Asian Journal of Applied Science and Technology (AJAST)
Volume 1, Issue 4, Pages 12-15, May 2017

Instinctive Paper Peddling Machine with Coin Changer

K.Kavitha[1], A.Sheela[2] and S.Mohamed Nizar[3]

[1]*UG Student, Department of Electronics and Communication Engineering, IFET College of Engineering, Villupuram, Tamilnadu, India.*
[2]*UG Student, Department of Electronics and Communication Engineering, IFET College of Engineering, Villupuram, Tamilnadu, India.*
[3]*Associate Professor, Department of Electronics and Communication Engineering, IFET College of Engineering, Villupuram, Tamilnadu, India.*

Article Received: 25 April 2017 *Article Accepted: 05 May 2017* *Article Published: 08 May 2017*

ABSTRACT

In the present circumstances, make use of papers and its need in the places like educational institutions, government offices, etc. are quite ineluctable. Also, consumers want to reduce time, the case which is essential for them. Acquiring papers in the stationary shop is very difficult during rush hours. In that, the seller is to be conscious on returning the balance amount for each and every one depends on products required for the corresponded amount. In the peddling machines, the consumers have to give the correct amount for their need of the product where the balance amount is not provided if they inserted excess amount. To reduce these problems, the "Instinctive Paper Peddling Machine with Coin Changer" is designed by using microcontroller and sensor where the balance amount is provided if needed depends on the amount inserted. It is inexpensive and used in places to provide the paper with balance amount by the machine. This system reduces the time and manual work of the person needed.

Keywords: Acquiring papers, Instinctive paper peddling machine with coin exchanger, Microcontroller and Sensor.

1. INTRODUCTION

The technologies are becoming developed to compensate the time reduction needed for the people. But, the possibility of reducing the time in all areas is ineluctable. We were concentrating on reducing the manual effort in the stationary shops which makes the seller work free by attentive on other parts of sale. A peddling machine is a machine, which gives out the products like snacks, beverages, lottery tickets, cologne, alcohol, consumer products and even gold and gems to customers instinctively after inserting currency or credits into the machine [2],[3]. For instance, instinctive cool drink peddling machine, ice-cream, water, tea, coffee peddling machine, etc. can be highly determined to influence the shops nowadays.

This reduces the time and also reduces the manual effort need to recognize, search, count and deliver the products along with cash managing. These kinds of peddling machine work based on the use of electronics, mechanical, and electrical engineering, which is collectively termed as mechatronics. But the balance amount for the product is not provided in those machines. In this project, we proposed to design and fabricate an "Instinctive Paper Peddling Machine with Coin Changer" based on the application of mechatronics fundamentals, so as to reduce the time taken to deliver a paper to customers while required quantity and size with the balance amount needed to be provided. It also meets the higher mandate for paper at the peak time such as examination seasons nearby educational institutions and almost everlasting mandate near government offices.

2. EXISTING SYSTEM

In the existing system, paper peddling machine is invented with the mechatronics principles and its fundamentals. When the user inserts the amount of rs1, rs2 the papers are delivered like the count as one, two paper. The number of papers for the related amount are pre-defined [1]. The microcontroller PIC16F877A is used for controlling the power supply and the motors. The use of transformer is to separate the power for the functions of paper roller and the micro-controller.

3. EXISTING SYSTEM BLOCK DIAGRAM

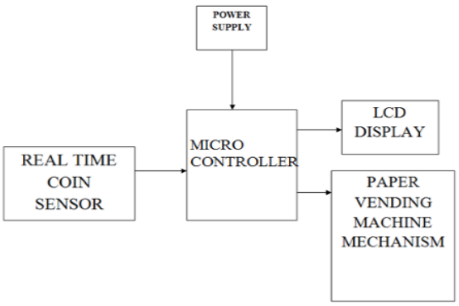

Fig.1 Block Diagram

4. OBJECTIVES

The main objectives of the "Instinctive Paper Peddling Machine with Coin Changer" project are as follows:

- To use mechatronics fundamentals and provide solutions for the fast delivery of paper with coin based dispatch.
- To reduce wastage of time and unnecessary crowding in the stationary shops, especially during examination times.
- To improve the accuracy of the counting of the paper, to exactly meet the number of papers demanded by customers.
- To reduce the persons cautions for inserting money for the products. Because of, here is the solution, which provides the balance amount depends on the quantity of the products.

5. PROPOSED SYSTEM

The "Instinctive Paper Peddling Machine with Coin Changer" works with the application of mechatronics system with the objective to provide automation work control mechanism. It also consists of four units which include

- Coin input unit.
- Processing unit.
- Paper output unit.
- Balance providing unit.

