

# PEDEL OPERATING COFFEE HULLER MACHINE

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## ABSTRACT

A Huller machine is a machine which is used to get the exact size and shape of the coffee bean from the coffee nut. Machines are used to remove the parchment layer from wet processed coffee; hulling method is extremely efficient resulting in higher outputs with lower power consumption. The friction between the coffee beans is less and hence there is no loss due to the generation of coffee dust or breakage and dry cherry coffee. The pedal operating coffee huller machine can be used for hulling both parchment and dry cherry coffee. This machine results in higher outputs with lower power consumption. This hulling method is extremely efficient.

## INTRODUCTION

A Huller machine is a machine which is used to get the exact size and shape of the coffee bean from the coffee nut.

Machines are used to remove the parchment layer (endocarp) from wet processed coffee.

Hulling dry processed coffee refers to removing the entire dried husk the exocarp, mesocarp & endocarp of the dried cherries.

This hulling method is extremely efficient resulting in higher outputs with lower power consumption. The friction between the coffee beans is minimum and therefore there is no loss due to the

generation of coffee dust or breakage of beans. This high efficiency "**Pedal operating Coffee Huller**" can be used for hulling both parchment and dry cherry coffee.

## LITERATURE REVIEW

While working in the C.E Lipe machine shop, located on Geddes street and considered an early business incubator in Syracuse, Montague began producing a hulling machine invented by the Brazilian mechanical engineer, Evaristo Conrado

engelberg. The machine could remove the husks and shells from rice and coffee beans, From this venture, the Engelberg-Huller company was formed and Montague manufactured the machines in the building by then, the company, whose trade largely consisted of exports, required larger quarters and moved to a new plant at west Fayette and Ontario streets.

## WORKING OF COFFEE HULLER MACHINE



Fig: Coffee huller machine

The Huller consists of a Cross Beater which rotates inside a perforated cylinder. The coffee to be hulled is fed into the hulling cylinder where the cross beater forces the coffee to pass through the perforated screen. This results in the complete separation of the husk from the coffee beans. The coffee beans and husk then pass through a powerful Aspirator which can be precisely adjusted for the

perfect separation of husk and peels from the coffee beans.

An Oscillating Screen is also provided for the separation of un-hulled coffee from the clean hulled coffee beans by means of specific gravity. The Oscillating screen consists of a conical swinging sieve suspended by a universal joint. The frequency of oscillation can be adjusted by means of a step-less adjustable drive.

## SPECIAL FEATURES

- Replaceable & abrasion resistant special steel impeller blades and impact ring.
- Variable speed drives to adjust the desired speed to suit specific product quality and moisture content for desired hulling of product.
- Cyclone with air seal to collect hulled product and discharge on to next processing machinery
- Air is recycled between hulling chamber and cyclone to prevent dust flying out
- Feed control device in feed pipe to regulate product flow.

## Analysis of coffee beans

The cherry is the name usually given to the fruit of the coffee tree (As shown in

Fig). Green to begin with, the berries ripen over several months, becoming successively yellow, then red, garnet red, and finally almost black. The ideal time for harvesting is when the berries are red. The red skin is called the exocarp. Beneath the pulp (the mesocarp), each surrounded by a parchment-like covering (the endocarp), lie two beans, flat sides together. When the fruit is ripe a thin, slimy layer of mucilage surrounds the parchment. Underneath the parchment the beans are covered in another thinner membrane, the silver skin (the seed coat). Each cherry generally contains two coffee beans; if there is only one it assumes a rounder shape and is known as a pea berry. Coffee beans must be removed from the fruit and dried before they can

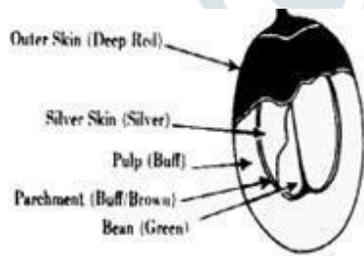


Fig Cross section of a coffee cherry

be roasted; this can be done in two ways, known as the dry and the wet methods. When the process is complete the unroasted coffee beans are known as green coffee.

