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PNEUMATIC MULTIPURPOSE MACHINING (DRILLING AND GRINIDING

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ABSTRACT

In small-scale industries and automobile maintenance shops, there are frequent needs of tightening and loosening of screws, drilling, boring, grinding machine. Huge and complicated designed parts cannot be machined with the help of an ordinary machine and further for every operation separate machine is required, therefore increasing the number of machines and increasing the area for them to be accommodated and hence overall initial cost required is increased. In a single machine all the above specified operation can be carried out, i.e., after drilling, the drill head is removed from the barrel key and the required tools like grinding wheels, boring tool etc., can be attached, and the operation can be performed. By the application of pneumatics, which is operated by an air compressor will give the successive action to operate this machine. By this we can achieve our industrial requirements.

INTRODUCTION

The main objective of our project is to perform various machining operations using "Pneumatic mechanism" in drilling machine with the help of pneumatic sources. For a developing industry the operation performed and the parts (or) components produced should have it minimum possible production cost for it to run profitability. In small-scale industries and automobile maintenance shops, there are frequent needs of tightening and loosening of screws, drilling, boring, grinding machine. Huge and complicated designed parts cannot be machined with the help of an ordinary machine and further for every operation separate machine is required therefore increasing the number of machines required and increasing the area required for them to be accommodated and hence overall initial cost required. In our project the above complicated problems are minimized. The main advantage of a pneumatic system is that it is economical and simple in construction which makes it different from other sources. It can be easily produce and can be control easily. It can perform faster, produce less noise and has low number of components.

LITERATURE REVIEW

A.Karthik, R.Krishnaraj, R.Murali : The main concept of this special drilling machine is to reduce the man power and for time saving and for better finish. These kinds of special drilling machines are very much used in mechanical workshops for specific job applications. It consists of both pneumatic and hydraulic cylinders. The hydraulic cylinder is used for cushioning process because the pneumatic cylinder will moves faster, if it moves faster than the piston of the cylinder will gets damaged and the drilling machine will moves suddenly, if it moves faster than the drill bit will damage. The output of the hydraulic cylinder is again connected to the input of the same cylinder using a PVC pipeline. The input and output of the pneumatic cylinder is connected to the solenoid valve where the compressed air will be regulated from the compressor. Then drilling machine is fitted with a rectangular movable

frame. The frame is then connected to the piston of the two cylinders. The drilling depth of the drilling machine is then controlled by a limit switch. The limit switch is attached to the rectangular frame. The limit switch is movable. It can be adjusted at any height. At the base there was a workbench where the work piece is placed for drilling.

Manish Kale, Prof. D.A.Mahajan, Prof. (Dr.) S.Y.Gajjal: The compressed air from the compressor is used as the force medium for this operation. The air from the compressor enters into the flow control valve which converts the flow of air and enters into the pneumatic double acting cylinder from lower port through the pipe linings pushes the piston outwards and move drilling and riveting spindle with the help of flange attached to stroke of pneumatic cylinder and spindle, this causes the application of gradual force to drilling and riveting spindle. The drilling tool drills the holes into the work piece as well as riveting tool applying the gradual force on the rivet till the snap head is to be form. After completion of operation the compressed air comes inside to the pneumatic cylinder from another port and drilling and riveting spindle comes upwards.

Prof. Gadhia Utsav D, Shah Harsh A, Patel Viral A, Patel Kushang P, Prof. Amin Harsh J: Today most of the industries are trying to make improvement in their production processes as well as relevant machinery to improve the productivity along with the automation. Drilling, taping, boring etc. are such operations which are most frequently used in small and large scale industries. Most of the industries uses the conventional method says hand tapping, drilling, boring. This conventional method is very time consuming process, less accurate and includes higher labour cost, and ultimately leads to less productivity. So there is a scope to develop the machine for various operation which would overcome all the problems faced by the conventional process. So we are going to develop the portable pneumatics machine which will make the use of compressed air for it operation less human involvement as which is used in hand tapping, drilling, and boring. **Asst.Prof. Arvind**

Kumar, Asso.Prof. Maughal Ahmed Ali Baig, and Asst.Prof. Ravindra Lathe: automation methodology involving Pneumatic systems to convert the existing conventional drilling machines into automated drilling machines. The automation process involves various pneumatic devices, pneumatic systems and also some electrical and electronic devices. The automation strategy, when implanted is believed to result in reduced cycle time, costs, improved product quality and increase in productivity. By considering a particular task of drilling holes, it is found from the present investigation that by the process of conversion the output rate increases four times as compared to that of conventional type of machines.

