REMOTE CONTROL SOLAR LAKE / POOL CLEANER

Project Reference No.: *47S_BE_1070*

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Introduction:

- Introducing the RC Solar Lake Pool Cleaner — your ticket to effortless and eco-friendly pool maintenance. Powered by solar energy and equipped with intelligent cleaning technology, this drone takes the chore out of keeping your pool crystal clear.

- Say goodbye to manual labor and hello to a pristine swimming experience with the RC Solar Lake Pool Cleaner. Embrace innovation, efficiency, and a cleaner future for your pool.

- Elevate your pool maintenance game with the RC Solar Lake Pool Cleaner. This compact and efficient device not only ensures a spotless pool but also operates on renewable solar energy, making it an environmentally conscious choice

Problem Statement:

- The contamination of water bodies resulting from daily human activities has led to a depletion in the available sources of potable water.
- Waste material such as plastic which tend accumulate causes adverse effect on water bodies (flora &fauna).
- Finding more reliable and sustainable methods of waste water treatment and garbage disposal is instrumental in combating water pollution in the long run, cleaning up water bodies is a far more pressing issue.

- As the population increases day by day, need for fresh water increases and hence the need for better, more efficient way to purify waste water increases rapidly.

Project Motivation:

For constantly growing water pollution inside the lakes, ponds and all the others water resources that are come inside the human touch and beneficial to the people for lots reasons. This is the important issue for the human society that the water required for each and every motive to the human being must be safe, clean and without pollution. But the lack of the equipment and the coast of the pollution controlling equipment it's miles more difficult to easy the rivers and make it garbage and pollution free for the motive of the river cleaning robotic is designed.

Objective and Scope:

The main objective of the project is to develop a sustainable water cleaner, which can work efficiently and uses less human interference:

- Collect many types of wastes: - Product should not be restricted to collect only one type waste. It must diversify its function to accomplish the given task.
- Less human interference: - The very basic idea should be satisfied that is to avoid the interference of the operator.
- Collect more amount of waste: Very firstly it must collect around 5kg of waste at a time when it is being left to the water.
- Easy disposal of waste: Another important thing is easy removal of wastes which are collected in the collecting box.
- It must be stable: To make the product stable it must get through with proper design calculations.
- Safety for the user: The product must be user friendly.
- Environmental friendly: It should not harm the aquatic animals.

Literature Review:

In this particular section, we review the work related to RC Solar Lake Pool Cleaner. Lakes are an important feature of the Earth landscape. They are mostly valuable ecosystems and provide a

variety of goods and offerings to humankind. They are not best a sizeable supply of precious water, but extend treasured habitats to flowers and animals, moderate the hydrological intense events (drought and floods), have an impact on microclimate and provide many recreational opportunities.

Pollution for the closing decades, there has been an explosive increasing in the urban population without corresponding growth of civic centers such as adequate infrastructure for the disposal of waste. Hence, as an increasing number of people are migrating to cities the urban civic services are becoming less. As a result, almost all urban water bodies in India are suffering because of pollutants and are used for disposing untreated nearby sewage and solid waste, and in many cases the water bodies have been in the end became landfills.

Hence new ways to deal with water pollution need to be invented. RC Solar Lake Pool Cleaner will be able to make changes in related field. It is remote operated device which can be operated to collect different types of waste (includes -plastic bottles, plastic bags, any floatable object) which need to be cleaned. It has the potential such that it can be used for the large-scale cleaning, instead of traditional machine RC boat can replace their need and be more eco-friendly.

Methodology:

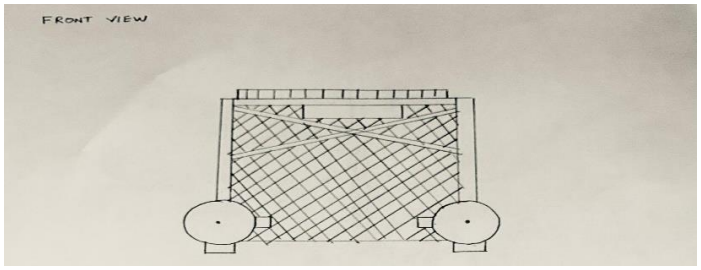
- The RC cleaner utilizes 3x High torque motors, RC Controller, Solar Panels, 2x Sensors, wireless camera, collector mesh and an Atmega microcontroller to achieve this task. The dual drive rudderless motor system is used to provide drive to the RC boat using dual propulsion system. This allows for an easy rudderless movement control.
- The collector mesh is enclosed inside the RC boat frame to capture surface garbage floating on water. This allows the drone to swallow all the garbage coming in its path and take it ahead. Any sea creatures caught along with the garbage may easily swim out of the mesh through front opening if caught, thus it doesn't harm any aquatic life.
- The RC controller is used to send movement controls to the drone controller unit via RF signals. These signals are received and decoded by the controller unit and then processed by microcontroller to operate drive motors. The drone uses 3x sensors -ph and Turbidiy to sense and ph and turbidity level

of water pollution which are constantly stored in the memory card for later reference.

