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## DESIGN AND FABRICATION OF DRAINAGE CLEANING MACHINE

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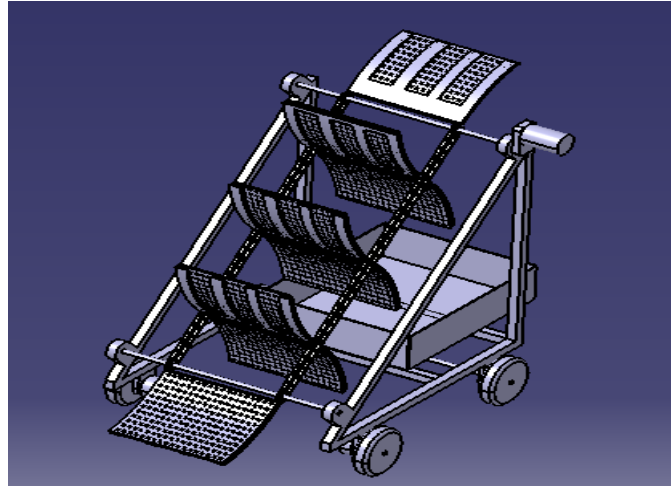
**Abstract :** This project emphasis on design and fabrication of the Drainage waste cleaning machine. "Drainage cleaning machine" a machine which involves the removing the waste debris from water surface and safely dispose from the water body. The work has done looking at the current situation of our national rivers which are dump with crore litres of sewage and loaded with pollutants, toxic materials, debris etc. Due to increase in water pollution in the form to waste debris; it is hampering the life of aquatic animal and make their life in danger. We designed our project to use this inefficient way to control the disposal of wastages and with regular filtration of wastages. The system has a wiper motor that starts running as soon as the set-up is switched on. Two power window motors are connected to the wheel and it is driven with the help of the remote-control set-up. The process starts collecting the trash waste by using the arm and it throws back the waste into the bin fixed in the machine at the bottom. An arm is used to lift the sewage and in turn, a bucket is used to collect them. The set-up runs even in sewage area with water (limited to a particular amount) so that the wastages which float on the water surface also gets collected. The garbage which affects the drainage is also picked up and removed. This system has limited human intervention in the process of cleaning and in turn, reduces the spreading of diseases to mankind.

**Keywords:** Drainage Cleaning Machine, Automation Technology, Conveyer, Sprocket, Trash Cleaning, ADCS

### 1. INTRODUCTION

The problem of floods and climate change has become quite bizarre because of its recent trends in the area where we live today. This has caused much concern in the world, especially in the developing world. Contaminants in running water can only be as empty bottles, polythene bags, paper, etc. Problems such as pollution and the spread of Infectious diseases are inevitable. This Drainage Cleaning system will clean up the waste in the drainage system which will allow water to flow. The automatic drainage cleaning system is used to clean the automatic drainage system by ADCS Machine, which is operated mechanically with the help of several configurations of various machine parts and various connections. Drainage flows with various contaminants contain plastic bottles, polythene, sewage and other solid waste. Due to blockage of water pipes we may face a few problems during the rainy season and on normal days. Due to the blockage of drainage system we can see that wastage piles up on the roads which is a big problem especially during the rainy season. So with the introduction of an automatic drainage cleaning system we can eliminate a number of problems and we can shut down the work of, people who clean these pipes and becomes more at risk of contracting diseases.

## Drainage Cleaning Machine



## 2. PROBLEM STATEMENT

To minimize the problem of wastage on sea drainages, lakes, and sea due to the plastic, electronic items, thermocol, metal parts, etc. This causes a huge amount of water pollution which affects aquatic animals as well as human life. It is also used in a small scale industries to remove the solid wastage from water, road, and sand with minimum cost.

## 3. LITERATURE REVIEW

Balachandra, et. al. It has been updated about drainage cleaning to replace using manual labour to automatic systems because the personal cleaning system is dangerous to human health and cleaning time, moreover to overcome this problem use the "Automatic water monitoring and control system using PLC and SCADA". PLC and SCADA are built. In this project to implement an effective waste management system regularly.

Dr. K.Kumaresan et.al. Specified manual function converted to the default system. Drainage pipe used for disposal and may be a loss of human life while cleaning the drainage closure. To overcome this problem, use the Automatic Sewage Cleaning System. They design their project in a different way to specify the wind objects are treated separately so that the flow of water flows smoothly. The project could be developed with the full use of men, equipment, and building materials and funds. They do their job economically and efficiently with the resources available. They use automated technology related to his use of mechanical, electronics, and computer systems to operate and control production.

