DESIGN FOR ASSEMBLY (DFA) ON GINTELL MASSAGER

NURAIZURA BINTI ABU BAKAR

2007271126

A thesis submitted in partial fulfilment of the requirements for the award of Bachelor Engineering (Hons) (Mechanical)

Faculty of Mechanical Engineering

Universiti Teknologi MARA (UiTM)

MAY 2010

"I declared that this is the result of my work except the ideas and summaries which I have clarified their sources. The thesis has not been accepted for any degree and is not concurrently submitted in candidature of any degree."

Signed : .....

Date : 17/5/2010

Nuraizura binti Abu Bakar

UiTM No: 2007271126

ACKNOWLEDGEMENT

Firstly, my praise to the Almighty for His benevolence and generosity in giving me the knowledge, strength and determination to complete my thesis successfully. His guidance allows me an easy road in completing my final year project and I will be forever thankful.

A very big thank you to my supervisor, Mr. Wan Emri bin Wan Abdul Rahman for all his help. The guidelines he provided, his advice, patience and understanding allowed me to produce a thesis that was essential in order for me to obtain my bachelor degree. I truly appreciate all his help and I could not have asked for a greater, more charismatic supervisor.

Finally, my final year project could never have run as smoothly as it has without the support of my family and friends. My parents and sisters supported me a lot mentally whilst my friends gave all the physical support that they could. I am forever grateful. Thank you.

ABSTRACT

Most of the products available in the market today are assembled units. Designers tend to focus on the functionality of the product as well as the ease of manufacture of individual components and parts. Aspects of design such as ease of assemble is often forgotten during product design and development. Problems during assembly of product can be very costly. Given the underemphasize on assembly design, this project examines the design of a Gintell Massager using Design for Assembly (DFA) methods. DFA recognizes the need to analyze each part assembly and the assembly of the whole product at an early stage of the design process. The main idea of DFA is to simplify the product so that the assembly cost is reduced. As a result of this, the quality and reliability of the product is increased, and production equipment and part inventory is reduced. This study will focus on the current design of the Gintell Massager and finding ways to improve the design; reducing parts and using common materials and comparing both designs to see the effects of DFA. In order for the parts to be analyzed, Computer Aided Design (CAD) software will be used to produce the current design drawing as well as the improved design drawing. A DFA method will be chosen to be performed on the Gintell Massager design. The result of the study will be used to make improvements on the design of the massager. Finally, comparisons will be made are based on number of parts, cost of assembly, assembly time and design efficiency. The targets of improvements are to reduce parts from 133 parts to 108 parts, reduce the operation time from 1073.5 seconds to 999 seconds, reduce assembly cost from RM 1.12 to RM 1 and increase design efficiency from 34.09% to 40%.

TABLE OF CONTENTS