



## PEDAL OPERATED CORN DESEEDING MACHINE

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### Abstract

**Corn is grown in small scale by farmers in developing countries like India. Corn is sold by farmers without deseeding. The average kernel price is approximately twice the price of the cob. Hence, more income can be generated by farmers if corns are decorticated and kernels are sold by themselves in the market. But this requires a cheap, manually operated and efficient corn deseeding. Lack of corn processing machines i.e. corn deseeding, is a major problem of corn production, especially in our country India. A study designed, fabricated, and performance of corn deseeding consisting of feed by manually with control flow rate, threshing unit, separating unit, and Pedal operated system. The performance of the machine was evaluated in terms of capacity, deseeding efficiency, material efficiency and mechanical damage. Regression models that could be used to express the relationship existing between the deseeding performance indices, moisture content and feed rate were established.**

**Keywords: Corn, Chain, Sprocket, Gear, Bearings, Shaft, Freewheel, Threshing Unit**

### I. INTRODUCTION

The historical importance of pedal powered machines can be easily overlooked by people who grew accustomed to fossil fuels and ubiquitous electricity. Therefore it cannot be stressed enough how much of an improvement Pedal power was in the light of thousands of years of human drudgery. This machine is environment friendly i.e. non-pollutant. It will bring innovation and mechanization in agricultural engineering. Unskilled women may also get employment. Development of such energy source which has tremendous utility in

energizing many rural based process machines in places where reliability of availability of electric energy is much low. The average work rate of any manufacturing process requiring more than 75W and which can be operated intermittently without affecting end product can also be man powered. Such man powered manufacturing process can be based on the following concept. In this processes a flywheel is used as a source of power. Manpower is used to energize the flywheel at an energy input rate, which is convenient for a man. Pedals and Cranks make use of human power in a near-optimum. All machine tools Employed in machine for production process can be broadly classified into Special Purpose Machine

SPM are designed to perform only specific operations.

- They can produce any number of identical items.
- They are used in mass production.
- The rate of production in SPM is high.
- The cost of SPM is high.
- The cost of SPM can be justified if it is used for mass production.
- SPM are built for a particular product and if the product designs changes, the machine may not be of use.
- But the various units of SPM may be used in the construction of another SPM.
- SPM are not made in bulk but they are produced as per order or only in small quantity.
- E.g. Capstan Lathe, Turret Lathe, Gun Drilling Machine, Transfer Machine etc.

The different methods of maize shelling can be categorized based on various mechanization technology used. These includes: hand-tool-technology, animal technology, and engine power technology. Hand technology involves the use of hand tools in shelling, while

as observed animals were used in threshing on the field by marching on the maize. Engine powered technology involves the use of mechanical assistance in threshing or shelling the maize. Some examples were seen in, the maize Sheller that was design and constructed in Nigeria. To facilitate speedy shelling of maize in order to reduce post-harvest deterioration, mechanical shellers are recommended, because hand shelling methods cannot support commercialized shelling.

## II. PROBLEM STATEMENT

The above sequence if observed has the human intervention throughout the process is necessary and more over the process of bar cutting does not add to the value of the product hence can be treated to be an idle time. Thus there is an attempt in the form of continuous cutting off machine to reduce the idle time to a minimal value. In the machine once the bar stock is fed to the stopper the machine automatically feeds the cutter to the work piece until it is cut to the required length during the cutting stroke and during the return stroke the bar will automatically fed to the stopper by the machine itself, and so also the clamping of bar stock during cutting stroke and de-clamping being done by the machine itself.

## III. OBJECTIVES

- Deseeding of Corn.
- Save electricity.
- Reduce human efforts.
- Handling is easy.
- No skilled labor to operate this machine.

## IV. SCOPE

In ruler areas cutting or deseeding the corn by hand it required more time and labor which is increases the labor cost. If we used motorized machine which cost is also higher and there are also an issue of electricity. So we try to develop the machine which reduces the human effort and work without an electricity.

## V. WORKING PRINCIPLE

A threshing machine is used to separate the grain from the straw and other light materials. It is, essentially, a three-stage process.

In the **first stage**, bundles of grain and straw were pitched into the feeder (or hopper). The feeder controlled the rate of feed passing into the machine to prevent overloading. In reality, the rate at which the bundles were pitched into the hopper probably had more effect on the rate than the hopper itself.

