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Design and Fabrication of River Cleaning Machine by Using Remote Control and Solar

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ABSTRACT: In India disposal of solid waste in major problem, according to the sources most of solid waste is disposed in drainage, river, lake other water regions. Cleaning the wastes by utilizing manual procedures would be insufficient as well as getting sicknesses from the irresistible microorganisms present in the sewage while cleaning manually. This project features a proposed plan of garbage gathering system viable and effective for tidying up waste from rivers, channels and lakes. As in rapid increase in water pollution in the form to waste, it is disturbing the life of aquatic animal and making them endangered. A remote controlling machine will remove the waste products from the water bodies which will eventually decrease the pollutants in the water so there will be no disturbance to aquatic life and such problems will be reduced. This proposed model is validation and following the American Society of Mechanical Engineering(ASME) and American Society for Testing and Materials(ASTM)standard.

KEYWORDS: Drainage , Sewage water , Solid water , Solar , Remote control

I. INTRODUCTION

Usually seen in densely populated country like India is that common waste like plastic bottles, covers and other plastic scrap left on the streets and in the open drainage. And the wastages can desolve in lakes and stored water like dams and ponds. These cause accumulation of waste water in drains. This accumulation of sewage water leads to water born disease like cholera, worm disease, typhoid, malaria etc. This can cause health issue and can also cause death. This waste can't be clean by the man because can't be swim by cleaning and carrying the solid waste. And Currently these drains are cleared with the help of manual workers where the workers have to get into drains and manually remove the waste. This affects the health of the workers. These workers suffered by the various diseases which affect their life and reduce their immunity By this machine we can operate and clean the solid waste by standing near the pond or lake. Machine can controlled by remote we can that machine in any directions so it will help to clean the solid waste and store in tank and it will be take out and remove the solid waste. To overcome this kind of problems faced by the manual workers and health issues, we proposed an automated mechanism "DESIGN AND FABRICATION OF RIVER CLEANING MACHINE BY USING REMOTE CONTROL AND SOLAR"

II. RELATED WORK

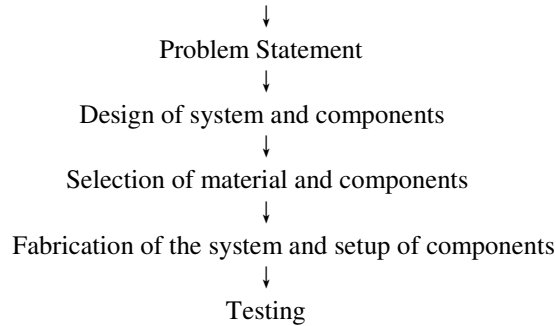
PROBLEM DEFINITION :-

Mainly automatic drainage cleaning system focus on the unwanted elements present in our nearby water resources such as garbage, plastic, Thermocoal . This system is simple and effective invention on sewage treatment. Now a days the amount of waste material in lakes ponds wells etc. is increasing day by day due to people's constant use. This amount of waste also increases to the extreme level on festivals. This drainage system in build with solar panel increases the life span of the system and also reduces energy usage from other electrical devices.



III. METHODOLOGY

Literature survey



IV. DESIGN OF SYSTEM AND COMPONENTS

WORKING PRINCIPLE:-

The working of the system is fully mechanically. The system is run on 12V dc battery. The battery is charged by 100watt solar panel. 25amp motor is used to drive the sprocket. The input sprocket is again drive the two another sprocket by chain transmission. The sheet metal jaw is fix on rotating chain which is used as conveyer to collect the waste floating in water. The collected waste in jaw is again drop in sheet metal dustbin. All this structure is supported by a solid MS frame.

