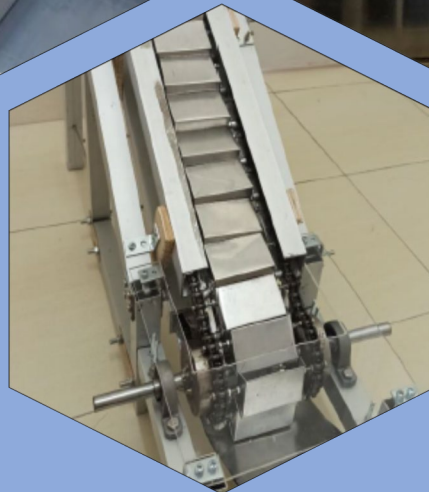


PROTOTYPE DESIGN COLLECTION

SERIES 1



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CHAPTER 62

Mini Agriculture Shovel with Cutter

Muhammad Izzat Shamsul Bahri and Najibah Ab Latif

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PROJECT DESCRIPTION

The project will help people to spend less on agriculture tools as this mini agriculture shovel with a cutter is a multipurpose tool and it will not be a problem to store as the product is compact and portable. The objectives of the project are to design a mini agriculture shovel with a cutter and to analyse the mechanical systems involved in the product. The product was designed firstly with a concept design sketch and later on proceeded to be finalised using SolidWorks software. After researching on how to fabricate the finalised design, the material of the product was then chosen as well as the price of raw materials were surveyed. Then, the product was fabricated using grinding, drilling, hammering, and other machining techniques. The fabricated working prototype was able to do two tasks which are shovelling work and cutting work. After a few testing of its functions, the product has its advantages as well as disadvantages. The advantages of the product is that it is a multipurpose product, user friendly, and cost saving. Meanwhile, the disadvantages are it requires force to do cutting work and it is only able to do light shovelling work. The design of the product plays a big role for the mechanical systems of the product to work properly. This is why there are optimum parameters that need to be considered when designing the product. After considering all the parameters, the product was fabricated and it achieved the objectives of the project. Some improvements can be applied to the design of the product to increase the quality such as make the shaft cylindrical instead of flat and add spring to the design of the product.

Keywords: *agriculture, cutter, shovel, mini*

PROTOTYPE



DESIGN PARAMETER

FAKULTI KEJURUTERAAN MEKANIKAL (FKM) UNIVERSITI TEKNOLOGI MARA (UITM) JOHOR KAMPUS PASIR GUDANG				
Course Name	MEC300 - FINAL YEAR PROJECT 2 SESSION; OCTOBER 2021 - FEBRUARY 2022			
Group	J4EM1105H			
Approved	Checked	Drawn MUHAMMAD IZZAT 25/2/2022		
Drawing Title	ASSEMBLY OF MINI AGRICULTURE SHOVEL WITH CUTTER			
Part Name	-			
Part No.	-			
Rev.	Scale	Projection	Weight	Sheet
0	1:2		1.0 kg	1/2

BILL OF MATERIALS (BOM)			
Part No.	Part Name	Description	Qty.
1	Shovel blade & shaft (Right)	603.61mm x 157.42mm x 2mm	1
2	Shovel blade & shaft (Left)	603.61mm x 157.42mm x 2mm	1
3	Screw for shaft	12mm x 10mm (diameter)	1
4	Nut	4mm x 10mm (diameter)	5
5	Shovel handle	125mm x 32mm x 15mm	4
6	Screw for handle	34mm x 10mm (diameter)	4
7	Screw for handle joint	34mm x 7mm (diameter)	1
8	Joint	105mm x 34mm x 42mm	1

FAKULTI KEJURUTERAAN MEKANIKAL (FKM) UNIVERSITI TEKNOLOGI MARA (UITM) JOHOR KAMPUS PASIR GUDANG				
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Approved	Checked	Drawn MUHAMMAD IZZAT 25/2/2022		
Drawing Title	ASSEMBLY OF MINI AGRICULTURE SHOVEL WITH CUTTER			
Part Name	-			
Part No.	-			
Rev.	Scale	Projection	Weight	Sheet
0	1:3		1.0 kg	2/2