

MULTIPURPOSE MECHANICAL MACHINE

^{#1}Tabish Naik, ^{#2}Rushikesh Ghorpade, ^{#3}Suraj Pawar,
^{#4}Munnakumar Prasad

²rushikeshghorpade0066@gmail.com

^{#1234}Department of Mechanical

Padmabhushan Vasantdada Patil Institute of Technology, Pune



ABSTRACT

This paper deal with design, development and fabrication of “MULTIPURPOSE MECHANICAL MACHINE”. Today in this world every task have been made quicker and fast due to technology advancement but this advancement also demands huge investments and expenditure, every industry desires to make high productivity rate maintaining the quality and standard of the product at low average cost. They are as follows: 1. DRILLING, 2. MILLING, 3. GRINDING, and 4. TURNING.

This machine perform multipurpose operation at same time with required speed & this machine is automatic which is controlled or operated by motor which is run with the help of current. This model of the multi operational machine is may be used in industries and domestic operation which can perform mechanical operation like drilling, milling, Grinding & Turning of a thin metallic, as well as wooden model or body.

Keywords: Multipurpose, drilling, milling, grinding, turning

ARTICLE INFO

Article History

Received: 22nd May 2019

Received in revised form :
22nd May 2019

Accepted: 25th May 2019

Published online :

26th May 2019

I. INTRODUCTION

Industries are basically meant for Production of useful goods and services at low production cost, machinery cost and low inventory cost. Today in this world every task have been made quicker and fast due to technology advancement but this advancement also demands huge investments and expenditure, every industry desires to make high productivity rate maintaining the quality and standard of the product at low average cost. In an industry a considerable portion of investment is being made for machinery installation. So in this paper we have a proposed a machine which can perform operations like drilling, sawing, grinding, some lathe operations at different working centers simultaneously which implies that industrialist have not to pay for machine performing above tasks individually for operating operation simultaneously.

Economics of manufacturing: According to some economists, manufacturing is a wealth-producing sector of an economy, whereas a service sector tends to be wealth-consuming. Emerging technologies have provided some new growth in advanced manufacturing employment opportunities in the Manufacturing Belt in the United States. Manufacturing provides important material support for national infrastructure and for national defense. In the present scenario machines are electrically driven. Machine with electric motor are faster but that are costly as well as

required electricity. The unit operating by means of electricity has limited applications in the rural area. In remote and interior places like in our Vidharbha where there is no facility of electricity as well as in urban areas, while in the duration of load shading or during electrical power-off timings, this type of human power operated unit will have very extensive utility. Therefore this human powered machine is having extensive utility in such areas. Also it reduces the machining equipment cost as three machines can be used simultaneously on same platform.

II. LITERATURE REVIEW

Barbara Linked, Paul Harris, Michael Zhang, Development of Desktop Multipurpose Grinding Machine for Educational Purposes, (2015).

Given the growing popularity of the maker movement, it is proposed that affordable machine tools may be desirable for both teaching purposes in universities and high schools and use at home by Do It Yourself enthusiasts. For the concept to become a reality, it is necessary that the machine tool can be easily assembled and disassembled by an end-user (e.g. student or hobbyist) and can adapt to changing projects or machining requirements. In this paper the concept and initial development of such a desktop multipurpose machine tool is

reported. Through the use of modular robot modules, it is demonstrated that a machine can be converted from an outer diameter grinding to freeform grinding configuration in approximately 15 minutes. The initial prototype machine will be used to demonstrate concepts such as miniaturization, multi-functionality, and re-configurability for machine tools to undergraduate and high school students.

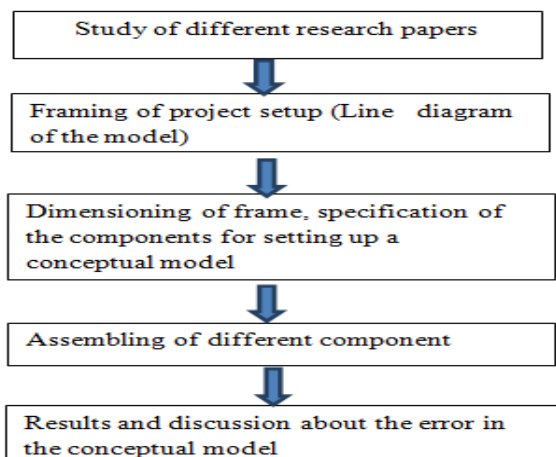
Kevin Patel, Niraj Kumar Shrivastav, Design and development of a Multifunctional portable machine, (2013).

