iJRASET
International Journal For Research in Applied Science and Engineering Technology



INTERNATIONAL JOURNAL FOR RESEARCH

IN APPLIED SCIENCE & ENGINEERING TECHNOLOGY

Volume: 10 **Issue:** IV **Month of publication:** April 2022

DOI: https://doi.org/10.22214/ijraset.2022.41632

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International Journal for Research in Applied Science & Engineering Technology (IJRASET)
ISSN: 2321-9653; IC Value: 45.98; SJ Impact Factor: 7.538
Volume 10 Issue IV Apr 2022- Available at www.ijraset.com

Cad Modelling of Combination Tool for End Mill and Reamer

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Abstract: ***CAD model quality in parametric design scripts largely determines the position of inflexibility and rigidity of a 3D model (how easy it's to alter the figure) as well as its reusability (the capability to use being figure in other surrounds and operations).***
In the environment of mechanical CAD systems, the nature of the point- grounded parametric modelling paradigm, which is grounded on parent – child interdependencies between features, allows a wide selection of approaches for creating a specific model. In this project involves designing and fabrication of the combination tool to perform desire operation.
This combination tool can perform two operation which is End milling, Reaming, this can be done in such manner that the lower part that is end mill will remove the material from previously drilled hole then the second stage of operation commence in which the reamer will finish off the small tiny particle in order to achieve desired flawless finish. The use of the combined cutting tools to optimize the productivity of fabrication & operative time by reducing the time to change the tools. Design of the tool has been done with the assistance of some software which is Catia, Blender.
Keywords: Combination tool, End milling, Reaming, Catia.

I. INTRODUCTION

Manufacturers are continually under pressure to ameliorate the speed of their manufacturing operation. While it’s egregious that reducing cycle time is one of the easiest ways to speed up product, the benefits of more rapid-fire product cycles are important deeper than what appears on the face.
Faster product eventually impacts all angles of the business cycle. Currently, the manufacturing assiduity demands high productivity of the competitiveness terrain. The design substantially involves the design and manufacturing of Combination tool [1]. The main aim of the work is to increase the productivity and reduce the cycle time of the machine. The combination tool performs both end milling and reaming operation simultaneously. The lower portion of the tool is end mill which will remove the excessive material from the work piece then the upper portion of the tool which reamer will perform the finishing operation. The tool is designed by various software’s and different processes under. The prototype model has been developed to analysis the stresses. CAD/ CAM systems and CNC machine tools have made significant impact on machining delicacy and productivity. Still, material junking rate and quality in machining may still be limited due to issues related to the process mechanics which aren't considered in CAD/ CAM systems [2].

II. LITERATURE REVIEW

A. From this paper we get to know that Some of the common problems faced in using End shop shanks are Mincing and breakage of the End shop shanks due to wrong selection of shanks, unhappy tool paraphernalia, milling speed or feed rate too high [3].
B. This paper help us to understand Adding the productivity, quality of the corridor performing from the slice operations are important objects of the modern manufacturing sedulity. This is emphasized in the specialized literature, thus for machining processes, stoners should ask the experts, or according exploits, to choose the better CNC machining parameters for different conditions of product. In general, each product has different machining demand; the milling delicacy and face quality are generally regarded as performance index of product quality during machining process [4].
C. In machining processes, it's vital to ensure good face finish quality as this will impact the performance of drafted corridor and product costs. Perfecting face finish has come a major concern particularly in
D. rapid-fire- fire manufacturing processes where the ideal is to achieve final figure directly.[5]

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III. CAD MODELLING OF A COMBINATION TOOL

In this paper major focus has been given on the design and fabrication of critical component of the combination tool of End mill and Reamer as shown below:

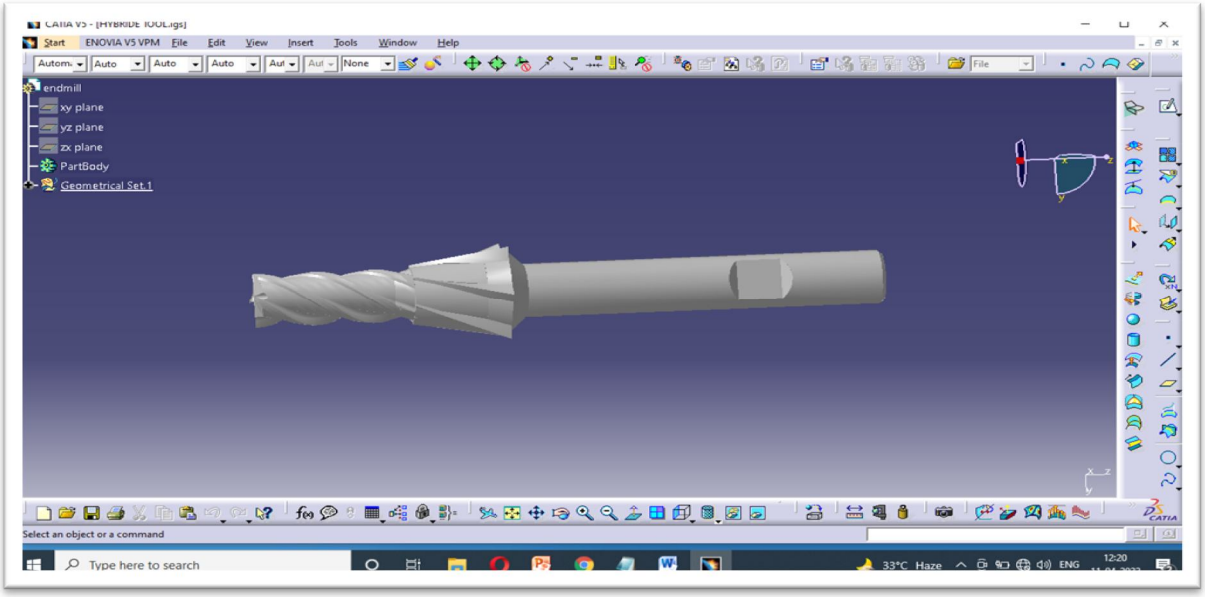


Fig. 1 Cad modal of CNC tool

Analemma- representing the three dimensional objects in two dimensions. It is a form of parallel projection, in which all the projection lines are orthogonal to the projection plane, resulting in every plane of the scene appearing in affine transformation on the viewing surface.

