



## DEVELOPMENT OF NOVEL TURMERIC POLISHING MACHINE BY HUMAN EFFORT

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### Abstract

In this investigation, manmade flywheel motors have been used in the past for a variety of applications, including sand, brick, wood turning, laundry, and others. The device makes use of a step-by-step cycle in conjunction with a flywheel, which drives the device by way of a gear screw clutch and a torque booster. The operator presses a power pedal in order to transmit this power to the machine in order to start it. Through the use of the crank chain flywheel, it is possible to transfer power to the working gear. The human-powered flywheel motor idea, also known as the HPFM, ushers in a whole new age of human-powered agricultural processing, harvesting, and post-harvest equipment. This High-Performance Fuel-Efficient Motor (HPFM) design will assist drive more automobiles in rural regions, which is important given the health, cultural, and environmental concerns, as well as the fact that power is a greater problem in rural areas utilising unskilled labour and Vidharbha. Machines may be employed to do physical labour, which allows for temporary pauses in production without negatively impacting the end result.

**Keywords:** *Human power machine, turmeric polishing.*

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### Introduction:

India is the world's most successful agricultural nation. India is now the leading exporter of turmeric and has the capability to generate more of it via its agricultural sector. The steps of cleaning, processing, drying, polishing, and grinding turmeric rhizomes are included in the process of polishing turmeric. When powdered, dried turmeric removes impurities from the skin, roots, rice flour, and grain, resulting in a rhizome that is smoother and brighter yellow in colour.

Normal polishing is done by hand; the worker must use the turmeric finger to polish the leather. When the kid spins with

the turmeric finger, the surface will be impacted by the damage caused by the roller mesh. Normal polishing is done by hand.

Dr. Vijay Talodhikar of the Nagpur District is the man behind Turmeric Shine. It is powered by a one horsepower electric motor. The polisher has a manual mode of operation, and the machine is responsible for creating turmeric of a better grade. In addition, turmeric prevents feelings of enviousness.

### Literature Survey

1. AshwadeepFulzeleShubhamGedam and BhupendraMeshram, "Theory and

## Optimization of Turmeric Polishing Machine” Volume 6, Issue 5, May – 2021

It takes a few days after harvesting the turmeric rhizomes before the process of completion is complete. Depending on the methodology that was used to create the turmeric, it is essential to keep as much of the curcuminoid content as possible after the turmeric has been further processed. The procedure involves the use of machines that clean the turmeric rhizome without resorting to boiling or steaming, both of which remove numerous vital chemicals that are responsible for turmeric's high quality.

2.R.V.Powar,S.B.PatilAnd P.S. Bandgar,“Comparative evaluation of different types of turmeric polisher”, Received : 03.11.2014; Revised : 15.03.2015; Accepted : 26.03.2015

In the Sangli area of Maharashtra (MS), the process of polishing turmeric uses a variety of polishers (brighteners). They are most often used by a variety of motors and engines, including diesel engines, electric motors, and tractors. The vast majority are constructed by farmers for their own usage as private labourers. Tractor polishers have a faster polishing rate and greater output than diesel engine polishers and electric polishers, respectively. Tractor polishers also have a shorter charging time and longer discharge time. Polishers that run on diesel demand a greater amount of energy than their tractor-powered and electric counterparts, respectively. Polishers that are driven by diesel are more costly than those operated by tractors and those powered by electricity, respectively. In general, tractor polishers are reliable and may be put to use for reasons related to buffing.

3 M. A. Hoque and M. A. Hossain,“Design and development of a turmeric polisher”, Received: 21 April 2018, Accepted: 06 August 2018

Rhizomes of dried turmeric are often crushed, which removes the filthy covering as well as the roots and soil, leaving behind rhizomes that are smooth, bright yellow, and lustrous. The traditional method of polishing turmeric is done by hand on farms since it is a time-consuming technique that is also difficult and inconvenient. An intermediate turmeric polishing machine was created and constructed in 2013 by the Department of Farm Machinery and PostHarvest Processing Engineering (FMPE) of the Bangladesh Agricultural Research Institute (BARI). This was done in order to address the issues that were previously mentioned. The polisher has dimensions of 1040 millimetres in length, 850 millimetres in breadth, and 1450 millimetres in height. The weight of the brightener including turmeric is ninety kilogrammes.

