Scientific Journal of Impact Factor (SJIF): 5.71

e-ISSN (O): 2348-4470
p-ISSN (P): 2348-6406

International Journal of Advance Engineering and Research Development

Volume 5, Issue 03, March -2018

Design And Fabrication Of River Waste Collector

Mahto Ravishankarkumar Ravindrabhai[1], Dehadray Vaibhav[2],

Kaka Smit[3] , Prof. Ankur Joshi[4]

[1,2,3] *Mechanical Engineering , Vadodara Institute of Engineering , Kotambi*
[4] *Professor, Mechanical Engineering , Vadodara Institute of Engineering , Kotambi*

Abstract — *This project emphasis on design and fabrication of the river waste collector. India is a holy country with diversified culture and different religious festivals which sometimes causes pollution among which water pollution is major. . Different types of solution have been used by the government to solve such issues. So this work is done after focusing on the current situation of our water reservoir.The government of India has taken charge to clean rivers and invest huge capital in many river cleaning projects like "Namami Gange", ''Narmada Bachao'' and many major and medium projects in various cities like Ahmadabad, Varanasi etc. So that to reduce the water pollution we are trying to make river cleaning machine."River Waste Collector" a machine which involves the removing the waste debris from water surface and safely dispose from the water body.*

Keywords*- Bearings with Housing, Chain and Sprocket Assembly, Perforated Fins, Mesh Fins, Coarse Fins.*

I. INTRODUCTION

The "River Waste Collector" used in that places where there is waste debris in the water body which are to be removed. This machine consist of different size of Fins in which garbage's are going to collect in between them. This also reduce the difficulties which we face when collection of debris take place. In this machine one end of fins is fixed and another side is movable , with the help of servo motors we lift the fins from movable side. All the waste debris are get collected at tank placed at the end of boat.This will ultimately result in reduction of water pollution and lastly the aquatic animal's death to these problems will be reduced.The use of this project will be made in rivers, ponds, lakes and other water bodies for to clean the surface water debris from bodies.

Minister of Environment, B. Kambuaya, and revealed waste production of 33 cities across Indonesia by the Central Bureau of Statistics records in 2007 reached 132,192 cubic meters per day. Not all of the waste disposed and transported in landfill, for example a lot of garbage that have not been handled properly such as burned and dumped in the river. This phenomenon that causes environment problems. Rivers turn into domestic landfill. Kambuaya states 80 percent of river has been polluted by domestic waste. River ecosystem that gets under pressure of high pollution load than other rivers in Java is Ciliwung River. This river is located in Jakarta which passes through many villages which have poor sanitary conditions in general. During the rainy season this river often overflows and causes floods. Jakarta government makes efforts to overcome trash pollution in the rivers. One of them is to launch issue regulation in Jakarta which prohibits dumping into rivers

Some alternative of wasting management have been are presented among others through the trash bank or recollect bank and reprocess them into handmade items that can make profits. In addition, the Indonesian government also makes effort by the issue of the regulation No. 18 of 2008 on Waste Management along with Government Regulation No. 81 of 2012, mandates the need for a fundamental paradigm shift in the management paradigm that is gathering garbage – transporting – processing waste into a convergent on wasting reduction and waste management. Wasting reduction activities means all levels of society include government, business and society conducting restriction of madden. They recycle and reuse garbage which is known as Reduce, Reuse, and Recycle (3R) through intelligent efforts, efficient, and program. Government's efforts have not been running at maximum. There are many garbage's found and clog the stream flows in the river, dumps into the branch of the river, piles up at the doors of water, in ditches, small streams and pose shelter illegal waste, which would damage the surrounding environment.

