

## Design and Fabrication of Husk Blower

**Manoj Prabhu.M<sup>1</sup>, Sabesh Novin.S<sup>2</sup>, Nalanraj Shanmugam.S<sup>3</sup>, Ganesan.A<sup>4</sup>**

<sup>1</sup> *UG - Mechatronics Engineering, Kamaraj college of engineerig and technology, Madurai, Tamilnadu*

<sup>2</sup> *UG - Mechatronics Engineering, Kamaraj college of engineerig and technology, Madurai, Tamilnadu*

<sup>3</sup> *UG - Mechatronics Engineering, Kamaraj college of engineerig and technology, Madurai, Tamilnadu*

<sup>4</sup> *Associate Professor, Mechatronics Engineering, Kamaraj college of engineerig and technology, Madurai, Tamilnadu*

*Corresponding Author Orcid ID : 0009-0001-5465-569X*

### ABSTRACT

The main idea of this project is about providing an alternate solution for conveyors, which is used to convey lightweight materials like husk. Since husk can be easily blown away conveying in open space is not possible because air can easily blow it away from the conveyors. Also initial cost of conveyors is high so small scale industries cant really afford it, so they go for manual ways to move husk from one place to another place. But we can't depend on manual labors all the time because of reasons like they are not easily available all the time and they would want overtime charge if the delivery is late or if the workers come late the unloading of husk can't be done at the moment notice, and work time is wasted. To avoid this type of loses and to move husk anytime to a desired location this project can be used. This project uses a impeller connected to a motor to produce a suction force to suck the husk from a suction mouth connect and will blow the husk through a outlet mouth to any location we want. Since rice husk are dust like particles it will be easily sucked and blown away through a pipe.

**Keywords—Husk moving, loading and unloading, suction.**

### 1. Introduction

Husk is a light weighted material, which is used as building material, fuel and other domestic applications but moving husk from one place to another place is a difficult task because of its weightlessness. A small breeze can easily blow away the husk and it can't be recollected again once it's lost, also due to its dust like nature it can enter into electrical components and damage them. There are many difficulties relating to moving of husk. By using conveyor we can easily move husk from one place to another but the conveyor has to be covered along the way to avoid the husk from being blown away, but the initial cost that is required is high that some small scale industries won't be able to install and run a conveyor system. This project is an alternate solution that can be used to move husk from place to another place, By using this project we can reduce the manual labor that is required to move husk and time can saved.

### 2. Methodology

Our project comprises of an impeller that will be connected to a motor by a v-belt drive to avoid direct connection of the shaft of the impeller and the motor. The impeller will provide the necessary suction force that will be used to intake the husk that is in the storage room which is in the lower portion. This husk will be blown out through the outlet port to a desired location. Since the husk is moved through a closed tube husk will not get dispersed into the atmosphere.

