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Design and Fabrication of Automatic Industrial Hazardous Material, And Waste Collecting Machine

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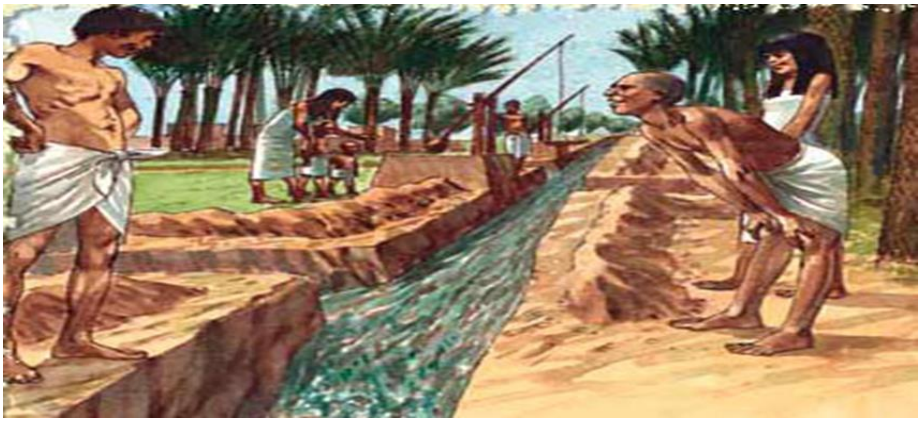
Abstract
Automatic Industrial Hazardous and Waste Collecting Machine Was Cleaning overcomes all sorts of floor area, Machine shops, Godowns, drainage problems In and Around of Industrial premises and promotes blockage free drains promoting continuous flow of drain water. In the modern era there have been adequate sewage problems where sewage water needs to be segregated to clean our surrounding environment.
The waste and gases produced from the industries as well as surrounding areas of cities are very harmful to human beings and to the environment. Our proposed system is used to clean and control the industrial level using auto mechanism technique.
The bedrock of the project is an endeavor to put back manual disposal of waste in sewage treatment plants and other industries. This will be an attempt to put weight off the shoulders of the manual workers involved in solid waste removal. The declining trend of deaths will be evident by replacing humans with these machines in clearing the solid waste of industries. Technological innovation for empowering the social dignity of the manual labor in sewage plants is inherent in this innovation. This will be a valid step put forth to boost one of the goals of sustainable development-A life of dignity for all, this paper presented is an agglomeration of socio-economic development, scientific temper and innovation which is stepping towards sustainable development.

Keywords: Design and Fabrication, Waste Collecting Machine, Hazardous Material

Introduction
The Indus Valley Civilization had advanced Sewerage, Cleaning systems and drainage systems. All houses in the major cities of Harappa and Mohenjo-Daro had access to water and drainage facilities. Waste water was directed to covered gravity sewers, which lined the major streets.
In 18th and 19th century the invention of hollow-pipe drainage is credited to Sir Hugh Dalrymple, who died in 1753.



Sewerage and Drainage systems in the period of Indus Valley Civilization

Civil engineering is responsible for drainage in construction projects. They set out from the plans all the roads, street gutters, drainage, culverts and sewers involved construction operations. During the construction process he/she will set out all the necessary levels for each of the previously mentioned factors.

Point drainage, which intercepts water at gullies (points). Gullies connect to drainage pipes beneath the ground surface and deep excavation is required to facilitate this system. Support for deep trenches is required in the shape of planking, strutting or shoring Channel drainage, which intercepts water along the entire run of the channel. Channel drainage is typically manufactured from concrete, steel, polymer or composites. The interception rate of channel drainage is greater than point drainage and the excavation required is usually much less deep. the main theme of this paper is to Cleaning of industrial drains/, channelsand floor areashasalways been a problem. Labors cleaning leads to high risk of infections and enough to cause deadful diseases.

