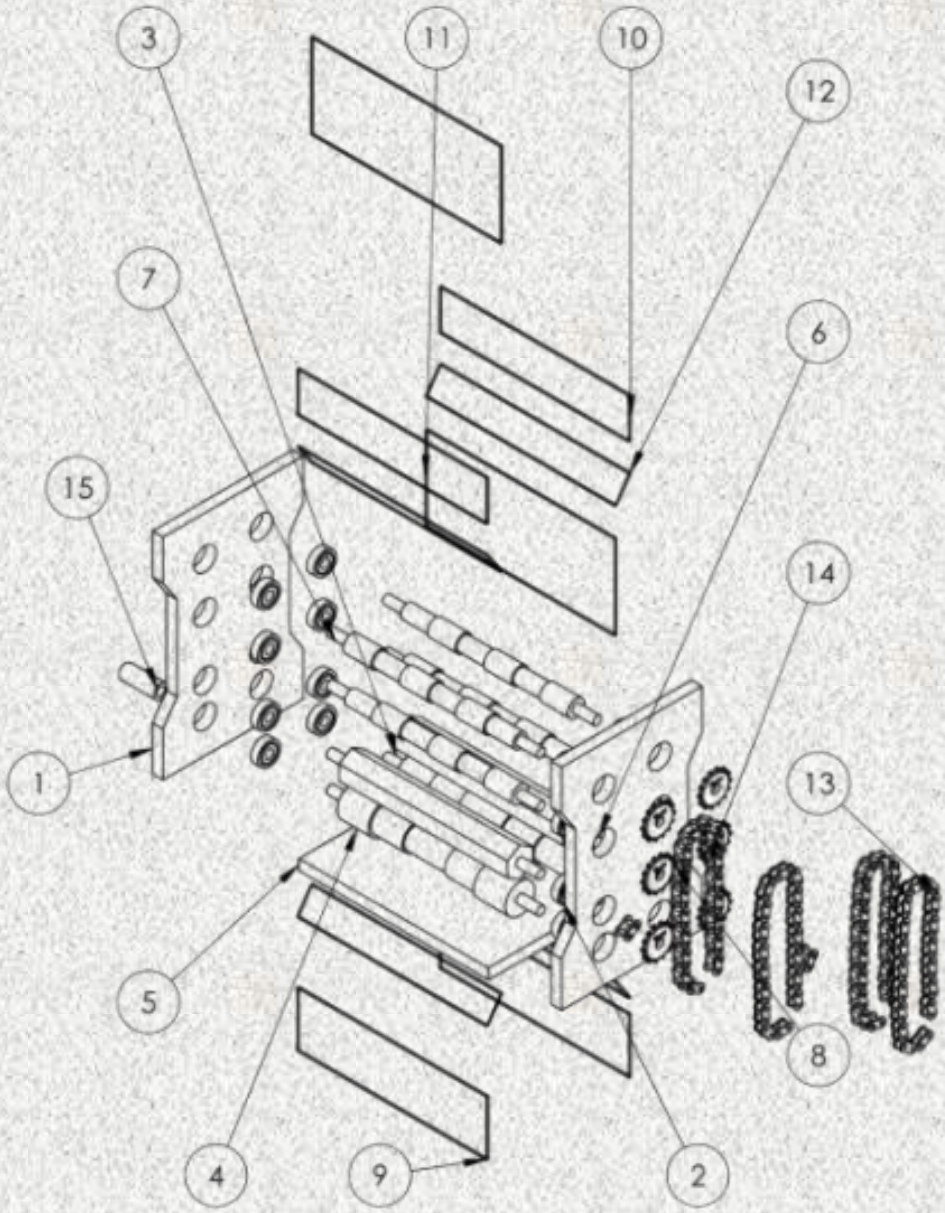
PROTOTYPE DESIGN COLLECTION

SERIES 4

Universiti Teknologi MARA
Pasir Gudang Campus

Prototype Design Collection

Series 4



Ahmad Najmie Rusli

CHIEF EDITOR:

Ahmad Najmie Rusli

EDITOR:

Nurul Nadiah Rasdi

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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 24

Portable Water Filter Device

Muhammad Irsyad Zufayri bin Azhar [1] and Wan Muhammad Syahmi Bin Wan Fauzi [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): wmsyahmi@uitm.edu.my*

PROJECT DESCRIPTION

Access to clean and safe drinking water remains a critical global challenge, especially in remote and disaster-stricken areas. Contaminated water sources pose severe health risks, leading to waterborne diseases that affect millions worldwide. To address this issue, this project focuses on the design and fabrication of a portable water filter device that provides a reliable, cost-effective, and user-friendly solution for water purification. The proposed device utilizes a multi-stage filtration system, including 12V water pump, ceramic filtration and activated carbon to effectively remove impurities, bacteria, and harmful contaminants. The methodology involves material selection, prototype development, and performance testing under different water conditions to ensure optimal efficiency. The design emphasizes portability, durability, and ease of use, making it suitable for outdoor activities, emergency situations, and rural communities with limited access to clean water. The results demonstrate that the device able to improve water quality by reducing turbidity, eliminating harmful microorganisms, and removing odor and undesirable tastes. By offering an affordable and practical solution, this portable water filter device contributes to public health improvements, disaster relief efforts, and sustainable access to safe drinking water. Future advancements may incorporate additional purification technologies and smart monitoring features to enhance usability and efficiency.

Keywords: *Water, Filter*

PROTOTYPE

DESIGN PARAMETER