

Water Cleaning Machine Project

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Abstract: *This project emphasis on design and fabrication of the river waste cleaning machine. Solar Water Cleaner is used to purify water. This equipment is based on the renewable energy source. Solar is a clean energy system which can cut down the pollution problems and gives the opportunity to generate reliable source of potable water. In the absence of solar energy, we are using electricity supply from electric company. This system is specially designed to meet the need of peoples in various regions. Also this system is designed mainly for those regions where electricity rate is high and electricity is rarely available. The system is mounted on the 4 wheel trolley so it is portable from one place to another and because of this we give name for project is as “Solar Water Cleaner”.*

Keywords: Solar Energy, Solar Still Distillation System, Drinking Water.

I. INTRODUCTION

The “River cleanup machine” used in that places where there is waste debris in the water body which are to be removed. This machine is consists of waterwheel driven conveyer mechanism which 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. 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. Similarly they are lots of problems of water pollution under Godavari River.

Nasik which affect the acoustic, human life & beauty of Godavari River. The some photo graphs are shows the water pollution near Godavari River Nasik. 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. Clean water is from a broken water supply line or leaking faucet. If not treated quickly, this water can turn into black water or gray water, depending on length of time, temperature, and contact with surrounding contaminants. A drainage ditch is a narrow channel that is dug at the side of a road or field to carry away the water. Nowadays, even though automation plays a vital role in all industrial applications in the proper disposal of sewages from industries and sewage cleaning is still a challenging task. Drainage pipes are used for the disposal of sewage and unfortunately sometimes there may be loss of human life while cleaning the blockages in the drainage pipes. 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

II. LITERATURE REVIEW

Ozuomba J.O. et al. (2012) In this paper find a roof-type solar water distillation (RSWD) kit was fabricated and tested under actual environmental conditions of Urualla, an ancient town in the Eastern part of Nigeria. The system includes four major components; a rectangular wooden basin, an absorber surface, a glass roof and a condensate channel. The RSWD was able to generate 2.3m³ of distilled water within six days. Though the condensate was not large enough compared to human need as is peculiar to many solar stills, the efficiency can be enhanced by using large solar absorber surface and by any method that can increase radiant energy.

M. Gowtham et al. (2012) In this research work the performance of solar concentrated distiller with latent heat storage capacity is compared with solar concentrated distiller with trays on the basin. Paraffin wax is used as the latent heat storage material. Experiments are conducted for improving productivity and this is done by various factors like heat storage capacity, exposure area and maintaining low depth. Hourly Productivity of the concentrated solar distiller is obtained for experimental duration 9AM to 5AM water was measured every hour by maintaining low depth. Analysis was made between two types of basin. Sponges were added to increase the exposure area by capillarity effect. It is observed that due to the presence of sponges, the water output is increased to 40.83% in latent heat storage distiller and 19% increase in tray basin type, while comparing with the plain basin type. Overall productivity was improved by a maximum of 48% by using various modifications.

Caroline S.E. Sardella (2012) We analyze in this paper the production rate of distillate water is estimated to be between 100 and 590 l/d per berkad depending on the efficiency of the system. The water extracted from the drinking water tank is expected to be within the bacteriological and mineralogical advised quantities where no adverse health effects are observed. The distillate is expected to be partially re-mineralized during the mixing process with the harvested rain water. However, accurate monitoring and analysis of the water quality is advised during the pilot project. In this project using the water extracted from the drinking water tank is expected to be within the bacteriological and mineralogical advised quantities where no adverse health effects are observed. The distillate is expected to be partially re-mineralized during the mixing process with the harvested rain water. However, accurate monitoring and analysis of the water quality is advised during the pilot project low cost technology with low cost maintenance, it is possible to improve the quantity and quality of the available water.

III. SOFTWARE REQUIREMENTS

- **Arduino IDE:** The Arduino IDE is an open-source software, which is used to write and upload code to the Arduino boards. The IDE application is suitable for different operating systems such as **Windows, Mac OS X, and Linux**. It supports the programming languages C and C++. Here, IDE stands for **Integrated Development Environment**. The Arduino IDE is an open-source software, which is used to write and upload code to the Arduino boards. The IDE application is suitable for different operating systems such as **Windows, Mac OS X, and Linux**. It supports the programming languages C and C++. Here, IDE stands for **Integrated Development Environment**.
- **C Language:** C is a general-purpose computer programming language. It was created in the 1970s and remains very widely used and influential. By design, C's features clearly reflect the capabilities of the targeted CPUs. It has found lasting use in operating systems, device drivers, protocol stacks, though decreasingly for application software, and is common in computer architectures that range from the largest supercomputers to the smallest microcontrollers and embedded systems. C is an imperative procedural language supporting structured programming, lexical variable scope, and recursion, with a static type system. It was designed to be compiled to provide low-level access to memory and language constructs that map efficiently to machine instructions, all with minimal runtime support. Despite its low-level capabilities, the language was designed to encourage cross-platform programming. A standards-compliant C program written with portability in mind can be compiled for a wide variety of computer platforms and operating systems with few changes to its source code.