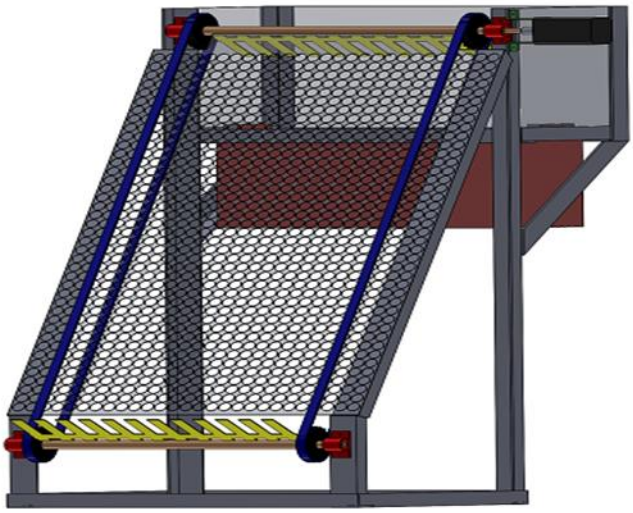
Disposing Manufacturing Waste, Metal chips,bottles, plastics and other such solid waste into the gutters lead to narrowing and eventually blockage of sewage flow. This leads to overflow in many cases.

So here we provide a fully automated drainage cleaning mechanism to tackle these modern-day gutter jamming issues.

The system uses an automated drain cleaning system that lets drain water flow through it but catches solid waste like Metal chips, bottles & plastic and cast aside in the collecting bin.

Image of Hazardous Waste in Industries.

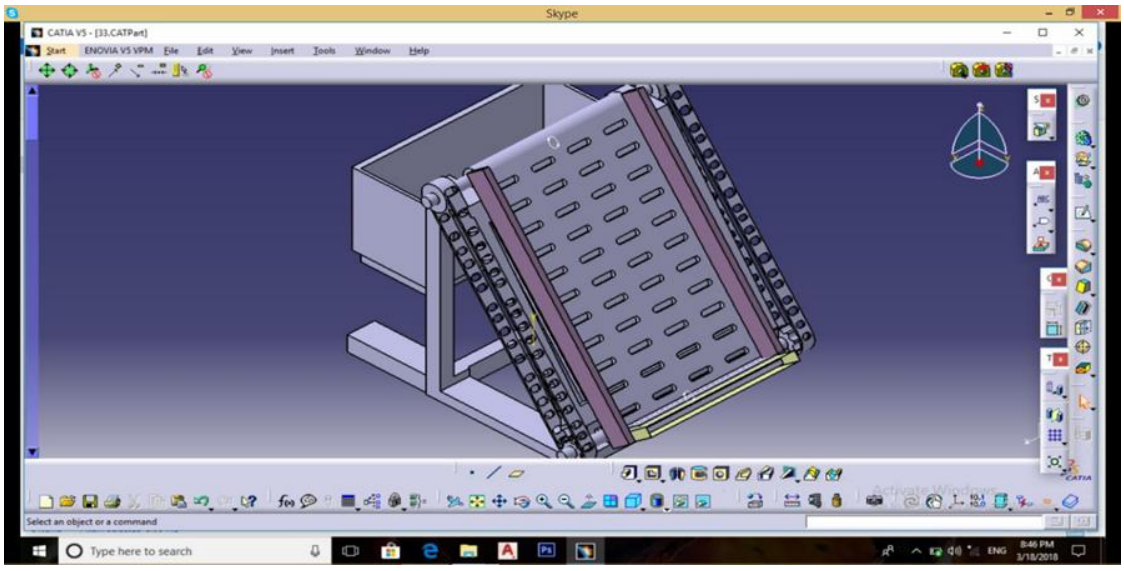
Automatic Waste Cleaner.

