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Design and Fabrication of Multi-Purpose Machine

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Abstract: ***Our project is primarily aimed at designing and manufacturing a multi-use boiler in which four operations can be carried out simultaneously or individually as required. The press conducts various operations, such as drilling, slotting, grinding, and simultaneously cutting, using the operating motor and the current at the desired speed. It is based on the power transmission system by sweaters, v-crops, engine gears, bevel gears and cum mechanism materials .Using thin metals and materials and small pieces for working materials. In workshop and elsewhere the computer can be used. The project aims at reducing costs and manpower for SMEs and workshops.***
Keywords: Drilling, Grinding, Cutting, Slotting in a machine.

I. INTRODUCTION

The main goal is to use a significant share of investment for machinery installation for all industries useful products and services at low cost, such as a tool inventory and manufacturing in an industry. The system for grinding, drilling, slotting and cutting operations. Multifunctional processing is a machine that operates quickly and effectively without the inconvenience of using different devices for various work piece operations. This machine performs all four main operations simultaneously. Today, every job has been performed faster and quicker in this world by technological progress, but this growth requires enormous investment and expenditure.

According to the manufacturing economics, there is a wealth-producing sector whereas the service sector is usually wealth-consuming. We have witnessed several research papers, suggesting that the installation of production-based machinery in difficult tasks involves a number of factors including power consumption, which can perform operations.

II. EXPERIMENTAL PROCEDURE

A. Drilling

Drilling is a cutting process that cuts or extends a circular cross section hole through solid material using a drill bit. The drill bit is a multi-point, rotary cutting tool. The piece is pressed against and rotated at hundreds to thousands of revolution per minute. The cutting edge is therefore pressed against the work piece and chips are cut off as they are drilled. Specially shaped bits can cut non circular cross section gaps, and a square cross section can be performed.

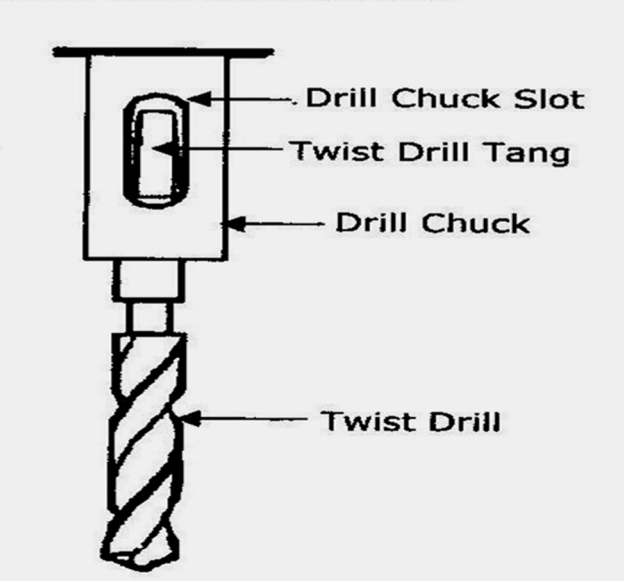

Fig 2.1 Drill fixed to the spindle

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B. Grinding

An expensive wheel for different grinding machining operations is a grinding wheel. It is usually made of a matrix of coarse and abrasive particles pressed together and bound together for a durable, circular shape. Depending on the intended use of the wheel different profiles and cross sections are possible. Grinding wheels with particles attached to the surface also can be made from solid steel or aluminum disk. In order to cool and lubricate the roll and working part and remove the chips created during the grinning process, the use of fluids during molding is required. The most common molding fluids include aquatic soluble, water-soluble, synthetic and p-soluble oils.

Fig 2.2 Grinding wheel

C. Cutting

Cutting is to divide a physical object, by applying an intensely guided force, into 2 or more parts. The knife and saw or the scalpel and microtome are common applications for cutting in medicine and science. Nevertheless, any sharp object can be cut if it is hard enough and is done with sufficient force than the cut surface. The object is sharp enough. And liquids can be used with sufficient force to cut things.

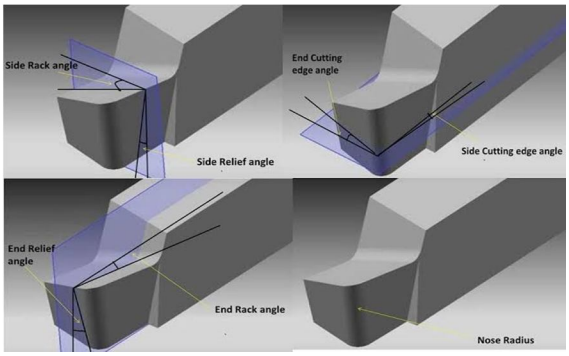

Fig 2.3 Cutting tool

D. Slotting

The slotter is a tool to reciprocate the ram holding the tool in a vertical axis, and the tool's cutting operations is only in the downward pitch. The foundation of the slotter is rigidly designed to withstand all cutting forces. The front of the vertical column provides guidance for the reciprocal ram device. The ram supports the tool head that is fixed on the frame. The piece of work is fixed to the table which is able to move lengthwise, crosswise and rotatively. The slotter is used for cutting grooves, keys and slots in different shapes, making both external and internal normal surfaces.

