# Fabrication of Root Crop Washer

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*Abstract*— Washing of roots is very important before taking it as food so that it will dust free and chemical free roots. Root cleaning machine for cleaning the roots so that they should not harm human being at the time of having it. By cleaning the roots with fresh water all the harmful chemicals can be separated from the roots. Washing is an important primary process unit operation, which reduces the surface microbial load, while removing the field soil, dust and even harmful pesticides, thus leading to the value addition of the produce at the farm level. The CAD model of root cleaning machine and all its parts was generated. In test results we found that this can help the farmers to clean up to 70 kg of root in just 4 to 5 hours.

***Keywords:*** Roots, Microbial, Pesticides, CAD

## I. INTRODUCTION

Washing of roots is a not avoidable process. There are number of processes by which root washing can be done, by showers and sprays or the best by combining two processes. In India the farmers are using some traditional method for cleaning the roots crops. They are using their hands and legs for cleaning the root crops. This process is very time consuming and it required many efforts. Although there are many options available to replace this traditional method but every farmer can't afford it. So there is a need of root crop washer which every farmer can afford.

## II. WORKING / FABRICATION

It consists of a drum made of perforated mild steel sheet with which the contaminated water flows out in the collector. An small opening is provided on top face of drum from where the crops are loaded/ unloaded. The steel drum runs with the support of solid shaft and the solid shaft is rotated by chain mechanism. The drum is closed from other side so that the crops cannot drop from drum while rotating and the water is also supplied from pipe for cleaning the crops present in drum. The flow of water is continuous and sprinkled with some pressure so that it can clean the clay or dust particles attached to crops easily. This shaft is fixed between bearings and the bearings are locked with the support of bracket. We get the water supply through the water pump which is kept inside the water reservoir. One side of the pump is dipped in reservoir and other side is connected to the drum with the pipe for water supply. On the other side of the drum a high torque motor is attached which rotates the drum with reliable speed. A 0.5HP electric motor is attached to the chassis of the cleaning machine.

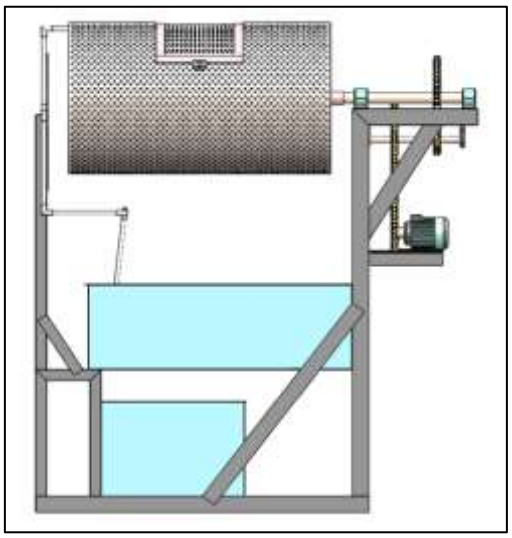

Fig. 1: Cad model of root cleaning machine

## III. DESCRIPTION OF PARTS

Drum is made with 0.0787 inch perforated mild steel sheet. Its diameter is 11.811 inch and Length is 35.984 inch. Area of sheet used is 96 inch. Drum is supported at one end with shaft and having the door at another end. MS flat 0.984x0.118 inch is rolled to form a drum shape. The capacity of the drum for containing roots at a time is 5kg to 7kg. The motor is one of the main component of unit and the drum is powered by 0.5HP or 240V motor and further it is rotated with the chain drive mechanism. The shaft transfers the motion from motor to small sprocket. Its length is 12.992 inch and diameter of the shaft is 1 inch. The bearing used is of number 6201. The chain mechanism is further used for transferring the motion to sprocket for rotating the drum. There are 2 small sprocket and 2 big sprocket used for transferring the motion as shown. The stand supports the assembly of root crop washer including water tanks on it, actual height of the machine is 60 inch. The water for cleaning is supplied from the reservoir with the pump. The pump should be in reservoir for providing the water required in cleaning the roots. The water is provided to the drum with the straight and elbow pipes. The total length of pipe is 39.64 inch from the pump to the final end situated in drum. The pump is operated with the electricity it can also transfer water up to 48 inch.

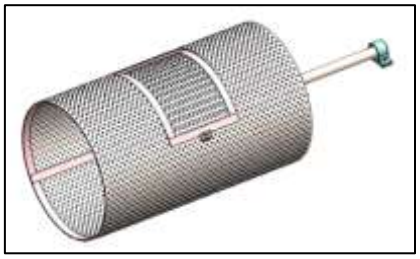

Fig. 2: Cad model of Drum

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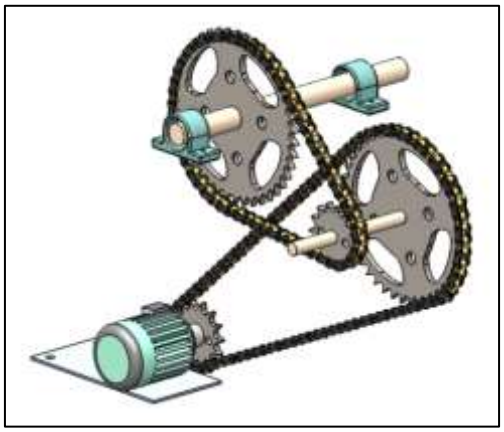

Fig. 3: Cad model of chain Mechanism

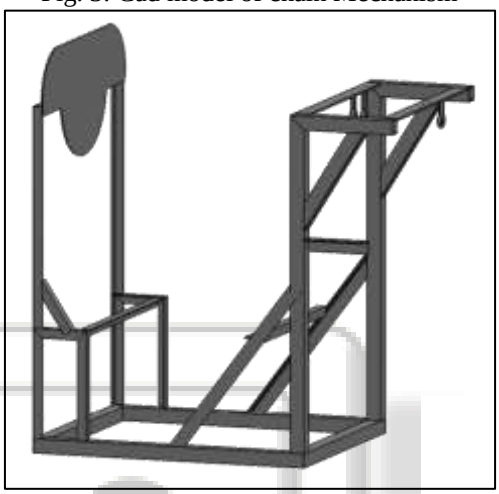

Fig. 4: Cad model of Stand

## IV. CONCLUSION

By this project, Farmers will be directly benefitted. In farms when the roots such as potato, carrot, beetroot etc. are removed from the soil, these roots carry a lot of dust particles and pesticides from the soil which is harmful for human beings if taken as food. So to remove these farmers are washing that roots by hand and this take a lot time. So root cleaner is manufactured so that it will save the time as well as save the human efforts. This root cleaning machine helps the farmers to clean or to wash the roots properly with very less time as well as less water

## V. APPLICATION

Root cleaner is used to wash roots especially roots which are grown underground in soil to remove all dust particles as well as pesticides.

## VI. FUTURE SCOPE

- Driving system of the system can be changed to increase the efficiency.
- By using design, the capacity of the system can be increased.
- Supporting frame of the system can be changed.

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