II. PREVIOUS WORKS

M.Mohamed Idhris M. Mohamed Idhris, M. Elamparthi, C. Manoj Kumar Dr.N. Nithyavathy, Mr. K. Suganeswaran, Mr. S. Arun kumar " Design and Fabrication of Remote Controlled Sewage Cleaning Machine " have been prepared a remote control machine which having two power window motors and used collect the sewage waste the arms. [1]

Mr.Abhijeet. M.Ballade, Mr. Vishal.S.Garde, Mr.Akash.S.Lahane and Mr.Pranav.V.Boob "Design & Fabrication of river cleaning system " have been prepared a clean-up machine which removes the waste debris from water surface and has been tested on Godavari river at Nasik. [2]

Mr. P. M. Sirsat, Dr. I. A. Khan, Mr. P. V. Jadhav, Mr. P.T.Date "Design and fabrication of River Waste Cleaning Machine " have prepared river waste cleaning machine which uses motors, transmitter & receiver, propeller, PVC pipes & chain drive with the conveyor to collect garbage and wastages from water bodies. [3]

Pankaj Singh Sirohi, Rahul , Shubham Gautam, Vinay Kumar Singh, Saroj Kumar "Review on Advance River Cleaner" have been prepared river cleaning device in which a turbine rotates by the flow of river water and through the mechanical gear arrangements two conveyor belts are arranged to collect the solid waste from the river and throw it out. [4]

Ndubuisi c. Daniels "Drainage System Cleaner A Solution to Environmental Hazards " have given a solution to environmental hazards caused in water bodies. [5]

Osiany Nurlansa, Dewi Anisa Istiqomah, and Mahendra Astu Sanggha Pawitra "AGATOR (Automatic Garbage Collector) as Automatic Garbage Collector Robot Model " have prepared an AGATOR(Automatic garbage collector) in Indonesia to solve the garbage issues which arises due to heavy tourism. [6]

Basant rai " Pollution and Conservation of ganga river In modern India "have given some ideas to solve some pollution issues in Ganges river and it's conservation. [7]

Huang Cheng, Zhang Zhi " Identification of the Most Efficient Methods for Improving Water Quality in Rapid Urbanized Area Using the MIKE 11 Modeling System " have prepared a MIKE 11 modelling system to improve water quality in urban area. [8]

Emaad Mohamed H. Zahugi, Mohamed M. Shanta and T. V. Prasad " Design of Multi-Robot System For Cleaning Up Marine Oil Spill" have designed a multi robo system to clean the main oil spills on water surface. [9]

Prof. N.G.Jogi,Akash Dambhare, Kundan Golekar, Akshay Giri, Shubham Take " Efficient Lake Garbage Collector by Using Pedal Operated Boat "have prepared pedal operated boat to use as garbage collector. [10]

Ankita B.Padwal, Monica S. Tambe, Pooja S. Chavare, Reshma K. Manahawar, Mitali S. Mhatre " Review Paper on Fabrication of Manually Controlled Drainage Cleaning System " have reviewed a fabrication of manually controlled drainage cleaning system. [11]

III. PROBLEM IDENTIFICATION

A. Motivation and objective

The problem of water logging due to plastic, thermocole 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.

B. Existing method

The existing system is completely a mechanical based project. It is a stationary system, simply kept in the sewage area to collect the wastes passing over it. The chain and sprocket is used for rims movement, which has fitted fins to collect the wastes from the sewage. The rotation of the chain along with the rims will push the boat in forward diirection, the floating wastes are collected between different sizes of fins and put off the wastes in the bin that is placed at the backside of the system.

IV. CONSTRUCTION AND WORKING PRINCIPLE

A. Construction

The project consist of different types of fins attached at both side. The component which is running the project is Chain and Sprocket assembly and two rims. On the spokes of Rims we are going to fix curvature cross-section due to which when rims are rotating on the surface of river it pushes the water in opposite direction and boat moves in forward direction. In this project Fins are fixed at one side and another side is moving, on moving side copper wire is fixed and this wires rolls on pulley connected with servo motor. Servo motor connected with 9V battery to pull the fins upward.

