

DESIGN AND FABRICATION OF SOLAR SEWAGE CLEANER

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ABSTRACT

This technique was selected by us by taking into consideration some comfort for Essential Workers while cleaning the Drains. It is seen that while doing this they often have to enter the manhole with no protection. By thinking over it we realized that we can really do something for them. So we decided to implement our course study and some extra knowledge and with the help of electrical and mechanical concept our project came into picture. The project Solar Sewage Cleaner restricts human beings from entering the manhole. Lots of harmful diseases can be stopped it reduces human effort in cleaning the drains. As the name suggests our project basically works on combined principles of mechanical and electronics. The growth of technologies requested higher performance machine in order to fulfil human needs and market. This project is implemented to make human work easier and can reduce the use of human power because of its potential applications. This appertains to new and useful improvements and more particularly to an apparatus whereby sewages can be cleaned in an easy and convenient manner.

Keywords :- drainage, sewage water, solid waste, solar, automatic

INTRODUCTION

In this research paper the proposed concept is to replace the manual work in drainage cleaning by automated system. Now-a-days even though automation plays a vital role in all industrial applications in the proper disposal of sewages from industries and commercials are still a challenging task. The waste materials are lifted by teeth and are stored in waste storage tank. DC motors with help of h-bridges designed. Dc motor control plays a major role in many applications; dc motor is required to be rotated in clockwise and counter clockwise directions. . In the modern era there have been adequate sewage problems where sewage water needs to be segregated to clean our surrounding environment. The waste and gases produced from the industries are very harmful to human beings and to the environment Our proposed

system is used to clean and control the drainage level using auto mechanism technique. 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 a noutfallor outlet. Impurities in drainage water can be only like empty bottles, polythene bags, papers, etc.

PROBLEM IDENTIFICATION

EXISTING METHOD

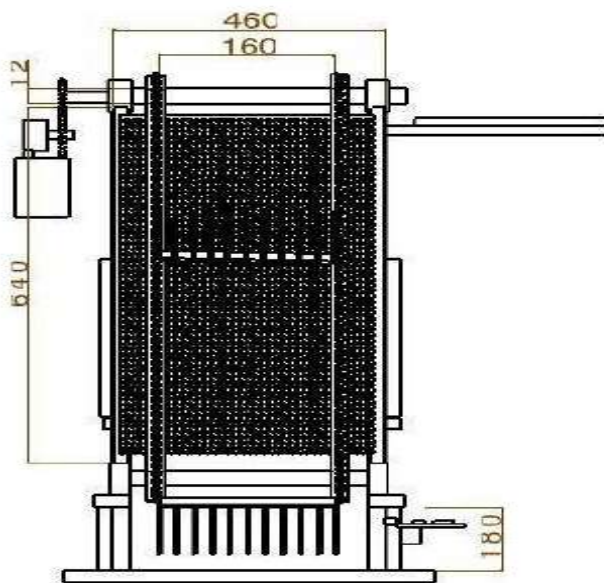
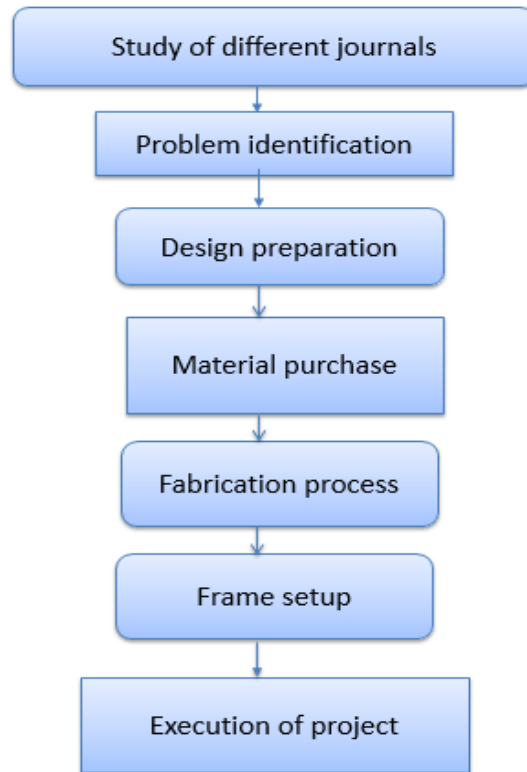
The existing system is completely a mechanical based project. It is a stationary system, simply kept in the sewage area to collect the wastes passing over it. The chain and sprocket is used for conveyor movement, which has fitted fork plates to collect the wastes from the sewage. The rotation of the chain along with the plates will collect the floating wastes and put off the wastes in the bin that is placed at the backside of the system.

