

Automation of Double Axis Welding Machine

Banne Akshay Anil¹ Harage Pratik Rajendra² Shirdhone Asif Aslam³ Patel Vaibhav Shamji⁴

^{1,2,3,4}Student

^{1,2,3,4}Department of Mechanical Engineering

^{1,2,3,4}SIT, Yadrav, Ichalkaranji, India

Abstract— In our project “AUTOMATIC PNEUMATIC DOUBLE AXIS WELDING MACHINE” is beings with an introduction to welding the various components automatically.it moves in both x and y axis. So, it is called as double axis welding machine.

Keywords: Automation, Double Axis, Welding Machine

I. INTRODUCTION

Automation of Double Axis welding machine.



Welding is one of the most important methods of joining of two similar and dissimilar metals with or without application of pressure. The Carbon dioxide welding (CO₂) process is generally accepted as the preferred joining technique and is mostly chosen for welding large metal structures such as bridges, automobiles, aircraft and ships due to its joint strength, reliability, and low cost compared to other joining processes. In the age of automation machine become an integral part of human being. By the use of automation machine prove itself that it gives high production rate at good quality than manual production rate. In competition market everyone wants to increase their production. The engineer is constantly conformed to the challenges of bringing ideas and design into reality. New machines and techniques are being developed continuously to manufacture various products at cheaper rates and high quality noise, e.g. in buildings, ships, power plants, process plants, etc. Excessive vibrations may lead to fatigue and cause damage to vital parts of installations. Fluid pulsations may also cause incorrect reading of flow meters and other control devices and the wastage of money and time also the monitoring of pulsations or vibrations can be valuable to diagnose those problems. So that there is a scope to investigate the response of a structure due to combined loading of fluid, fluid inertia and structural inertia. Hence in the present study an attempt will be made to investigate.

II. LITERATURE SURVEY

Seayon S. Dmello et al. [1] Advances in Multi-robotic Welding Techniques: virtual reality technology and intelligent cooperative control technology of welding robot will be the main research direction in the future. welding robots will enter a new stage of development.

Akshay M P 1 Anilkumar N2 Anup Potdar3 Darshan S B 4 et al. [2] A SEMI-AUTOMATED ARC WELDING MACHINE” which is very useful in small industries and provides safety for the worker Semi-automated welding machine takes less time to weld, when compared to the unskilled labor semi-automatic welding machine is better than opting unskilled labor for welding. there are many work to be completed

1N.Jeyaprakash, 2Adisu Haile, 3M.Arunprasath et al. [3] The Parameters and Equipments Used in TIG Welding: , we discuss the influence of the power source, type of current, gas flow rate, electrodes, filer wire, TIG Machines settings, and shielding gases which are most important in determine. Automation or mechanization of the TIG process can have a number of benefits

Baicun Wanga , S. Jack Hub , Lei Suna , Theodor Freiheita, * et al. [4] Intelligent welding system technologies This article reviews that modern intelligent technology of welding process this is fundamental components and techniques necessary to create an smart intelligent

Alessandra Caggianoa,b,*, Luigi Nelea , Emanuele Sarnoa , Roberto Tetia,b * et al. [5] 3D Digital Reconfiguration of an Automated Welding System for a Railway Manufacturing Application: order to automate the gas metal arc welding process, a proper software tool has been developed. Image processing is performed using image and data analysis tools to reconstruct the joint profile starting from the acquired image. Each tool is employed for a specified task. a suitable reconfiguration of the system was required due to the strong limitations in terms of part size

1Mr.Sateesh.R, 2 Sreenithi.R.M, 3Tamilmani.R, 4Tamil Selvan.V, 5Vasanthakumar.A et al. [6] FABRICATION OF AUTOMATIC PNEUMATIC DOUBLE AXIS WELDING MACHINE In this report, the emphasis is given on design calculation and structural analysis. The analysis of L section base frame and bridge. The report gives step wise development and analysis of the entire designing process for automatic welding equipment. The design can be implemented to manufacturing working mode

