

DESIGN AND MANUFACTURE OF HYDRAULIC PRESS MACHINE FOR BAFFLE STUFFING

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ABSTRACT

Hydraulic machine for baffle stuffing may be a vertical stuffing machine for inserting single baffles or complete baffle assemblies into a pre-formed muffler shell. Heads are hydraulically powered and are adjustable for loading position, stuffing position and stuffing speed. The shell clamps drop by design for quick change over. The operator manually loads the baffles or baffle assemblies onto each of the ram tools and cargo the muffler shell into the loading station on the walking beam. When the cycle is activated, the muffler shell is transferred into the stuffing station by the integral walking beam where the shell is gripped by the integral walking beam where the shell is gripped by the shell clamps then the baffles are inserted into the shell by the ram heads. When the stuffing operation is complete, the stuffed shell is returned to the operator. An optional extended walking beam transfer system is out there to transfer shells through the stuffing operation for integration into automatic lines.

Keyword : - Hydraulic press, Special purpose machine, Press fitting, Muffler, and Silencer.

1. Introduction:

This SPM is TWIN STATION press FOR STUFFING ASSLY. Necessary settings & adjustments are provided on this SPM to make sure smooth operation of this system. Hydraulic press may be a tool to supply compressive force by means of fluid. It depends upon Pascal's principle that the pressure throughout an indoor entity is constant. By means of mechanism larger forces are often produced in contrast with mechanical and electrical systems. Such forces are often used for the press work application like blanking, punching, piercing, coining, trimming etcetera. Press work may be a method of production involving the cold working of metals, usually within the sort of thin sheet or strip. Press working is one among the extensively employed methods of fabricating parts of intricate shapes with thin walls. Press working processes make use of huge forces by press tools for a brief interval which ends up in cutting or shaping the sheet. Since, press working doesn't involve heating of the parts, close tolerances and high surface finish are often obtained on the part. Since presses can produce components at fairly fast rates, the cost of labour for operating the press is fairly low. Press working forces are found out, guided and controlled during a machine mentioned as a Press. Thus, an effort has been made to atomize the method of press work using Hydraulic mechanism in press machine. The inputs and outputs of the system including hydraulic mechanism are solely mechanical like shaft or reciprocating plunger. The prime remuneration of implementing this technique is that the movement of the mechanical devices are often operated by means of hydraulic components like actuators to initiate the movement which might be within the sort of lever to use manually or by means of switches to work automatically.

1.1 Problem Statement:

Design, development and analysis of the special purpose hydraulic power press suitable for assembly of Shell and Stuffing ,used in Mufflers for silencers.

1.2 Objectives:

1. The most objective of project is to supply 15-ton pressure for battle stuffing in muffler up to provide area.
2. By this we will increase the productivity and reduce the labour cost.
3. We offer laser system to avoid accidents.
4. By applying exact pressure to muffler, the muffler won't get damage at the time of baffle stuffing.
5. Thanks to this scrap in reduce and that we can get more profit.

2. Process Flow And Methodology:

Methodology Is The Systematic. Theoretical analysis of the methods applied to a field of study or the theoretical analysis of the body of method and principles associated with a branch of study. The below flow chart shows the sequential operation/steps that will be performed during the project process.

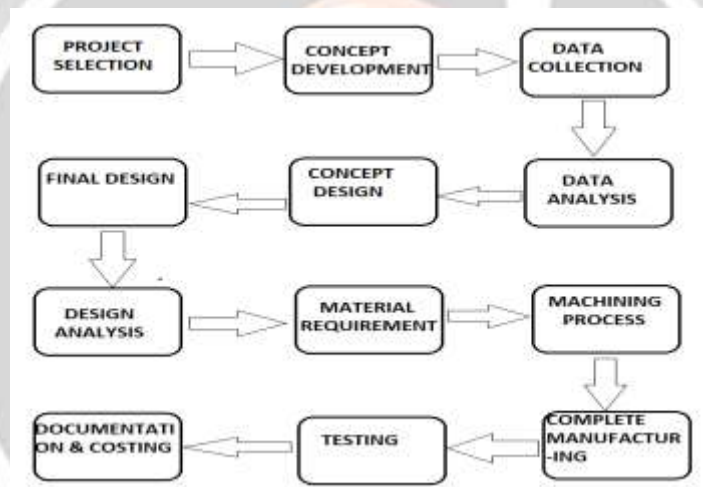


Chart-1: Methodology

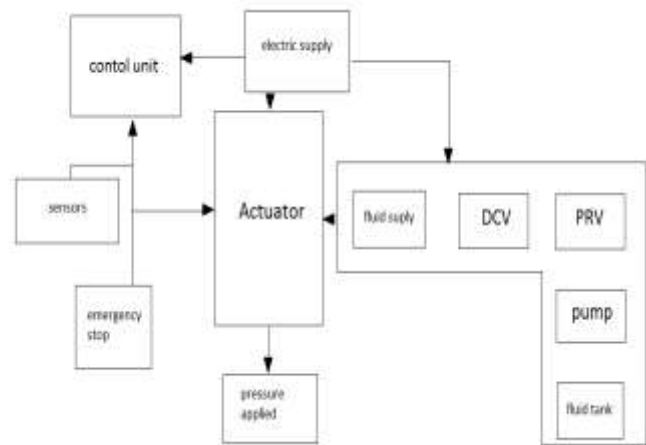


Fig-1: Figure of Hydraulic Machine

2.1 LITRATURE REVIEW:

1. Design and control of a press by J. A. Ferreira, P. Sun and J. J. Grácio: this paper describes the event of a 100kN hydraulic actuated press to perform aluminium stamping operations also as mechanical tests. The press has two hydraulic servomechanisms: a hydraulic cylinder, driven by a servo-solenoid flow control valve, to support the punch tool; a hydraulic cylinder, where the chamber pressure is controlled by a servo-solenoid pressure control valve, to support the operations of loading and unloading of the press blank holder. A true time DSP based control card form dSPACE, which is directly programmed by the Matlab/Simulink environment, is employed to implement the control and monitoring tasks and to perform data acquisition. The cylinders piston positions and chambers pressures are acquired with two optical scales and with analogue pressure sensors, respectively. [1]

