

AUTOMATIC WATER TANK CLEANING MACHINE

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Abstract— *The goal of this project is to create a mechanical cleaning solution for home cylindrical water tanks. The mechanical system consists of a gear mechanism and brush adjustment linkages. PVC brushes are affixed to the connections' ends and bases. When the motor is turned on, the linkage connection rotates, causing the brushes attached to it to rotate, cleaning the tank's wall and base. The goal of this research is to reduce human labor while also avoiding toxic effects on the health of those who enter the tank for cleaning.*

1. INTRODUCTION

According to recent studies, no automation-based machine is employed in the cleaning of overhead tanks. This is due to the tank placements' uneven shape and varying heights. With the results of the previous survey, an attempt was made to create a machine that would clean the tank using an automated procedure. An answer has devised a strategy for resolving the issue. Syntex tanks are used by around 71 percent of population in India. After doing research, it was discovered that workers have experienced numerous challenges, including continuous employment in filthy environments, irregular payment, and other factors. This endeavor could also be motivated by continuous work

and sporadic salary. As a result, we came to the conclusion that cleaning the overhead tank utilising an automated approach could be beneficial in resolving all of these issues. In this instance, the equipment is capable of cleaning the tank swiftly and easily. Electrical and Electronics Engineering Department.

2. EXISTING SYSTEM Vs PROPOSED SYSTEM

The goal of this research is to reduce human labour while also avoiding toxic effects on the health of those who enter the tank for cleaning.

Tank cleaning in a mechanical system is meant to give high safety, high efficiency, reduced cleaning time, and eliminate environmental contamination issues.

3. METHODOLOGY

The tank's whole contents are first removed. Detergent is then put on the tank's inner wall to make dirt removal easier. The cleaning arrangement is mounted on a frame near the water tank's opening, and manual rotation is given by a hand lever connected to a pinion gear that rotates in a clockwise manner. This causes the rack, which is attached to it, to move linearly downward, allowing the cleaning arrangement to enter the tank. This engine will operate until the brushes on the bottom of the

tank make contact with the tank's bottom surface. When the hand lever attached to the adjusting lever is pressed against the folding link, the adjusting link extends, causing the brushes positioned perpendicular to the link to come into contact with the side surface of the water tank. The cleaning motor is now turned on, causing the entire arrangement to revolve and scrubbing the inside walls of the tank with the brush action. In this way, the tank is cleaned in the shortest amount of time and with the least amount of human work.

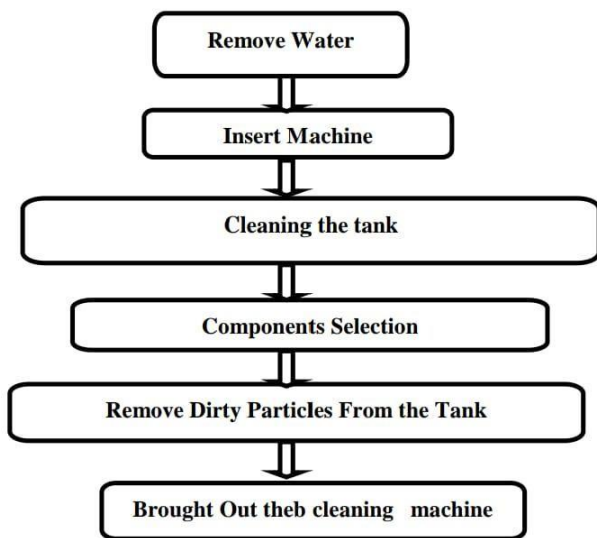


Fig : Methodology

4. DESIGN OF AUTOMATIC WATER TANK CLEANING MACHINE

Above is a block schematic of the "design of an automatic water tank cleaning machine." In this diagram, include the following blocks.

- D C MOTOR
- BATTERY
- FRAME
- SHAFT
- CLEANING
- BRUSH
- SHAFT

5. DC MOTOR

An electrical motor is a device that transforms electrical energy into mechanical energy. When a current carrying conductor is placed in a magnetic field, it experiences a mechanical force whose direction is determined by Fleming's left hand rule, according to Faraday's law of Electromagnetic Induction. A dc generator and a dc motor are structurally identical. The same dc machine can be utilized in both cases. as a motor or a generator When a generator is turned on, it is mechanically driven and produces voltage.



Fig.DC Motor

6. BATTERY

Batteries are utilised in a variety of items around the house. Remote controls, torches, wall clocks, flashlights, hearing aids, and weight scales are all powered by batteries. Batteries appear to be the only storage option that is both technically and economically feasible. Due to the high capital costs of both the photovoltaic system and the batteries. It is critical to optimise the overall system in terms of available energy and local demand patterns. Solar energy storage requires a battery with a specific set of characteristics in order to be economically viable. as a motor or a generator When a generator is turned on, it is mechanically driven and produces voltage.

7. BRUSH

Poly Vinyl Chloride (PVC) polymer is used to make the brushes. Brushes attached to the ends of the four bar

linkage rotate due to the rotation of the motor shaft to clean the inner surface of the tank. A brush is a popular instrument with bristles, wire, or other filaments to clean the inner surface of the tank. It usually comprises of a handle or block to which filaments are attached in a parallel or perpendicular orientation, depending on how the brush will be grasped during use. Both the block and the bristles or filaments are made of materials that can endure the risks of their intended application, such as corrosive chemicals, heat, and abrasion. It's used for hair grooming, make-up, painting, surface finishing, and a variety of other things. It is one of the most basic and adaptable instruments in use today, with dozens of different types in the ordinary household.



Fig: Brush

8. SHAFT

Shafts are a common and essential machine component. In general, it is a revolving part with a circular cross-section that is used to transmit power. It is possible for the shaft to be hollow or solid. For power transmission, the shaft is supported on bearings and rotates a set of gears or pulleys. Bending moment, torsion, and axial force are all forces that act on the shaft. The primary goal of shaft design is to determine the stresses that arise at critical points in the shaft as a result of the aforementioned loads. Axle and spindle are two other types of shafts that are similar. Axle is a non-spinning element that supports rotating wheels and other objects. Neither do they convey any torque. A short shaft is referred to as a spindle. The design procedure for an axle and spindle, however, is the same as for a

shaft. 8.1.2 Shafts are available in a variety of sizes. Solid shaft sizes that are commonly available on the market Shafts are made of this material. Depending on the application, ferrous, non-ferrous, and non-metal materials are utilised as shaft materials. The following are some of the most frequent ferrous materials used for shafts. Carbon steel that has been hot-rolled. These are the least expensive materials. Because it is hot rolled, scaling is always present on the surface, necessitating machining to smooth it out.

9. EXPERIMENTAL RESULT

One of the cleaning medium is a water tank cleaning device. We are all generally unaware of the water crisis, which is why we must address it. Saving water for the future will entail overcoming water scarcity. This device will assist in resolving issues with the water tank used for water storage by simply washing the walls without disrupting the flow lines and cleaning it. Until and unless a full proof cleaning for tanks has been discovered, that is. When the motor is turned on, the linkage rotates, cleaning the tank's wall and base with the help of brushes. The goal of this research is to reduce human labour while also avoiding toxic effects on the health of those who enter the tank for cleaning.



FIG: Experimental Result

10. CONCLUSION

The revolving brushes of the water tank cleaner were used to clean the water tanks. This method was more efficient and secure than previous methods. This method can clean water tanks in less time and with less human effort.

11. REFERENCES

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