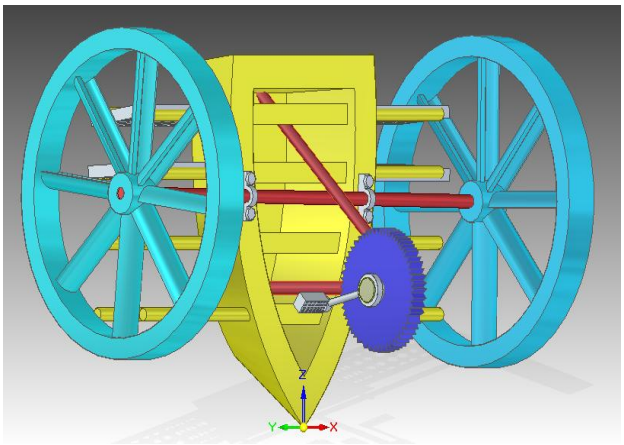


FIG:- 1 RIVER WASTE COLLECTOR

B. Working Principle

In general terms, the present invention relates to a stationary, Solid waste Screening or skimming vessel for collecting waste from flowing waterways by means of using four different types of Fins. The Fins are connected with Rod with the help of Hook at outside of the Boat. The flowing of water from Fins collects the floating solid waste. After collecting solid waste between Fins all the waste are Transferred into Last section by Lifting the fins with the help of Servo Motor. Fins are Hanging from one point and another point is connected with metal wire and Metal wire is connected with Servo motor. Servo motor is connected with 9V Battery. This Boat can run by using manually operated Link (Chain and Sprocket Assembly) or else different types of Engines which are used in boats.

As noted above, the device of the present invention will preferably be used to collect floating or partially sub merged trash and debris from waterways (e.g., streams, harbors, rivers, lakes, and the like). It is adapted to being moved to different locations. Accordingly, it is a principal object of the present invention to provide a solid waste collection system for collecting Solid waste in a body of flowing water. It is another object of the present invention to provide a solid waste collection system that is simple to operate, requires minimum maintenance.

Briefly described, those and other objects and features of the present invention may be accomplished, as embodied and fully described herein, by a solid waste collection system for collecting Solid waste in a body of flowing water that has a flotation platform adapted to being securely positioned in and floating on the flowing water, a Solid waste collection section mounted on the platform having, on one end. Two rod attached to and extending outward from the upstream end of the platform used to connect the fins with Boat. This section can be attached with boat using hooks and if this containers are filled with waste then it can be replaced with another one or else by detaching the container this boat can be used for Transportation.

