

Solar Based River Water Garbage Collector

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Abstract: This project emphasis on Design and Analysis of the River Water Cleaning Machine. The work has done looking at the current situation of our national rivers which are dump with crore litters 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 river cleaning projects like "Namami Gange", "Narmada Bachao" and many major and medium projects in various cities like Ahmadabad, Varanasi etc. By taking this into consideration, this machine has designed to clean river water surface. Nowadays almost all the manufacturing process is being atomized in order to deliver the products at a faster rate. Automation plays an important role in mass production. In this project we have fabricated the remote operated river cleaning machine. The main aim of the project is to reduce the man power, time consumption for cleaning the river. In this project we have automated the operation of river cleaning with help of a motor and chain drive arrangement. Some needs of automation are described below. Here using RF transmitter and receiver are to control the cleaning machine. Automation can be achieved through computers, hydraulics, pneumatics, robotics, etc., of these sources, pneumatics form an attractive medium for low cost automation.

Keywords: Efficiency, Output, Solar Panel, Waste Removal.

INTRODUCTION

The Over two thirds of Earth's surface is covered by water; less than a third is taken up by land. As Earth's population continues to grow, people are putting ever-increasing pressure on the planet's water resources. In a sense, our oceans, rivers, and other inland waters are being "squeezed" by human activities so their quality is reduced. Poorer water quality means water pollution. This invention relates to skimmer boats, i.e., work boats for collecting and disposing of floating solid waste materials in harbors and waterways. The invention is more specifically directed to highly manoeuvrable vessels equipped with means for picking up floating debris, means for storing the debris on the vessel, and means for discharging the debris from the vessel to a storage area, which may be ashore or which may be another vessel such as barge. Many work boats and vessels have been proposed for collection of floating solid waste and other debris. These may typically be formed as a catamaran-type hull, i.e., a pair of pontoons or sponsors, or as a monohull, with paddle wheel or screw driver propulsion, and an operator station. In one typical trash skimmer design, one or more hydraulically powered open mesh conveyors are positioned between the pontoons of a catamaran-type twin-hull vessel. The problem of flooding and climate change has become outrageous because of its recent trends in our environment today. This has become a cause of major concern to the world, especially the developing countries. Water running through a water drainage system mostly carries along waste materials most which are non-biodegradable which not only cause flooding but also climate change. Overflow of water drainage system occurs when there is a blockage of an end of the drainage system forcing the water to find its way elsewhere apart from the mapped out drainage system, therefore the running water spills over the horizontal height of the drainage systems spreading to regions alongside the drainage system, thereby causing problems such as pushing down of structures such as fences, water logging of farm lands and residential building, etc. The impurities present in water can cause hazardous and disease. As long as the draining system is considered the function of the main drainage system is to collect, transport and dispose of the water through an outfall or outlet. Impurities in drainage water can be only like empty bottles, polythene bags, papers, etc. It's an Industrial Working Prototype of Entirely Solar Powered Water Cleaning Mechanism which Can auto collect floating garbage and solid waste from the water surface and collect it into its floating bin. It can be programmed, scaled up to any size and can operate remotely. The system is indigenous and efficient to tack river cleaning cause.

1. Problem statement

In this project the proposed concept is to reduce the human effort in garbage cleaning in seaways by automated system. Now a days even though automation plays an important role in all industrial areas in the proper dumping of waste material from industrial and domestic areas are still challenging task and faces many problems to doing the task. To reduce this problem and to save the human life and human effort we design device "Garbage Collection from Surface Water of River". We design our project to use this in effective way to control the dumping wastages and the process of garbage

cleaning and it also reduce spreading of diseases to human being. To pick the garbage from surface of river using solar floating robot.

2. Objective

- This proposed system is to minimize or overcome the problem faced while using man operated machine.
- To minimize the increased dumping rate of waste.
- Remote Controlled Machine that is it can be controlled by using Bluetooth.
- To inform about box is full of debris by using small message to user.

II.LITERATURE REVIEW

1] This technique was used for some specific floating derbies and plans as well. There are limitations to the size of waste and the development of the technique is under limiting stage. No further development for this technique is mentioned. [1]

2] In many religions of the world water is used to celebrate the occasion which causes pollution of water. This is hazardous for aquatic lives an make the water unusual. Due to which the concept of removing waste from water is arrived. [2]

3] There should be strictly ban on the hazardous compound production as well as their imports which indirectly will help prohibiting the pollution in countries. The toxic compounds may directly attack on human as well as aquatic lives. [3]

