MICROCONTROLLER BASED REMOTE CONTROLLED LOTTERY MACHINE

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ABSTRACT

In today's world, according to the increasing working tempo of people's life the alternatives that people can rest and also have fun are increasing. On this manner in lots of countries many lotto applications are being developed, which people can have fun and also try their chances.
More over in Turkey many private schools take their students with drawing lots model and there is no automated for this job. Nowadays these drawings are made by drawing a ball from the bag which's impartiality is not absolute.
On this manner RCLM (Remote Controlled Lottery Machine) have been designed. The RCML can handle all these kinds of lottery drawings. In the system of RCLM the balls mixing process is applied by pressured air such that the mixture process is being applied perfectly.
In conclusion RCLM is a device that can be successfully used in many lottery drawings in all countries with its low manufacturing cost and ease of use.

I. INTRODUCTION

RCLM is a micro controller controlled lottery device that is capable of materializing lotteries with a remote control and provide real mixture of the balls with air blow it includes. RCLM also controls the number of balls that can fall on the winning tray, which should be one at a time.
RCLM can be used in all kinds of lotteries for example it can be used in firm's lotteries and also it can take place in high school student lotteries which is done almost all private.
RCLM is mainly designed up on a request from a well know foreign company and several investigations on the market which showed that it has really several alternatives in local market.
There are two main types of lotto machines: gravity pick and air mix. The machines have a few things in common.
1. They are designed and proven using statistical analysis to procedure random combination of numbers.
2. The balls are always visible during the mixing process – This helps prevent tampering: and since the drawings are televised live, it gives the viewer confidence that the drawing is not being fixed.

II. WORKING PRINCIPLES OF RCLM

As RCLM is designed to be useful for everyone and its design is very clear for everyone to understand. RCLM consist of three pieces the machine part we call it as body, the sphere that we place on the body and lastly the balls (9 balls) that we place in the sphere.
For a closer look to RCLM the main idea and critical points of the project are;

1. The balls should be mixed perfectly and really randomly we provide this by our air mix system, which creates an air blow in several directions such that balls mixes randomly.
2. Each time only one ball should come out of the device that we provide with our solenoid devices.
3. The RF signal should be encrypted for protection of the lottery application.

As the critical points are stated above the working principles of the device is consists of several processes. At first all the pins are closed such that no ball can fall down. The process starts with the push to the first button on the remote control. With the push to the remote control button the air blower motor starts to blow air so that the balls start to mix. This process takes place since it is pushed to the same button again. When the user pushes the button for the second time the air blow stops and the system takes a delay for the balls to fall down. After the delay the upper pin opens and upper pin closes and below pin opens such that the ball, which was in the falling hole, falls in the winning number tray. When this whole process completes the machine starts to wait for a new signal to restart the process.

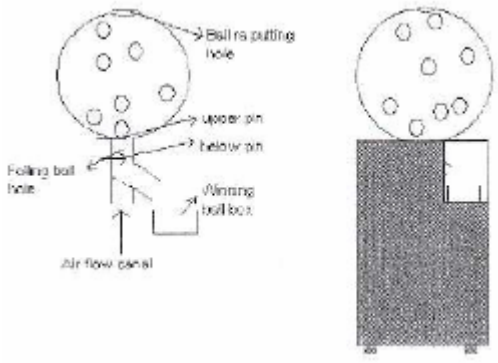

Figure 1. A picture demonstration of RCLM

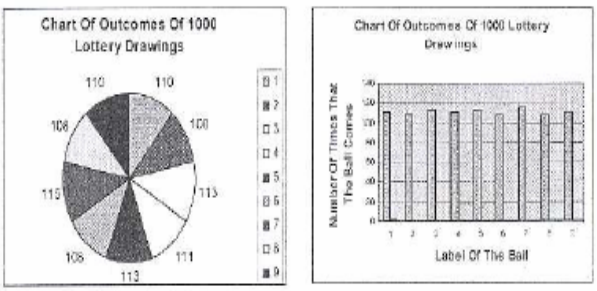

Figure 2. Demonstration charts. The results are gathered by 1000 drawings.

II. METHODOLOGY

In the design of RCLM many electronic and mechanic devices have been used.

Regulated switch mode power source

The power source used in RCLM has three alternative power outputs which are 5, 12, 24 volts. The five volt output of the power source is used for powering the microcontroller unit. Twenty volts output of the power source is used in our system to power the remote control receiver and relay that we use for controlling the devices attached to our circuit. The power source used is need for supply 1 ampere in 5 volts output, 2 ampere in 12 volts and 1 ampere in 24 volts which are enough for our system. The reason that a regulated power source is used in the design is that a microprocessor needs regulated and direct current to work properly.

