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Productivity Improvement in Priming Shop by using Jig and Fixture

Dhiraj Pethe¹, Vaishnav Borkar², Ravi Gupta³, Vikrant Deotale⁴ Vaibhav Choudhari⁵, Prof A.B.Ganorkar⁶

^{1, 2, 3, 4, 5}Mechanical Engineering, Priyadarshini Bhagwati College of Engineering, Nagpur, India

⁶Assistant Professor of Mechanical Engineering, Priyadarshini Bhagwati College of Engineering, Nagpur, India

Abstract: *The paper gave a detail about improvement of productivity in industry and also identified the numerous advantages that are associated with the use of jigs and fixtures in manufacturing to include: production increase, cost reduction, interchangeability and high accuracy of parts, reduction of the need for inspection and quality control expenses, reduction of accident as safety is improved, easy machining of complex and heavy components, as well as low variability in dimension which leads to consistent quality of manufactured products. The work also explained that since the design is dependent on numerous factors which are analyzed to achieve an optimum output, that jigs and fixtures should be made of rigid light materials to facilitate easy handling. For adequate strength and rigidity, a mild steel strip with 38 millimeters width and 5 millimeters thickness was chosen for the design of a sample jig and fixture. The fixture of dimension of (585*508) millimeters with the weight of 3.6 kg. After painting front face of fixture by using hooks we can switch the face and also paint back face. The calculated values confirmed that a 16 millimeter diameter mild will lead to the construction of a rigid and strong jigs and fixtures that will guarantee high machining accuracy, consistent quality of products, and interchangeability. Finally, the paper advocated that jigs and fixtures must be provided with adequate clearance which should allow for variations in size of components*

Keywords: *Productivity Improvement, Manufacturing, Jig And Fixture, Priming.*

I. INTRODUCTION

Manufacturing and assembly industries are continuously upgrading their products quality and processes efficiency in order to sustain competitive advantage within their respective area. The pace of change will continue to accelerate, as such, manufacturing and assembly industrials tend to outsource some low end and low value-added activities. This move is to free-up internal resource in order to focus on high value-added activities, such as new product development and continuous improvement program. In conjunction with this, jig and fixture design and fabrication jobs are among activities that are commonly outsourced by manufacturing and assembly industries.

So, for development and productivity improvement in priming shop by new/modifying fixture we all are getting a project from akar industries. and for that purpose we have one design of fixture to reduce their manual handling time or increasing overall productivity of akar industry. ease of use.

As the efficient running of a manufacturing company which demands a prompt and simple work positioning strategy for correct operations depends largely on the interchangeability of machine components and work-pieces, to ensure un-complication, and unit cost reduction, as well as to become competitive, reduce the enormous manufacturing cost, and also increase their profitability, the industry has resorted to streamlining its supply chain in a bid to maintaining a very low amount of inventory. This has also led to the demand for a better and cost effective work-holding devices which will ensure better quality products, reduce lead time, and also increase throughput.

II. ABOUT COMPANY

Akar Industry Pvt. Ltd. is situated in M.I.D.C. Hingna.. The company is established in Dec. 1986, from last 23 years company manufactured about 160 component which can produce in two plants.

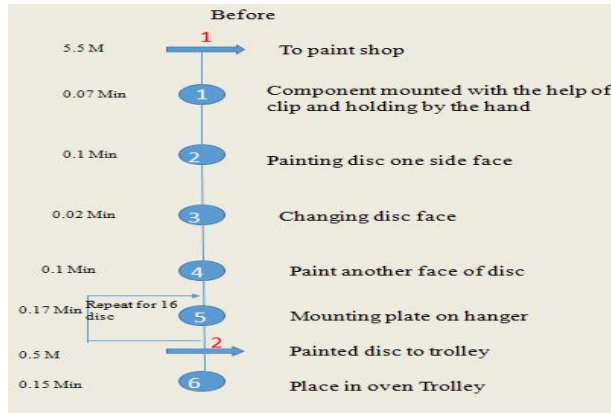
In unit 1, initial process is done and the component is transport to 2nd unit, In unit 2 welding, painting and packaging process can be done and then it supplies to main company.

Akar industry is a vender industry of Mahindra and Mahindra, Ashok Leyland, Spacewood Furniture, B. P. Argo And Many More. Manufacturer and exporter of sheet metal component, pressed components, press tools and pulveriser machines.

