



The Research Paper on Design and Development of Smart Water Tank Cleaning Machine

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Abstract: In recent years, the need for efficient and automated solutions for cleaning water tanks has become increasingly important due to the growing concern about water quality and safety. This work aims to design and develop a smart tank cleaning machine that can be effectively and efficiently clean water tanks. This machine will be designed to be portable and easy to transport to different locations.

Keywords: Water Tank, Cleaning, Brush, Mechanical Linkage.

I. INTRODUCTION

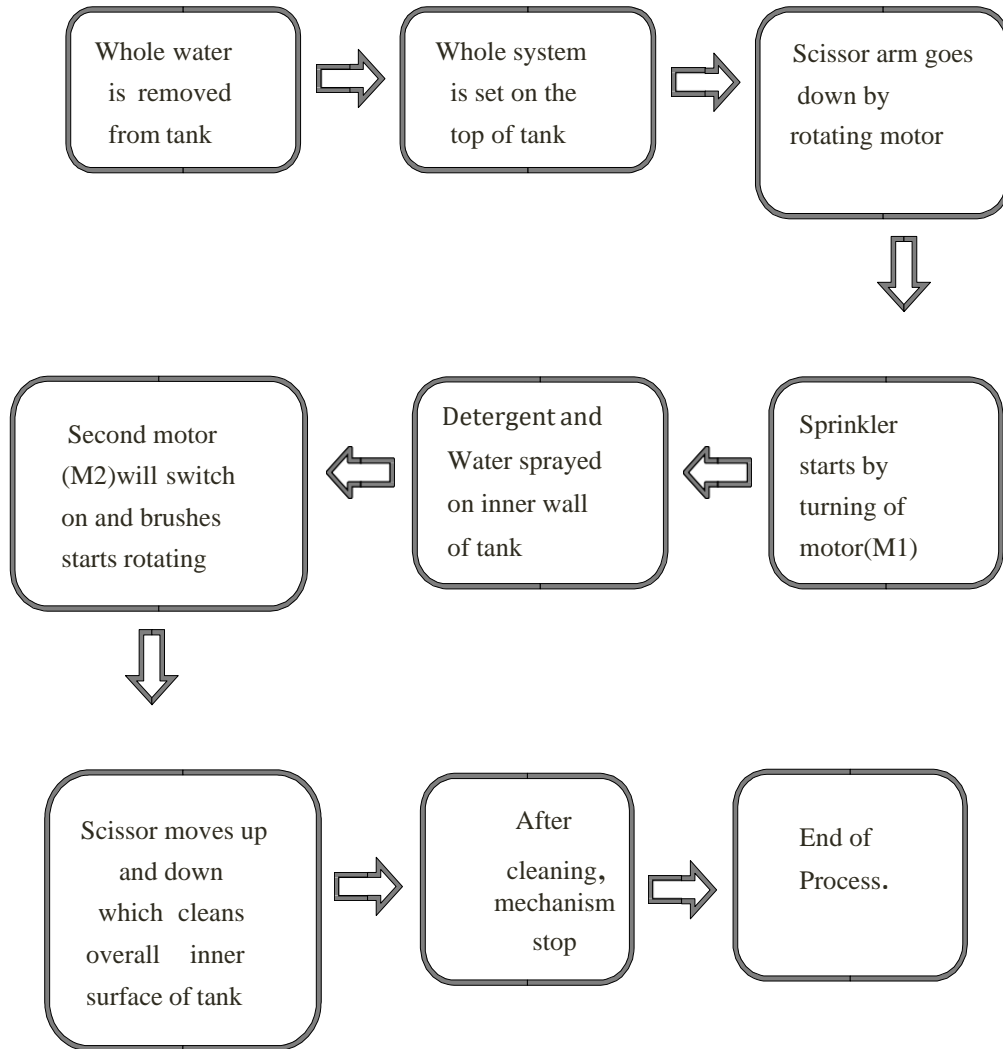
In India, the usage of sinter tanks by the people is approximately 71%. After studies made the information that have faced a lot of difficulties like continuous work in the dirty places, irregular payment and other various reasons. Continuous work and irregular payment may also be the major reason for this attempt. So came to a conclusion that cleaning the overhead tank using automation process can be useful to solve all these problems. In this case, machine has the capability to clean the tank easily and quickly. Designing of our machine is based on the survey report conducted.

