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## DESIGN AND FABRICATION OF FLOUR SIEVING MACHINE

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### ABSTRACT

Sieve is a device for separating wanted elements from unwanted material or for characterizing the particle size distribution of a sample, typically using a woven screen such as a mesh or net. A lot of the sieve product that are in the market are money consuming. Skilled workers are also required to operate the product. Other than that, it is also required big space to install the product. A higher maintenance for the product is also one of the problems that a lot of the user faces. The aim of this study is to design a product that are compact and less space consuming. Price of the product also must be affordable especially for small industries. Finally, a low maintenance that can equal with less money consumption. The first part for our methodology of research is to compare the entire product that is in the market. Second, create a design that satisfies the objective. After finalizing the design, search material that is suitable for the spec of the product. Finally, create the product and run test on small industry to collect data and analysis. All the data and the analysis that are obtained are used to write a report. The finding that can be gain after the test is that the flour sieving machine is suitable for small industry to use because it satisfies their requirements without exceeding the need. There are lot of improvement that can be done on this product such as make it portable, upgrade the motor and larger capacity.

**Keywords—** Small and Compact, Portable, Affordable

### 1.Introduction

A sieve is a device for separating wanted elements from unwanted material or for characterizing the particle size distribution of a sample, typically using a woven screen such as a mesh or net. This project focuses on design, fabrication of the mechanical part of machine and the system of the sieve machine. To achieve this project objective, this sieve machine body structure and mechanical system needs to concern some other criteria such as strength, safety, and ergonomic design. Sieving machine is a machine designed to separate the particle according to their mesh size various levels. In many industries for example the pharmaceutical, it is often desirable to community particulate matter. A small sieve such as used for sifting flour has small holes. Depending upon the types of particles to be Separated, sieves with types of holes are used. Sieves also used to separate stones from stand. A metallic plate or sheet, or other similar device, with regularly spaced apertures of uniform size, mounted in a suitable frame or holder, for use in separating material according to size.

### 2.Literature review

[1]. Decision making problems were broken down to reach in the conclusion by using AHP. Out et al. (2009) discussed Multiple Criteria Decision Making for choosing the appropriate material handling equipment to explore the duelling factors

[2]. In that research, FANP, MHE and TOPSIS were employed to determine the system characteristics and proper system alternatives. Osman Kulak (2005) developed the factors for the selection of material handling equipment's. He used FUMAHES, which is a multi-attribute decision making process

[3]. Evaluation for complete and incomplete information has also done in his research in order to the selection process. Product development for specific industry has been researched by Krishnan and

Ulrich (2001). Variation in market opportunity is necessary. This is also important for the sale of the products. This work combined the operation management and product designing in a single phase [4]. Brown and Eisenhardt (1995) organized the product development into three steamed research. Research findings were synthesized into a successful product designing model

[5]. sneering cost is an important factor for designing and development of new product. Marion and Meyer (2011) investigated in such a way that new entrepreneurial companies can yield a definitive fund flux

[6]. Chen and Liu (1999) researched that 3 objectives can be achieved at a same time. They are identifying factors of product designing stage, cost effective design and design with computer software. They also cleared that; product life cycle is also important for the cost-effective design

### **3. Design process**

The Manufacturing process result of this project, there are some steps have been made. The next topic is topics selection selections of topics is very first step before starting work encountered work related to the project. The project title should be appropriate to the project for the course D in Mechanical Engineering. In addition, the selection of appropriate projects to help power the creative and innovative thinking as well as it symbolizes the level of consciousness of a person. After the project is selected, the title of the project should be selected based on its ability to attract others to know more about the project closely. Tittle that attracts the attention of others symbolizes the initial status of the project

#### **3.1 Design selection**

In the design selection, the researchers have used the existing product design and improved the product design according to the customer's needs. The researchers have considered the factors and efficient way the tool works, then the design planning using the Autodesk Inventor software. To plan the innovation of this product, numerous factors must be examined in terms of benefits and drawbacks for specific design enhancements.