4] Water and the Environment in the year January 1992, have stated that, in the newly industrializing cities economic growth is the very basic factor of consideration. More attention on pollution carrying capacity of environment is preferred. Basic west water treatment plant transferred 1m of west water in to 1-2lit of concentrated sludge. [4]

5] The usage of mechanical drainage cleaner to replace the manual work required for drainage cleaning system. Drainage pipes are very dirty. Sometimes it is harmful for human life while it is need for cleaning drainage system. To overcome this problem, they implemented mechanical semi-automatic drainage water cleaner To overcome this issue, the mechanical semi automatically operated drainage waste cleaner is made which makes water to flow effectively due to regular filtration of wastages.[5]

III.SYSTEM IMPLIMENTATION

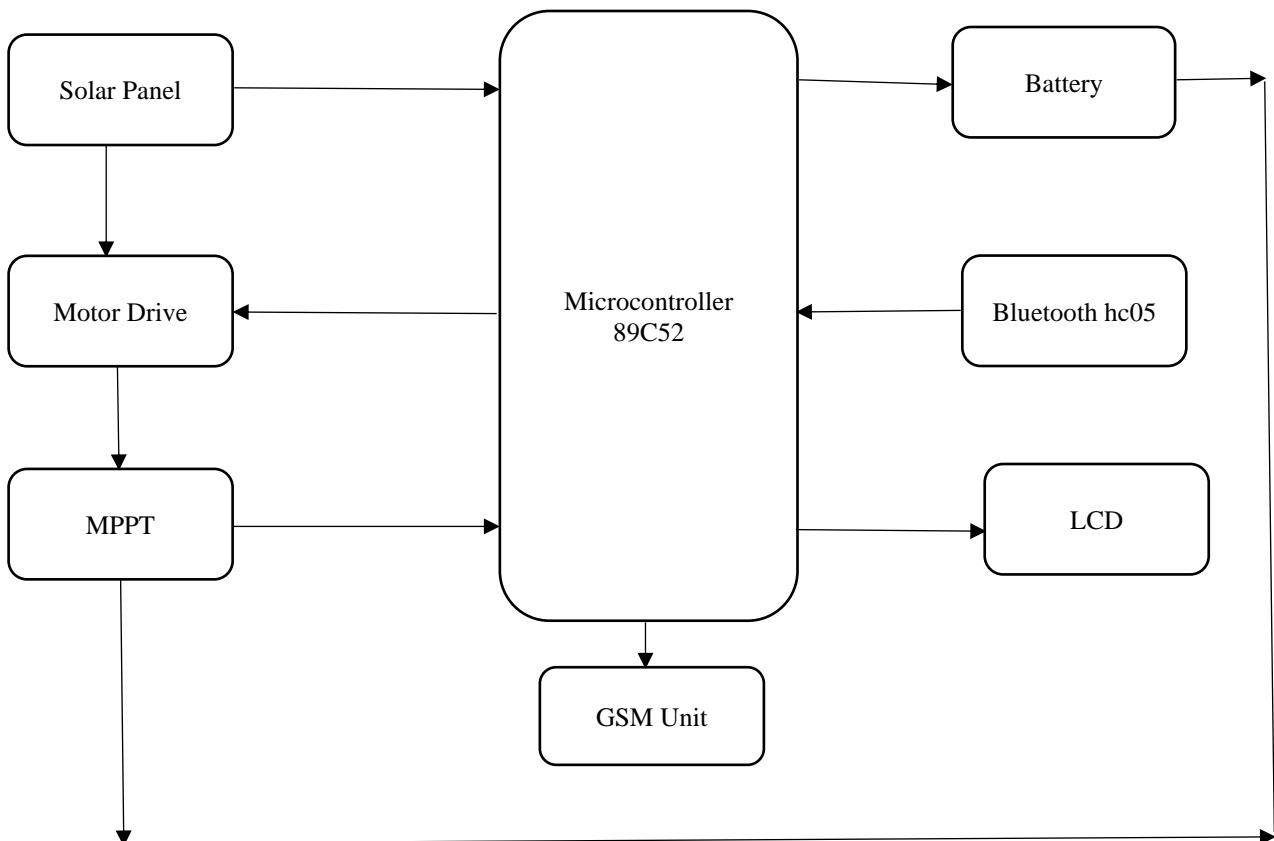


Fig.1 System Block Diagram

This project emphasis on design and fabrication of the river waste cleaning machine. The work has done looking at the current situation of our national rivers which are dump with crore litres 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 river cleaning projects. By taking this into consideration, this machine has designed to clean river water surface. Nowadays almost all the manufacturing process is being atomized in order to deliver the products at a faster rate. A wide variety of anthropogenic artefacts can become marine debris; plastic bags, balloons, buoys, rope, medical waste, glass bottles and plastic bottles, cigarette lighters, beverage cans, polystyrene, lost fishing line and nets, and various wastes from cruise ships and oil rigs are among the items commonly found to have 3 washed ashore. For example, in Delhi 2010-11 to check the changes in 3 water bodies in last 10 years the status of 44 lakes was ascertained and it was found that 21 out 44 lakes were gone dry due to rapid urbanization and falling water tables. The two thirds of Earth's surface is covered by water; less than a third is taken up by land. As Earth's population continues to grow, people are putting ever-increasing pressure on the planet's water resources. In a sense, our oceans, rivers, and other inland waters are being "squeezed" by human activities so their quality is reduced.