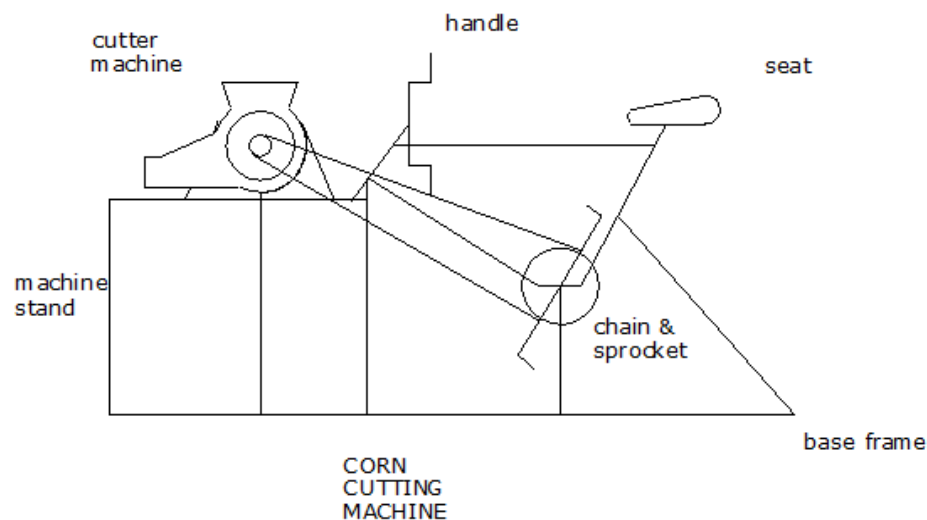


Fig 1. Pedal Operated Corn Deseeding Machine.

In the **second stage**, the separator, a rapidly rotating set of blades (visible at the end of the feeder), first tore the bundles apart, breaking the twine and snapping the heads from the straw, then beat the straw and heads onto a grooved plate, knocking kernels from the heads without crushing them. The straw then passed over a

straw rack that removed most of the straw from the kernels. Whatever passed through fell onto a series of progressively smaller shaking screens, removing most of the remaining straw and chaff from the kernels.

In the **third stage**, the cleaner, kernels that passed through the last screen were moved

over a stream of air that blew the remaining straw and chaff away. The cleaned kernels then fell into a hopper to be elevated to a measuring device before being dumped into sacks or

conveyed to a granary. The straw and chaff were blown out onto the straw stack by a larger, stronger blower.