III. PROBLEM DEFINITION

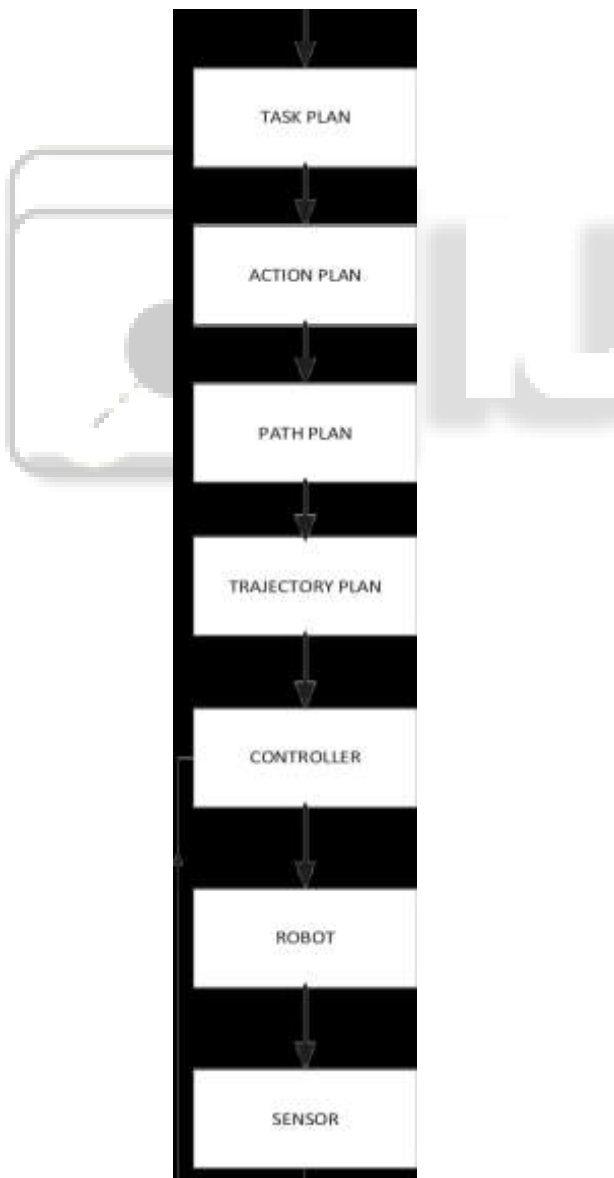
Automatic welding machine tools are designed and manufactured for specific jobs and such never produced in bulk, such machines are finding increasing use in industries the techniques for designing such machine would obviously be quite different from those used for mass produced

machine. A very keen judgment is essential for success of such machines. Circular Co2 welding process is a very critical welding which is done on cam shaft with different profile cams, to achieve the dimensional accuracy for different cam shaft welding on same platform special purpose machine is required

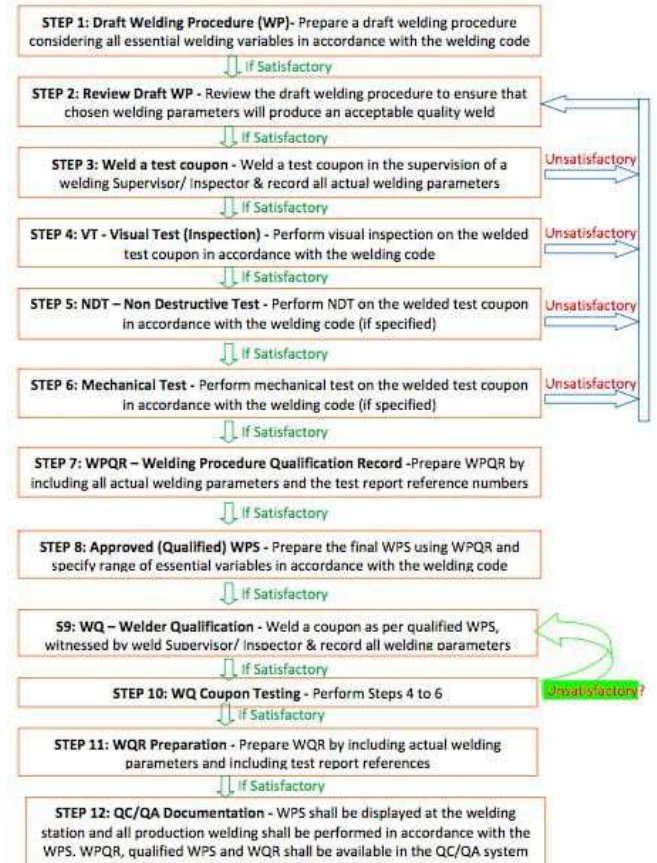
IV. PROPOSED METHODOLOGY OF SOLVING IDENTIFIED PROBLEMS

After completing research on automation of welders and robotic welding fixtures, we began to plan how the project would be completed. We envisioned four smaller tasks as integral to this accomplishment. This chapter will discuss these goals and what specific actions were taken to accomplish them. The process has been divided into phases includes several steps which are vital to a successful project completion. A more detailed description of the methods used is described in this section.

