
Design and Development of Drilling and Bore Tool of VMC Machine

Rahul Sarjerao Patil¹, Shivam Sadashiv Mahadik², Bipin.B.Patil³

Students^{1, 2}, Lecturer³ Department of Mechatronics

Department of Mechanical Engineering

Sharad Institute of Technology, Polytechnic, Yadav, Maharashtra, India

Corresponding Author's Email id: rp2433553@gmail.com¹

ABSTRACT

In this paper deals with design and development of "special drilling and bore tool of VMC machine". This VMC machine tool is designed for the purpose of drilling and bore operation. This tool is reduced one (CNC) machine performing operation. Used tool material is car bite for tool manufacturing and also increase productivity. This VMC machining tool is used in JAGADEESH ENG. WORKS, PLOT NO.23 D23 MIDC INDUSTRIAL AREA, MIRAJ

KEYWORDS: *Design, Development of Drilling, Bore Tool, VMC Machine*

INTRODUCTION

The bore and drill tool of VMC machine to design and development following steps included. Understand the specific application requirements such as bore size, thread type, material to be worked on, and production volume. Generate initial concepts for the tool design, considering factors like ease of use, efficiency, durability, and cost-effectiveness. Utilize CAD (Computer-Aided Design) software to create detailed designs of the bore and tap tool, including dimensions, materials, tolerances, and mechanical features. Build prototypes based on the design to test functionality and performance. Prototyping may involve 3D printing, VMC machining, or other manufacturing techniques. Conduct thorough testing of the prototype to evaluate its performance, reliability, and durability. Iterate on the design based on test results and feedback. Once the design is finalized, prepare for mass production by

selecting appropriate manufacturing processes and sourcing materials. Implement quality control measures throughout the manufacturing process to ensure consistency and reliability of the final product. Assemble the bore and tap tools and package them appropriately for distribution, considering factors such as protection during shipping and ease of use for end- users. Create user manuals and technical documentation to guide users on the proper use, maintenance, and troubleshooting of the bore and drill tool. Plan and execute a marketing strategy to introduce the bore and drill tool to the target market, highlighting its features, benefits, and competitive advantages.

LITERATURE REVIEW

It is evident from the examination of the entire manufacturing process that a large number of components were rejected due to uneven drilling and subpar finishing. One job at a time can only be worked in the traditional method. A special-purpose tool or accessories that can boost productivity by are required due to rising productivity demands. A. Executing numerous operations on multiple jobs concurrently, or B. Executing multiple operations in a single cycle. Therefore, customers in today's market want products that are of the appropriate quality, quantity, cost, and timing. As such, raising both productivity and quality is imperative. The use of a multi-spindle drilling head can do that. Multiple-spindle drilling machines are utilized for mass production.

March 2012, P. R. Sawant et al

Developed The primary goal of the 17-machine was to drill and tap the TATA cylinder block. It contains 8 drills, with 7 holes measuring 06.75 mm and 1-hole measuring $\text{\O} 12$ mm. It also includes linear and angular tapping operations for 12 mm and 5.1 mm, respectively. Because hydraulic clamping reduces the amount of time needed for loading and unloading, it boosts output and reduces work rejection because of automatic control.

Prof. Chukwumuanya et. Al (November)

Research on the design and development of a multiple spindle drilling 41-head system for the mass manufacturing of Peugeot 504 automotive brake drums was conducted by Prof. Chukwumuanya et al. in November 2016. They created a multi-spindle drilling head for this design that can drill six holes simultaneously—two holes measuring 08.5 mm and four holes measuring 014.5 mm. They do a theoretical examination of the different gear forces. The

conclusion is that, in comparison to a single drilling operation, mash enhances production rate.

Uninteresting Procedure The purpose of the boring method is to create spherical interior profiles on a drilled hole or in another procedure. Boring har is the name for a single-piece cutting tool. Boring machines are machine tools that revolve a boring bar against a stationary workpiece (10). With a fixed boring bar in the tool position and the work piece kept in the lathe chark, Bering can be established on a Turing machine.

Compared to a portable drilling machine, this universal drill machine offers more operating stability. Additionally, it appears to have more benefits than traditional drilling machines. This is portable and light in weight. Better control is thus provided during the procedure. It functions as expected because the joints are designed to allow for greater performance and rotation in all directions. Both the amount of labor needed for the drilling activities and the total amount of energy used to complete the same tasks are decreased. It is also easy to handle and takes up less room.

Mukesh Mane SRTC VIT Kamshet, Pune

Information regarding drilling and tapping procedures is provided in this document. The design and development of already-existing machinery have received more attention in the last year. In this regard, efforts have been undertaken to create a device that can carry out tapping and drilling tasks on the same apparatus concurrently. Numerous devices, including hand tappers, automated tappers, and portable drills, have been invented

PROBLEM DEFINATION

In Jagadeesh Eng. Works, Miraj manufacturing multiple parts the one of them is portal cover so, my group is identified this part works in 2 CNC machine and 1 VMC machine. The following operation performing

1. 1st In this step the first side finish of portal cover operation complied in CNC machine.
2. 2nd In this step second side of portal cover bore or drill (9mm) operation perform in VMC machine is compiled operation and ruffing center hole.
3. 3rd in this step threading, tap and finish operation is complete in CNC machine. But this operation is possible in 1 CNC machine and 1 VMC machine.

SOLUTION

Operations are possible in 1 CNC machine and 1 VMC machine.

1stIn this step the first side finish of portal cover operation complied in CNC machine.

2nd in this step included new designed and developed bore and drill tool is added in VMC machine so, 1 machine performing 2 operations one is bore or drill, threading tapping operations.

CONCLUSION

The productivity of Indian industries determines their growth. Examine various papers on automation and integrate operations in order to increase productivity. Information about drilling and boring is provided in this document. The primary goal of this project is to design and build a specialized machine that can be used to simultaneously drill and bore work pieces of varying thicknesses and materials.

REFERENCES

1. Raval Sshreom, Ravalharshil, Seta Ddarshit and Anil Kumarrat Hour
2. Design and development of multi spindle drilling machine” 24 June 2020.
3. Prof. P.R. Sawant, Mr. R. A. Bara wade, design and development of SPM-a casesstudy in multi drilling and tapping machine” January-march 2012/5557.
4. V.R. naik, A.M. takale “design and manufacturing of multi spindle drilling head (msdh) for its cycle time optimization “January-April 2012.
5. Shekhar B Pandya,Jignesh Kumar M Parmar “design and development of multistepboring tool”
6. Bhosale Aniket d., sheet Yogesh, Prof. Miss. Shinde S.S. “fabrication of universal drilling machine” 4 April 2018.
7. Gajanan s. yallurkar ,Rishikesh r. Patil , Shubham s. kadam , omkar b. Patil , Yogesh
8. g. chaugule “design and manufacturing of drilling and tapping head for street lightlamp casing”