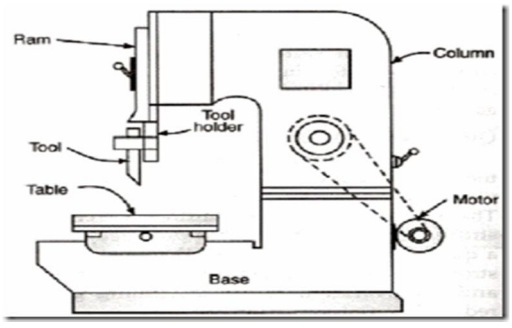

Fig 2.4 Slotting machine

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E. Induction Motor

An induction motor is an electric motor which is an alternative current motor where power is supplied to the rotor via electromagnetic induction. The rotor can be powered by several means. This power is delivered directly from a DC source into the frame in a DC motor, while the rotating system induces this power in one inductive motor. An induction engine is sometimes referred ta as rotating transformer because the stator is basically the primarily side of the transformer, and the rotor is the secondary component of the transformer. The current of the main side evoke ma.

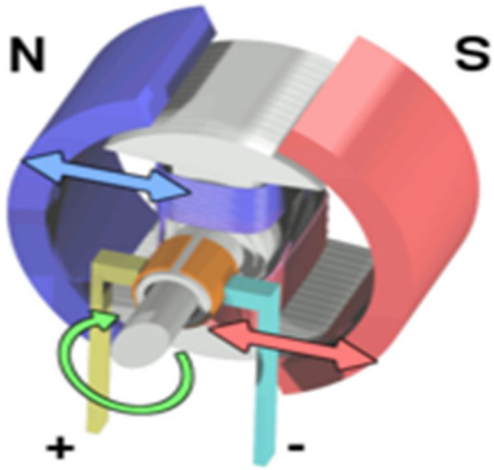

Fig 2.5 Induction motor

F. Hacksaw

Originally and primarily for cutting metal, hack screw is a specialized tooth saw, We may also cut various other materials, such as wood and plastic, often using plastic pipes for say, plumbers and electricians. Hand saw and driven models are available. The hacksaw is mostly handsaws with a C-shaped frame carrying a edge under tension. Such hacksaws have a handle with pins to secure a small bladder, normally a piston grip. The frames are also used for tensioning the thin blade. Hacksaws forgive the frame and have a sheet required instead. Sciences are no longer common, but blades holders for hacksaws allow the use of standard blades.

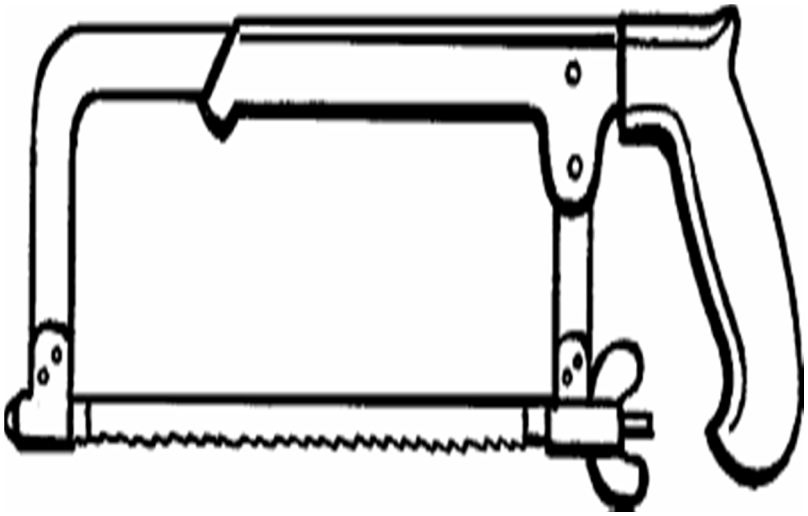

Fig 2.6 hacksaw

III. METHODOLOGY

In this area of industries and automated workshops, the research carried by us has been impressive. The workers at the industrial facility at the service plant are very useful. The cost involved in this project has been reduced. The entire requirement function which has also been assigned was planned to fulfill.

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IV. RESULT AND DISCUSSION

This "multipurpose machine" features can cut, grind, mount, drill and run.

A. Properties

The chosen materials must have the correct characteristics for the application proposed. The following four type principle properties of materials affect their selection

1) Physical
2) mechanical
3) chemical
4) Manufacturing standpoint.

