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Design modification of top and bottom fixture of Hydraulic pressing machine to accommodate lead wire

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ABSTRACT

Hydraulic Pressing machine is used to press the stator (6782) in stator body (6782). The existing design of the hydraulic press machines, top and bottom fixture may often cut the lead wire of stator and also have harmed the operator while handling. So we have modified the top and bottom fixture of the hydraulic pressing machine to reduce the damage of the lead wire, lead time and to increase the operator safety.

INTRODUCTION

The hydraulic pressing machine is used to press the stator coil into the stator body. To during the pressing time, the stator coil outer diameter is mounted to the stator body inner diameter through pressing. To during the pressing time the stator coil lead wire is tough to press and the lead wire is damaged. So that the damaged job is reworked. Rework of the lead cutting wire is very tough and waste of time. And the same time, it is harmed to human after who working in this machine. The fingers injured during the pressing. The job in bottom fixture is damaged while irregular movement of the top fixture, it damaged the stator body.Top fixture moves in vertical motion (y), bottom fixture moves in horizontal motion. (x), We have modified the top and bottom fixture to reduce the problem from damage of lead wire, human hand injuries and reduce the lead time while using Hydraulic press machine.

LITERATURE REVIEW

A press machine is disclosed for which the main components are movable ram and the striker device connected to the ram. The striker device includes striker for striking a tool of the press machine and a drive mechanism to adjust the position of the striker with respect to tool.

A stator core for rotary high power density in electro-mechanical transducers formed of multiple segments which have radially oriented teeth. The stator core is a composite of two or more segments circumferentially combined into form a cylindrical stator or armature for electric motors and generators. The segments are wound with lead wire either when the segments are aligned linearly.When arranged circumferentially on the inside surface of a jig or about a cylinder. The wound stator have teeth extending radially outwards or inwards to accommodate an outside or inside rotor. [1-5]

Amethodofrepairing is a joint between conducting elements of a stator winding bar of an electrical machine and the connecting device is

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connected to the end of the stator winding bar for providing electrical connection and the coolant flow for the conductor elements includes the steps of removing an exists connecting device from the end of the stator winding bar. Align the conductors of the end of the stator winding bar by heating the bar end to above a flow point of the braze holding the conductors in a position while simultaneously. Holding the conductors of the end of the stator winding bar under compression in the two orthogonal direction are perpendicular to the length of the stator winding bar. [6-10]

A press tool of forming a compressible mass into annulus of given inner and outer diameter and axial length, that the tool having radially movable Outer and inner tool parts adapted to expand and to contract, to form the mass to the desired inner and Outer dia. An axially movable annular member includes the working face for forming of the Compressible mass to the desired axial length.

A stator core including a central cylindrical opening defined by a plurality of teeth consecutive through a circumferential continuous portion is prepared by winding the magnetic strip having a corresponding shape into the spiral. The formation of cylindrical rod having a diameter larger than the inside diameter of the core is forced into that opening. Then the pressure is axially applied to the coreto compress it to level the beginning and last edges of the strips. The rod will be removed from the core and the pressure is released to complete the stator core having a predetermined the inside of diameter. [11-15]

Assistor press including the coil forming device and a coil former, the coil forming device having a plurality of blades arranged to be inserted into the slots of a rewound stator and then moved radially outwards. Each blade being independently move by the separate hydraulic piston and cylinder assembly. The hydraulic piston and cylinder assemblies being connected to a common source of hydraulic fluid to simultaneous movement. The radial movement of the blades seating the coils in the slots of the stator to make room for more coils. The coil forming device being supported on press which includes a coil former to bend the loop of the coils outwards away from the opening in stator.

A hydraulic press includes long stroke piston cylinder assembly to drive a movable plate along four pull down power rods between an upper open position and the lower reference position. It is adjacent to the parallel with the stationary platen, a wedge ring clamp mechanism to lock the movable platen to the four pull down power rods at the upper or lower reference positions.Short stroke piston cylinder assemblies are operative reciprocal axially to drive the four pull down power rods when the upper platen is locked.

