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# MULTI OPERATIONAL MACHINE

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**Abstract -** *An abstract summarizes, in one paragraph (usually), the Industries are basically meant for production of useful goods and services at low production cost, machinery cost and low inventory cost.The document a machine which can perform operations like drilling, grinding and cutting,etc.The systematic arrangement called "MULTI OPERATIONALMACHINE". The concept mainly carried out for production based on the industries purpose which spends lots of economy for multiple machine for a single operation. The model facilitate we get the operation performed at different working process simultaneously. As it get drive from single power source. Obtained power is transmitted to shaft with bevel gear arrangement to function various operations. Here cutting and grinding operation can be dis-engaged whenever it is not functioned with the help of spur gear arrangement. The main objectives of this model are conservation of (power supply), reduction a cost associated with power usage, increase the productivity, reduce the floor space. The machine is one of the best replacement for separate machineries used in the industries and domestic operation.*

**Key Words: Drilling, Grinding and Parting off**

## INTRODUCTION

*This deal with design, development and fabrication of MULTI OPERATIONALMACHINE. The concept is mainly carried out for production based industries. Industry are mainly for Production for useful goods and services at low production cost, machinery cost and low inventory cost. We developed a concept of model for a machine which would be capable of performing different operation simultaneously, like drilling, grinding and punching. The model facilitate we get the operation performed at different working process simultaneously. As it get drive from single power source.*

## CONSTRUCTION

*The base frame for mounting the overall setup is fabricated with the help of square tubes and channels by metal cutting and metal joining process called welding. The rotational source is mounted on the base frame and it is coupled to the operational shaft by means of pulley and belt drive. This shaft is fixed in a vertical manner to the frame with the help of bearing support in order to attain friction free rotation. One end of the shaft is coupled to the drill chuck for fixing drill bit, while its other end is connected with spur gear. Parallel to the operational shaft two shafts are mounted, these two shafts get connected with separate bevel gear assembly at its ends, the output from both bevel gears are connected with cutting and grinding wheels. To transfer the rotation these two shafts spur gears are used, which can be engaged and disengaged with the help of nut and bolt arrangement*.

## WORKING PRINCIPLE

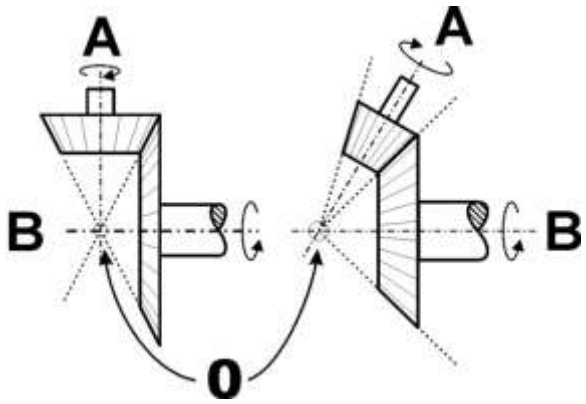
*When the motor gets turned on, it functions the shaft by transferring its motion via belt drive these shaft activates the drill bit for performing grinding operation, simultaneously the spur gear attached with it also gets rotated. When the cutting or grinding operation has to be done, its activation shaft is connected with spur gear at is end to mesh with driver gear of operational shaft, this makes the rotation of operational shaft to transfer into parallel mounted shafts with the help of these meshed gear, there by activating the cutting or grinding wheel.*

## MAJOR COMPONENTS

1. A C MOTOR
2. BELT
3. PULLEY

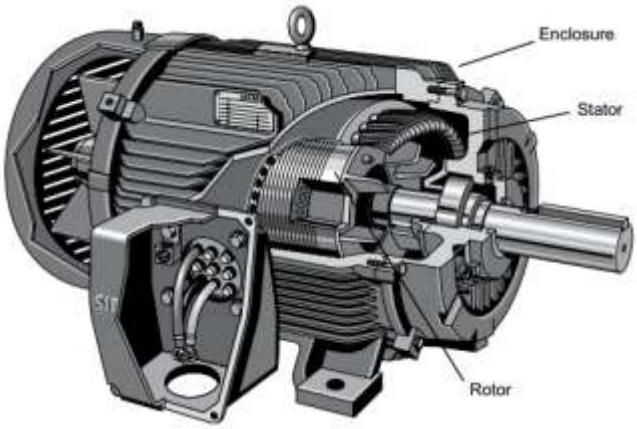
4. FRAME
5. SHAFT
6. BEARING
7. BEVEL GEAR
8. DRILL BIT
9. GRINDING WHEEL
10. CUTTING WHEEL

**BEVEL GEAR:**




Bevel gears are most often mounted on shafts then they are 90 degrees apart, but can be designed to work at other angles .The pitch surface of bevel gears is a cone.

