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REVIEW ON DESIGN AND MODIFICATION OF VALVE TAPPET FACE POLISHED MACHINE

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ABSTRACT

In present situation the industrial manufacturing has brought new trend. This project deals with the design and modification in clamping mechanism of tappet face polished machine. New trends using in tappet face polished mechanism leads to the important manufacturing process.This clamping fixture satisfies the requirements such as simple design, safety, reliability and wide clamping range. This was also used for loading and unloading of engine valves and increases its efficiency. So pneumatic clamping is our best choice. For pneumatic operated clamping we choose the material by differentiating and studying different material. Finally we choose OHNS material because of its ease as availability and high strength of property. We made modification in design of pneumatics operated clamping mechanism which makes it smoothworking and increases human comfort.

Keywords: Creo, AutoCAD,U-shaped part, Pneumatic Component's

I. INTRODUCTION

Present situation in the industrial manufacture has brought new trends in the kind of flexibility and intelligence. In these days following to the globalization small and middle series production is dominating. These kind of manufacture are usually oriented to the individual clamping. The pneumatic system is used, in clamping mechanism for that with the help of U-shaped component .In this project we are made modification in present tappet face polish machine by using pneumatic system .In this work we have change the various parameters of machine and there size for valve facing application .In pneumatically operated tappet face polish machine compressed air is used as working medium. Normally at pressure 6 to 8 bar by using pneumatic control or electrical signal (D.C or A.C. Source) can be used for clamping .It will develop maximum force up to 150 N. To choose appropriate mechanism for clamping designing to perform loading and unloading operation is perform. To design pneumatic system performing engine valve face polishing activity.To choose appropriate material for fabrication of pneumatic system and C-clamp.To perform stress analysis of the pneumatic system and C-clamp parts.

II. MACHINE CONSTRUTION

For Fig1 shows pneumatic operated face polished machine. In this machine die mounted on collet to hold the arbitrary size of valve .Mainly two pulley are used among them one is attached by the main shaft and second

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pulley is mounted on electric DC motor. Long and sort shaft are provided in the machine both are hollow in cross section.

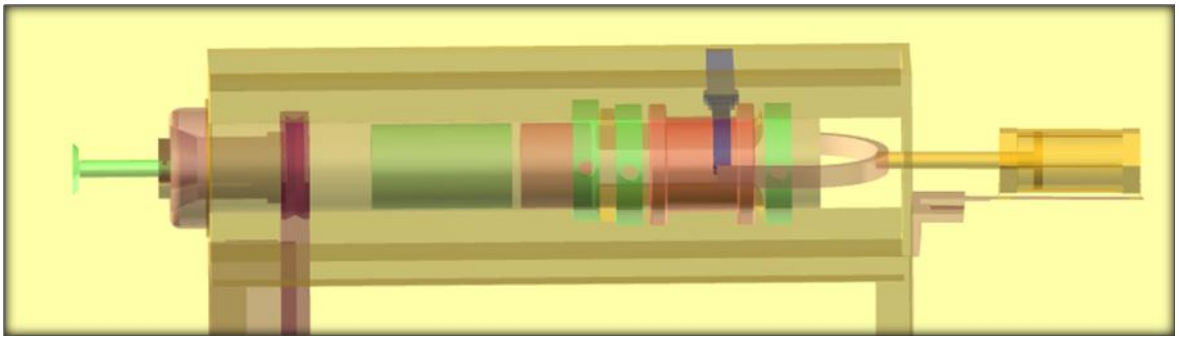

Fig 1: - Arrangement of tappet face polished machine

I-section and finger key are attached to shaft to apply the force on long and short shaft .There are three disks they mounted on shaft for proper clamping mechanism .the position of disk are depend on valve size . Main hollow shaft is used for properly alignment of all parts on machine. The main purpose of U-shape is proper sliding of flange in machine .when force is applied key move in up and down direction, so we can apply 6 to 8 bar pressure.

