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Experimental Working Model of River Cleaning And Trash Cleaning Boat

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ABSTRACT

This paper emphasis on the working model of the river waste cleaning boat. The work has done looking at the current situation of our national rivers, which are a dump with milion 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 rivers cleaning projects like “Namami Gange”, “Narmada Bachao” and many major and other projects in various cities. By taking this into consideration this boat has designed to clean river water surface. The main aim of the project is to reduce the man power, time consumption for cleaning the river. In this paper, we have automated the operation of river cleaning with the help of motor and chain drive arrangement.

KEY WORDS: Dirty river, Boat, rivercleaning

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INTRODUCTION

What is water pollution?

Water pollution is the contamination of water bodies (e.g. lakes, rivers, oceans, aquifers and groundwater), very often by human activities. It occurs when pollutants (particles, chemicals or substances that make water contaminated) are discharged directly or indirectly into water bodies without enough treatment to get rid of harmful compounds. Pollutants get into water mainly by human causes or factors. Water pollution is the second most imperative environmental concern along with air pollution. Any change or modification in the physical, chemical and biological properties of water that will have a detrimental consequence on living things is water pollution.

Sources of Water Pollution There are various classifications of water pollution. The two chief sources of water pollution can be seen as Point and Non-Point.

Point refer to the pollutants that belong to a single source. An example of this would be emissions from factories into the water

Non-Point on the other hand means pollutants emitted from multiple sources. Contaminated water after rains that has travelled through several regions may also be considered as a Non-point source of pollution.

Types of water pollution

Surface water pollution found on the exterior of the Earth's crust, oceans, rivers and lakes.

Groundwater Pollution found in soil or under rock structure or aquifers.. Microbiological pollution microorganisms that thrives on water and fishes that can cause illness to land animals and humans.

Oxygen Depletion pollution microorganisms that in water and feeds on biodegradable substances.

So, we have decided to make the remote operatable boat for solving all these types of problems. The boat which we had made in that there are two wheels of the boat. In that one airfield bucket connect with one wheel and another air field bucket is connected with another wheel. There is one moving belt (dust lifting grill) attach with the boat it works as to collect the garbage from the river and put this garbage in the garbage collector.

LITERATURE REVIEW

Pankaj Singh Sirohi et al. says this project they are saying that turbine rotates by flow of river water and through the mechanical gear arrangement they arrange two conveyor belts. The first conveyor belt is used to pick solid waste from river and the second conveyor belt is used to draw solid waste out of river for solid waste management. They said that No need of electric power to operate this river cleaner machine, but actually it generates electric power with the help of alternator coupled to turbine. Hydropower is used to run this advance river cleaner which is renewable source of energy. Solid wastes are collected for solid waste management by incineration technique. Incineration is waste-to-energy technology in which the heat generated is used to generate electric power.

Kumar Sainath et al. this project they are saying that this product collects the waste which floats on water bodies and the collected waste can be easily disposed from the product, this product cleans wastes found such as plastic wastes, garlands, bottles and other wastes found floating on water. They detect the waste in the water with a help of an action camera and this product is RC controlled using a battery, we have mainly used parts such as frame, waste collector bin and a propeller. They say that Aqua Drone was designed with an intention of clean the water debris floating on the lake, by using their drone they can collect many floating wastes like plastic bottles, bags, flowers without any human interference and then dispose of the waste easily, one can clean the lake just by operating it with the help of remote control. Also, their product helps in reducing the water pollutants to a certain extent.

Problem statement

In the absence of more garbage and Trash removal facilities, the practice of plastic,solid elements, garbage and trash into closed river water bodies has become fairly common in recent years and has posed long-term harmful impacts both on bio-diversity of the area and as well as on the occupant and local environment.

OVERVIEW

River cleaning boat is designed with an intention of clean the water debris floating on the lake, by using our boat we can collect many floating wastes like plastic bottles, bags, flowers without any human interference and then dispose of the waste easily, we can clean the lake just by operating it with the help of remote control ang manually. Also, our product help in reducing the water pollutants to a certain extent. The

major advantage is the safety provided by our product that is one need not risk his life while he is cleaning the lake, river, etc. and we just need one person to control the boat. The product is socially helpful for the laborers who clean the lake and economically viable. If the product is used in large numbers, it would be a perfect example of 'Technological application in environmental protection'.

EXISITING SYSTEM

The main objectives of this project are:

1. **Collect many types of wastes:** collect plastic wastes, plastic bottles, organic wastes which include crop debris, food wastes &any type of wastes which is floating on water.
2. **Less human interference:** The very basic idea should be satisfied that is to avoid the interference of the operator. This will happen only by the adoption and sustained usage of technology in the workspace.
3. **Easy disposal of waste**: Another important thing is easy removal of wastes which are collected in the collecting box.
4. **Safety for the user:** The product must be user friendly.
5. **Environmentally friendly:** It should not harm the aquatic animals. It must not have any property that has an adverse effect on the water source.
6. Reduce the man power
7. Collect more amount of waste in less time.

PROPOSED SYSTEM

The main aim of this project is to lift the dust material from the river water. The arrangement of this boat consists of dust lifting grill which connects with the garbage collector. This dust which is on the river surface it collects by this dust lifting grill. This dust lifting grill is always kept rotating so when the dust is coming in the touch of this grill so with the help of the rotation of this grill the dust is collected by the dust lifting grill and put the dust into the garbage collector.

