DESIGN AND FABRICATION OF MULTIPURPOSE GRINDING MACHINE

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ABSTRACT

This paper presents the concept of Multi-Purpose grinding Machine mainly carried out for production based industries. 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. We have developed a conceptual model of a machine which would be capable of performing different operation simultaneously, and it should be economically efficient .In this machine we are actually giving drive to the main shaft to by v-belt drive another shaft driving the multi grinding machine operation done by used only on electric motor. The mode facilitate us to get the operation performed at different working centre. Simultaneously as it is getting drive from single power source. Objective of this model are conservation of electricity (power supply), reduction in cost associated with power usage, increase in productivity.

Keyword: *Multipurpose1, Centre less Grinding2, Rough Grinding3, Fine4, medium Grind5, Cutting6.*

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1. INTRODUCTION

Every industry desire 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 project work is propose where a machine is designed which can perform operations like rough, medium, fine , and center less grinding with extra arrangement is cutter to cutting woods, steel bars , the grinding operation is removing the material as per requirement like rough, medium, fine, and center less grinding operation one machine this operation is simultaneously in one machine .

"Grinding is a metal cutting operation perform by means of rotating abrasive wheel that acts to tool. This is used to finishing the work pieces which must show higher surface quality, accuracy of shape and dimension . Art of grinding goes back many centuries .Mostly grinding is the finishing operation because it removes comparatively little metal 0.25 to 0.50 mm per revolution in most operation and the accuracy in dimension is in the order of 0.000025 mm .

2 Literature survey

Before starting work undergone through many research papers which indicates that for a production based industries machine installation is trick task as many being associated with it such as power consumption, maintenance cost. It is provide an opportunity to gain additional knowledge in the areas of own research and show that understanding the theoretical background to own project. It is also provide information where there are gap research that has been works. It helps to survey previous studies on knowledge sharing and intranets .and we get the idea of multi-purpose grinding machine

2.1 Rakesh S. Ambade, Komal D. Kotrange et.al. "Paddle operated multipurpose machine"

The survey of the literature regarding pedal driven machine are listed: Dharma Chaitanya Kirtikumar was design and develop of multipurpose machine which does not required electricity for several operation like cutting and drilling etc. This is a human power machine runs on chain drive mainly with human effort. But if we wanted to operate this machine by electric power this machine can also does that. This design is ideal for use in the developing world because it does not required electricity and can be build using metal base, pulley, rubber belt, chain, grinding wheel, saw, bearing, foot pedal for operated by human effort. **[1]**

2.2 Krishnappa R1 , Venkatesh G2 , et. al . "Motorized multipurpose machine"

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. **[2]**

2.3 Dr. Toshimichi Moriwaki (2006) "Multi-function operating machine"

Recent trends in the machine tool technologies are surveyed from the viewpoints of high speed and high performance machine tools, combined multifunctional machine tools, ultra precision machine tools and advanced and intelligent control technologies. Frankfurt-am Main, 10 January 2011. The crisis is over, but selling machinery remains a tough business. **[3]**

2.4 Mr.Gawari Tushar1 , Mr. Gawade Rahul2 , et.al. ' Multi Purpose Machine'

This model of the multi operational machine is may be used in industries and domestic orientation which can perform mechanical operation like drilling , cutting and shaping of a thin metallic as well as wooden model or body. 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 **[4]**

2.5 Heinrich Arnold "The recent history of the machine tool industry and the effects of technological change"

The study establishes a connection between radical technological change, industry structure, and competitive environment. It reveals a number of important occurrences and interrelations that have so far gone unnoticed. The findings are supported by a worldwide qualitative survey in which statements from 59 companies were collected. **[5]**

2.6 S. Perumal , T. Manikandan, et.al. "Design and Synthesis of Multipurpose Hand Driller Machine for Various Processes"

The portable driller is made and its advantages and disadvantages are discussed. Its motion characteristics are studied. It is concluded that this mechanism is a good choice to convert rotating motion into reciprocating motion because of fewer moving parts and smoother Operation. **[6]**

2.7 Prof. S.S.Lande1 ,Shrishiel Desai2 et.al. "Design & Development of Multipurpose Machine"

Multipurpose machine we can perform number of operation on single machine. It helps to improve production rate and machining quality. 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, sawing, grinding at different working centers simultaneously which implies that industrialist have not to pay for machine performing above tasks individually for operating operation simultaneously. **[7]**

2.8 Frankfurt am Main, "Multi-purpose machines ensure enhanced independence"

The trend towards the kind of multi-purpose machining centers that are able to cost efficiently handle a broad portfolio of products with small batch sizes accelerated significantly during the crisis. "With a multi-purpose machine, you're less dependent on particular products and sectors", explains Biermann. "But there are still going to be specialized machines for large batch numbers." However even when it comes to the classical representatives for large-series production, there is definitely an incipient trend reversal: in the automotive industry. **[8]**

3.PROJECT FIGURE

Fig.1 Design and Fabrication of Multipurpose Grinding Machine

4. COMPONENT USED

1) Electric Motor.
2) Cone pulley
3) V-Belt

4) Pulley
5) Shaft
6) Pedestal Bearing
7) Grinding Wheel
8) Cutter
9) Center less Grinding
10) Table

5. RESULT

- Performing operation on more than one Job at a time.
- Performing multiple operation in one cycle.
- Indexing capability to sequence operation one after another.
- Easy operation and attachments.
- Easy to install and use anywhere.
- Easy to operate.
- Low maintenance cost.
- Simple in construction.

5. ADVANTAGES AND APPLICATION

5.1. Advantages

- Machine cost is minimum.
- More than one work at a time.
- Five operation work at a time in machine.
- Maintenance cost is low.
- Easy to assemble.
- Simple in operation.
- No need of skill operator.
- All operation is performing by only in one motor.

5.2. Applications

- This machine can be used in Steel industry.
- It can be used in workshop.
- It can be used for multiple operations in workshop.
- It can be used in welding shop.
- It can be used in part manufacturing work.

6. CONCLUSION

After Compilation of project Design and Fabrication of Multipurpose Grinding Machine we have learned a lot from this project about machine and how are the use in mechanical workplace in industry , some basis technique like cutting ,surface finishing, planning, grinding are introduce very nicely . in addition to this we have also learnt about painting ,selection of material and welding .moreover this project gave us a good experience of purchasing material from market and incised our surveying capability.

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