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“A Coin to Cash Converter Machine”

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ABSTRACT

In today's world human beings are going to use easiest way to fulfil any kind of their requirements. In this paper we are going to propose a machine which can convert the coins into cash. To carry the coins for a big amount, is very difficult, children always save their money in the form of coins, but to carry it for purchasing anything is so difficult. So, the easiest way is, convert these coins into CASH and carry it inside the pocket safely. To buy any thing from market and to pay the bill at any place Cash payment is very easy. The Coin Counter will count the coins and dispatch the amount in the form of Cash (Paper Currency).

Keywords: coin, cash, coin counter

I. INTRODUCTION

Now a day's people are working with machines every time, everywhere. These machines are providing easiness to human being, reducing time, providing safety, calculating fast, transferring the secret data with security, making the brain more active and competent, solving the problems and challenges. In this paper we are going to propose the coin to cash converter machine. It is the best example of mechatronics technology, it uses the knowledge of Mechanical and Electronics Engineering. This machine can be used to convert a large amount of coin into Cash. For this we need a coin counter machine which counts the coin inserted inside it. The coin counter machine made up of a counter, a display unit, a motor, sensors, microcontroller etc. interfaced with cash

dispatching machine which gives the amount in the form of notes denominations.

We are dividing this system into 2 different parts. One part is for electronics requirements and interfacing and another part is for mechanical machine making. The programming of microcontroller, sensors connectivity, Counter, LCD display of count, switching of machine ON and OFF, Keyboard interfacing etc. are the requirements which will be completed in electronics part. Motor controlling, cash counting and cash dispatching is completed by mechanical system.

Block Diagram

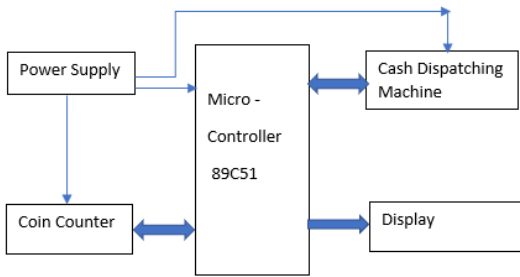


Figure 1. Block Diagram of Coin to Cash Converter Machine

The Block Diagram of Coin to Cash converter machine is shown above. It is having 1 microcontroller 89C51 block for processing and controlling the machine as per the programming. A block of Cash Dispatching machine to dispatch the cash amount by taking command from the microcontroller. Power supply section is there to supply required power to all the units. A coin counter machine is there interfaced with microcontroller to count the coins inserted inside it and give result to microcontroller. The result will be displayed on the display unit. Now let us see the working of each block.

1. Power Supply:

The Power Supply unit is the basic need of this mechanism. To fulfil this need we required 230 V, 50 Hz power supply connected to Cash Dispatching & Coin Counter machines. Microcontroller and one Seven Segment display need 5 V DC supply for which we need one AC to DC power converter. Block diagram of AC to DC Power Supply is given below.

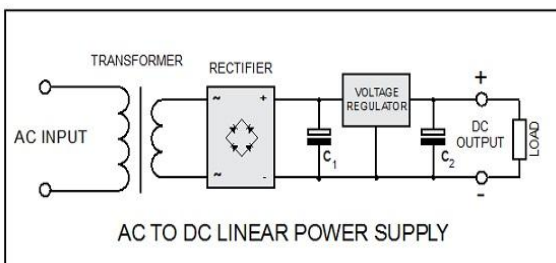


Figure 2. AC to DC Power Supply

For Cash Dispatching and Coin Counter Machines, we can directly connect to the Mains i.e. 230 V, 50 Hz Power Supply.

2. Coin Counter:

A coin counter machine is the combination of hardware and software technologies. To design it we need one tray on which we can pour the coins for counting. Below this tray we have one motor connected with inclined disc, which has some holes. These holes having specific diameter so that the coin of the size of those diameters can be inserted in to the chamber of coin counter machine. If we are making the coin counter machine for INDIA then we can have the sizes of holes for 1, 2, 5 and 10-rupee coins diameter. These holes are connected with infrared light sensor which senses the incoming of the coin through specific hole. The thickness of the coin cuts the infrared light for specific time, which clears, whether the incoming coin is one or two connected with each other. The disc which is connected to the motor and inclined, rotate continuously and the coins will get inserted through it continuously. Now the timing diagram will give the count of coins and this count will be shown on the seven-segment display unit. Here the timing diagram microcontroller and counter works together to display the count. The chamber stores the coin. The outline for coin counter machine is as shown in fig. 3. Below.