V. CAD Model of River Waste Collector

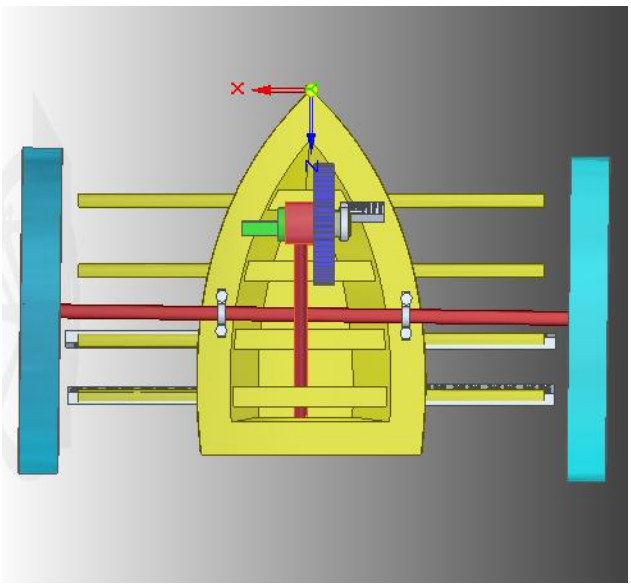


FIG:- 2 FRONT VIEW

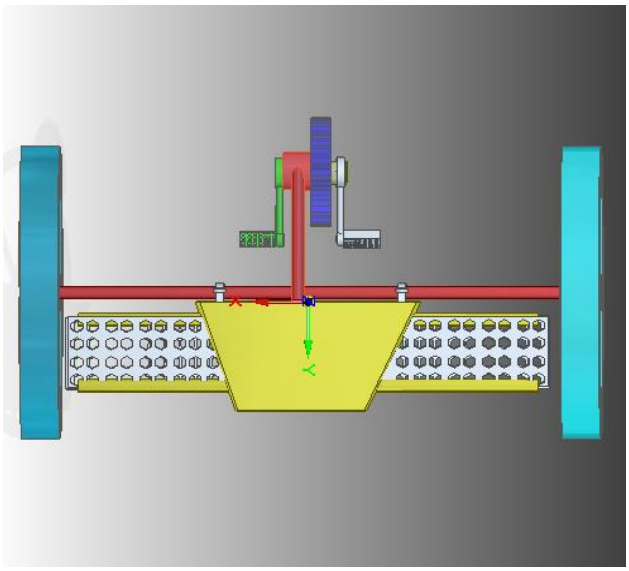
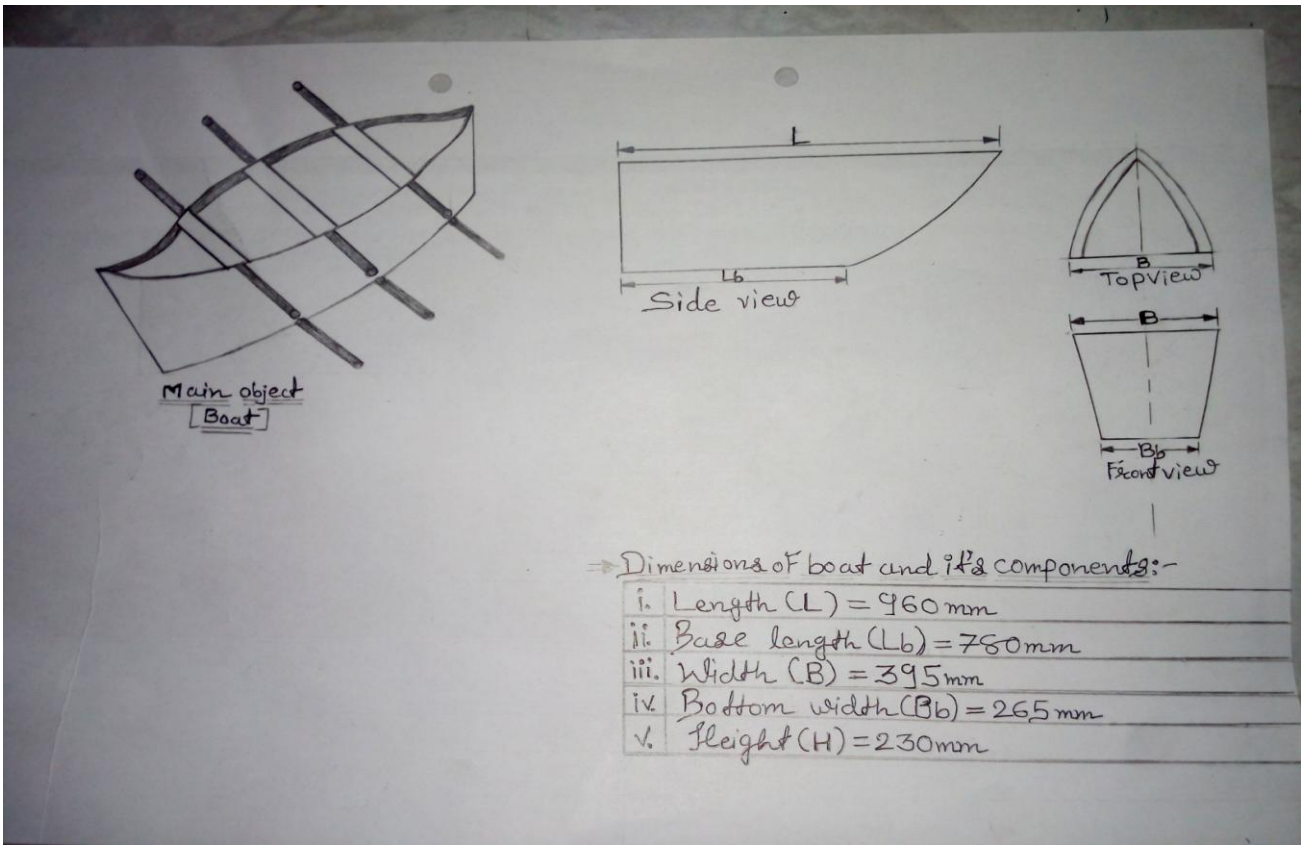


FIG:- 3 FRONT VIEW

VI. MATERIALS / TOOLS REQUIRED

1) Flexible Plywood
2) Wooden Blocks
3) Electric Motor
4) Chain and Sprocket Assembly
5) M.S Rod
6) 9V Battery
7) Fins
a) Perforated type fins
b) Meshed type fins
c) Coarse type fins
8) Water Proofing Powder

VII. DIMENSIONS OF RIVER WASTE COLLECTOR



VIII. ADVANTAGES & LIMITATIONS

A. Advantages

1) Initial & maintenance cost is less.
2) It is very useful for small as well as big lake, rivers where garbage is present in large amount.
3) Easy replacement and installation of various parts
4) Skill worker not required to drive the system self propel.
5) Environment friendly system.

