

FIXTURE FOR SEMI AUTOMATIC ARC WELDING

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ABSTRACT

Arc welding is the commonly used metal joining process in industry as well as commercial purpose. Usually the arc welding process is done manually with the aid of human worker and issue related to this manual welding are insufficient weld full to full depth and sticking of extra material on the work piece. The above stated issue have been addressed in this project by development of fixture for semiautomatic arc welding. the use of fixture will ensure minimum human intervention in the process and hence also safety of worker is ensured to a certain level. This automated fixture will decrease production times compared to those of a stationary welding fixture. For reducing cycle time and increasing efficiency of welding so, automation in welding required. So, fixture for semiautomatic arc welding is design for small scale welding industry. In semi-automatic arc welding which increase weld accuracy and reduced time of welding. Our mechanism done only linear welding in two axis. It's further expanded into three axis welding. Automated welding is no different than any other robotic manufacturing process. It increases efficiency and lowers the cost of the process. There are four significant benefits to automated welding: increased productivity, higher weld quality, decreased waste produced, and decreased costs associated with labor. The new fixture design reduces the cycle time and operator labor while increasing functionality and allows complex welding operation to be completed two axis welding

Keyword: - fixture, semi-automatic, arc welding, , minimum human intervention and safety

1. Introduction

In fabrication industry normally arc welding is done manually by the worker. In this manual welding defects like porosity, under cutting and extra stuck material. Normally welding requires specialize worker for welding process. Now a day's focus has shifted on automation in welding. The new fixture design reduces the cycle time and operator labor while increasing functionality and allows complex welding operation to be completed two axis welding. The main benefits of an automated welding process are, improved weld quality, increased productivity, decreased waste production, decreased costs associated with labor. However, an automated welding operation may not be best suited for every application. This automated fixture will decrease production times compared to those of a stationary welding fixture. For reducing cycle time and increasing efficiency of welding so, automation in welding required. So, fixture for semiautomatic arc welding is design for small scale welding industry. In semi-automatic arc welding which increase weld accuracy and reduced time of welding. Our mechanism done only linear welding in two axis. It's further expanded into three axis welding. Automated welding is no different than any other robotic manufacturing process. It increases efficiency and lowers the cost of the process. There are four significant benefits to automated welding: increased productivity, higher weld quality, decreased waste produced, and decreased costs

associated with labor. Weld quality consists of two factors: weld integrity and repeatability. ensure weld integrity through electronic weld process controllers. Combining mechanized torch and part motions with electronic recall of automated welding parameters results in a higher quality weld than can be accomplished manually, offering instantaneous quality control. Because an automated weld is made only once, defects are readily visible and detectable. Humans tend to "smooth over" a mistake with the torch, hiding lack of penetration or a possibly flawed weld. In some cases, leak testing and vision systems can be integrated into fully automated welding systems to provide additional quality control. Repeatability is a function of the quality of the weld process controller and of the engineering of the machine motions. Automated welding provides repeatable input parameters for more repeatable output. Assuming the controller is functioning properly, the question comes: Can the mechanisms of the machine position the parts or the torch within the specified tolerances for welding automation? The answer to this question will attest to the quality of system purchased. Semi-automatic and fully automatic welding systems increase output by eliminating the human factor from the welding process.

1.1 Design of welding fixture and positioners

Robotic welding accurately hold the work piece during automation. It increase welder safety and quality here welding closes the gap in the engineering automated fixture mechanism.(S.N SHINDHE) [1].

1.2 computer aided fixture design: recent research and trends

Developed computerized fixture design result can result in high efficiency. Short set-up time and low cost. Trends in manufacturing flexibility and customize small production and research on the application of computerized modular fixtures and dedicated fixtures. (YIMING RONG, HUALI, PRINCE SHEN) [2]

1.3 process control and automation development in welding

This paper set out to show answer to growing skill shortage, productivity, cost, quality and limitation. This technology may make welding a more attractive proposen for those workers who are involved. (J. NORRISH) [3].

1.4 robotic shielded metal arc welding

here described methodology to generate the electrode holder trajectory during welding in order to move the weld bead forward along the base metal according to speed by keeping electric arc length constant (E.J.LIMA , A.Q. BRACARENSE) [4]

1.5 Design of Welding Fixture for Head End Sub-Assembly of Motor Case

In this paper details about welding fixture for the head end sub-assembly of a rocket motor case namely Y-Ring, Dome, Igniter Boss and the Fore skirt ring that have to be welded to each other with a specified tolerance and weld quality. (NAVEEN A M , V A GIRISH) [5].

1.6 welding job sequencer

It is working cell including welding job sequencing and select automatically process. It detect welding operation and amount of welding wire supplied and also detect amount of energy. (JOSEPH A. DANIEL, DEMITRY BRANT) [6].

