

e-ISSN:2582 - 7219



INTERNATIONAL JOURNAL OF MULTIDISCIPLINARY RESEARCH IN SCIENCE, ENGINEERING AND TECHNOLOGY

Volume 4, Issue 6, June 2021



INTERNATIONAL
STANDARD
SERIAL
NUMBER
INDIA

Impact Factor: 5.928



9710 583 466



9710 583 466



ijmrset@gmail.com



www.ijmrset.com



Design and Manufacture of Hydraulic Press Machine for Baffle Stuffing

Kothawade. K. Sushant¹, Jagtap T. Krushna ², Kute A. Rahul³, Mahajan A. Rohan⁴,
Mr. Vikas S Daund⁵

BE Student, Department of Mechanical Engineering, MCOERC, Nashik, Maharashtra, India^{1to4}

Assistant Professor, Department of Mechanical Engineering, MCOERC Nashik, Nashik, Maharashtra, India ⁵

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.

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

I. 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 incompressible fluid 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 labor 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.

II. LITERATURE SURVEY

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 aluminum 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 from SPACE, 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]

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]

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]

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 machine 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 controlled 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]

III. 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:

- Hydraulicfluids
- Seals andPacking.
- Reservoirs
- Filter andstrainers
- Cylinders
- Pressure controlvalve

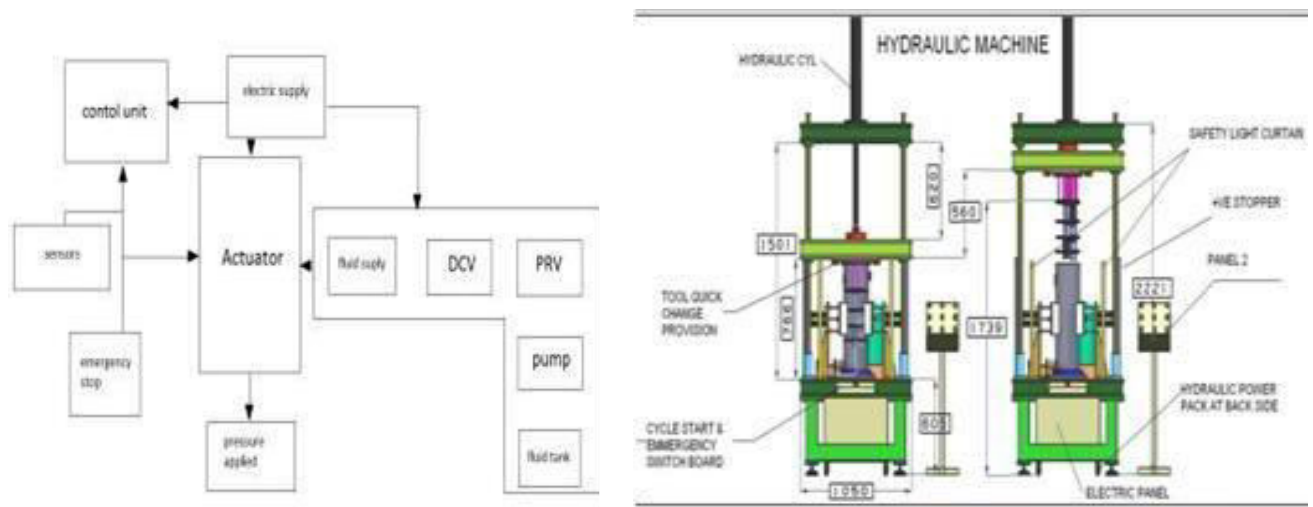


Figure of Hydraulic Machine



➤ **ADVANTAGES:**

- Full power stroke- the complete power of a press is often delivered at any point within the stroke. Not only at the very bottom, as is that the case with mechanical presses.
- 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.
- 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.
- Quite- Fewer moving parts and therefore the elimination of a flywheel reduce the general background level of hydraulic presses compared to mechanical presses.
- Reliability- Hydraulic punching machines are more reliable operational than any mechanical punching machines.

➤ **DISADVANTAGES**

- Hydraulic machines are complex in construction.
- Hydraulic machines have oil leakage problems.
- They have more maintenance issues than pneumatic machines.
- They have slower motion than pneumatic machine.

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 System needs a more Human effort And more time required For fitting. The Exhaust system of generator 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 human effort within minimum time.

IV. CONCLUSION

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 BAFEL 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.



REFERENCES

1. Electro-hydraulic proportional pressure control system of hydraulic machine Yuanlou Gao, Nan Ding Dept. of Mechanical and Electronic Engineering Beihang University Beijing, China (2012)
DOI:10.1109/INDIN.2012.6301057
2. Hierarchy Control Approach for Hydraulic Press Machine Xin-Jiang Lu*, Ming-Hui Huang, Yi-Bo Li, Min Chen, Ming Liu School of Mechanical & Electrical Engineering Central South University Changsha, China (2011)
DOI:10.1109/ICEICE.2011.5778245
3. Design and control of a hydraulic press J. A. Ferreira, P. Sun and J. J. Grácio (2006)
DOI: 10.1109/CACSD-CCA.2006.4776750
4. Application of Force Feedback to Heavy Duty Hydraulic Machines N.R. Parker S.E. Salcudean
5. P.D. Lawrence Dept. of Electrical Engineering, University of B.C., Vancouver, B.C., Canada (1983)
DOI: 10.1109/ROBOT.1993.292010
6. System-Decomposition-Based Multilevel Control for Hydraulic Press Machine XinJiang Lu and MingHui Huang (1980)
DOI: 10.1109/TIE.2011.2160137



INNO SPACE
SJIF Scientific Journal Impact Factor
Impact Factor:
5.928

ISSN

INTERNATIONAL
STANDARD
SERIAL
NUMBER
INDIA



INTERNATIONAL JOURNAL OF MULTIDISCIPLINARY RESEARCH IN SCIENCE, ENGINEERING AND TECHNOLOGY



9710 583 466



9710 583 466



ijmrset@gmail.com

www.ijmrset.com