SOLAR FLOATING WASTE COLLECTING SYSTEM - FLOAT AND CONVEYOR

Project Reference No.: *47S_BE_2778*

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Abstract:

Our project deals with the design and the fabrication of the solar powered floating waste collecting system. By autonomously navigating the water's surface, Solar powered floating waste collecting system proposes a new system for ocean-skimming and solid waste removal. Solar powered floating waste collecting system uses a photovoltaic powered conveyor belt made of a nylon wire mesh to propel and bucket is fixed on it and it will collect floating waste.

Solar powered floating waste collecting system is intended to work as a fleet, or "swarm" of vehicles, which communicate their location through GPS and Wi-Fi or remote control in order to create an organized system for collection that can work continuously without human support.

Keywords:

Water pollution control, Solar-powered system, Eco-friendly waste collecting system

Introduction:

Each Solar powered floating waste collecting system robot is comprised of a head, which is covered by a layer of photovoltaic cells, and conveyor belt. The photovoltaic cells generate enough electricity to keep the fleet moving for several weeks and provide the energy to propel the vehicles forward. As the head moves through the water the conveyor belt constantly rotates and sucks up pollution. Buckets are fixed on the

conveyor belt which is used to collect the floating waste and it will drop on the collecting buckets.

This process is more streamlined than current ocean-skimming technologies because the robots can operate autonomously and don't need to return to the shore for constant maintenance. As the vehicles work in unison, they can cover large areas and by communicating with each other and researchers on land, they can coordinate their collection efforts. Hence by keeping above problem statement, this study is justified because minor floods are among the most frequent natural disasters that cause greater economic losses and difficulties to human activities.

Objective:

In response to the growing global challenge of aquatic pollution, our project aims to develop an innovative and sustainable solution for the efficient removal of floating waste from water bodies. The objective of our endeavors is to design, implement, and evaluate a Solar Floating Waste Collecting System equipped with a Float and Conveyor mechanism. This system will harness solar energy to power its operations, thereby reducing reliance on conventional energy sources and minimizing its environmental footprint. Through the deployment of this system, we seek to address the pressing issue of waterborne debris accumulation in lakes, rivers, and coastal areas.

Methodology:

1. Each robot is comprised of a head, which is covered by a layer of photovoltaic cells, and conveyor belt. The photovoltaic cells generate enough electricity to keep the fleet moving for several weeks and provide the energy to propel the vehicles forward.
2. As the head moves through the water the conveyor belt constantly rotates and sucks up waste materials like plastic and others.

3. This conveyor will be collecting waste and drop in the collecting tray which is fitted in the bottom of the conveyor belt.
4. This process is more streamlined than current ocean-skimming technologies because the robots can operate autonomously and don't need to return to the shore for constant maintenance. As the vehicles work in unison, they can cover large areas and by communicating with each other and researchers on land
5. 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. This project also plays a major role in collecting the oil content on the water bodies

Results And Conclusions:

- The fabricated project of solar floating waste collecting system been well executed and it has been shown that the floating waste on the surface of the water can be removed without any man help.
- The collected waste can be kept in the waste collecting container which is attached to it body up to 5kgs initially
- The collected waste can be removed when the robot comes near the waste depositing area.
- The developed Solar Floating Waste Collecting System offers a promising and sustainable solution for addressing aquatic pollution by efficiently removing floating debris while minimizing energy consumption and environmental footprint.

- he modular design and adaptable features of the system make it suitable for deployment in various water bodies, catering to different geographical and operational requirements.

Innovation In the Project:

1. Solar-Powered Operation: The integration of solar panels to power the entire waste collection system represents a significant innovation, enabling autonomous and sustainable operation without reliance on external power sources.
2. Float and Conveyor Mechanism: The incorporation of a floatation platform equipped with a conveyor belt system is an innovative approach to efficiently collect and transport floating debris.
3. Automated Sensor Technology: Integration of automated sensors for real-time monitoring of water quality, debris accumulation, and system performance enhances the efficiency and adaptability of the waste collection process.

Scope For Future Study:

Integration with Water Treatment Technologies:

Integrating the Solar Floating Waste Collecting System with water treatment technologies, such as filtration, sedimentation, and bioremediation systems, can further enhance its effectiveness in removing pollutants and restoring water quality.

Integration with Renewable Energy Grids:

Integration of the Solar Floating Waste Collecting System with renewable energy grids, such as offshore wind farms or floating solar arrays, can create synergies between clean energy generation and environmental protection efforts.

Advanced Sensor Integration:

Future iterations of the Solar Floating Waste Collecting System can incorporate advanced sensor technologies, such as artificial intelligence (AI) and machine

learning algorithms, to enhance real-time monitoring and decision-making capabilities.

Autonomous Fleet Deployment:

With advancements in robotics and autonomous navigation systems, there is potential to deploy fleets of interconnected floating waste collection units equipped with intelligent coordination algorithms.