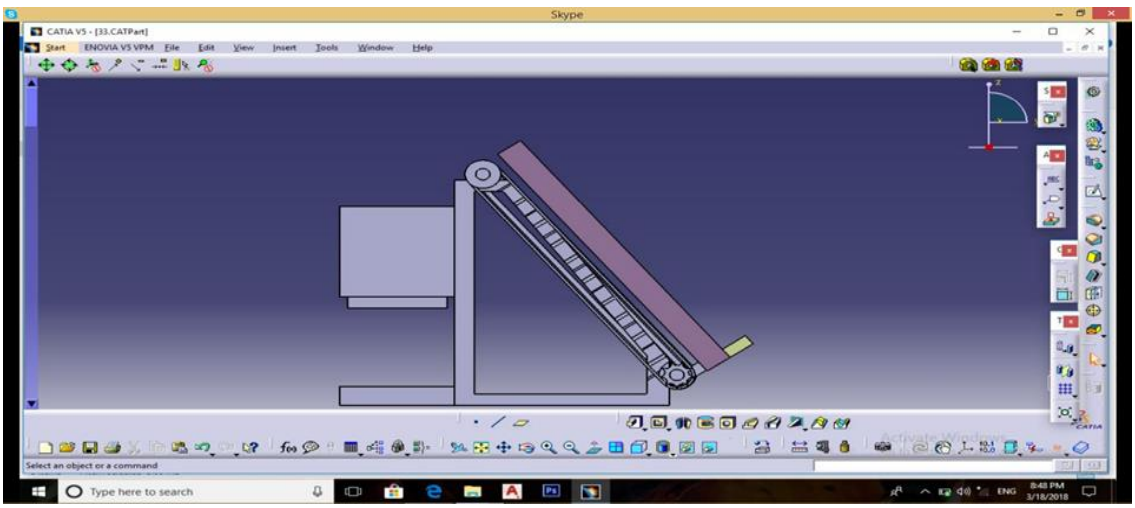


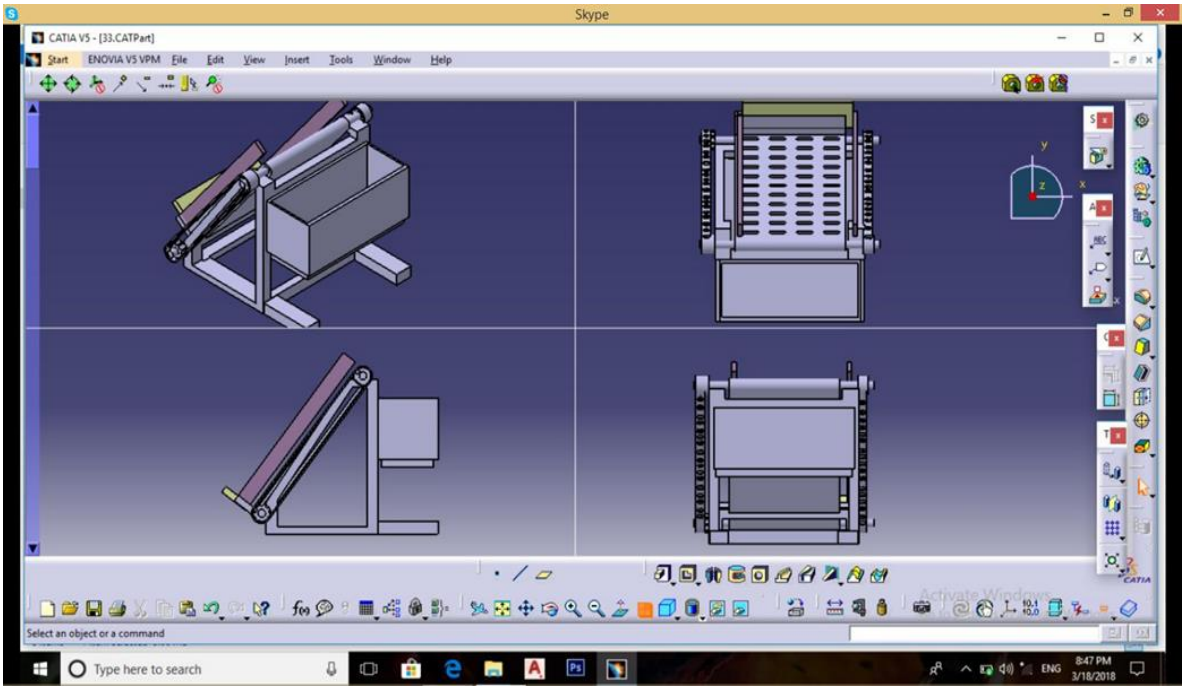
Automatic Channels, Drainage cleaner equipment.

The main components of automatic drainage cleaning system: -

1. Frame body
2. Collecting tank
3. Collecting jaw or bucket
4. DC motor
5. 12 v battery
6. Iron wire mesh
7. Roller chain
8. Sprockets
9. Shaft
10. Ball bearing
11. Conveyor belt
12. Rollers
13. Nut and bolts







Parts Designed by Using CATIA Software.

