DESIGN AND FABRICATION OF COFFEE OUT-TURN MACHINE

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College: Coorg Institute of Technology, Ponnampet
Branch: Department of Mechanical Engineering
Guide: Mr. Rajesh T N
Students: Mr. Manoj M B
Mr. Sarath Kumar P
Mr. Abijith Surendran

INTRODUCTION

The coffee ‘out-turn test’ which has become a sort of headache for the coffee planters who are being taken for a ride by the traders. Some of the finer points involving the ‘out turn test’ to determine the quality of bean. Earlier, the prices of coffee were fixed based on the demand and supply in the international market. But now the quality of seeds has become an add-on factor to determine such prices.

Out-turn is the quantity of total produce obtained after processing. For instance, 50kg of cherry coffee should yield 26.5 kg bean leaving behind the husk. Similarly, 100 grams of cherry coffee should yield 53gm of been to obtain the market value.

On May 21st, 2004, the International Coffee Organization (ICO) made it legitimate practice by passing a resolution known as Resolution 420 which is applicable only to beans. Accordingly, 300g of Arabica beans can possess 85g of defective beans whereas, 300g of Robusta can posses 150g. Initially it was in east African region the concept of out-turn was present and gradually it extended across the world. As per the ratio the out turn for Arabica and Robusta was fixed at 1:6 & 1:5 respectively.

Objectives:

Earlier, the prices of coffee were fixed based on the demand and supply in the international market. But now the quality of seeds has become an add-on factor to determine such prices.

The concept of out-turn analysis started in the international market during late 1990s and early 2000 when there was a glut in the market owning to large scale export from all the coffee growing regions without any leash on the quality. Keeping this in view at the international market the concept of out-turn was introduced, also known as Green Bean Equivalent (GBE) to comprehend the quality of the coffee before purchasing from producers.

Coffee out-turn machine is used to find out the quality of the dried coffee berry/cherry to set the selling prices. It is difficult to find out the quality of the entire coffee bean/cherry which a planter is produced, by taking a small amount of coffee beans nearly about 250g-350g the quality is checked and then calculated for the entire dried coffee beans based on the quality of the measured beans.

It will the economical method for the purchaser to find out the quality of the beans and set the price for the coffee beans.

Methodology:

The parts of the machines are made of Mild steel. The machine mainly consist of a sieve hulling drum inside the chamber which is connected to the 25mm shaft. The shaft is connected to 2 bearings. And the adjustable blades are placed inside the sieve drum which is also connected to the shaft. And this shaft connected to the induction motor through the pulley connection. Here the size of driven pulley is more than that of driver pulley to reduce the rpm to the hulling blades.

Blower is also made of mild steel and blower connected to the induction motor by another shaft of 25mm through the pulley. For blower the driven pulley size should be equal to driver pulley to
get equal rpm that of motor. Hopper is made of steel plates. PVC pipes are used in the blower weighing and moisture tester is placed in the output chamber of the machine.

The dried coffee is placed in the hopper then it will go to the sieve hulling drum. The motor will run both the shaft with varying rpm. when the sieve drum is rotating the coffee husk and beans are separated. Blower will suck the coffee husk through the blower and the coffee bean is collected in the output and tested for quality of the bean.

Table: List of materials

<table>
<thead>
<tr>
<th>Sl.No</th>
<th>Part</th>
<th>Material</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Hopper</td>
<td>Sheet Metal</td>
</tr>
<tr>
<td>2</td>
<td>Shaft</td>
<td>Mild Steel</td>
</tr>
<tr>
<td>3</td>
<td>Motor</td>
<td>Mild Steel</td>
</tr>
<tr>
<td>4</td>
<td>Bearing</td>
<td>Mild Steel</td>
</tr>
</tbody>
</table>

Conclusions :
1. Cost of production is low.
2. No need to purchase heavy machineries.
3. Working principle is quite easy.
4. The out-turn machine is portable.
5. It is easy to construct.
6. It requires low maintenance.

Scope For Future Work :
1. Coffee out-turn machine can be used for small scale industries.
2. Coffee traders or planters can use coffee out-turn machine.
3. Can be used for coffee hulling process.