2. Electro-hydraulic proportional pressure system of hydraulic machine by Yuanlou Gao, Nan Ding Dept. of Mechanical: this text is especially talking a few moulding hydraulic machine realized by telescopic cylinder under the control of constant pressure variable pump. so as to realize a particular control of prospective pressure conditions, there's a requirement to work out the PID parameters by analyzing its pressure closed-loop simulation and performance, which supported the SISO Design Tool of MATLAB.[2]

3. Hierarchy Control Approach for press Machine Xin-Jiang Lu*, Ming-Hui Huang, Yi-Bo Li, Min Chen, Ming Liu: during this paper, a completely unique hierarchy control method is proposed to 5regulate press machine. The complex press machine system is firstly decomposed into two simple sub-systems. Then, the corresponding sub controller is developed to regulate every sub-system, which is additionally ready to handle the coupling between sub-systems. Finally, the instance study will demonstrate the effectiveness of the proposed method. [3]

4. System-Decomposition-Based Multilevel Control for press machine XinJiang Lu and Huang;-In this paper, a completely unique system-decomposition-based multilevel control method is proposed to regulate the complex press macine system. The key idea during this proposed method is to decompose the system complexity into a gaggle of straightforward subsystem, and therefore the control task ids shared by a gaggle of straightforward sub controller. First, the complex system is decomposed into a gaggle of straightforward subsystem consistent with the method knowledge, upon which each subsystem is definitely contrlled by an easy sub controller. Then, a sequence control strategy is developed to assist these sub controllers to handle the coupling between subsystems. Finally, the proposed method is applied to regulate a practical press machine and compared with the normal proportional-integral-derivative control. [4]

2.2 Working:

Hydraulics now could be defined as a means of transmitting power by pushing on confined liquid. The input component of the system is called a pump; the output is called an actuator. While for the sake of simplicity we have shown a single small piston, most power-driven pumps incorporate multiple pistons, vanes or gears as their pumping elements. Actuators are liners, such as the cylinder; or rotary, such as the hydraulic motor. The hydraulic system is not source of power. The power source is a prime mover such as an electric motor or an engine which drives the Pump. The reader might ask, therefore, why not forget about hydraulic and couple the mechanical equipment directly to the prime mover? The answer is in the versatility of the hydraulic system, which gives it advantages over other methods of transmitting power.

Hydraulic systems contain mainly following parts:

- (1) Hydraulic fluids
- (2) Seals and Packing.
- (3) Reservoirs
- (4) Filter and strainers
- (5) Cylinders
- (6) Pressure control valve

3. ADVANTAGES:

1. Full power stroke- the complete power of a press are often delivered at any point within the stroke. Not only at the very bottom, as is that the case with mechanical presses.
2. Much lower original cost and operating costs- Hydraulic presses are relatively simple, they need a big cost advantage over mechanical presses in comparable sizes. The numbers of moving parts are few, and these are fully lubricated during a flow of pressurized oil.
3. More control flexibility- Press power is usually in check. The ram force, the direction, the speed, the discharge of force, the duration of pressure dwell, all are often adjusted to suit a specific job.
4. Quite- Fewer moving parts and therefore the elimination of a flywheel reduce the general background level of hydraulic presses compared to mechanical presses.
5. Reliability- Hydraulic punching machines are more reliable operational than any mechanical punching machines.

3.1 APPLICATIONS:

The exhaust System Of generator make more noise So there is need to provide the Silencer (Muffler) For Reducing the noise & conversion of harmful gases into harmless gases.

To fit the Muffler inside the exhaust Syetem needs a more Human effort And more time required For fitting. The Exhaust system of genrator at higher location therefore when the workers went to fitting the muffler, chances of accident was more.

Therefore the need of project is to stuff the baffle in the muffler by means of some amount of pressure without more human effort With In minimum time.



Fig- Hadraulic Press

4. CONCLUSIONS:

The Present project described the design and manufacture of hydraulic press machine to perform stuffing of baffle in muffler. The machine is operated both manually and automatically. The PLC (Programmable Logic Controller) Provides a good performance for the realized position control. The proper guidance of project head and the sincere efforts of our group have lead to the successfully accomplishment of our concerned project. The project based on "DESIGN AND MANUFACTURE OF HYDRAULIC PRESS MACHINE FOR BAFTEL STUFFING" was interesting to work on and was also gained in this project work. This knowledge of project will definitely be helpful in our future. So we must maintain that this final year project was an essential part of our engineering education enhancing our technical knowledge and practical skill.

5. ACKNOWLEDGEMENT:



The successful completion of the project is the result of dedicated efforts of many people and this report would be incomplete without giving due credit to them. This acknowledgement is taken of small gratitude in recognition of the help provided by them. We wish to express our heartfelt appreciation to all the people who had contributed to this project, both explicitly and implicitly. First to all we want to thank our projects guide Ms. Y. M. PATIL for giving us this opportunity to work under his guidance. His empathy towards us made our work easy. Many thanks to him for encouraging and supporting us to complete this project work. We are thankful to Prof. S. N. SHELKE Head of the Department, Mechanical Engineering and Prof. Y. R. KHARDE principle of SVIT, CHINCHOLI, NASHIK



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