Design and Manufacturing of Automatic Profile Cutting Machine

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Abstract: In most recent couple of decades human requires more push to cut the high thickness metal utilizing cutting machines like physically and acquire less exactness, more human endeavors and having numerous other constraint. Additionally cutting of sporadic round, triangular shapes by physically gas cutting is tedious. To defeat this issue Automatic profile slicing machine is shaped to decrease the human endeavors increment creation rate and acquire high exactness. Programmed profile cutting machining enhances quality as well as diminish time of slicing to cut the material.

Keywords: Magnetic Tracer, Template, bearings etc.

1. INTRODUCTION

Presently a day's number of metal slicing procedure are accessible to cut the material, for example, Laser shaft machining, Water fly machining, Plasma curve machining, Abrasive stream machining, CNC cutting, ultrasonic cutting and so on. These all-machining procedures are robotized yet in these procedures, material to be cut is ought to be electrically conductive. These machines are high exorbitant and in addition these machines required substantial floor space range. These machines are not accessible in little size and least cost and not in convenient nature and furthermore cut vast shape and size work pieces. It is difficult to utilize these machines in little scale ventures in light of less space accessible for working and working of these machines required exceptionally talented laborers. To conquer the above issues it is important to make with "Programmed Profile Cutting Machine" which will attempt to satisfy number of previously mentioned issues with sufficient exactness and also simplicity of work and perplexing shape. And furthermore it will attempt to accomplish to cut the material from 0.5 mm to 20 mm thickness effectively, this can be satisfy the prerequisite of little scale businesses. This machine will cut conductive and additionally nonconductive material. The machine is to be intended for spotless, smooth and sufficient cutting of Mild steel and Low amalgam steel.

2. LITERATURE REVIEW

A. Automatic metal sheet cutting machine - Rahul Ranjan1, SS Solanki2, Vivek Keshri3, This paper presents a simple way of designing and implementing an automatic metal sheet cutting machine using easily available low-cost micro-controllers. This machine takes shapes to be cut on the sheet in, as input a high resolution raster image via laptop and cuts the sheet accordingly. Results have shown that the performance of this machine meets well the industry requirements at a much lower development cost. also now In India, traditionally, the task of metal sheet cutting is accomplished using manual or semi-automatic machines like gas cutting machines, pug machines, circle cutting machines etc. pug machines being the most common.

B. Design and Manufacturing of Automated Gas Profile Cutting Machine using PLC-Ajay M Patel1 Dhaval Shah2 Mudit Kothari3, This paper introduce the plan of a robotized Gas profile cutting machine for straight profile cutting of metallic sheets. Utilizing mechanized gas profile cutting machine diminish the time required to play out the dreary operation, which will decrease any human blunders in order to build precision and wipe out the need of gifted work. In this paper reason for gas cutting operation creator has consider cutting sheets of metals for the most part of size 1500mmX1800mm with a profundity of not more than 100mm, thickness inside the scope of 6-100mm. These metal sheets are utilized as a part of foundry machine generation. The business for actualizing mechanization at their premises on a bigger scale with our plan. Mechanized gas profile cutting machine give higher generation rates, composed stockpiling of inventories, more and straightforward entry in the meantime

C. Experimental Investigation of the Plasma Arc Cutting Process-K.Salonitisa, S. Vatousianosb, & Experimental Study and Optimization of Mrr In CNC Plasma ARC Cutting Gurwinder Singh, Shalom Akhai, this paper display that how to function profile cutting machine by utilizing PLC method. Additionally this paper displayed a plan of a framework in light of PLC that is utilized for profile cutting in mechanical reason. The proposed PLC framework which has been intended to program with specific shape and size, then slicing machine keeps running as indicated by programming of PLC and cuts the profile with flawlessness. At the point when the PLC perceives any expansion or diminishing in the level of voltage, current or temperature esteems the unit has been made shutdown so as to keep it from further harms with the assistance of transfers in the framework. The framework cuts profile as well as it consequently controls the framework and makes culminate shape and size of profiles. This claims the proposed plan of the PLC framework makes the profile

cutting machine more powerful and computerized against some key issues. Subsequently the machine is made more dependable and profoundly proficient by methods for the proposed framework

D. A Review on Current Research and Development in Abrasive Waterjet Machining- M. M. Koratl, Dr. G. D. Acharya2, The paper introduced here is a diagram of late improvements of AWJM and future research headings. It was demonstrated that AWJM procedure is accepting increasingly consideration in the machining ranges especially for the preparing of hard to-cut materials. Its one of kind favourable circumstances over other regular and unpredictable techniques settle on it another decision in the machining business. Aside from cutting, AWJM is likewise reasonable for exact machining, for example, cleaning, penetrating, turning and processing. The AWJM procedure has looked for the advantages of joining with other material evacuation techniques to additionally extend its applications. Almost no writing accessible so far demonstrates the standoff remove at the ideal incentive amid the AWJ cutting procedure by checking and control. This sort of work has not been accounted for some other parameters. Thus, more work is required to be done around there. In a large portion of research work, principally navigate speed, water fly weight, standoff remove, grating coarseness size and rough stream rate have been considered. Almost no work has been accounted for on impact of spout size and hole breadth.

3. METHODOLOGY



Fig 1: Methodology

3.1 WORKING MODEL SETUP





4. CONCLISION

In future, the use of profile gas cutting machine is very vast and comfortable by the use of new technologies. By using automatic profile changer at a time, we can place number of different profile so that the time of profile changing is reduced. By making the machine computerized, we get following advantages Increased efficiency, Reduced time of cutting, Increased accuracy, Comfortable to use the operator, No need of finishing, Size of machine can be reduced We can use electromagnet or different sensors at the place of magnetic roller; machine can be making more comfortable to user, also by using new technology machine can work at any environmental conditions.

REFERENSES

[1] SS Solanki2, Vivek Keshri, Rahul Ranjan1 Automatic metal sheet cutting 3International machine, , Journal of Advanced Engineering Applications, Vol.1, Iss.4, pp.1-2

[2] "Automated cutting of textile material"©woodhead publishinglimited, 2012

[3] Shashisahu, Satya Kumar Behra, Amar Kumar Dey,"A review of automated Profile Cutting Machine Using PLC,"
IJDACRMay 2015, vol. 3, issue 10.
[4] Qin Hua*, Sun Cunzhi', Shandong, China, Optik New method of circle and arc cutting, 123 (2012) 1550–1554

[5] 'Vora F. R., Trivedi J. HCNC Profile Gas Cutting Machine. Conference on Recent Trends in Engineering & Technology

[6] Ajay M patel Dhaval shah Mudit Kothari" Design and manufacturing of Automated Gas Profile cutting machine using PLC", IJSRD/Vol. 3, Issue 05,2015.

[7] K. Salonitisa, S. Vatousianosb Procedia, 'Experimental Investigation of the Plasma Arc Cutting Process CIRP 3(2012) 287 – 292 Sciverse Science Direct

[8] Gurwinder Singh, Shalom Akhai Gurwinder Experimental Study and Optimisation of Mrr In CNC Plasma ARC CuttingSingh ISSN : 2248-9622, Vol. 5, Issue 6, (Part - 5) June 2015, pp.96-99