

Research Methodology On Design, Modelling And Analysis Of Vegetable Cleaning Machine For Agriculture Use

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ABSTRACT -

Tubers such as radishes, carrots, and potatoes must be removed from soil particles and clay after harvest, and then transported from the field to the market. Indian farmers usually follow the traditional method of peeling carrots and turnips, which includes washing the roots with hands and feet. Editing requires a lot of time and energy. The best solution to this problem. The design of this peeler allows vegetables to be peeled correctly. The focus of this research is on vegetable design. In this project, we create a CAD model of the machine and run FEA on it. Help us understand pressure and displacement.

Keywords: CAD model, finite element analysis,

I. INTRODUCTION

Washing vegetables is an important step in any technical process that makes vegetables attractive and chemical-free. After harvest, the roots and stems of tomatoes, potatoes, onions, carrots and radishes need to be cleaned of dirt and clay particles. The method of peeling carrots and radish roots before transporting them from the field to the market. Indian farmers need a cheap peeler that everyone can afford. Cleaning is the main operation of the main processing unit to remove harmful chemicals, foreign matter and microorganisms from the surface before putting them on the market. The added value of the company's

high-quality products. Plant infestation is usually a collecting and selling habit. bad. Because of lack of time, farmers do not peel. correct.

1. AIM AND OBJECTIVE

- Develop a conceptual plan for the development of organic vegetables.
- Calculate the layout of the vegetable cleaner.
- CAD modeling of sketch projects. Reduce labor costs; reduce the energy and time required for cleaning.
- Peel vegetables and remove unwanted particles.
- Bring vegetables to the market as soon as possible.

II. RESEARCH METHODOLOGY

The following techniques can be used to create cheap peeler designs: A deep understanding of previous agricultural research points you in the right direction. Minimal load, CAD model, design and manufacturing optimization.

- Collect data and research literature on peeled vegetables.
- Concept development based on collected data and market demand.
- Design Conceptual calculation.
- Project statics and optimization
- Discussion of results
- Design revision



III. PROBLEM DEFINITION

Indian farmers usually follow the traditional peeling method of carrots and radishes, which is to wash the roots with hands and feet. Washing hands takes a long time and requires more effort. Because farmers have no time to put vegetables directly on the market by mistake. Remove them, many unwanted particles will stick to the surface, posing a threat to health, so vegetable cleaners are needed to solve this problem.

IV. LITERATURE REVIEW

In this work, a model of a vegetable washing machine with a limit of 50 kg was developed and its efficiency was evaluated. The effects of several rotors at speeds of 1466 rpm, 1476 rpm, and 1486 rpm were evaluated when they were at the limit of 20 times. Cm (110 liters), the water depth is convincingly recorded. The washed fruit is used to assess the impact on potatoes. The ratio of the cost of manual cleaning of potatoes to the cost of machine cleaning is 5.89:1. The average cost of machine cleaning is 24.80 rupees per ton. The cost of this machine is 14,650 rupees, including the electric motor. The external dimensions of this configuration are 1000 x 560 x 750 mm. Tests show that the washing efficiency of all rotors used for washing potatoes is between 96.36% and 98.18%. The setting range is 340.87 to 892.11 kg/h, and the PI is 2.25 to 3.26. In rotor C at 1486 rpm, the maximum PI value of potato kg/h is 3.26. R.N. Kenghe [1].

This research focuses on the design and development of an automatic root crop cleaning system, which is a device that can be used in farmland. The soil and clay particles must be cleaned up after harvest before they can be sold. Usually she follows the traditional process of peeling radishes and carrots with hands and feet. This research focuses on the details of installation. Insert the root plate into the drum through the hole on the drum. Then close the opening with straps and zippers. Provide pressurized water conditions for root cleaners. The drum is sucked out of the barrel and rotates with the help of an electric motor. The rotation of the drum and constant water flow remove soil and clay particles from root crops. Muddy water droplets seep from the groove of the drum. Therefore, the tubers are cleaned and transported. We are preparing a vegetable market. Ravdeep Singh [2].

This research describes the design and manufacture of energy-saving vegetable cleaners, from computer modeling to structural prototyping, mechanical design, material selection, engineering and prototyping.

The effectiveness of cleaning tubers has been proven. The main goal of the root crop cleaning project is to meet the student-led requirements of McGill Ecological Park by reducing the impact of fresh cleaning on processing. Powerful conceptual solutions through computer simulation, design analysis and prototype development. Correct and improved washing. The model of the car was obtained after successful testing. The emergency solution for agricultural activities MSEG. Prospective student of the College of Bioresources Technology. Michelle Choi [3].

The purpose of this article is to develop an economical, mechanically driven carrot cleaning machine. Reduce working time and work. Operating limitations and design features include crushing and tearing capabilities of 3 kg (6.6 lbs) to 11 kg (24.5 lbs), low water consumption and pressure, small parts retention, easy handling, and cost savings compared to manual cleaning and cleaning systems Operator safety. Before cleaning in this system, separate the carrots from the stems and leaves. No safe food cleaning is required. Non-submerged rotary cleaning system with a 208-liter (55-gallon) horizontal roller, supported by a roller drive and equipped with a low-pressure spray gun. J. A. Moss [4].

Tubers like carrots grow on thick, rough, and heavy soil. Since these vegetables grow underground, they need to be cleaned of dirt and dust. Collect tubers and leaves by hand to minimize shipping damage. They are very susceptible to microbial contamination, cracks, cuts, abrasions, etc. It is recommended to remove dirt particles as soon as possible. Granulate the soil as soon as possible. It is recommended that you remove dirt particles as soon as possible because they will not stay on the unwanted particles for a period of time. In post-processing. There are relatively few data on mechanical cleaning of small tubers in the research literature. C. S. Ambrose [5].

This research aims to develop, manufacture, and evaluate performance to achieve the highest cleaning performance available on the market and to determine the maximum cleaning capacity of the equipment. The performance of this configuration is also compared with the manual. The following parameters: cooking efficiency, processing and ease of use. This is a very difficult task for anyone. Peel the tubers by hand. Before weighing, sorting and sorting, it is very important to remove potato chips and crumbs. The key process of freshness and maximum value. It is not a problem for consumers to buy fresh potatoes at high prices. Glazalin B. Batara [6].

V. PLAN AND WORK

- Data collection
- Literature research
- CAD simulation of peeling machine Analysis of peeling machine in FEA
- Result discussion
- Design completed

CONCLUSION

According to the requirement of vegetable peeling machine, the data collection and structure calculation of the machine are considered in the design. This project aims to clean all vegetables according to the goals, collected data calculations result, and CAD model of lifting mechanism. After CAD modelling, finite element modelling and finite element analysis were carried out, and FEA method used for verification to verify the developed CAD model.

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