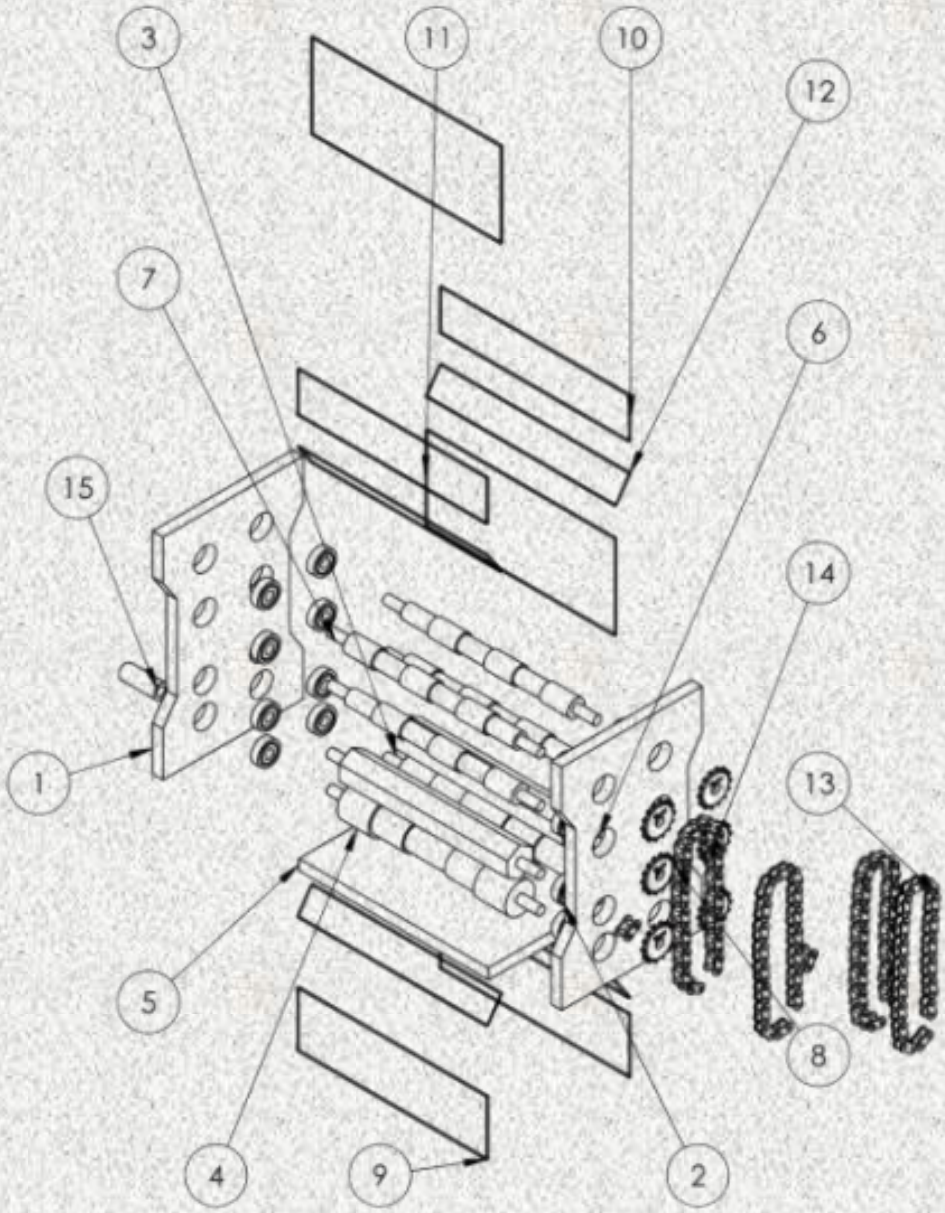
PROTOTYPE DESIGN COLLECTION

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 40

Design and Fabricate Mini Lathe Machine

Nik Daniel Haziq Bin Nik Azman Abadi [1] and Ab Aziz Bin Mohd Yusof [2*]

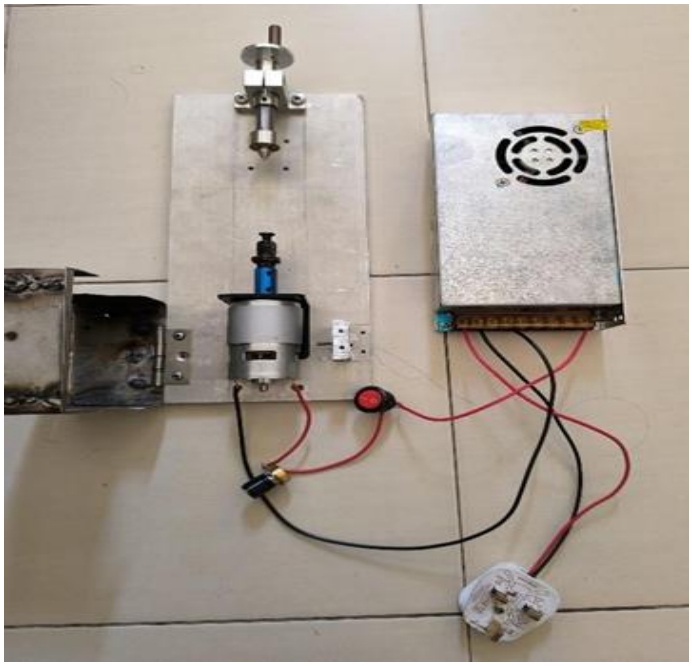
[1,2]Faculty of Mechanical Engineering, Universiti Teknologi MARA Johor Branch, Pasir Gudang Campus, 81750 Masai, Bandar Seri Alam, Johor Darul Ta'zim.
**Corresponding author (e-mail): abaziz86@uitm.edu.my*

PROJECT DESCRIPTION

Lathe machines are commonly used in workshops for various machining operations such as cutting and turning, with different types including CNC, engine, and bench lathes. These machines consist of three main components: the headstock, tailstock, and bed. A key challenge in this project is designing the bed of a mini lathe machine, as it must be sufficiently heavy to stabilize the structure and prevent excessive shifting. The machine will be designed specifically for machining wood, which is softer and easier to shape than metal but produces significant waste in the form of shavings and dust. The project has two main objectives: first, to design a prototype of a mini lathe machine using SolidWorks, and second, to fabricate the machine based on the developed design. Engineering analysis will identify high-stress areas and determine the factor of safety, while detailed design drawings will provide a clear visualization of the machine's components and assembly.

Keywords: *Design and fabrication, Mini lathe*

PROTOTYPE



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DESIGN PARAMETER