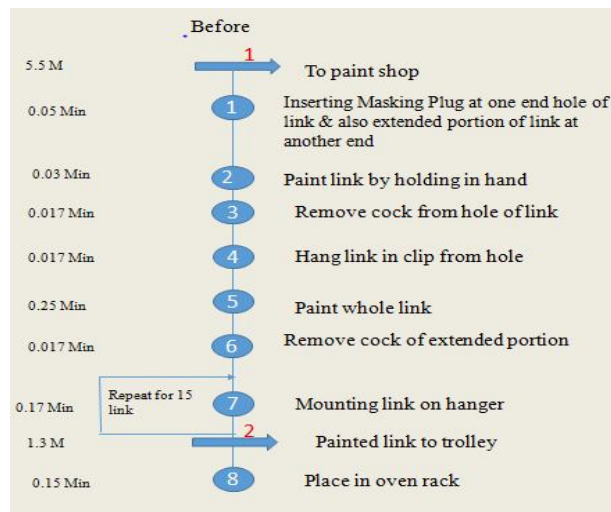
III. CASE STUDY

A. Phase I:- Observing And Collecting Data

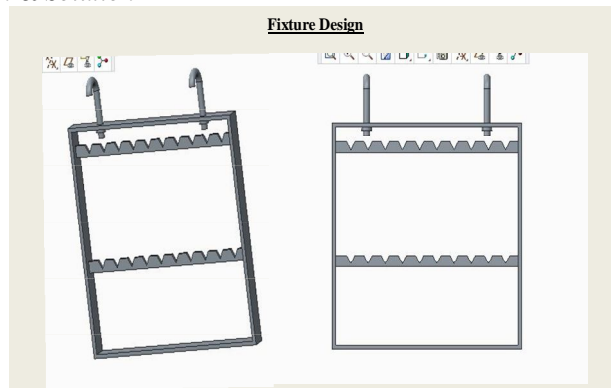
- 1) *Time Study By Stop Watch:* First we select the component for time study, then we record their priming time, then we divide time for priming front side and back side of component, then we calculate priming per piece.
- 2) *Method Study By Flow Process Chart*
 - a) *Cover Plate Oil Seal PTO*



