

Design and Fabrication of Solar Operated River Water Cleaner

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Abstract - This project accentuation on arranges and creation of "SOLAR OPERATED RIVER WATER CLEANER" a machine that has eliminating the waste garbage from the water surface and firmly arranges from the water body. The work has done taking a goose at the ebb and flow circumstance of our public streams that square measure dump with large integer liters of waste and stacked with toxic materials, flotsam, and jetsam so forth attributable to growth in water contamination within the structure to squander garbage; it's hampering the existence of amphibian creature and create their life at serious risk. A machine can elevate the waste surface wreckage and jetsam from the water bodies, this may eventually motivate a decrease of water contamination and lastly, the sea-going creature's passing to those problems are diminished. The principal purpose of the task is to reduce the labor, time utilization for cleansing the waterway. during this endeavor, we've got store the energy within the battery associate degreed utilizing this energy for stream cleansing with the help of an engine and chain drive arrange. Water is assumed a major a part of our life. At the purpose after we name the water that's on the planet, the surface of the planet is roofed with regarding seventy 71% water and also the water gift within the ocean is around 97% of the full-scale water gift on the planet. Whereas the surplus three-dimensional of the water is as ice, within the streams, within the lakes.

Key Words: Drainage¹, sewage water², solid waste³, solar⁴, toxic⁵.

1. INTRODUCTION

Water is most precious resource for the humans furthermore for the animals. Water may be a finite and unprotected natural resource. The utilization of water affects the standard of this resource itself and therefore the nature in a very broader sense. Sea, river and lake water is effective for the setting, irrigation and drinking. It's elementary to guard and fairly use the water. It's necessary to manage the provision and disposal of water with wisdom holding that clean water continues to be out there to future generations at a moderate price. This result of plastic to figure is the cause that is done by human itself. Humans are commonly thrown the plastic of any wafers that 1st they eat and therefore the wrapper they throw into the water. Likewise, the plastic bottles also are thrown by human when their use It may eaten by marine animals which can cause their life damage and therefore the marine animals once eaten by humans it also causes to human body. To prevent the danger of garbage thrown to water, we tend to propose the golem ship which can facilitate to gather the garbage from water and piss harmless and clean. The ship can altogether work on solar energy that is completely free energy. The ship won't want the other kind energy in order that it save cash in day time ship can store the energy and at the hours of darkness time ship can begin operating and collect garbage. During this manner we tend to support the Swachh Asian country Abhiyan and serve the state to create piss free from damage furthermore as cleanliness can maintain.

These waste since blockage of ooze framework throughout rain season once stream of water through the pole and ooze framework. This reason amassing of waste water in channels. This aggregation of material water prompts water planned malady like Indian cholera, typhoid, malaria then forth to overcome this kind of issues we've an inclination to planned associate "programmed waste cleanup framework utilizing sun powered board". This framework is employed to wash seepages dispensing with human work inclusion and to spice up the cycle of assortment of waste. The Over sixty-six of surface is roofed by water; not specifically a third is haunted via land. As Earth's public keeps on developing, folk unit of measurement swing steady increasing tension on the planet's water assets. It's going to be same, our seas, waterways, and different midland waters unit of measurement being "crushed" by human exercises so their quality is diminished. Less lucky water quality ways that water contamination. This creation relates to skimmer boats, i.e., work boats for gathering and discarding glide durable waste materials in harbors what is extra, streams. The innovation is all the extra expressly coordinated to exceptionally flexibility vessels supplied with implies for getting glide trash, implies for swing away the trash on the vessel, and suggests that for emotional the trash from the vessel to a capability zone, which can be shore wards or that may be another vessel, as associate example, freight ship. Many work boats and vessels square measure projected for assortment of skimming durable waste and different jetsam and jetsam. These may of times be fashioned as a sailing ship type structure, i.e., one or 2 of boats or supports, or as a mono structure, with paddle wheel or screw driver impetus, and associate administrator station. In one commonplace

rubbish skimmer prepare, a minimum of 1 powerfully controlled open lattice transports unit of measurement placed between the boats of a vessel type twin-frame vessel. The difficulty of flooding and environmental modification has become ludicrous due to its new patterns in our current circumstance these days. This has become a reason for important worry to the world, notably the creating nations.