1.7 Dual switch for semi-automatic arc welding

Dual switch has a switch lever that pivot between three position .At first position gun is off ,at second position lever engages the first switch to turn the gun on. Pivoting the switch lever to its third position release the locking lever to enable the switch lever to return ,under a spring bias to its first position. (VICTOR LUBIENIEDCI, JAMES W.LYALL)[7]

1.8 Automatic and semi-automatic welding systems and methods

Disclosed control methods may include receiving a data set including one or more features of a joint to be welded and receiving a weld procedure for the joint to be welded. The weld procedure for the joint is determined based on a sample virtual weld performed by an operator, a stored procedure developed for a substantially similar weld joint, or a combination thereof. The method may further include determining one or more desired changes to the weld procedure based on the received features of the joint to be welded and

generating an updated weld procedure by altering one or more parameters of the received weld procedure. (BRUCE PATRICK ALBRECHT, TODD GERALD BATZLER)[8]

1.9 Portable electric arc welding clamp

The purpose of this utility model is implemented as follows: This is the handle of the pliers, clamps and insulating sleeve components. The handle is hollow core. Chuck is a clip from the clip and the next constitution. Sandwiched between the upper and lower ribs with three longitudinal balance, and one in the middle of the clip and downward convex, the two sides and is located under the folder convex upward, and the end of the two solid clip together, fastened end into the handle inside the hollow core. When not in use, cover it with an insulating sleeve chuck out. (ZHOU DYNASTY)[9]

1.10 Method designing fixture for weld based on predicted stresses and distortions

In one aspect of the present invention a method for designing a weld fixture is disclosed. The method includes the steps of modeling a set of distortions produced by applied mechanical forces on a material to be welded, modeling a set of distortions produced by applied thermal forces on the material to be welded, determining a set of reaction forces at a series of locations on a simulated weld fixture as a function of the modeled distortions, and designing a weld fixture as a function of the set of reaction forces. (XIAO CHEN, YI DONG, EDWARD T. MARTIN, ZHISHANG YANG, WAYNE TANNER) [10]

2. METHODOLOGY

With the help of motor operating the feed screw which guide fixture plate for the welding tool holder hold the arc welding tool and it guide it by the help of slotted plates. Here we are performing semiautomatic arc welding.

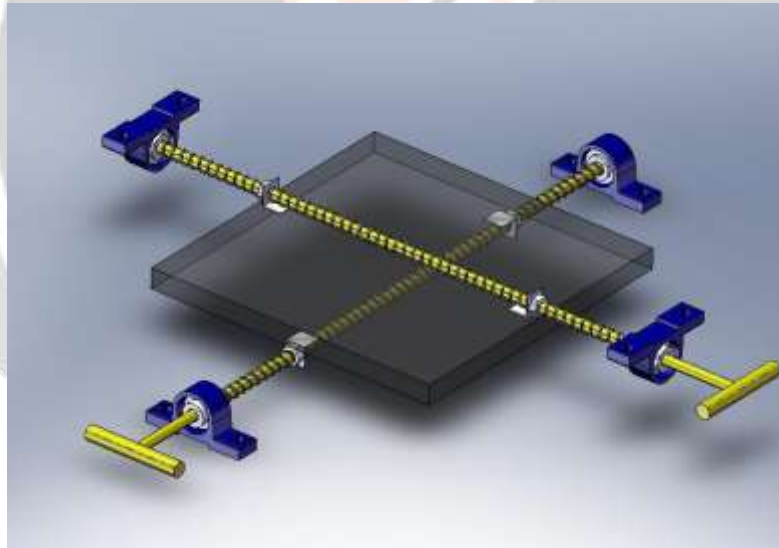


Fig -1: guide mechanism

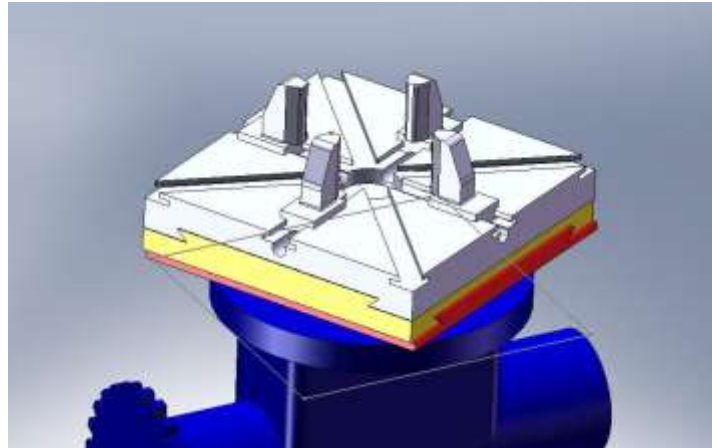


Fig-2: fixture

3. CONCLUSIONS

In this project, we have concluded that fixture in arc welding is require for human safety, accuracy and weld quality is increase. Now a day's robotics automation welding are available but its high cost so decreasing cost of fixing element and automation in welding at small scale required fixture for semi-automatic arc welding.

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