

Pneumatic Punching Machine

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Abstract:- Pneumatic is a department of engineering that offers which examine of air/fuel feature and additionally their use in engineering home equipment both in atmospheric or above atmospheric stress. Now an afternoon quantity of utility will increase in pneumatics gadget because of excessive wearing capacity, low protection fee and maximum vital now no longer dangerous. Either compressed air or inert fuel are normally used. This significance is because of its accuracy and fee. This consolation in operating the pneumatic system has made us to format and fabricate this unit as our project. This unit, as we're hoping that it is able to be operated with out issue with semi-expert operators. The pneumatic press tool has an advantage of jogging in low pressure, that is even a pressure of 6 bar is enough for operating the unit.

Keywords: *Pneumatic, Pressure, Punch, Force.*

I. INTRODUCTION

Pneumatic structures are energy structures the usage of compressed air as a operating medium for the energy transmission. Their precept of operation is just like that of the hydraulic energy structures. An air compressor converts the mechanical power of the high mover into, mainly, strain power of the compressed air. This transformation allows the transmission, storage, and manipulate of power. After compression, the compressed air need to be organized for favored work. Pneumatic structures are energy structures the usage of compressed air as a operating medium for the energy transmission. Their precept of operation is just like that of the hydraulic energy structures. An air compressor converts the mechanical power of the high mover into, mainly, This transformation helps the transmission storage, and manage of energy. After compression, the compressed air ought to be organized for favored work. storage, and control of energy. After compression, the compressed air should be prepared for desired work.

II. DESIGN OF MODEL

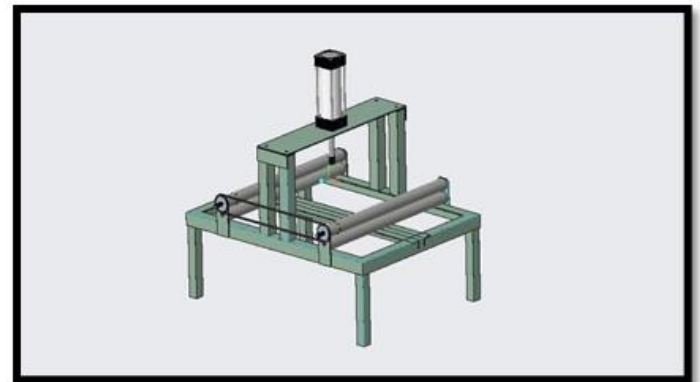


Fig -1 Design of Actual Model

III. WORKING

The compressed air from the compressor on the stress of eight to ten bar is handed thru a pipe related to the hand lever operated valve with one enter. The hand lever operated valve has outputs stress underneath the piston is extra than the stress above the piston. So, those pass the piston rod from BDC to TDC. This pressure performing is handed directly to punch which additionally actions downwards. The punch is guided via way of means of a punch manual who's constant such that the punch is absolutely guided to the die. The substances are in among the punch and die. So because the punch comes down the substances are sheared to the specified profile and one enter. The air moving into the enter is going out thru outputs. When the hand lever valve is pressed, because of the excessive air stress on the BDC of the piston, the air of the punch and the clean is moved downwards thru the die Clearance. When the piston is at the intense factor of the stroke length, the exhaust valve is opened and the air is exhausted thru it and while hand lever operated valve is freeing the pressurized air are available on the TDC of the piston and it pushes the piston from TDC to BDC. So, the only aspect of the air is pulled downwards and the opposite aspect is lifted upwards. So, the punch is consequently pulled upwards from the die. Now the piston reaches the BDC of the specified stroke length. Now the fabric is fed and the following stroke of the piston is made ready.

IV. DESCRIPTION OF COMPONENTS

➤ *Actuator :*

Pneumatic cylinders, additionally known as air cylinders or actuators, are mechanical gadgets which use compressed air to transport a load in a linear path. The maximum not unusual place kind of pneumatic actuator consists of a piston and rod transferring internal a closed cylinder, in which the piston plays the preferred movement. In pneumatic systems, air is used because the supply of electricity to perform and entire a given task, on this case, extending and retracting the piston internal a cylinder.



Fig - 2Actuator



Fig -3 hand lever valve square tubes are capable of bearing different loads, despite the material variation

➤ *Compressor:*



Fig- 4 Compressor

➤ *5/2 DCV:*

Compressors are mechanical gadgets used to growth stress in a number of compressible fluids, or gases, the maximum not unusual place of those being air. Compressors are used at some point of enterprise to offer store or tool air; to electricity air tools, paint sprayers, and abrasive blast equipment; to segment shift refrigerants for air con and refrigeration; to propel fueloline via pipelines; etc. As with pumps, compressors are divided into centrifugal (or dynamic or kinetic) and positive-displacement types; however in which pumps are predominately represented through centrifugal varieties, compressors are extra regularly of the positive- displacement type.