The purpose of this work is to reduce the human efforts and to avoid the chemical influence on health of person entering the tank for cleaning. In this modern world, cleaning of overhead tanks manually is a tedious job. To overcome this, we have aimed at tackling the disadvantages of cleaning overhead tanks, so a mechanical system overhead tank cleaning is designed to provide high safety, high efficiency, less time for cleaning and to avoid environmental pollution problems. Purpose of this project is to clean domestic cylindrical water tank with the help of mechanical system.

The mechanical system consists of a thread rod attached to two arms with brushes at ends. The two arms are connected to the thread rod by nut. By rotating the thread rod, the up down motion of the two arms is achieved. The gear rod is rotated with the help of a rotating handle. The clockwise rotation of the main shaft will make the arms move and vice versa. The achievement of this project is reduction of cost and manual labor because there will be harmful diseases for the person who will go inside and it will affect the health as well as the other human being who consumes water from the tank.

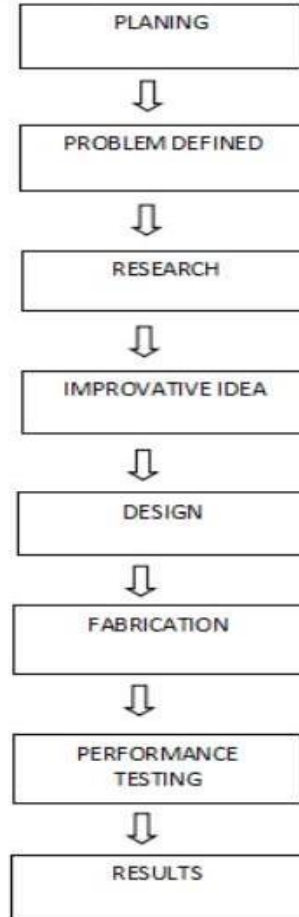


II. METHODOLOGY





III. STRUCTURAL ANALYSIS



IV. PROPOSED WORK

PHASE 1:

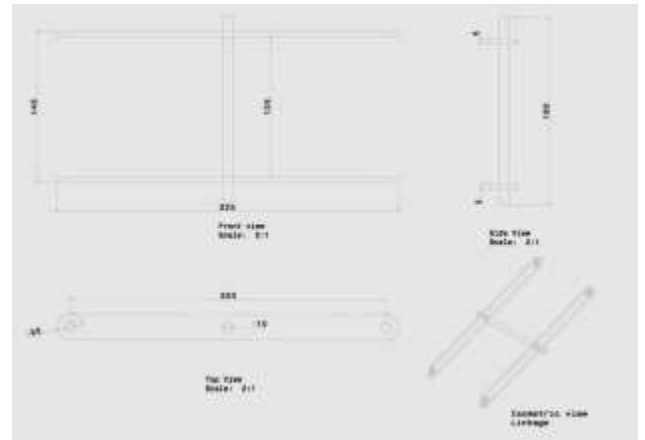
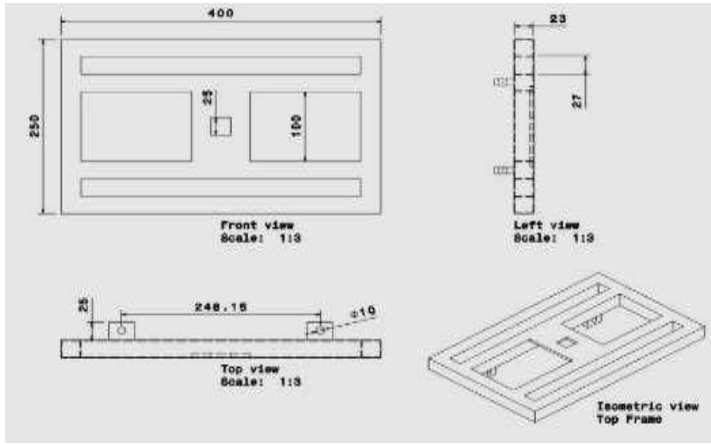
1. Concept development and literature review is done.
2. Study of Automatic Mechanical linkage is done.
3. Learning modelling and analysis software is done.
4. Selection of Linkage & Motor done.
5. Design of Smart Water Tank cleaning Machine is done.
6. 2D and 3D model of Water Tank cleaning Machine is done.