**A.C. MOTOR:**

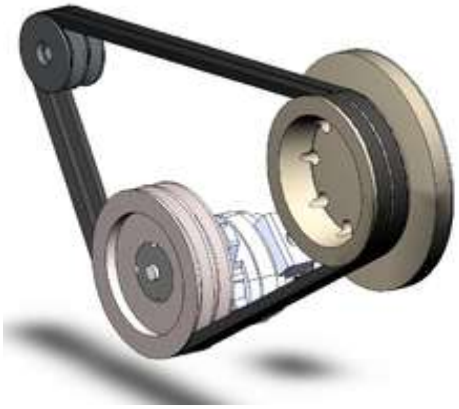



AC induction motors are the most commonly used in industrial motion control systems, as well as in mainly powered in home appliances. The ac motor constrction should be simple and low maintenance and direct connection to an AC power source. The main advantages of AC induction motor used in home applineces.

**BELT :**

A belt is made up of a polymer material used to tranmit power between two or more rotary shafts, mostly parallel in arrangement. Belts may be used to transmit power effectively. Belts are fitted over grooves in pulleys and also may have twists between pulleys, and the shafts need not to be parallel in all conditions. Flat belt, vee-belt, round belt are the some important types of belts. Here the vee-belt has been looped over the driving motor and the driven wheel.

**PULLEY:**



A pulley is a mounted on the shaft that is designed to support movement and change of direction of a belt, or transmit the power between the shaft and belt.

In the case the pulley supported by an frame that does not transfer the power to a shaft, but it is used to guide the belt. It is known as called pulley.

**FRAME:**

The metal frame is generally made up of mild steel bar for machining, suitable for lightly stress components including studs, bolts, gears and shafts. It can be case-hardened to improve wear resistance. They are available in squares and flats and hot rolled rounds.

**SHAFT:**

Shaft is a common and important machine element. It is used to transmit power. The shaft may be hollow or solid. By using the shaft is supported on the bearings and it rotates a set of gears for the purpose of power transmission. The shaft is generally acted by the bending moment and axial force. Design of shaft primarily involves in determining stress at critical point of the shaft .Other two similar forms of the shaft are axle and spindle.

**Specifications**

Shaft diameter: 12mm

Material: mild steel

Length: 26 inch

**DRILL BIT:**

Drill bit are used to cutting the tool and it is used to remove the metal to create holes, almost of circular cross-section. Drill bit come in many sizes and shapes and can create different kinds of holes in different type of material. In order to create holes drill bit are usually attached to a drill, which power them to cut through the work piece by an rotation. The drill bit fixed on the upper end of the shank

**GRINDING WHEEL:**

A grinding wheel is a made up of abrasive material and used for various grinding (abrasive cutting) and abrasive machining operations. Such grinding wheels are used in grinding machines.

The wheels are generally made up of composite material consisting of coarse-particle and bonded together by a cementing matrix to form a solid, circular shape and the grinding wheel profiles and cross sections

**CUTTING WHEEL:**

Cutting wheel is the procces of cut the metal sheet into two or more portions, through the application of an directed force.

Even liquids can be used to cut the things when applied with sufficient force (see water jet cutter). Cutting wheel

**ADVANTAGES AND APPLICATIONS:**

**ADVANTAGES:**

- Power consumption is completely reduced
- Floor space occupied by these machines are completely less when compared to other machineries
- Simple in construction

- Less maintenance
- Increased production rate

Components used in for construction are less costly and easily available

**APPLICATION:**

- In small, medium and large scale industries
- In institutes workshop

For commercial purposes is normally used in small industry while remove or cutting material

**CONCLUSION**

The main purposes of MULTI OPERATION MACHINING is reducing the overall production time and utilize the same machine for drilling, grinding and parting off. it saves lot of time in work piece holding as well as tool change time. When we use different machine of different operation overall production cost also increases. In order to reduce that we are making a machine that operates different operations in a single workspace

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