Coin input unit

The coin input unit of the instinctive paper peddling machine with coin exchanger comprises of the components required to receive the coin from the customer and sensing the authentication of the coin.

Processing unit

The processing unit comprise of the components required to ensure the reception of the authenticated coin. It further signals the paper output unit to deliver the number of papers to the customer when insertion of an authenticated coin inside the instinctive paper peddling machine with coin exchanger.

Paper Output unit

The paper output unit comprise of the components required to deliver the paper to the customer. It operates depends on the instruction from the processing unit.

Balance providing unit

Here depends on the quantity needed, the instruction is compared and if the cost of the quantity of product to give the paper using the paper output unit. If comparison with the cost of the product is less than the amount inserted, the balance amount is provided.

Block Diagram

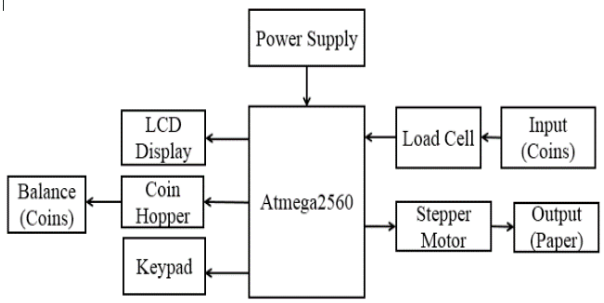

Fig.2 Block Diagram of Proposed System

6. DESIGN OF INSTINCTIVE PAPER PEDDLING MACHINE WITH COIN CHANGER

The instinctive paper peddling machine with coin changer is made by the following components list:

1. Atmega2560
2. DC motor
3. Servo motor
4. LCD
5. Coin Sensor
6. Keypad
7. Roller

Atmega2560

The Arduino Mega 2560 is a microcontroller board based on the ATmega2560. It has 54 digital input/output pins, a USB connection, a power jack, an ICSP header, and a reset button [4]. It comprises of everything required to connect it to a computer with a USB cable or power it with an AC-to-DC adapter or battery to get started.

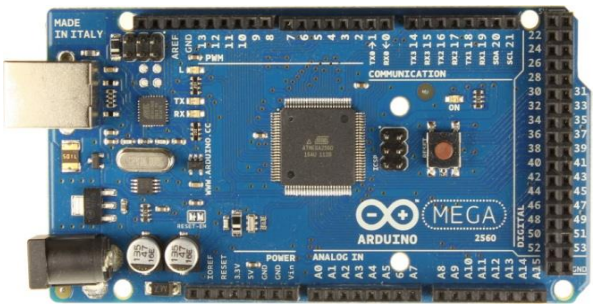

Fig.3 Arduino Mega 2560

DC motor

A DC motor is the most common type of motor [5]. DC motors normally have just two leads, one positive and one negative. If two leads are connected directly to the battery, the motor will rotate. It periodically changes the direction of rotation by the flow of current over the motor. It converts the electrical energy into mechanical energy [6].

Fig.4 DC Motor

Servo motor

Servo motor is the small and light weighted with the high output power [7]. It can rotate approximately 180 degrees (90 in each direction) and works just like the standard kinds but smaller. It is useful for moving the objects from places with feedback & gear box; especially it will fit in small places [8].

Fig.5 Servo motor

LCD

An LCD (Liquid Crystal Display) is a flat panel, an electronic visual display. Liquid Crystals do not radiate light directly. The LCD displays information about the paper needed, coin insertion, balance amount to be dispensed [9].

Fig.6 LCD

Coin Sensor

A load cell is a device that is used to measure weight or force [10]. When a weight is applied to it in a specific manner, a load cell produces an output signal that is proportional to the applied weight. Strain gage load cells are at the heart of the majority of weighing measurement devices produced today. One end of a load cell is typically supported on an inelastic structure while the other end supports a load-receiving device through which the load is applied [11].

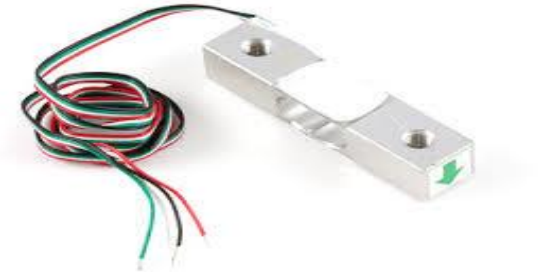

Fig.7 Load Cell

Keypad

The 16 button keypad provides a useful interface component for the microcontroller. For interfacing, 8- pin access to the matrix [12],[13].