Ganesh U L, et.al. Demonstrated the use of a water purifier to replace the manual labor required in the water purification system. Drainage pipes are very dirty. Sometimes it is dangerous to human health while it is necessary to clean the drainage system. To overcome this problem, they have used a mechanical semiautomatic drainage filter and so the water flow is smoother due to the normal waste filter with the help of that function. Different types of environmental hazards have been reduced with the help of the Drainage system.

Nitin Sall, et.al. The defined flow of used water from homes, commercial enterprises, and commercial activities is called wastewater. 200 liters and 500 liters of waste are produced per person daily. Therefore use wastewater technology that removes, rather than destructive, impurities from the drainage system

S D Rahul Bharadwaj, et.al. Proposed automatic cleaning of wastewater to prevent global warming and melting glaciers. The results underscore the need for wastewater treatment plants, where water is purified before being suspended in rivers. First, the energy is generated and that energy is used in the process of purifying wastewater.

R.Sathiyakala, et.al. explained the use of an E bucket (electronic bucket) in the sewage treatment system because the E bucket lifted the sewage and used its vapor in the wet sewage and was turned into dry news, with the ARM board (ARDUINO) this process was carried out. After this program they added the garbage to the state bank without any kind of viral love

Mr. Nikhil S. Pisal, et.al. the proposed safe chain load and similar ability to handle the use of Finite Element Modeling can be the main purpose of the work. An existing chain was used to measure the research work. Finite Element Analysis tools such as Hyper Mesh and ANSYS were suitable for detecting link performance under tight loads. The chain design will be subjected to F.E Analysis to determine the effect of loads (thickness) on the link. The proposed method uses software in the FEA domain to analyze the effects of variance in design parameters that influence the operating condition. The FEM method is used to analyze the stress state of the extensor body by a given geometry, such as a chain link.

Shao-Wu-Zhang, et.al. We have introduced three drainage materials for the ceramic filter water drainage system, improving the design according to the shorter arrival of the drainage device and the operation of the automatic drainage device. This device has stable performance,

low cost and low failure rate. They compared the operating processes of three water pumps, and analyzed its future development. Their goal was the shortcomings of the three types of drainage systems and their application conditions, the automatic pumping system was upgraded.

Prof. S.D.Anap, et.al. The blockage shown is a major cause of pollution and flooding in major cities. They have developed a system to detect water blockages in order to avoid such problems. The system provides monitoring of the flow of water and informs the authorities of the situation.

Gregor Burger, et.al. Explained the concept and software design of the common goal-setting platform for network-based model development and addressed some of the key issues of computer design. They have developed improvements in the design of a very fast template, easy to use, easy to integrate and expandable. It was up to 40 times faster than its predecessor based on MATLAB and allows for easy use. Installing features such as a hot startup system and expansion areas proved to be very useful when connecting drain 3 of the city as a sub-model of a major software project.

M. Naveena Reddy, et.al. developed a profile mathematical model that changed the way the elliptical gear was produced. They probe the tooth under an elliptical gear cut in an unusual, based on the intended mathematical model. Improved driving and dynamic profile that shifts elliptical gears. This project is useful for the construction and production of high-density gear gears.

James C.Y. Guo, et.al. showing road sand is a common practice in cold climates because sand increases road collisions when mixed with snow. In this study, an ice shelf was introduced in a project to rehabilitate a mountainous highway that runs through Colorado-sensitive forest area. The acquisition of winter sand dumps on the highway was designed to be a concerted effort to flow water and sweep machines. As there is a trade-off between sand discovery and the size of the ice storage area. This study also introduces a growth strategy where the size of the ice shelf can be determined by the reduction of sand reclamation.

N.Prabhushankar, et.al. showed the flow of water flowing water is usually done using a centrifugal pump, but the use of a centrifugal pump is not very effective in the complete extraction of solid and heavy solids and uses a lot of electrical energy in its operation. The main purpose of this proposed project was to drain the flowing water with a pneumatic pump. Reduce the manpower needed for water purification. Instead of a slider crank mechanism a pneumatic system and a spring-loaded cylinder were used to extract drainage particles that were large in size and had no external power supply.

James C. Conwell, G. E. Jhonson. He proposed the design and construction of a new testing machine that offers the same benefits as the traditional one. The new machine and auxiliary equipment provide real chain loading and allow for link tightness and impact monitoring of the roller sprocket during normal operation. The installation of an idle sprocket allows for independent adjustment of the length test and preload.

Mr. Brage Prashant Ravindra et.al. Designed roller chain plate design based on FEA. They reduce its stress concentration by reducing weight to increase chain strength. They obtained test results and software using Finite Element Analysis. They found better weight gain without any change in stress. Reduce the center height of the connector plate by removing the outer material so as not to have a direct impact on the pressure setting. They perform a chamfering-like operation, inserting a fillet into the link plate to reduce the weight of the connecting plate. They focus on specific parts of the chain. Evaluate the impact of change at different limits and the production methods of the external link in the stress on the building and determine whether conservation is reasonable or not.

