COIN SORTER

Category: Physical Science Group

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ABSTRACT

The design was entitled the Improvised Coin Sorter. As people dealing with the different coin denominations. The extent of the improvised coin sorter cover 5 different coins namely 5 cents, 25 cents, 1 Php ,5Php and 10 Php. The researchers aimed to create an improvised coin sorter that wouldl accurately and efficiently sort the Philippine Peso coins for the benefit of all as it lessens the fatigue that comes with manual sorting.

The sorting part of the design is basically mechanical as it sorts the coins through their physical size.

After performing some tests with the Improvised Coin sorting, the group could say that an almost accurate and reliable machine was created as manifested by the results it made.Improvised Coin sorting has been practical issue in various financial transactions. The arrival of improvised coin sorting machine, people used to count the coins manually. This a very time consuming and tedious job for those who handle the work. Mistakes are common due to various reasons such as; eye tiredness, fatigue, too many coins cause confuses in eyes and etc. It is applied to modern innovative design and it is the device meeting the need in places for many small denominations of currency. The machine has improved labor productivity, and also brought many conveniences to life. Improvised Coin sorting machines have the ability to sort from a random collection of coins into separate bins for different denomination. The concept of the improvised coin sorter is mostly based on the detection of the dimension, weight, edge of credit pulses by using sensors.

A. Introduction

Separating out coins by hand can be exhausting and time consuming. Why waste all of that time sorting and rolling coins when a machine could help you complete that task in half the time? The time you save can then be dedicated to other important tasks that you might not have gotten to otherwise. Time is money, and the less time you have to spend counting and sorting money, the more time you can actually make money.(*Santiago* 2014)

Improvised Coin sorters are incredibly useful tools not only in your personal life, but in your professional life, too. They might be just a small convenience to help you keep track of your spare change at home, but to a business they can provide numerous additional benefits. If you've ever considered getting more financially organized and better at managing your coins,Improvised coin sorters could be the solution you've been looking for. . In fact, one of the major reasons businesses invest in improvised coin sorters is the amount of time saved. Not only that, but improvised coin sorters take a lot of weight off of in-office accounting services. So the whole office will benefit financially from the use of improvised coin sorters.If you work with customer finances and need to process numbers quickly and accurately, a Improvised coin sorting machine is going to be the competitive edge your business needs, especially if you work with physical cash every day. A Improvised coin sorter andallows you to get accurate information to your clients in less time, which can help build customer relationships. (*Torralba. 2008*)

Having a Improvised coin sorter could be the financial solution your business has been looking for.

Statement of the Problem

The study aimed to separate quickly, accurately and reliably Philippine peso coin through an improvised coin sorter in a form of a machine.The Study sought to answer the following questions.

1.What are the advantages and disadvantages in making improvised Coin Sorte?r

2.How much time it took the Improvised Coin Sorter to separate coins in terms of

    a. 5 ₵

    b. 25 ₵

    c. Php 1

    d. Php 5

    e. Php 10

3.How does the improvised coin sorter work?

Significance of the Study

This study is making a improvised coin sorter. It would help to separate coins . This may also help future researchers to make a better improvised coin sorter of their own. Coins are used daily but most especially if you have a dry cleaning store or a general store or any other business for which you get paid for money in form of coins

Scope and Limitations

This project focused on making an improvised coin sorter that separate peso coins from each other. The Improvised coin sorter is not capable for counting and cannot recognized whether the coin is fake or genuine.

