

SPOT WELDING ROBOT

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ABSTRACT

Spot welding robot is used for industrial purpose because it is costly when compared to ordinary welding machine and is not portable. In order to overcome this problem a 'Spot welding robot' is used in small scale industries and domestic purpose as a portable machine. Spot welding robot can be a big relief for manufacturing industries. Here this system is a spot welding machine with insulator frame and two arms to hold electrode. 120V 60Hz transformer used for power supply to two electrode. one electrode is fixed and another electrode is movable. Two electrodes are fixed in arm. MAL20X150 double acting cylinder, solenoid valve are used for motion of upper arm. Pneumatics based system transmits the power from the solenoid to the cylinder. The system is driven by a microcontroller 5V 10A 2 channel relay module Arduino. The lifter mechanism consists of a links arrangement to move the arm. A double acting cylinder consist of two motions. So it is possible to move the arm in up and down motion. The stepper motor is used for moving the welding machine in linear motion with help of belt drive. The relay module and stepper control drive receives these commands and the microprocessor processes these commands to drive the double acting cylinder and stepper motor as well as the lifter mechanism and linear motion accordingly. The lifter mechanism consists of links arranged to move the upper arm for welding two metals. Collectively the double acting cylinder can be connected with solenoid valve driven by a relay module based on programme. Spot welding robot is an equipment with automation, used for welding two components.

Keywords: Arduino; lifter mechanism; Relay; Stepper control drive

1. INTRODUCTION

With ever increasing demand for both high production rates and high precision, fully mechanized or automated welding process have taken prominent place in the welding field. The rate at which automation is being introduced into welding process is astonishing and it may be expected that by the end of this century more automated machines than men in welding fabrication units will be found. In addition, computers play critical role in running the automated welding processes and the commands given by the computer will be taken from the programs, which in turn, need algorithms of the welding variables in the form of mathematical equations. To make effective use of the automated systems it is essential that a high degree of confidence be achieved in predicting the weld parameters to attain the desired mechanical strength in welded joints.

2. OBJECTIVE

- To achieve the up and down moment of welding arms using by pneumatic cylinder.
- To achieve the linear motion of the welding machine with the help of stepper motor.
- To achieve fully automation and simultaneously repeated.

3. SPOT WELDING ROBOT

3.1 FRAME OF SPOT WELDING MACHINE

Modeling was done using solid work. The models of frames heads have been shown in figure 1 with a dimension. because the

frame decided the motion of the welding machine. The frame is portable because this type of spot welding are domestic purpose.



Figure 1 DESIGN OF FRAME

3.2 SPOT WELDING MACHINE

The models of welding machine heads have been shown in figure 2 with a pneumatic cylinder. This machine is ordinary resistance welding machine. And the two arms mounted. one arm is fixed.

Another arm is movable because both arms hold electrode that electrode was producing heat to melt the metal and weld the two metals. Pneumatic cylinder has used for moving the upper arms. Arduino board used for automation with the help of programme.

And fully automatic and repeatable process.

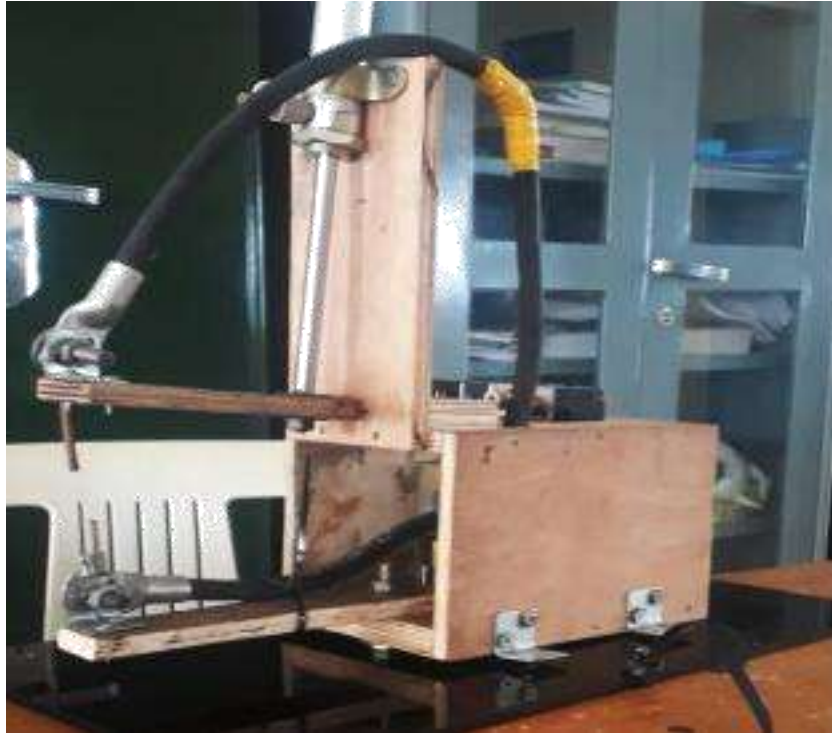


Figure 2 SPOT WELDING MACHINE

3.3 PROGRAM

```
void setup()
{
pinMode(2,OUTPUT);
}
void loop()
{
digitalWrite(2,HIGH);
delay(3000);
digitalWrite(2,LOW);
delay(3000);
}
```

4. CONCLUSION

By this, we conclude that we fabricated a spot welding Robot at a very low cost. By this machine, we can fulfill all our domestic spot welding purpose and also we can fulfill some workshop purposes also.

Automation is also a credit here. We manufactured this machine with the very low cost so even a small workshop also can accommodate.

Due to financial constraints, we have used a half kV transformer and Shorter frame of reference, if we use the more capacity transformer and larger frame of reference we get the more efficient welding, if we increase the power the time of weld will be decreased .

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