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3.8.1Construction Of Pneumatic Drill

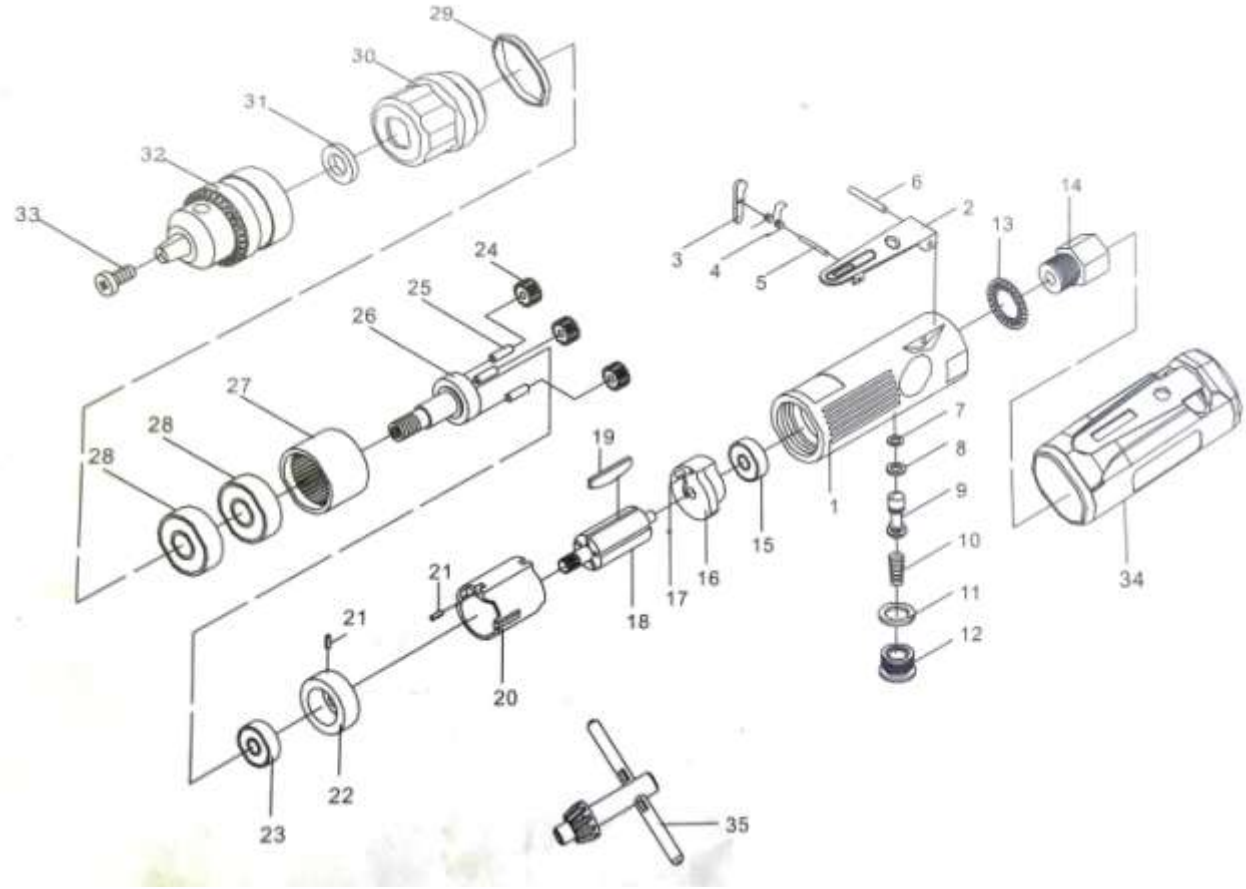

Fig-2

Part No.	Description	Quantity
01	Main Housing	1
02	Lever Trigger	1
03	Lever Block	1
04	Spring	1
05	Bolt	1
06	Bolt	1
07	O-ring	1
08	O-ring	1
09	Valve Stem	1
10	Spring	1
11	O-ring	1
12	Screw Nut	1
13	Muffler	1

