

Study of Pedal Operated Oil Extraction Machine

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Abstract

This paper aim on design and Development of pedal operated Seed oil extraction machine. The machine is portable which makes it light in weight and can be used for small scale industries and for Household and Pure oil extraction. Since this machine requires less space to move, it can be used in a more versatile manner as compared to heavy powered machines that are mounted on heavy and large industries. This machine can be efficient and easy to operate and maintain. The oil extracted has various applications in food, medicine, and industry. Various application based oil extraction such as food, medicine, and industry. It can be used to extract around 100 in 500 gm of flex and mustard seeds thus covering more time compared to hydraulic jack machine. Design is made in such a way that easy to assemble and dissemble¹.

Keywords: extraction, coconut oil, solar, mechanisms, design.

Introduction:-

Oil extraction are a mechanical method for extracting oil from raw materials. The raw materials are squeezed under high pressure in a single step. When used for the extraction of food oils, typical seeds such as flex, mustard, and peanut which are supplied to the press in a continuous feed. As the seeds are pressed, friction causes it to heat up; in the case of harder nuts (which require higher pressures) the material can exceed temperatures of 140 °F (60 °C). Oil expeller is a device which can produce pressure by rotating feed to expeller screw manually or automatically. Screw press method for oil extraction is a mechanical method for extracting oil from raw materials. Oil extracted by screw pressing is used either as a food product or as an industrial product. Food products include raw oil in dressings and made up to corn oil, peanut oil, rice bran oil etc. For this heat generation it faces some common problem including overheating, excessive thermal stress, dimensional stability and other thermal related factors. By analysing through simulating software design verification of parts used in screw presser can be modified and increase performance efficiency².

the roasting of seed granules between two stones mixing the crushed mass with water, cooking of mixed paste in order to obtain the oil by floating and skimming, and then drying of the oil by further heating is the old traditional way of extraction seed oils as They further described by olaniyam and yusuf. This method as tedious time consuming, energy sapping, Inefficient and low in yield and quality, In the other words, the oil traditional methods of crude, largely unscientific, inefficient, and yielding poor quality extracted oil.[1]

small scale coconut oil production can be profitable and if coconut oil can be locally produced to a price which enables to compete with the common cooking fuels like kerosene, LPG, fuel wood and charcoal. This paper gives the different oil extraction methods such as dry coconut oil extraction method and wet coconut oil extraction method.[2]

The findings associated with VCO up to date is discussed in this paper. Physicochemical properties, antioxidant activity, clinical and authentication studies of VCO were some of the topics addressed in this review by A.M. marina. wet oil extraction method in which fermentation technique is explained in detail, also enzymatic oil extraction method, physiochemical properties of oil, antioxidant properties of oil and presence of phenolic compound is mainly discussed on this paper.[3]

the effect of method of extraction on the quality of oil is discussed in this paper. D.M. Dissanayake tells that peroxide value and acidic value were 94% and 90% respectively higher in commercial coconut oil compared to homemade coconut oil, the commercial coconut oil is more prone to oxidation is indicated. The amount of fatty acid is compared and there composition between commercial coconut oil and manmade coconut oil, the amount of phenolic compound is also given. The quality of coconut oil is highly dependent on method of extraction is indicated in the result. [4]

this paper reports the design, construction and testing of a parabolic dish solar steam generator. J.folaranmi describes the sun tracking system unit by manual tilting of the lever at the base of the parabolic dish. The whole arrangement is mounted on a hinged frame supported with a slotted lever for tilting the parabolic dish reflector to different angles so that the sun is always directed to the collector at different period of the day. On the sunny and cloud free days, the test results gave high temperature above 200°C. S.A. [5]

the various types of solar thermal collectors and applications is presented in this paper survey. Initially, the benefits offered by renewable energy systems are outlined and an analysis of the environmental problems related to the use of conventional sources of energy is presented in this survey. the uses of solar energy is attempted followed by a description of the various types of collectors including flat plate, compound parabolic, parabolic trough, evacuated tube, Fresnel lens, heliostat field collectors and parabolic dish are occurred in historical introduction. An optical, thermal and thermodynamic analysis of the collectors and a description of the methods used to evaluate their performance is followed.[6]

the large parabolic dish concentrator mirrors are an important component of many solar energy systems is described in this paper. They need to be precise and are expensive to transport and fabricate, also a new concept for fabricating and designing large parabolic dish mirrors is shown. The several optimal-shaped thin flat metal petals with highly reflective surfaces forms the dish mirror Attached to the rear surface of the mirror petals are several thin layers whose shapes are optimized to have reflective petals form into a parabola when their ends are pulled toward each other by cables or rods. This paper has potential to provide precision solar parabolic solar collectors at a substantially lower cost than conventional methods.[7]