Fig 2. CAD Model of Corn Deseeding Machine



Fig 3. Actual Corn Deseeding Machine

VI. FABRICATION

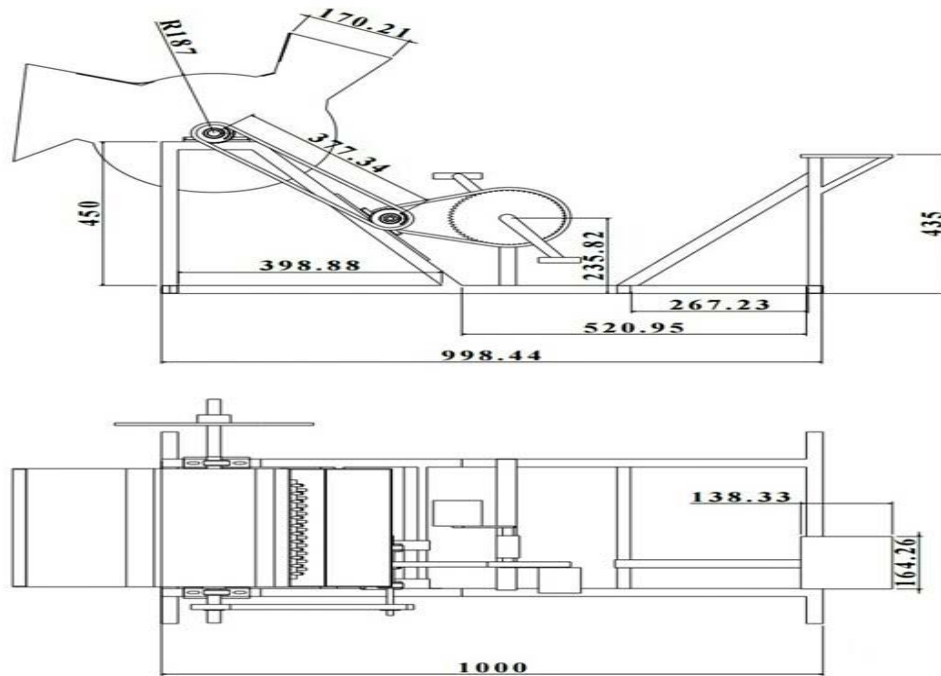


Fig 4. Side view and Top view

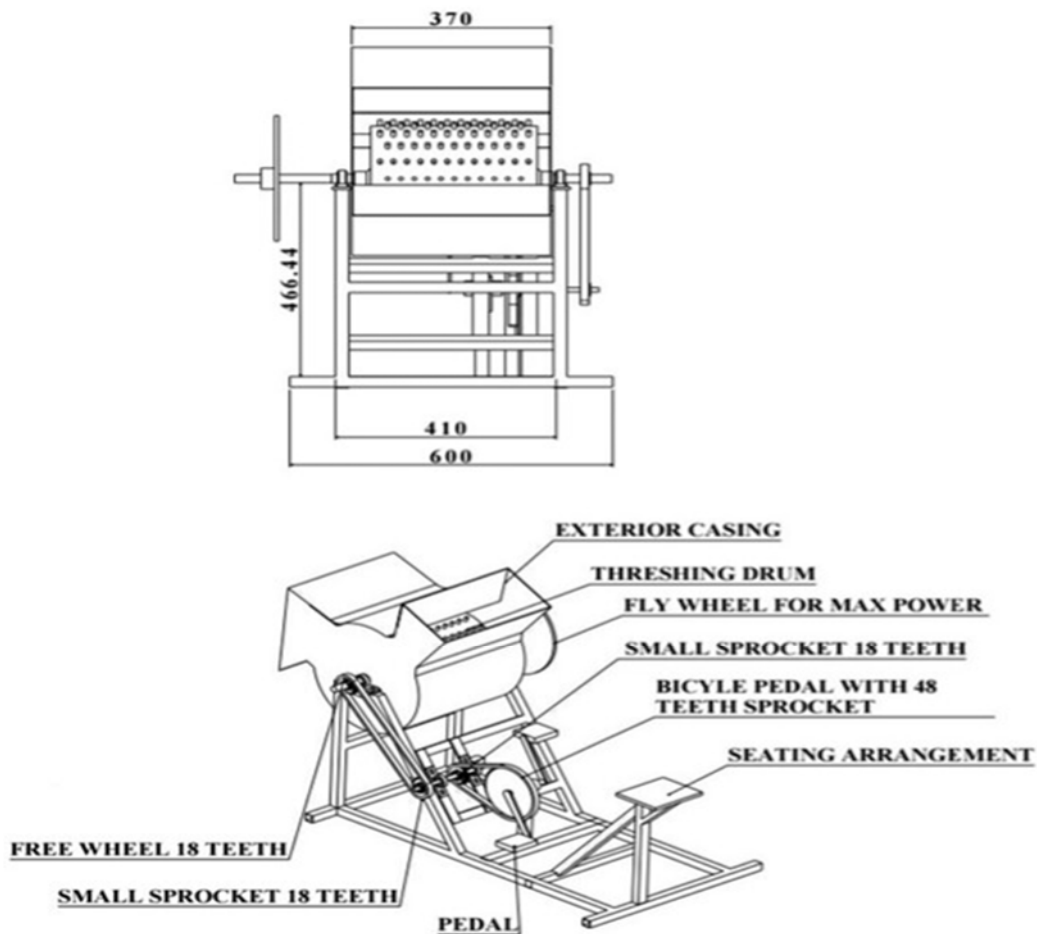


Fig 5. Top view and Isometric view

The following parts were fabricated using the material and process shown below

1. Angles( 20 x 20 mm)  
Material: Mild steel  
Operation: Cutting, welding & Drilling.
1. Shaft  
Material: Mild steel  
Operation: Facing, Planning, steeping, Turning
2. Metal plate:  
Material: Mild steel  
Operation: Marking, Cutting & Welding
3. Base Support  
Material: Mild steel  
Operation: Marking, Bending & Cutting.
4. Bearing Support  
Material: Mild steel  
Operation: Marking, Cutting & Drilling.
5. Sprockets  
Material: Mild steel  
Operation: Boring, Fitting.
6. Bearing  
Material: Grey Casting  
Operation: Fitting.
7. Gear pair  
Material: Mild Steel  
Operation: Fitting.

## VII. CONCLUSION

The de-seeding machine has been designed, developed and fabricated by keeping in mind, the constraints and requirements of the Indian farmers. The deseeding machine was tested in the machine shop and later taken to the field. It worked well in the field conditions and gives a better output. The manoeuvrability of the device is quite good and the handling is quite simple. The seed discharging mechanism is effective and corn seeds can be discharged off very easily. For commercial purpose one can improve the efficiency of the device effectively by increasing the size of the device and providing it with multiple heads. Additionally, the de-seeder is a multifunctional machine that can de-seed various types of food item such as corn, rice, chilly powering, potato paste, de-husking etc. This can be done by changing the drum and teeth.

## VIII. REFERENCES

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