VERSATILE HOLDING FIXTURE FOR KEYWAY CUTTING ON VMC MACHINE

Abstract

The Installation are work holding Gadget utilized to Find and settle the position of work pieces for machining, Gathering, Assessment, and other operations. A Installation comprises of an course of action of Clamping and locators. A clamping framework that employments high-pressure fluids to control clamps and hold a work piece input. Powerfully clamped installations have numerous preferences over physically clamped fixtures.

Keywords: Hydraulic Fixture, Single Acting Spring Return Cylinder, clamping, Clamping on VMC machine, Fixture.

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I. INTRODUCTION

From the best installation to automated helped machining centers, Enerpac work holding items can perform the situating, back, and clamping capacities in a wide cluster of fabricating forms. With a setup time per portion of as it were 5-10% of manual strategies, water powered work holding offers a gigantic efficiency increment in forms such as machining, punching, squeezing, and numerous others. Not as it were are creation forms quickened, but less parts are rejected and comes about are more steady since each portion is situated, backed, and clamped in precisely the same way. And, the robotized nature of pressure driven work holding frameworks permits them to be promptly coordinates with administrator security frameworks. The benefits of pressure driven work holding don't apply fair to high-volume fabricating; it's frequently appealing for brief and medium run generation. A framework can be set up rapidly and cheaply for brief runs. Center-hole barrels utilize standard stud string sizes and are effectively trades with manual clamps. Numerous manual components can be utilized straightforwardly with pressure driven barrels. Include a basic air-operated pump and controls, and your installation is changed over to a water powered setup. For medium runs, a small more robotization pays off. For illustration, swing barrels permit simple stacking and expulsion of parts.

II. LITERATU REREVIEW

A Water powered installation could be a work-holding or bolster gadget utilized within the fabricating industry. Installations are utilized to safely find (position in a particular area or introduction) and bolster the work, guaranteeing that all parts created utilizing the installation will keep up congruity and tradable. Employing a installation progresses the economy of generation by permitting smooth operation and speedy move from portion to portion, lessening the necessity for skilled labor by simplifying how work pieces are mounted, and increasing conformity across a production run. labor by rearranging how work pieces are mounted, and expanding similarity over a generation run.

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1. Drawbacks: The Draw backs of Manual Clamping areas follows

- It takes more time

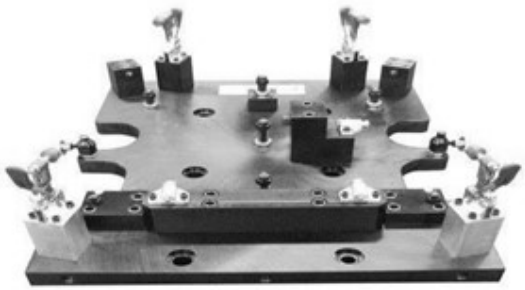

Figure1: Manual clamping fixture.

- Equal Forces not Acted
- It can damage the jobs
- Job is not clamped properly
- Low rate of Production.
- Job work time increases, it results in increasing in machining time
- Labour work increases

2. **Proposed System:** We proposed this type of system since, by the usage of hydraulic fixture we can easily clamp the jobs and it is time saving it reduced the extra wages paid to the labour. The Hydraulic Fixture functions more efficiently than the manual clamping fixture Hydraulic fixture saves time which is required for the manual clamping.

Figure 2: Hydraulic Clamping Fixture

3. **Working of Hydraulic Fixture:** The Fixture showed in fig.02 is the hydraulic fixture this fixture is proposed to save the time and increase the productivity. The hydraulic oil is entered in the system through inlet valve and through the manifold valve it enters the seme less tube and after entering the smiles tube it enters the spring return single acting cylinder and due to the pressure of the hydraulic oil the forward moment to the piston occur and the spring get compressed and job gets clamped.

III. METHODOLOGY

We are going to make a Hydraulic clamping Fixture for VMC Machine that is very easy to use and as compared to the existing manual clamping fixture. It saves time.

