DESIGN OF AN AUTOMATED PUNCHING SYSTEM FOR REFRIGERATOR DOOR MANUFACTURING PROCESS

Master of Science dissertation

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DESIGN OF AN AUTOMATED PUNCHING SYSTEM FOR REFRIGERATOR DOOR MANUFACTURING PROCESS

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by

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DECLARATION

The work submitted in this dissertation is the result of my own investigation, except where otherwise stated.

It has not already been accepted for any degree, and is also not being concurrently submitted for any other degree.

UOM Verified Signature

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G.T.Galagedarage

15-02-2011

We/I endorse the declaration by the candidate.

UOM Verified Signature

Dr.Udayanga Hemapala.

CONTENTS

Abstract

Regnis Lanka (PLC) is a leading manufacturer in Refrigerators, has identified a bottle neck in its manufacturing process of Refrigerator doors. There is a semi automated Hydraulic punching machine which consumes one operator for metal sheet feed in, positioning and feed out after been punched. This consumes about 40 seconds to complete a single punched sheet and it has reduced the total capacity of the whole manufacturing line to 500 Refrigerators per a shift. Factory is in the position of automating the door manufacturing system nearly to double the capacity by reducing the punching cycle time.

As a part of the project to fulfill the requirements of an automated punching system, A 3-DOF magnetic gripper mechanism for metal sheet feed in, positioning & feed out of the sheet from punching machine along with a sheet input bay to support all the 3 degree of movements of the sheet is designed. A controller with Control logic is designed for all mechanical movements. The verification of controller was done by MATLAB for analysis and physical model been created by SOLID WORKS.

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