UNIVERSITI MALAYSIA PERLIS

AUTOMATIC KUIH KASTURI MACHINE WHICH INCLUDE COMPRESSING, COATING AND FRYING PROCESS

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Technical Report

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ACKNOWLEDGEMENT

Firstly, we want to extend our thanks to Universiti Malaysia Perlis (UniMAP) and the Faculty of Mechanical Engineering Technology (FTKM) for giving us such an opportunity that allows us to practice the knowledge we had gained throughout the years of study by implementing it in a real-life situation of problem solving.

PREFACE

The Ronaz Enterprise, which is located in Kuala Lipis, Pahang is a local Small Medium Enterprise (SME) company that has gained high popularity for kuih kasturi products. However, the company has to limit their production because the making of kuih kasturi was run manually. Therefore, UniMAP (specifically DeFOS Research team) has assisted the company in producing machines that are capable of forming kuih kasturi dough and coating it with flour mixture. The proposed mechanism is to combine 3 processes automatically on the same machine; shape, coat and fry the kuih kasturi. First, the beans that are already boiled and cooked is poured into the filling container (tank). Then, the dough which has been removed from the tank is shaped to the desired round-size and compressed using a compressor. The dough will then be placed on a moving conveyor. The dough will move and fall into a tank or container filled with a liquid flour mixture for the coating process making the round dough completely coated. In this flour tank, another conveyor will move the coated dough into a pan filled with hot oil and ready to cook. The results of this project are; 1. System 3 in 1 (Shaping, Coating & Frying) run concurrently to reduce the time and labor of kuih kasturi production, 2. Easy-to-maintain and wash after usage, 3. Proper and optimal machine size on premise, and 4. The process of making the kuih kasturi can be volume up to 1800 pcs per hour by using the machine compared to 180 pcs if produce manually. As a result, the company enjoys nearly 10 times increase in productivity.

1. INTRODUCTION

1.1 Executive Summary

Kuih Kasturi as shown in Figure 1 or also known as Kueh Rengas or Kueh Kacang is a kind of Malay traditional cake. This cake is made from green beans which is boiled, cooked and compressed in a flattened shape, then coated with a layer of flour so that the cake feels crispy when fried. Frying is only done in partially cooked because the product is meant to be frozen food. All these earnings processes are run manually and causing the company cannot cater to the high demand from the customer.

The complexity of the product making of the Kuih Kasturi which includes several processes is one of the factors in limiting productivity. Researchers from Design for Sustainable Research Team (DEFOS) of Faculty of Mechanical Engineering Technology (FTKM), UniMAP proposes an automation process which can increase productivity by combines the process of compressing, coating and frying on one machine. This machine can help to increase the productivity of the company.

Figure 1: Kuih Kasturi

1.2 **Problem Statement**

Companies are experiencing difficulties in producing Kuih Kasturi in consistent size and shape, and the production process is still done manually. This method consumes much time and man power.

In term of technological needs, the company needs a new mechanism to improve the productivity of Kuih Kasturi.

1.3 **Project Objective**

To produce an automated Kuih Kasturi machine which is capable of increasing the productivity of the company by combining the process of forming in constant size, coating of flour and frying process.

2. PROPOSE SOLUTION

2.1 **Project Methodology**

The proposed mechanism is to combine three processes and work simultaneously on one machine; forming, coating and frying the Kuih Kasturi.

First, prepared boiled and cooked nuts will be put into a hopper. The bean removed from the hopper is formed according to the desired round size consistently and is compressed by the compressor. Then the bean paste will be removed and put on the rotating mold. Then the bean paste will be pressed to form in round shape using the actuator press before the bean is shifted over the moving conveyor. The formed Kuih Kasturi will move through the pool or container filled with liquid flour for the coating process to make the bean dough completely coated. The stuffed dough then move into a pan containing hot oil and ready to cook. All of these processes are automated using system conveyer, motor and system actuator as shown in Figures 2 and 3 below.