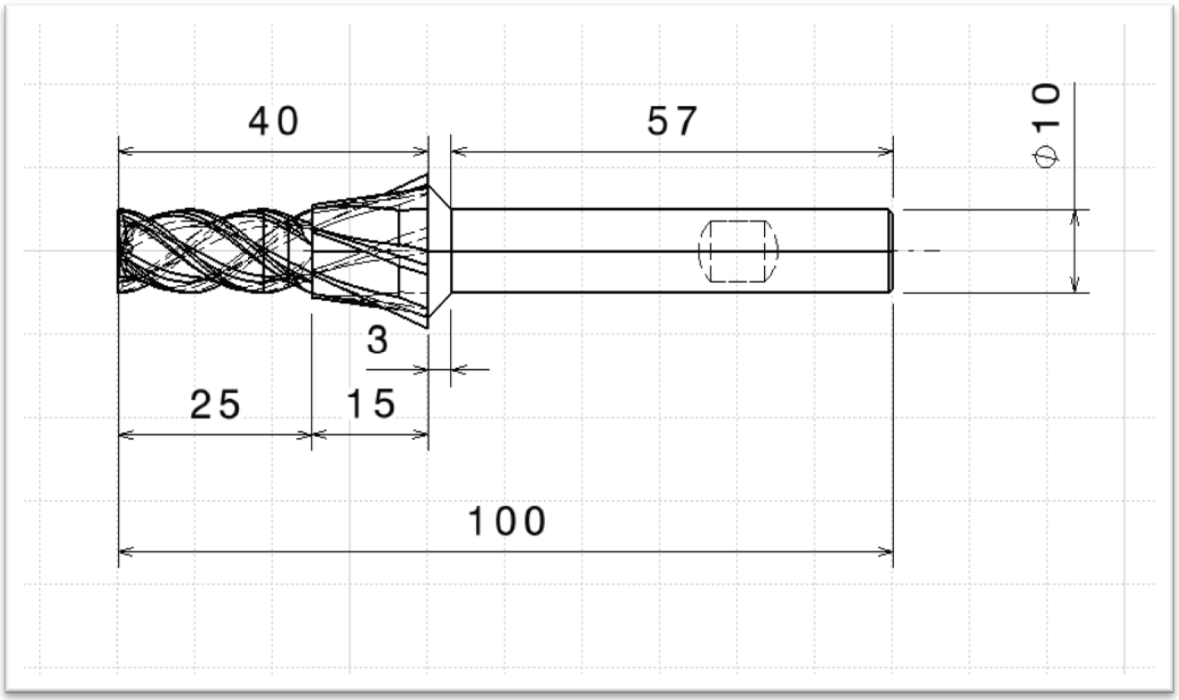


Fig. 2 orthogonal Side view

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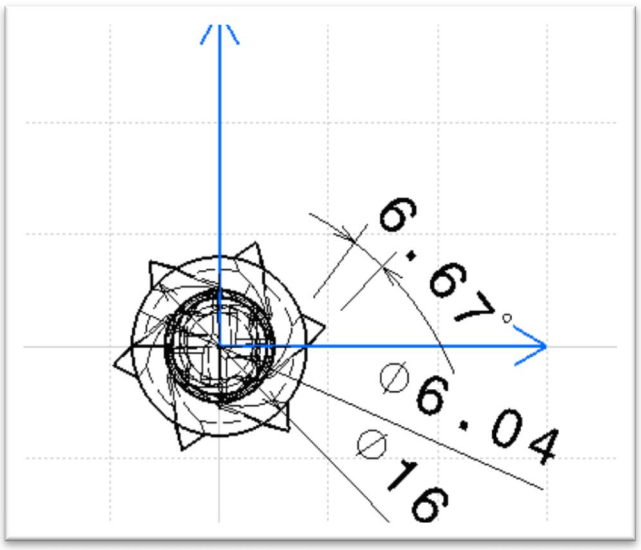


Fig. 3 Orthogonal Top view

Fig- 3 shows the orthogonal top view of a combination tool. Once the model is designed in Catia. The orthogonal view is created by doing drafting in CAD software Catia.

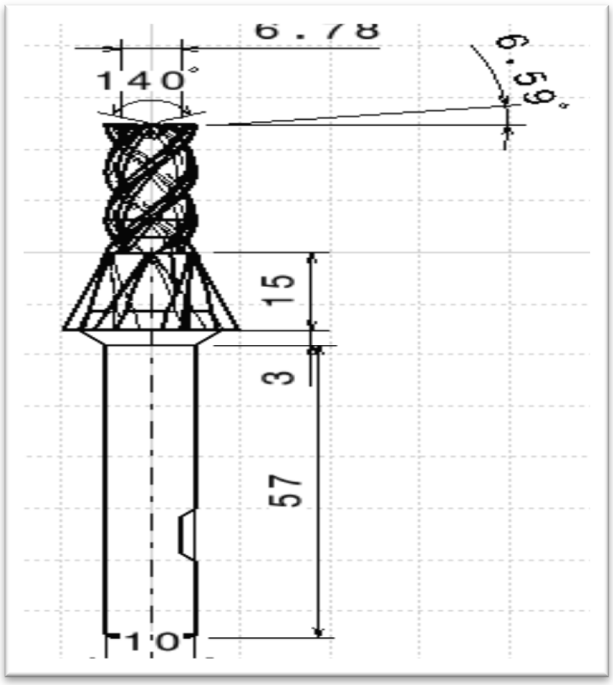


Fig. 4 Orthogonal Front view

Once the design is created, It is observed that this design of a combination tool is ready for analysis.