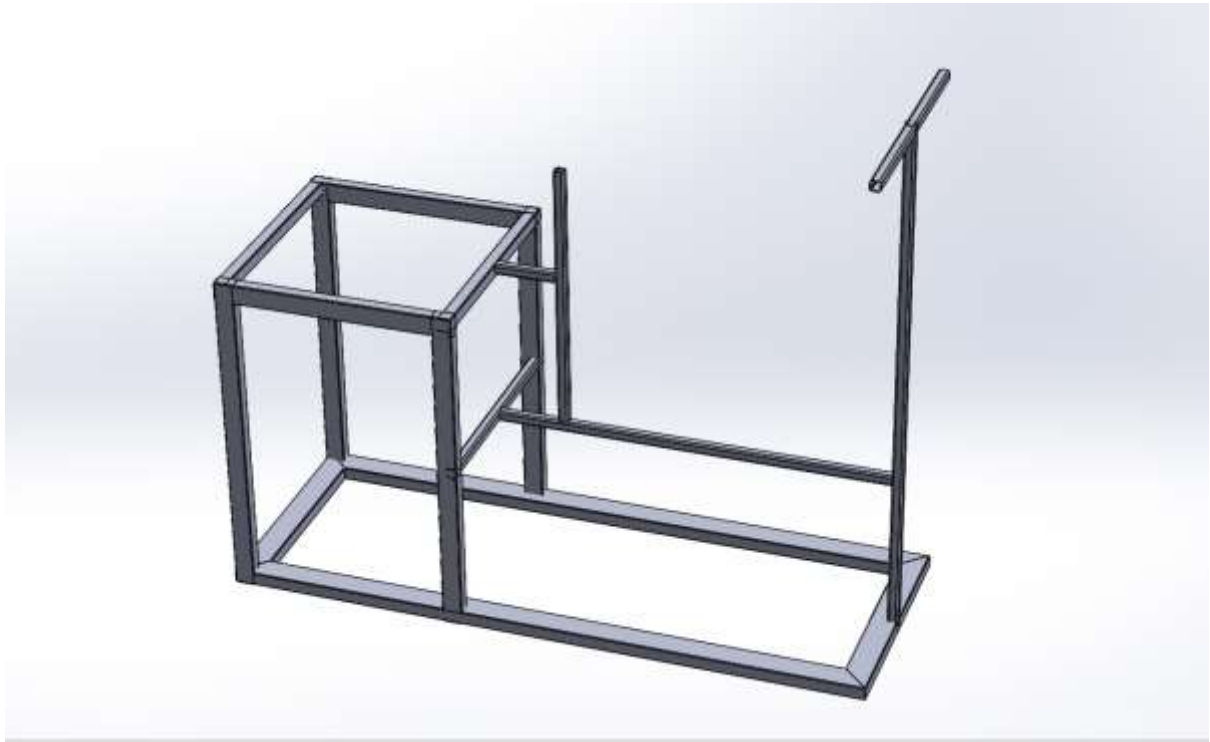
the aim of this paper is to design and fabricate an improved, durable and electrically powered oil expeller making use of accessible raw material. In order to achieve this, specific objectives such as develop a machine to extract oil from an oil bearing fruit, reduce the amount of time spent in extracting oil and increase oil yield by a considerable percentage, thereby increasing income and providing a suitable alternative to industrial oil millers that is affordable to small scale oil milling industries. The design was targeted toward achieving the following, high oil yield, high extraction efficiency, high quality of oil, availability and low cost construction of groundnut oil expeller. Other considerations included the desire to design the cylindrical barrel to accommodate the require quantity of raw material. Also considered is to design the worm shaft to ensure maximum conveyance, crushing, grinding and pressing of the nuts.[8]

