

AUTOMATIC DRAINAGE CLEANING SYSTEM USING AUTO MECHANISM

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Abstract - Water is a basic necessity of humans & all living beings. There is plenty of water on earth but that is not suitable for human use. Clean water is more important if used for some purpose. The impurities is present in water can cause hazardous & disease. As long as the draining system is considered as the function of main drainage system is to collect, transport & disposed of the water through an outlet. Impurities in drainage water can be only like empty bottles, polythene bags, papers etc. this impurities present in drainage water can causes blockage or drainage system can be cleaned time to time manually or such a system can be designed that will automatically throughout wastage & will keep the water clean this project is designed to keep clean the drainage system and help the smooth working of the system. This project automatically cleans the water automatically clean the water in the drainage system is time any wastage appears and this form and efficient & easy way of cleaning the drainage system and preventing the blockage.

1. INTRODUCTION:

Automatic drainage water cleaning and control system using auto mechanism proposed to overcome the real time problems. With the continued expansion of industries, the problem of sewage water must be urgently resolved due to the increasing sewage problems from industries of the surrounding environment. Our proposed system is to clean and control the drainage level using auto mechanism technique. Auto mechanism is the major controlling unit and the drainage level a monitor by municipal. In this system we used hand wheel, chain, driver, bucket, frame. Water is being used very fast in today. The significance of water is mainly used for cooking, cleaning and drinking in our lifestyle. The water used in the factory and the house comes from the drains and reaches in the rivers, in the ponds and in the oceans. In which more solid ingredients (polythene, bottles etc.) along with water also reaches. We have built automatic drain cleaning machine with the main purpose of removing these solid materials from drains. This machine can be established at any point of drain very easily. It has been design in such a way that its lets water flow through it but collects all the solid substances and gives a group in the dustbin. This machine is able to do cleaning and moving process together on the drains/gutters.

2. LITERATURE REVIEW:

Mhael Okpara (2014) implemented a design "automatic drainage water pump monitoring and control system using

PLC and SCADA". In this project the use efficient way to control the deposal of wastage regularly treatment of disposal in different way toxic and non-toxic.

K Raghavendra (2015), explained removes an unwanted phenomenon, by using chain drive simulation program. It is used as an alternative to or in combination with physical experiment. They formed a specific model of the marine engine chain drive for a large speed system. They used contact force method for simulation analysis. Performed a dynamic simulation of large marine engine chain drive.

R. Sathiyakala (2016), said that the usage of mechanical drainage system cleaner to replace the manual work required for drainage cleaning system.

S D Rahul Bharadwaj proposed with the automatic cleaning of waste water in order to reduce global warming & wastage of power to treat waste water management.

Dr .K.KUMARESAN explained manual work converted to automated system. They made their project economical and efficient with the available resources.

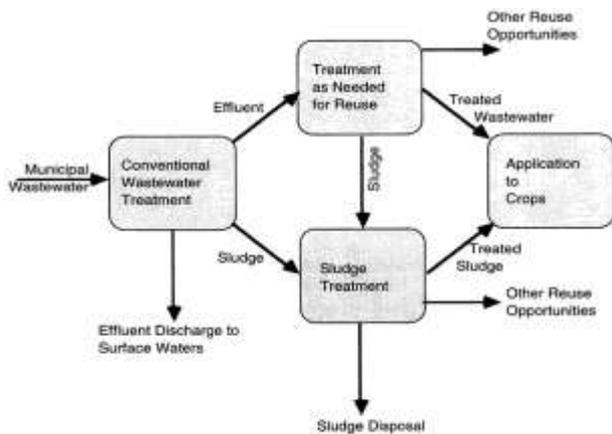
NDUBUISI C. Daniels showed the Drainage system cleaner machine used to remove garbage and the drainage system cleaner has three major parts which are the Propeller, the Cleaner and the Pan all makes up for its effective functioning.

3. MOTIVATION AND OBJECTIVE:

The major objectives of the proposed work are Design of mechanical drainer, taking into account the various factors that might affect the functionality of the equipment. Fabrication of the model and Assembling of the model carried out, then process are studied and optimized for effective semi-automatic drainer for sewage water treatment for floating materials. The problem of water logging due to plastic, and metal leads to pest growth and it favors 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.

4. SLUDGE TREATMENT:

Sludge treatment is focused on reducing sludge weight and volume to reduce disposal costs, and on reducing potential health risks of disposal options. Water removal is the primary means of weight and volume reduction, While pathogen destruction is frequently accomplished through heating during thermo phallic digestion, composting , or in cineration.



5. EXPERIMENTAL PROCEDURE:

The device is placed across drain so that only water flows through lower grids, waste like bottle, etc. Floating in drain are lifted by teeth which is connected to chain. This chain is attached by gear driven by motor. When motor runs the chain starts to circulate making teeth to lift up. The waste materials are lifted by teeth and are stored in waste storage tank.

If we turn on motor switch or if we supply current to the motor, the motor starts to rotate.

The rotary motion of the shaft is connected to the top shaft by chain and sprockets which is placed on taper bars.

From top shaft that motion is transferred to the bottom shaft by using sprockets and chains.

The teeth which is used for lifting waste from drainage is placed or attached between two chains which are on top and bottom shafts.

The dust bin which is used for collecting all the waste is attached to vertical bars behind the chains.

There will be a metal sheet between the chains and dust bin which act as a barrier for stopping the waste without floating.

When we switch on the motor the two shafts starts to rotate. Thus the teeth also start to rotate.

