

Design And Fabrication of Rotating And Tilting Height Adjustment Modification Pipe Vice (New Technique) For Holding Prosthetic and Orthotic Mould

Satheesh S¹, Jitendra Narayan², Brightex J³

²Assistant professor

^{1, 2, 3} ISHWAR Institute of Prosthetics & Orthotics, Chennai, TN, India.

Abstract- *Modification holding pipe vices are very use full in Prosthetic and Orthotic industries to hold moulds. In existing vices we cannot generate some operations and used to hold moulds in fixed position. Here we prepossess rotating and tilting height adjustment modification pipe vice. These have been designed by using adjustable frames. Fabrication is carried out by different joining methods. The proposed modification holding pipe vice is very useful to hold moulds, especially at different tilting and rotating position with height adjustment.*

Keywords- modification pipe vice, mould holding vice, orthotic vice, prosthetic vice,

I. INTRODUCTION

Reduction of human effort and enhancing safety plays a vital role while designing and fabricating the modification holding vice which is used to hold the Prosthetic and Orthotic moulds during modification works. In an ordinary vice the human power requirement is more due to fixed position, but in this modification holding vice the lever is used in order to rotate and tilt with height adjustment option. In normal pipe vice the Prosthetics and Orthotics involves in turning the handle to hold the moulds tightly for modification with no adjustment options which eventually results in increased fatigue level. This may be avoided by involving more lever acting modification holding vice in which the holding moulds can be adjusted according to the person or operator height. A lever rotates a lock movable jaw their using puss back rod screw to forward and reverse movement of the vice jaws to remove the work piece and to hold the work piece. These types of modification holding vice can be used to hold all type of Prosthetic and Orthotic moulds. A holding device or vice could be a mechanical equipment accustomed secure associate object to permit work to be performed thereon. Vices have two parallel jaws, one mounted

and also the alternative movable, rib in and out by a screw and lever. The following are the various types of vices such as

Wood working: Woodworking vices square measure connected to a bench, usually flush with its surface. Their jaws square measure fabricated from wood or metal, the latter typically moon-faced with wood, known as cheeks, to avoid marring the work. The movable jaw might embody a retractile dog to carry work against a bench dog

Engineer's vice: An engineer's holding device, conjointly referred to as a vice or bench vice, is employed to clamp metal rather than wood. It's wont to hold metal once filing or cutting. It's generally fabricated from solid steel or malleable forged iron, however most square measure fabricated from forged iron. The jaw gap of associate engineer's holding device is nearly invariably a similar size because the jaw dimension, if not larger.

Machine vice: Machine vices square measure mounted on drill presses, grinding machines and edge machines. Abrasive chop saws have a special sort of machine bench vice designed into the saw. Some hobbyists use a machine bench vice as a holding device owing to the low price and little size.

Vacuum vice: A vacuum bench vice could be a hobbyist's tool, unremarkably wont to hold circuit boards, model airplanes and alternative tiny work. They mounted with a suction cup and infrequently have associate degree articulated joint within the middle to permit the bench vice to pivot and swivel. Jewellers additionally use vacuum vices to carry jewellery.

Pipe vice: Pipe vices are a plumber's tool, typically accustomed hold pipes in situ for threading and cutting. There are two main styles: chain and yoke. The yoke sort holding device uses a screw to confine the pipe, and also the chain

vogue uses a sequence for securing the pipe. These are the various types of machine vice as described above.

Hence in this paper attempt has been made to design and analyse prosthetic and orthotic modification vice.

Prosthetic and Orthotic modification vice is one of the holding devices that are used to hold the job in rigid condition. This vice is operated by lever mechanism. There is a lever attached with it. The job is tightly held within the jaws. The job is placed in between the fixed and movable jaws, and then the movable jaw is adjusted accordingly with lead screw rod with help of profile attached with it. Job is fixed tightly in the fixture by operating the lever attached to the system. These types of operated vice can be used to hold the prosthetic and orthotic moulds with adjustment options. It will results in satisfaction of work productivity, reduction in setting time of job, and improved satisfaction of workers with reduced fatigue level.

