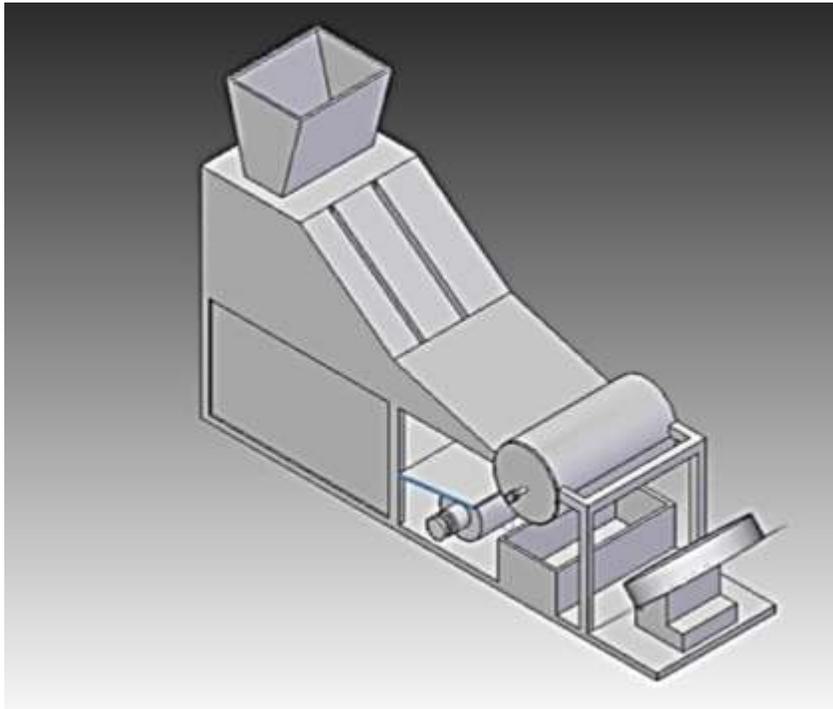


SOCIALLY RELATED PROJECTS- MECHANICAL ENGINEERING

Multi-Source Modular Decorticator for Multiple Crops

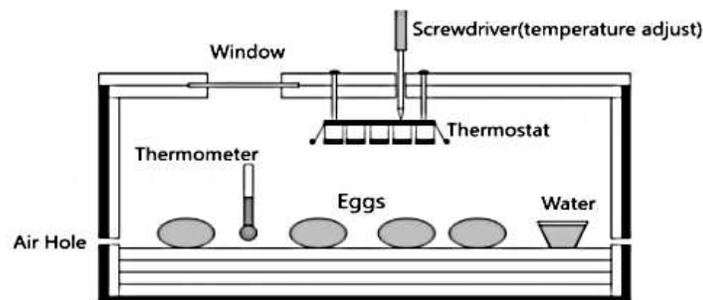
Agriculture plays a vital role in the Indian economy. Over 70% of the rural households depend on agriculture. Agriculture is an important sector of Indian economy as it contributes about 17% to the total GDP and provides employment to over 60% of the population. Indian agriculture has registered impressive growth over last few decades. The food grain production has increased from 51 million tons (MT) in 1950-51 to 250MT during 2011-12 highest ever since independence. Crops such as Groundnut, Caster are grown throughout the year and decorticating these crops are very tough and expensive considering about 80% of Indian farmers are small-scale farmers, decorticating them in factories are expensive, human labor is difficult and hazardous to humans' health.

The main purpose of our project is to develop a compact decorticator which can decorticate multiple crops of various sizes very efficiently. This can not only run through electricity but also solar energy or a prime mover such as tractor. The husk collected is generally wasted, but we are shredding it which can be used as manure or decorative utensils. Therefore, use of multiple power source, majorly renewable energy and at places without electricity, prime mover can be used to power the decorticating machine to decorticate multiple crops of different sizes reduces effort, time and cost.



Modification and Fabrication of Automatic Egg Incubator

An electric powered incubator using a forced draft principle was developed using the available local materials and it was tested with hatchable hen egg. The aim was to produce a low cost incubator and increase the production of day old chicks for small and medium scale poultry farmers. The incubator has the hatching capacity of 540 eggs. Factors that were considered during the performance evaluation of the incubator were humidity, 55% and temperature, 37 °C during the first 18 days and was maintained at 37.5 °C till hatching. Turning of eggs was achieved with the use of tilting trays mechanism using an electric gear motor (0.5 h p). The trays were lifted through an angle of 40 ° either side of horizontal at every hour and lasted for four minutes. 420 clean, healthy, well developed and matured hatchable eggs were used to test the incubator. The result of the test revealed the following average values-fertile eggs 387, infertile eggs 29 hatched eggs 325 and hatchability of 84.06%.



Design and Fabrication of Plastic Compression Molding Machine

Plastic waste becomes one of the world's growing concerns due to its increasing production and consumption by human. By 2050, the world might have plastics in the oceans much more than fish. Therefore, it is threatening the world's environment, economy and human health. Based on latest global statistics, most common plastic waste is either landfilled, recycled or incinerated. Recycling is the least implemented method. Degradation of manufactured plastics can take between 100 to 600 years. They get fragmented in the terrestrial and aquatic environments into little particles called "micro plastics", which may end in human body through food chain, derma products and drinking bottled water. India has witnessed a substantial growth in the production of plastics and an increased consumption of plastic. In the absence of adequate waste collection and segregation process, the management of the waste created by discarded used plastics items, especially ones used for packaging applications has become a challenging task.

Plastic recycling is the process of recovering scrap or waste plastics and reprocessing the material into useful products, sometimes completely different in form from their original state. For instance, this could mean melting down soft drink bottles and then casting them as plastic chairs and tables. Typically, a plastic is not recycled into the same type of plastic, and products made from recycled plastics are often not recyclable. The Plastic compression molding

machine can be used to recycle and reuse these plastics. The compression molding is a process of molding the material in a confined shape by applying heat and pressure. The process is followed by three steps – preheating, pressurizing and cooling. These recyclable plastic wastes are made into useful products. Depending upon the shape of the die, different products can be made. The Machine helps in bringing down the plastic wastes in landfills which is primarily responsible for environmental pollution. Most common recyclable plastic products are beverage packaging widely used for water, soda, cool-drinks and juice, plastic bags and plastic containers used for packing food products.

