Improved River Cleaning System"

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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 .This project focuses on design and fabrication of the river waste cleaning machine. The work has done looking at thecurrent situation of our national rivers which are dump with core liters of sewage and loaded with pollutants, toxic materials, debrisDue to polluted water there are many skin diseases to human kind are observed. So that to reduce the water pollution we are trying to make water clean-up machine. "Water clean-up machine" a machine which involves the removing the waste debris from water surface and safely dispose from the water body. Our proposed project uses special light weighted pipes,ultrasonic sensor ,turbidity sensor and water garbage waste storage box equipment's to work as automatic water garbage cleaning system.

Index terms- UPVC pipes ,geers ,motors ,sensors etc

1. INTRODUCTION

Rivers are important part of human lives. But unfortunately, only few are aware of its importance. The proof: tons of trash in our rivers and creeks, making it look and smell like a dumpsite. The garbage in rivers is more than just an eyesore because it can possibly contaminate our drinking water and threaten nature, our lives, and that of our loved ones. Even a piece of litter thrown on the street may contribute to the piling garbage in our rivers and creeks. Rivers remain an important source of drinking water for many towns and cities. The water is purified first before it reaches to our tap. However, if our rivers remain polluted, the water can't be purified to the extent that it won't be suitable for human consumption anymore. It is crucial to look after our river systems and protect them from pollution to we want them to keep on flowing to our taps. Rivers provide habitat to a wide range of animal and plant species. A drainage ditch is a narrow channel that is dug at the side of a road or field to carry away the water. Nowadays, even though automation plays a vital role in all industrial applications in the proper disposal of sewages from industries and sewage cleaning is still a challenging task. Drainage pipes are used for the disposal of sewage and unfortunately sometimes there may be loss of human life while cleaning the blockages in the drainage pipes .The Over two thirds of Earth's surface is covered by water; less than a third is taken up by land. As Earth's population continues to grow, people are putting ever-increasing pressure on the planet's water resources. In a sense, our oceans, rivers, and other inland waters are being "squeezed" by human activities so their quality is reduced. Poorer water quality means water pollution. This invention relates to floating matchine, i.e., work like floating boats for collecting and disposing of floating solid waste materials in waterways .

2. LITRATURE REVIEW

POLLUTION AND CONSERVATION OF GANGA RIVER IN MODERN INDIA [1]

BasantRai , International Journal of Scientific and Research Publications, Volume 3, Issue 4, April 2013 1 ISSN 2250-3153

According to a World Bank Sponsored Study (State of Environment Report- U.P.) (In: Mallikarjun, 2003), pollution levels in the Ganga are contributing 9-12% of total disease burden in Uttar Pradesh (U.P.). The coliform bacteria levels are in excess of 2 lakh MPN as against the national water quality standard of 5000 (Mallikarjun, 2003). The report estimated total health damage on account of water pollution in up to is around 6.4 million daily (Disability Adjusted Life Year).According to the CPCB survey report, the total municipal sewage generated in the identified 25 towns in 1985 was of the order of1340 million liters per day (mld). Apart from this sewage, 260 mld of industrial wastewater, runoff from 6 million tons of fertilizers and 9,000 tonnes of pesticides used in agriculture within the basin, large quantities of solid waste, including thousands of animal carcasses and human corpses were being released into the river every day. Out of this, works corresponding to 873 mld only (65%) were taken up under the first phase

of GAP. The remaining sewage was to be taken up under the 2nd phase of GAP which is already in progress. The Action Plan primarily addressed itself to the interception and diversion for treatment of the targeted municipal sewage of 873 mld. According to report of Water Resources Planning Commission (May, 2009), the programme GAP and NRCP has been positive. Water quality monitoring done by reputed independent institutions indicates some improvement in the water quality over pre-GAP period. The water quality analysis of samples collected at 16 stations on River Ganga during 1986 and 2008 shows improvement in Dissolved Oxygen (DO) levels at 4 locations namely up and down streams of Allahabad and Varanasi. All the 16 stations except Patna downstream and Rajmahal show reduction in Biological Oxygen Demand (BOD) values. From this paper, a composite marine propeller is designed and modeled from three composite materials. The model is evaluated for its open water characteristics and cavitation performance numerically using hydro-elastic model. To validate the results, composite propeller is fabricated using open mold technique and is tested in cavitation tunnel available at NSTL vizag. From the results it is concluded that, the hydro-elastic model used for analysis of composite propeller is in close agreement with experimental results. The stacking sequence which contributed to the optimum performance is selected from the choice of stacking sequences. The results of the same are presented in this paper.