2D MODEL:-

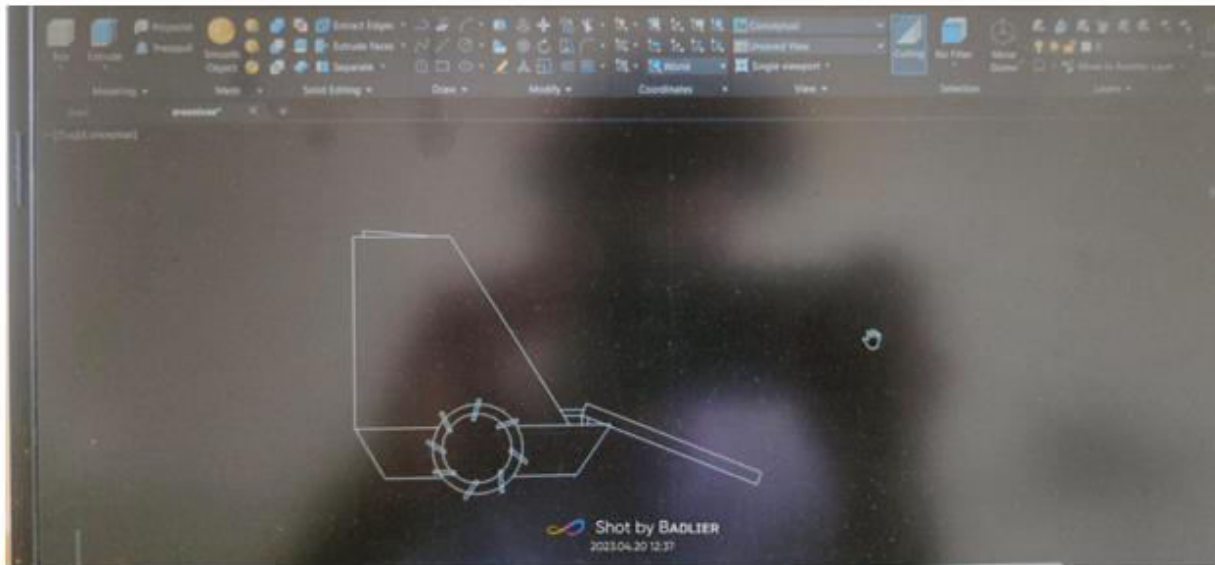


Fig.(1) Auto cad 2D Model.

COMPONENTS:-

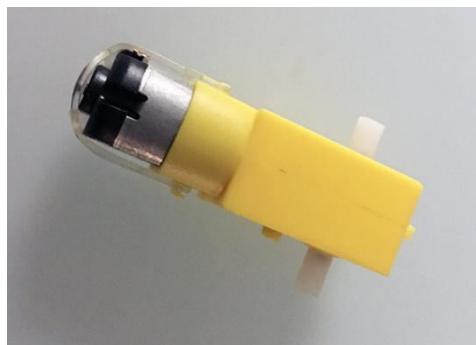
SOLAR PANEL:- A solar panel is a group of electrically connected solar cells .Enclosed in a frame ,which converts sunlight into electricity .Solar is a most abundant energy source on earth .Solar is the fastest and most popular form of new electricity generation .Solar panels save lot of money.



Fig (2) Solar panel.

GEAR MOTOR :-

The main purpose of the gear motor is to produce high torque while using a low horsepower or low speed , motor output .Most synchronous AC electric motors have output range from 1200 to 3600 RPM .The operating voltage is +12v.



Fig(3) Gear motor .

REMOTE CONTROLLER:-

A remote control (RC) is a small, usually hand-held, electronic device for controlling another device, such as a television, radio or audio/video recording device. Remote controls commonly operates via infrared signals but sometimes by radio frequency signals. The remote control may control a variety of functions such as volume, channel, track number and other functions. Modern remote control devices often have more controlling functions than are found on the device itself, which may have only a few primary essential controls.

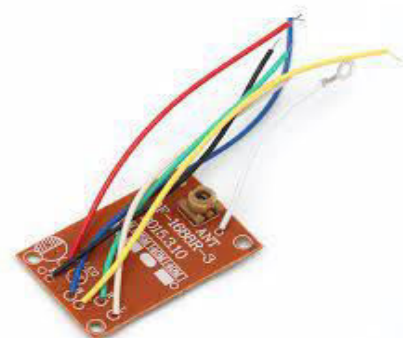


Fig (4) Remote control Board.

SUN BOARD:-

A strong and lightweight material that is easily cut with a sharp craft knife or picture framing mat cutter. They are waterproof and scratch-resistant. A layer of lamination film pasted on the image also prevents the inks from fading in the sunlight. A laminated sunboard print is easy to maintain and keep tidy. Foam board can be used to insulate any exposed cavity in your home from the top to the bottom, and even the walls if you are remodeling and the drywall is down. It can also be installed in the open cavities of your pole barn.