Conceptual Framework

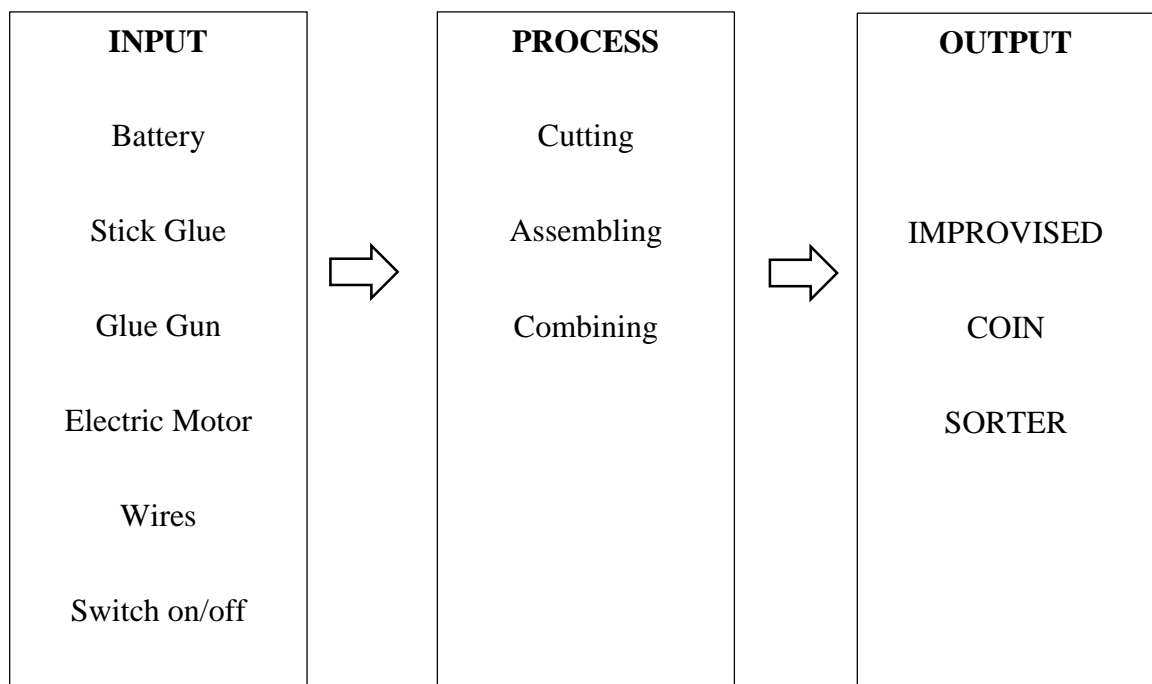| INPUT		PROCESS		OUTPUT
Battery		Cutting		
Stick Glue	⇨	Assembling	⇨	IMPROVISED
Glue Gun		Combining		COIN
Electric Motor				SORTER
Wires				
Switch on/off				

Figure 1.1 Conceptual Framework

The design will sort the coins according to its denomination and size, starting from the smallest to the largest coin. The researchers thought that this is the best way to sort coins.

Definition of Terms

To better understand and clarify the terms used in the study, the following are hereby defined:

Cardboard. This refers to a material made from cellulose fiber (such as wood pulp) like paper but usually thicker

Battery. This refers to a container consisting of one or more cells, in which chemical energy is converted into electricity and used as a source of power.

Wire. This refers to an electronic listening device that can be concealed on a person

Electricity. This refers to a form of energy resulting from the existence of charged particles (such as electrons or protons), either statically as an accumulation of charge or dynamically as a current.

Improvised Coin Sorter. This refers to a device which sorts a random collection of **coins** into separate bins for various denominations.

B. Methodology

The researcher used the following materials when they conducted the experimental design of the project. The first is card board use for the actual structure of the project . The next one is a 9Volt Battery, Electric motor ,Switch and wires ,additional materials were stick glue and glue gun.

First measure how large the coins are in .Once its measured out all the coins you can proceed by cutting approximately 1 inch long holes the width of each coin, then carefully cut out the holes. The next step is to cut out a small piece of cardboard according to coins thickness and glue it to the bottom of the piece with holes in it ,which allows the coins to roll down it and then fall into their corresponding holes. If they all fall into place correctly you can continue and glue on the backside that will help keep the coins in and rolling straight. Apply a small amount of glue on the outside of the connection to avoid making bumps inside where the coins are rolling. Now that both sides of the ramp are glued on cut out pieces of cardboard with rectangles at a slight angle so that they can slide over the ramp and separate the holes of which the coins will eject from. Glue the pieces on and using scissors cut it straight . The chutes will help separate and order the coins into nice piles. Now that the chutes are glued on. Make sure that you keep the chutes flush with the ground in order to keep the proper angle when gluing on the back plate. Before gluing it cut the rectangle down in order to minimize the extra cardboard, then glue it on to the side with the

holes and chute. Create Connection of Battery, Switch and Motor. Then create Outer Box of Given Dimensions and Attach All Components

Your Automatic Coin Sorter Is Now Ready to Use.

The Philippine Peso Coins

10 Peso

Obverse	Apolinario Mabini, Republika ng Pilipinas, 10 piso at year mark
Reverse	Kapa-kapa, BSP Logo
Obverse	Andres Bonifacio, Republika ng Pilipinas, 5 piso at year mark
Reverse	Tayabak, BSP Logo
Material	Nickel-Plated Steel
Coin Edge Profile	Plain
Edge Thickness	2.20 mm
Diameter	25.0 mm

Weight	7.40 g

5 Peso

1 Peso

N	Jose Rizal, Republika ng Pilipinas, 1 piso at year mark
Reverse	Waling-Waling, BSP Logo
Material	Nickel-Plated Steel
Coin Edge Profile	With intermittent reeds
Edge Thickness	2.05 mm
Diameter	23.0 mm
Weight	6.00 g

Obverse	Republika ng Pilipinas, 25 Sentimo, stylized Philippine flag and Year Mark
Reverse	Katmon, BSP Logo