This proposed Kuih Kasturi automatic machine technology has several advantages, among which;

I. 3 in 1 (Forming, Coating & Frying System) simultaneously can reduce the time and labor of Kuih Kasturi production.

II. Machine that is easy to maintain and clean after use.

III. The appropriate and optimal size of the machine in the premises space.

IV. The resulting output is higher than the manual process (1800 seeds per hour).

V. The specification of the machine is shown in Table 1.

VI. Attachment 1 – Bill of Material Drawing & Attachment 2 – Main Component Drawing.

Figure 2: Automated Kuih Kasturi Machine

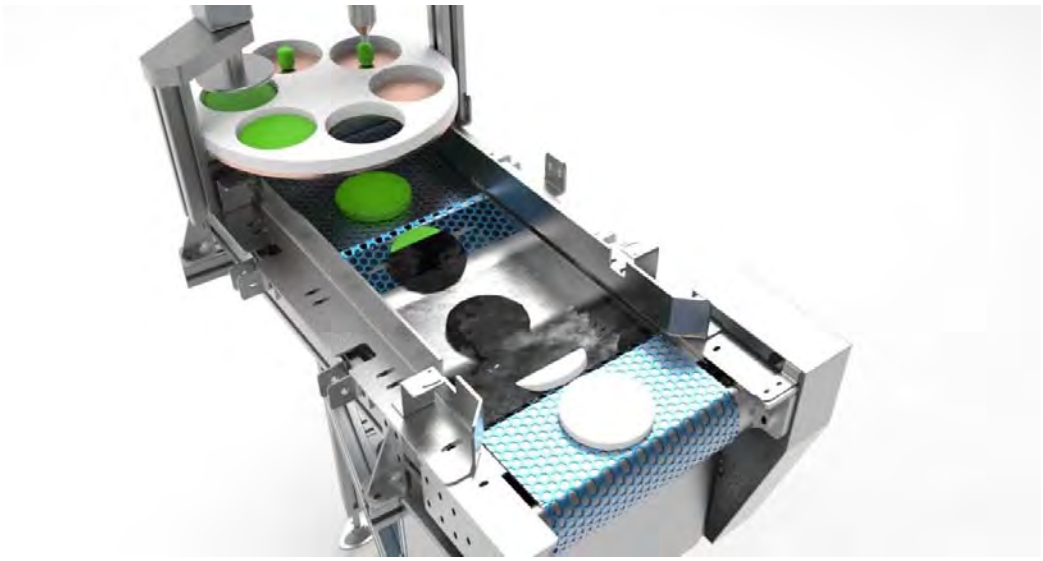

Figure 3: Automated Kuih Kasturi Machine (details)

Table 1: Specification of Machine

Full Description	Automatic Kuih Kasturi Machine
Material	Stainless Streel 304 (Food Grade)
Capacity	20 kg
Power Source Presser	1.1 kW
Voltage	220V
Transferring System	Conveyor Mesh Type
Mould Machanisme System	Linear Actuator (speed 30 mm/s)
Conveyor Speed Range	10 – 30 mm/s (adjustable)
Size	1200 x 370 x 1200 mm
Working Height range	550 – 700 mm
Output	500 pcs/hr
Add-on	Cooking Feature

3. PROJECT SCOPE

3.1 **Milestone Project**

The proposed project development is only focused on the hopper, molding, conveyer system, flour container and frying container.

First phase:

- 4 months
- Machine design conformation process, purchasing of raw materials, equipment and fabrication.

Phase Two:

- 2 months
- Delivery process, test run and monitoring on the premises.

4. PROJECT OUTCOME

4.1 Delivery of the Project

The proposed solution of the problem that has been facing by the industry (Ronaz Enterprise) have been successfully delivered on time based on the milestone projected. Figure 4 shows the actual machine that has been set up in the premise of the company, while Figure 5 shows the installation and delivery with the owner of the company.

Figure 4: Actual Delivered Automated Kuih Kasturi Machine

Figure 5: Installation and Setup