The various properties involved include melting point thermal and thermal properties. The four type of materials influences their selection.

The various mechanical properties involved are tensile strength, compressive cuts, bending, torsional and buckling load, fatigue power, resistance to impact, the elastic limit, durability limit, and elasticity modulus, stiffness, wear and slid ability. From a manufacturing standpoint, the different properties concerned are casting capacity for surface forges.

Quality required it usually affects the method odd production and, eventually, the products. For example, casting a smaller number of components that can be manufactured much more effect tively by welding or forging the steel by hand would never be desirable. Product availability Most items may be scarce or in limited supply.

V. CONCLUSION

In this area of industries and automated workshops, the research carried out by us has been impressive. The workers at the industrial facility at the service plant are very useful. The cost involved in this project has been reduced. The entire requirement function which has been assigned was planned to fulfill.

Photography Of The Project

Fig 6.1 Multipurpose machine

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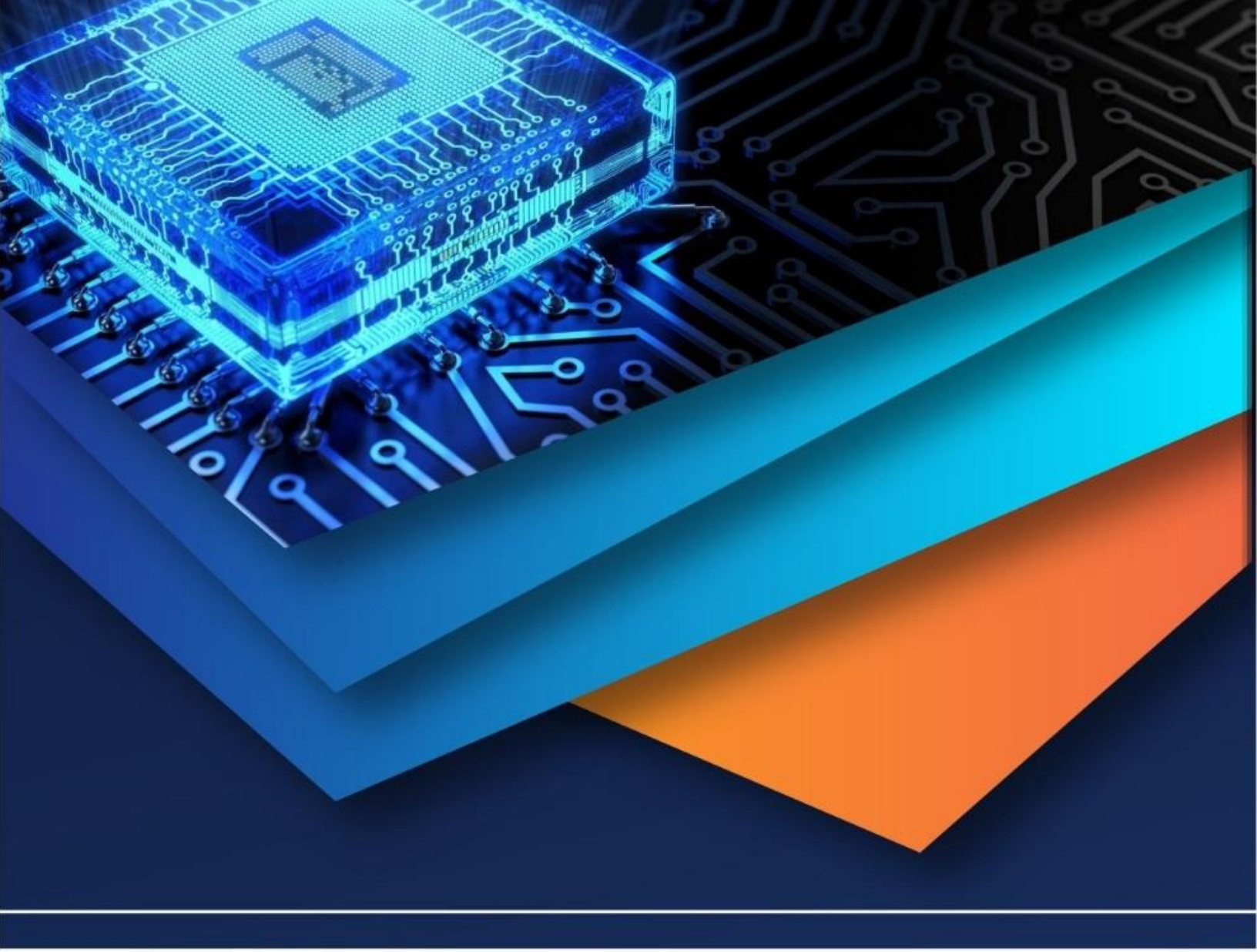

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