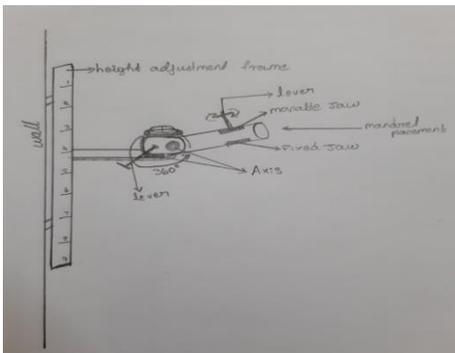


Fig 6: Block Diagram of Prosthetic and Orthotic modification vice

II. REVIEW OF LITERATURE

Manufacturing prosthetic and orthotic modification vice processes is the key production system involved in industries where raw materials are converted to end customer required products. The process starts with the design stage where the materials are created according to the design required. These designs of materials are then converted to required component through manufacturing processes. Process of manufacturing includes reshaping of materials through forging, welding, cutting, heat treatment processes and sheet metal forming processes etc. The manufacturing process includes the process planning, quality assurance of materials and products manufactured even during starting and ending of manufacturing processes. Mould modification is the manufacturing process in which the unwanted materials are removed and a required shape of product according to design standards are manufactures. These wastes are removed in forms of pop powder. The rectification of materials is done by

removing of pop materials through hardened surform blade tools. These types of material fractures are normally done in names of shaping, milling, facing, grinding, chiseling and broaching operations. Accordingly in all processes of machining the job shape is finally changed to the required shape according to the design of product through material fracture. Commonly used fixtures are Vices, 2 jaw, 3 jaw chucks, etc. Machining operations includes different operations for a single job such as modification, build up, drilling, grinding, cutting and mould rescue etc. So that job has to be removed and clamped tightly for each operation which makes the human operator tired and also to get fatigue. So that a new fixture called modification vice is used to tight and loosen the jobs easily to the different positions even during variety of operations in a same component.

III. DESCRIPTION OF EQUIPMENT'S

Axis A center axis is a perfectly shaped part of a rotating wheel or shaft that strikes a lever at one or more points on its axis of circular path. The axis is said to be a simple to allow 360 degree rotation.

Frame Stand Frame stand of the device is made up of flat rods with welding and sheet metal forming process. The frame stand is used in order to hold the fixed jaw, the lever and moving jaw, lead screw, and handle with height arrangements in this device.

Lever The hand lever is used in order to load and unload the arrangements in the modification vice. These make the equipment to be operated easily with lever which is attached to the arrangement.

Fixed Jaw and moving Jaw The fixed jaw is stable and mounted with the frame stand of the equipment. The moving jaw is attached with lead screw arrangement makes the moving jaw to get moved easily while operating the handle lever of the mechanism. The jaw is actually fixed on the frame stand of the equipment.

IV. WORKING PRINCIPLE

The modification vice consists of Frame stand with fixed jaw, moving jaw, lever, lead screw, handle, lever and height adjustment mechanism to be operated. The fixed jaw is fixed on the frame. The moving jaw is arranged in a parallel axis through the fixed jaw. The center axis arrangement is well placed in center for 360 degree rotation. The main objective of the modification vice is used to clamp and unclamp the different size job component on it. The mandrel is placed between the fixed jaw and moving jaw, and then the lever is

operated by manually operated lever. The mandrel is perfectly clamped and with help of tilt lever can adjust tilt position. Then the lead screw is used to fit the correct area in the arrangement. After the operations were done on the job, the job is released from the jaws by operation lever opposite to the direction of locking. When the lever is operated to release the job from the jaws, movable jaw moves backward to its original position.

Materials for Vice:Cast Iron&Stainless Steel

Results

Decreased fatigue level, increased body balance, less stress on muscles, more convenient and easy to operate.

V. CONCLUSION

The main advantage of manufacturing these types of modification vice is to provide flexibility in holding the jobs of different size of prosthetic and orthotic moulds. This innovation is more desirable and economical which enhances the safety standards to human involved in manufacturing process. Cost of manufacturing this vice is optimal and can be used for any ranges of work from small, medium to large scale. Future research recommendations can also to be made.

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