IV. CONCLUSION

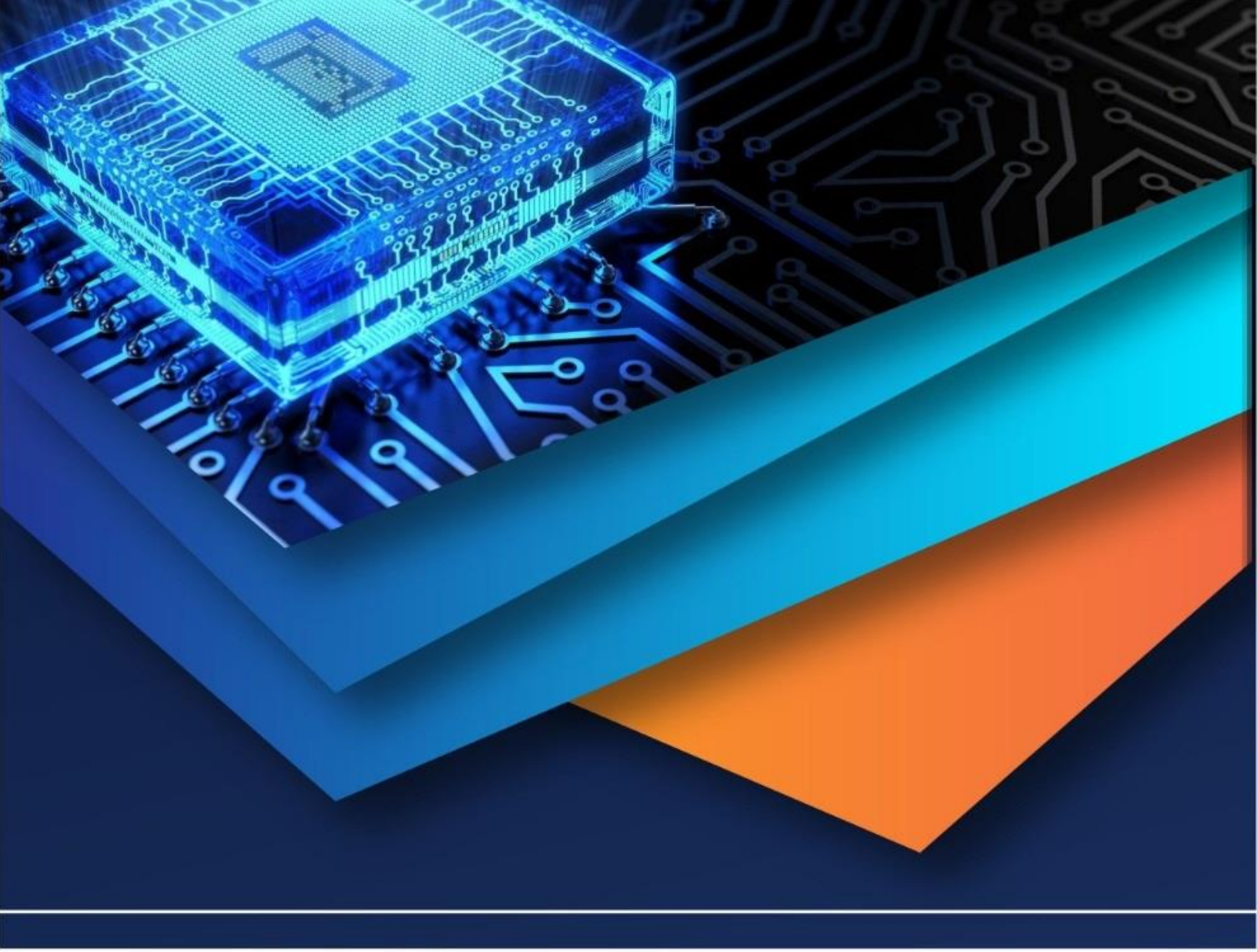
After the various test, the design of a combination of CNC tool for a special purpose operation for making a component has validated by using software tool CATIA. It is also proven that this combination of CNC tool is able to perform two operation simultaneously. With the success of developing this combination tool it will definitely help in reducing production cycle time & cost.

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