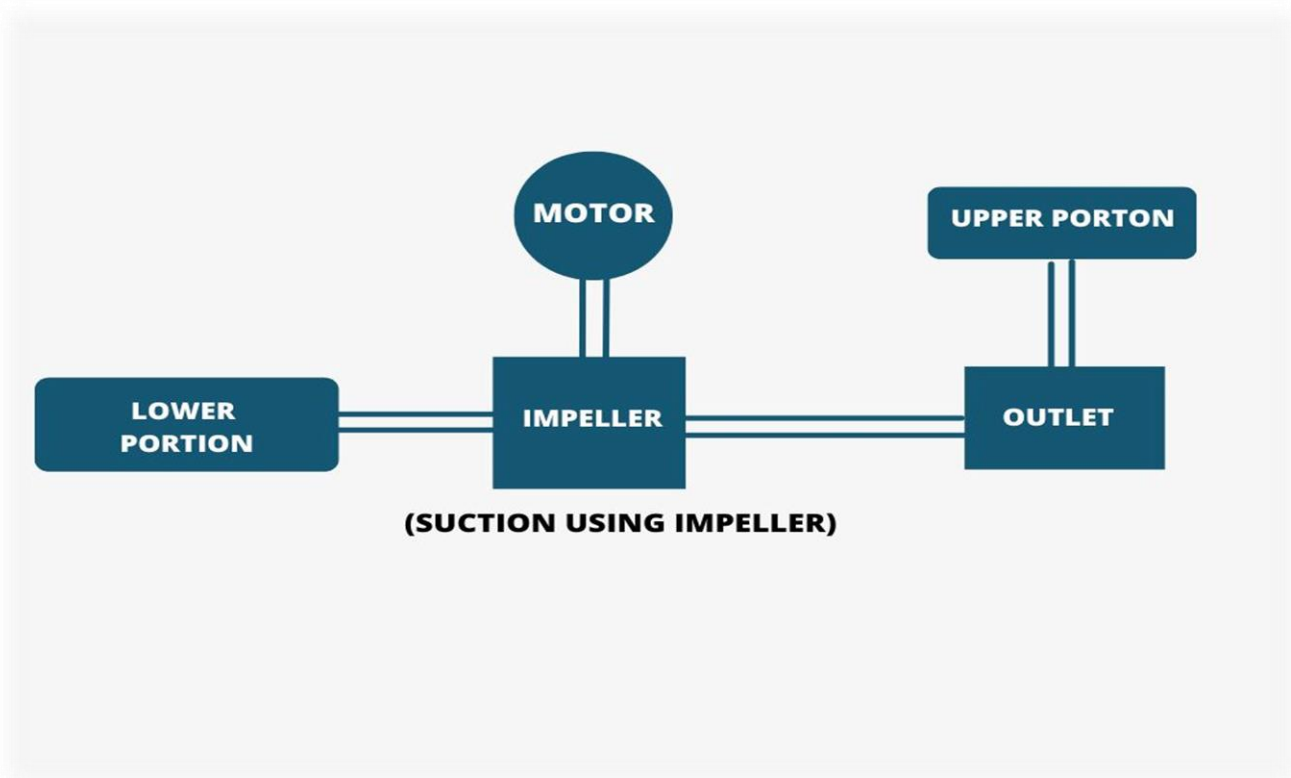


fig.1 simple block diagram

### 3. Design

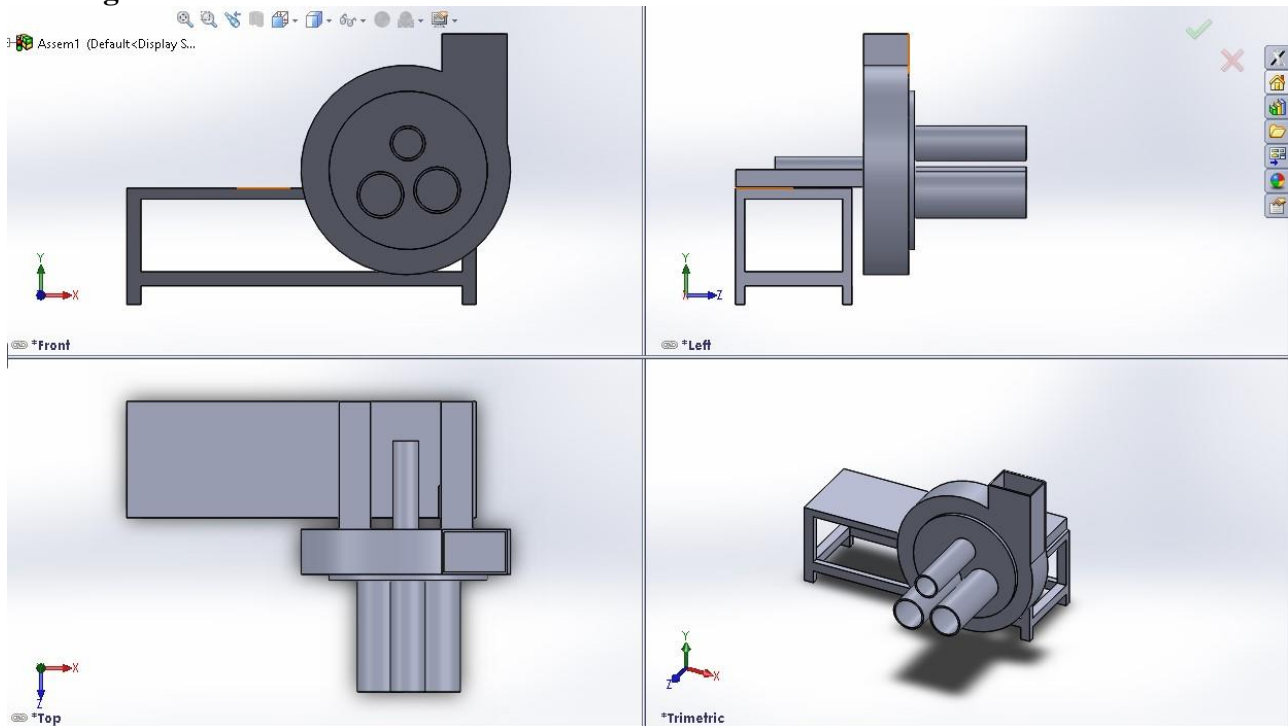


fig.2. Proposed design

The design comprise of a bench where the motor, impeller, impeller casing and other parts will be mounted. The impeller will be covered with an impeller casing that will be used as a protective covert so that no objects from the outside will damage the impeller. Also the suction mouth and the outlet port are connected and with the impeller casing itself. There are three mouths attached with the

impeller casing, One is the primary mouth that will be inserted into the heap of husk and the secondary mouth will be used to suck atmospheric air incase of any blockage in the primary mouth the additional air will be used to break through the blockage and to create a smooth flow. The third will act as a relief valve incase of unwanted pressure increase inside the impeller casing. There is a opening behind the impeller casing for the impeller shaft to be connected with the motor through a belt drive.

#### 4.Literature review

**“Dust control system and a method for straw blower”** by Alfred T.Nitta is a product about how closed environment ca be used to blow light particles like straw and it can be moved to any location we want by using air as a moving force.

**“Design and fabrication of a tractor powered leaves collector machine equipped with suction-blower system.”** by Mohsen Azadbahkt, Ali kiapey, Ali jafri published in ICGR journal in september 2014, It says that how suction force can be used to intake weightless particles without any difficulties and can aviod human intervention to collect and store weightless particles.

**“Optimizing the Design Parameters of Radial Tip Centrifugal Blower for Dust Test Chamber Application Through Numerical and Statistical Analysis”** by Selvaraj, Mohammed Aslam Noorani, Sathickbasha Kathar, Harihara Sakthi Sudhan, Pandiraj an article published by FME transaction in 2020 discuss about how dust particles can enter into machines and moving parts and can damage them while running.