This paper. In novel system decomposition based multilevel control method is a proposed to control the complex of hydraulic press machine system. The key idea in this proposed method to decompose a system complexity into a group of simple subsystems, and the control task is shared by a group of simple sub controllers. First, the complex nonlinear system is decomposed into a group of a simple subsystems according the process knowledge, upon which every subsystem is easy controlled by a simple sub controller, a sequence control strategy is developed to help these sub controllers is handle the coupling between subsystems. Finally, a proposed method is applied to control a practical hydraulic press machine and compared with the traditional proportional integral derivative control. [16-20]

The method and apparatus for treatment of stator coil lead wires for a electric rotary machines, in which a plurality of coil lead wires extending in the radial direction of a stator for an electric rotary machine are movably arranged between two plane like or cylindrical surface members opposite to each other, a plurality of coil lead wire are pressed in an predetermined gathering direction by a lead wire pressing member which is capable of moving between the two plane like and cylindrical-surface members, so the plurality of coil lead wires is transformed and gathered into a predetermined shape. The coil length required for treatment of the stator coil lead wires can reduced, and the lead wire treatments can performed quickly and automatically.

The tandem press system is the high speed manufacture of rotor cores and stator cores of electric motors. The tandem press system includes a rotor press and as stator press arranged in series for stamping out laminations from the web of stock material and pre-assembling them into rotor cores and stators cores, respectively. The Structure is

provided between the rotor and stator press to maintain a control the web and provide a substantial barrier to transmission of vibrations in web to the stator press. The rotor and stator presses was capable of shifting from stamping one type of the lamination to stamping another type of lamination without any interruption in a operation of the presses.

It is a possible for the present invention to operate with the optimal control to a prevent ram from overshooting in case that a load acting on ram was decreasing rapidly, it like a stamping machining process. Linking an hydraulic circuit which consists of a hydraulic pump 3 and a hydraulic cylinder 2 to make the ram 1 for the hydraulic press equipment move upward and downward then a full bridge hydraulic circuit was four proportional sheet valves V1 through a V4. [21-25]

The electric rotating machine has a rotor having N and S poles and includes a stator with annular stator core and slots. The Multiple phase stator windings is embedded the slots, and are formed by winding continuous wires such that straight parts of the stator windings pressed in an flat shape are wound in rings around an grooved cylindrical member. a cylindrical member is inserted into bore defined by the annular stator core so that a grooves of the cylindrical member are arranged opposite to the slots. a set of the windings are folded back alternately outside of the slots of the stator core and are wound so the sets of the windings are embedded alternately in the direction of the depth of the slots. Leading and trailing end of the continuous wires was superposed after being wound at least one turns around the circumferentially arranged slots of the stator.

A use of dedicated computer based control system to solvean automation problem is essential to manufacturing automation today. The works describe the design implementation of control system for that operation of mechanics hydraulic pressing machine. This over operation and control is based a all programmable logic unit and an sensor system.

PROBLEM IDENTIFICATION

The lead wire is being damaged in hydraulic pressing machine. We intended to modify the hydraulic pressing machine top and bottom fixture.

