

# Design And Fabrication Of Dual Axis For Welding Machine

POOVENDRAN C

<sup>1</sup>(Mechanical Engineering, Sri Krishna Polytechnic College, Coimbatore, India, [cpoovendran@gmail.com](mailto:cpoovendran@gmail.com) )

**Abstract**— In our project “DESIGN AND FABRICATION OF DUAL AXIS WELDING MACHINE” is beings with an introduction to welding the various components automatically. Three- pneumatic cylinder and solenoid valve are provided. One cylinder is for the up and down movement, another one for arm lifting and one for the rotary motion.

**Keywords**—Welding; Pneumatic; Axis.

## 1. INTRODUCTION

Automation can be achieved through computers, hydraulics, pneumatics, robotics, etc., of these sources, pneumatics form an attractive medium for low cost automation. Automation plays an important role in automobile. Nowadays almost all the machines are being atomized in order to product the human being. The automobile vehicle is being atomized for the following reasons.

- To achieve high safety
- To reduce man power
- To increase the efficiency of the vehicle
- To reduce the work load
- To reduce the vehicle accident
- To reduce the fatigue of workers
- To high responsibility
- Less Maintenance cost

## 2. PROBLEM IDENTIFICATION

The current state in small scale industries are that they still using to manual welding and machining methods due to lack of monetary property and infrastructure.

So, that the uniformity and quality of the weld cannot be ensured, not to mention the work hours put in and the expenditure spent on the labors.

Also there is a constant risk of causing hazards to the operator through fumes, fires, spatter flying off those machines.

The idea behind fabrication of low cost Automatic welding machine is to full fill the demand of CNC welding machines for small scale to large scale industries with optimized low cost.

In addition to that the quality of the weld is also quite paramount therefore using an optimization technique we try to optimize the different weld parameters and get a good quality of weld.

We aim to develop a trial product 3-axis CNC Welding machine.

## 3. BLOCK DIAGRAM

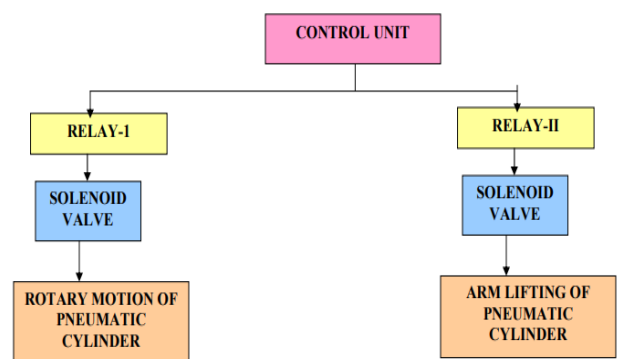


Fig.1 – Block diagram

## 4. WORKING PRINCIPLE

The Double axis welding machine makes use of properly shaped MS alloy electrodes in order to apply pneumatic pressure and carry electrical current through the work pieces.

Heat is generated mainly at the merging point between two sheets.

This causes the material being welded to melt gradually, thereby forming a molten bath, known as the weld mass.

The molten bath is held through the pressure applied by the electrode tip and the encircling solid metal.

If the compressed air goes to solenoid valve to pneumatic cylinder the cylinder one is actuate in x axis and cylinder two is actuate in y axis direction .

Welding holder connected to pneumatic cylinder which actuated by solenoid valve at the time automated welded for metal.

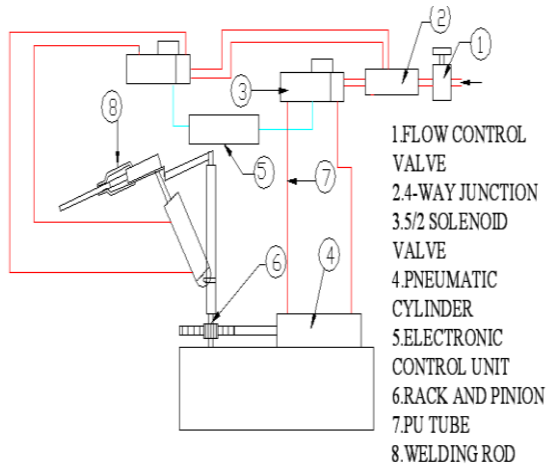
## 5. DESCRIPTION OF ASSEMBLY

The assembly unit consists of a base block, cylinders, rack and pinion, base plate, tie rods, solenoid valves and gripper. Cylinder 1 is mounted on the base block with rack and pinion assembly connected with tie rods.

The vertical cylinder is mounted vertically over the base plate to increase the height with a block and endplate provided at the end.

The horizontal cylinder is mounted on the block of the vertical cylinder horizontally to increase length of the arm with a block and end plate provided at the end position.

#### 6. CONSTRUCTION DIAGRAM



**Fig.2 – Construction diagram**

In future, it is applicable to all type of vehicle whether it is costly or cheaper bike. In future there is also some advanced modification is possible to like on the basis of the sensor. In this project, we operated mechanism of lifting off the stand in the very smooth way.

#### 7. ADVANTAGES

- Low cost intelligent robot Portable in size and Easy transportable
- Since the project is based on the electronics, it is compact and swift and response.
- No external devices are used here to control it.
- The medium is air; the operation of the arm movement is fast

#### 8. CONCLUSION

This project is made with pre planning, that it provides flexibility in operation.

This innovation has made the more desirable and Economical.

This project “Design and Fabrication of dual axis welding machine” is designed with the hope that it is very much economical and help.

This project helped us to know the periodic steps in completing a project work.

Thus we have completed the project successfully.

#### REFERENCES

- [1] K. Abbasi, S. Alam, and Dr. M.I. Khan, 2012, “An Experimental Study on the Effect of MIG Welding parameters on the Weld-Bead Shape Characteristics”.
- [2] Jukka Martikainen Lic. and Raimo Suoranta , 2007, “Welding of sheet metal using modified short arc MIG/MAG welding process”.
- [3] S. R. Patil and C. A. Waghmare, 2013, “Optimization of MIG welding parameters for improving strength of welded joints”.
- [4] P. Kumari, K. Archana and R.S. Parmar, 2011, “Effect of Welding Parameters on Weld Bead Geometry in MIG Welding of Low Carbon Steel”, International Journal of Applied Engineering Research .
- [5] Satoshi Nakamura, Y. F., Y. Ikuno, Shinji Kodama and T. Maeda, 2005, “Automatic Control Technology of Welding Machine MAG-II for Onshore Pipelines”.
- [6] Xu, Y. Li, J. Sun, and S. Wang, 2012, "Research and development of open CNC system based on PC and motion controller".
- [7] V.K. Pabolu and K.N.H. Srinivas, 2010, "Design and implementation of a three dimensional CNC machine".
- [8] B. Jayachandriah, O. V., P. Abdullah Khan and R. A. Reddy, 2014, “Fabrication of Low Cost 3-Axis CNC Router”.
- [9] J. Norrish, 2009, “Process control and automation developments in welding”.
- [10] V. B. Bhandari, Design of Machine Elements, New Delhi: McGraw Hill, 2014.
- [11] PSG Design Data book, Coimbatore: Kalaikathir Achchangan, 2015.
- [12] Chavan D K, Pawar Udayan, Tambe Niharika and Sane Abhishek. Design of Three Axis Pick and Place Mechanism for Friction Welding Machine to Reduce the Time Cycle and to Increase Productivity. International Journal of Design and Manufacturing Technology (IJDMT).5 (1), 2014, pp. 12-22.