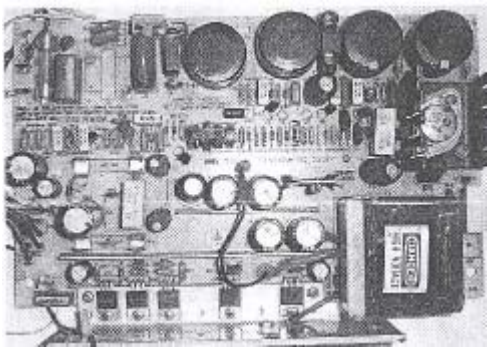

Figure 3. The picture of the Used Power Supply

Remote Control Sender and Receiver Units (RC)

In the design of RCLM handiness were important topics such that RCLM is equipped with a remote control unit, which we can control the entire device with the help of just one button, which is placed on the remote control of RCLM. The first issue on remote controlling is security, which is provided with 8-bit encryption in RCLM. The remote controller unit is operates in 433 MHz. frequencies and enables the relay placed in remote control receiver as an input to micro controller which sends starts and stop signals to the micro controller. According to these signal the micro controller processes the program written in it.

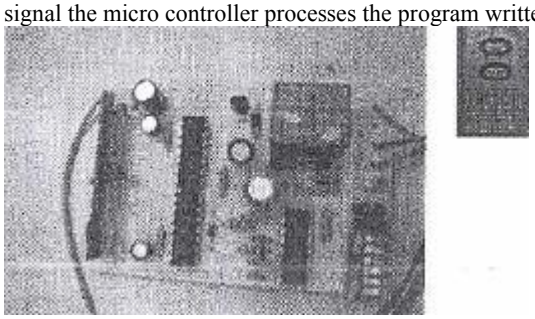

Figure 4. The picture of the Remote Control Unit

Solenoids

In the design of RCLM two solenoids were used which operates and controls the number of balls falling each time. The solenoids operate with 24 volts with 24 volts, which is provided by the power source that is used in RCLM.

Main Circuit Including Micro Processor Logic (Reset Circuit and Oscillator circuit)

In the design of RCLM a main circuit is designed that provides all the interfaces between the devices and provides reset circuit and oscillator circuit for the Micro Controller. The relays and the remote receiver unit are placed on this circuit. There are three relays placed on this circuit, two of them are used for controlling the solenoids and one of them is used for controlling the air blower machine. All the devices connected in the main circuit are processed by conversion of logic signals to electric currents to control the devices.

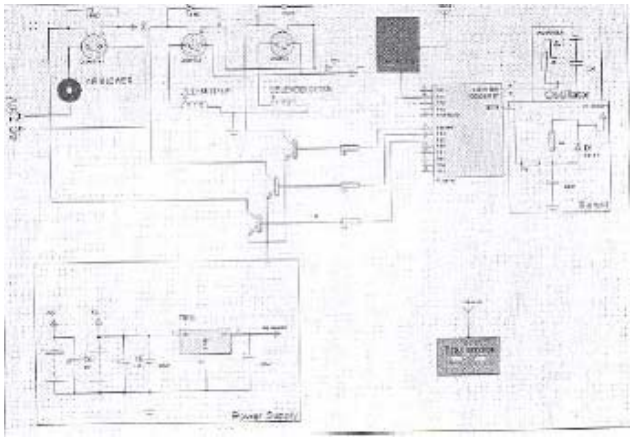

Figure 5.the circuit diagram of the main circuit

Air blower Devices

Air blower that is used in RCLM is Makita 4014NV-Electric Blower.

Micro Controller

The micro controller used in RCLMK is PIC16F84A 18 pin 8-bit micro controller. This micro controller has 102 words of program memory, 68 bytes of data RAM and 64 bytes of Data EEPROMS. In RCLM the micro controller is programmed to process all the tasks according to signals that user sends with remote control unit.

The flow chart of the software

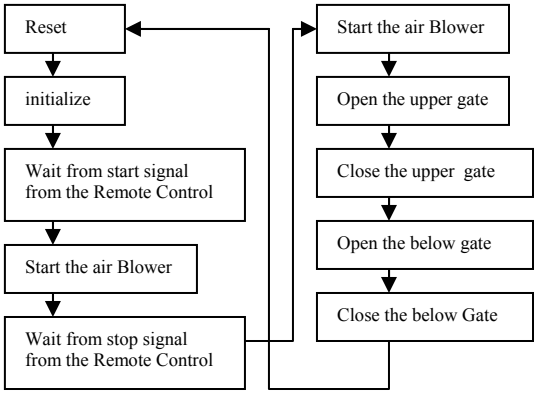

Figure 6. The flow chart of the software

IV. CONCLUSION

Integrating mechanic devices, electronic components and microcontroller technology, a user friendly have designed cost effective and reliable system. Because of these features RCLM is a suitable device for all kinds of lottery applications with the design templates and circuits diagrams RCLM is a quickly produce able and easy to repair device that users would be satisfied with the quality.

RCLM is tested with several different scenarios and test conditions, the system ran successfully without any complications and it has completed its task with accuracy.

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