1. Major components Involved in the Model are showed in table no.01.

Sr.no	Components	Quantity
01	Support liver Fixture	1
02	Single ActingSpring Return Cylinder	4
03	Manifold Block	1
04	Semens Job	4
05	Hose Pipe	3
06	Semeless tubes	4
07	Pressure Gauge	1
08	Hydraulic Hand Pump	1
09	AlanBoltsM6	4
10	AlanBoltsM8	20
11	AlanBoltsM10	20
12	AlanBoltsM16	2

2. Survey of Research Paper and Finalization of Topic: During the survey of various types of research papers. We found that many companies and workers in companies are facing many such problems regarding the fixture, so our team started searching about the easiest method of fixture and then we started doing the survey of many research papers such as, 'Design and development of hydraulic fixture for machining' by S.S Panchbhai and L.P Raut, 'Analysis of Hydraulic Fixture by G.Vamshri krishna and K.S.S Gurudatta' and so many, after the researching these research papers we finalized our topic.

3. Analysis of Materials/parts: We analysis the following materials

- Support Liver Fixture
- Single Acting Spring Return Hydraulic Cylinder Top & Bottom
- Manifold block for top and bottom Cylinder connection line,
- Clamp cylinder mounting block S
- EN8Material.
- Hydraulic Hand pump
- Hose Pipe
- Seme less tube
- Pressure Gauge
- AlanBolt-M6,M8,M10,M16.

4. Design (Description) of Components:

- **Support Liver Fixture:** Support Liver Fixture is used to Support the whole Fixture.
- **Single Acting Spring Return Cylinder:** They are used in the fixture to hold the job tightly.

- **Manifold Block:** It is used to control the flow of Hydraulic Oil in fixture.
- **Clamp Cylinder Mounting Block:** It is used for the purpose of clamping and the cylinder are mounted on this block.
- **Hydraulic Hand Pump:** It is used to Pressurized the hydraulic oil and transfer it into the hydraulic fixture. (It is operated Manually)
- **Seme less Tube:** It is used to supply the Hydraulic oil in Single Acting Spring Return Cylinder.
- **Pressure Gauge:** It is used to measure the pressure of hydraulic oil.

Figure 3: Hydraulic Hand Pump.

IV. EXISTING SYSTEM

A jig varies from a installation in that because it guides the instrument to its adjust position in expansion to finding and supporting the work piece. Installations ought to be planned with financial matters in intellect; the reason of these gadgets is frequently to decrease costs, and so they ought to be outlined in such a way that the fetched lessening exceeds the fetched of executing the installation. It is ordinarily way better, from an financial point of view, for a installation to result in a little taken a toll diminishment for a handle in consistent utilize, than for a huge fetched decrease for a prepare utilized as it were once in a while. Most installations have a strong component, attached to the floor or to the body of the machine and considered steadfast relative to the movement of the machining bit, and one or more mobile components known as clamps.

These clamps (which may be worked by numerous distinctive mechanicals implies) permit work pieces to be effortlessly put within the machine or evacuated, and however remain secure amid operation. Numerous are moreover movable, permitting for work pieces of distinctive sizes to be utilized for distinctive operations. Installations must be planned such that the weight or movement of the machining operation (ordinarily known as the bolster) is coordinated essentially against the strong component of the installation. This diminishes the probability that the installation will come up short, hindering the operation and possibly causing harm to foundation, components, or operators.

Fixtures are utilized to hold the work piece during machining operations. It is additionally utilized amid the time of assessment, welding and collecting prepare. This paper

presents, plan investigation and improvement of pressure driven installation for genuine mechanical installation. The component is pressure driven lift lodging which is tractor portion. The operations to be performed are processing, penetrating, reaming & chambering on VMC.

In existing plan, the installation set up is done by water powered. The existing installation plan is vibration happens from the machining handle, so item quality is less. From existing inquire about examination in this zone, our project thought is additional pivot clamp gadget should be included. Water powered installation to decrease vibration and increment the item quality. In this investigate is analyzed by ANSYS we have found that the unused installation plan will be superior than existing show since the unused demonstrate will grant the less sum of vibration than existing model.

In arrange to have conversely parts in mass generation, dances and installations play a imperative part in fabricating process. A fixture may be a uncommon device outlined for particular reason and for particular component for operation. The show work bargains with the plan of machining installation for milling and penetrating operations for a wrench case.

A installation may be a uncommon instrument planned for particular reason and particular component for operation. The show work bargains with the plan of machining installation for processing and boring operations for a Wabco body lodging. The cutting powers included within the operations are taken into thought for planning the installation. The display installation designed is water powered worked and utilized for operation like confront processing, penetrating and boring of the body housing.

