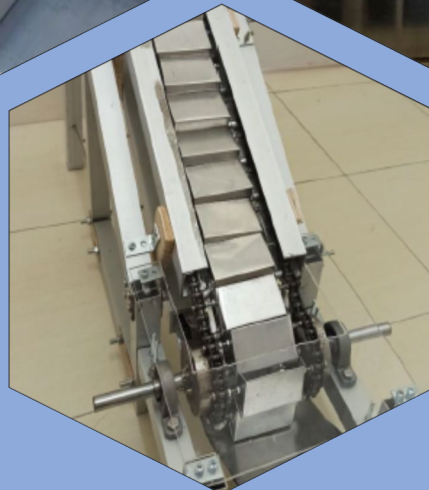
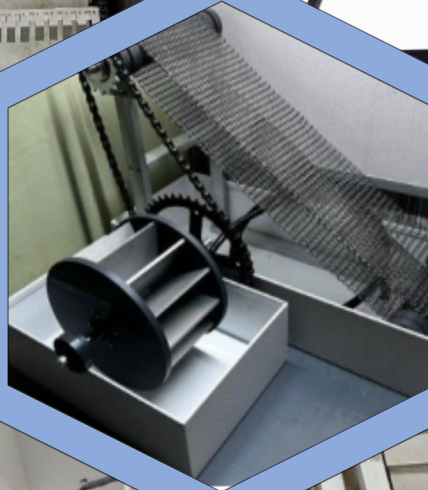


PROTOTYPE DESIGN COLLECTION

SERIES 1



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CHAPTER 96

Design and Fabrication of a Portable Hack Saw Machine

Danish Haikal Bin Mohamad Hamzani and Miqdad Bin Khairulmaini

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PROJECT DESCRIPTION

One of the most common fabrication processes used when entering a workshop is woodcutting. Woodcutting can be done manually using a hand saw, or power saw such as the mitre, and circular saw. However, purchasing a quality power saw is quite expensive and its availability in workshops is limited. Hence, users will often opt for the conventional method of using a hand saw which can be time-consuming and requires more energy. Furthermore, the quality of work might be affected if the process is done repeatedly due to human fatigue and loss of focus. The objective of this project is to design and fabricate a prototype for an automatic and portable hack saw machine which can replace the conventional method for woodcutting and be an inexpensive alternative to power saws. Designing the product includes comparative benchmarking with current woodcutting tools, producing, and evaluating conceptual designs using the morphological chart and Pugh chart respectively. Design drawing was done using the Solidworks software. To fabricate the prototype, proper material selection and machining processes such as cutting, drilling, and welding, were carried out. The outcome of this project is a prototype that would help ease woodcutting by reducing the time and energy required. The quality of work achieved when using the product was also not affected by human factors such as tiredness. Cost analysis conducted for this product showed that the production price is very competitive when compared to currently available power saws. Thus, the product will provide a cheaper and more viable alternative tool for woodcutting.

Keywords: *Wood, cutting, automatic, hack saw*

PROTOTYPE



DESIGN PARAMETER

BILL OF MATERIALS (BOM)			
Part No.	Part Name	Description	Qty.
1	Main Body	850mm x 41mm x 18mm	1
2	Sonoff Switch Wifi	86mm x 38mm x 24mm	1
3	AC/DC Converter	77mm x 35mm x 108mm	1
4	Vice Clamp	134mm x 126mm x 48mm	1
5	Power Window Motor	174mm x 29mm x 125mm	1
6	Supporting Wall	130mm x 72mm x 300mm	1
7	Crank Shaft	350mm x 3mm x 20mm	1
8	Handle	45mm x 22mm x 1000mm	1
9	Hacksaw	410mm x 10mm x 102mm	1

FAKULTI KEJURUTERAAN MEKANIKAL (FKM) UNIVERSITI TEKNOLOGI MARA (UITM) JOHOR KAMPUS PASIR GUDANG				
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Group: J4EM1105L				
Approved:	Checked:	Drawn: ENJITH HADZAL-EDY HICOMAD HADZAT 12022		
Drawing Title: EXPLODED ASSEMBLY OF PORTABLE HACKSAW MACHINE				
Part Name: -				
Part No.: -				
Rev.:	Scale:	Projection:	Weight:	Sheet:
0	1:7	-	15.0kg	2/11