

# Review on Development of Turmeric Polishing Machine by Human Power Flywheel Motor

Sachin Ganeshpuri Goswami<sup>1</sup>, Dr. Vijay Talodhikar<sup>2</sup>

<sup>1</sup>M.Tech. Student, <sup>2</sup>Asst. Prof.

Abha Gaikwad Patil College of Engineering, Nagpur

goswami.sachin27@rediffmail.com

**Received on:** 03 April, 2023

**Revised on:** 28 April, 2023

**Published on:** 30 April, 2023

**Abstract-** *In the current research, the human concept flywheel motor has been used in the past for grinding, brick making, wood turning, laundry washing. The machine uses step-by step cycling technology and a flywheel that drives the machine through a dog helical clutch and torque enhancing gear. The power pedal is used by the operator to send this power to run the machine. Power can be transmitted to the working gear through the crank chain flywheel. This human powered flywheel motor concept (HPFM) ushers in a new era in human powered agricultural processing, harvesting and post-harvest equipment. Given the social, cultural and environmental issues and the fact that electricity is more of an issue in rural areas than use unskilled labor and Vidharbha is involved, this HPFM concept helps drive more rural systems. Machines are useful for use in human processes that can interrupt operations without affecting the final product.*

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

## I -INTRODUCTION

India is a leader in agriculture. India has the capacity to produce more turmeric in agriculture and India is the largest exporter of turmeric. Turmeric polishing is after the cleaning, processing, drying, polishing and grinding of turmeric rhizomes. Dried turmeric is ground to remove the dirty skin, roots and ground rice and grains, making it a smoother, brighter, yellow rhizome. Normal polishing is done by hand polishing, workers should use turmeric fingers to polish the hard surface, when children with turmeric fingers rotate, and the surface will be affected by the destruction of the mesh of the roller. Turmeric Shine, Dr. Vijay Talodhikar from Nagpur district. It works with 1hp electric motor. This polisher can be operated manually and the machine is in charge of producing higher quality turmeric. It also prevents wastage of turmeric.

## II- LITERATURE SURVEY

[1] Ashwadeep Fulzele Shubham Gedam and Bhupendra Meshram, "Theory and Optimization of Turmeric Polishing Machine" Volume 6, Issue 5, May – 2021 After the completion of the turmeric rhizomes, it takes several days after harvest. In further processing, it is important to pr

preserve the curcuminoid content in turmeric, depending on the method used to make the turmeric. The process includes machines that clean the turmeric rhizome without boiling and steaming, where many important substances that degrade turmeric quality are lost [2] R.V. Powar, S.B. Patil And P.S. Bandgar, "Comparative evaluation of different types of turmeric polisher", Received : 03.11.2014; Revised : 15.03.2015; Accepted : 26.03.2015 Polishing of turmeric in the Sangli (M.S.) district was practiced with different types of polishing machine (polisher). They are usually driven by different engines such as diesel engines, tractors and electric motors. Most of them are created by the farmers themselves and used as private worker. Charging time and discharge time, polishing rate and machine output of tractor polishers were higher than diesel engine polishers and electric polishers, respectively. Diesel powered polishers require more power than tractor powered and electrically powered polishers, respectively. The polishing cost of the diesel powered polisher is higher than the tractor driven and electrically powered polishers, respectively.

In general, the tractor polisher works well enough and is acceptable for buffing purposes.

[3] M. A. Hoque and M. A. Hossain, "Design and development of a turmeric polisher", Received: 21 April 2018, Accepted: 06 August 2018 Dried turmeric rhizomes are often ground to remove the dirty layer, roots and soil, turning them into smooth, shiny, yellow rhizomes. Farm-level turmeric polishing is done manually, as the traditional process is slow, cumbersome, and labor-intensive. To overcome these problems, the Department of Farm Machinery and Post-Harvest Processing Engineering (FMPE) of Bangladesh Agricultural Research Institute (BARI) designed and built an intermediate turmeric polishing machine in 2013-14. The length, width and height of the polisher are 1040 mm, 850 mm and 1450 mm, respectively. The weight of the turmeric brightener is 90 kg.

A 0.37 kW single-phase asynchronous motor is used as power to operate the polisher. The brightener was tested at FMPE Division, Regional Spice Research Station (RSRS), Magura and Hill Agricultural Research Station (HARS), Khagrachari. The polishers polished 30 kg of dried turmeric in 25 minutes. The price of the polishing machine is 30000 taka. The average price a polisher will polish is 1.42 Tk per kilogram of turmeric, while hand polishing is 5.12 Tk per kil

ogram. Compared to manual polishing, the polisher can save 81% of polishing time and 78% of polishing costs. The payback period for the gloss is 97 hours.