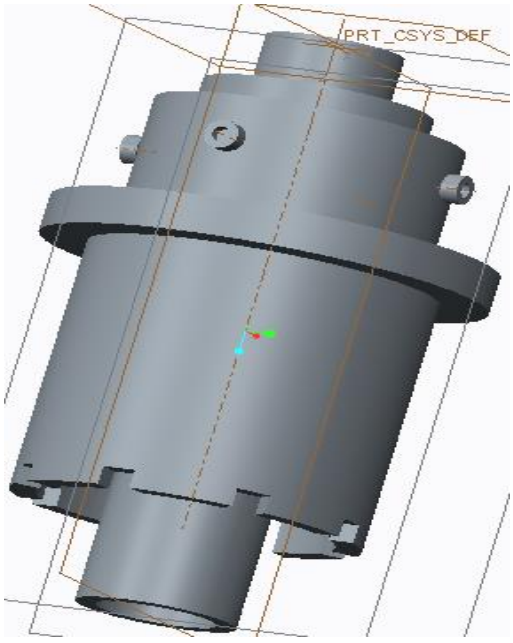

Fig.1 Before modification design in top fixture

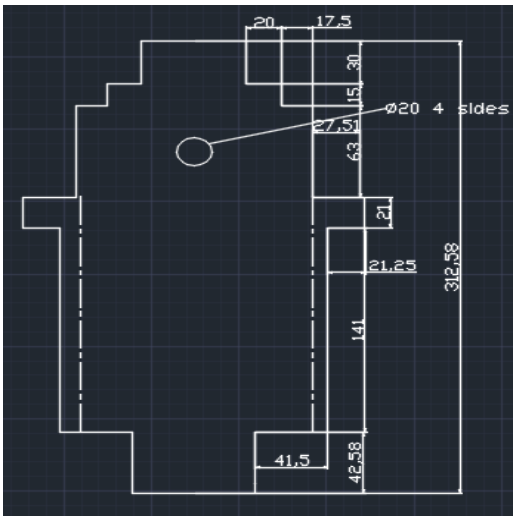

Fig.2 Old modification design of top fixture top view

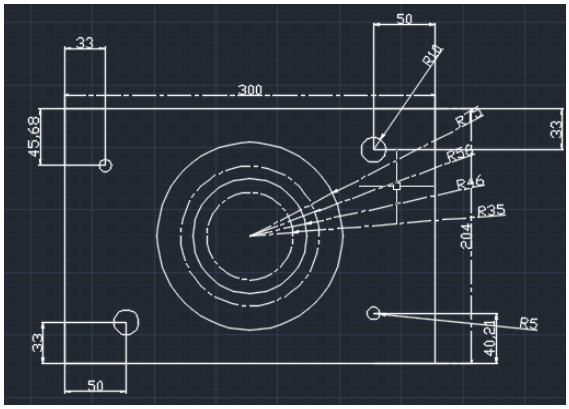

Fig.3 Old modification design top fixture bottom view

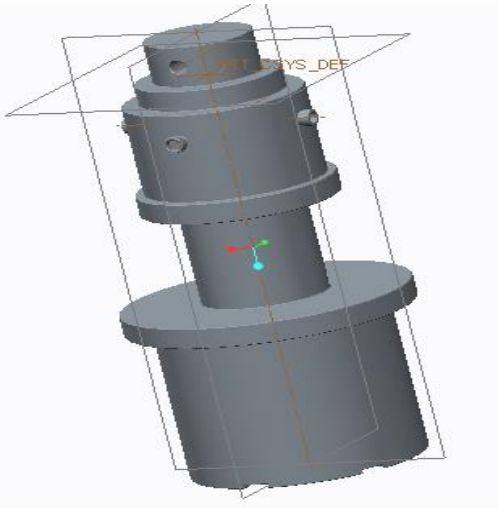

Fig.4 After modification top fixture

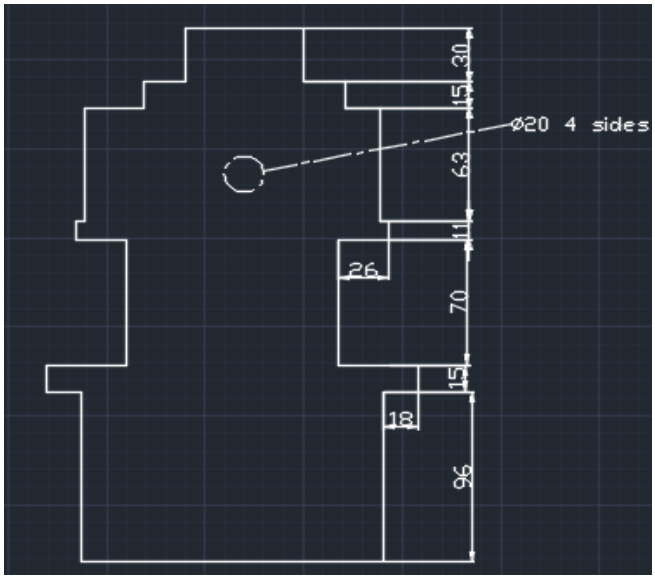

Fig.5 New modification design of top fixture top view

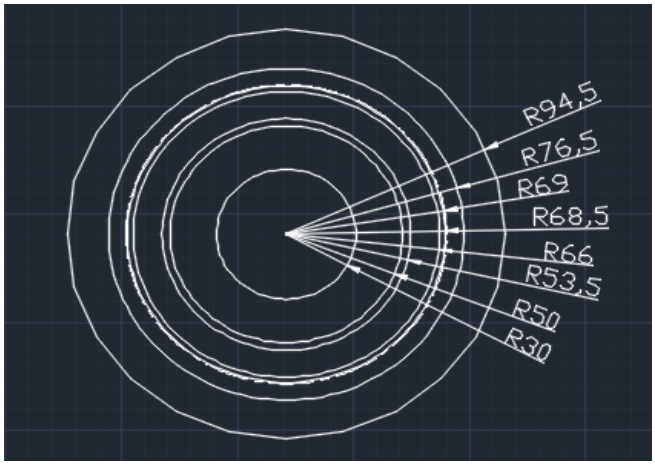

Fig.6 New modification design of top fixture bottom view

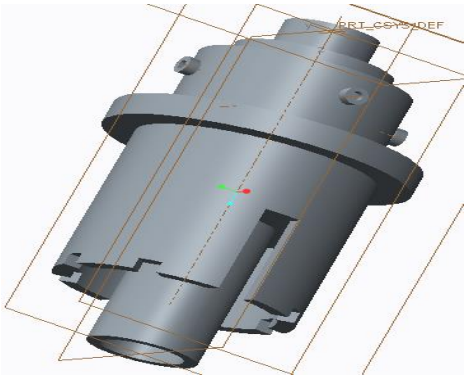

Fig.7 Another design modification of top fixture

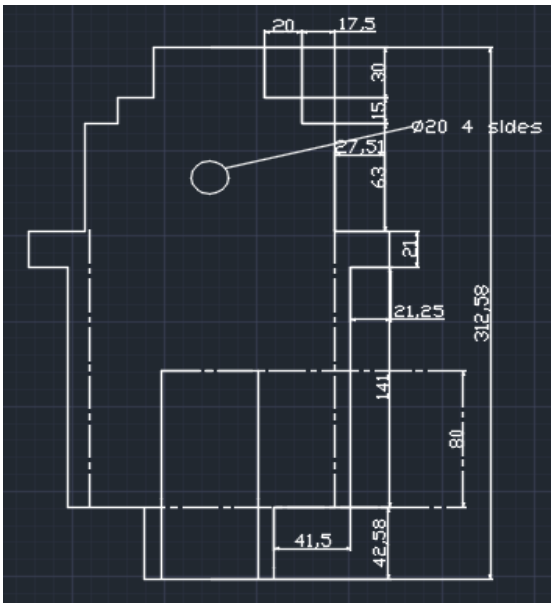

Fig.8 Design modification of slot cut top fixture top view

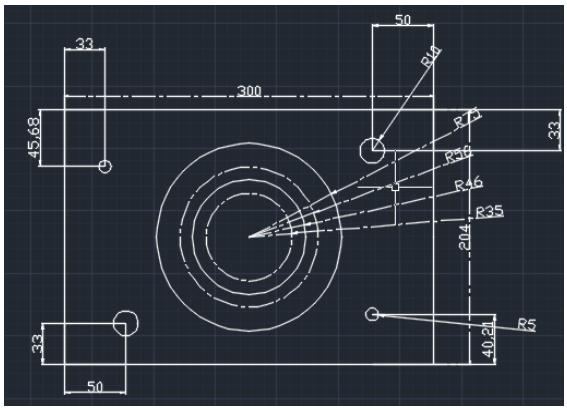

Fig.9 Design modification of slot cut top fixture bottom view

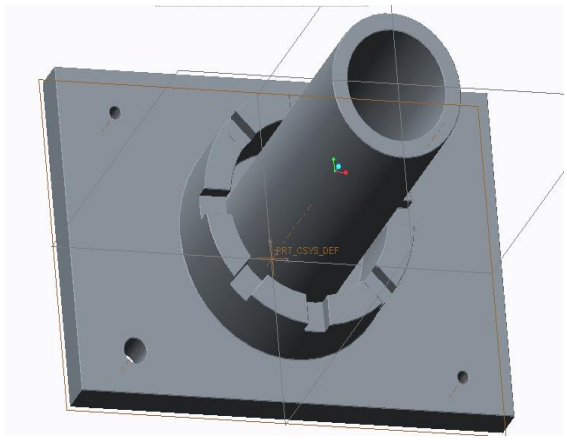

Fig.10 Before modification design in bottom fixture

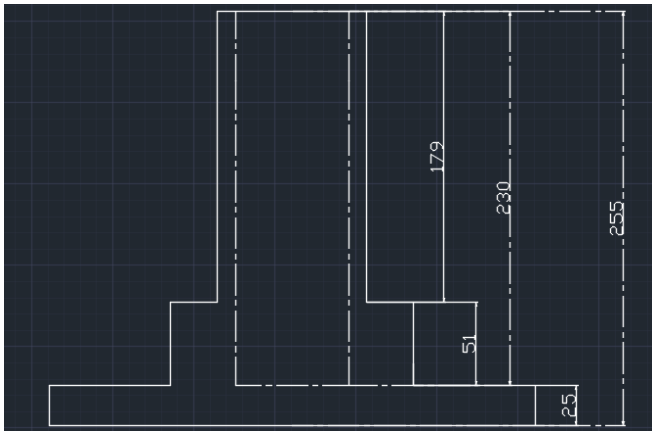

Fig.11 Old bottom fixture top view

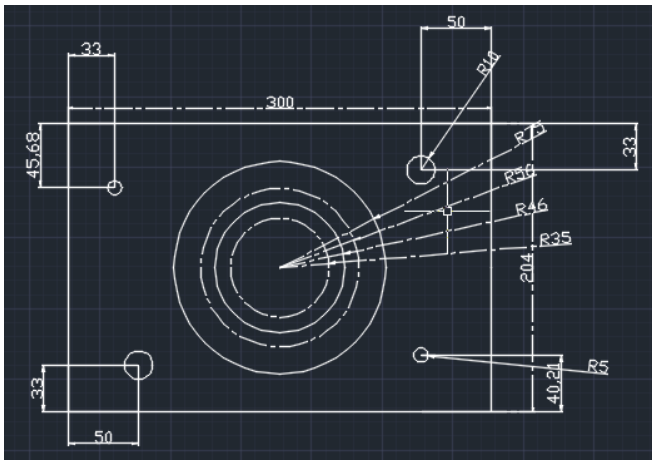

Fig.12 Old bottom fixture bottom view

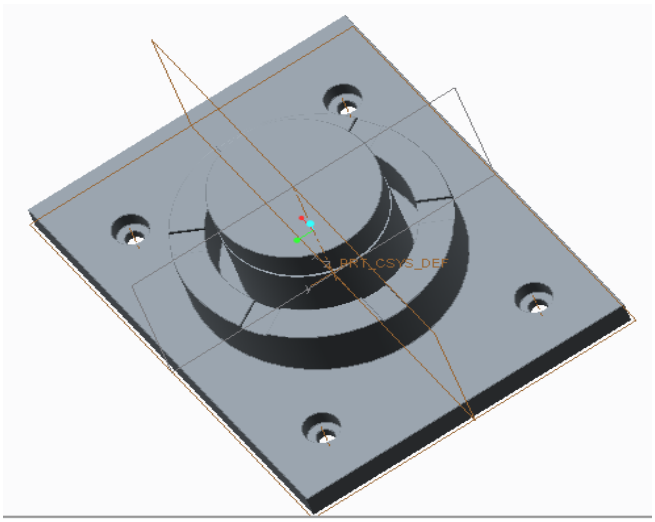

Fig.13 After modification bottom fixture

