International Research Journal of Engineering and Technology (IRJET) e-ISSN: 2395-0056
Volume: 06 Issue: 03 | Mar 2019 www.irjet.net p-ISSN: 2395-0072

PNEUMATIC OPERATED HACK SAW AND GRIDING

Shinde vaibhav Satyawan [1], Kesale Ajay lahu[2], Suryawanshi Suraj Motiram [3], Jadhav Sharad Bibhishan[4]

Makane Amol Shivdarshan[5]

[1, 2,3,4] *Student of Diploma in Mechanical Engineering Department Vishweshwarayya Abhiyantriki Padvika Mahavidhyalay, Almala , Maharashtra, India*

[5] *Lecturer in Mechanical Engineering Department, Vishweshwarayya Abhiyantriki Padvika Mahavidhyalay, Almala, Maharashtra, India.*

Abstract: *The objective of this work is the pneumatic power hacksaw & grinding machine in order to achieve high productivity of work-pieces than the electrical hacksaw machine using pneumatic power.*

Pneumatic is a huge topic of science and engineering dealing with the mechanical properties of air. In our project we take this pneumatic and a hacksaw or grinding for cutting purpose, The pneumatic reciprocating high-speed hacksaw machine has an advantage of working in high pressure , the hacksaw used in this is reciprocate such that required shape can be cute according to the requirement.

The hacksaw and grinding is the metal cutting machine tool designed to cut metal by applying pneumatic pressure. Hacksaws and grinding are used to cut thin and soft metal sheet operation of the unit is simplified to a few simple operations involving a cylinder block and piston arrangement. There are numerous systems in hacksaw machine Key Words: Automation, power hacksaw, Solenoid valve, Pneumatic cylinder and Pneumatics

KeyWords: Pneumatic power, Science and engineering, Grinding, Cutting, Cylinder block and piston arrangement, Pneumatic cylinder and Pneumatics

1.Introduction

There are many electrically operated grinding machines of different configurations and different manufacturers are available for the use in machine shop. These machines can grind jobs of different material precisely. Now in industry, it is necessary to grind jobs with very high rate to achieve mass production requirements. So there is need to move for a new technology which gives us a mass production with less time and less energy input. It is impossible to depend upon conventional grinding machine. By using this pneumatic grinding machine the jobs can be ground maintaining tolerances to achieve high speed cutting rate and mass production for maximum benefit in manufacturing industries. This machine overcomes the drawbacks and limitations of conventional grinding machines. It can be used in a small workshops and industries as it is available in very low price and its smaller size and high efficiency.

The hacksaw is the metal cutting machine tool designed to cut metal by applying pneumatic pressure. The machine exclusively intended for mass production and they represent fasten and more efficient way to cut a metal. Hacksaws are used to cut thin and soft metals the operation of the unit is simplified to a few simple operations involving a cylinder block and piston arrangement. There are numerous systems in hacksaw machine. The main function of pneumatic hacksaw is to cut thin and soft metals by pneumatic power.

2. Literature Review

Pneumatics which in turn originates from (pneuma) meaning air organ which in turn comes from (pneumagreek for air). It is a branch of technology, which deals with the study and application of pressurized gas to effect mechanical motion.

Pneumatic systems are extensively used in industry, where factories are commonly plumbed with compressed air or compressed inert gases. Pneumatic systems are widely used systems in industry. While they are used widely in the industry, the system components like pumps, valves, cylinders are always became investigation topics in the history.

Pneumatic cylinders are one of the most common components of the pneumatic systems used in many engineering applications like - automatic manufacturing and montage lines, heavy construction equipments, control systems, sensitive measurement and test systems. They are used for producing linear motion in the pneumatic systems and they convert pneumatic energy to mechanical energy.
Most science and engineering disciplines and cover concepts such as pipe flow dam design air and air control, computational fluids called dynamics. flow measurement ,river channel , behaviour and erosion ,however if used incorrectly , pneumatic instrument can result in weird.

3. Working Principle

The compressed air from the compressor reaches the solenoid valve. The solenoid valve changes the direction of flow according to the signals from the actuator. The compressed air passes through the solenoid valve and it is admitted into the front end of the cylinder block. The airpushes the piston for the cutting stroke. At the end of the cutting stroke air from the solenoid valve reaches the rear end of the cylinder block. The pressure remains the same but the area is less due to the presence of piston rod. This exerts greater pressure on the piston, pushing it at a faster rate thus enabling faster return stroke. The weight attached at the end of the hacksaw frame gives constant loads which lower the hacksaw to enable contineous cutting of the work. The stroke length of the piston can be changed by making suitable adjustment in the actuator.

4. Advantages, Disadvantages & Application

4.1 Advantages

Quick operation.
Accuracy is more.
Low cost machine.
Simple in construction
Less maintenance.
Reduces manual work

4.2Disadvantages

Leakage of air affects the working of the unit.
Costlier than manual grinding because of compressor unit but it can be cut-short if compressor is already employed
Only small sized jobs can be ground.

4.3Application – Can be implemented in industries which utilise materials such as –
Plastic and rubber.
Stone, ceramics and glass.
Leather and metal

5. Future Scope

- The forward stroke can be increased by using a superior cylinder for grinding longer jobs by increasing the pressure production capacity of the compressor
- Automatic feeding mechanism for material can be introduced by using limit switches or sensors.
- Automatic lifting up mechanism for job when grinding operation is finished to introduce next portion of job for grinding.

6. Conclusion

As per the above discussion we concluded that to overcome problems in conventional grinding machines and hack saw, due to high efficiency, easy to operate and affordable price the proposed model of solenoid operated pneumatic grinding machine and hack saw is helpful and completes all the expectations needed in the mini industries. Future scope of proposed research work is to increase the production rate, grind the metal jobs easily.

It can withstand the vibrations, there are no hazards from jerk, no special training required to operate it. After studying this report we have known that how the pneumatic hack saw & grinding machine will work, and knowing the construction and how the mechanism works in the machine.

We learnt how the theoretical design is possible in practical. This grinding machine has lighter weight compared to other machines. The cost of machine is less and easy to operate so it is affordable for all industries. In this machining process at a time tow operations are performed.

7. References

1) Brian S. Elliott, Compressed Air Operations Manual, McGraw Hill Book Company, 2006, ISBN 0-07-147526-5.

2) HereshMistry, Fundamentals of Pneumatic Engineering, Create Space e-Publication, 2013, ISBN 1-49-372758-3.

3) Krar, Gill &Smid 2003

4) "How Do Air Compressors Work?. PopularMechanics .2015-03-18. Retrieved 2017-01- 12.

5) "Compressor Selection Basics: Positive Displacement versus Dynamic Compression". Retrieved 2017-01-12 – via The 5th Utility.