b) Connecting Link Assy



B. Phase II:- Problem Identification & Solution

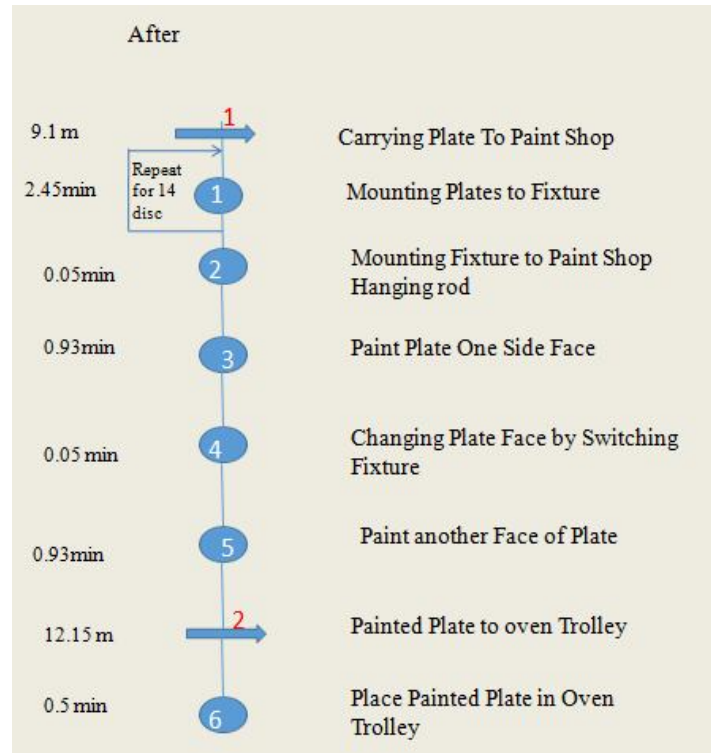


Specification

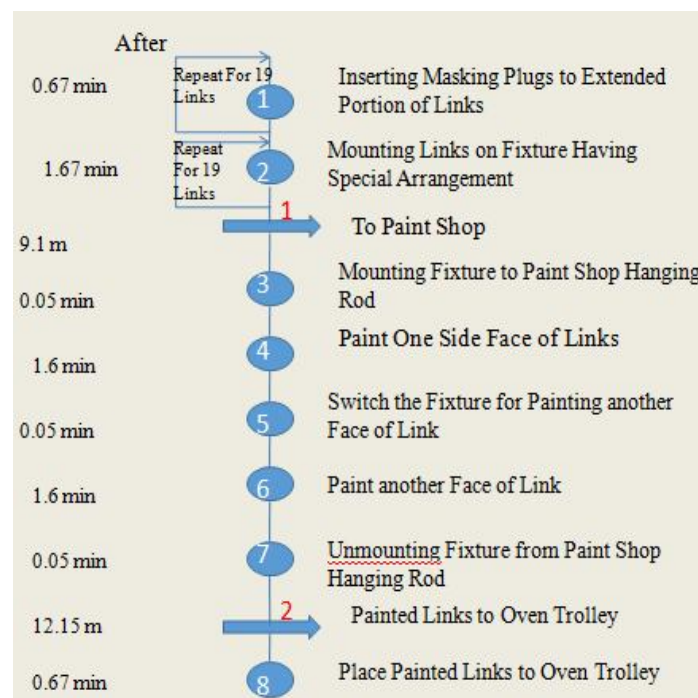
- 1) The weight of the fixture is 3.6 kg
- 2) length 20 inch & width 23 inch.
- 3) After painting front face of fixture by using hooks we can switch the face and also paint back face.

C. Phase III:- Implementation of Solution

- 1) Time Study By Stop Watch: After Implementation of new fixture we select 10 component for time study and painting front face of fixture by using hooks we can switch the face and also paint back face.
- 2) Method Study By Flow Process Chart
- a) Cover Plate Oil Seal PTO



b) Connecting link assy.



IV. CONCLUSION

As the conclusion, the objective which is to obtained through understanding of design fixture implementation to the productivity improvement was met. Based on the understanding through the literature review, the relationship of productivity and quality is proven in terms of charts and calculation in order to understand more about quality the present quality system in the company was studied and analyze. The root cause of the main paint consumption had been successfully determined based on the analysis, the company is suggested to implement new fixture design in the incoming priming process in order to measure the quality improvement. From the data gathered, the result shown the drastically saving the paint (23.811) liters. Implement the fixture also lead to drastically change in cost saved and time saved.

REFERENCES

- [1] Joshi, P. (2010). "Jigs and Fixtures" Tata McGraw Hill Education, New Delhi, India.
- [2] Nanthakumar, K. and Prabakaran, V. (2014). "Design and Fabrication Testing of Combined Multipurpose Jig and Fixture" IOSR Journal of Mechanical and Civil Engineering. www.iosrjournals.org.
- [3] Lin, Q., Burdick, J., and Rimon, E. (2006). "Constructing Minimum Deflection Arrangements Using Invariant Norms" IEEE Transactions on Automation Science and Engineering, Vol. 3, No. 3.
- [4] Blogspot (2010). "Introduction to Jigs and Fixtures" [Online] engineeringhut.blogspot.com/2010/11/jigs-andfixtures.html [Accessed 5 May 2015].
- [5] Spogel (2014). "Mini project on Jigs and Fixtures" [Online] <http://files.spogel.com/miniprojectsin-mech/p-0027--Jigs-andFixtures.pdf> [Accessed 18 May 2015].
- [6] Kaija, T. and Heino, P. (2006). "The Optimization of Onwafer Shield-Based Test Fixture Layout" IEEE Transactions on Microwave Theory and Techniques, Vol. 54, No. 5.
- [7] Meduettaxila (2012). "Jigs and Fixtures Module" [Online] <https://2k9meduettaxila.files.wordpress.com/2012/04/scanjigs-and-fixtures.pdf> [Accessed 22 May 2015].
- [8] Mechnol (2015). "Applications of Jigs and Fixtures" [Online] <http://www.mechmol.com/applications-of-jigsandfixtures.html> [Accessed 11 July 2015].
- [9] Pachbhai, S. and Raut, L. (2014). "A Review on Design of Fixtures" International Journal of Engineering Research and General Science, Vol. 2, Issue 2.
- [10] Chennu, V. (2014) "Jigs and Fixtures and their Purposes" [Online] <http://www.memechanicalengineering.com/2015/02/jigs-and-fixtures.html> [Accessed 12 July 2015].



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