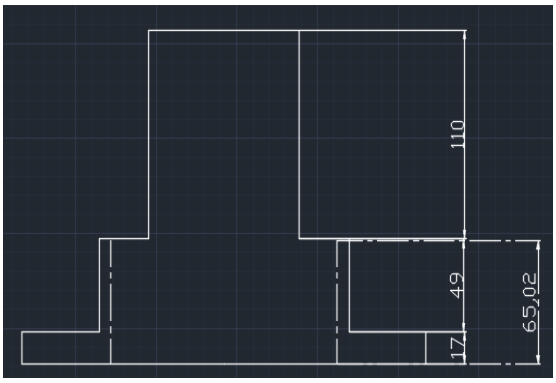

Fig.14 New modification design of bottom fixture top view

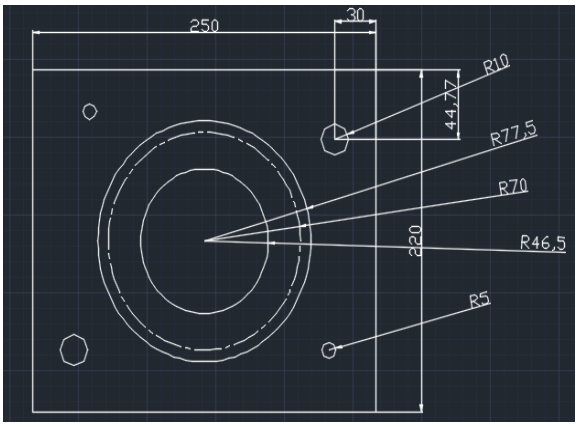

Fig.15 New modification design of bottom fixture bottom view

EXPERIMENTAL PROCEDURE

Hydraulic pressing machine

A hydraulic pressis a machine press using a hydraulic cylinder to generate a compressive force. It uses the hydraulic equivalent of a mechanical lever, One part of the system is a pistonacting as a pump, with a modest mechanical force acting on a small cross-sectional area; the other part is a piston with a larger area which generates a correspondingly large mechanical force. Only small-diameter tubing (which more easily resists pressure) is needed if the pump is separated from the press cylinder.

Stator

The stator is the stationary part of a rotary system, found in electric generators, electric motors, sirens, mud motors or biological rotors. Energy flows through a stator to or from the rotating component of the system. In an electric motor, the stator provides a rotating magnetic field that drives the rotating armature; in a generator, the stator converts the rotating magnetic field to electric current. In fluid powered devices, the stator guides the flow of fluid to or from the rotating part of the system.