To provide the necessary amount of power for the polisher's operation, a 0.37 kW single-phase asynchronous motor is used. At the FMPE Division, the Regional Spice Research Station (RSRS) in Magura, and the Hill Agricultural Research Station (HARS) in Khagrachari, the brightener was put through its paces. In a quarter of an hour, the polishers were able to polish 30 kilogrammes of dried turmeric. It will cost you 30,000 taka to purchase the polishing machine.

The cost of having one kilogramme of turmeric polished by a machine is typically 1.42 tk, whereas the cost of having one kilogramme polished by hand is 5.12 tk. When compared to hand polishing, the polisher may save up to 81% of the time spent polishing and up to 78% of the expenditures associated with polishing. 97 hours is the amount of time needed to recoup the cost of the gloss. Because of this, the polisher is advised for use in Bangladesh and other nations where turmeric is grown for the purpose of polishing turmeric.

4. Shweta S Walunj, AA Sawant, KG Dhande and SB Kalse, "Turmeric polishing machine for small scale processing", 08-08-2022 Accepted: 11-09-2022

The rhizome of a plant in the ginger family is where turmeric, also known as *Curcuma longa* L., gets its colour and flavour. The turmeric root is first cooked, then dried, then polished, and finally powdered. Polishing turmeric is a significant challenge for producers of turmeric. Sanding the rhizomes is the typical method for removing the soiled skin. Polishing is often done by hand, which is a highly labor-intensive operation that also takes a significant amount of time. In 2021, Dapoli's C.A.E.T. developed a turmeric brightener for use in operations on a smaller scale so that they could address this issue. The capacity of polishing is more than that of hand polishing, and it is 30 kilogrammes per hour. The polisher is simple to use and is well suited for usage in agricultural settings. As a result, it is strongly suggested that a polishing machine be used for producing turmeric..

5. Ashwadeep Fulzele, Atharva Sagdeo, Swati Kurhadkar, "Introduction and Literature Reviews of Turmeric Polishing Machine", Volume 4, Issue 5, May 2021

When the turmeric rhizome is ready for harvest, the process might take several days. Depending on the methodology that was used to create the turmeric, it is essential to keep as much of the curcuminoid content as possible throughout any subsequent processing that the spice undergoes. The method entails cleaning the turmeric rhizomes, which have lost a significant amount of value due to the fact that they are not boiled or steamed first.[6] During the polishing process, turmeric fingers are rubbed over the surface of the inner expanded metal mesh of the drum. This is done while the drum is rotating. The outer skin, which has been polished, is removed by passing it through the drum's perforations. The

capacity of the turmeric polisher is often maintained at fifty percent of the drum capacity. This setting enables the dried rhizome to be spun and mixed effectively while the polisher is in operation.

### Problem Identification

Products that break turmeric This include the following steps.

- 1) Improved the Turmeric Shine design.
- 2) Optimization of main product dimensions of handmade turmeric brighteners.
- 3) Establishes relationships between variables.
- 4) Calculate the minimum torque required for stripping.
- 5) Calculate the minimum time required for the flywheel

to reach the target speed of light.

- 6) Calculation of the minimum working time for polishing

### 4. Methodology

Data from the case study provided three subsystems for the Turmeric Brightener Conceptual Model

1. Energy unit.
2. Submit
3. Class.

An example of a brightener for turmeric that is driven by HFM. The model is built around a bicycle-style power mechanism that includes a big gear 1, a pinion 2, an accelerator gear pair called G1P1, and a flywheel to store the power that is input. Before the transmission can begin, the flywheel has to be decelerated in accordance with the real torque produced by the engine. This adjustment is made in accordance with the actual torque supplied by the engine. After the flywheel has amassed its maximum amount of power, this capacity is then transmitted to the engine with the assistance of the C1 dog clutch. Ahead of the pair of G2P2 gears that come from the clutch.

### Conclusions

The following deductions are possible after reviewing the study presented above on the idea of the human body and the

many functions it serves, the procedure for polishing turmeric, and the polishing machine.

1. The study described above and the recipe that was provided may yield excellent results for turmeric polishing.
2. Will make it possible to design and build the structure in such a way that it will be straightforward, and the machine will need just a single action; hence, fewer people will be needed to meet these specifications.
3. Some upgrades of current machines and processes and designs based on the work done by humans in the past will be just as effective as polishing capacity that is equal to or higher than that of present systems.

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