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Design & Development of Water Garbage Cleaning System

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ABSTRACT

In this project the proposed concept is to replace the manual work in water garbage cleaning by automated system. India is holy country & during lots of festival like ganesh visarjan, navratri durga puja & mainly Siahnsth kumbhmela there is lots of water pollution. The water pollution is very important problem in rivers, ponds and water bodies. 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. Similarly sometimes the aquatic animal tends to eats surface waste debris considering it as a food; which ultimately cause the death of animals. Due to polluted water there are many skin diseases to human kind are observed. So that to reduce the water pollution we are trying to make water clean-up machine. "Water clean-up machine'' a machine which involves the removing the waste debris from water surface and safely dispose from the water body. Our proposed project uses special chain drive system, D.C motor, D.C battery, bearing, shaft, carrier, and water garbage waste storage box equipment's to work as automatic water garbage cleaning system.

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I. INTRODUCTION

Automatic Water garbage cleaning overcomes all sorts of water garbage problems 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 are very harmful to human beings and to the environment. Our proposed system is used to clean and control the water garbage level using auto mechanism technique.

Automatic water garbage 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. The waste and gases produced from the industries are very harmful to human beings and to the environment. Our proposed system is to cleaning and controls the water garbage level using auto mechanism technique. Auto mechanism is the major controlling unit and the water garbage level a monitor by municipal .In this system we used motor, chain, driver, bucket, frame automatic water cleaning overcomes all sorts of garbage problems 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 "River cleanup machine" used in that places where there is waste debris in the water body which are to be removed. This machine is consists of motor driven chain drive mechanism which collect & remove the wastage, garbage & plastic wastages from water bodies.

A machine will lift the waste surface debris from the water bodies, It consists of Belt drive mechanism which lifts the debris from the water. The use of this project will be made in rivers, ponds, lakes and other water bodies for cleaning upper water waste debris.

II. PROBLEM STATEMENT

The statement of the project is "Design & Development of Water Garbage Cleaning System" to remove the waste debris, plastic waste & garbage from water bodies, which causes harm to aquatic & human life.

The project is to reduce the man power and time consumption for cleaning the river. In this project we have automated the operation of river cleaning with help of a motor and chain drive arrangement.

III. OBJECTIVES

1) To reduce the pollution in water bodies.
2) To overcome the difficulty of removing waste particulate floating on water surface.
3) To maintain the automation during working towards cleaning water bodies.
4) To perform the fast & reliable operation during cleaning water bodies.
5) Improve the water quality.
6) To work for society for clean up a section of a water bodies.

IV. PROPOSED SYSTEM

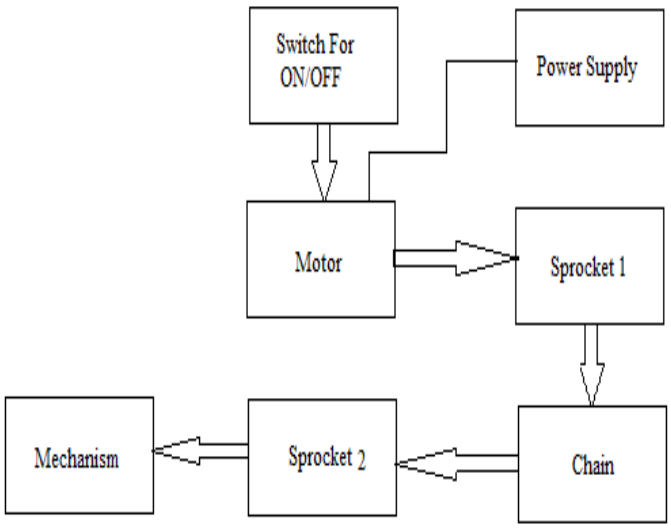

Fig.1: Block Diagram of Setup

Methodology

1) System consists of chain drive which acts as a conveyor to carry the waste particles from the water garbage system.
2) It is operated by the motor which runs the chain drive.
3) It also consists of wastage tank which is used to store the water garbage waste particles.
4) The carrier is connected to the middle of the chain drive which carries the waste particles and settled down in the storage tank.