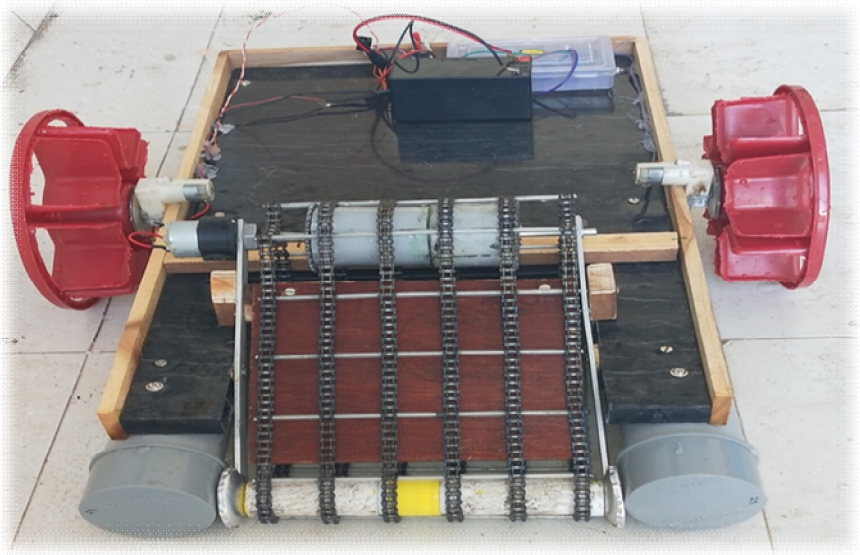

Fig.1 River Cleaning Boat

This dust lifting grill works with the help of roller and this roller runs by the motor and there are two wheels in the boat which is also working with the help of a motor. The motor gives the direction to the wheels for moving in forwarding or backward direction and for moving in left-side the motor runs the only right-side wheels and for moving right side motor gives motion to left side wheels only. The air-filled bucket is used to float this boat in the river water as shown in the figure. This boat is operated by remote and for charging the battery which runs the motor we can also use the solar panel.

SPECIFICATIONS OF COMPONENTS

Air filled bucket: This air filled bucket is used to float the boat in the river. The air filled bucket withstands the load of all the other components. This bucket is filled with air so it cannot sink down into the water.

Garbage collector: The garbage collector is made up of fiber material and it is connected with the dust lifting grill so it can store the garbage which is collected by the dust lifting grill and the water which is left in the dust material garbage collector can also remove that water.

Dust lifting grill: The dust lifting grill is work as a conveyor. In the process or manufacturing and production industry, products and raw materials necessity to be transported from one stage to another. Material handling equipment is designed such that they facilitate fast,easy,economy and safe loading and unloading with least social interference. Belt type conveyor system can be working for easy handling of materials

beyond human capacity in terms of weight and height. The dust type lifting grill is used to lift the dust waste from the river and waste is lifted with the help of roller which is always kept rotating so this grill can easily to collect the dust waste from the river and put it into the garbage and trash collector.

Propeller (Wheel): Propeller is used for giving the motion to the boat. The flopped Propeller is motorized in the boat so it can easily give the direction to the boat for moving in forwarding or backward direction.

Battery: This boat is fully operated by battery. The battery which can run the dust lifting grill and wheels so man can easily operate the boat and it requires very less effort.

Motor: The motor which is placed in the boat it can help to move the dust lifting grill in any direction and collect the dust it can also help for moving the wheels of the boat in left or right side as well gives the direction to the wheels for moving in forward or backward direction.

Roller: The roller is connected with the dust lifting grill. The roller is always kept rotating so when the dust comes in the touch of the grill it can easily come in the dust lifting grill.

Remote: This boat is fully operated by remote with help of sensor we can control the boat in the river without direct human contact.

ADVANTAGE, APPLICATION AND LIMITATION

Advantage

1. Skilled Worker is not required to operate the boat.
2. Very less human contact with the water.
3. Easy to dispose of the waste.
4. Collect more amount of waste in less time.
5. Should not harm the aquatic animals.
6. It's initial & maintenance cost is low.

Application

1. It is applicable to reduce water pollution in rivers, ponds.
2. It is useful to decrease the environmental and company solid waste pollution at River.

3. It is also useful in fisher collect plant to collect solid impurities and dead fishes from river.
4. Than also remove the sediments present in the pond and swimming pool to keep it clean.
5. It is useful to remove eichhornia (Water plants) from the top of the river.

Limitations

1. The waste collecting capacity of machine is limited at a time.
2. This machine is capable to collect the waste which is only floating on water surface.

FUTURE SCOPE

1. The product right now is remote controlled but through automation techniques such as sensor technology, it can be made self-automated.
2. Use this project for cleaning of the river and many water bodies by collecting floating solid waste from the surface of the river and Ghats.
3. It will also helpful for government and municipal corporation for cleaning of the river and different type of water bodies.
4. We can use a solar panel for the power of the boat. So, we can get power resource free of cost.
5. In this system, we can use advance conveyor system and conveyor material for increasing the efficiency of collection of garbage.
6. This project makes only for a small lake by doing some modification in its size and capacity it can use in a big lake and river like the Narmada.

CONCLUSION

This River cleaning Boat was designed with an intention of clean the water debris floating on the lake, by using our boat we can collect many floating wastes like plastic bottles, bags, flowers without any human interference and then dispose of the waste easily, one can clean the lake just by operating it with the help of remote control. Also, our product helps in reducing the water pollutants to a certain extent. The major advantage is the safety provided by our product that is one need not risk his life while he is cleaning the lake and we just need one person to control the boat. The product is socially helpful for the laborers who clean the lake and economically viable. If the product is used in large numbers, it would be a perfect example of technological application in environmental protection.

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