International Journal of Scientific Research in Engineering and Management (IJSREM)
Volume: 07 Issue: 04 | April - 2023 Impact Factor: 8.176 ISSN: 2582-3930

Fabrication of Pneumatic Multipoint Grease Gun

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Abstract - Automation in the modern world is inevitable. Any multipoint machine aimed at the economical use of man, machine, and material worth the most. Lubrication is the lifeline for any industry. Machines in various industries like textile, printing, machine tools, automobile industries and excavators are to be lubricated in order to reduce the friction created between moving parts. If machines are not properly lubricated at regular intervals they are seized thus incurring heavy losses. The manufacturers of machinery are recommended to lubricate various points at a periodic interval. The lubrication of various points of machinery is also a difficult task in industries where more number of machines has been installed and needed lubrication like printing machinery, excavators, textile machinery etc., where the number of points to be lubricated may range from 40 to 50. In the above cases, lubrications are not only a time consuming process, but also results in workman fatigue. The centralized multipoint lubricating system is used for easy and economical lubrication of multiple points from one centrally located distributor. It is designed to deliver the right amount of lubricant at the right time to every point by means of distributors connected by hoses points of machinery is also a difficult task in industries where more number of machines have been installed and needed lubrication like printing machinery, excavators, textile machinery etc., where the number of points to be lubricated may range from 40 to 50. In the above cases, lubrications are not only a time consuming process, but also results in workman fatigue. The centralized multipoint lubricating system is used for easy and economical lubrication of multiple points from one centrally located distributor. It is designed to deliver the right amount of lubricant at the right time to every point by means of distributors connected by hoses.

***Key Words*:** Direction Control Valve, Double Acting Cylinder, Solenoid Valve and Automatic Lubrication System.

1.INTRODUCTION

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2. BODY OF PAPER

The body of the paper consists of numbered sections that present the main findings. From the Pneumatic Multipoint Lubrication system it is concluded that the cost and man power equire for the lubricating the various grease points can be eliminated. The loss of grease during greasing reduces as compared with the manual greasing. The system provides safety to the lubricating component and the operator. This system enables the greasing to the points which are not reachable to operator and down time also reduces. Air-powered or pneumatic grease guns use compressed air to apply pressure to an air piston, which drives the grease piston and forces lubricant out of the coupler into a grease fitting. By depressing the gun's trigger, a steady flow of lubricant is dispensed. Typically, pneumatic grease guns are rated up to 6,000 psi. With today's equipment running at higher speeds and longer periods, it is more important than ever to ensure that lubrication systems are providing bearing devices with efficient, timely applications of lubricating oil or grease in order to ensure wear life, safe operation, reduced unscheduled downtime of processing machinery, and more economical operating costs. For that reason many manufacturers are opting for automating their lubrication systems.

Table -1: Material Cost

Sr. No	Part Name	Cost
1	Lever	Rs 350
2	Grease Tank	Rs 400
3	SV	Rs 5000
4	Pneumatic cylinder	Rs 2500
5	Base Frame	Rs 1295
6	Grease Tank	Rs 400
7	Control Unit	Rs 5500

3.WORKING

The air from the atmosphere is drawn into the air compressor and is compressed. The air compressor is driven by the motor. The high pressure air is stored in the air tank. Our system incorporates a solenoid valve and an electronic timer. A timer may be made to operate at periodic interval of time. Whenever the timer is on, the solenoid valve gets opened. The air from the air tank is now admitted to the rear end of the double acting cylinder. Now the compressed air pushed the piston of the pneumatic cylinder forward. This makes the plunger in the distributor to push the grease towards the outlet of the grease gun. So the grease goes to another single acting solenoid valve. The timer will on this solenoid valve so that the grease will supplied to various parts where the hoses are connected.

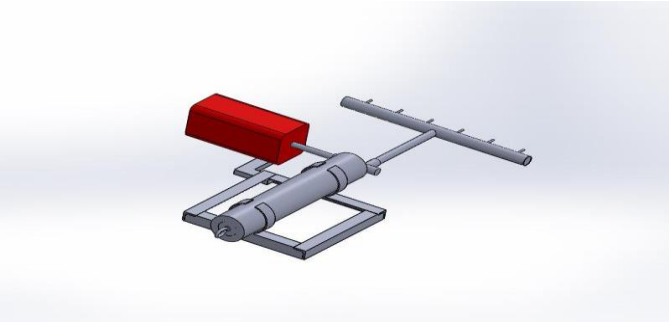

Fig -1: Figure

4. CONCLUSIONS

From the Pneumatic Multipoint Lubrication system it is concluded that the cost and man power require for the lubricating the various grease points can be eliminated. The loss of grease during greasing reduces as compared with the manual greasing. The system provides safety to the lubricating component and the operator. This system enables the greasing to the points which are not reachable to operator and down time also reduces.

5.CONSTRUCTION AND DESIGN

The project mainly consists of Grease gun, pneumatic cylinder, lever,grease tank and controller. The pneumatic cylinder is mounted on the base frame of the machine. The piston rod of the cylinder is coupled with the lever of the pump. The pump is used for pumping of the grease from the tank. The output of the grease tank is split into provide a multipoint output. When the machine is switched ON, the SV will be actuated. This makes the Pneumatic cylinder is to extend and retract. The extension and the retraction of the pneumatic cylinder will be controlled by the SV. The switching of the SV is done by the control unit. As the cylinder inactuated the handle of the grease gun attached also moves produces a pumping action. By this the greasing process takes place. If the machine is switched 'OFF' the switching of the SV will be turned OFF, which turns OFF the process too. The air from the atmosphere is drawn into the air compressor and is compressed. The air compressor is driven by the motor. The high pressure air is stored in the air tank. Our system incorporates a SV and an electronic timer. A timer may be made to operate at periodic interval of time. Whenever the timer is on, the SV gets opened. The air from the air tank is now admitted to the rear end of the DAC. Now the compressed air pushed the piston of the pneumatic cylinder forward. This makes the plunger in the distributor to push the grease towards the outlet of the grease gun. So the grease goes to another single acting SV. The timer will on this SV so that the grease will supplied to various parts where the hoses are connected. Sequence (I): When the SV actuators, the air from the compressor enters the air cylinder and pushes the piston forward. The cylinder will push the grease gun handle Sequence (II): When the SV closes, the air from the compressor to the air cylinder is exhausted through the exhaust port of the SV. Since the air cylinder is double acting, the piston retraces its path which in turn pulls the grease gun handle, thereby creating a vacuum in a grease gun. Then the grease from the reservoir is sucked into the outlet port to compensate the partial vacuum.

6. MATERIAL SELECTION

The proper selection of material for the different part of a machine is the main objective in the fabrication of machine. For a design engineer it is must that he be familiar with the effect. The choice of material for engineering purposes depends upon the following factors:Availability of the materials.Suitability of materials for the working condition in service.The cost of materials.Physical and chemical properties of material.Mechanical properties of material.The material selected should with stand it. Another criteria for selection of metal depend upon the type of load because a machine part resist load more easily than a live load and live load more easily than a shock load. Selection of the material depends upon factor of safety, which in turn depends upon the following factors..Reliabilities of properties .Reliability of applied load. The certainty as to exact mode of failure The extent of simplifying assumptionsThe extent of localized The extent of initial stresses setup during manufacturingThe extent loss of life if failure occurs .The extent of loss of property if failure occurs.

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