**“Innovative design of pneumatic conveying and foreign substance cleaning and dust removal system”** by Longwang Yue, Kong fah tee published by Australian Journal on Mechanical Engineering in 2017, It discuss about the problems faced during conveying of weightless particles and Possible solutions are discussed.

#### 5.Results



**fig.3.Fabricated model**

The model of the husk blower was successfully fabricated and implemented to achieve the objective, Which is to provide an alternate solution for conveyors and to minimize human dependency on moving husk from one place to another. Although husk can be blown out through the outlet if the outlet is too big the husk will be dispersed throughout the room so the outlet port has to be as small as possible to avoid dispersing of the husk inside the room.

## 6.Future work

In the future, The project can be developed by using automated moving inlet which will move on its own covering the entire room and will intake all husk that will be presented inside the storage room and by calculating the flow rate and head rate in the outlet the total load can be monitored all the time and can be viewed from anywhere. This process can be fully automated and the amount of energy that will be spent can be minimised considerably.

## 7.Conclusion

This husk blower is a project which can be used to move husk from place to place with ease and by spending less amount of money. Since the destination can be changed it can be moved anywhere we want, Conveyor will be fixed setup but since this husk blower is not a fixed one it will be alternate solution for the conveyor and the power required to move the husk will be less so that it will be cost efficient and it can be time saving compared to moving husk by using human worlrs.

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