25 Centavo

Material	Nickel-Plated Steel
Coin Edge Profile	Plain
Edge Thickness	1.65 mm
Diameter	20.0 mm
Weight	3.60 g

5 Centavo

Obverse	Republika ng Pilipinas, Stylized Philippine flag, 5 Sentimo and Year Mark
Reverse	Kapal-kapal baging, BSP Logo
Material	Nickel-Plated Steel
Coin Edge Profile	with Reeds
Edge Thickness	1.6 mm
Diameter	16.0 mm
Weight	2.20 g

C. RESULTS AND DISCUSSION

The testing of the design made was very critical since it involved money and required much accuracy and reliability. The results would show if the machine had been successful in its ob1ectives and could help the trade and industry

Test conducted For 1 Peso coins

The purpose of this test was to know if the holes in the machine would exactly fit 1 peso coin and could actually sort it through its physical size. To sort 25 pieces of 1 peso coin, the limit was set to 25 for the first three trials then to 50 for last three trials as well. After, the sample coins were placed, the machine was turned on when the start button was pressed the motor stopped when it reached the set limit.

Table 1 Testing for 1 Peso Coins

P1	LIMIT 25		LIMIT 50	
TRIALS	NUMBER OF COINS	TIME	NUMBER OF COINS	TIME
Trial 1	10	28 sec	25	47 sec
Trial 2	10	25 sec	25	43 sec
Trial 3	10	26sec	25	41sec

Table 1 presents the results of test conducted for 1 peso coins. The limit was first set to 10; then 20 coins were placed for sorting. The results showed that both trial 1 and trial 3 exceeded the limit of 25 but also showed that the machine and actual count

tallied the same number. The average time to sort 1 Peso coins is 26.3. Then the limit was set to 100. It was noticed that there were no errors in the three trials. It would take 43 seconds to sort 25 pieces of 1 Peso coin.

Test conducted for 5 Peso coin

The purpose of this test was to sort 5 peso coins.

Table 2 Testing for 5 Peso Coins

P5	LIMIT 25		LIMIT 50	
TRIALS	NUMBER OF COINS	TIME	NUMBER OF COINS	TIME
Trial 1	10	31	25	47
Trial 2	10	32	25	58
Trial 3	10	29	25	55

As can be gleaned in table 2, all trials have the same number of machine count. Though it exceeded the limit that was set, the machine still provided accuracy satisfactory enough. This happened when large quantity of coins was placed in the machine at the same time that it sorted continuously. However when exact quantity was placed, the machine sorted it accurately.

Test conducted for 10 Peso coins

The purpose of this test was to sort 10 peso coins.

Table 1.3 Testing for 10 Peso Coins

P10	LIMIT 25		LIMIT 50	
TRIALS	NUMBER OF COINS	TIME	NUMBER OF COINS	TIME
Trial 1	10	33	25	45
Trial 2	10	32	25	49
Trial 3	10	35	25	47

Table 3 shows the results of the test for the 10 peso coins. Trial 1 had exact number of coins when the limit was set to 25 and both trial 1 and trial 2 exceeded the limit by 1. Sorting 10 pieces of 10 peso coins requires almost a minute (33.3 seconds). Upon setting the limit to 25 coins.

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Conclusion

The researcher used the following materials when they conducted the experimental design of the project. The first is card board use for the actual structure of the project . The next one is a 9Volt Battery, Electric motor ,Switch and wires ,additional materials were stick glue and glue gun.

The machine, Some of those modifications include changing holes to accept different types of coins, increasing the rate at which you can drop in coins and changing or redirecting the chutes and coin collectors. The sorting part of the design is basically mechanical as it sorts the coins through their physical size

After performing a number of tests and trials on how the Coin Sorting was performed, it can be concluded that a nearly accurate and reliable machine was created as proven by the results taken, though a few errors had occurred in certain trials, the percentage of error was minimal and negligible. The machine can perform its best if the quantity of coins placed is not too massive or heavy because the behavior of coins depends greatly on the amount of quantity placed simultaneously in the machine.

Recommendation

The use of metal   as the primary material for the coin sorter is highly recommended. The use of metal plates will help the product to be stable and can guarantee the long time quality of the said product. An improvement on the sorter's

noise production is also advisable since the researchers observed that the dropping of the coins results in a loud noise

After finishing the project, the group highly recommends performing further studies on the conducted experiment in order to ensure that the product can really be effective. The coins to be dropped should be tilted as the group proved that this will result in fewer errors like the coins being stuck and dropped in the wrong container.

This will make the product more effective since it can sort all the different kinds of coins. The next group of researchers must also be very hands on., thus resulting in a few minor problems with the size of the holes and the different angles