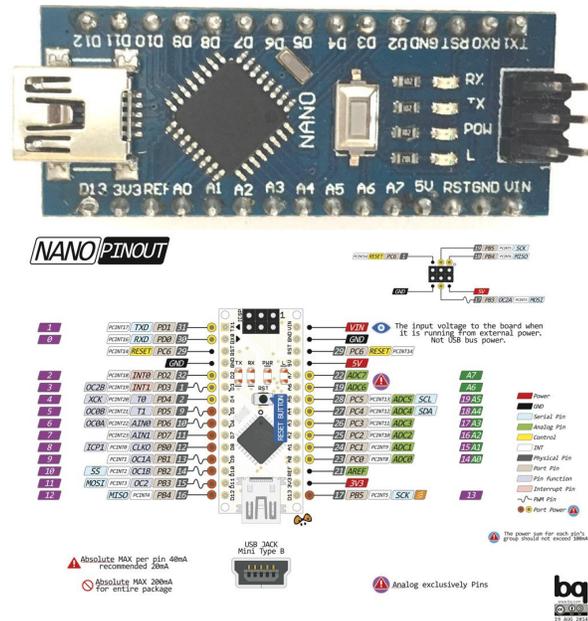
IV. HARDWARE REQUIREMENTS

- **DC Motor:** 60RPM – 12Volts geared motors are generally a simple DC motor with a gearbox attached to it. This can be used in all-terrain robots and variety of robotic applications. These motors have a 3 mm threaded drill hole in the middle of the shaft thus making it simple to connect it to the wheels or any other mechanical assembly.



60 RPM 12V DC geared motors widely use for robotics applications. Very easy to use and available in standard size. Also, you don't have to spend a lot of money to control motors with an Arduino or compatible board. The most popular L298N H-bridge module with onboard voltage regulator motor driver can be used with this motor that has a voltage of between 5 and 35V DC or you can choose the most precise motor driver module from the wide range available in our Motor drivers category as per your specific requirements.

- **Arduino Nano:** The Arduino board is designed in such a way that it is very easy for beginners to get started with microcontrollers. This board especially is breadboard friendly is very easy to handle the connections. Let's start with powering the Board.



- **HC-05 Module:** The HC-05 is a very cool module which can add two-way (full-duplex) wireless functionality to your projects. You can use this module to communicate between two microcontrollers like Arduino or communicate with any device with Bluetooth functionality like a Phone or Laptop. There are many android applications that are already available which makes this process a lot easier. The module communicates with the help of USART at 9600 baud rate hence it is easy to interface with any microcontroller that supports USART. We can also configure the default values of the module by using the command mode. So if you looking for a Wireless module that could transfer data from your computer or mobile phone to microcontroller or vice versa then this module might be the right choice for you. However do not expect this module to transfer multimedia like photos or songs; you might have to look into the CSR8645 module for that.
- **Battery:** An electric battery is a source of electric power consisting of one or more electrochemical cells with external connections for powering electrical devices. When a battery is supplying power, its positive terminal is the cathode and its negative terminal is the anode.
- **Charge Controller:** Solar Charge Controller is an electronic device that manages the power going into the battery bank from the solar array. It ensures that the deep cycle batteries are not overcharged during the day and that the power doesn't run back to the solar panels overnight and drain the batteries. Some charge controllers are available with additional capabilities, like lighting and load control, but managing the power is its primary job.
- **Conveyer Belt:** A conveyer belt is a material handling system designed to move supplies, materials, and components using an efficient and effortless process that saves on time, energy, and cost. The design of conveyer belts includes two motorized pulleys with the conveyer material looped over them.
- **Couplers:** A device for transferring electrical energy from one circuit to another, as a transformer that joins parts of a radio apparatus together by induction.

- **Solar Panel:** A solar cell panel, solar electric panel, photo-voltaic (PV) module or solar panel is an assembly of photo-voltaic cells mounted in a framework for installation. Solar panels use sunlight as a source of energy to generate direct current electricity. A collection of PV modules is called a PV panel, and a system of PV panels is called an array. Arrays of a photovoltaic system supply solar electricity to electrical equipment.

V. DESIGN DEVELOPMENT

In this project the main aim of this machine is to lift the waste debris from the water surface and dispose them in the tray. Here we are fabricating the remote operated river cleaning machine. The collecting plate and pulley drives are rotating continuously by the motor. The collecting plate is coupled between the two pulley drives for collect the waste materials from river. 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 bluetooth which use to control the machine remotely.

VI. CONCLUSION

The solar still are friendly to nature and eco-system. Various types and developments in active solar distillation systems, theoretical analysis and future scope for research were reviewed in detail. Based on the review and discussions, the annual yield is at its maximum when the condensing glass cover inclination is equal to the latitude of the place. The multistage solar desalination system with heat recovery system produces higher yield than the simple solar still. The length of solar still, depth of water in basin, inlet water temperature and solar radiation are the major parameters which affects the performance of the still. Higher productivity during night time is achieved by using energy storing materials in the active solar stills. So as per our goal off this project, we design a dependable way to purify water for locations those are off grid and don't have constant sources of clean water. This design also fulfill the requirement of low budget product considering the most of the places don't provide potable water to their citizens. Water purification through solar power is one of the best inventions to save energy and to have uncontaminated water. An electric cleaner system requires more power and costs a lot more too.

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