

Robotic Soldier with Electromagnetic Gun

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Abstract— Our paper presents an idea to secure the border in a simple and more reliable way. given idea has a simple design and has a very high range, it covers a very large border area securing the border area from illegal entries, smuggling, illegal movement of weapon without more involvement of security forces near border. After analyzing the previous attack in our country and the number of accidents happening each year, it is evident that in most of the cases the security force are unaware of the entry of these terrorist hence in order to protect our nation from attacks and terrorist activity there is a need to implement a security system which will be smart to detect these activity and give proper information about each and every activity happening near the border.

Keywords—Gun firing mechanism, Camera, Gas sensor, Electromagnetic force.

I. INTRODUCTION

A single-stage, sensor less, coil gun designed to demonstrate the capability to accelerate a ferromagnetic projectile to high velocity. This paper includes all important steps during coil gun design, such as physical laws of the coil gun, preliminary calculations, the testing device and final product. The electromagnetic model of the capacitor-driven inductance coil gun was constructed to be able to optimize the coil's dimensions. This Driving circuit was implemented as dynamic model for simulation of current. Electromagnetic accelerating systems are usually constructed as rail guns or coil guns. The rail gun is conceptually more simple than the coil gun, but has some inherent problems with plasma during the projectile launches. That is why this conception is not use here. On the other hand the coil gun is much more suitable for common application seven if it needs some additional supporting facilities such as energy accumulator, switcher and driver. Main advantage lies in loose of almost all negative phenomena damaging all the launch device. The coil gun is designed for an exhibition center as an exhibit. It's not designed for a really shooting applications, this means the projectile is accelerated at relatively low speed.

II. CIRCUIT DIAGRAM

The operation of system described in above circuit .In our project 89s51 (series of 8051) microcontroller used. advantage of this microcontroller is that we can 1000 times reprogramming to this microcontroller. For starting the system 3 important part required i.e. power supply, clock and reset.8051 controller is an 40 pin IC. The 40 number pin of the microcontroller is connect to the power supply. The 5 volt dc supply is given to 40 no. pin of the microcontroller.20 number pin of the microcontroller is connected to the ground. The 8051 microcontroller having four port as shown in fig. Port 0, Port 1 and Port 2 and Port 3. All are 8 pin bi-directional port.

Port 3:

In this port, the Pin 18 and Pin19 are oscillators pin. So at which crystal oscillator is connected. The crystal oscillator is used for provide an oscillation frequency to the microcontroller for its operation.

The Pin 9 is a reset pin in which one capacitor and register are connected; it is called power on reset. It is used for reset the program in the microcontroller.

Pin 1 and Pin 2 are Rx and Tx Pins. This pins are used for serial communication. At this pin we connect the bluetooth device which is used for the communication between the microcontroller and mobile through which we can control the robot. Rx pin of microcontroller is connected to the Tx pin of Bluetooth device and Tx pin of microcontroller is connected to the Rx pin of Bluetooth device. so data will transfer serially.

At the Pin 6 and Pin 7 we connected the Metal sensor and Gas sensor respectively. The metal sensor is used to detect any obstacle that surrounds our robot and the Gas sensor is used to sense flammable gases. The data from these two sensing elements is displayed on an LCD Display and also in a mobile Application. So we can easily see the value of the sensor.

