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Design and Fabrication of Lake Garbage Collecting Robot

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ABSTRACT

Clean water is a basic need for all living beings. Without water survival in the Earth is not possible. Water covers about 70% of the Earth's surface among that only 3% of that is pure water. Water gets polluted due to any reasons like industry waste, sewage waste, garbage waste. This Robot is a manually controlled river cleaning intelligent to achieve a sustainable environment. 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. This "Lake Garbage Collecting Robot" is places where there is waste debris in the water body which are to be removed. This machine consists of waterwheel controlled by a joystick which is having lift buttons that 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.

I. INTRODUCTION

The "Lake Garbage Collecting Robot" used in that places where there is waste debris in the water body which are to be removed. This machine is consists of cleaner mechanism which collect & remove the wastage, garbage& 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. Waste water is defined as the flow of used water from homes, business industries, commercial activities and institutions which are subjected to the treatment plants by a carefully designed and engineered network of pipes.

The biggest impact of cleaning the chemical wastes can cause respiratory diseases and it plays a challenging issue for the municipality officers Water damage is classified as three types of contaminated water. They are clean water, gray water and black water. The municipality workers are only responsible to ensure that the sewage is clean or not. Though they clean the ditches at the side of buildings, they can't clean in very wide sewages. The municipality workers need to get down into the sewage sludge to clean the wide sewage. It affects their health badly and also causes skin allergies. Now day by day the world is facing the biggest problem of floating garbage. And it's increasing in tremendous amounts so it's very difficult to wash all this floating garbage due to more requirement of manpower. so, in future this remote operated floating river cleaning machine has more scope to remove large capacity of garbage automatically as fast as possible. And by making modifications during this machine, this is used for automatically removing the garbage from beaches also.

II. DESIGN DIAGRAM

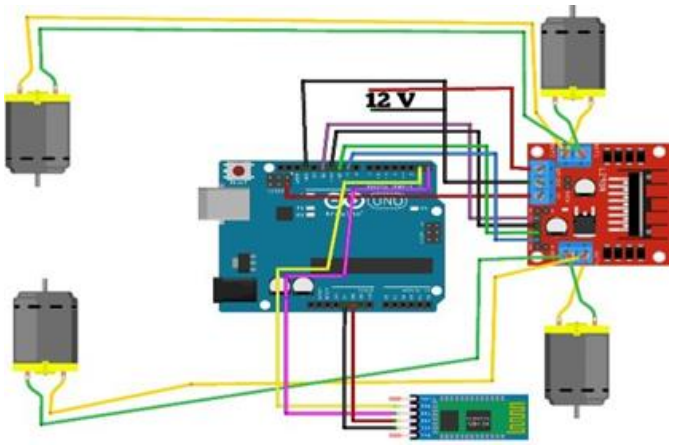

Fig 1: Circuit Design Of Lake Garbage Collecting Robot

Components Used:

ARDUINO UNO:

Arduino UNO is the main controller of the circuit. It assembles all the components and works in the desired way by programming.

BLUETOOTH MODULE:

HC-05 Bluetooth Module is an easy to use Bluetooth SPP (Serial Port Protocol) module, designed for transparent wireless serial connection setup.Its communication is via serial communication which makes an easy way to interface with controller or PC. It uses the 2.45GHz frequency band. The transfer rate of the data can vary up to 1Mbps and is in range of 10 meters.

DC MOTOR:

A DC motor in simple words is a device that converts electrical energy (direct current system) into mechanical energy.A DC motor's speed can be controlled over a wide range, using either a variable supply voltage or by changing the strength of current in its field winding.

L298N MOTOR DRIVER MODULE:

The L298N is a dual H-Bridge motor driver which allows speed and direction control of two DC motors at the same time.The module can drive DC motors that have voltages between 5 and 35V, with a peak current up to 2A.

CONVEYOR BELT PLATFORM:

The Conveyor Belt Platform is used to take Garbages and other Floating Wastages On Water Surface.It's working is the Belt is rotated anti- clock wise Help by DC Motor.The Conveyor Belt Platform is Lift the Wastages From Water Bodies Like Lake,Pond and Rivers.

PADDLE WHEELS:

The Paddle wheels are help to Floating and Motion for Lake Garage Collecting Robot.This Paddle wheels main advantages is it's used on Road Surface and Water Surface and it's helpful to easy transport of this Kind of water Surface Cleaning Robots and Machines.

LITHIUM-ION BATTERY:

A 2200mAh battery can provide 2.2A. It can be drained before the battery needs to be charged. If you used half the current, you should get two hours of usable power.It's Power Backup time is Two hours.

ANDROID APPLICATION:

The Android platform is built for mobile devices, a typical Android app is designed for a smart phone or a tablet PC running on the Android OS. Android apps is Controlled to the "Lake Garbage Collecting Robot".

III. BLOCK DIAGRAM

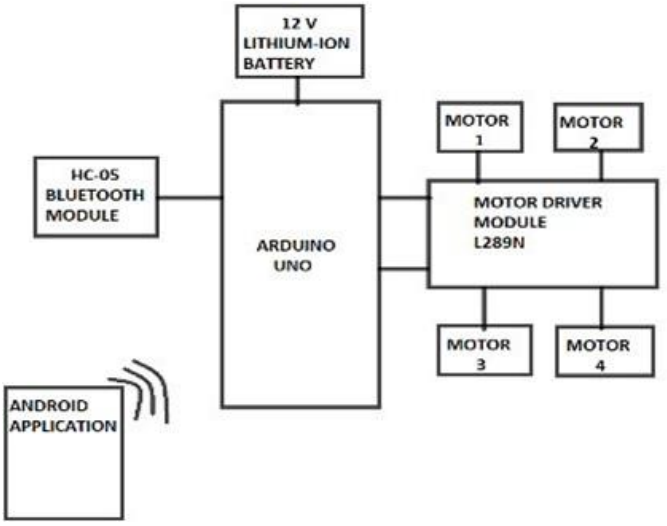

Fig 2: Block Diagram of Lake Garbage Collecting Robot

Lake Garbage Collecting Robot

WORKING PRINCIPLE

Fig 3: Lake Garbage Collecting Robot

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 RF transmitter and receiver which are used to manage the machine remotely. Collecting Mechanism is employed in our project to beat real time issues as thanks to water tension garbage is difficult to collect. By using this four bar mechanism, it rotated at a particular angle intended to gather the rubbish for the model. it's two windows open and shut as the user wishes using remote to ON and OFF the mechanism. Water wheel is bolted on a shaft which is placed aboard the frame. The aim of a water wheel (Paddle Wheels) is to maneuver the machine forward or backward on water. Motor is used to rotate the water wheel with the assistance of a chain drive mechanism. In this project tracking system is additionally implemented which is helpful to regulate angle of Robot. The paddle wheel is a device for converting between rotary motion of a shaft and linear motion of a fluid. In the linear-to-rotary direction, it is placed in a fluid stream to convert the linear motion of the fluid into rotation of the wheel. This rotation can be used as a source of power, or as an indication of the speed of flow.

IV. FUTURE SCOPE

Now day by day world is facing biggest problem of floating waste in the lakes and rivers and it is increasing at very high amount so it is very difficult to clean all this floating waste because of more requirement of manpower. So, This Kind of robots are easily clean and collected.

V. CONCLUSION

The robot can be manually controlled with the help of a Bluetooth. The direction of the robot can be controlled using a Mobile Device. Water pollution is increasing in a rapid rate in the current scenario so this project is of high need in the world.

VI. REFERENCES

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