#### **3.2 Selected design**

The researcher produced the overall design using the chosen design concept after obtaining an innovation for the flour sieve machine design concept, which would subsequently be analysed and simulated.

#### **3.3 Analysis and simulation**

Following the creation of the tool design, the design will be examined for calculations and simulations using Autodesk Inventor software. The simulation tool's goal is to figure out what the design's safety factor will be. The stage will return to the design selection process if the simulation results

#### **3.4 SUMMARY OF CHAPTER**

In this chapter, project planning and phases are made and being implemented during the project production in order to ensure the process go smoothly. It also helped to as a reference to ensure that we achieve the objective on time. Without a proper schedule, the production of the product will be delayed and the efficiency in making the product will be dropped because of it. This show that methodology is one of the importance things that need to be done properly because it

### **Generation and selection of concept**

In a process of designing, generating, and selecting design concepts need to be done in detail so that the project produced effective and a good impact on consumers. This is because effective project can be used in a long time.

### **Detailed design**

Detailed design is done in order to ensure the project meets the requirements of users. In addition, it can follow all the aspects which have been set as not to drop out from the project scope. By doing this income, detailed design projects are more effectively.

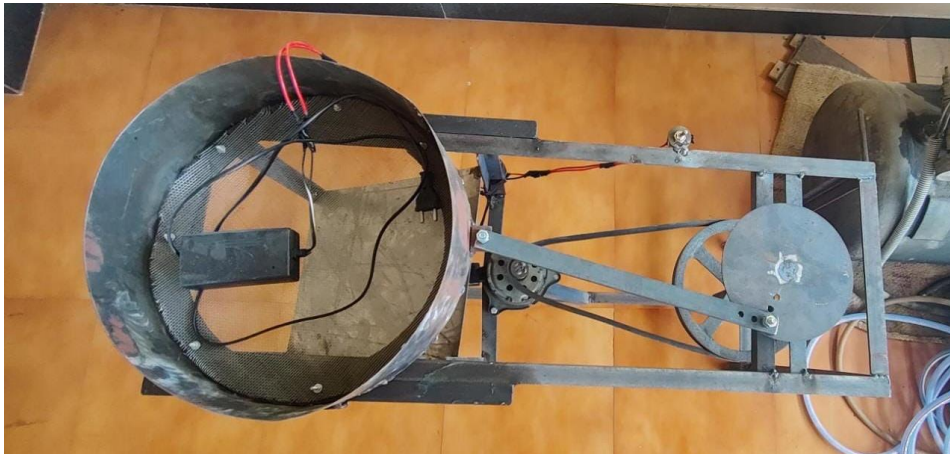
**safety**

Safety in operating the project toward the user is one of the important things that must be think about. The safety measure that has been done in this project is as follow:

- 1) Every sharp corner in the product has been ground to make it dull in order to avoid injuring the user.
- 2) The wheel on the product can be locked to ensure the product does not move when it is being used. A wall has been made to ensure the carriage does not derail when it.

**Working Principle**

A proven sieving solution for wheat flour (Maida/atta), the Russell Compact Sieve® is ideal for removing oversize contamination to safeguard your product quality. This versatile machine can be used for a variety of flours and food powders, meeting the hygiene standards of the food industry while increasing your production rates. Using a 1500mm diameter sifter, an impressive throughput rate of 21 T/hr could be achieved for sieving wheat flour. The inclusion of the Vibrionic Spiro screen™ also keeps the mesh clear to further maximize flow rates. The compact sifter is available in different sizes with additional customization options to suit your specific requirements.

**Conclusion**

After finalizing the design, search material that suitable for the product specification we all know that this machine will be the great addition especially to the baker to help in bakery production line and manufacturing. Our target in this project is to make a fully electric-powered flour sifter that is easy to use and save some processing time that is needed for a small bakery or household. More, the project design.

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