

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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CHIEF EDITOR:

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CONTENT EDITORS:

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Norhisyam Jenal

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Radzi Abdul Rasih

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Tel: +60 7-381 8493

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 76

Combined Soil Preparation Machine of Plowing and Crop Boundaries for Smallholder Agriculture

Lutfil Hadi Bin Suhaimie ¹, Ab Aziz Mohd Yusof ^{2*} and Kamariah Md Isa ³

^{1,2,3}*Mechanical Engineering Studies, College of 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

The project is called a combined soil preparation machine of plowing and crop boundaries in agriculture for farmers. The main objectives of this project are to fabricate a physical prototype of the machine that can plow with the alternative blades and to design and improve a machine model that can use a rake and shovel while making crop boundaries. By replacement of the blade, farming can be more efficient because it only uses one machine. The project was started by designing the machine using Solidworks before proceeding with structural analysis to see the strength of the proposed design. The fabrication then proceeded to fabricate the component using measuring, cutting, grinding, and welding. The blade has two alternatives which are rake-type and shovel-type blades. The rural area with poor conditions is the target for this project. This project aims to make a machine cheaper than other available products and has a multi-tasking purpose. The project is trusted to help small farmers farm more efficiently. To conclude, the project's performance needs to be achieved by the fabrication process and material applied in this project.

Keywords: *Soil preparation, Plowing, Crop boundaries*

PROTOTYPE



DESIGN PARAMETER