➤ *Square Tubes (MS) :*

Square tubes are structural steel or metal products that can be used to form a network of building columns. This is one of its most suitable uses because A 5/2 way directional valve from the name itself has 5 ports equally spaced and 2 flow positions. It can be use to isolate and simultaneously bypass a passage way for the fluid which for example should retract or extend a double acting cylinder. There are variety of ways to have this valve actuated.

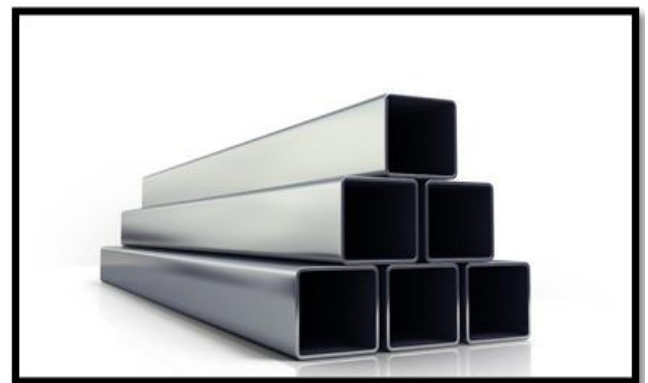


Fig – 5 square tubes (MS)

➤ *Polyurethane tubes :*

Polyurethane has a excessive resistance to abrasion whilst being notably bendy and kink resistant. Its maximum fantastic best aleven though is its “memory”. This polyuerethane tubing will stretch and flex however constantly go back to its unique shape.

V. HARDWARE RESULT

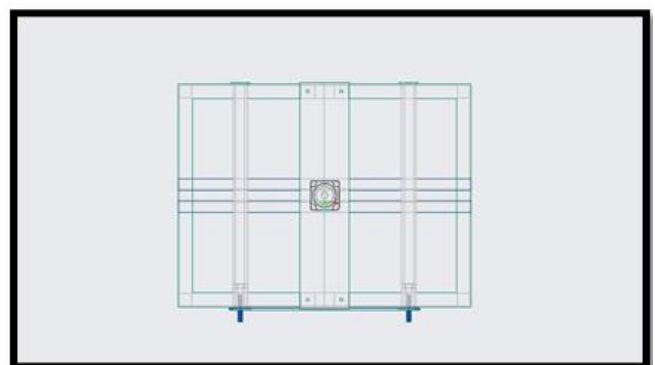


Fig -7Top view of model



Fig -6 Polyurethane tube

VI. COSTING OF EQUIPMENTS

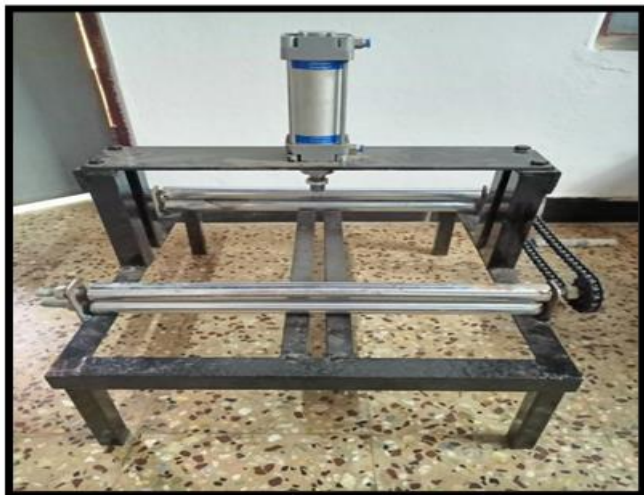


Fig -8 Actual model result

VII. ADVANTAGES

- It uses less area for operation
- It's construction is simple and requires less maintenance.
- Easy and fast operation

Sr. NO.	Particulars	Cost in Rs.
1	Double acting cylinder	3000
2	5/2 way hand lever valve	800
3	Square Tubes	800
4	Rollers	250
5	Chain	300
6	Sprocket	300
7	Pneumatic fittings	250
8	Nut bolts	250
9	Punch	250
Total Price		6200

Table – 1 costing of equipment's

- Low cost
- High degree of accuracy
- Less maintaining cost.

VIII. CONCLUSION

Pneumatically operated punching machine is appropriate for small scale and medium length industries. Based at the shear supplied at the punch face the punching pressure discount of 25% to 60% there by growing device lifestyles and decreasing device machining cost. Therefore with this pressure discount we're capable of effortlessly punch sheets. Circularity of numerous sheets punched is proportional to the blanking strain and in addition research discovered that the circularity embed on a plastic sheet is greater beneficial than Aluminium and Galvanized Iron because the capacity to withstand identical strain is much less in plastic cloth similar to Aluminium and Galvanized Iron .

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