UNIVERSITI TEKNOLOGI MARA

DEVELOPMENT OF A PROTOTYPE PORTABLE AUTOMATIC HAMMER

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ABSTRACT

A hammer is an old, time-tested way of delivering a huge force onto a surface. Whether it is to insert a fastener to join two separate pieces of object together, or to shape a hard and ductile surface like metal, or even to be used a weapon to bludgeon one's enemy, a hammer is a reliable way to generate a huge amount of force in a small package. However, as such tool offers that amount of force, it also comes with a problem in which there are no safety measures to reduce the chances of injury such as breaking one's finger or nail when using the hammer. Hence, the objective of this project is to reduce such injury while also reducing the amount of time needed to hammer a fastener such as a nail. Methodologies used for this project will be designing the product using Solidworks to design and propose a concept that is able to achieve such objective.

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INTRODUCTION

1.1 Background of Study

Innovation is the pinnacle of the human mind. Ever since mankind first found a way to light a fire, innovation never stops. From the ancient civilization of Mesopotamia to the modern civilization of the 21st century, mankind has innovated and engineered a lot of machines that have either helped with food production, cultivation, building of habitation space or even destroy lives. Among the ingenious devices that have been created from the intellect of the human brain, a hammer is one of them. A hammer is a tool consisting of a piece of metal with a flat metal end that is fixed onto the end of a long, thin, usually wooden handle, used for hitting things [1]. The hammer is one of the simplest yet is also one of the most significant tools in product manufacturing. From forging a sword for use in a war to building high-rises and aircrafts, the hammer helps to deliver a huge amount of force in a small area to shape or bend the materials or securing it with the use of a fastener such as a nail.

The problem with a traditional hammer is that it offers no safety protection to the user. The user is prone to being injured in the fingers due to misaiming the hammer trajectory, injuring their foot due to their grip slipping or worse, damaging the materials that they are trying to connect with nails. Users who have zero experience with hammering are also usually unable to gauge their strength and as a result, either miss their aim entirely, or being unable to provide sufficient force to properly secure the nails, or misalign their nails, or even hitting the nails too hard that it becomes wedged into their materials.

As it is primitive in nature, which is to say a hammer is just a tool used in conjunction with the motion of swinging back and forth to force materials to bend to one's will, the logical next step in innovating the hammer is to automate the process of hammering. It should also be noted that making it portable and easy to use is of the utmost importance so that beginners can use the product with the same efficiency as those who are experienced with traditional hammering.