14	Inlet Nipple	1
15	Bearing	1
16	Rear Plate	1
17	Steel Ball	1
18	Rotor	1
19	Rotor Blade	5
20	Cylinder	1
21	Bolt	2
22	Front Plate	1
23	Bearing	1
24	Gear	3
25	Bolt	3
26	Rotating Axle	1
27	Interior Gear	1
28	Bearing	2
29	Decorating Ring	1
30	Fixing Ring	1
31	Spacer	1
32	Drill Chuck	1
33	Screw	1
34	Soft Grip	1
35	Chuck Key	1

DESIGN SPECIFICATION

Pneumatic Gun

1.	Drill Capacity	9.5 mm
2.	Free Speed	2,500 rpm
3.	Average Air Consumption	4.5 SCFM
4.	Air Inlet	1/4"
5.	Air Hose	8 mm
6.	Overall Length	215 mm
7.	Compressor Outlet	1/2"
8.	Required Pressure	6.3 Bar
9.	Net Weight	0.90 Kgs

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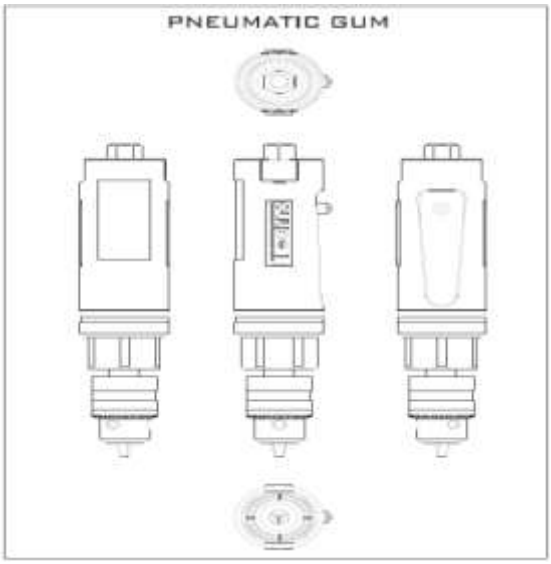

Fig-35

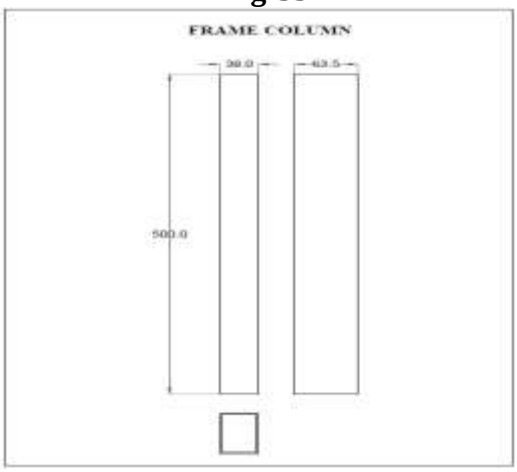

Fig-36

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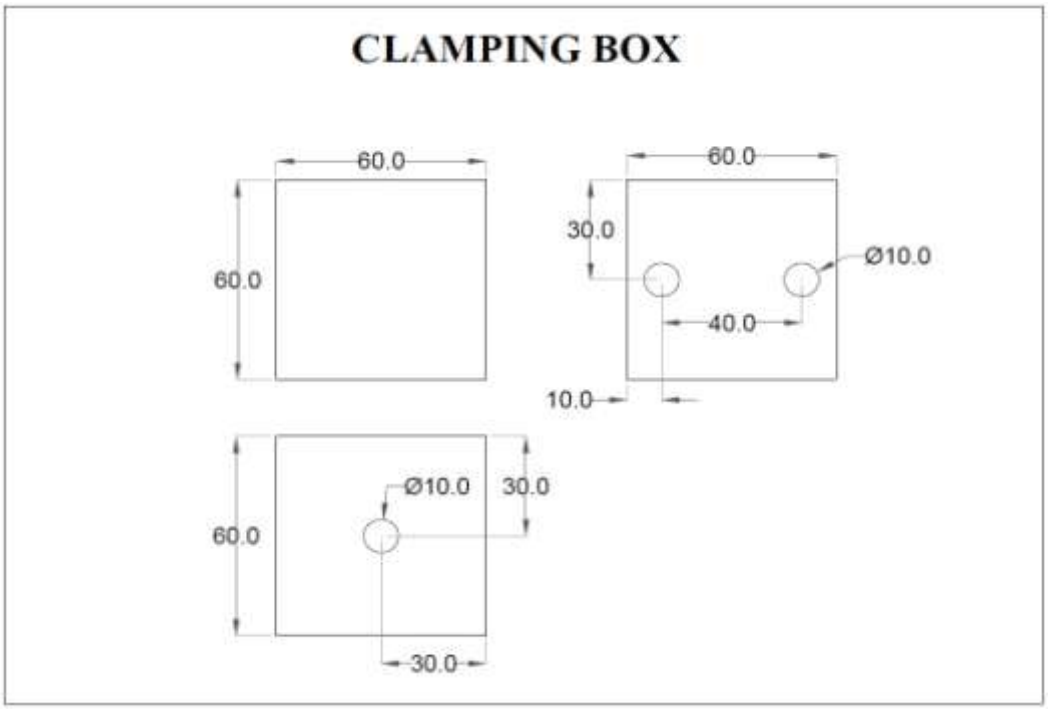