This paper presents a development of a portable workshop which will be available for the small work. It is a multipurpose machine which can be used to perform various operations like drilling, milling, grinding of small work pieces very precisely. The purpose of developing and designing the portable workshop is to make aware the student about the basic operations at very minimum cost in the Institute, they can learn the basic mechanism behind the operations, beside that it can be useful for the industries and also at home for repairing purposes, and in the industries small job preparation can be done without using the Heavy machines. In the designing of a portable workshop a shaft of 40C carbon steel and a dc motor of 100 rpm 12v are used.

III.METHODOLOGY

At the centre of bed main pulley is connected to motor. When the motor is switched on the main pulley starts rotating as the shaft of motor is coupled with main pulley. On the sides of bed other four sub pulleys are connected with the main pulley by means of belt drive.

Shafts are coupled with the four sub pulleys for providing some length to attach tool post. On each shaft different tool posts are connected to perform the operations like drilling, milling, grinding and turning



IV.EXPERIMENTAL SET-UP

In the conceptual model there is Belt-pulley arrangement is use for power transmission .basically motor is connected to shaft on which main pulley is at other end. power is transmitted to different pulley at each corner of table through belt.

Working Principle:

1. Power transmission through Belt drive: A belt is a looped strip of flexible material used to mechanically link two or more rotating shafts. A belt drive offers smooth transmission of power between shafts at a considerable distance. Belt drives are used as the source of motion to transfer to efficiently transmit power or to track relative movement.

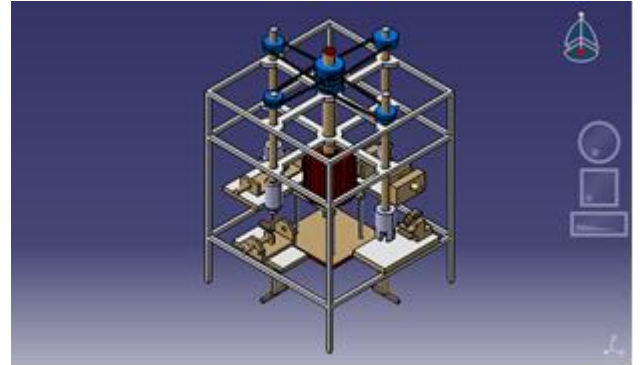


Fig 1. Setup structure

V. CONCLUSION

We can see that all the production based industries wanted low production cost and high work rate which is possible through the utilization of multi-function operating machine which will less power as well as less time, since this machine provides working at different center it really reduced the time consumption up to appreciable limit. In an industry a considerable portion of investment is being made for machinery installation. So in this paper we have proposed a machine which can perform operations like drilling, grinding, milling, turning at different working centers simultaneously which implies that industrialist have not to pay for machine performing above tasks individually for operating operation simultaneously.

REFERENCES

1. Arana, R.Rathish , N. Balakrishnan ,M. Elavarasan ,J. Dhinakaran, Fabrication Of Three In One Multipurpose Mechanical Machine Using Whitworth Mechanics, (2017).
2. S. H. Satbhai, D. B. Zagade, S. S. Shaikh, B. V. Somwanshi, A Paper on Study & Design of Multipurpose Riveting Machine, (2017).
3. V. Senthilraja, S.A.Srinivasan, M.Magudeswaran, P.Saravanakumar, S.Thirunavukarasu, P.Sathiyamoorthi, Design and Development of Multi-Purpose Mechanical Machine, (2016).
4. R.Robert Henty, R.Ranjith Kumar, R.Raju, M.Sheik Mohamed Shabir, V.Tamilvanan, Multi Purpose Scotch yoke Mechanism, (2016).
5. Drossel, W. G. ;Bucht, A. ; Pagel, K. ; Mäder, T. ; Junker, T. , Adaptronic applications in cutting machines, (2016).
6. Awez Inamdar, Rahul Gupta, Prasad Kawli, Rohan Malekar, Design And Fabrication Of Prototype Of Multipurpose Machine For Sheet Metal Operations, (2016).

7. Barbara Linke, Paul Harris, Michael Zhang, Development of Desktop Multipurpose Grinding Machine for Educational Purposes, (2015).

8. Ravi Teggin, Shivanand Kavadiatti And Shashank Hebbal, Design And Fabrication Of Machine Performing Multiple Wood Working Operations, (2015).

9. Sharad Srivastava , Shivam Srivastava , C.B. Khatri, Multi-Function Operating Machine: A Conceptual Model, (2014).

10. Kevin Patel, Niraj Kumar Shrivastav, Design and development of a Multifunctional portable machine, (2013).

11. Masakazu Soshi, Haruki Ishiguro , Kazuo Yamazaki, A study on the development of a multi-purpose spindle system for quality productive machining, (2009).