

PROTOTYPE DESIGN COLLECTION

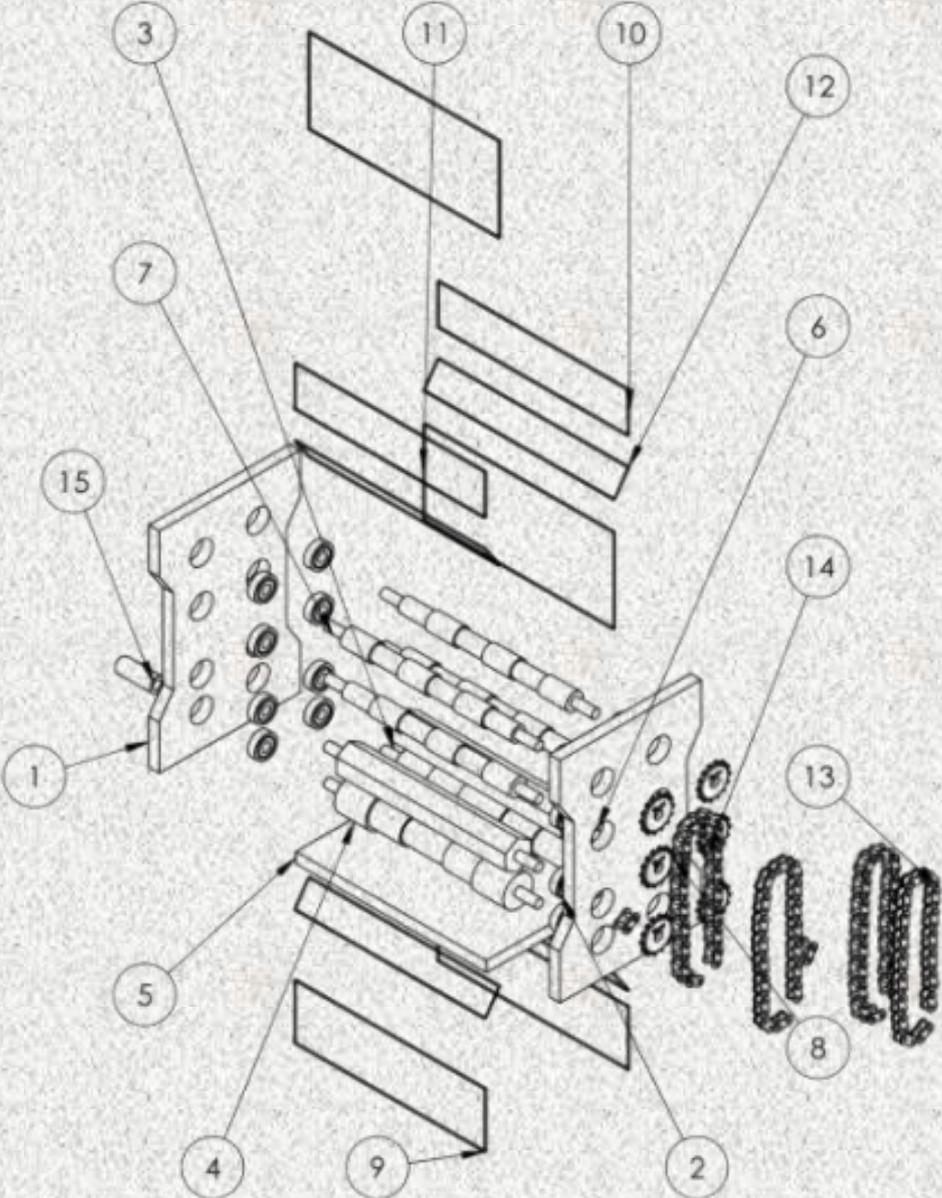
SERIES 4



Universiti Teknologi MARA
Pasir Gudang Campus

Prototype Design Collection

Series 4



Ahmad Najmie Rusli

**Copyright © 2025 Universiti Teknologi MARA Cawangan Johor, Kampus Pasir Gudang,
Jalan Purnama, Bandar Seri Alam, 81750 Masai Johor.**

All rights reserved. No part of this digital book may be reproduced, stored in a retrieval system, or transmitted in any form or by any means, electronic, mechanical, photocopying, recording, or otherwise, without the written permission of the Head of the Centre for Studies, Faculty of Mechanical Engineering, Universiti Teknologi MARA Johor Branch, Pasir Gudang Campus.

