SOLAR OPERATED SEWAGE CLEANING MACHINE WITH RF CONTROL

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Abstract

Drainage cleaning system is proposed to overcome the real time problems. The present drainage system depends on canals as primary drainage source, secondary drains which discharge to primary canals or backwaters, the drain along road sides are the area drains with or without covering slabs. The main aim is to clean these road side drains and dispose them in a place far from the residential areas such that it does not affect the people. The chief function of the automatic drainage system is to collect as well dispose the solid waste to the waste bucket with the help of forks. Solid waste in drainage water includes empty bottles, polythene bags, papers etc. Drain can be cleaned continuously by the help of model using the drive system to remove the solid waste and threw it into waste bucket.

Keywords: *Automatic drain cleaner, solar power, Methodology, Fabrication & Working of Automatic drain cleaner*

Introduction

Usually what we see in a country like India is that common wastes like plastic bottles, covers, cans, and even used cars and electronic goods are not biodegradable etc and others are left in the streets and in the open drains. These waste particles obviously cause blockage of the drainage system during monsoon season when there is a flow of water through the roads and drainage systems. This blockage of drainage system can cause accumulation of waste water in these drains. Thus, when they accumulate they cause a health threat to people. Moreover, it also causes damage to terrestrial organisms while also reducing the uses of the land for other more useful purposes. Therefore, this problem needs immediate remedial measures. These impurities present in drainage water can cause blockage or the drainage system. The drainage system can be cleaned time to time manually or such a system can be designed that will automatically throw out wastages and will keep the water clean. Cleaning of drains/gutters has always been a problem. Labors cleaning gutters & drain seems unethical and also leads to a high risk of them catching infections or poisoning due to large amounts of waste/chemicals in them. This helps to clean water in the drainage system each time any wastage appears and this form an efficient and easy way of cleaning the drainage system and preventing the blockage.

- Daily operation should require minimum education and guidance to users of all ages.
- Cost of the system should be within the reach of users.
- Construction of the system should be based mainly on the use of local materials and its maintenances should be possible with semi-skilled labor, available in the areas.
- Requirement of water for transport and treatment should be minimum.

Methodology

The device is place across a drain so that only water flows through the lower basement. Floating waste like bottles, plastic cans, covers…..etc. is lifted by lifters which are connected to the chain. The chain revolves with the sprocket wheel which is driven by the motor. The energy provided to the motor is electrical energy. When motor runs the chain starts to circulate making the lifter to lift up. The wastage material are lifted by lifter teeth and stored in storage or collecting bin. Once the collecting bin is full, the waste materials are removed from the bin. It has a detailed description on how the product will satisfy and meet customer requirements. Existing design constraints may even be solved by having a good development in the design concept.

For this project, many alternative concepts have been generated. The various generated concepts were then individually evaluated to find the most appropriate concept for the product. The concepts that gave the most advantages were considered as the best concept and a waits further evaluation. The product sketch for the chosen concept was further drafted.

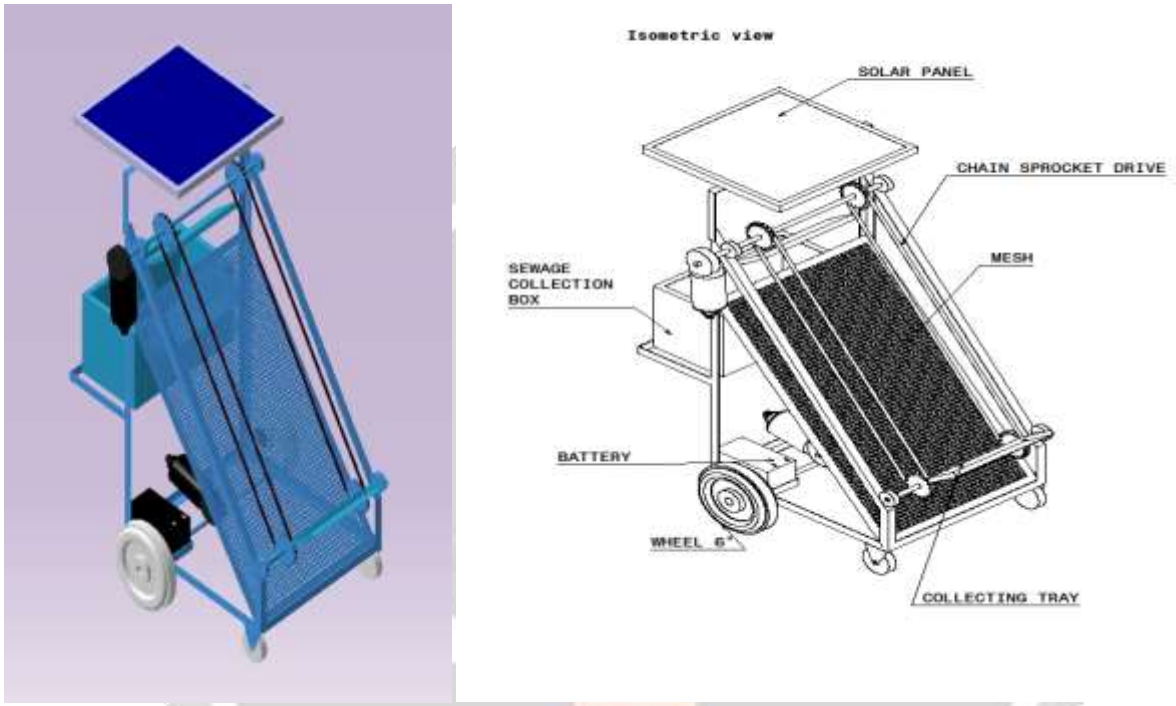

Fig 1: Design

DESIGN CALCULATION

TECHNICAL DETAILS

Frame width: 450mm

Chain sprocket diameter: 80mm

Chain sprocket center distance: 750mm

Shaft diameter: 12mm

Shaft length: 480mm

Drive gear diameter: 40mm

Motor drive gear diameter: 65mm

Wheel diameter: 6”

Front wheel diameter: 3”

Sewage collector tray dimension: 100mm x 280mm

Sewage storage box dimension 450 x 200 x 200mm

CALCULATION

Motor selection

Given

Diameter for sprocket=80mm

Weight of collector assembly with garbage is= 3 kg

Torque required for motor:

Torque=weight*length of link

=3kg x 750mm

=2250 kg mm

=22.5 kg cm

So torque required for seeder motor is =25 kg cm

Therefore we are selecting motor with 25kgcm torque.

Power output of DC motor is =voltage *current

=12x 1.2

=14.4 watt

Power=2*pi*N*torque/60

14.4 =2*pi*N*2.25/60

N=61.11 rpm

The motor used is of 90 rpm

Hence it's safe to use.

Gear ratio: T2/T1

=24/72

= 1/3

Or the gear ratio is 1:3

Solar panel:

Voltage 12 v

Power 10 W

Current 0.75 A

CONCLUSION

Design and develop of automatic drain gutter cleaning system is successfully implemented. The deplete squander water cleaner machine is planned and made by utilizing gear changing and shaft coupling rule. It comprise fundamentally DC equipped engine, shafts, squander expulsion plates, clean receptacle, course, sprocket and chains. Construction materials are effortlessly available, creates work (development and maintenance), simple to build.

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