The teeth enters into water while rotating when it is coming up it also lift the waste present on the water along with it.

It carries the wasted along with it and finally dumps that waste in dust bin during rotation.

The process will continue and vice versa.

6. MECHANISM:

A chain mechanism is nothing but a mechanical system or component, specially a device that operates automatically under predetermined conditions. Most often, the power is conveyed by a roller chain known as the drive chain or transmission chain, passing over a sprocket gear, with the teeth of the gear meshing with the holes in the links of the chain. The gear is turned, and this pulls the chain putting mechanical force into the system. Sometimes the power is output by simply rotating the chain, which can be used to lift or drag objects. In other situations, a second gear is placed and the power is recovered by attaching shafts or hubs to this gear. Though drive chains are often simple oval loops, they can also go around corners by placing more than two gears along the chain; gears that do not put power into the system or transmit it out are generally known as idler wheel. For example, when the bicycle pedals gear rotate once, it causes the gear that drives the wheels to rotate more than one revolution. For the lifting of the sewages we require conveyor belt like construction for such purpose we used chains of the motorcycles. A chain conveyor system is a type of conveyor system which is used for moving material through production lines. The chain driven conveyor the belt is bolted to a series of cross-members, the ends of which connects to chains running down each side the conveyor. The chains connect to the motor via a sprocket. The main benefit that the chain driven belt conveyor provides, pure power, without slipping.

7. EQUIPMENT REQUIRED & ANALYSIS:

Sl. No	Component	Quantity
1	Square Tube	30
2	Motor	1
3	Metal Sheet	5 Pieces of different size
4	Sprocket	4
5	Bearing	2
6	Shaft	2
7	Chain	2
8	V-Belt	1
9	Pulley	1
10	Plummer Block	4

8. LOAD CALCULATION:

We know, 1 horsepower (H.P) is a unit in the foot-pound-second (F.P.S) or English system, sometimes used to express the rate at which mechanical energy is expended. It was originally defined as 550 foot-pounds per second (ft-lb/s). A power level of 1 HP is approximately equivalent to 746 watt s (W) or 0.746 kilowatt s (kW).

Also, 1 H.P can raise 249.47 kg load with the up liftmen of 1 foot in 1 sec. We are taking the load as 250 kilograms approximately.

We know, 1.35 H.P can raise load of = 300 kg per foot per sec

So, 0.45 H.P can raise load of = 100 kg per foot per sec

So, 0.225 H.P can raise load of = 50 kg per foot per sec

Therefore, 0.09 H.P can raise the load of = 20 kg per foot per sec

Since 1 H.P can raise 250 kg load per foot per sec, 0.09 H.P can raise the load of = 22.5 kg or 25 kg per foot per sec approximately.

We know, 0.1 H.P is capable of having speed of 38 rpm or 40 rpm approximately.

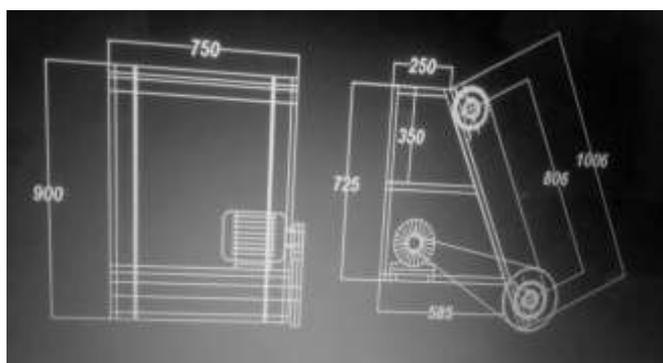
So, When 1 H.P is loaded with 20 kg, variation of speed will be = $(40/10)$ rpm = 4 rpm.

.But the motor has a specification of 2900 rpm.

Hence, $(2900-4)$ rpm = 2896 rpm is the variation of speed.

We have calculated the variation of speed for minimum load of 20 kg which can be enough for drainage cleaning system.

Thus, by using varies, we can uplift loads (wastage) of different kilograms.



This is a Basic outline of our project model with all the required dimension

9. CONCLUSION:

In the treatment system of drainage Waste water control by the motor, roller chain and sprocket, lifter and the collecting bin to achieve semi-automatic control of sewage waste water treatment. Drainage from industries is treated through this project to meet the national emission standards, with stable operation, low cost and good effect. Drainage wastewater control is treated by this method to irrigate plants, clean toilets, etc. The cleaner functioned move effectively during the heavier rains which had more

volume of running water with garbage and high velocity. Automation is a technology concerned with his application of mechanical, electronic and computer based systems to operate and control production. This system is used To Operate Automatic Sewage Cleaning System. This project may be developed with the full utilization of men, machines, and materials and money. Also we have followed thoroughly the study of time motion and made our project economical and efficient with the available resources. This system was Designed, Fabricated successfully and also tested. It works satisfactorily. We hope that this will be done among the most versatile and interchangeable one even in future. Thus we can able to obtain Automatic Sewage Cleaning system. Automation is a technology concerned with the application of mechanical, electronic and computer based systems to operate and control production. This technology is applied on our sewage cleaning system. Also we have followed thoroughly the study of time, motion and made our project economical and efficient with the available resources. The system is made more efficient by the use of solar energy and a micro controller. This system was designed, fabricated successfully and also tested. It works satisfactorily. Thus we obtain automatic drainage cleaning. As the project has been based on the baseline to make integration of the benefits for human health, societal concerns and national cleanliness policy. Therefore it covers much section of proportionate benefits to the all sphere of our present life.

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