Water sport a water waste framework typically conveys on squander materials most that unit of measurement non-biodegradable that not merely motivation flooding yet to boot environmental modification. Flood of water waste framework happens once there is a blockage of a finish of the ooze framework compelling the water to find its direction in different places separated from the written flowing framework, consequently the running water spills over the flat tallness of the waste frameworks spreading to areas obtainable the ooze framework, consequently inflicting issues, as associate example, pushing down of styles like wall, water work of ranch lands additionally, personal structure, then forth The debasements gift in water can cause risky and malady. but long the depleting framework is viewed as a result of the capability of the essential ooze framework is to assemble, ship and discard the water through associate exit or on the other hand outlet. Contaminations in waste water square measure actually because it's like void containers, rosin packs, papers, then on it associate Mechanical operative example of entirely star oil-fired Water cleanup Mechanism which could automobile gather glide trash and strong waste from the water surface and gather it into its drifting receptacle. It is modified, scaled up to any live and should work distantly. The framework is native and expert to tack waterway cleanup cause.



Fig.1.Floating Plastic

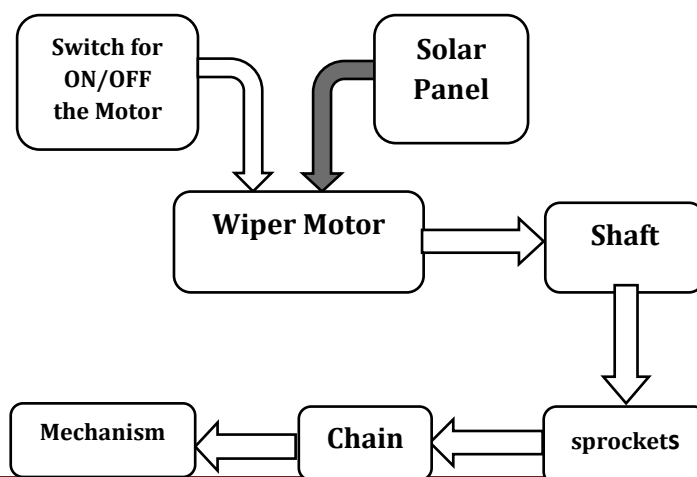


Fig.2.E-Waste

OBJECTIVE

- 1) Purpose of this project is to replace the manual work in drainage cleaning by an automated system.
- 2) The manual cleaning causes various disease to the workers to avoid it.
- 3) To avoid the blockage of drainage line cause by solid waste.
- 4) To avoid floods situation in rainy season

BLOCK DIAGRAM



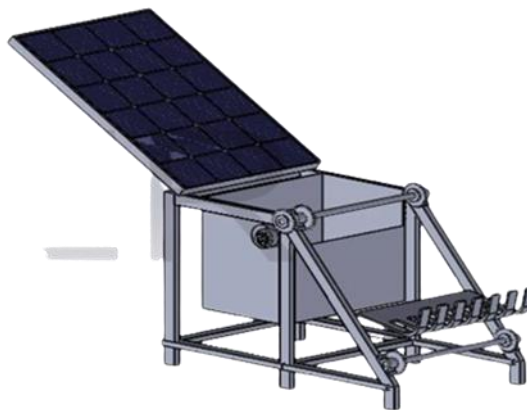
2. DESIGN OF THE SYSTEM

The framework is outlined in strong works software with which we were able to build 3D show with required measurements. The impedances between designer and computer program are truly great in solid - works compare to other software. The plan of the framework is done on the basis of exact working of the framework. The plan is done so that it can bear stack of working instrument and components like solar panel, battery, conveyor mechanism and waste material collected within the box. There are basically two parts of design.

- 1) Plan of the system
- 2) Mechanical design

The plan of the framework consists of plan of framework of mild steel which is able back the system and mechanical plan consist of plan of mechanical components like transport component.

CAD/3D MODEL



SELECTION OF MATERIAL AND COMPONENTS

SHAFT: The shaft is the most turning components which transmits control or on it the sprocket to be mounted.

PEDESTAL BEARING: It is utilized to diminished the contact or to bolster the shaft the Platform heading are mounting on the slanted plane.



Fig. Pedestal Bearing

MS Point Outline: It is used to made or to make the most body of the machine.it underpins all the components of the machine

CHAIN DRIVE: Chain drive could be a transmission framework of water cleaning machine. Here we utilize two sets of chains.

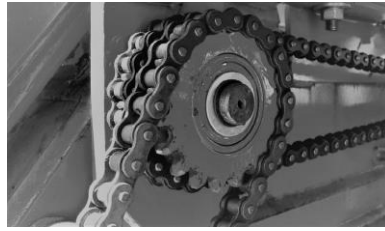


Fig. Chain Drive

SOLAR BOARD: It is utilized to put away the sun based energy.it is put on the top portion of the dustbin where no impediments between the sun beams and solar panel.