V. MODELING AND ANALYSIS

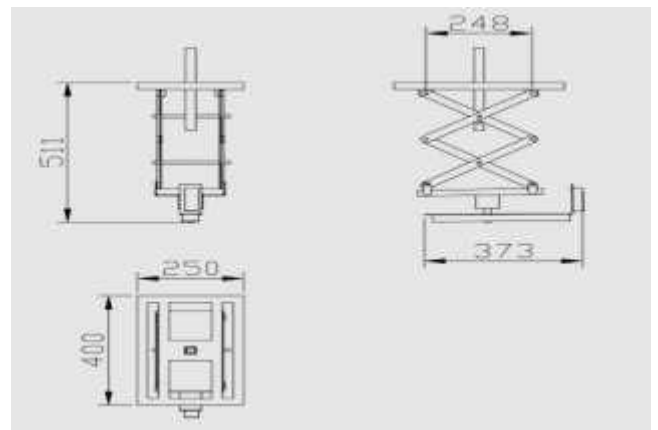
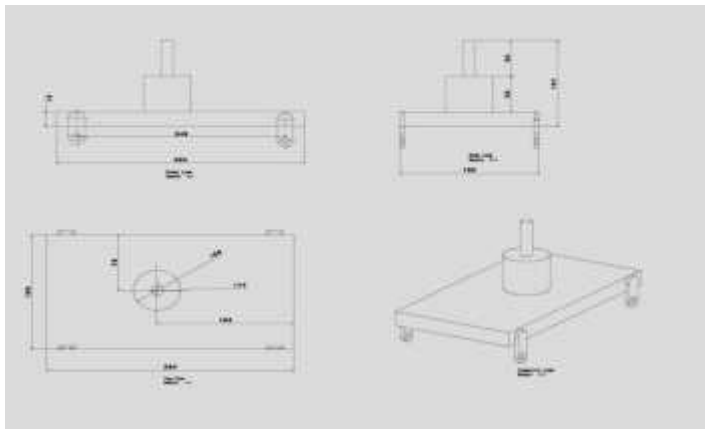
FACILITIES REQUIRED & AVAILABLE:

1. Welding shop
2. Machine shop
3. Project lab
4. Library

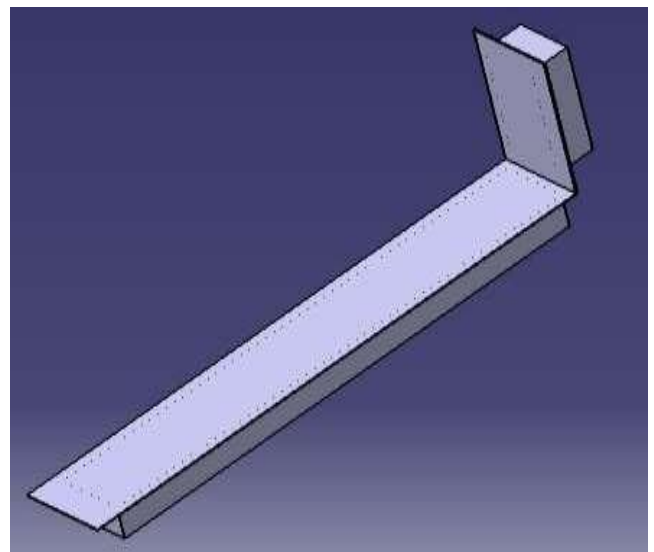
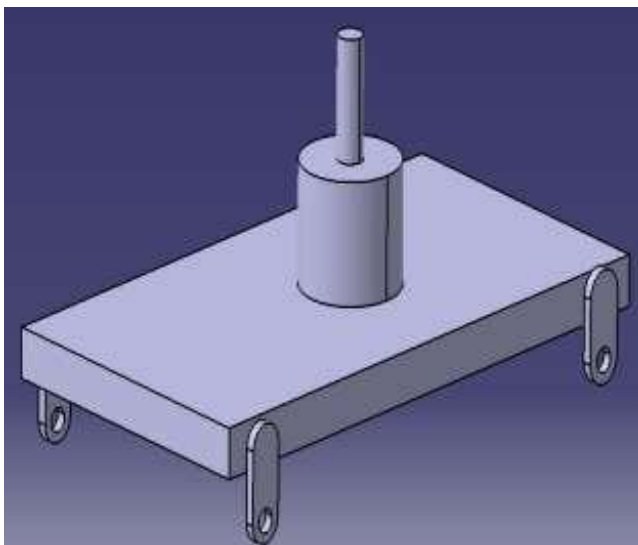
Design of the component and CATIAV5 and AUTOCAD