ATmega328 Microcontroller

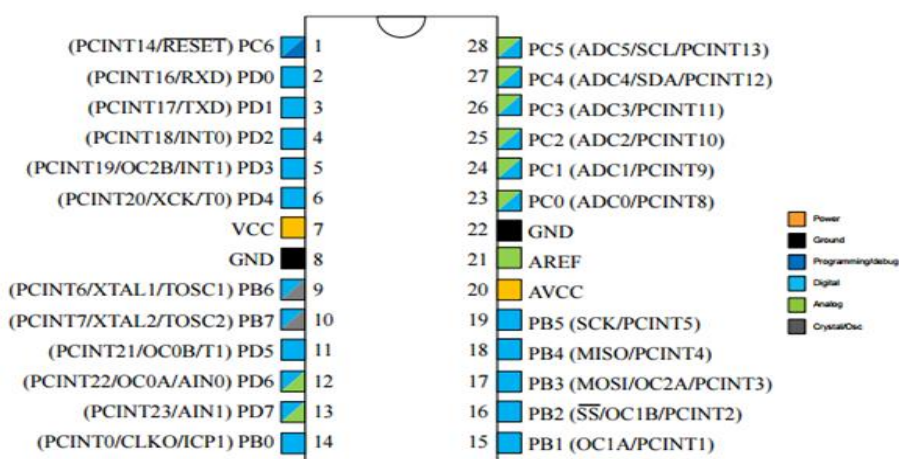


Fig.2 Pin out Of ATmega328 Microcontroller

ATmega328 is an 8-bit high performance microcontroller of Atmel's Mega AVR family with low power consumption. ATmega16 is based on enhanced RISC architecture with 131 power full instructions most of the instructions execute in one machine cycle. ATmega16 can work on maximum frequency of 16MHz. ATmega328 has 16KB programmable flash memory, static RAM of 1KB and EEPROM of 512byte. The endurance cycle of flash memory and EEPROM is 10000 and 100000 respectively. ATmega16 is a 40 pin microcontroller there are 28 I/O lines which are divided into four 8-bit ports designated as PORTA, PORTB, PORTC. ATmega328 has various in-built peripherals like USART, ADC, Analog comparator, SPI, JTAG etc. Each input output pin has an alternative task related to inbuilt peripherals. AVR microcontroller 4times faster than 8051 microcontroller. It based on RISC architecture with PWM channel and inbuilt ADC. Memory size is large as compare to 8051 microcontroller and consumes less power. Due to this specialty we use AT mega 328 microcontroller.

MPPT:

Just 30 to 40 percent of the incident irradiation of solar is converted into energy of electrical by a typical panel of solar. The technique of max. Power point monitoring is used to boost the panels of solar performance. The power output of a circuit is optimum when the impedance source equals the load impedance, according to the max. Power of transfer technique. The impedance source is balanced with that impedance load by adjusting the duty cycle of the converter of buck correctly via the PWM signal. Various MPPT approaches are being suggested. The methods of disturbing or also observing (P&O) or also incremental conductance (INC) are commonly used among these methods, like as the oscillation around MPPP or also confusion by rapidly changing atmospheric conditions.

In this proposed system observe or also perturb MPPT algorithm is used. The controller varies the voltage by less amount from the array in this system or also calculates power if the rises, more directional charges attempted until the power no longer rises. This is known as method of P and O. it is most widely used MPPT approach because to cost effective and easy implementation. If the power of output rises, the voltage is continuously increased power output begins to decrease. The voltage of cell is initially increased. When the power output begins to decrease, before power of max. Is reached, the voltage of cell deceases. Until the obtained MPPT, this procedure is continued. This effect is an oscillation around MPP

of power output. The power output curve of the module of PV as a voltage function (curve of P-V), assuming that the module of PV operates at a point that is away to the MPP at module temp. Constant or also irradiance constant. Periodically, this the algorithm of P and O increase or decrease the cells of PV terminal output voltage or also contrasts the power obtain in cycle current with the previous value. If power is raised, then the point of operating is considered to have been shifted close to MPP. Therefore, more disturbances of voltage in direction of same could shift the point of operating towards the MPP. If decreasing the power, the point operating has shifted away to the MPP, or also the perturbation direction should be the reverse to shift back to the MPP.