Fig. Solar Panel

BATTERY: sun-oriented vitality put away within the shape of chemical vitality. At that point the battery supplies the chemical vitality within the shape of electrical energy.it is put at the side of T-section where it may not come in contact of water.



Fig. Battery

WIPER MOTOR: The motor is used to rotate the shaft in order to complete required torque and load. This will carry whole conveyer mechanism. It is essential to bear load of conveyor.



Fig. Wiper Motor

FORKS BUCKET: it is joined between the two chains.it is utilized to lift the garbage from water

Forks: It is attached between the two chains. It is used to Lift the GARBAGE from water.

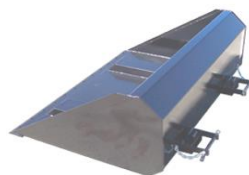


Fig. Fork

ADVANTAGES:

- Environmentally friendly system.
- Reduces threat to human life.
- It is compact, portable, highly efficient.
- It is a non-conventional river clean-up system.
- Working principle quite easy.
- It is ECO friendly.

DISSADVANTAGES:

- Jerks in chain may be happen.
- It required flat solar panel.
- This machine is able to collect the waste which is only floating on water level.
- The structure may be rusting due to water.
- Small vibration occurs due to wires brush wheel attachment.
- The waste collecting capacity of machine is limited at a time.

APPLICATION:

- It is applicable to reduce water pollution in rivers, ponds, ocean
- It can be installed for domestic sewage treatment.
- It is also useful in fishery plant to collect dead fishes and solid impurities from waste water.
- It can be used for proper treatment of sewage as well as to avoid blockage of drains.
- It is useful to reduce the environmental marine pollution at Godavari river, Nashik.
- It can be installed for domestic sewage treatment.
- It is portable and compact in size which initiates easy handling

3. CONCLUSIONS

- Mechanization could be an innovation concerned with his application of mechanical, electronic, and computer-based frameworks to function and control generation; this framework is utilized To Function Programmed SEWAGE CLEANING EQUIPMENT.
- This venture may be created with the complete utilization of men, machines and materials, and cash. Moreover, we have taken after altogether the study of time movement and made us extend temperate and productive with the accessible resources. This system was outlined, created effectively, additionally tested. It works palatably. We trust that this will be done among the foremost flexible and conversely ones indeed within the future. In this way we will able to get Programmed SEWAGE CLEANING Hardware.

REFERENCES

1) Ganesh U L, Vinod Rampur, semi automatic drain for sewage treatment plant of floating materials. Volume: 05 Issue: 07 July 2016.

- 2) Dr.K.Kumaresan M.E, Ph.D., Prakash.S, Rajkumar.P, Sakthivel.C, Sugumar.G “Automatic Sewage Cleaning Equipment” “International conference on explorations and innovations in engineering and technology”.
- 3) Shwetmala, HN Chanakya and TV Ramachandra, Assessment of solid wastes choking open sewers and vulnerability to urban flooding 2nd International conference on solid waste management and exhibition, Jadavapur University, Kolkata, 9-11-2011.
- 4) Gears educational system, chain drive system, 105 Webster St. Hanover Massachusetts 02339.
- 5) Nikitas Zagoras Graduate Research Assistant Clemson University Restoration Institute, SC, Battery Energy Storage System (BESS): A Cost/Benefit Analysis for a PV power station. September 2014.
- 6) Ashok Dargar, et.al., “A Method of Identification of Kinematic Chains and Distinct Mechanisms”, Institute of Fundamental Technological Research, 2009.
- 7) Viki Sahebrao Bagul Yogesh Dilip Jadhav, AUTOMATIC DRAINAGE CLEANING SYSTEM, International Journal of Science Technology Management and Research, Volume 2, Issue 2, February 2017.
- 8) NDUBUISI C. Daniels, Drainage System Cleaner A Solution to Environmental Hazards Volume 3, Issue 3(March 2014), PP.54-60.
- 9) R.Sathiyakala., “Smart Sewage Cleaning System” International Journal of Innovative Research in Computer and Communication Engineering, Vol No4, February 2016.
- 10) Aniket S. Shukla 1 , A. R. Kambekar 2, P.G. Student, Construction Management, Department of Civil Engineering, Sardar Patel College of Engineering, WORKING OF PREFABRICATED VERTICAL DRAIN- A CASE STUDY, Vol. 2, Issue 8, August 2013.