Ashok Dargar, et.al. proposed a new way to identify different methods taken from a given kinematic series. They used the MATLAB software for two structural variables, the total number of total polynomial coefficients and the maximum total polynomial coefficient. Their research has helped to select the best way to do the work mentioned in the design concept category. This method does not require a separate isomorphism test.

Ms. T.Deepiga, et.al. described water monitoring systems such as monitoring water tank contamination and monitoring leaking water pipes. They avoid much water wasted by the uncontrolled use of large apartments. Use PID-based water quality monitoring to determine the water level in the tank. They avoid water wastage, energy consumption and easily prevent water generation in our generation. Use a sensor-based water pollution detector to monitor water quality using parameters such as PH level, turbidity and temperature measured by the sensor. They also see leaks with the rise of the LED meter and the running sound will have a beard on the headphones.

#### 4. COMPONENTS USED:

##### MOTOR:

The power required to drive the conveyor depends on various factors like the amount of load to carry, type of material to be carried, the speed at which material is to be carried, type of conveyor used, and the inclination of the conveyor, by considering above factors to drive 300 metric tons per hour the power required is 14 kw and to drive 1000 metric tons per hour the power required is 45 kw.

A DC motor is any of a class of electrical machines that converts direct current electrical power into mechanical power. The most common types rely on the forces produced by magnetic fields. Nearly all types of DC motors have some internal mechanism, either electromechanical

or electronics, to periodically change the direction of current flow in part of the motor. Most types produce rotary motion; a linear motor directly produces force and motion in a straight line.

DC motors were the first type widely used since they could be powered from existing direct-current lighting power distribution systems. A DC motor's speed can be controlled over a wide range, using either a variable supply voltage or by changing the strength of the current in its field windings. Small DC motors are used in tools, toys, and appliances. The universal motor can operate on direct current but is a lightweight motor used for portable power tools and appliances. Larger DC motors are used in the propulsion of electric vehicles, elevators and hoists, or in drives for steel rolling mills.

### **BUCKET CONVEYOR:**

A bucket elevator, also called a grain leg, is a mechanism for hauling flowable bulk materials (most often grain or fertilizer) vertically. It consists of: 1. Buckets to contain the material; 2. A chain to carry the buckets and transmit the pull; 3. means to drive the chain; 4. Accessories for loading the buckets or picking up the material, for receiving the discharged material, for maintaining the chain tension, and for enclosing and protecting the elevator. A bucket elevator can elevate a variety of bulk materials from light to heavy and from fine to large lumps. 5. Bucket conveyors consist of endless chains or belts which are attached to buckets to convey bulk material in horizontal, inclined, and vertical paths. The buckets remain in the carrying position until they are tipped to discharge the material. Various discharging mechanisms are available.

### **COLLECTING TANK:**

A collecting tank is a water tank that is used to collect and store wastage and collects from sewage. A collecting box is one that is used to collect wastes from drainage (or) sewage. Chain: A bicycle chain is a roller chain that transfers power from the upper shaft to the lower shaft by wiper motor runs. The conveyor is connected to the chain through welding. Most chains are made from plain carbon or alloy steel, but some are nickel-plated to prevent rust, or for aesthetics.

### **SPROCKET:**

A sprocket or sprocket-wheel is a profiled wheel with teeth, cogs, or even sprockets that mesh with a chain (or) indented material. The sprocket wheel engages a chain and runs over it. It is distinguished from a gear that is never meshed directly, differs from shafts in these sprockets have teeth and pulleys are smooth. Sprockets and chains are also used for power transmission from one shaft to another where slippage is not admissible, sprocket chains being used instead of belts or ropes and sprocket wheels instead of pulleys. They can be run at high speed and some forms of the chain are so constructed as to be noiseless even at high speed.

