

PROTOTYPE DESIGN COLLECTION

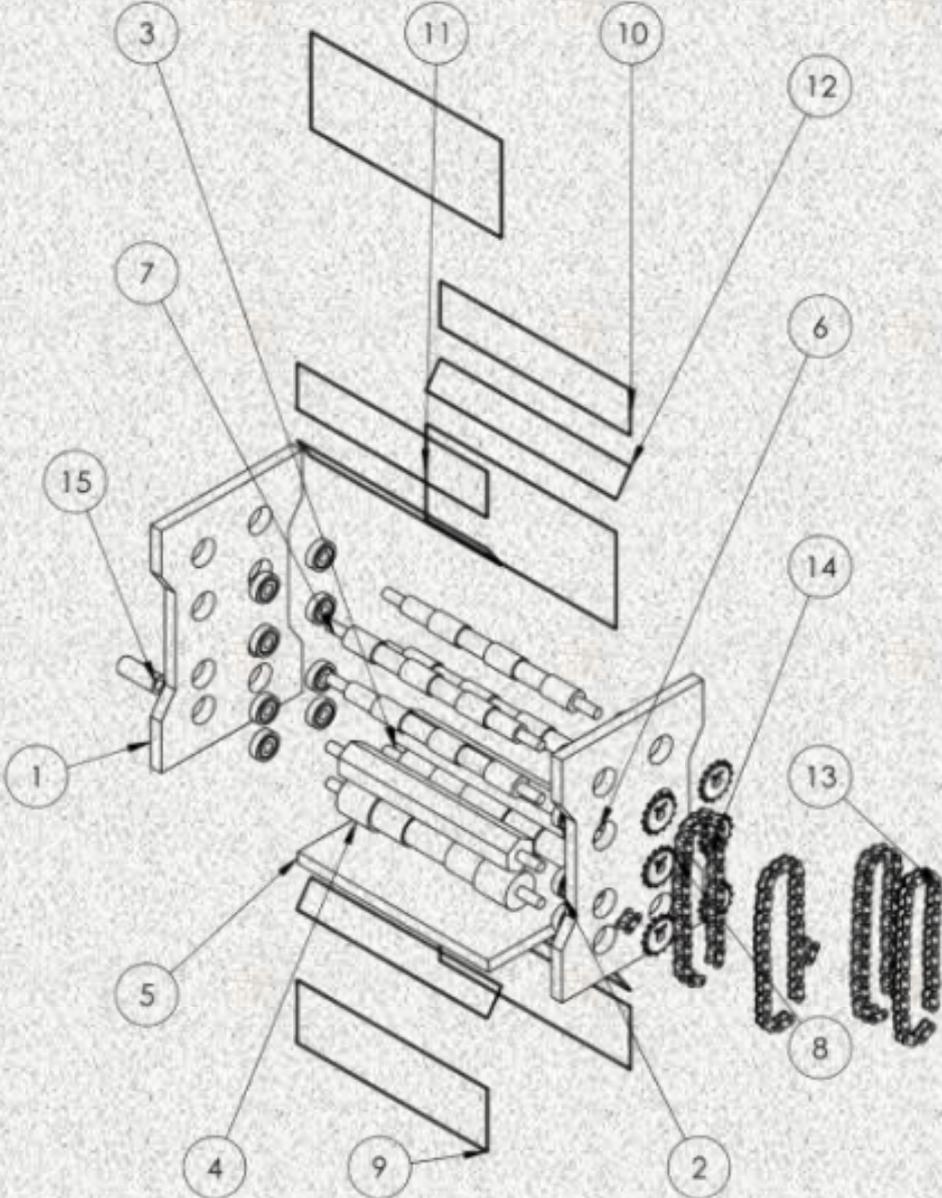
SERIES 4



Universiti Teknologi MARA
Pasir Gudang Campus

Prototype Design Collection

Series 4



Ahmad Najmie Rusli

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PUBLISHER:

Universiti Teknologi MARA
Cawangan Johor Kampus Pasir Gudang,
Jalan Purnama, Bandar Seri Alam, 81750 Masai, Johor
September 2025

eISBN: 978-967-0033-62-4

FOREWORD

This digital book on Prototype Design Collection Series 4 (PDC Series 4) is published as a reference design for mechanical engineering students. The designs presented experience a few phases of analysis before fabrication of prototype. Each project summarises the project description, prototype, figures, and design parameter. The design products vary in tools or equipment for household, workshop, entrepreneur, etc. Suggested material and detail of prototype dimension are also mentioned in this book.

It is hoped that this book will assist the students to have more ideas on innovation design products in the future.

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CHAPTER 13

Coconut Grating Machine

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PROJECT DESCRIPTION

Coconut is a widely used ingredient in traditional and modern cooking. Existing grating methods, however, often pose safety hazards, require high physical effort, involve bulky and expensive equipment. This study addresses the dual challenges of user safety and machine compactness in conventional coconut grating machines. The aim of this project is to design and fabricate a low-cost coconut grating machine that is safe, efficient and suitable for household and small-scale use. The methodology involves a systematic engineering approach comprising conceptual design, material selection and computer-aided design using SOLIDWORKS. Fabrication processes were carried out through a series of operations including cutting, drilling, welding and assembling. A coconut clamping mechanism was incorporated to prevent direct hand contact with the rotating blades and reduce the risk of injury. The machine prototype incorporates a slotted angle bar frame, a 2800 rpm AC motor and a stainless-steel bowl as the grating base. The final prototype demonstrated effective coconut grating performance, user-friendly and improved safety, all in a compact design and at a cost below RM300. In conclusion, the developed machine provides a cost-effective and practical solution for safe and efficient coconut grating. Future improvements in ergonomics and automation could further enhance its performance and support sustainability in household food processing.

Keywords: *Coconut Grating, Low-cost*

PROTOTYPE



DESIGN PARAMETER