DESIGHN ,FABRICATION AND ANALYSIS OF COMPOSIT MARINE PROPELLER [2]

Dr, P Ravinder Reddy, CBIT, Hyderabad.

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

DESIGHN OF CONTINEOUS LOADING VERTICAL CHAIN CONVEYOR, [3]

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A conveyor system is a common piece of mechanical Handling equipment that moves materials from one location to another. The main purpose of this project is to safely lift the load at the rate of 6m/min. This paper consist of, selection, the design of basic mechanical elements. This system is able to overcome the drawbacks of inclined belt conveyor, achieves desired height and occupies less floor space as the material is transformed in vertically upward direction. This Chain Conveyor utilizes a continuous chain arrangement, carrying a series of the single pallet for lifting the load. The chain arrangement is driven by a motor, and the material suspended on the pallets is conveyedtothenext floor.

"DRAINAGE SYSTEM CLEANER" A SOLUTION TO ENVIRONMENTAL HAZARDS [4]

Ndubuisi c. DanielsInternational Refereed Journal of Engineering and Science) ISSN(Online) 2319-183X, Volume3, Issue 3(March 2014)

The Drainage system cleaner is a machine which helps to protect the environment from different kinds of environmental hazards through the promotion waste management by the removal of garbage from the drainage system. These wastes when not removed end up settling in residential places where these wastes are burnt thereby causing climate change otherwise these wastes block the drainage systems thereby causing flooding. The machine is designed in such a way that it generates motion for its functions by itself through the action of running water thereby cutting out the dangers of the powering the machine by other sources of power because of the harshness of the rain on these other sources. The drainage system cleaner has three major parts which are the Propeller, the Cleaner and the Pan all make up for its effective functioning. The Drainage system cleaner was tested on three different days in the first day it rained in the months of September, October and November 2012 respectively. Based on the findings made after the test the Drainage system functioned
well when there is maximum load. I therefore recommend the use of this system by various individuals, government companies and waste recycling companies for prevention of environmental hazards and also encouraging waste management. Drainage systems are blocked most times by garbage like nylon, plastic bottles, and empty cans which cluster together and find their way into the drainage systems. If these garbage are allowed to flow the will end up flowing down to recreational beaches used for tourism purposes making a scene not pleasurable to the eyes (Larsen et al 2009) else these garbage flow to residential sites where they are burnt in a way of getting rid of them, thereby causing climate change. Overflow of water drainage   system occurs when there is a blockage of an end of the drainage system forcing the water to find its way   elsewhere apart from the mapped out drainage system, therefore the running water spills over the horizontal height of the drainage systems spreading to regions alongside the drainage system, thereby causing problems such as pushing down of structures such as fences, water

logging of farm lands and residential buildings etc.

DESIGHN AND CONSTRUCTION OF RIVER CLEANING MECHANISM [5]

Dharmesh N. Kandare, Aniket N. Kalel, Aniket S. Jamdade, Gitesh P. Jawale , R.K. Khanpate Professor

The project emphasizes on design & construction of river cleaning mechanism. The system is successfully able to clean the floating solid waste over the river surface more efficiently. This system works towards its social aim of cleaning the rivers & other water bodies. It simulates the conventionally used mechanisms of using conveyors in its working principles but have an intimidating modification of Air Tube Piping Guider mechanism for improving its efficiency. The conventional & generally used method of cleaning or more precisely collecting the floating waste are manual or by means of boat etc. and are deposited near the shore of river. But these methods are risky, costly, time consuming and required major workforce. By considering all the parameters of river surface cleaning systems and eliminating the drawback of all the methods mention earlier, the remote operated river cleaning machine has been design and constructed which helps in river surface cleaning effectively, efficiently and ecofriendly. The main aim of the project is to reduce the manpower, time consumption and thereby increasing the efficiency of the machine for cleaning the river. In this project, we have remotely controlled the operation of river cleaning with the help of motor, coupling & R/C arrangement.

3. COMPONENTS OF RIVER CLEANING SYSTEM
1. Motor

Here you can get Johnson Geared Motor which is made in INDIA with different RPM of the motor. A DC motor is any of a class of rotary electrical motors that converts direct current electrical energy into mechanical energy. Nearly all types of DC motors have some internal mechanism, either electromechanical or electronic, to periodically change the direction of current in a part of the motor.