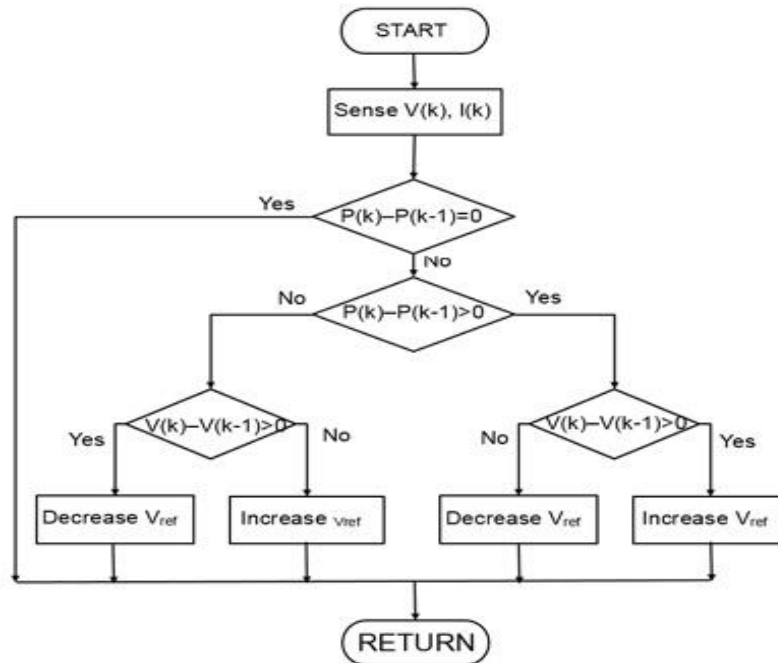


Fig.3 P and O MPPT Flow Chart

IV.RESULT



Fig.4 Actual project image

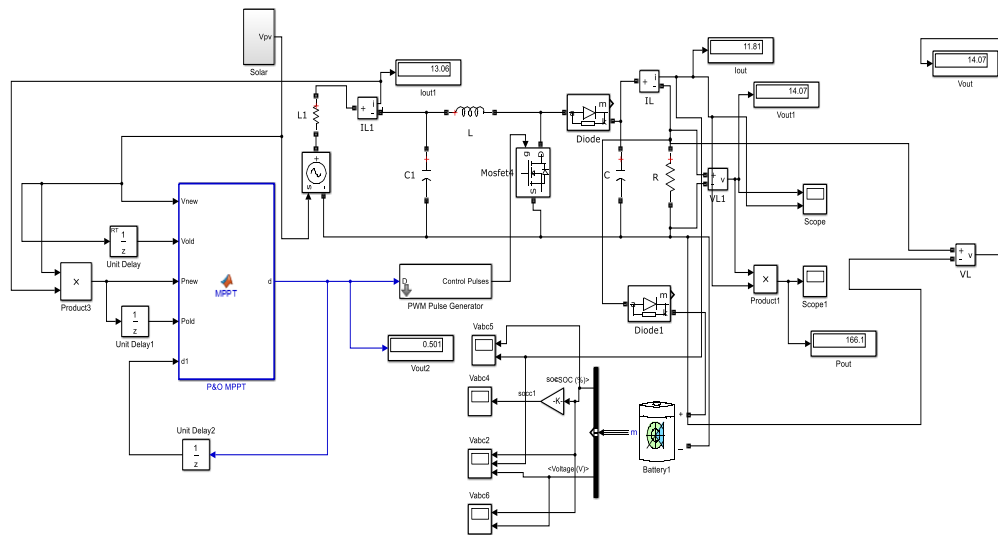


Fig.5 Solar battery charging simulation

V.CONCLUSION

The project has designed which is very much economical, easy to operate and helpful for water cleaning and it can be modified with more cleaning capacity and efficiency. Although the design criterions with problems definitions which, however were overcome by using references and teacher's guidelines. The choice of raw materials helped us in machining of the various components to very close tolerance and thereby minimizing the level of balancing problem. It is very useful for society

VI.APPLICATIONS

- It is used in a river for collecting floating garbage.
- It can also be used in ponds, lake, sea etc.

VII.FUTURE SCOPE

- The machine can be designed for deep cleaning.
- Capacity of the machine can be increased for cleaning big river and lakes.
- Remote controlling can be done.

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