Stator body

Stator body is a stationary part of motor, it holed the stator and rotor. Its covers the stator and rotor.

Motors

The Depending on the configuration of a spinning electromotive device the stator may act as

the field magnet, interacting with the armature to create motion, or it may act as the armature, receiving its influence from moving field coils on the rotor. The first DC generators (known as dynamos) and DC motors put the field coils on the stator, and the power generation or motive reaction coils on the rotor. This is necessary because a continuously moving power switch known as the commutator is needed to keep the field correctly aligned across the spinning rotor. The commutator must become larger and more robust as the current increases. The stator of these devices may be either a permanent magnet or an electromagnet. Where the stator is an electromagnet, the coil which energizes it is known as the field coil or field winding

The coil can be either with either iron core or aluminium. To reduce loading losses in motors. Manufactures invariably use copper is the conducting material in winding. Aluminium, because of its lower electric conductivity, may be an alternate material in fractional horsepower motor, especially when the motors are used for very short durations.

An AC alternator is able to produce power across multiple high current power generation coils connected in parallel, eliminating the need for the commutator.

Placing the field coil on the rotor allows for an inexpensive slip ring mechanism to transfer high voltage, low current power to the rotating field coil. It consist of a steel frame enclosing a hollow cylindrical core (made up of lamination of silicon steel). The lamination are to reduce the hysteresis and eddy current losses.

CONCLUSION

we have modified the existing design of top and bottom fixture which has a slot of dimension length 30 mm and height 80 mm, thus it accommodates the lead wire during the pressing process and hence the problem of lead wire being cut has been eliminated, since the lead wire can be safely holded in the slot the need for human intervention during the pressing has been discarded thus the cause of human injury has been eliminated.

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