3D Printer Controlled By Arduino

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Abstract- *3d printer is a new generation of machine they can produce different kinds of object like ceramic cups ,toy etc. But our machine also produce PLA plastic material like that college logo ,holding device etc .they can replaced traditional machine to one single machine just like home ink printer ,colour picture .The first working 3d printer was created in 1984 by chuck hull of 3d system crops .3d printer depend on the extruder .plastic filament produce into 1.75 mm of diameter and 3d printer also known as additive manufacturing technology where to create 3d solid object layer by layer.3d printer is used for both technology and manufacturing distributor .In application of architecture, civil engineer, biotech etc .Doesn't it sound interesting .3d printer increase the production quantity with less time and also time consuming .initially manufacturing company are used this technology and in this technology remove extra material by cutting or drilling.*

Keywords- About four key words or phrases in alphabetical order, separated by commas. Keywords are used to retrieve documents in an information system such as an online journal or a search engine. (Mention 4-5 keywords)

I. INTRODUCTION

In traditional manufacturing have a more limitation. which widely based on the labour and hand operated. However the world of manufacturing has change and introduced the automated process such as machining casting, forming and moulding etc. but new complex require machine, compute and robot technology. This technology depends upon the substracting material, this material made by larger block which produce a tool for casting or moulding process and this is a series limitation within overall manufacturing process. In traditional manufacturing required to expansive tool to produce the product such as the fixture and need for assembly for complex part. In substractive manufacturing process, such as machining in which 90% of the original block of material being wasted.

3D Printing, known as additive manufacturing (AM), it is processes object is created by laying down successive layer of material in which layers of material are form under computer software control to create an object. The objects can be made any shape or geometry and typically are produced using software like Fusion360 or Auto CAD and Stereo lithography (STL) is one of the most common file types that 3D printers can read. There are used Arduino unno as controller process, it is intermediate controller between computer and 3d printer machine. object can be designed specifically to avoid assembly requirement and complex feature created at low cost. 3D printing is also emerging as an energy efficient technology utilizing up to 90% of standard material and throught the product lighter and stronger design. The running cost of 3D printer is low and also power consumption is low. It is give the simple interference and smooth finishing product at minimum time.

II. LITERATURE REVIEW

A). Prof. Gerald C.

Technical progress in the open-source self-replicating rapid prototype (Riprap) community has enabled a distributed form of additive manufacturing to expand rapidly using polymer-based materials. However, the lack of an open-source metal alternative and the high capital costs and slow throughput of proprietary commercialized metal 3-D printers has severely restricted their deployment

B).Prof. D. P. S. Pranav, D. Anil Kumar, I. Abhishek

Current The objective of this project is to re-use old computer parts that should be easily accessible to make an affordable CNC/3D printer. 3D printers are commercially available and range from some tens of thousands to lakhs of rupees. In this project, the aim is to make a 3D printer for enthusiasts who are not willing to shell out a fortune for a 3D printer. CNC stands for Computerized Numerical Control and it's a method that allows computers to automate machines. Often used with machines that move along in different axes like X-axis & Y-axis and almost like coordinates that computer will tell it exactly where to go, adding a Z-axis will allow us to control the depth.Deposits material in the required geometry, layer by layer, to build up a 3D shape

III. WORKING OPERATION

The 3d printer working principle is to print the object layer by layer create 3d solid object design and to finish the

printer has a frame structure and three axis x, y and z axis that moves left to right front to back and up and down respectively. The 3d model is created surface with 3d modeling software. The process of 3d printer as shown in fig:1.1
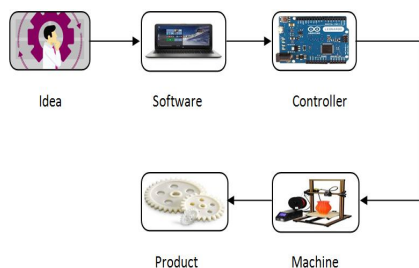

Fig. 1.1:flow process of 3d printer

A person create 3d model on computer by using software like Auto-Cad, fusion 360, PTC-Creo etc. Draw a model in Auto-Cad and save this model in STL file, generating G-code and design into hundred or thousand layer of the horizontal layer and need to be done with Slicing software. When your 3d model is sliced , you are ready to feed it to your 3d printer. the movement of the extruder and stepper motor need to be controlled for that PWM generated by the Arduino is used, the g-code generated is used to drive the electronics motor works and through the help of extruder.
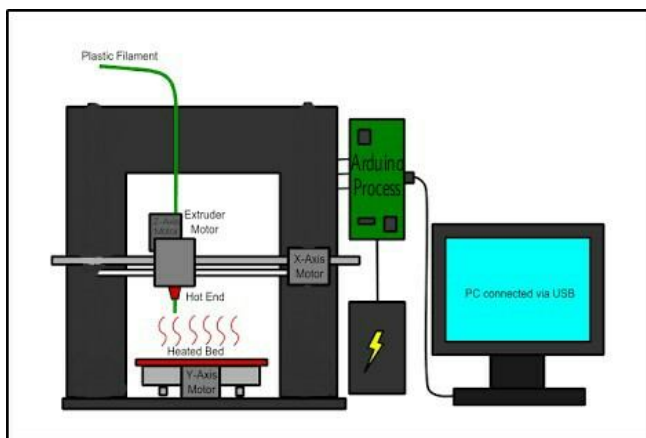

Fig.1.2: schematic of 3d printer

Then it gives control to the movement of the extruder at required rate. The X direction movement of extruder is possible by the X-motor. When the X-motor rotate the shaft also rotate and extruder move in X- direction. The Y-direction movement of extruder is made possible by the Y-motor. The X-direction movement is made by the print table.The component called extruder which is responsible for feeding the plastic to print and melt the plastic

VI. CONCLUSION

This 3d printing is additive manufacturing. It is processes; object is created by laying down successive layer of material. This 3D printer is low cost and also portable. Component of this printer are easily replaced and also assemble and disassemble at the time of requirement. This 3D printer is controlled by microcontroller i.e. Arduino. The arduino require the simple programming coding for controlling system. The accuracy is good as compared to other printer about 10 microns 0.01mm

V. ACKNOWLEDGMENT

REFERENCES

[1] D. P. S. Pranav, D. Anil Kumar, I. Abhishek. "Development of Arduino Controlled CNC/3D Printer", International Journal of Emerging Research in Management &Technology, Vol.5, Issue-7, July 2016

[2] Gerald C. Anzalone, Chenlong Zhang., "Open-Source Metal 3-D Printer" ,Department of Materials Science and Engineering Michigan Technological University, Houghton, MI 49931, USA, vol 3 Nov 5, 2013

[3] J. Cano, "The Cambrian explosion of popular 3D Printing'', Int. J. Artif.Intell. Interact. Multimedia, vol. 1, no. 4, pp. 30-32, 2011

[4] C. Bachelor, M. DeVuono, and J. M. Pearce, "Distribute recycling of waste polymer into RepRap feedstock," Rapid Proto typing, vol. 19, no. 2, pp.118-125, 2013

[5] Guida, D., Nilvetti, F., and Pappalardo, C. M., "On Parameter Identification of Linear Mechanical Systems", Programmed and Proceedings of 3rd International Conference on Applied Mathematics, Simulation, Modeling (ASM'09), Vouliagmeni Beach, Athens, Greece, December 29-31, pp. 55-60. 2009