Top mounting plate Linkage

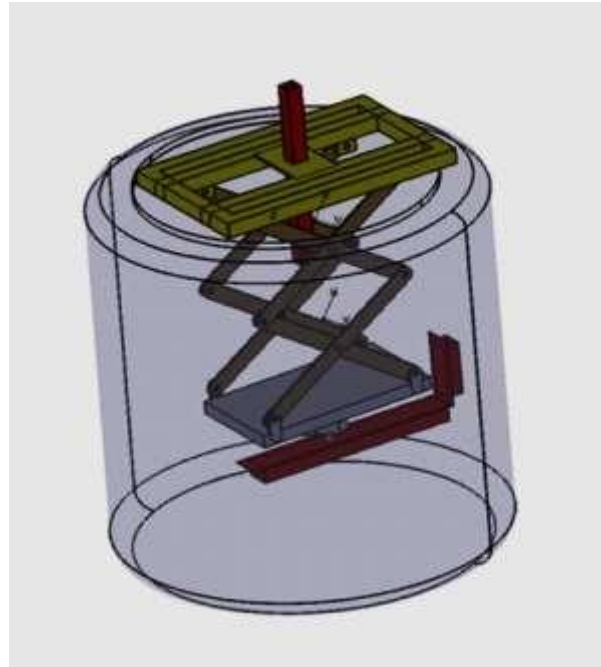
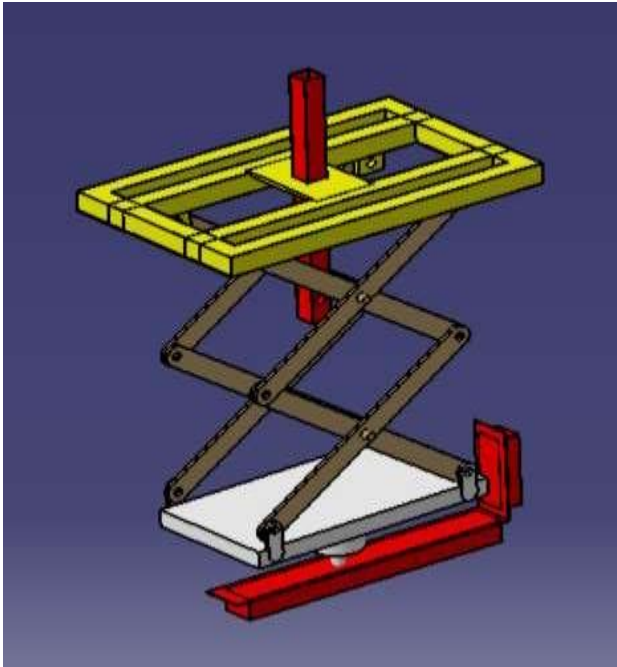


BOTTAM SIDE PLATE BRUSH





Mechanical linkage assembly of smart water tank cleaning machine



VI. RESULT

We have tested mechanism on a 500L tank. The parameters were considered to be the time required to clean the tank, manpower, cleanliness and weight of machine.

This method reduces time for cleaning tank around 25-30 minutes as compared to the manual cleaning method This method reduces time for cleaning tank around 25-30 minutes as compared to the manual cleaning method

Sr no	Testing Parameter	Manual Method	Automated Method (Our System)
1	Time	80 Min	50 Min
2	Manpower	0.3	01
3	Cleanliness	80-85%	90-95%

CONCLUSION

Water tank cleaning machines have emerged as a viable solution for maintaining clean and safe water storage system. This machine offer several advantage over traditional cleaning method, including faster cleaning times, increased efficiency, and reduced labor cost .Additionally this machine can reach difficult to access areas ,ensuring a thorough cleaning of the entire tank.

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