

# A REVIEW ON MOTORISED PORTABLE MULTI PURPOSE MACHINE

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## ABSTRACT

The global drive toward intermediate technology and sustainable development motivated the development of multipurpose machines for small-scale metal. Improving the productivity of manufacturing process are significant tasks in all manufacturing engineers and manufacturing industries. The model "**Motorized portable multipurpose machine**" allows us to perform the operation like drilling, grinding shaping, and cutting in different work centers at the same time, as it receives impulse from a single source of energy. The goal of this model is to conserve electricity (energy supply), reduce the cost associated with using energy, increase productivity, and reduce space. This machine is used in domestic industries and services. In an industry a considerable portion of investment is being made for machinery installation. This paper presents the concept of fabricating Multipurpose Machine which mainly carries out for production based industries. We have developed a conceptual model of a machine to operate through mechanism which fully automatically driven by IHP Motor and have capacity of performing different operations simultaneously and is also economically efficient. In this machine we are actually giving drive to the main shaft to which grinding wheel is directly attached, scotch yoke mechanism is used for cutting operation and shaping operation by referring power from main shaft to another sub shafts, by using different sized pulleys we have reduced the speed and by using bevel gear we are doing drilling operation.

**Keywords-** Multipurpose machine, Drilling, Grinding, Cutting operation

## 1. INTRODUCTION

Manufacturing is the process of converting raw material into semi or finished goods. There are many manufacturing processes found in production process. Depending on the manufacturing process industries use numerous machines to convert raw materials in to products. Since to increase the productivity and profit of the industries, manufacturing machines/equipment should be properly designed and manufactured. However the methodology of rapid machine design attempts to shorten design-to manufacture time of production equipment by using advanced engineering tools such as Computer Aided Design systems (C A D), mathematical and Finite Element Analysis (FEA) during the conceptual design phase. Since identifying and to apply the best design concepts, overall development time can be shortened. However, in this paper the new approach to conceptual design can be applied at any phase during the concept generation, whether it is the design as a whole or a component in particular. As components are already part of the machine assembly, changes in their design are automatically updated in the whole skeleton. Main while most machines are performs single operations and limited production performances, those are their main disadvantages, however the main challenges that are seen on single purpose machines were higher machine cost, productivity, poor production time and non-versatile. As the result multipurpose machine need to be designed and fabricated in order to reduce machine cost and increase productivity and improve competitiveness of the sectors. Since, the main objective of the study is to design and fabricate multipurpose machine so as to improve the productivity and competitiveness of sheet metal manufacturing sectors. The design and fabrication process were includes select proper materials for multipurpose machine, mathematical design calculations and fabrication of multipurpose machine, and productivity and costs were considered.

### 1.1. Drilling:

A drill is a device connected to a cutting device; drill is usually used to drill holes in different materials or by using fasteners, different materials are tied. Add a helper to one end of the drill and press against the target material. The purpose of cutting is cut the material. It is used for wood, metal and construction.

**Fig-1: Drilling****1.2. Shaping:**

Produce a flat or flat surface that can be in a vertical, horizontal, or angular plane.

**Fig-2: Shaping****1.3. Cutting:**

There are many types of metal and each requires different metal cutting techniques. For this reason there are a variety of methods available for cutting metal materials. The method chosen for the project will depend on the type of metal used, the level of precision required and the intended use of the manufactured part and the project.

**Fig-3: Cutting****1.4. Grinding:**

The content of the surface used to display grinding is the process of removal and the whole part made of metal and optional materials processing is being done. It can be ten times better than any turn or process.

**Fig-4: Grinding**

## 2. NECESSITY OF FABRICATING MACHINE

In the current scenario, the machines are electrically operated. Therefore, we had the idea of the multi-purpose machine able to perform operations, such as external grinding, and with that we included a drill with the help of a bevel gear, this could work in a single power supply without activity. 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.

## 3. OBJECTIVES

- ❖ To make multipurpose machine.
- ❖ To perform 4operation simultaneously on same machine.
- ❖ For increase in efficiency of the machine.
- ❖ To take down the manufacturing cost of 4 machine to 1.

## 4. METHODOLOGY

In this project we are supplying power to shaft by means of Electrical motor mechanism containing one big pulley and one small pulley which is fitted on shaft and belt on pulley helps to rotating shaft, on which a pulleys are mounted on it by means of motor pulley arrangement. One pulley transmits power by v belt to the grinding wheel under it and also by link attachment the power is transmitted to the hacksaw frame (rotator motion is converted to reciprocating motion). Also other pulley transmits power by v belt to the drilling attachment.

## 5. WORKING PRINCIPLE

### 5.1 Scotch Yoke Mechanism:

The Scotch yoke is a mechanism for converting the linear motion of a slider into rotational motion or vice-versa. The piston or other reciprocating part is directly coupled to a sliding yoke with a slot that engages a pin on the rotating part. The shape of the motion of the piston is a pure sine wave over time given a constant rotational speed.

### 5.2 Power Transmission through Gears:

Bevel gears are gears where the axes of the two shafts intersect and the tooth-bearing faces of the gears themselves are conically shaped. Bevel gears are most often mounted on shafts that are 90 degrees apart, but can be designed to work at other angles as well. The pitch surface of a gear is the imaginary toothless surface that you would have by averaging out the peaks and valleys of the individual teeth. The pitch surface of an ordinary gear is the shape of a cylinder. The pitch angle of a gear is the angle between the face of the pitch surface and the axis

### 5.3 Power transmission through v belt and pulleys:

The transmission of power through the v belt and pulley to the drilling, cutting and grinding. The belts can be used as a source of movement, to transmit control productively or to monitor relative development. The belts are surrounded by pulleys and may have a turn between the pulleys, and the poles must not be parallel.

## 6. CONCLUSION

Here, we have created and modified the model in the light of the writing survey and developed a greater idea for the use of machine tasks of multiple purpose with a single motor. In a sector, a large segment of consideration is created for the creation of model. Therefore in this paper, we have proposed a machine which is of capable performing activities such as cutting, grinding, drilling, shaping and in various work path independently, as this machine will perform each tasks individually separately and also parallel all operation. This machine can be used as part of remote places where energy is low. It can be used for light cutting operations, grinding operation and drilling operation. In addition, correlation activity can be used to refine the edges of devices and also to

remove additional materials. Your work can be done possibly in less space. Even incompetent work can deal with it effectively. we can reduce the cost of creation of model, which is the most essential factor in the industry.

## 7. REFERENCE

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