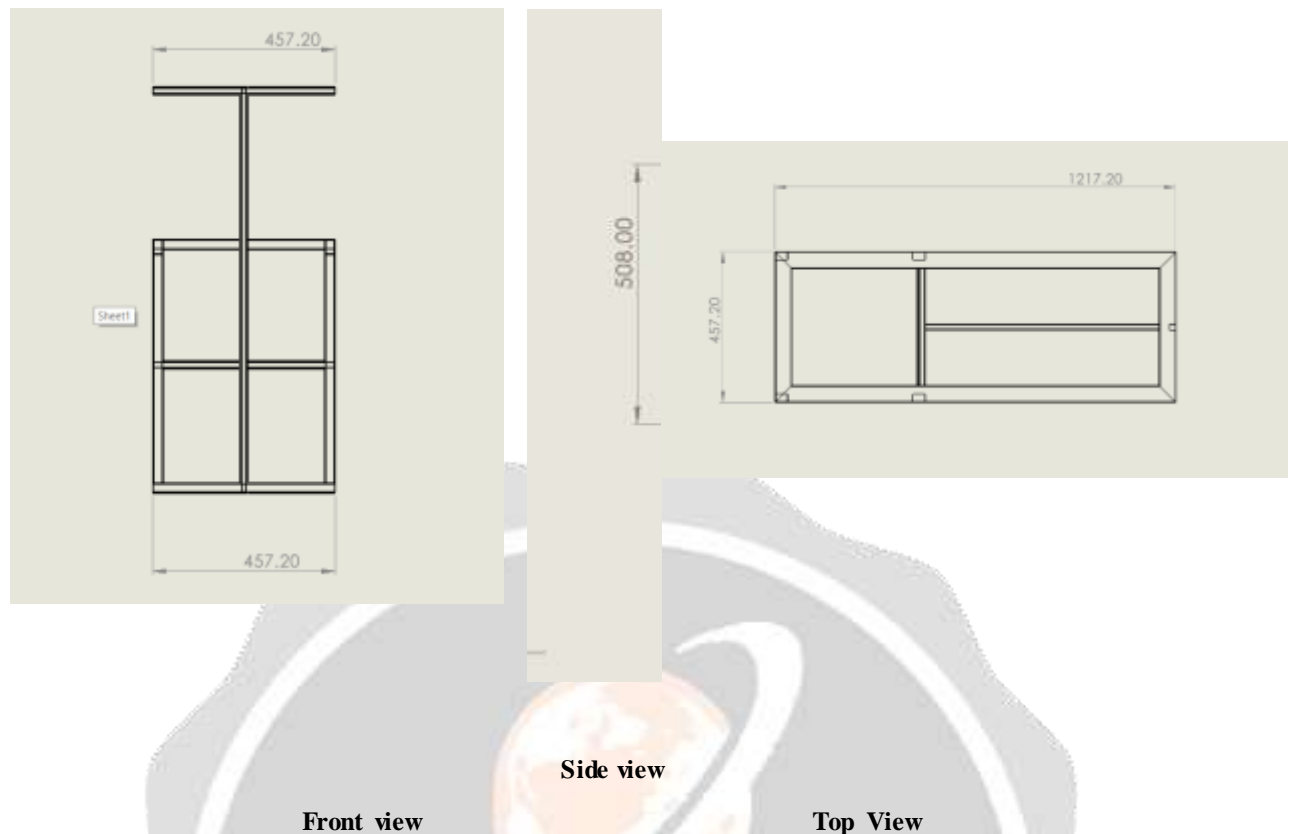
tells about the virgin coconut oil production manual, for village and micro scale processing, D.D Bawalan described the demand for virgin coconut oil is increasing over the world and its production is mostly done at household. The different processing technology, methods for the extraction of coconut oil and different fermentation techniques with economic analysis is also given. The different maintenance and operations procedure is mentioned, other than this it gives the by-products coming out from the coconut milk. [9]

the latest developments and advances in solar thermal applications, providing a review of solar collectors and thermal energy storage systems is mentioned in this paper. Various types of solar collectors are discussed and reviewed, including both concentrating collectors (high temperature applications) and non-concentrating collectors (low temperature applications). The optical optimization, heat loss reduction, heat recuperation enhancement and different sun-tracking mechanisms are studied. [10]

this paper is presented to being made to trace the path of how solar concentrators evolved and to the day to day life. This energy can be produced by using different type of collectors such as solar plate collector, flat plate collector, photo voltaic cell and solar ponds. This paper tries to utilize solar energy for the cooking purpose. Y.R suple Aim is to make the solar cooking as comfortable as possible and also it should be similar to conventional cooking system. Only boiling and steaming is possible in box type solar/ cooker with flat collectors. However, use of concentrating type collector permits all the operations like boiling, steaming, roasting and frying with relatively high capacity is permitted by use of concentrating type collector. Therefore keeping in view the food habits of rural people and for efficient utilization of solar energy, paraboloid type concentrating collector was fabricated.[11]

Design:-





Conclusion:-

In achieving the aim of the work literature survey of various papers have been done in order to obtain an idea of effective method of expelling oil from the seeds both in the terms of cost and strength. After literature survey we came to a conclusion oil extraction with the help of Pedal is more effective, energy consuming, electricity saving and efficient the product has been designed based on the formulas and the detailed drawing of the developed product has been done using the software AutoCAD.

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