N.C. Drilling Machine

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Abstract - Now a day's drilling machine can be defined as an instrument which is used to drill holes. Drilling machine plays an important role in mechanical workshops. The purpose of this project work is to get hold of complete information pertaining to drilling machines. CNC Drilling is commonly implemented for mass production. This circuit consisting of 12 keys is aimed to generate drilling depth information in millimeters. Out of 12 keys, 10 keys are utilized to raise drilling data through numeric numbers of 0 to 9. The 11TH key is used as clear key, & the 12TH key is used as start/go key. After entering the data and by activating the go key, the machine starts & performs the function of drilling. The micro-controller (consisting of processor, RAM and EPROM, and three ports) takes care of hardware and software, when the keyboard is interfaced to it. In this concept, the micro-controller scans the keys continuously, i.e., the function of programs stored in the EPROM through the keys. The micro-controller monitors the keyboard continuously & detects the activated key automatically. Controller is programmed to store the data of activated keys information in to its EPROM.

Key Words: **Mass production, Drilling Depth, Numerical control, Micro controller, Automatic**

INTRODUCTION

Drilling machine can be defined as an instrument which is used to drill holes. Drilling machine plays an important role in mechanical workshops. The purpose of this project work is to get hold of complete information pertaining to drilling machines. A drilling machine comes in many shapes and sizes, from small hand-held power drills to bench mounted and finally floor-mounted models. Today the Industrial growth is purely depending up on latest machines; therefore, the subject of drilling machines is extended too widely, because today wide varieties of drilling machines are designed for various applications. The most advanced version-drilling machine is CNC (Computer Numeric Control), it is used for drilling the PCB"s (Printed circuit boards). CNC Drilling is commonly implemented for mass production.

Simple drilling machines like hand held portable drilling machines, power feed drilling machines, etc. are quite common, we can find these machines everywhere. Often these machines are used for drilling a through hole over the job; these machines cannot be used for number of machining operations for specific applications. Human force is required to drill the hole, drilling depth cannot be estimated properly, job may spoil due to human errors, and different size holes cannot be drilled without changing the drill bit. Consumes lot of time for doing repeated multiple jobs, these all are the drawbacks. To overcome all these problems, this automated drilling machine is designed which is aimed to drill the holes automatically over a job according to the drilling depth data programmed through a key board. The main concept of this machine is to drill the holes over particular jobs repeatedly at different depths, sequence is maintained. As the machine contains drill motor, the movement is controlled accurately.

Especially the control circuit designed with microcontroller plays dominant role in this project work.
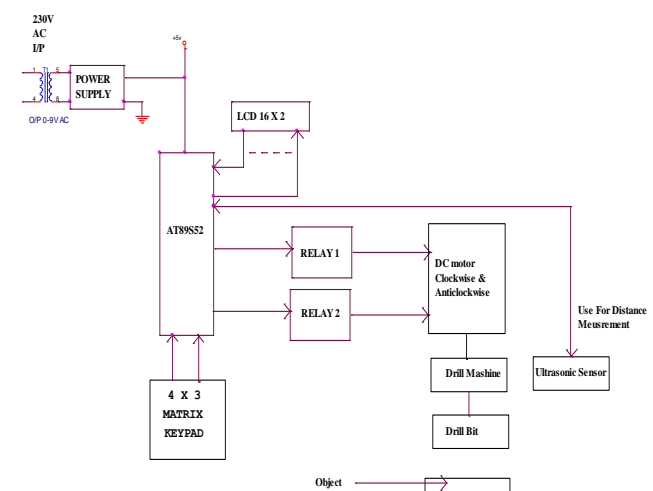
1. Experiment

1.1 Block diagram

Fig-1: Block Diagram of N.C. Drilling machine

1.2 Experimental Procedure

- First, input the number of seconds for which the Drilling machine will be on.
- The machine is started by pressing starting button.
- Microprocessor will take the input and it generate actuate signal for conveyor motor, gripper and drilling machine.

- Firstly, the conveyor motor rotate on predefined speed and work piece are placed on conveyor belt. When sensor analyses the work piece it passes signal to microcontroller and microcontroller actuate stopping signal to conveyor motor thus stopping work piece in defined position.
- Gripper will come and hold the work piece rigidly.
- Drill start rotating and gradually comes down and produce hole in work piece. The length of which the drill will come down is already defined as per geometry of work piece.
- Drill will come on its original position and so also gripper will move to its original position
- Again, conveyor belt will rotate by to remove finished product and also to define new work piece below the drill.

2. OBJECTIVES AND SCOPE OF THE STUDY

- To improve drill accuracy.
- To improve productivity.
- To reduce drill bit losses.
- To avoid dislocation.
- Desired depth of the hole can be obtained.
- Using portable drilling machine cannot measure proper depth.
- If Drilling is not proper then soldering is difficult.

Therefore, the project will reduce the above problems and it easy to drill.

3. CONCLUSION

Due to using of automatic drilling machine it has been observed the production time of drilling is reduced by greater amount. As automatic positioning of workpiece result in increase in efficiency of machine and thus overall machining time is reduced which fit best in mass production type industries. Reduction in employee fatigue due automatic positioning.

REFERENCES

[1] B. Malleswara Swami, K. Sunil Ratna Kumar, "DESIGN AND STRUCTURAL ANALYSIS OF CNC VERTICAL MILLING MACHINE BED", IJAET/Vol.III/ Issue IV/Oct.-Dec., 2012/97-100.

[2] Kumara B, M. Mohan Ram, "DESIGN AND FABRICATION OF LATHE FIXTURE FOR BRAKE DRUM (cargo) MACHINING", International Journal of Scientific and Research Publications, Volume 4, Issue 7, July 2014

[3] Dr. V.S.S. Murthy, P. Sreenivas, "CNC PART PROGRAMMING AND COST ANALYSIS ON VERTICAL MACHINING CENTRE (VTC)", International Journal of Modern Engineering Research (IJMER), Vol. 3, Issue. 4, July-august. 2013.

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