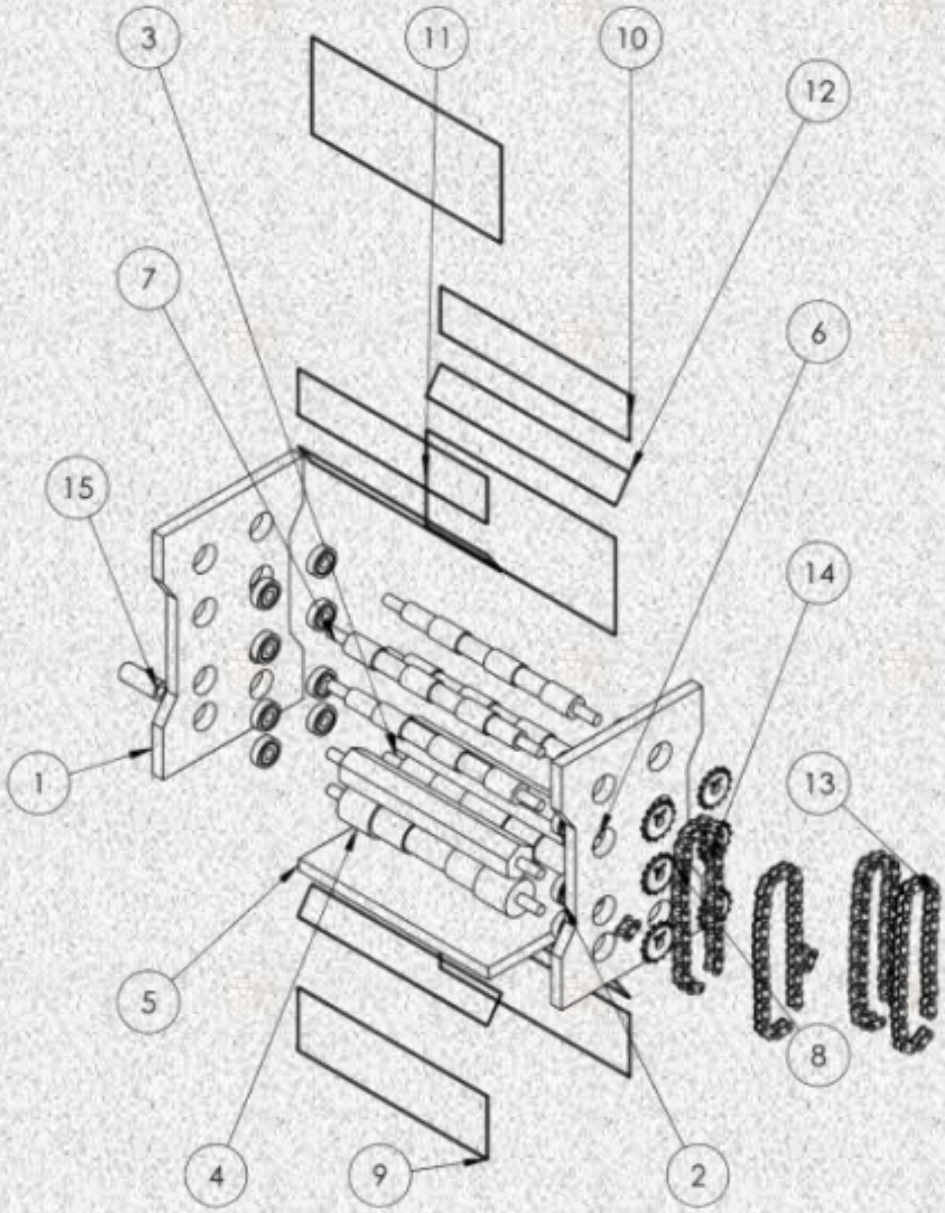
PROTOTYPE DESIGN COLLECTION

SERIES 4

Universiti Teknologi MARA
Pasir Gudang Campus

Prototype Design Collection

Series 4



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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 27

Design and Fabrication of Platform Trolley

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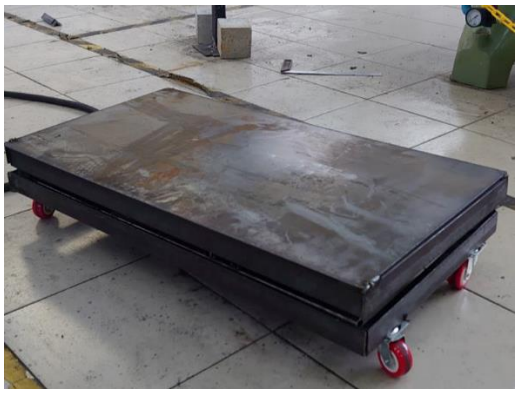
PROJECT DESCRIPTION

Material handling is a critical operation in manufacturing, warehousing, and logistics sectors, where the movement and positioning of heavy loads are frequent. Manual lifting not only reduces productivity but also poses a risk of musculoskeletal injuries to workers. In many small and medium-scale industries, workers are often required to lift and move heavy objects manually, which can lead to physical strain, reduced productivity, and long-term musculoskeletal injuries. This project addresses these issues by developing a manually operated lift trolley that combines both mobility and vertical lifting capability. The primary objective is to design a cost-effective, user-friendly, and durable platform that can be easily maneuvered and adjusted in height without the use of electrical power. This makes the system especially suitable for environments where electricity is limited or where powered lifting devices are not economically feasible. The problem being solved is the lack of affordable lifting equipment that offers both transportation and vertical lift functionality in a compact form. The proposed trolley incorporates a scissor lift mechanism actuated by a mounted on a wheeled base for easy movement. The design process involves detailed CAD modeling, selection of appropriate materials such as mild steel for structural strength, and fabrication using welding, cutting, and machining techniques. The platform is reinforced to ensure stability during load lifting, while swivel caster wheels with brakes are added for enhanced control and safety.

Keywords: *Keyword 1, Keyword 2*

PROTOTYPE



DESIGN PARAMETER