The Automatic Industrial Hazardous Waste Collecting system is based on 2 Mechanisms

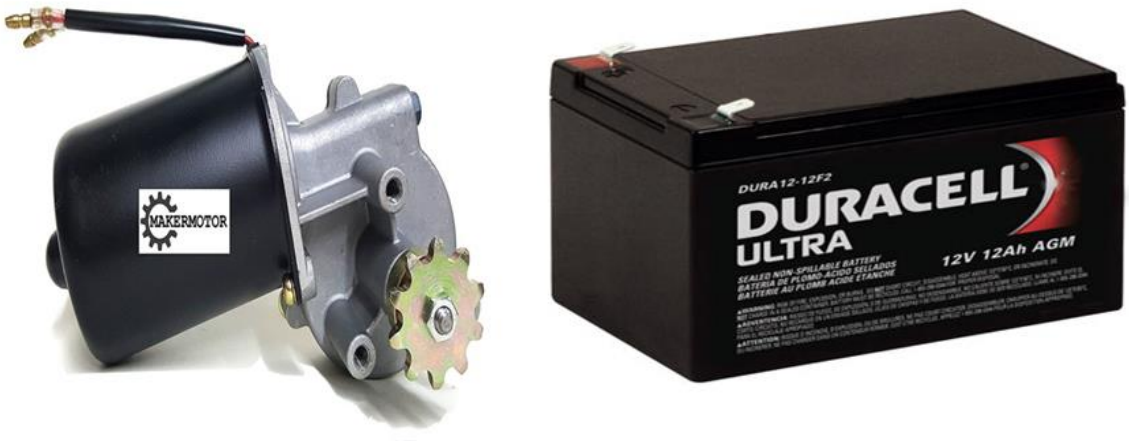
1. Chain drive mechanism
2. Conveyor systems
3. Chain drive is a way of transmitting mechanical power from one place to another. It is often used to convey power to the wheels of a vehicle, particularly bicycles and motorcycles. It is also used in a wide variety of machines besides vehicles.

A conveyor system is a common piece of mechanical handling equipment that moves materials from one location to another. Conveyors are especially useful in applications involving the transportation of heavy or bulky materials. Conveyor systems allow quick and efficient transportation for a wide variety of materials, which make them very popular in the material handling and packaging industries.

Chain drive mechanismConveyor systems.

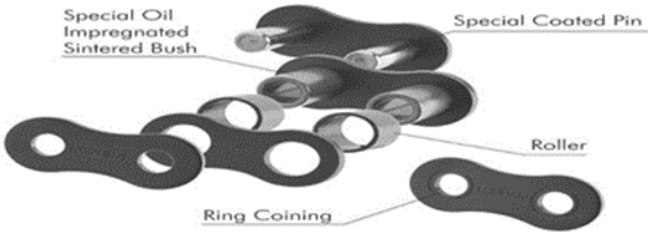
Frame body of machine.

Collecting bin with net.



Electric motor with sprockets attachedUsing a 12 v battery.

A DC motor is any of a class of rotary electrical machines that converts direct current electrical energy into mechanical energy. 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 electronic, to periodically change the direction of current flow in part of the motor.
A Battery is supplying electric power, its positive terminal is the cathode and its negative terminal is the anode.
A chain is a serial assembly of connected pieces, called links, typically made of metal, with an overall character similar to that of a rope in that it is flexible andcurved in compression but linear, rigid, and load-bearing in tension. A chain may consist of two or more links. Chains can be classified by their design, which is dictated by their use:



Basic parts of roller chain.

ASME/ANSI B29.1-2011 Roller Chain Standard Sizes							
Size	**Pitch**	**Maximum Roller Diameter**	**Minimum Ultimate Tensile Strength**	**Measuring Load**			
25	0.250 in (6.35 mm)	0.130 in (3.30 mm)	780 lb. (350 kg)	18 lb (8.2 kg)			
35	0.375 in (9.53 mm)	0.200 in (5.08 mm)	1,760 lb (800 kg)	18 lb (8.2 kg)			
41	0.500 in (12.70 mm)	0.306 in (7.77 mm)	1,500 lb (680 kg)	18 lb (8.2 kg)			
40	0.500 in (12.70 mm)	0.312 in (7.92 mm)	3,125 lb (1,417 kg)	31 lb (14 kg)			
50	0.625 in (15.88 mm)	0.400 in (10.16 mm)	4,880 lb (2,210 kg)	49 lb (22 kg)			
60	0.750 in (19.05 mm)	0.469 in (11.91 mm)	7,030 lb (3,190 kg)	70 lb (32 kg)			

A sprocket or sprocket-wheel is a profiled wheel with teeth, or cogs, that mesh with a chain, track or other perforated or indented material.
[5][6] The name 'sprocket' applies generally to any wheel upon which radial projections engage a chain passing over it.
It is distinguished from a gear in that sprockets are never meshed together directly, and differs from a pulley in that sprockets have teeth and pulleys are smooth.