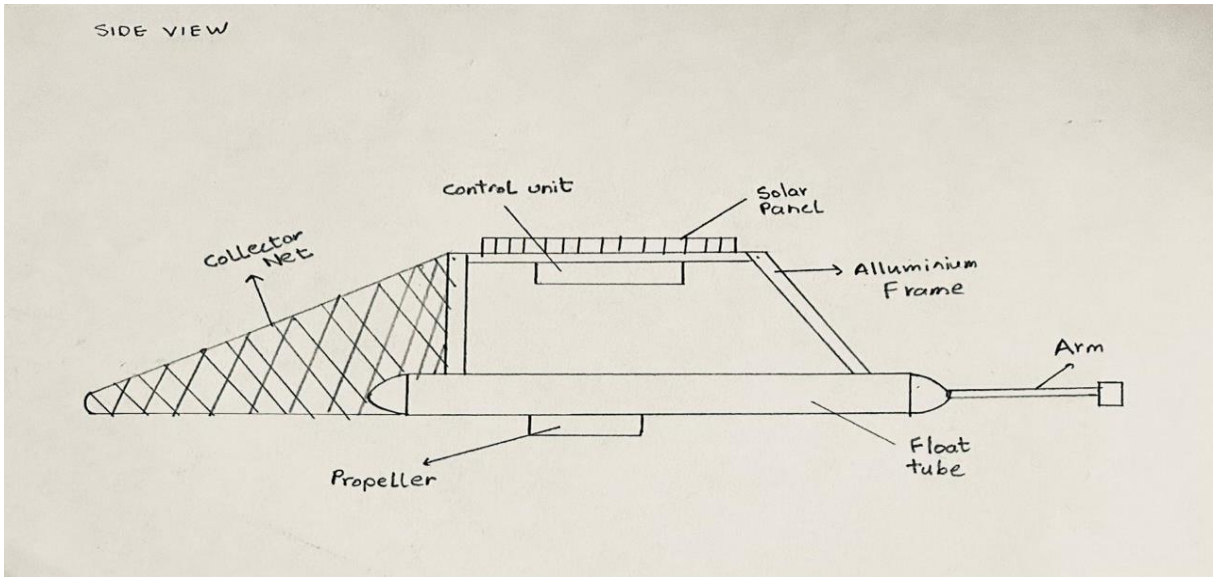
- The top mounted solar panels are used to draw solar power and constantly charge the battery as the drone operates.
    - Even if the cleaner shuts down in the middle of the lake. Half an hour of sunlight can again make the robot operational again. Also, a top mounted strobe light is used to find the drone in darkness or misty conditions. This allows for a remotely operated long range lake pool cleaner .

Design:

Front view:



Side view:



Constructed model:

Hardware and Software Used:

- Atmega Microcontroller
- 3 x High Torque Motors
- 3 x Propellers
- Solar Panels
- Wireless Camera
- RC transmitter
- RC Receiver Circuit
- Motor Drivers
- Strobe Light
- PCB Board

- Electronics Components
- Frame
- Supporting Frame
- Mounts and Joints
- Screws and Bolts

Advantages:

- Remote control operation makes it a single person job.
- Skims the surface of water bodies and uses a wire mesh to collect garbage.
- Ph and Turbidity sensor help in detecting the level of pollution.
- Solar Panels helps to increase the battery life and increase operational hours.
- Rudderless operation ensures simplicity and makes the system easy to repair.
- Wireless Live Stream Camera For Android Display.
- 24v strobe light improves visibility in fog and low-light condition

Applications:

- Helpful in monitoring water pollution and cleaning water bodies.
- Can be used for large scale industrial application
- Development and testing of new or improved floating water waste collection technologies
- Integration of floating water waste collection with other environmental initiatives
- Can be used in fishery plants to collect dead fish

Results and Conclusions:

By considering and studying this concept of RC Solar Lake /Pool Cleaner mechanism we can conclude that it is very useful in cleaning waste material.

This system is designed, fabricated and work satisfactory. We can make more study and get robust design to improve the working area in futur

Future scope:

- The device that is developed, reduces the number Of workers needed to clean the arrays significantly. Further Development could be done to optimize the system to be Smaller, lighter and easier to assemble in higher volumes and to become more user-friendly.
- The next focus will be on Diversifying the robot's functionality by including auto-Inspection, communication and self-diagnostic features.

- The installation of a thermal camera module that will allow for inspection of the panels since the cleaning Head is in direct contact with every individual panel. Cold Spots just under the glass surface will indicate a section of Panel that remains un-cleaned and will prompt the cleaner to Make another pass if needed.
- Solar panel energy can be used Instead of using individual battery. Wireless cameras can be Also attached for perfect wireless operation.

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