Design & Manufacturing of Multipurpose Hydraulic Press Machine For Small Scale Industry

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Abstract- *Many fields require hydraulic equipment. Barber and dentist chairs are hydraulically lowered and raised. Hydraulic jacks lubricate cars. Hydraulic power stops four-wheelers and two-wheelers by pressing the brake pedal. Hydraulic presses are best for plates, rods, and bars. Press the plate between the die. It presses the plate at the right angle for the dies. Hydraulic jack operation is easy. Industries employ presses and load appliers for pressing. Bulky and pricey. Hydraulic pressing machines are portable, adaptable, and cheaper than those detailed earlier. Thus, hydraulic plate pressing machines should replace conventional equipment. It reduces size and expense. Manual presses require no power or maintenance. It can be automated or electrically controlled during mass production to increase production. Production, petroleum, chemical, and automobile sectors use pressing machines.*

Keywords- Hydraulic Cylinder , Hydraulic Pump , Springs , Dies

I. INTRODUCTION

The hydraulic pressing press is a versatile machine used for shearing, punching, pressing, scrolling, and shaping various parts. It is particularly suitable for metal fabricators in industrial settings. The hydraulic plate pressing press is ideal for small to medium-sized industries looking for cost-effective production machinery. The operating procedure is simple: a plate is loaded and clamped between two dies, while additional dies hold it loosely. Mechanical force is then applied to shape the plate according to the die. Different methods, such as rolling and curving, are employed depending on the desired outcome. The tooling used in plate pressing consists of hardened steel or softer materials like aluminum or bronze to prevent damage. Hydraulic machinery, powered by fluid pressure, offers high power density and flexibility. Designing a machine requires a flexible approach, as rigid rules may not yield the best and most cost-effective results.

II. PROBLEM STATEMENT

Existing manually operated hydraulic pressing machines are cost-effective with no power consumption or maintenance costs. However, they have high manufacturing lead time and cycle time, making them slow for mass production. To address this, manual machines can be converted into electrically or pneumatically operated systems, suitable for mass production and reducing lead time. However, this conversion requires high initial and maintenance costs, and adds complexity and bulkiness with additional components. Despite these challenges, the conversion to automated systems is beneficial for increasing production rates, particularly in the automobile industry. Automatic control allows for pressing plates, and the press can be measured using vernier calipers. For flat pressing, the mandrel needs to be advanced.

III. OBJECTIVES

1. To make a machine who should not pinch the plate while pressing.
2. Plate should press at any desired angle in predefined range.
3. To make portable machine which can be carried out anywhere at working site
4. To make low-cost plate presser
5. To study about hydraulics system.

IV. LITERATURE REVIEW

The horizontal press brake, introduced by SIMASV in 1957, offers flexibility and versatility. It is user-friendly and easy to maintain, fitting the needs of small to medium-sized industries. The hydraulic plate pressing consists of two series: the standard series and the super series, both with years of improvements for maximum value. Notably, the cylinder is placed below the table, providing better accuracy and work surface. The operator performs operations in front of the machine, ensuring quality products and a protected position. The patented conical pins eliminate mechanical slack, offering superior accuracy. The super series features hydraulically controlled stroke end devices for maximum accuracy and repeatability. A 25-ton machine is suitable for 50% of applications, while a 45-ton machine covers 90% of applications, making it the most profitable choice. Investing in

the right tonnage ensures increased profitability and efficiency.

V. METHODOLOGY

The hydraulic jack consists of a piston, piston rod, screw rod, and hydraulic oil. The reciprocating handle moves the compressed oil into the hydraulic jack piston, which pushes the moving die against the plate to be pressed. By changing the die, different shapes of pressed plates can be produced. The frame, made of mild steel, provides strength and support for the machine. Various components such as the hydraulic cylinder, ram, oil tank, plunger pump, and release valve lever are essential for the operation of the hydraulic plate pressing machine. Hydraulic systems offer advantages such as light weight, simplicity, reliability, and precise controllability.

VI. CONCLUSION

This project has provided a valuable opportunity to apply limited knowledge and gain practical experience in various aspects such as planning, purchasing, assembling, and machining. It serves as a bridge between academic institutions and industries. Despite the time constraints, the "HYDRAULIC PRESSING MACHINE" has been successfully completed and is functioning satisfactorily. It is worth noting that the designed machine allows for multiple operations, and the table can be changed if needed to accommodate different press operations with different dies and punches.There is a need for seating solutions in various occupations and recreational activities where prolonged standing or leg use is required but access to seating is limited. For example, assembly line workers often have no access to chairs during idle periods between work projects, and spectators or participants in sporting events need seating options that are easily movable. Hikers and campers also face challenges in carrying chairs along with their other equipment. Therefore, there is a demand for a lightweight and accessible body support solution that does not require hand carrying.While previous patents related to seating structures may have expired, it should not diminish the innovation and mission of companies like Noonee.

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