ADVANCES in NATURAL and APPLIED SCIENCES

ISSN: 1995-0772
EISSN: 1998-1090
2017 April 11(4): pages 428-431

Published BY**AENSI Publication**
http://www.aensiweb.com/ANAS
Open Access Journal

Water Hyacinth Removal Machine From Lake

[1]S. Balan, [2]R. Sathish, [3]S. Balamurugan, [4]S. Pasupathi, [5]S. Rajeshkanna

[1]UG Scholar,Department of Mechanical Engineering, knowledge Institute of Technology, Tamilnadu, India.
[2]UG Scholar,Department of Mechanical Engineering, knowledge Institute of Technology, Tamilnadu, India.
[3]UG Scholar,Department of Mechanical Engineering, knowledge Institute of Technology, Tamilnadu, India.
[4]UG Scholar,Department of Mechanical Engineering, knowledge Institute of Technology, Tamilnadu, India.
[5]Assistant Professor, Department Of Mechanical Engineering, knowledge Institute of Technology, Tamilnadu, India.

Received 28 January 2017; Accepted 22 April 2017; Available online 1 May 2017

Address For Correspondence:
S. Balan, UG Scholar,Department of Mechanical Engineering, knowledge Institute of Technology, Tamilnadu, India.

Copyright © 2017 by authors and American-Eurasian Network for ScientificInformation (AENSI Publication).
This work is licensed under the Creative Commons Attribution International License (CC BY).
http://creativecommons.org/licenses/by/4.0/


Open Access

ABSTRACT
Water pollution is one of the most important causes for environment pollution. The quantity of pure water around the world is less. Remaining pure water is polluted by the increased population. For example water is mainly polluted by unwanted plastic substances, solid & liquid wastages and Water hyacinth plants. The main objective of this project is to remove the Water hyacinth and unwanted wastage's from the lake. It consists of conveyor, pneumatic cylinder, electric motor, rotating shaft, blade and collecting tank. As the boat run forward, the blades are rotating anticlockwise within the conveyor. The conveyor is merged under the water angularly. So that solid wastages and the algae's are picked up by the blades and transmitted to the conveyor. The conveyor drops it in the collecting tank. By using this project, we can prevent the water pollution. Also we get the clean environment.

KEYWORDS: Pollution, Water, Pneumatic Cylinder, collecting tank.

INTRODUCTION

Water pollution is one of the most important cause for environment pollution. The quantity of pure water around the world are less. Remaining pure water are polluted by the increased population. For example water are mainly polluted by unwanted plastic substances, solid & liquid wastages and hydrilla plants. This type of water plants are hazardous to human health and water based living things. The machine we designed for the removal of hazardous plants does not affect human being and living things.

The main objective of this machine is to remove the Water hyacinth plants, algae and solid waste in the lake or ponds. In this machine is fitted in front of the boat and it is operated by combination of electric and pneumatic processer. It consists of conveyor, pneumatic cylinder, electric motor, rotating shaft, blade and collecting tank. As the boat run forward, the blades are rotating anticlockwise within the conveyor.

ToCite ThisArticle: S. Balan, R. Sathish, S. Balamurugan, S. Pasupathi, S. Rajeshkanna., Water Hyacinth Removal Machine From Lake. **Advances in Natural and Applied Sciences**. 11(4); Pages: 428-431

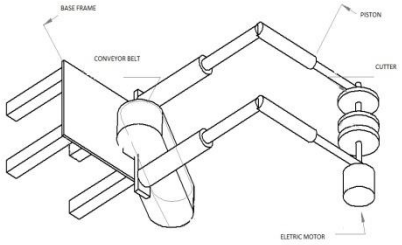

Fig. 1.1: Water Hyacinth Removal Machine

The conveyor is merged under the water angularly. So that solid wastages and the algae's are picked up by the blades and transmitted to the conveyor. The conveyor drops it in the collecting tank. The Water hyacinth plants are not able to remove by the conveyor blades. So a setup consist of blades at the front end are operated by a motor fixed at the one end of shaft. The blades are moved up and down by a pneumatic cylinder connected at the sidewall. When the boat moves forward, the external blades are immersed in the water and cut down the plant for a particular area. As the blades rotating the clockwise direction, the plants are pushed toward the conveyor.

