

## DESIGN OF AONLA (*Phyllanthus emblica*) PRICKING MACHINE

SINGH VIJAY RAJ<sup>1\*</sup>, KUMAR NARESH<sup>2</sup> AND KUMAR DINESH<sup>3</sup>

Maharaja Agarsen Agriculture College, (S.K.R.A.U), Suratgarh, Sriganganagar, Rajasthan

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**Abstract** – In India an economical manufacturing remedy is vital for product being affordable to rural areas as well as small scale industries, in India *Aonla* produced on very large scale for various purposes like candy, murabba, pickles etc. The purpose of study is to investigate and overcome problem by overcoming manual method of pricking *Aonla* while manufacturing murabba. *Aonla* has the hallowed position in *Ayurveda*. *Aonla* is native to India and also grows at tropical and sub tropical region like India, Pakistan Sri Lanka and Uzbekistan. In India Uttar Pradesh has the highest area under cultivation and production of *Aonla*. Area under *Aonla* orchard in Pratapgarh district of Uttar Pradesh is about 13000 hectares. Traditional method for making *Aonla murabba* is hygienic because for making *murabba*, *Aonla* has to be pricked first and that pricking method of *Aonla* is drudgery prone and most of the workers are injured by hand pricking method. Also it takes too much time for pricking. Thus to overcome these problems and keeping in mind the benefits of small and medium farmers a low cost, pedal operated *Aonla* pricking machine suitable for farm women has been designed.

### INTRODUCTION

India is the country of agriculturist people. Approximately 15-20% share of GDP is given by agriculture as we know that *Aonla* is Ayurvedic medicine, *Aonla* (*Phyllanthus emblica*) is known as the Indian Gooseberry it contain rich amount of vitamin C. In India *Aonla* is consume in the form of candy, Murabba, pickles etc. The method is use for this is traditional in which punching, remorse, seed removing, shredding, pricking processes are manual (Ghuge *et al.*, 2016). These methods are unhygienic in nature, very time consuming and may cause minor accidents. Nutrients are loss at higher rate due to unhygienic methods. This machine was designed for rural areas men and women for decreasing human drudgery and increasing production of *Aonla murabba*. Designing of this machine was held on solid works (Mechanical software). In which each part of machine was designed. A demonstration had been taken of working mechanism before fabrication of this machine. This machine was working on the principle to and fro (reciprocating) motion. This machine was designed as paddle operated because of easy operation with less power consumption.

### Objective

1. To design a paddle operated *Aonla* pricking machine for rural areas men and women for neglecting human drudgery.

### MATERIALS AND METHODS

#### Frame

Frame of machine is regular frame of 990x600x400 mm as shown in figure. The material is a mild steel 3 x 30 mm thick L-angle. Frame was developed in

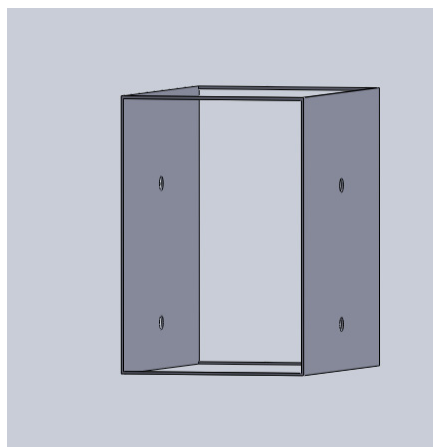
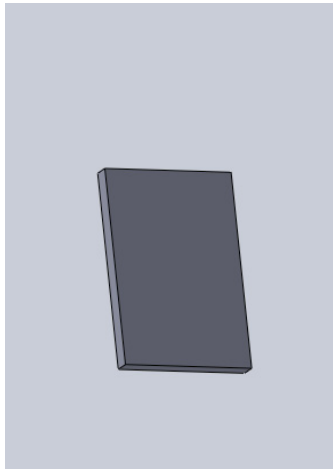


Fig. Frame

right plane, boss extrude and cut extrude with material specified (mild steel).

#### **Fabrication of needle plate**

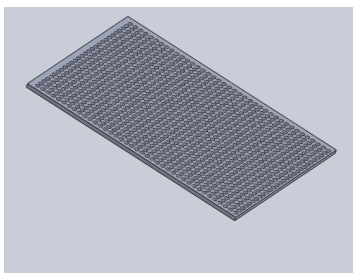
Needle plate has dimension 600x400 mm. which is drilled by the drilling needle of 10 mm cross-section area. No. of drill on the plate is 21x36. This plate developed in solid works software in front plane with material specification 201 annealed stainless steel.



**Fig:** Needle plate (756 nails)

#### **Fabrication of sieve plate**

This plate developed in solid works software in front plane with material specification 201 annealed stainless steel. They are arranged one by one for making a sieve as shown.



**Fig:** Sieve plate

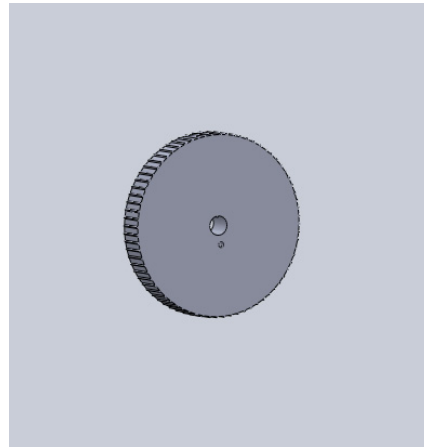
#### **Fabrication of fruit plate**

It is a mild steel plate having thickness 5mm and diameter 600x400 mm. This plate developed in solid works software in Top plane with material specification **201 annealed stainless steel**.

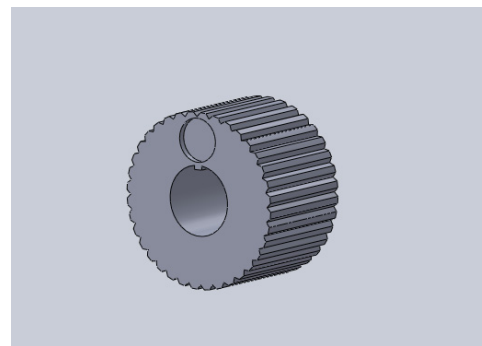
#### **Fabrication of power transmission unit**

These gears are designed in solid works with

material specification of plain carbon steel, Filletes R0.20, boss extrude, cut extrude in front plane. It is consisting of gears (two small and one large).



**Fig.** Large gear



**Fig.** Small gear

#### **Fabrication of Paddle**

It is made up of mild steel. It is connected to the lower part of the frame. This is free for movement up and down. The operator applies the force on the paddle.

#### **Design by Using Solid Works**

Solidworks is solid modelling software that allows to design product in 3 dimensions. The technique is generally to sketch 2 dimension profiles then use method like extruding and lofting to produce a solid shape. Solid works is mechanical software which is use to draw simple and complex mechanical shape or assembly and modelling it.

#### **CONCLUSION**

The designed machine is successfully working on solid works software. It was observed motion of all parts of the machine was working satisfactorily.

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