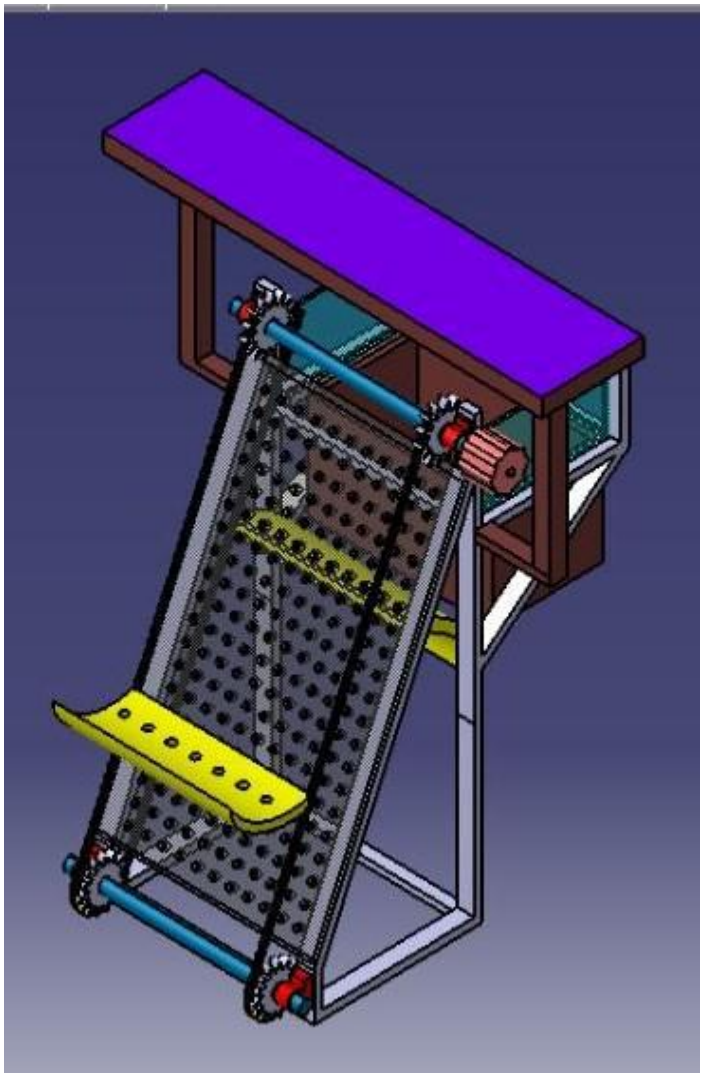

Fig 2. Catia design

Technical Specification

1. Motor
Type: D.C Motor
Speed: 60 RPM
Voltage: 12V
Current: 3amp
Power: 36 watt

2. Battery & Solar
12 volt, 3Amp.
25*54inches
36cells
1cell=0.5v
36cell=18v

3. Shaft
Material: M.S Rod
Size: 15 mm diameter
Quantity: 2

4. Chain & Sprocket
Type: Bicycle Chain
Quantity: 2
Type: Rear sprocket of motorcycle
Quantity: 4

No of Chain Links = 142
Center Distance = 604.8 mm
Chain pitch (p) = 9.525 mm
Pitch Diameter (D) = 46.014 mm
Roller Diameter (d_1) = 6.35 mm (Max)
Width between Inner Plates (b_1) = 5.72 mm (Min)
Transverse Pitch (P_t) = 10.24 mm
Top Diameters
D_{max} = 51.57 mm
D_{min} = 48.179 mm
Tooth Width = 5.43 mm

5. Bearing Selection

ISI No = 20A CO_2
Bearing Basic Design No = 6202
Dynamic Capacity (C) = 8.725 KN

6. Drain Collector

Material: M.S Sheet
Size: 250 x 250 x 200 mm (L x w x H)
Thickness: 1.2 mm

7. Frame

Material: M.S Square Pipe
Size: 1 x 1 inch (25 x 25 mm)
Thickness: 1.5 mm

V. ADVANTAGES AND APPLICATION

Advantages:

1) It is non-conventional river cleanup system.
2) Its operation and manufacturing is simple.
3) It is portable.
4) It can be efficiently used.
5) It's initial & maintenance cost is low.
6) Skill worker not required.
7) Construction materials are often locally available.
8) Environment friendly system.

Applications:

1) It is applicable to reduce water pollution in rivers, ponds, oceans.
2) It is useful to reduce the environmental marine pollution at river.
3) It is also useful in fishery plant to collect dead fishes & solid impurities from waste water.
4) It is useful to remove the sediments present in swimming pool to keep it clean.

Limitations

1) Small vibration occurs
2) It is difficult to balance.

VI. FUTURE SCOPE

1) In future, it is possible to make it a file automated system by the implementation of control algorithms .Thus, this project helps in making our nation clean and healthy.
2) In India sewage drains are open, so people throw waste in sewage drains.
3) It can be used in disaster affected areas.

VII. CONCLUSION

In the treatment system of Water garbage waste water control by the motor, roller
chain and sprocket, lifter and the collecting bin to achieve semi-automatic control of river
waste water treatment.

Water garbage from industries will be treated through this project to meet the
national emission standards, with stable operation, low cost and good effect.

The cleaner functioned move effectively during the heavier rains which had more
volume of running water with garbage and high velocity.

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