Fig.8 Keypad

Roller

The laser printer roller is used for the paper delivery operation. To control the paper delivery process, the coil is used where the power supply over it regulates the paper driving function [14].

Fig.9 Roller

7. WORK PLAN

The working of the paper peddling machine with coin changer can be explained in the following stages:

Stage 1:

The first stage of operation is giving pulse, corresponding to the amount of coin inserted. When the coin is inserted into the coin inlet, the load cell used to determine genuineness and value of the coin based on a weight of the coin inserted and providing a pulse to the Arduino mega.

Stage 2:

After determining the value of a coin, the LCD display "Enter the number of paper need". Here the customer needs to enter their required paper count through the keypad and the entered required paper count is read by the Arduino mega.

Stage 3:

After inserting the genuine coin and getting the information about required paper count, Arduino mega calculate the balance amount by comparing the value of coin inserted and the required paper count.

Stage 4:

Arduino mega sends an electrical pulse to the DC motor to dispense the paper as per the required paper count. The DC motor drives paper roller setup such that the first paper would be delivered out first.

Stage 5:

Arduino mega sends an electrical pulse to the servo motor based on the balance amount, this balance amount is calculated from the comparison of inserted coin value and required paper count. Here two servo motors are used, one for providing 1 Rupee coin and another for providing 2 Rupee coin.

Note:

The overall setup designed to deliver one paper for 1 Rupee and two papers for 2 Rupee. If the balance amount is 3 Rupee, then Arduino mega will send a pulse to both servo motor (servo motor for 1 Rupee and for 2 Rupee).

Advantages

The advantages of this paper peddling machine with coin changer are the following:

- The manual effort is reduced at large.
- The accurate paper count delivery leads to less time consumption.

- Balance amount is provided when the excess amount is inserted for their paper need.
- The use of approximate coins for acquiring paper is allowed for the consumers which reduce their tension for searching exact amount.

8. FUTURE ENHANCEMENT

The limitations for the instinctive paper peddling machine with coin changer is overcome by the future approach:

- The fake coin detection is contributed by FGPA kit. Also the coin acceptor module is used for the fake coin rejection.
- Further this project will be developed for using the currency papers in the peddling machine.

Applications

This instinctive paper peddling machine with coin changer is used in places such as:

- Government Offices
- Educational Institutions
- Stationary Shops

9. CONCLUSION

Even though many peddling machines are available, the peddling machine with the dispensing of balance amount is not available. This system introduces the Instinctive Paper Peddling Machine with Coin Changer. Here, the time and human effort are reduced where the consumer is free to use the approximate amount for the paper.

REFERENCES

[1] Kamalanathan.P, Irshath Ahmed. R, Mohamed Aamir. M "Automatic paper vending machine" *International Journal of Science, Engineering and Technology Research (IJSETR)*, Volume 4, Issue 4, April 2015.

[2] S.Sukhumar, B.Sinduja, G.Rajkumar, N.Divya, T.Devika, N.Suthanthira Vanitha "A Novel Approach of Automation in Ticket vending Machine Using ARM Processer" *International Journal of Engineering Trends and Technology (IJETT)*, Volume 8 Number 5- Feb 2014.

[3] Indrajeet Deshmukh, Shubham Angre, Digvijay Kakde, Roshan Rahane "Designing and Implementation of Water Vending Machine" *IJARIIE*, Vol-2 Issue-3 2016.

[4] *https://www.arduino.cc/en/Tutorial/HelloWorld*

[5*] https://en.wikipedia.org/wiki/DC_motor*

[6] http://solarbotics.net/starting/200111_dcmotor/200111_dcmotor2.html

[7] https://en.wikipedia.org/wiki/Servomotor

[8] *http://www.jameco.com/jameco/workshop/howitworks/how-servo-motors-work.html*

[9]*https://circuitdigest.com/microcontroller-projects/arduino- LCD-interfacing-tutorial*

[10] *https://en.wikipedia.org/wiki/Load_cell*

[11]*http://robokits.co.in/sensors/force-flex/digital-electronic-scale-5kg-mini-load-cell-transducer-sensor*

[12]*https://circuitdigest.com/microcontroller-projects/keypad-interfacing-with-arduino-uno*

[13]*http://www.circuitstoday.com/interfacing-hex-keypad-to-arduino*

[14]*http://www.feedroller.com/Store/Service%20Manual/FO2850SM4.PDF*