

## A Case Study :

# Formulation of the approximate generalized data based model for oilseed presser using human powered flywheel motor as an energy source

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## ABSTRACT

Human Powered oilseed presser presses the oilseed and extract the oil which can be used for eating purpose or even in small laboratories where we can take different test on oil. A machine has been fabricated which will perform this pressing operation not by electric power but by human power. The human power is sufficient which could easily be converted into work [1 to 12]. In this paper an approximate generalized data based model for a human powered oilseed presser was developed by varying some independent parameters during experimentation.

**Key words :** Human powered, Flywheel motor, Energy, Oil seed presser

Modak and his associates [1 to 12] had developed human powered process machines which could energize process units needing 3 to 7 hp and which had intermittent operation.

This machine system comprise of three subsystems (1) energy unit (2) mechanical power transmission system (3) process unit. Energy unit comprise of an arrangement similar to a bicycle, a speed raising gear pair and a flywheel. The flywheel size is one meter rim dia, 10 cm rim width and 2 cm rim thickness. A flywheel is with 6 armed constructions each arm is with elliptical cross section. Mechanical transmission comprises of spiral jaw clutch. (1) or other clutches [4,5] and torque amplification gear pair. Process units tried were for brick making [1, 6, 7] wood turning [8]. Algae formation [9] wood strips cutter and smiths hammer [10] and electricity generation [11] could be looked upon these models design data for designing such system.

A young operator with a slim stature and 165cm height speeds up flywheel to 700 to 800 rpm in a minute's time. After pedaling is stopped and then clutch is engaged connecting this human powered flywheel through torque amplification gears to a process unit. The stored energy in the flywheel around 2800 kgf-m gets exhausted within 3 to 10 seconds in operating a process unit depending on its process resistance. This amounts energizing of a process unit in the range 3 to 12 hp. Recently Modak [10] had proposed the concept of, when to use human powered flywheel as an energy source or on load operation of the process unit depending on the operating characteristic of the process unit. In view of this, fertilizer

mixture using human powered flywheel motor as an energy source was developed. Its approximate generalized experimental data based model was evolved. This model was evolved applying methodology of experimentation proposed by Schenck [03].

## Scope of present research:

Scope is to establish design data for low and medium capacity oil seed presser energized by human powered flywheel motor. With the help of this design data the specific unit for a low medium capacity presser could be designed. The utility of such presser will be for small farmer and oil extractor for bringing about low cost automation. Thus, result of this project will be useful (1) Partly as an aid to a low/ medium capacity farmer for eating oil, cake of oil seed after extracting oil will be used as healthy food for the cows, oxes etc. (2) Alternatively to low profiled entrepreneur who could execute the business of extracting the oil. As the work was ultimately useful for low profiled farmer in present context of lot many cases of suicide of farmers in India this scientific research effort was likely to be useful in lessening the severity of this socio economic problem. Low profiled farmer will be benefited by the proposed work. Other similar systems will be needed by large number of low profiled farmers who may need such an oil seed presser but with different capacities remaining within same concept of Human Powered oil seed presser in future to be adopted for various other agricultural operations. This would add to enhancement of technology for low profiled farmer from the point of view or human powered