V. WELDING PROCESS FLOW CHART



WELD QUALIFICATION PROCESS CHART



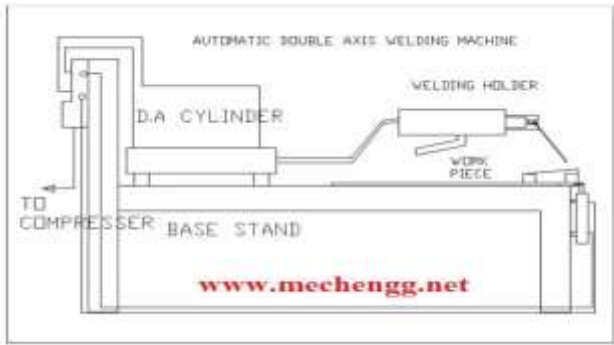
VI. WORKING PRINCIPLE

The trial setup comprises four chambers, all are of twofold acting compose. The cylinder1 is utilized to incite rack and pinion get together, cylinder pole of chamber 1is associated with rack, which is fitted with the opinion. By working the cylinder1, rack and pinion turn the entire get together for 180. By changing the length of the rack the turning edge can be adjusted. Vertical chamber or cylinder2 is utilized to expand the stature of the setup. The stature is restricted to cylinder bar length.

A. Description of Assembly:

The get-together unit comprises a base piece, chambers, rack and pinion, base plate, tie poles, solenoid valves and gripper. Barrel 1 is mounted on the base square with rack and pinion get together associated with tie bars. The vertical chamber is mounted vertically finished the base plate to build the tallness with a piece and endplate gave toward the end. The even chamber is mounted on the square of the vertical barrel on a level plane to expand the length of the arm with a piece and end plate gave toward the end position.

VII. WORKING DIAGRAM



VIII. ADVANTAGES AND DISADVANTAGES

A. Advantages

Small in size.

- 1) Cost is less compared to other welding machine.
- 2) Due to the nature of portable it can be easily handled.
- 3) Due to portable ability it is easily handled.

B. Disadvantages:

- 1) Not so effective for very hard materials.
- 2) Feed should be given intermittently.
- 3) Overload should be avoided.

IX. APPLICATIONS:

There are many different uses of spot welding machines. Some of the areas where it finds application are:

- 1) Automobile industry
- 2) Automotive manufacturing
- 3) Metal working
- 4) Shipbuilding
- 5) Fabrication
- 6) Casting

X. MATERIALS ARE USED IN CONSTRUCTION ARE



- 1) linear shaft,
- 2) liner bearing,
- 3) Shaft end support, Base table (Table frame) ,
- 4) x-y axis connecting plate,
- 5) Bearing, Hardware(Not-bolts),
- 6) Motors (limit switch) Etc

XI. CONCLUSION

Automatic welding machine was successfully designed. The design can be implemented to manufacturing working model. Knowledge of various fields of engineering such as strength of material machine design was applied to carry out efficient designing. While designing manufacturability of the design was considered. Simplicity of the design was maintained to its best in order to achieve the objective of designing cost efficient automatic welding machine.

REFERENCES

- [1] Seayon S. et al. "Advances in Multi-robotic Welding Techniques" International Journal of Mechanical Engineering and Robotics Research Vol. 9, No. 3, March 2020
- [2] Akshay M P 1 et al. "A SEMI-AUTOMATED ARC WELDING MACHINE" International Journal of Engineering Research & Technology (IJERT) <http://www.ijert.org> ISSN: 2278-0181 IJERTV6IS060286 (This work is licensed under a Creative Commons Attribution 4.0 International License.) Published by : www.ijert.org Vol. 6 Issue 06, June 2017
- [3] IN.Jeyaparakash, et al. "The Parameters and Equipments Used in TIG Welding" The International Journal Of Engineering And Science (IJES) || Volume || 4 || Issue || 2 || Pages || PP.11-20 || 2015 || ISSN (e): 2319 – 1813 ISSN (p): 2319 – 1805
- [4] Baicun Wanga et al. "Intelligent welding system technologies" Department of Mechanical Engineering, University of Michigan, Ann Arbor, MI 48109, USA b School of Environmental, Civil, Agricultural and Mechanical Engineering, University of Georgia, Athens, GA 30602, USA/ journal homepage:
- [5] Alessandra Caggianoa,b, et al. "3D Digital Reconfiguration of an Automated Welding System for a Railway Manufacturing Application" 8th International Conference on Digital Enterprise Technology - DET 2014 – "Disruptive Innovation in Manufacturing Engineering towards the 4th Industrial Revolution"
- [6] Mr.Sateesh.R, et al. "Fabrication Of Automatic Pneumatic Double Axis Welding MACHINE"http://www.iaeme.com/MasterAdmin/Journal_uploads/IJMET/VOLUME_8_ISSUE_3/IJMET_08_03_026.pdf