# SYNOPSIS

1) Project Reference Number: **46S_BE_2841**

2) Title of the project: **FABRICATION OF COCONUT PRODUCTS DRYER MACHINE USING HYBRID TECHNOLOGY**

3) Name of the College & Department: **S.D.M. INSTITUTE OF TECHNOLOGY, Ujire & Mechanical Engineering Department**

5) Keywords: **Dryer, Electric heater coil, Tray, Heat energy, Blower, Moisture**

6) Introduction / background (with specific reference to the project, work done earlier, etc) -

Fifty per cent of world production coconut is converted, into copra. The Raw coconut is processed to copra by first removal of husk and then splitting in to two shells and then dried. In India Open Drying is the common age old method followed by copra producers. During open drying the product is exposed to Sun and the reduction of moisture is made by evaporation. This process is nature depend, open to atmosphere is having high degree of variation having poor control over drying process. In adverse climates if any variation to the sun light especially poor sunlight, delaying the drying process. The drying delay leads into microbial attack and fungi growth in copra, totally affects copra quality and the yield.

Fabrication of a coconut product dryer using hybrid technology focuses on the development and construction of a drying system specifically designed for coconut-based products. The hybrid technology employed in this project combines two distinct drying methods to optimize the drying process and enhance the quality of the final products.

The dryer system consists of a container in which the coconut products are placed. With the help of the air blower or exhaust fan the hot air is passed inside the heating unit is passed into the container through pipe which is sealed to the hollow shaft. The hot air is passed for several hours into the container. The container temperature is maintained at a constant level throughout the process. When the hot air is passed uniformly on the coconut, the moisture content in the coconut gets reduced. So by continuous supply of hot air the coconut products gets shrinked and becomes easy to remove from the moisture content.. The hot air (exhaust) is passed out through the outlet.

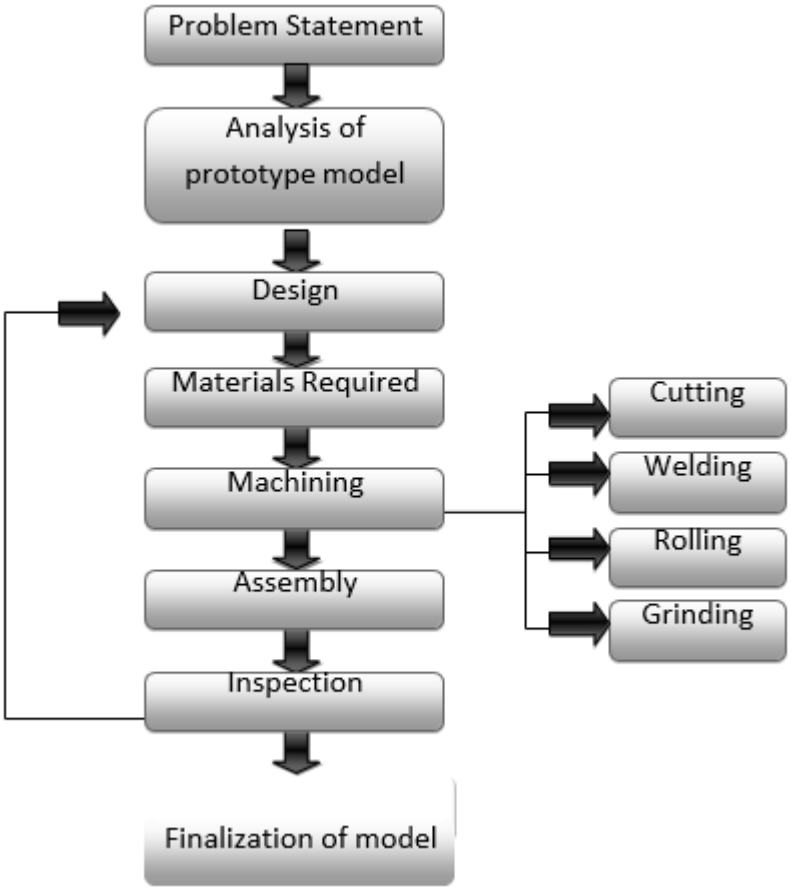
7) Objectives (about 10 lines)

1. Develop an efficient and cost-effective coconut drying system.
2. Design a coconut dryer that reduces the drying time while maintaining the quality of the coconuts.

3. Optimize the drying process to minimize energy consumption and maximize productivity.
4. Conduct thorough research on existing coconut drying methods and technologies to identify potential improvements and innovations.
5. Test and evaluate the performance of the coconut dryer prototype, considering factors such as drying

8) Methodology:

a. Design for Heater coil and Blower based on tray dimensions
b. Fabrication process involved the following steps




c. Geometric modelling with CAD software.

