Mini/Portable Turmeric Polishing Machine

Tambe Pankaj Ramdas[1] Joshi Saurabh Bhagchand[2] Shaikh Aejaj Mushtaq[3]
Shaikh Moh. Aman Moh. Harun[4] Prof. Dange Bharat S.[5]
[1,2,3,4,5]Department of Mechanical Engineering
[1,2,3,4,5]S.N.D. COE and RC Yeola Nashik, SPPU University Affilated, Yeola, Maharatshtra, India

Abstract— Polishing of harvested turmeric is a bigger problem for the turmeric producers in an India. The customer is in need of high-quality polished turmeric for making turmeric powder. In this regard there is a need of polishing machine for washing turmeric to remove unwanted impurities and scales of harvested turmeric. The paper presents the new design of turmeric polishing machine which is based on designed for manufacturing, assembly and maintenance. The phenomenon of abrasion used in polishing, which is caused by the friction between expanded wired metal mesh and turmeric. The scale and unwanted impurities are fallen down on the base easily, which seems to be quite difficult in hand polishing. The designed machine is very simple in operation, efficient in polishing of harvested turmeric at a good speed of production. This machine seems very simple at same time very efficient in polishing about 50 kg of harvested turmeric at a speed about of 75 rpm for about 20 min.

Keywords: Dimension, Investment, Conventional, Rotational

I. INTRODUCTION

India is a agriculture oriented country, agriculture is the prime business of India and so we aim to help the farmers by designing a mechanical device empowered width the capacity of polishing one of the important spice of India "The Turmeric". Turmeric is very important spice in India, which produces nearly entire whole world's crop and consumes 80% of it. India is by far the largest producer and exporter of turmeric in the world. Turmeric occupies about 6% of the total area under spices and condiments in India. As World scenario, Turmeric is also cultivated in China, Myanmar, Nigeria and Bangladesh. Turmeric plays a very important role in increasing the taste of spicy Indian foods; also it is having a great role in medicinal product making. So for this project we have discussed with our professors before selecting, simply Shaking the rhizomes with stones in a gunny bag or bamboo basket is also practiced. Mechanical polishing is carried out in polishing drums. These are very simple drums rotated by hand or by power.

II. OBJECTIVE

1) To improve rate of polishing.
2) Portable/Mini for 100kg small batch capacity.
3) Minimum cost of polishing machine.

During rotation of the drum, polishing was done by rubbing the turmeric finger against the inside-expanded wire mesh surface. The outer skin, rubbed by polishing, fell through the perforation of the drum. The holding capacity of the turmeric polisher was generally kept 50% of volume of the drum to facilitate turning and proper mixing of dried rhizomes during polishing.

III. MODELING AND ANALYSIS

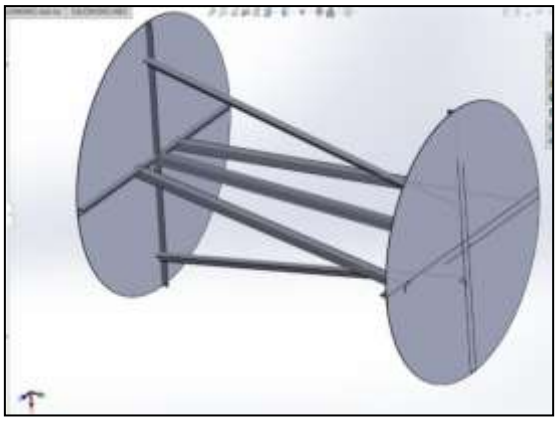


Fig. 1: Structure inside the Drum

Fig. 2: Angle Bar

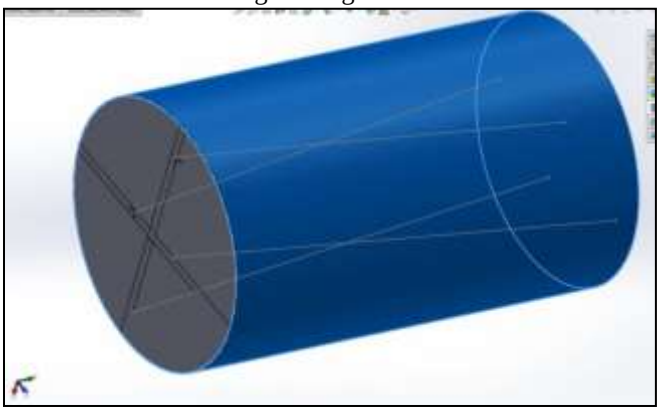
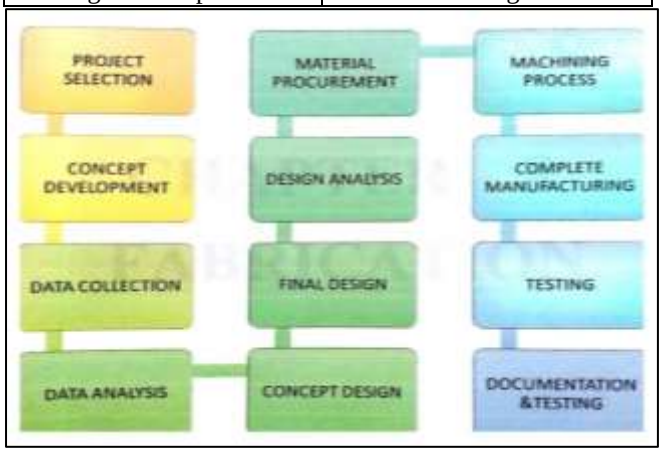


Fig. 3: External view of Drum

IV. PARAMETERS AND METHODOLOGY

Parameter	Dimension
Overall dimension	1040mm×850mm×1450mm
Number of polishing drum	01
Length of cylindrical drum	900mm
Diameter of drum	600mm
Length of main shaft	1040mm
Power source	0.5HP motor

Holding capacity of drum	30mm
Critical speed of drum	54rpm
Operating speed	51rpm
Weight of the polisher	100kg



The harvested turmeric rhizomes before entering into the market are converted into a stable commodity through a number of post-harvest curing processes like washing, boiling, and drying. Curing of turmeric is taken up within 3 or 4 days after harvest. The fingers and mother rhizomes are separated and curved separately since the latter will take a little longer time to cook.

V. Results and Discussion

After completion of farm level processing farmer used to sold the turmeric in the market. Turmeric is always in the form of rhizome or fingers. Processing on such fingers started at Industry level. Following are some important operations of processing of turmeric at Industry level. i. e. Coloring, Grinding, Fingering, drying, polishing, packing, storage.

Fig. 4: Before Polishing

Fig. 5: After Polishing

VI. Conclusion

The turmeric polishing machine is simple in operation and easily accessible to farmer because of its compact design. All parts are easily available in the market, and machine is easily assembled and dissembled in case of breakdown as well as for replacement of any part. The machine is easy to operate and maintenance and requires only one operator. Performance of the equipment was found quite satisfactory and therefore, can be used for carrying out tedious post harvested polishing operation and 100kg of harvested turmeric has been polished at a time. The developed machine uses simple mechanism which found to be a simple and cost-effective solution.

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