

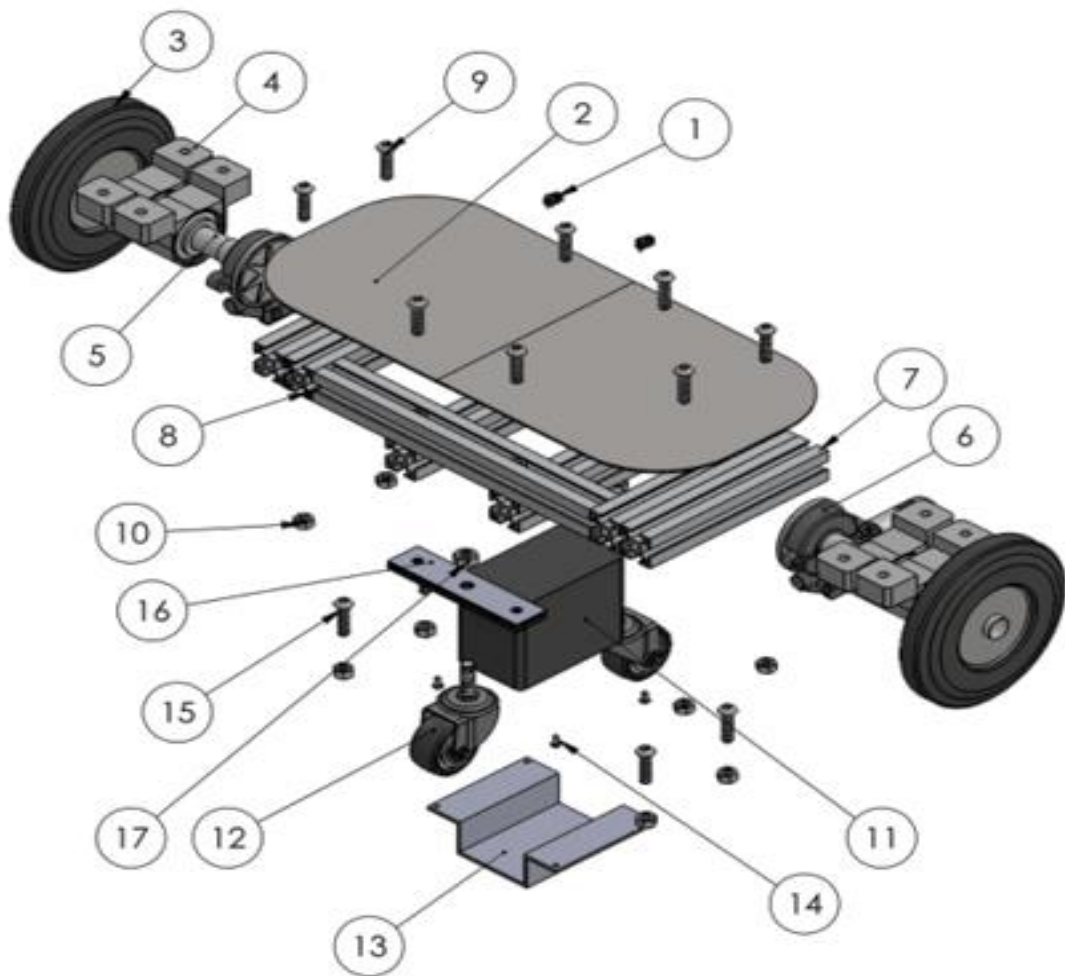
# PROTOTYPE DESIGN COLLECTION

## SERIES 2



# Prototype Design Collection

## Series 2



**AHMAD NAJMIE RUSLI**

**UNIVERSITI TEKNOLOGI MARA CAWANGAN JOHOR  
KAMPUS PASIR GUDANG**

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# FOREWORD

This digital book on Prototype Design Collection Series 2 (PDC Series 2) 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 143

### Design and Fabrication of Semi-Automatic Pestle and Mortar Machine

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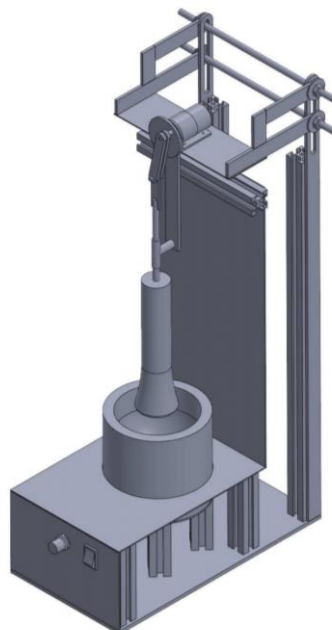
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#### PROJECT DESCRIPTION

The use of pestle and mortar has been a common practice in various fields such as cooking, laboratory research, and pharmacy. However, the traditional method of manually crushing and grinding ingredients using pestle and mortar requires a lot of time and human labour. This problem has motivated the development of a semi-automatic pestle and mortar machine. The problem statement is that the traditional method of using pestle and mortar is laborious and time-consuming. Therefore, the objective of this project is to design and fabricate a machine that can semi-automate the process of crushing and grinding ingredients using pestle and mortar. The methodology used in this project involved the design and fabrication of a reciprocating mechanism that moves the pestle semi-automatically using electricity. The machine was powered by AC supply and incorporated other electric components such as a DC motor and an AC to DC converter. The result of the project was a semi-automatic pestle and mortar machine that could help reduce human labour and save time. The machine was able to convert manual operation to semi-automatic operation, which made the crushing and grinding process more efficient and convenient. In conclusion, the development of a semi-automatic pestle and mortar machine has significant potential in various fields that utilize these tools. This machine can help save time and reduce human labour, which can lead to improved productivity and efficiency.

**Keywords:** *Pestle and mortar, Semi-automated machine, Crushing*

#### PROTOTYPE



**DESIGN PARAMETER**