This DC motor gives very good torque at an affordable price hence they are widely applicable in Pan/Tilt camera, auto shutter, welding machines, water meter IC card, grill, oven, cleaning machine garbage disposers, household appliances, slot machines, money detector, automatic actuator, coffee machine, Towel disposal, lighting coin refund devices, the peristaltic pump and so on

2.Arduino Board

Arduino/Genuino Uno is a microcontroller board based on the ATmega328P (datasheet). It has 14 digital input/output pins (of which 6 can be used as PWM outputs), 6 analog inputs, a 16 MHz quartz crystal, a USB connection, a power jack, an ICSP header and a reset button. It contains everything needed to support the microcontroller; simply connect it to a computer with a USB cable or power it with a AC-to-DC adapter or battery to get started.. You can tinker with your UNO without worring too much about doing something wrong, worst case scenario you can replace thechip for a few dollars and start over again.

3. Node MCU

The NodeMCU (Node MicroController Unit) is an open source software and hardware development environment that is built around a very inexpensive System-on-a-Chip (SoC) called the ESP8266. The ESP8266, designed and manufactured by Espressif Systems, contains all crucial elements of the modern computer: CPU, RAM, networking (wifi), and even a modern operating system and SDK. When purchased at bulk, the ESP8266 chip costs only $2 USD a piece. That makes it an excellent choice for IoT projects of all kinds.

However, as a chip, the ESP8266 is also hard to access and use. You have to solder wires, with the appropriate analog voltage, to its PINs for the simplest tasks such as powering it on or sending a keystroke to the "computer" on the chip. And, you have to program it in low-level machine instructions that can be interpreted by the chip hardware. While this level of integration is not a problem when the ESP8266 is used as an embedded controller

chip in mass-produced electronics, it is a huge burden for hobbyists, hackers, or students who want to experiment with it in their own IoT projects.

4. Turbidity Sensor

Global Water's Turbidity Sensor is a highly accurate submersible instrument for in-situ environmental or process monitoring. Applications for the turbidity sensors include: water quality testing and management, river monitoring, stream measurement, reservoir water quality testing, groundwater testing, water and wastewater treatment, and effluent and industrial control.

In accordance with USEPA Method 180.1 for turbidity measurement, the Turbidity Sensors are a 90 degree scatter nephelometer. The turbidity sensor directs a focused beam into the monitored water. The light beam reflects off particles in the water, and the resultant light intensity is measured by the turbidity sensor's photodetector positioned at 90 degrees to the light beam. The light intensity detected by the turbidity sensor is directly proportional to the turbidity of the water. The turbidity sensors utilize a second light detector to correct for light intensity variations, color changes, and minor lens fouling.

For environmental or process monitoring, simply place the turbidity sensor directly in the water and position it where the turbidity is to be monitored. Since the turbidity sensor uses light to detect the water's turbidity ensure that the minimum amount of external light possible is exposed to the monitoring site.

5. Ultrasonic sensor

An ultrasonic sensor is an electronic device that measures the distance of a target object by emitting ultrasonic sound waves, and converts the reflected sound into an electrical signal. Ultrasonic waves travel faster than the speed of audible sound (i.e. the sound that humans can hear). Ultrasonic sensors have two main components: the transmitter (which emits the sound using piezoelectric crystals) and the receiver (which encounters the sound after it has travelled to and from the target).

In order to calculate the distance between the sensor and the object, the sensor measures the time it takes between the emission of the sound by the transmitter to its contact with the receiver. The formula for this calculation is **$D = \frac{1}{2} T \times C$** (where D is the distance, T is the time, and C is the speed of sound ~ 343 meters/second).

4. ADVANTAGES AND APPLICATIONS

Advantages

1. Easyinoperation .
2. Environment friendly system .
3. Light in weight .
4. It's initial and maintenance cost is low .
5. It is non conventional river cleaning system .

Applications

1. It is applicable to reduce water pollution in river , ponds , oceans .
2. It is used to reduce the environmental marine pollution at river .
3. To clean the garbage present in small ang big water bodies .
4. To tackle the problem regarding wastage food material , plastic present in the waterbodies.
5. To clean the polluted water due to which save the aquaticanimals.

5. CONCLUSION

This project "An Improved River Cleaning System" is designed with the hope that it is very much economical and helpful to river and pond cleaning. It is very portable and very useful for the society. It will be helpful in cleaning river as a result will be helpful in saving aquatic lives.

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