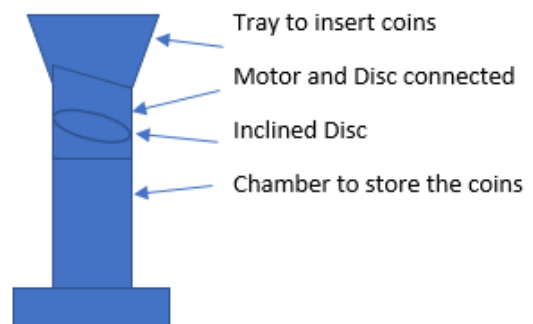


Figure 3. Outline for Coin Counter machine

3. Cash Dispatching Machine:

The Cash Dispatching Machine will work like ATM (Automated Teller Machine). In which the machine can dispatch the amount in the form of NOTES. This machine is connected to the microcontroller to take the command from it. The amount counted by the coin counter machine will be displayed on the display unit through microcontroller. This data will be stored in microcontroller and then given to the Cash Dispatching Machine. The Cash Dispatching Machine then read this data and conclude the result that how much amount has to be dispatched through it. Now the user will press the green button which will be the acknowledgement to the microcontroller to give the amount in the form of cash. The Cash Dispatching Machine will dispatch the amount through it and the user will collect it. Here the user can cancel the dispatching of cash if he will not be ready to take that amount, to round up the amount he or she can insert more coins inside the tray, then the count will get increased and the user can take the notes in the replacement of coins.

4. Microcontroller:

The Microcontroller 89C51 is the controller working on 8-bit data and having 4 I/O ports connected to it. Having 128-byte RAM & 4KB flash programable and erasable read only memory, and requires 5V DC power to work. The Microcontroller 89C51 controls all the activity happening in this proposal. It is connected to the Coin Counter Machine, the Cash Dispatching Machine and the Seven Segment Display too. The arithmetic and logical operations will be executed in the Microcontroller 89C51. The programming will be done for these controlling and dumped in it for step wise execution. Firstly, the coin counter will count the coins and give the signal to the microcontroller, then the microcontroller read this signal and display it on the seven-segment display,

then the user will allow to insert more coins if he or she wants to increase and round up the amount. Once again, the coin counter gives the result of count to microcontroller and it will display the count on the display unit. The memory present inside the microcontroller will store the data of the counting. Now when the user will give the acknowledgement to dispatch the cash the microcontroller will give the signal to the cash dispatching machine to dispatch the amount in the form of notes and the user will collect it.

The block diagram of microcontroller 89C51 is as shown in figure 4. bellow

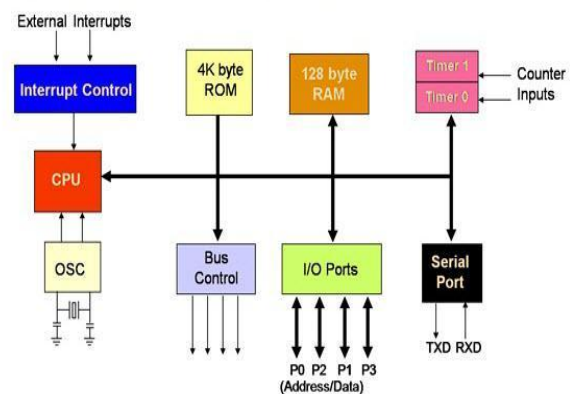


Figure 4. Block Diagram of Microcontroller 89C51

5. Seven Segment Display:

The LCD 16 X 2 Display is used to display the counting result of the Coin Counter Machine. It is also interfaced with microcontroller 89C51. It is more preferable that 7 segment displays and LED display. It can display 16 characters per line, and it has 2 such lines. It also requires 5 V DC supply for working. The pin diagram of LCD Display is as shown in fig. 5. The interfacing of LCD Display is as shown in fig. 6. ahead. Here we have connected 1 LCD Display with Microcontroller 89C51.

[2]. The 8051 Microcontroller and Embedded system using Assembly and C. A book by Muhammad Ali Mazidi, Janice Gillispie Mazidi, Rolin D. McKinlay



Figure 5. LCD Display

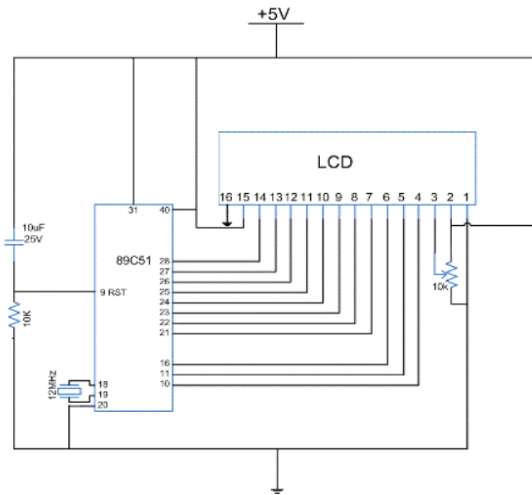


Figure 6. Interfacing of Microcontroller 89C51 with LCD Display

Future Scope:

1. We can interface one DD Dispatching Machine for the easiness to students taking admissions in various institutes.
2. We can convert the Cash in Coins too, which is the requirement of the shopkeepers.
3. In future we can assemble all the machines together so that compatibility and space requirement will be fulfilled.

II. REFERENCES

[1]. Introduction to Mechatronics and Measurement System. A book by David G. Alciatore, Michael B. Histan