CHIEF EDITOR:

Ahmad Najmie Rusli

EDITOR:

Nurul Nadiyah Rasdi

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.

Table of Contents

CHAPTER 1	1
Design and Fabrication of a Multipurpose Baby Cot	1
Nabil Qayyum Bin Roslan ¹ and Miqdad Bin Khairulmaini ^{2*}	1
CHAPTER 2	3
Design and Fabrication of a Weather Sensing Cloth Drying Rack	3
Mustaqim Syah Bin Kamarul Zaman ¹ and Miqdad Bin Khairulmaini ^{2*}	3
CHAPTER 3	5
Design and Fabrication of a Patient Transfer Aid for Seamless Bed to Wheelchair Mobility ..	5
Fateen Aqela Binti Azzaidi ¹ and Miqdad Bin Khairulmaini ^{2*}	5
CHAPTER 4	7
Prototype of a Donut Topping Machine	7
Nurul Athirah Binti Ramizan Nassir ¹ and Ahmad Najmie Rusli ^{2*}	7
CHAPTER 5	9
Prototype of a PLA Filament Extruder	9
Abdul Harith Hazim Bin Abd Rashid ¹ and Ahmad Najmie Rusli ^{2*}	9
CHAPTER 6	11
Prototype of a Candy Sorting Machine	11
Hairul Ikhwan Bin Hazizan ¹ and Ahmad Najmie Rusli ^{2*}	11
CHAPTER 7	13
Prototype of a 3D Printing Scrap Recycling Machine	13
Raziq Amir Bin Rosdi ¹ and Ahmad Najmie Rusli ^{2*}	13
CHAPTER 8	15
Manual Compaction Machine for Casting	15
Muhammad Hazim Md Azli ¹ , Najibah Ab Latif ^{2*} and Ainaa Maya Munira Ismail ³	15
CHAPTER 9	17
Convertible Cart-Ladder	17
Mohamad Aimi Zuhairi Fikri Mohd Aimi Zamani ¹ , Najibah Ab Latif ^{2*} and Ainaa Maya Munira Ismail ³	17
CHAPTER 10	19
Design and Fabrication of Mini Firefighting Device	19
Adam Faris Bin Ahmad Zaidy ¹ and Muhamad Faris Syafiq Bin Khalid ^{2*}	19
CHAPTER 11	21
Design and Fabrication of Shuttlecock Launcher Machine	21

CHAPTER 26

Dry Chili Seed Remover

Muhammad Ariff Bin Murad ¹ and Nur Aini Sabrin Binti Manssor ^{2*}

^{1,2}*Faculty of Mechanical Engineering, Universiti Teknologi MARA Johor Branch, Pasir Gudang Campus, 81750 Masai, Bandar Seri Alam, Johor Darul Ta'zim.*
**Corresponding author (e-mail): nuraini0175@uitm.edu.my*

PROJECT DESCRIPTION

This project presents the design and fabrication of a dry chili seed remover machine aimed at improving the efficiency, safety and hygiene of separating seed from dried chili peppers. Traditional manual methods are labor intensive, time consuming and pose risks of injury. The main objective of this project were to design and fabricate a cost effective prototype suitable for domestic and small scale use. The prototype features a compact design, incorporating a motor powered rotating blade to cut chili peppers and a crank slider mechanism that drives a sieve for seed separation. The machine is constructed using mild steel and stainless steel to ensure strength and food safety. The final prototype, measuring 600 x 270 x 210 mm was successfully tested and demonstrated efficient seed removal with minimal effort and reduced risk of injury. This project offers a practical solution for small food processing operations, promoting productivity, safety and sustainability.

Keywords: *Chili Seed Remover, Agricultural Machinery*

PROTOTYPE



DESIGN PARAMETER