### **BEARING:**

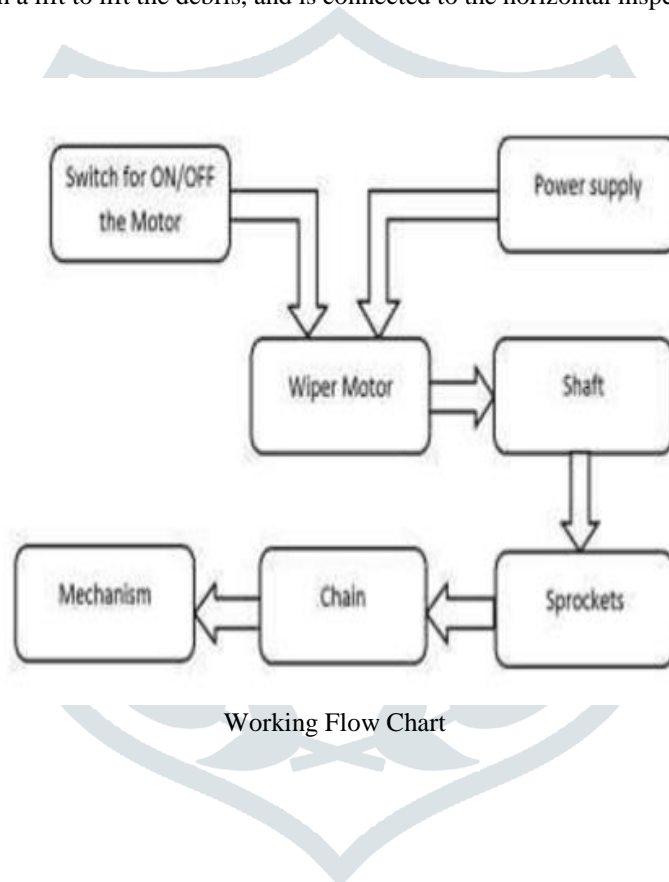
A bearing is a machine element that constrains relative motion to only the desired motion and reduces friction between moving parts. The design of the bearing may, for example, provide for free linear movement of the moving part or for free rotation around a fixed axis; or, it may prevent a motion by controlling the vectors of normal forces that bear on the moving parts. Most bearings facilitate the desired motion by minimizing friction. Bearings are classified broadly according to the type of operation.

## CONVEYOR SYSTEM:

Functions of the Conveyor System, Conveyors are able to safely transport materials from one level to another, which when done by human labor would be strenuous and expensive. They can be installed almost anywhere, and are much safer than using a forklift or other machine to move materials. They can move loads of all shapes, sizes, and weights. Also, many have advanced safety features that help prevent accidents. There are a variety of options available for running conveying systems, including the hydraulic, mechanical, and fully automated systems, which are equipped to fit individual needs. Conveyor systems are commonly used in many industries, including automotive, agricultural, computer, electronic processing, aerospace, pharmaceutical, chemical bottling, canning print finishing, and packaging.

## 5. WORKING PRINCIPLE

The machine is placed in a ditch so that only water can flow on the screen, rubbish like bottles, plastic etc. Floating in the trench is raised a lifting object attached to the screen. The screen is connected to a chain-driven shaft with the help of a DC motor. When the engine is running the chain starts the rotating screen with a lift to lift the debris, and is connected to the horizontal inspection and waste stored in the container.



## 6. PROCESS

When the current is supplied to the motor, the motor begins to rotate, the movement of the rotary shaft is transferred to the sprocket with the help of a chain. With the help of the upper sprocket the rotating movement is transferred to the lower sprocket using a chain. The lifter is used to lift plastic waste from drainage placed between two chains. When the motor is switched on the two shafts start rotating, thus the elevator starts to rotate again. The lift goes into the water and lifts the plastic waste into the water next to it, Carries the waste and dumps the waste into another combination of sprocket, chain and shaft moving horizontally. The horizontal cover holds waste in a container where plastic waste can be removed by operation.

## 7. FUTURE SCOPE

We have collected the information and resources required for the Automatic Drain cleaning program. He studied the structure and mission of ADCS. Developing ADCS and evaluating its effectiveness. Hopefully this will be between a flexible and flexible cleaning system.

As the project is based on the concept, combining the benefits of human health, public concern and national hygiene policy. It therefore encompasses many components of equitable benefits throughout the field of our present life.

- I. Industrial- Our project, as a youth in the market network will provide entrepreneurs with much needed ideas for integrating technology and social benefits and using the market. As a nation we focus on public benefits in policy making and providing the new generation with employment and environmental protection. Although being a potential market capitalization saves profits on the part of the industry as well as providing social benefits for the business.
- II. Organizational → Sanitation is one of the basic necessities for a basic human life and to provide such a technological and economic tool that can change the sad state of sanitation in the cities and towns of central India. With such a tool that can generate job opportunities in the community through industry cooperation, these products put you in a position to win people over.

## 8. CONCLUSION

The problem of water blockage due to plastic waste and other solids can be eliminated by using the ADCS system. Cleaning the pipes / gutters has always been a problem. Workers cleaning gutters & drains appear unethical and lead to increased risk of infection or poisoning due to the large amount of waste / chemicals in them. So here we provide an automatic vacuum cleaner to deal with these modern gutter stop problems. Our system uses an automatic waste / waste disposal system that allows liquids to flow through it but holds large solid waste such as bottles and plastic and accumulates. So garbage collectors just need to clean up these garbage disposal systems instead of cleaning the whole floor.

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