Fig-37

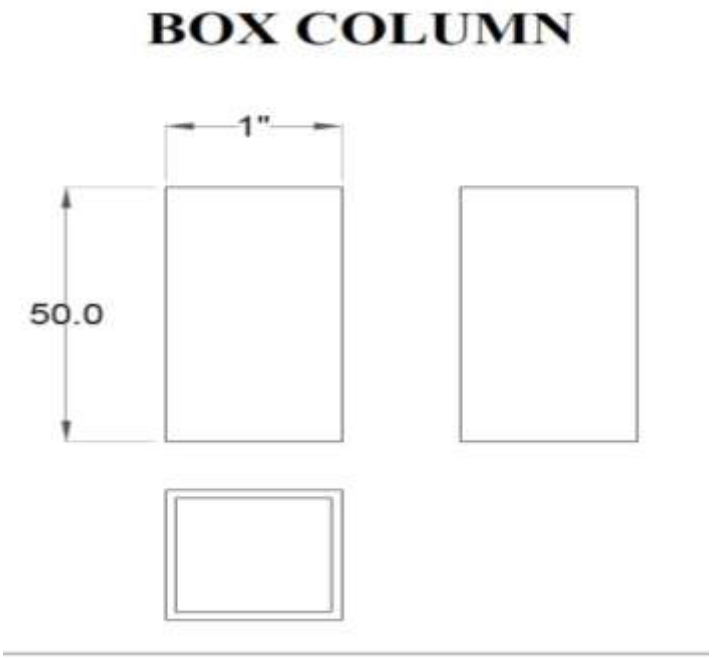

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Fig-38

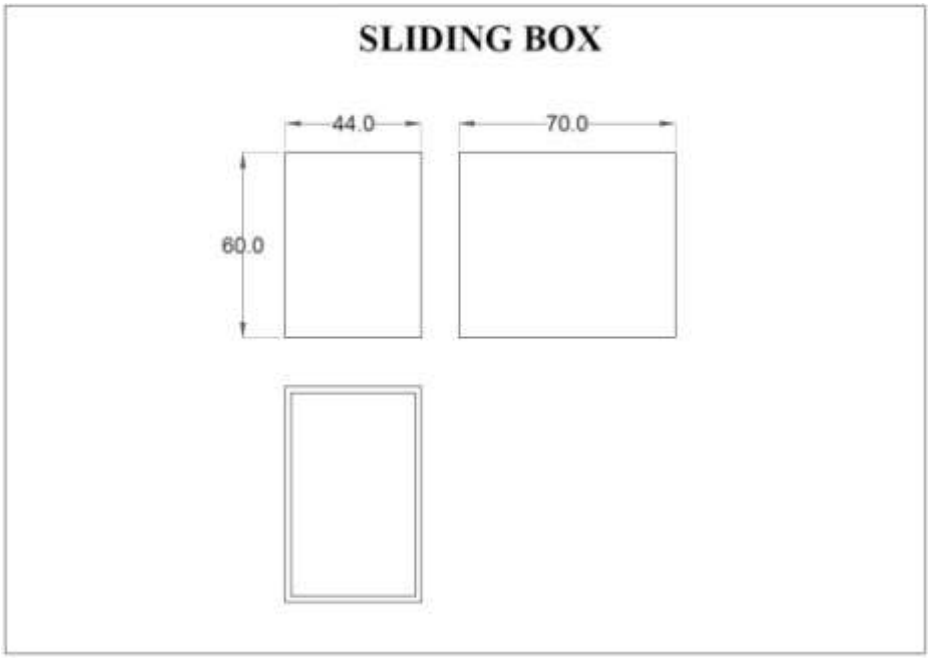

Fig-39

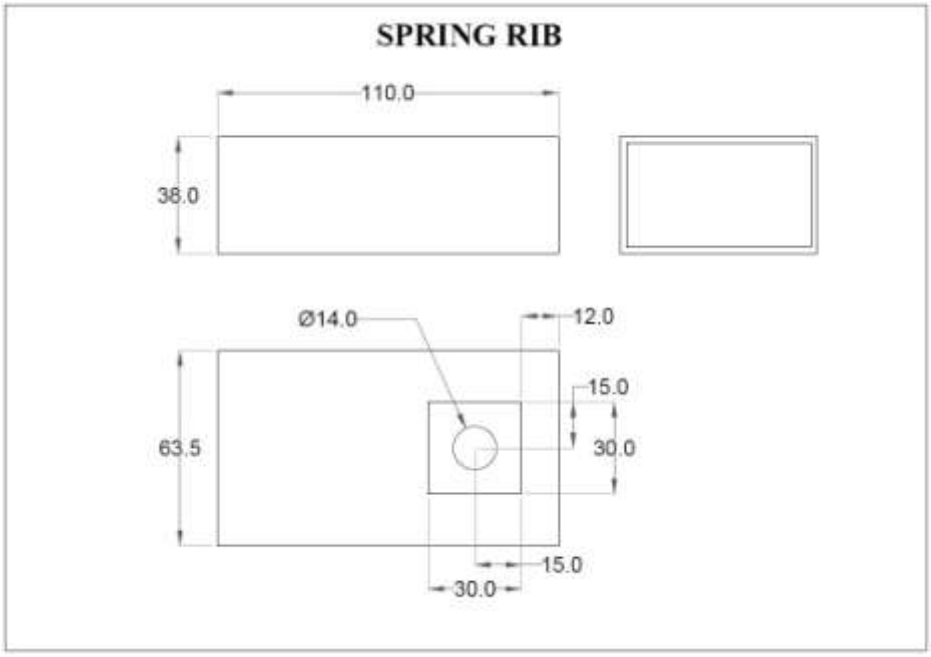

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Fig-40

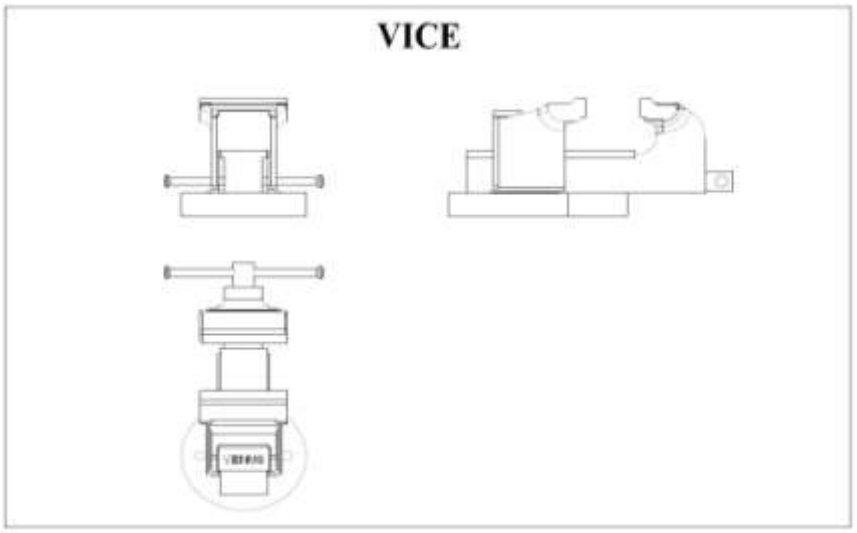

Fig-41