### FLOW SHEET ILLUSTRATING THE STAGES OF WET AND DRY COFFEE BEANS.

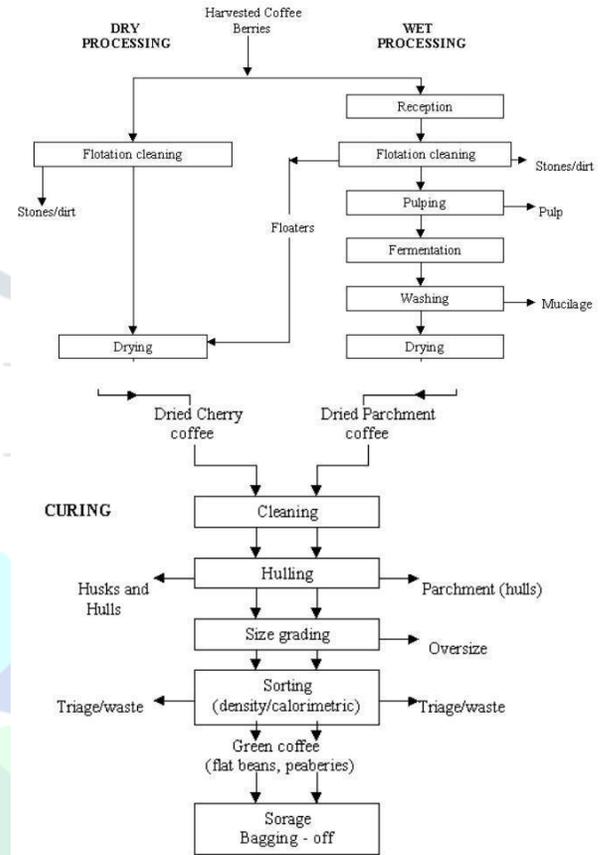


Fig: flow sheet illustrating the stages of wet and dry processing of coffee

### DESIGN

Consists of a cross beater which rotates inside a perforated cylinder. A powerful aspirator separates the husk and beans. An oscillating screen consisting of a swinging sieve suspended by a universal joint separates unhulled coffee from clean hulled coffee beans. The screens can easily

be changed by swinging down the inlet door and sliding them out. Consists of a cross beater which rotates inside a perforated cylinder, A powerful aspirator separates the husk and beans. An oscillating screen consisting of a swinging sieve suspended by a universal joint separates un hulled coffee from clean hulled coffee beans. The screens can easily be changed by swinging down the inlet door and sliding them out, Individual motors for the Huller, Aspirator and Oscillating screen maintains smooth performance. We came across this procedures while getting our connecting pipes, at that junction we decided to make a project which will be very useful for this type application and we decided for small and cost effective hydraulic bench press which can be used by all small and medium industries and also workshops.

### USES, ADVANTAGES AND APPLICATIONS

#### Uses

It can remove the husk easily with minimum time & less effort.

It can remove bean without damaging the job.

It can be used to the rural areas.

It is used for unskilled workers.

It is used as small scale industries.

#### Advantage

Work can be easily done without damaging the component.

Time taken is less compared to other means.

Maintenance is very less & cheap. It has high strength & less weight. It can accommodate different size of works.

It is less wear & tear.

Provides higher output by consuming lower power.

#### APPLICATIONS

The Height of the handle can be adjusted to suit any build.

Adjustment of saddle for one's comfort can be made.

Output capacity huller machine is 10kg coffee beans per hour approximately.

Output capacity can be increased to 18kg per hour by fining electric motor.

#### CONCLUSION

From the above project, it can be concluded that the "pedal operating coffee huller machine" is a very simple yet very powerful design of hulling coffee beans.

If the "**Pedal operating Coffee Huller machine**" brought into application in the rural areas of the developing countries

can aid a lot of plight and the suffering of the poor peoples who find it very difficult to hulling coffee beans.

This hulling method is extremely efficient resulting in higher outputs with lower power consumption. The friction between the coffee beans is minimum and therefore there is no loss due to the generation of coffee dust or breakage of beans.

This high efficiency "**Pedal operating Coffee Huller**" can be used for hulling both parchment and dry cherry coffee.

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