Problem Identification:

Eichhornia crassipes mats clog waterways, making boating, fishing and almost all other water activities, impossible. Water flow through water hyacinth mats is greatly diminished. An acre of water hyacinth can weigh more than 200 tons; infestations can be many, many acres in size; mats may double their size in as little as 6-18 days. Water hyacinth mats degrade water quality by blocking the air-water interface and greatly reducing oxygen levels in the water, eliminating underwater animals such as fish. Water hyacinth greatly reduces biological diversity: mats eliminate native submersed plants by blocking sunlight, alter emersed plant communities by pushing away and crushing them, and also alter animal communities by blocking access to the water and/or eliminating plants the animals depend on for shelter and nesting. In Florida, millions of dollars a year used to be spent on water hyacinth control; finally getting the plant under "maintenance control" has greatly reduced that expenditure.

3. Methodology:

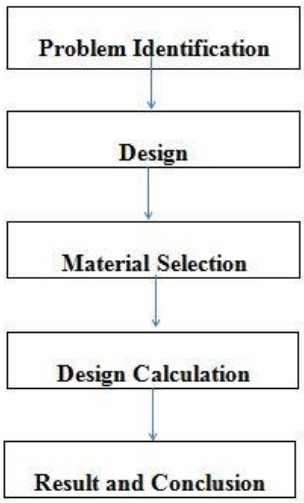

Fig. 3.1: METHODOLOGY

Material Selection:

S.No.	PARTS	MATERIAL
1	Cutter	Carbon steel
2	Pneumatic cylinder	Aluminium
3	Conveyor	Leather
4	Collecting tank	Mild steel
5	Base frame	Mild steel

5. Design Calculation:

5.1 Double acting pneumatic cylinder:

Stroke length : 100mm = 0.1m
Piston rod : 10mm =$10x10^{-3}$ m
Quantity : 1
Seals : nitride (buna-n) estover
End cones : cast iron
Medium : air
Temperature : 0-80^0c
Pressure : 8N/m^2

5.2 Solenoid flow control valve:

Port size : $0.635x10^{-2}$m
Medium : air
Quantity : 1

5.3 Connectors::

Max working pressure : $10x10^5$N/m^2
Temperature : 0-100^0c
Fluid Medium : air
Material : brass

5.4 Capacity of air cylinder:

Diameter of the cylinder, d = 0.025 m
Length of the cylinder, L = 0.08 m
Thickness of cylinder, T = 0.003 m
Stroke length of the cylinder = 0.125 m
Area of the cylinder,A= π/4*d^2
= π/4(0.025^2)
= 4.908 x 10^{-4} m^2
Volume of the cylinder, V = area*length
= 3.9264 x 10^{-5} m^3

5.5 Hoses:

Max pressure : = $10x10^5$ N/m^2
Outer diameter : = $6x10^{-3}$m
Inner diameter : =$3.5x10^{-3}$m

Pressure Of The Cylinder:

Intensity of pressure = 9.81*volume/area of cylinder
= (9.81*39.249*10^)/(490.62)
= 1.5 bar pressure

Result And Conclusion:

Water pollution is one of the most important causes for environment pollution. The quantity of pure water around the world is less. Remaining pure water is polluted by the increased population. For example water is mainly polluted by unwanted plastic substances, solid & liquid wastages and Water hyacinth plants. The main objective of this project is to remove the Water

electric motor, rotating shaft, blade and collecting tank. As the boat run forward, the blades are rotating anticlockwise within the conveyor. The conveyor is merged under the water angularly. So that solid wastages and the algae's are picked up by the blades and transmitted to the conveyor. The conveyor drops it in the collecting tank. By using this project, we can prevent the water pollution. Also we get the clean environment.

REFERENCES

1. Design, O.E. 1991. and construction of Water Hyacinth (Eichhorniacrassipes) harvester. Unpublished M.Sc. Thesis.
2. Lancar, L., K. Kake, 2002. Aquatic weeds and their management, international commission on irrigation and drainage. International Development Research Centre Ottawa.
3. Malik, A., 2007. Environmental challenge, Vis-vis opportunity, the case of water hyacinth, 33(1): 122-138.
4. Sharma, P.C., D.K. Aggarwal, 2007. Machine design. Publisher of Engineering and Computer books.NaiSarak Delhi.
5. Kaewprakaisaengkul, C., 1985. Harvesting of water hyacinth.Journal of Agric. Mechanization in Asia, Africa and Latin Ametica, 18(2).