

# **COIN SORTER AND COUNTER MACHINE**

**A Project Study presented to the Faculty of the  
COLLEGE OF ENGINEERING, ARCHITECTURE & TECHNOLOGY  
DE LA SALLE UNIVERSITY DASMARIÑAS**



**In Partial Fulfillment  
Of the Requirements for the Degree of  
Bachelor of Science in Mechanical Engineering**

**By:**

**Bautista, Ramon P.**

**Cartalla, Vergel V.**

**Figueroa, Leo Manuel II S.**

**Gonzaga, Angelo Troy D.**

**Sobremonte, Reymon G**

**MARCH 2011**

## **Abstract**

This project study provides a framework on the operational procedures of a coin sorter and counter machine. This was intended to aid the "Piso Para sa Iskolar" project, local churches, and other foundation and establishments that have to go through the process of sorting and counting coins. The method used in this project is the combination of a gravity rail equipped with electromechanical solenoids and photoelectric sensors.

The development and construction of the coin sorter and counter machine followed the following processes: Planning (Sketching, Dimensioning and estimating the average capacity of coins that will be sorted); Programming and Fabrication (Includes the basic framework and construction, significance of each material to each other and as well as the bill of materials from canvassing to furnishing of aesthetics.); Performance testing (Data gathering, Experimentation, Setting of limits, troubleshooting, testing by different batch of specific amount and number of coins and accuracy testing).

The accuracy of the fabricated coin sorter and counter machine in sorting and counting of coins increases when the feeding rate of coins and capacity of the machine decreases. The finalized coin sorter and counter machine rated at 28 coins per minute achieved an accuracy of 98%.

## Table of contents

Title Page.....	i
Approval Sheet.....	ii
Acknowledgement.....	iii
Abstract.....	iv
Table of contents.....	v
Chapter I	
Introduction .....	1
Background of the Study.....	1
Statement of the Problem.....	2
Significance of the Study.....	2
Scope and Limitation.....	3
Chapter II	
Review of Related Literature.....	4
Theoretical Framework.....	9
Components of the Machine.....	13
Definition of Terms.....	15
Chapter III	
Methodology.....	16
Conceptual Paradigm.....	16
Performance Specification.....	21
Technical Specification.....	21
Chapter IV	
Presentation of Data and Results, and Analysis.....	18
Chapter V	
Conclusions .....	38
Recommendations.....	39
Appendices	
Appendix A: Sample Computation.....	40
Appendix B: Bills of Materials.....	43
Appendix C: Costs of Fabrication and Labor.....	44
Appendix D: Machine Specification.....	44

Appendix E: Machine Component Specification.....	45
Appendix F: Micro-Controller Programming Code (PIC16F87x)..	48
Appendix G: Operating Procedures.....	56
Appendix H: Trouble Shooting.....	57
List of Drawings	
Drawing 1: Isometric View.....	58
Drawing 2: Orthographic View.....	59
Drawing 3: Relay Diver Schematic Diagram.....	60
Drawing 4: Micro Controller Flow Diagram.....	61
Drawing 5: Pin Assignment for PIC16F877A.....	62
Drawing 6: Wiring Diagram for PIC16F877A.....	63
LCD Schematic, Relay Schematic, Relay Positioning.....	64
List of Tables	
Table 2.1 Physical Properties of the current Philippine Coins.....	4
Table 2.2 Properties of the current Philippine Coins.....	5
Table 4.1 Coin Sorting and Counting of 65 Pieces of coins Totaling to Two Hundred (200) Pesos.....	23
Table 4.2 Coin Sorting and Counting of 72 Pieces of coins Totaling to Two Hundred (200) Pesos.....	23
Table 4.3 Coin Sorting and Counting of 69 Pieces of coins Totaling to Two Hundred Fifty (250) Pesos.....	25
Table 4.4 Coin Sorting and Counting of 76 Pieces of coins Totaling to Two Hundred (200) Pesos.....	26
Table 4.5 Coin Sorting and Counting of 14 Pieces of coins Totaling to Fifty (50) Pesos.....	28
Table 4.6 Coin Sorting and Counting of 18 Pieces of coins Totaling to Fifty (50) Pesos.....	28
Table 4.7 Coin Sorting and Counting of 25 Pieces of coins Totaling to Fifty (50) Pesos.....	29
Table 4.8 Coin Sorting and Counting of 50 Pieces of coins Totaling to One Hundred (100) Pesos.....	30
Table 4.9 Coin Sorting and Counting of 34 Pieces of coins Totaling to One Hundred (100) Pesos.....	31

Table 4.10 Coin Sorting and Counting of 38 Pieces of coins Totaling to One Hundred (100) Pesos.....	32
Table 4.11 Coin Sorting and Counting of 95 Pieces of coins Totaling to One Hundred Seventy-Five (175) Pesos.....	33
Table 4.12 Coin Sorting and Counting of 76 Pieces of coins Totaling to Two Hundred (200) Pesos.....	34
Table 4.13 Coin Sorting and Counting of 69 Pieces of coins Totaling to Two Hundred (200) Pesos.....	35
Table 4.14 Coin Sorting and Counting of 82 Pieces of coins Totaling to Two Hundred Fifty (250) Pesos.....	36
List of Figures	
Figure 2.1 Talaris Mach 6.....	6
Figure 2.2 Semacon S-500 Series.....	7
Figure 2.3 RH-850 NEW.....	8
Figure 2.5: Flow Diagram Processes of the Coin Sorter and Counter Machine.....	10
Figure 2.6 Schematic Diagram of Coin Sorter And Counter Machine.....	11
Figure 3.1: Conceptual Paradigm.....	16
Figure 3.2: Galvanized steel sheets arrangement.....	19
Figure 4.1 Coin Dispenser With 8 Holes.....	22
Figure 4.2 Coin Dispenser with 4 Holes.....	25
Figure 4.3 Coin Dispenser with Single Hole.....	27
Figure 5.1 Switching Power Supply.....	45
Figure 5.2 Coin Slot.....	46
Figure 5.2 Schematic Diagram of Coin Slot with Dimensions.....	47
List of Photos.....	68
Curriculum Vitae.....	69