III. WORKING

The cylinder rod is attached for top side of U-shaped part and bottom side is attached by flange. At the same time main hollow shaft is rotated by 2200 rpm with the help of electric motor than we use 4/3 DCV solenoid operated of double acting cylinder to forward direction and to stop of anywhere in the middle the 4/3 DCV is 4

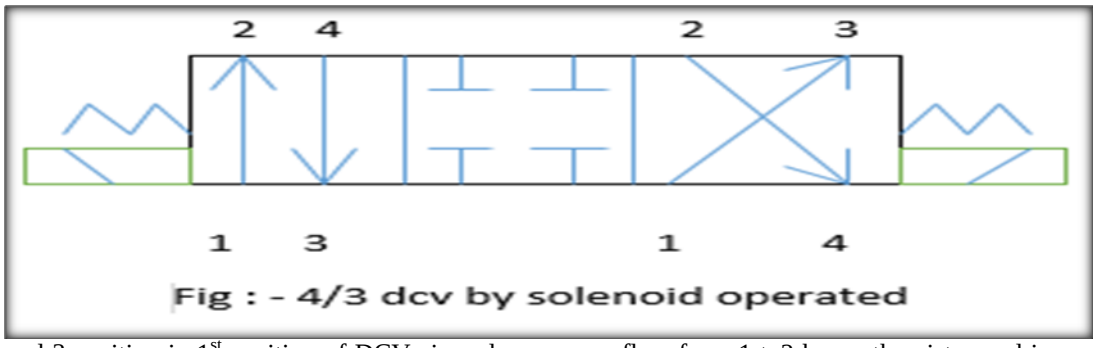

Fig : - 4/3 dcv by solenoid operated

part and 3 position in 1st position of DCV air under pressure flow from 1 to2 hence the piston rod is move for forward motion and flange is slide at the time short hollow shaft is applied the force with the help of finger key then short and long hollow shaft move in forward motion the T-Slot are applied the force on die and clamping is done for the 2nd or middle position of DCV air is not flow the cylinder at that time the facing operation is perform before the complete operation the 4/3 DCV air under pressure flow from 1 to 3 than piston rod is reverse direction than clamping is freely than remaining air flow from 2 to 4.

III. CALCULATION

*Cylinder*bore = 32 mm

Stoke length = 100 mm

Piston Dia =16 mm

Piston rod length = 8 mm

Cylinder thrust

F = Cylinder thrust in kg

D = Dia of piston in cm

d =Dia of piston rod in cm

1) **Double acting in forward stroke**

$$F= (\pi/4*D^2)*P$$

$$= \pi/4*(32)^2*6$$

$$= 48.248$$

2) **Double acting in return stroke**

$$F = (\pi/4*(D^2-d^2))*p$$

$$= \pi/4*(3.2^2-1.6^2)*6$$

=36.186 N

3) **Air consumption**

Free air consumption =piston area *(operating pressure +1.013)*stroke

$$=\pi/4*(1.6^2)*(6+1.013)*8$$

=7.6207

4) **Theoretical air consumption calculation**

Free air consumption in liters for forward stroke

$$C = \pi/4* (D^{2*}(p+1)*l)/1000$$

$$= 0.7853*(1.6^2*(6+1)*0.8)/1000$$

= 0.01125 hrs.

$$C = \pi/4* (D^2 - d^2)(p+1)*l)/1000$$

$$= \pi/4* (3.2^2 - 1.6^2)(6+1)*0.8)/1000$$

= 0.03377 hrs.

IV. BENEFITS

- Pneumatics system is very fast in operation. This is because of very low viscosity of compressed air.
- Pneumatics System works better even in hot surrounding. The pneumatic system are cool on duty even in very hot surrounding of about 398 K
- Pneumatics System are very clean, absolutely dust free surrounding.
- Automatic and safety circuits are possible.
- If overload, the system stalls. System will start working once the load is reduction in efficiency.

- Pneumatics System is better in mines. Because they do not generate any spark and hence no change of explosion and fire hazard.

V. LIMITATIONS

- Force developed by Pneumatics System is very less compared to hydraulic systems. This is because; the air is compressible in nature. Air pressure cannot be increased to high value. Generally, a pressure up to 10 bar is used.
- Air is freely available in nature, but not the compressed air

VI. CONCLUSION

Pneumatic system is using clamping mechanism are selected as solution to our industrial problem. To increase the state of and being efficient precision in loading and unloading of material i.e. pneumatic clamping are our best choice. Hence we choose material for pneumatic operated clamping by differentiating and studying different material like steel, brass etc. We have concluded that OHNS is our outstanding choice for pneumatic operated clamping because it is without difficulty available and sufficient top in strength. Hence a fundamental basic design is created which can balance at any irregular shape. The design of the clamping is lack to study to sympathy the mechanisms that could be used and which would be the most suitable. A material is selected by studying different materials thoroughly and then we selected OHNS. Required changes were made according to the dynamic issues faced in the design.

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