Therefore, the polisher can be recommended for turmeric polishing in Bangladesh and other turmeric growing countries.

[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 Turmeric (*Curcuma longa* L.) is an ancient spice derived from the rhizomes, belongs to the family Zingiberaceae. Turmeric is processed by boiling, drying, polishing and grinding. Polishing turmeric is a bigger problem for turmeric manufacturers. The rhizomes are usually polished to remove the dirty skin. In the traditional process, polishing is done manually, which is time consuming. To overcome this, Dapoli's C.A.E. T. He developed a turmeric brightener for small-scale operations in 2021-

22. Polishing capacity is higher than manual polishing, ie 30 kg per hour. The polisher is easy to use and suitable for agricultural polishing. For this reason, machine polish is recommended for turmeric making.

[5] Ashwadeep Fulzele<sup>1</sup>, Atharva Sagdeo, Swati Kurhadkar, "Introduction and Literature Reviews of Turmeric Polishing Machine", Volume 4, Issue 5, May 2021 After the completion of the turmeric rhizomes, it takes several days after harvest. In further processing, it is important to preserve the curcuminoid content in turmeric, depending on the method used to process the turmeric. The process includes machines that clean the rhizomes of turmeric without boiling and steaming, which has lost many important

### III- METHODOLOGY

Information from research data provided three subsystems for the turmeric brightener concept model

1. Energy unit.
2. Delivery
3. Study room.

An illustration of the turmeric brightener powered by HFM.

The model is made of a power unit bike mechanism that includes a large gear 1, a small gear 2, an accelerator gear pair G1P1 and a flywheel that stores input power. After storing the maximum power in the flywheel, this potential power is sent to the engine with the help of the C1 claw clutch, before the transmission the flywheel must be decelerated according to the actual torque provided by the engine, this torque is increased according to the actual torque provided by the engine. Clutch clutch before passing thr

ough G2P2 gear pair.

#### IV –CONCLUSION

Based on the above research on the concept of the human body and its different uses, the turmeric polishing process, the polishing machine, the following conclusions can be drawn.

1. The above research and suggested formula can give good results for turmeric polishing. Model
- 2 will enable the design and construction so that the structure will be simple and only one operation will be required on this machine, fewer workers can work at these standards.
3. Some improvements of existing machines and processes and designs based on the work of past people will be as effective as polishing capacity equal to or greater than existing systems.

#### V- ACKNOWLEDGEMENT

In developing world, polishing of a harvested turmeric is a bigger problem for turmeric producer, power operated machines exist, but they are impractical in rural regions because the socio economic conditions of peoples living in village's side of developing country, ever increasing energy crises, also electric are expensive or unavailable. In this regard attempts have been made to develop human powered equipment for turmeric polishing which energized by human powered flywheel motor. There are so many machines has been developed as bricks making, wood turning, clothes washing, and drying, Chaff Cutter. This machine concept provided most compact design. The machine consist of human powered flywheel motor bicycle-drive mechanism with speed increasing gear pair, a flywheel and torque increasing gear pair which drive the process unit with square jaw.. The proposed method has several advantages. In the present investigation, in the recent past human powered flywheel motor concept has been used for chaff cutter, bricks making, wood turning, cloth washing. The machine uses bicycle technology, with speed increasing gearing and a flywheel, which drive the process unit through a spiral jaw clutch and torque increasing gearing. Pedal power is used transmit this power to run the machine by the operator. Power can be transmitted through crank chain to free wheel to the working unit. This human powered flywheel motor concept (HPFM) provide new era in the human powered agriculture processing, harvesting, post harvested operations equipments. Considering social, cultural and environmental factor as well as in many rural operations utilizing unskilled worker and in Vidharbha rejoin there is more problem of electricity so this kind of HPFM concept is helpful in driving various rural machines. The machine is economically viable, can be adopted for human

powered process units which could have intermitted operation without affecting the end product

#### REFERENCE

- [1] Ashwadeep Fulzele Shubham Gedam and Bhupendra Meshram, "Theory and Optimization of Turmeric Polishing Machine" Volume 6, Issue 5, May – 2021
- [2] R.V. Powar, S.B. Patil And P.S. Bandgar, "Comparative evaluation of different types of turmeric polisher", Received : 03.11.2014; Revised : 15.03.2015; Accepted : 26.03.2015
- [3] M. A. Hoque and M. A. Hossain, "Design and development of a turmeric polisher", Received: 21 April 2018, Accepted: 06 August 2018
- [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
- [5] Ashwadeep Fulzele1, Atharva Sagdeo, Swati Kurhadkar, "Introduction and Literature Reviews of Turmeric Polishing Machine", Volume 4, Issue 5, May 2021 6.