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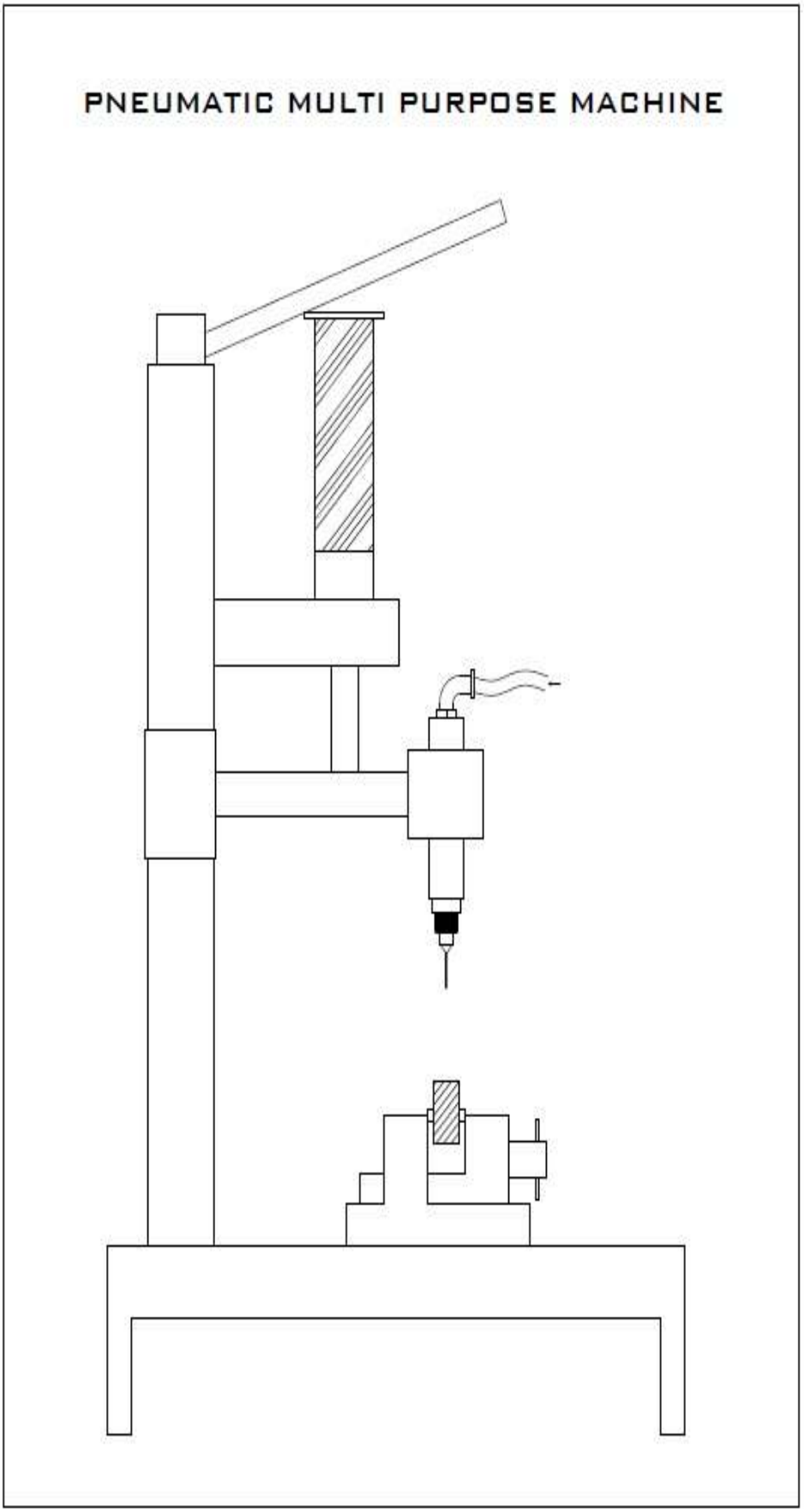

Fig-42

CONCLUSION

The project carried out by us made an impressing task in the field of small scale industries and automobile maintenance shops. It is very usefully for the workers to carry out a number of operations in a single machine.

This project has also reduced the cost involved in the concern. Project has been designed to perform the entire requirement task which has also been provide.

Thus the machining time has been reduced by using pneumatic drilling when compared to the conventional drilling and also performing operations like grinding,buffing,etc., in our single pneumatic machine.

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