MOTIVATION AND OBJECTIVE

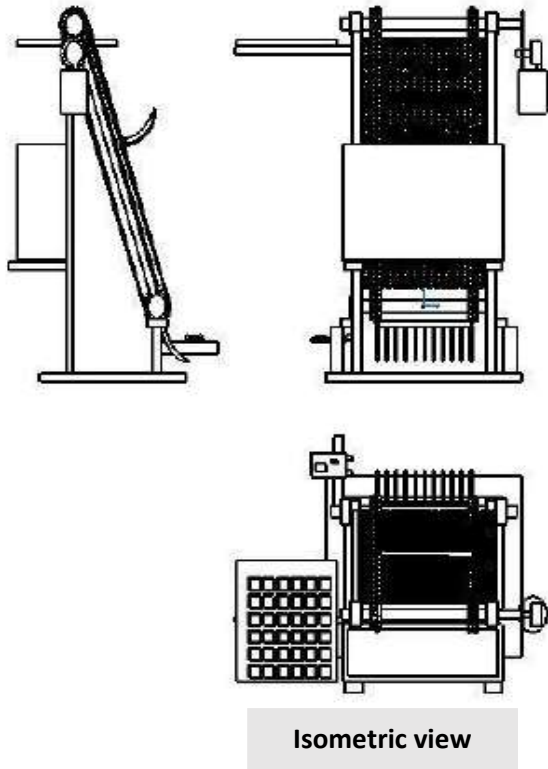
The problem of water logging due to plastic, thermocol and metal leads to pest growth and it favours diseases like malaria, typhoid etc. This is unsafe for human life and hence the idea of this project emerged. The objective of the proposed project is to design and fabricate an automated machine for drainage cleaning in order to prevent humans from getting affected by various diseases from the infectious microbes present in the sewage while cleaning manually. This proposed system is to minimize or overcome the problem faced while using man operated machine and to minimize the increased dumping rate of waste.

METHODOLOGY

Design Preparation



2-D Dimensional View



Frame (Material Used: Mild Steel)

Breath: 460mm

Length: 460 mm

Height: 640mm

Slant Length: 600mm

Leg length: 180mm

Bearing (Material Used: Stainless Steel)

6202 Ball Bearing

Battery

12 Volts, 4.5AH, Lead Acid battery, Rechargeable type battery, Works for 2 Hrs.

D C Motor

12Volts, 90 Watts, 30 rpm, Permanent Magnet D.C Motor, Worm Gear Motor.

Spur Gear (Material Used: Steel)

Gear Ratio: 1:1

Pitch: 8 mm

Radius: 52.5 mm

Radius hole: 12 mm

Shaft (Material Used: Mild Steel)

Upper Shaft

Length: 500mm

Radius: 12mm

Lower Shaft

Length: 500mm

Radius: 12mm

Trash Lifter-fork (Material Used: Mild Steel)

Total Length: 260 mm

Length of the fork: 100 mm

COMPONENTS REQUIRED

- Ball bearing
- Spur gear
- Wiper motor
- 12v Battery
- 5w solar panel
- IR sensor
- Chain and sprocket
- MS Shaft
- Relay

WORKING PRINCIPLE

Battery is connected to the DC motor and once it is fully charged chemical energy is converted into electrical energy and is passed to DC motor which rotates the armature of coil which in turn initiates the chain & sprocket drive mechanism. Chain is properly lubricated. Finger shaped fork is attached to the chain which is used to pick up the solid waste from drain and carries it and throws it away in waste bucket attached at backside of drainage system model. This process works automatically with the help of IR sensor connected to the DC motor in order to avoid power wastage

APPLICATIONS

- It can be installed for domestic sewage treatment.
- It can be used for proper treatment of sewage as well as to avoid blockages of drains.
- It is portable and compact in size which initiate easy handling.
- Manual assistance is not required.
- In industries, streets, houses, etc., which can be practically implemented in realtime.

ADVANTAGES

- It is reliable and portable.
- It cleans continuously.
- It is time saving.
- Development materials are regularly locally applicable.

CONCLUSION

Modern services are becoming polarized. With the emergence of more and more automatic terminal services, modern services are also gradually becoming unmanned. Thus this automated sewage cleaning system helps in cleaning the sewage automatically and helps in decreasing the spread of diseases due to direct human intervention into the sewage. Since the system operation mainly depends on high level programming, it can be extended as per requirements. This system is time saving, portable, affordable, consumes less power and can be made easily available so that can use this system whenever and wherever. Thus, these kinds of machines operate based on the application of electronics engineering, mechanical engineering and electrical engineering, which are collectively termed as 'Mechatronics'. Drainage from industries is treated through this project to meet the national emission standards, with stable operation, low cost and good effect. Drainage waste water control is treated by this method to irrigate plants, clean toilets, etc.

This system functions move effectively during heavier rains, which have more volume of garbage running water.

FUTURE SCOPE

The proposed project can extend the project by adding wind power to charge the battery from wind turbine energy. It can also extend the project by adding one suppression motor to suppress the dust particles in the storage tank also increase the storage tank size for more particles to store which are collected from the drain water

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