Fig(5) Sun Board.

Conduction is the movement of heat through a medium, which means that reduced heat conduction created by foam board insulation can work to keep your home more comfortable if it is installed correctly. The most common types of material used to make foam board insulation include polystyrene, polyisocyanurate and polyurethane.

CONVEYOR BELT:-

A belt conveyor system consists of two or more pulleys (sometimes referred to as drums), with a closed loop of carrying medium the conveyor belt that rotates about them. One or both of the pulleys are powered, moving the belt and the material on the belt forward.

V. FABRICATION OF THE SYSTEM CONSIST OF MANUFACTURING SETUP OF COMPONENTS:-

The main body parts are used the sun board because floating is main purpose so the sun board is light weight and strong. In this we have mainly two types of operations. Cutting and Sticking operations.

CUTTING:-



Fig (6) Cutting Operations.

STICKING:-



Fig (7) Sticking Operation .



Fig (8) Sticking Operation.

CALCULATION:-

Solar panels - 6v 100mah

There are 12 cells in a single 6 volts solar panel

Each cell produce approximately 0.5 to 0.6v

$V = \text{voltage in each cell} * \text{no. of cells in solar panel}$

$V = 0.5 * 12 = 6V$

We need minimum of 12v to run the motors, Because of the operating voltage of the gear motor is 12V.

MODELLING:-

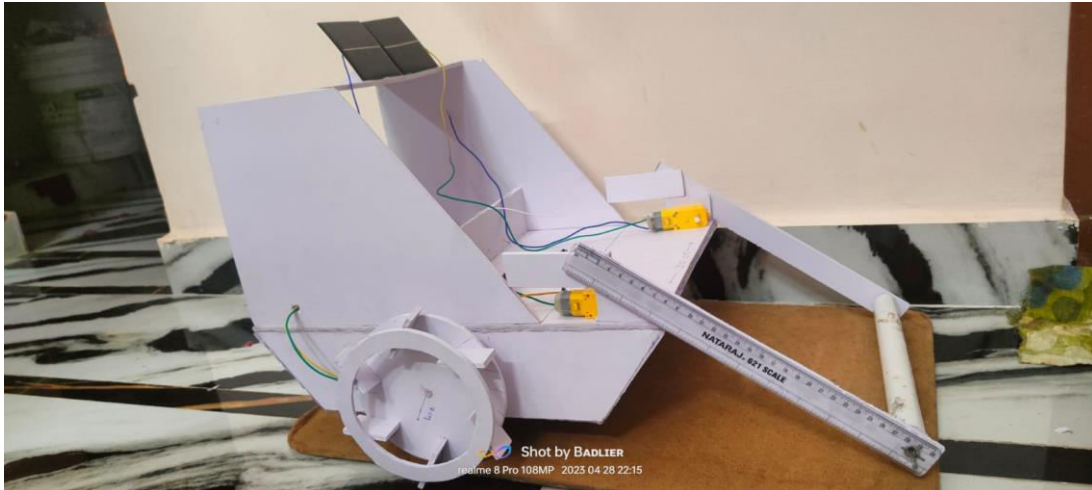


Fig (9) Complete model .

VI. EXPERIMENTAL RESULTS

Our automatic drainage cleaning system has successfully replaced manual drainage cleaning ways. So our project is economical and efficient by the use of solar energy. This system was designed and fabricated successfully it works satisfactorily.

VII. FUTURE SCOPE

Now a days world the use of plastic is more and facing the biggest problem of floating garbage. And increasing the tremendous amount so it difficult to clean and requiring more manpower. So, in the future this remote operated floating river machine has more scope to remove large amount of garbage as fast as possible . And this remote operated floating river machine Modification by using solar it will be more effort in collecting garbage.

VIII. CONCLUSION

This project emphasizes supply flexibility in operation. It made in low cost and “Remote Controlled Unmanned Floating River Cleaning Machine by solar” is usually designed to get rid of water impurities and consider economical and helpful in it. Mainly this is used for increasing the life time of aquatic animals.

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