

Design and Development of Small Sized Groundnut Oil Extracting Machine

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Abstract: *Present methods of oil extraction are inefficient, time consuming and costly due to the refining process involved. There are many issues where it is not possible to know adulteration which causes health related problems. Also, it requires external temperature above 100°C to extract oil. This high temperature reduces the quality of oil which is not suitable for human health. The aim of this project primarily focuses on maintaining/ improving the quality of oil which is extracted from groundnuts. To achieve this purpose, it will be necessary that compact, portable, easily operated, less time consuming and low-cost machines should be developed. At the same time the machine should maintain below specified temperature to avoid nutritional losses. Hence it is today's need to have an oil extracting machine which can be used at home by maintaining oil quality efficiently in a cost effective and adult – free way for a healthy life. Considering the above problems for this project it was decided to develop an oil extracting machine which will maintain the nutritional value and will be small in size & economical. The main aim focuses on maintaining the temperature below 70°C. based on this a machine will be developed and the output (oil temperature) will be checked to find the quality of oil.*

Keywords: Intrusion, Dataset, SDN, Network Traffic, Network Security, SDN Security, etc.

I. INTRODUCTION

The conventional traditional method of extracting oil from raw materials is stressful, inefficient and takes longer time which effect on the cost of purely refined oil in market. Indian agricultural resources are vast and progressive harnessing of there- source will result in substantial improvement in output. Groundnuts are generally economic crop. Gujarat tops with 27.87% of total production followed by Andhra Pradesh 24.19%, TamilNadu 14.84% and Karnataka 10.95%. Though other states like Maharashtra, Rajasthan, Orissa, Madhya Pradesh, Uttar Pradesh and West Bengal are the important groundnut producing states. This project is set out to establish possible extraction of oil from groundnuts and to improve processing procedure, market value and quality of the derived products from the groundnuts.

The overall objective of the work is to design, construct and evaluate the performance of simple and compact equipment for oil extracting machine from groundnuts. Initially we are using metal rollers for crushing and extraction. If the metal rollers fail to maintain required temperature, we are going to replace metal rollers with wooden rollers. Oil extracting machine is a mechanical assembly for extracting oil from raw materials which are squeezed under high pressure and proper working temperature.

The typical raw materials are groundnuts, seeds like soybeans and soon which are easily available in market and supplied to press in continues feed. However, despite the increase in production, it is only the ground nut that is mostly utilized in the processing industry. It is necessary to provide external temperature near about 353K for harder raw materials to extract oil from the mandthis effects on the nutrients, vitamins and other important gradient.

II. LITERATURE REVIEW

1) Current Situation in Market

At present day, themini oil extraction machine is available in market for sell with addition of external temperature. In this machine, the button is provided to heat the extraction rod before actual extraction process starts. This affects the chemical properties of feed material, oil quality, ingredients and their effect on human comforts etc. Hence it is necessary to think about upgrading the machine considering above mentioned parameters and ill effects.

2) Need of Upgrade

Present methods of oil extraction are inefficient in terms of quality, time and cost due to refining process involved. At the same time, it is not possible to know adulteration which causes health related problems. Apart from this it requires external temperature above 120°C to extract oil. It has been observed that the high temperature reduces quality of oil which is not suitable for human health. So to overcome these issues, it is necessary to have advice which is compact, portable, easily operated and low-cost. At the same time, the machine should maintain below specified temperature to avoid nutritional losses. Hence it is today's need to have an oil extracting machine which can be used at home by maintaining oil quality efficiently in cost effective and adult-free way for healthy life.

3) Oil Extraction Machine

Considering above problems we decided to develop an oil extracting machine which will maintain the nutritional value by maintaining the temperature below 70-80°C and will be small in size & economical. Considering the facts mentioned, the components required for the machine are designed to develop a machine for specified task.