The progress of the project related to the development of 2D drawings with required dimensions and these drawings are developed to 3D models, the models are made using SOLID EDGE CAD software. Further based drawings fabricate the hybrid coconut products dryer machine.

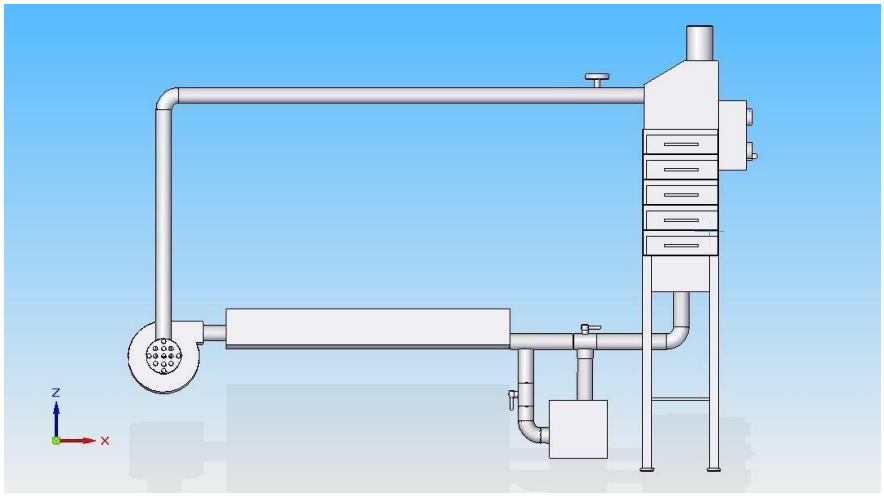


Fig.1 Front view of the dryer

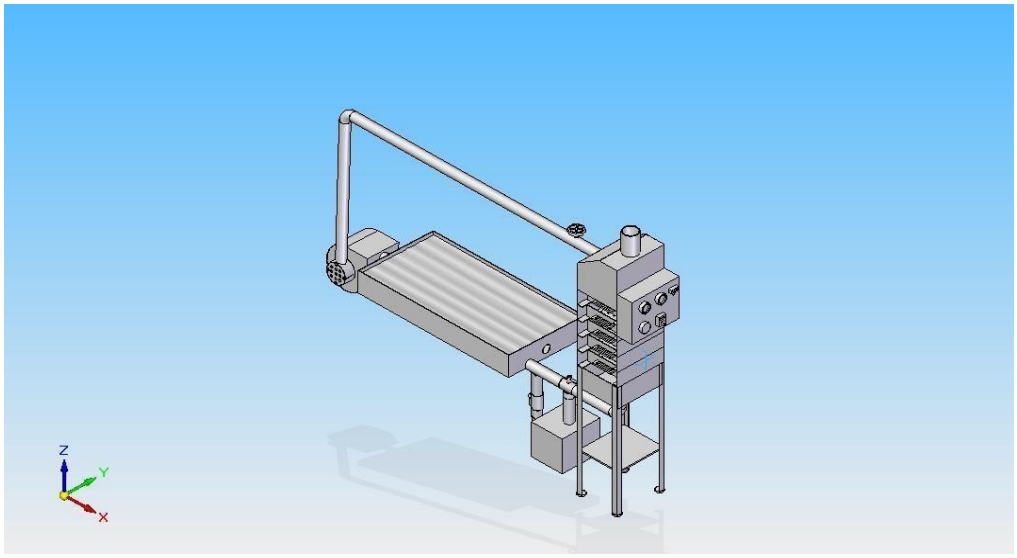


Fig. 2 ISO view of the dryer

9) Results and Conclusions:

- Using heating coil we can dry the coconut into copra in 45-50 mins
- Using hot air blower it takes 2 hours to dry the coconut
- The time taken to dry coconut using coal or fire wood is 4-5 hours

When coconuts are dried, the moisture content is reduced, leading to extended shelf life and increased usability. The specific results of a coconut drying process can vary depending on several factors, including the drying method used, environmental conditions, and the desired outcome.

10) Scope for future work:

- A solar collector can be used to harness the sun's energy and provide heat for an electric heater coil for drying process
- The process would be similar to the previous explanation. However, it's important to note that drying coconuts typically requires higher temperatures and specialized drying equipment
- It's important to note that the specific design and configuration of the solar collector system would depend on various factors, such as the drying requirements, the amount of coconut to be dried, and the local climate conditions.