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VNC - 2020 TASU

VIDYAVARDHINI'S NATIONAL CONFERENCE ON TECHNICAL ADVANCEMENTS FOR SOCIAL UPLIFTMENT

VNC - 2020 TASU

4TH APRIL, 2020

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About us:

Vidyavardhini means a Body committed to enhancement of Knowledge. Vidyavardhini was established as a registered society in 1970 by late Padmashri H. G. alias Bhausaheb Vartak for the noble cause of education in rural areas.

Vidyavardhini's College of Engineering and Technology, Vasai is located on the sprawling campus of Vidyavardhini, spread over an area of 12.27 acres. It is a short, two minutes walk from Vasai Road (W) Railway Station. The college is also accessible by road from Mumbai.

Vidyavardhini Society received approval from AICTE to start the new college of Engineering & Technology with effect from July, 1994. The college is affiliated to the University of Mumbai for the four year degree program leading to the degree of Bachelor of Engineering in six branches.

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Technology has always been potential tool for simplifying the way we do things. Present time demands directing the technological advancements towards addressing societal challenges such as improving health care, education environment, sanitation, agriculture, smart city, etc., VNC 2020 TASU aims to provide an opportunity to researchers, academicians, Industrialist and students to interact and share their ideologies and contributions made for social upliftment with the aid of technological advancements.

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Any other relevant topics

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1. Selected Papers will be published in International Journal of Information Technology, Published by Springer Nature, ISSN: 2511-2104 (Print Version), ISSN: 2511-2112 (Electronic Version)
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Important Dates:

Submission of full length paper
15TH Feb 2020
Paper Acceptance Notification
22ND Feb 2020
Submission of Final Version of Paper
29TH Feb 2020
Registration Deadline
5TH March 2020
PPT Submission
20TH March 2020
Conference
4TH April 2020

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Automation in Conventional Drilling Machine to Multi Spindle Drilling SPM

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Abstract
The current scenario for industries is the production of fuse box component work piece of 14mm and 10 mm sq. rod, that takes two workers to operate the conventional pillar drilling machine (Model-SKP 20mm capacity) to drill three holes of various diameters at various center distance. The complete process time for one work piece takes about 2-3 minutes. The production target of 14mm sq. rod is 6000 pieces and 10mm sq. rod is 10000 pieces in 26 days. The aim of this paper is to automate the entire process with minimum human intervention and thereby increasing production rate and minimizing the process time. The motive is to provide the automated setup at lower cost compared to available machines in the market. The entire theoretical design calculation, manufacturing work carried out in industries has a demand to reduce the process time and increase the production rate. Therefore, to fulfil the demand the idea behind the project is to automate the conventional drilling machine setup to an automated drilling machine setup. For this the modification in conventional machine need to be done is to incorporate a separate motor for both z-axis and x- axis travel that are controlled by using a microcontroller. Clamping and unclamping is done with help of pneumatic cylinder. A Multi spindle head is designed. For this purpose, helical gears have been designed by using standard design calculations. The theoretical time results study for the entire process done shows that the expected process time of drilling for 5 work pieces of 14mm sq. rod is 54 sec and that of 10mm sq. rod is 42 sec. The positioning accuracy of sliding table is tested by constructing a prototype that shows accuracy about 0.005mm.The results obtained match the requirements for the process.

Keywords: multispindle, automation, drilling machine.

1 Introduction

Manufacturing industries have evolved a lot throughout the years in terms of technology. Large-scale industries have already started using automation for production. Nevertheless, large-scale industries rely on smaller industries for the production of components that are to be used in their assemblies. However, small-scale and mini-scale industries still prefer conventional machining operations. This leads to low production rate and long working hours. In order to maximize productivity and obtain accuracy these industries need to opt for the automated process. Gears are the most important components for power transmission at high speeds. If not selected properly can cause problems such as vibrations, heating due to friction and high frequency noise intolerable to human ears and jamming of gears. For this, the factors affecting are center distance between gears, gear material and their hardness, helix angle, pressure angle, bearing type, lubrication. Gearbox is specially designed for such SPM. This includes gear selection and its material to be used. Types of gear failures and their causes are considered while design of gearbox.

It is proposed to carry out design, development and testing of multi-spindle gearbox along with the linear automation setup. The main objectives of this paper is to design a multi-spindle gearbox for maximum 2800 rpm drilling speed. The overall complete design of setup in Solid works including manufacturing drawings. Testing the multi-spindle and linear x-axis & z-axis travel of setup. Testing the drilling operation for diameter of 2.5 mm hole at optimum feed and speed. The drilling machine is one of the most important machine tool. In a pillar drilling machine, holes can be drilled quickly by mounting. The holes is generated by the rotating edge of a cutting tool known as the drill which exerts large force on the work clamped on the table.As the machine exerts vertical pressure to originate a hole it is also called as a "Drill Press". [1]

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Vinay Dahyabhai Patel

of Vidyavardhini's College of Engineering and Technology,Vasai

for presenting paper titled

Automation in Conventional Drilling Machine to Multi Spindle Drilling SPM

in the Vidyavardhini's National conference 2020 "Technical Advancements for Social upliftments" organised by Vidyavardhini's College of Engineering and Technology, Vasai held on 27th June, 2020

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