Sprockets

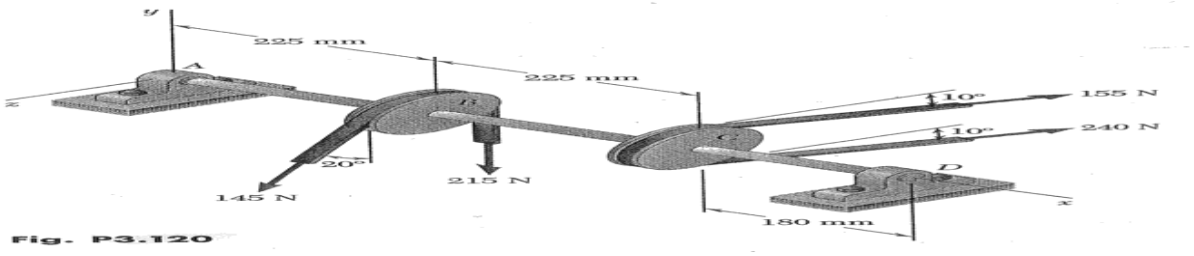
A mesh is a barrier made of connected strands of metal, fiber, or other flexible or ductile materials. A mesh is similar to a web or a net in that it has many attached or woven strands.
It protects the floating wastage not to pass through the machine.

Iron mesh

Transmission shafts are used to transmit power between the source and the machine absorbing power; e.g. counter shafts and line shafts.

Machine shafts are the integral part of the machine itself; e.g. crankshaft.

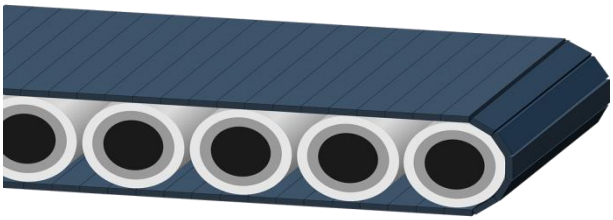
Line shaft



Line shaft in application use

A ball bearing is a type of rolling-element bearing that uses balls to maintain the separation between the bearing races.

A belt conveyor system consists of two or more pulleys (sometimes referred to as drums), with an endless loop of carrying medium—the conveyor belt—that rotates about them.



Fabrication Process:

Arc welding is a process that is used to join metal to metal by using electricity to create enough heat to melt metal, and the melted metals when cool result in a binding of the metals. It is a type of welding that uses a welding power supply to create an electric arc between an electrode and the base material to melt the metals at the welding point.

Working Principle

The gadget is place over the deplete so water course through lower grids, squander like Industrial Hazardous materials, plastic waste, bottles, cloth, wood papers etc. Flowing in deplete are restricted by teeth which is associated with chain.This anchor is appended to equip driven by motor. Motor is beginning bind is begin to circle. Making teeth to lift up squandered material put away in tank. Motor can use to rotate chain drive. This motor can operate on battery and battery charge using solar plate.

The devices is place across drain so that only water flow through lower grids, Hazardous materials, plastic waste, 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. The automated mechanism is basically designed to filter out the solid waste of the running drains

and hence removing the possibility of any blockage of the flowing waste water.

The turbine is the power (rotation) generating element that functions on the hydraulic power and hence then drive the chain mechanism. The power generated by the turbine is being transmitted through the sprocket-chain arrangement from turbine shaft to mechanism driving shaft and hence the chain mechanism is being driven.

The chain mechanism is being fitted with the wire mesh filter that just picks up the solid waste while the liquid waste flows through the mesh.

The size of mesh holes can be adjusted in order to decide the different size of solid waste we are working on.

The system is being adjusted at an angle so that mesh is able to hold the solid waste.

The storage box is kept where the solid waste is collected and later that box can be cleaned to remove the collected waste.

Conclusion

Drainage of industries is treated through this paper to meet the national emission standards, with stable operation, low cost and good effect. This Automatic Cleaner functioned and moved Effectively during the heavier rains which had more volume of running water with Industrial solid waste with high velocity. Presently as a nation, India purposefully focusses on two major things. Firstly, as young and fast-growing nation we are concentrating to pull out the maximum from our manufacturing sector with a touch of Start-up stashing of sub-topic focus.

This paperwill provide the entrepreneurs, much needed ideas to blend the technology with societal benefits and harness the market.

Secondly, as a nation we are focusing on the public benefits in the policy making and providing the young generation the employment and environment safety. While being a high-market potential project conserves the profit for the industry section with the advance of providing the corporate social benefits.

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