1.4 Review

Abdul-Akaba Tijani et. al. [January-2015] studied that the machine is fabricated from locally available materials successfully which is applicable for local production, operation, repair and maintenance. Fabricated machine extract average 62 % of oil from nuts when operated manually and electrically. The operation is quite simple, time saving as well as energy saving which can be used in rural areas also where electricity problem is major.

Odunlami S. A. & Ramonu O.J. etal. [September-2017] studied that oil extraction efficiency from dry coconut is more than the efficiency from wet coconut. But it is also observed that performance characteristics like temperature also varies in dry and wet coconut. Temperature may affect and reduced some gradients from coconut like vitamins, nutrients, fat etc.

K.A. Yusuf, A.M. Olaniyan, E.O. Atanda, I. A. Suleiman et. al. [Year-2014] studied that the temperature is necessary to perform the experiment but as we know temperature may affect the important gradients. We have to minimize and maintain the temperature of whole assembly including crushing temperature to achieve desired properties of oil. It is also observed that efficiency of oil extract from nuts in dehulled condition is greater than un-dehulled condition.

Xue-xia Liu et. al. [April-2019] studied that the objective of investigation is to compare structural and functional property of starch after oil extraction. All five starches are composed of particles with various shapes such as triangular, irregular, round etc. A typical C-type X-ray diffraction pattern is observed.

III. IMPLEMENTATION

1) Calculation & Selection of Materials

Initially we selected some groundnuts. We recorded and calculated their required data like their weight, density, volume, torque required to crush them to extract oil. On the basis of calculated data, we determine avg. torque, avg. stress, and hence the similar data for machine with full load.

After the full load calculation, we selected the motor of required horsepower, force and speed. We selected different materials depending on their requirements like strength, hardness, thermal prop. for various components as describe in selection of materials previously.

2) Manufacturing

After the selection of materials, we started our manufacturing of components required for machine. Initially we fabricated our main Wooden Spiral Shaft with calculated dimensions. For that, we used gear cutting method at 'WARISGARAGE & WORKSHOP', PUNE 411046. We fabricated hopper, supporting key shaft, supporting rings, assembly table in the workshop of Mr. Rajkumar Landge at the same workshop.

After the fabrication process, we started assembling the machine, in which motor is installed on the assembly table with nut & bolt arrangement. Motor is connected with supporting key shaft gear-pinion arrangement. The supporting key shaft is in contact with spiral crushing wooden shaft with sunk key.

Since, this all arrangement is of rotating parts, tapered bearings are provided with lubrication at required positions. The supporting rings are welded to table and outer side of cylindrical crushing Barrel.

At the upper side of barrel, Hooper is attached with screws to provide the feed. Hence the assembly is completed.

3) Testing of Machine

We switched on the machine and feed some regular groundnuts for initial startup testing and then we adjusted the nut-bolt as required. As we know the machine can bear maximum load of 625 to 650 grams, i.e., 2400 to 2500 groundnuts.

We feed the machine at half load and extracted the oil from them. We took such observations thrice. Then we feed the machine at full load and extracted the oil from them. We perform such operation 3 times and it is found that we successfully achieve 60-65% efficiency.

IV. CONCLUSION AND DISCUSSION

The various required components for the development to ground nut oil extraction machine are designed. The purpose is to have the small size oil extracting machine and the reduction of the temperature with rollers having combination of wood metal. It is found that oil extraction efficiency from dry groundnuts is more than the efficiency from wet groundnuts. But it is also observed that performance characteristics like temperature also varies in dry and wet groundnuts. Maximum number of vitamins, fats, proteins other nutrients can be achieved by maintaining the temperature below 70o– 80oC.

It helps to maintain low cholesterol and maximum quality of oil can be achieved within minimum temperature for better health. The machine is fabricated from locally available materials successfully which is applicable for local production, operation, repair and maintenance. Fabricated machine extract average 62% of oil from nuts when operated manually and electrically. The operation is quite simple, time saving as well as energy saving which can be used in rural areas also where electricity problem is major.

V. REFERENCES

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