

A Review on Special Purpose Machine

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ABSTRACT

Today in this phase of 21st century every task have been made quicker due to advancement in technology, but this advancement demands high initial investment. Nowadays market is very competitive and to survive in this competitive market, machine tools are required which can improve the productivity rate maintaining the quality and standard of the product at low cost. Thus we have developed a conceptual model which is a special purpose machine which can perform different operations. This machine tool will be able to perform various operations like external grinding, internal grinding and drilling operations. All observations will be performed using single power source.

Keywords: External Grinding, Internal Grinding, Drilling.

I. INTRODUCTION

This document is a template. Engineering is a branch of Science and Technology where society expects lots of innovation and creativity from engineers. The main goal of the today's industries is to raise the productivity along with the quality as well as the accuracy of the product.

Now a days in small scale industries various machines operations are perform by using energy sources for individual machine tool, for increase the productivity of the industries, the machine tool should be able to perform the various operations with the less consumption of the energy.

The versatile grinding machine tool perform the various operations like internal grinding, external grinding and drilling, this machine tool has a capability to perform the multitasking operation by using the single source of energy.

This machine tool works with the flexibility and by using single energy source, it reduced the rate of energy consumptions. And increase the productivity

by performing multitasking operations, and also used for mass production.

II. LITERATURE REVIEW

Before starting our work we had viewed many research papers which indicates that for a production based industries machine installation is a crafty and a skillful task as many factor are associated with it such as power consumption, time required, maintenance cost, no of units produced per machine etc.

Some research papers which led us an idea are as follows:

Dharwa Chaitanya Kirti Kumar designed and developed a multipurpose machine which does not require electricity for several operations like cutting, grinding etc. This is a human powered machine runs on chain drives mainly with human efforts. But if you wanted to operate this machine by electric power this machine can also does that. It has some special attachment so use both human power as well as electric power. The design is ideal for use in the developing world because it doesn't require electricity and can be built using metal base, chain, pulley,

rubber belt, grinding wheel, saw, bearing, foot pedal, electric motor, chain socket.

Rakesh Ambade developed a conceptual model of a machine which would be capable of performing different operation simultaneously, and it should be economically efficient. This machine can be used in remote places where electricity is irregular or insufficient. It is designed as a portable one which can be used for cutting in various places. It can be used for operating on materials like thin metals, wood and p.v.c. The material can be cut without any external energy like fuel or current. Since machine uses no electric power and fuel, this is very cheap. Energy is the most vital aspect in the development of modern technological civilization. In the present work, a human powered multipurpose machine is developed which can perform three types of operations drilling, sawing and grinding. Power required for pedalling is well below the capacity of an average healthy human being. The system is also useful for the work out purpose because pedalling will act as a health exercise and also doing a useful work.

Sharad Srivastava 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 which scotch yoke mechanism is directly attached, scotch yoke mechanism is used for sawing operation. On the main shaft we have use bevel gear system for power transmission at two locations. Through bevel gear we will give drive to drilling centre and grinding centre. The model facilitates 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, reduced floor space.

Dr. Toshimichi Moriwaki (2006): Recent trends in the machine tool technologies are surveyed from the

view points 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. Machine tools nowadays have to be veritable “jack of all trades”, able to handle all kinds of materials, to manage without any process materials as far as possible, and be capable of adapting to new job profiles with maximized flexibility. Two highly respected experts on machining and forming from Dortmund and Chemnitz report on what’s in store for machine tool manufacturers and users. Multi-purpose machines are the declarations of independence. The trend towards the kind of multi-purpose machining centres 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.

Pradip R. Bodade proposed a machine which can perform operations like drilling, grinding, cutting, fabrication of ‘MULTI-FUNCTION OPERATING MACHINE’. the concept of Multi-Function Operating 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. The model facilitates 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, reduced floor space. This machine is may be used in industries and domestic operation.

Harshal G.Suryawanshi proposed that Grinding is a machining process which uses an abrasive wheel or belt type cutting tool. This grinding machine is used in various industries for finishing of work pieces and

give high surface quality. Grinding with wheel or belt type cutting tool is used for different precision applications such as deburring in foundries and constructions, polishing, engraving and cut-off grinding. This paper highlights on recent development by using various power tools such as electric power tools & pneumatic power tools also by implementing robotic systems.

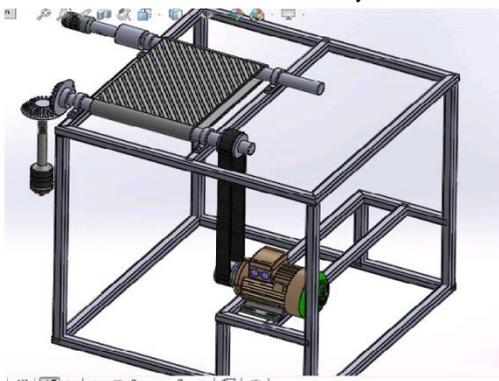
III. NEED OF DEVELOPMENT OF MACHINE

In present scenario machines are electrically driven. Thus, we came up with an idea regarding multipurpose machine which could perform both operations such as internal and external grinding and with that we included drill with help of a bevel gear, this could actually work on a single power source without any pedalling activity as pedalling is not very efficient process in this productive and fast-growing market.

This is actually a conceptual model which can be helpful for small and medium scale industries to raise productivity and can be successfully implemented there.

IV. PROPOSED METHODOLOGY

In this project power is supplied with help of motor to pulley with help of a v-belt, set rollers are attached to the pulley on which a external grinding belt rotates. At one end of roller horizontal speed of grinding belt is converted to vertical with help of bevel gear for drilling purpose. At other end of roller internal grinding tool is provided in a chuck. All three operations will work simultaneously.



V. CONCLUSION

The processes and conceptual model stated in literature review such as running the multi-purpose machine with help of electricity generated by pedaling work with effort of human was not very efficient and was inapplicable in this modern industry.

Thus, we developed and modified the model based on the literature review and came up with a better idea of use of multi-purpose machine operations with single power source.

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