B. Limitations

1) The waste collecting capacity of machine is limited at a time.
2) This machine is able to collect the waste which is only floating on water level.

IX. FUTURE SCOPE

1) The machine can be designed for deep cleaning
2) Solar panel can be used for providing power to the machine and engine can be used
3) Capacity of the machine can be increased for cleaning big rivers and lakes.
4) Remote controlling can be done
5) At the place of fixed Fins we can use movable fins

X. CONCLUSIONS

This project is fabricated on the basis of studying different literature and research on different journal so it can provides flexibility in operation. This innovation is easy and less costly and has lots of more future scope. This project " River Waste Collector " is designed with the hope that it is very much helpful to river and River cleaning. On the basis of it design and estimating cost and availability it is very cheap and very useful for the society.

On the basis of these result we can conclude that it is an innovative method of minimizing manual stress and thus very much reliably stabilizing the in the river. The project carried out by us made an impressing task in the environmental purpose and it is very useful for the small scale works. Although this system able to collect the garbage from the river with human interaction. The objective of the project was successfully achieved.

REFERENCES

[1] M. Mohamed Idhris, M.Elamparthi,C. Manoj Kumar, Dr.N.Nithyavathy, Mr. K. Suganeswaran, Mr. S. Arunkumar, "Design and fabrication of remote controlled sewage cleaning Machine", IJETT – Volume-45 Number2 -March 2017
[2] Mr.Abhijeet.M. Ballade, Mr. Vishal.S. Garde, Mr.Akash.S. Lahane and Mr.Pranav.V.Boob, "Design & fabrication of river cleaning system", IJMTER Volume 04, Issue 2, [February– 2017] ISSN (Online):2349–9745.
[3] Mr. P. M. Sirsat, Dr. I. A. Khan, Mr. P. V. Jadhav, Mr. P. T. Date, "Design and fabrication of River Waste Cleaning Machine", IJCMES 2017 Special Issue-1 ISSN: 2455-5304
[4] Pankaj Singh Sirohi, Rahul Dev, Shubham Gautam, Vinay Kumar Singh, Saroj Kumar,"Review on Advance River Cleaner", IJIR Vol-3, Issue-4, 2017 ISSN: 2454-1362.
[5] Ndubuisi c. Daniels, "Drainage System Cleaner A Solution to Environmental Hazards", IRJES) ISSN (Online) 2319-183X, Volume3, Issue 3(March 2014)
[6] Osiany Nurlansa, Dewi Anisa Istiqomah, and Mahendra Astu Sanggha Pawitra, "AGATOR (Automatic Garbage Collector) as Automatic Garbage Collector Robot Model" International Journal of Future Computer and Communication, Vol. 3, No. 5, October 2014.
[7] Basant Rai, "Polltution and Conservation of ganga river in modern India", International Journal of Scientific and Research Publications, Volume 3, Issue 4, April 2013 1 ISSN 2250-315
[8] Huang Cheng, Zhang Zhi*,"Identification of the Most Efficient Methods For Improving Water Quality in Rapid Urbanized Area Using the MIKE 11 Modelling System", 2015 Seventh International Conference on Measuring Technology and Mechatronics Automation.
[9] Emaad Mohamed H. Zahugi, Mohamed M. Shanta and T. V. Prasad,"Design Of Multi-Robot System For Cleaning Up Marine Oil Spill", IJAIT Vol. 2, No.4, August 2012.
[10] Prof. N.G. Jogi, Akash Dambhare, Kundan Golekar, Akshay Giri, Shubham Take, "Efficient Lake Garbage Collector By Using Pedal Operated Boat", IJRTER Volume 02, Issue 04; April 2016 ISSN: 2455-1457.
[11] Ankita B.Padwal, Monica S. Tambe, Pooja S. Chavare, Reshma K. Manahawar, Mitali S. Mhatre, "Review Paper on Fabrication Of Manually Controlled Drainage Cleaning System", IJSER, Volume 8, March-2017 ISSN 2229-5518.