The cutting powers included within the operations are taken into thought for planning the installation. The display installation outlined is water powered worked and used for operation like confront processing, boring, Tapping, Harsh &Wrap up Boring of the wrench case.

Design benchmarks are taken from Makino for planning this machining installation. Within the plan handle based on the geometry of the component to be machined, the machine, the table format and comparing clamping
opening positions are at that point selected.

Since the ultimate component cannot be created by a single operation it is vital to plan for various operations to induce the ultimate shape. The installation is at that point planned by considering all the clamping strengths from various cutting operations.
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V. RESULT AND DISCUSSION

The system proposed by our group is very effective and time saving it leads in increasing of production in minimum time and high accuracy is obtained. The graph showed below in fig.no.04 tells us about the rate of production increased by the

Hydraulic Fixture that is the proposed System in comparison with the existing system that is manual fixture.

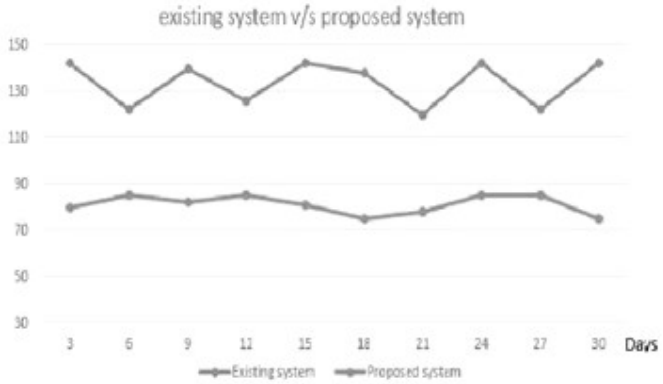

Figure 4: Graph of Existing system and proposed System

VI. DESIGN ANALYSIS

Fixtures are work holding gadgets planned to hold, find and bolster work pieces amid fabricating operations. Installations give a implies to reference and adjust the cutting device to the work piece but they don't direct the instrument. Installations are utilized to safely find and bolster the work, guaranteeing that all parts created utilizing the installation will keep up similarity and interchangeability.

Rate of production is increased due to the implementation of the hydraulic fixture the rate of production of manual fixture and the hydraulic fixture is showed below in the form of graph. The Graph is showed below.

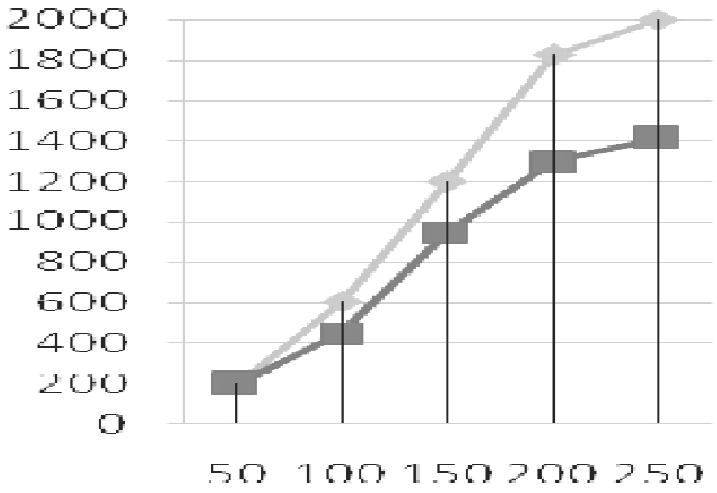

Figure 5: Graph of rate of production

VII. CONCLUSION

Thus, the method of manual fixture is very time consuming and difficult it requires lots of human efforts to clamp the job manually, and hence our group proposed this type of Hydraulic Fixture which is very easy to used and very easy used to handle, also it takes very less time in clamping of job.

VIII. FUTURE SCOPE

Our fixture is a Hydraulic Fixture it requires very less amount of effort and at this moment it working on manual operated hydraulic pump, a manual operated Hydraulic pump is used to pressurize the hydraulic oil in the fixture to produce work that is to clamp the job. But in Future it can be work on Automated Hydraulic pumps, Electric Hydraulic pump and it can even work on the hydraulic power pack.

Figure 6: Electric Hydraulic Pump

Figure 7: HydraulicPowerPack

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