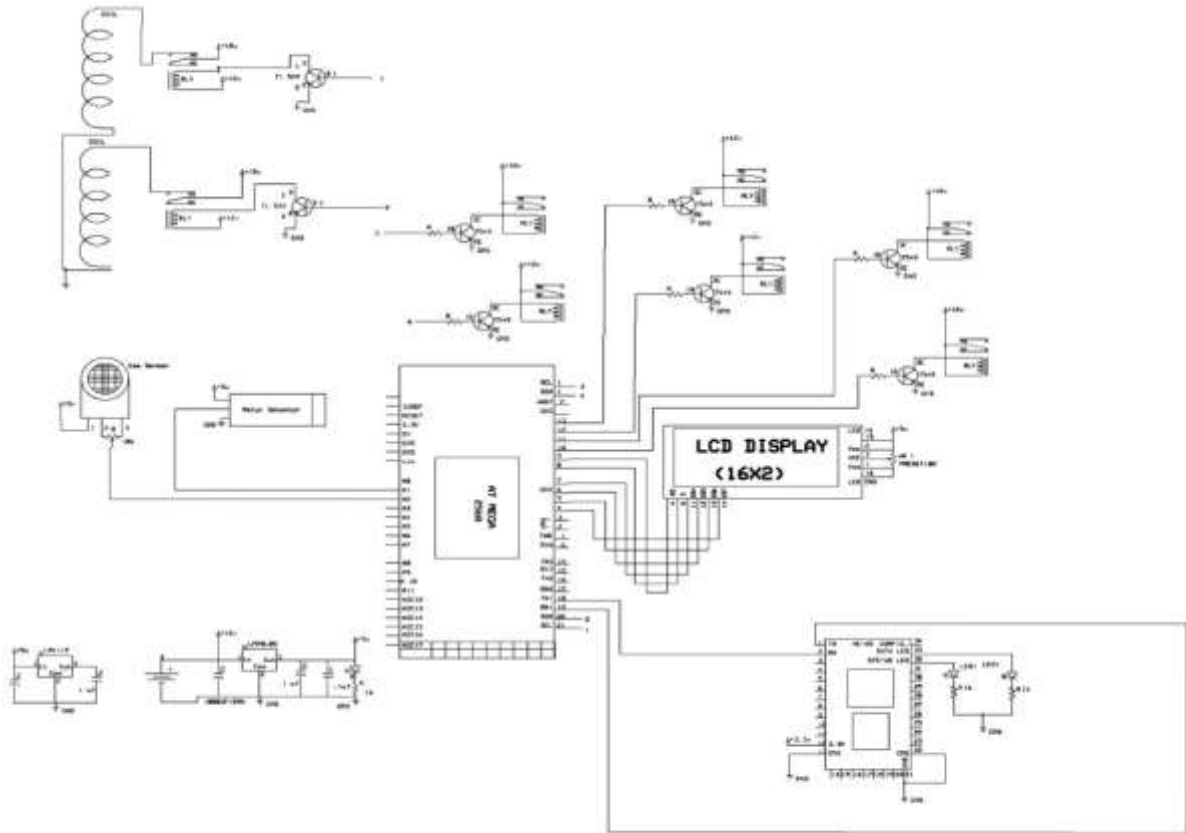


Fig.1 Circuit Diagram

Port 0:

It is used for checking status of data. In this port LCD display is connect. We used display of size 16*2, its means 16 character 2 routes. By controlling the value of resistance we can control the brightness of the LCD.

At port 0 having 3 control pin, RS (data command), Read Write and Enable. In which Rs and enable attach to the controller. In read and write pin , write pin is zero so its connected to the ground so in LCD display we can only read a data but not write anything.

Port 2:

It is used for controlling the operation of the motor. The output of port 2 is logic signal so we can't it directly connect to the motor. So output is first given to the transistor as relay driver. It will amplify to the that signal. Here we used the six electromagnetic relay which is operated at 12V dc supply. The relay has two contacts. i.e. NO(Normally Open) and NC(Normally closed). The NO contacts are connected to the 12V dc supply where as the NC contacts are connected to the ground. When logic 1 signal is given to relay 1 and logic 0 signal to the remaining relays then the relay 1 will operate and the motor will rotate in forward direction and when logic 1 signal is given to relay 2 and logic 0 signal is given to remaining relays

then the relay 2 will operate and motor will be rotate at reverse direction. In this way we can control the direction the motor and control the robot.

Port 1:

At port 1 we connect the electromagnetic coil. At Pin 0 and Pin 1 we connected the two electromagnetic coil. Here also we used the electromagnetic relay which is operated at 12V dc supply. Which is also has two contacts .i.e. NO and NC. When we give the logic 1 signal to the relay 1 then the relay will operate and thus the 12V dc supply is connected to the coil 1 and thus coil 1 will gets energized and it will attract the bullet which will place near to this coil.

As the bullet will attracted by the coil 1 we will switch the supply and given the supply to the coil 2 thus coil 2 will be gets energized and it will attract the bullet and at the end of interval bullet will launch.

III. WORKING

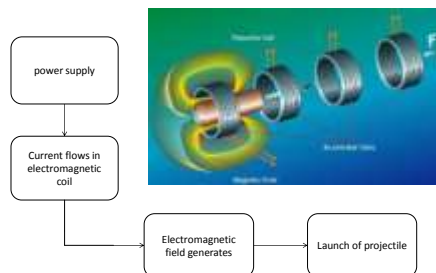


Fig.2 Working

We connect the electromagnetic coil. At Pin 0 and Pin 1 we connected the two electromagnetic coil. Here also we used the electromagnetic relay which is operated at 12V dc supply. When we give the logic 1 signal to the relay 1 then the relay will operate and thus the 12V dc supply is connected to the coil 1 and thus coil 1 will gets energized and it will attract the bullet which will place near to this coil. As the bullet will attracted by the coil 1 we will switch the supply and given the supply to the coil 2 thus coil 2 will be gets energized and it will attract the bullet and at the end of interval bullet will be launch.

IV. ADVANTAGES

1. Reduce human effort
2. Security
3. Easily controllable

V. FUTURE SCOPE

1. Detect and defuse Improvised Explosive Devices (IED)
2. IOT system

VI. APPLICATIONS

1. Police force
2. Terrorist attack
3. Border areas

VII. CONCLUSION

This paper has clearly shown the outline of construction of single-stage, sensor less, coil gun lurching system. Reductance of cost and decrease of manpower is possible due to advancement of technology .A robotic soldier system would cease all kind of illegal movements near the border areas, urban areas and help bsf, police forces etc. controlling these activities in a perfect and more precise way.

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