

A REVIEW PAPER on PEDAL OPERATED WINDING MACHINE

Prof. Sharad Pawar¹, Gaurav Devkate², Rupesh Umredkar³, Akash Vaidya⁴

¹Associate Professor Of Department of Mechanical Engineering, Smt. Radhikatai Pandav College of Engineering Nagpur, India. Email-id- shapa_26@rediffmail.com

²Student of Department of Mechanical Engineering, Smt. Radhikatai Pandav College of Engineering Nagpur, India. Email-id- gauravdevkate12@gmail.com

³Student of Department of Mechanical Engineering, Smt. Radhikatai Pandav College of Engineering Nagpur, India. Email-id- rdumredkar1997@rediff.com

⁴ Student of Department of Mechanical Engineering, Smt. Radhikatai Pandav College of Engineering Nagpur, India. Email id-akashvaidya7058@gmail.com

Abstract: The paper exhibit the point by point investigation of manual worked loop winding machine. It incorporates the outline of a loop twisting machine for a stator twisting of an engine utilized as a part of fans. The regular loop winding machine winds copper wire onto a previous. The previous is connected to the sliding arm which is impelled physically. Be that as it may, this machine typically has material strain, confinement, administrator mediation and low profitability. The primary target of this task is to build up a manual curl winding machine that will lessen the cost behind the programmed loop winding machines. The manual Coil winding machine is effortlessly versatile, low support, straightforward in development, and minimal effort as correlation with programmed loop winding machine. This winding machine is simple being used and it likewise compact.

Keywords — Coil winding machine, motor, stator

I. INTRODUCTION

The pedal worked winding machine winds a material, for example, metal wire, string or paper, onto a center, spool or bobbin. The paper manages the pedal worked winding machine. So we are exhibiting a creative technique for manual worked winding machine. This will eventually diminish cost and time. In any case, the fundamental favorable position is that we are proposing the strategy that is totally going to take out the high cost. There are a couple of unmistakable sorts of turning machine from essential manual urge machine to complex PC numeric control (CNC) machines. A part of the more run of the mill utilizes for winding machines are twist winding, rope winding, and determined fiber winding. A curl winding machine is one of the kinds of winding machine that accessible in ventures today. The loop winding machine can be arranged by their speed levels and limit. The regular utilization of curl winding machine is to twist loop for a transformer pointer engines and gags. Numerous ventures utilize this gadget including material, hardware, and wire businesses. A manual winding machine ordinarily has an inside on hub and the customer energizes wire, rope or other material onto the middle. The customer controls the pivot speed and supports the material through client hands, overseeing it to control the weight and load plan. These essential machines may be of a seat top size or tremendous stay singular winder

II. LITERATURE REVIEW

Though we referred many books, journals, various sites but we did not get specific or standard method for manufacturing transformer. So we started searching for the manufacturing methods those are widely adopted by the different transformer manufacturing companies. Finally we would like to classify them as manual & semi-automatic. The details are presented here along with relative diagram.

1. EXISTING METHOD

Though we referred many books, journals, various sites but we did not get specific or standard method for manufacturing transformer. So we started searching for the manufacturing methods those are widely adopted by the different transformer manufacturing companies. Finally we would like to classify them as manual & semi-automatic. The subtle elements are introduced here alongside relative graph.

Complete Manual Method: In this kind of transformer winding assembling strategy the entire windings are finished by the gifted laborer. In this method the shaft on which bobbin is mounted is rotated manually with paddle assembly as shown in fig.1 Rotating paddle and then providing horizontal motion by a another hand makes the process hectic.

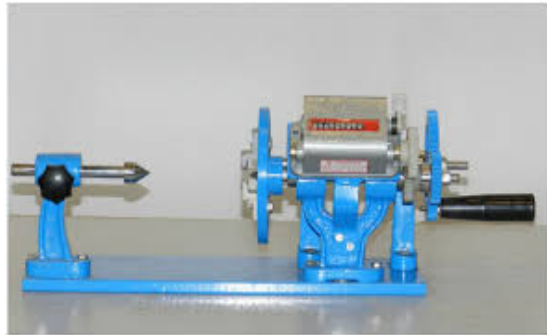


Fig.1 Complete Manual Method

Semi Automatic Transformer Winding Machine: The pushed interpretation of the transformer winding machine is made as the paddling physically was redundant business. So new machine was created around 1965 in France and this machine was generally acknowledged everywhere throughout the world and with a few changes is utilized today also. In spite of the fact that this machine was acknowledged overall still it needs the talented laborer to work it as it is simply dispense with the obstacle of paddling.

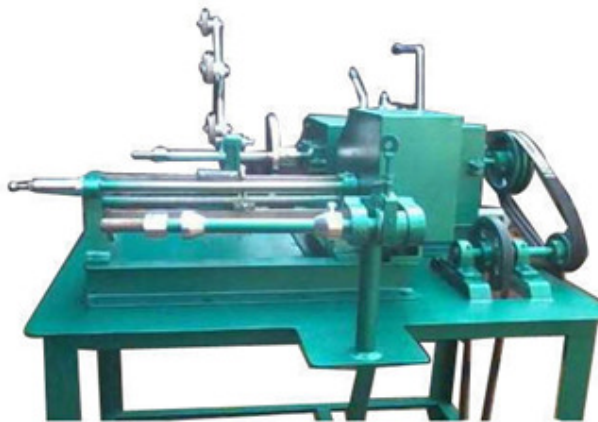


Fig.2. Semi-Automatic Transformer winding machine.

As appeared in fig.2 the winding procedure is still relies upon the gifted work as he needs to deal with 4 distinct things at the same time, for example, controlling pace of acceptance engine . likewise he needs to deal with number of turns finished and what number of turns are remained. Likewise he needs to deal with number of turns per layer ought not surpassed the predefined esteem for that specific guage of wire and as this shifts according to guage of wire eventually this makes the entire procedure dull.



Fig.3. Advanced Semi-Automatic Coil winding machine

Advanced Semi-automatic Transformer winding machine: This is additionally created system for self-loader transformer completing machine as its gives level forward and in reverse development thusly. However, the primary downside of this machine is that it must be utilized for assembling LV transformers and there likewise for particular scope of bobbin measure.

2. PROPOSED METHODOLOGY FOR COMPLETE AUTOMATIC TRANSFORMER WINDING MACHINE

We are interested to make a fully manual winding machine which will eliminate the dependency on skilled/trained worker requirement and also will reduce required time and cost significantly. The desired machine will have smooth and controlled rotations as per requirement. The machine should avoid delays in delivery by following up with the existing manufacturing method i.e automatic winding method and also avoid accidents that occurs during other types of winding method and also avoid accidents that occurs during manual winding.

The machine will enhance the nature of transformer by killing manual understanding and start new or advancing advancement in transformer outline and produce for the expanded proficiency with lessening in cost, time and skilled manpower requirement. Likewise the machine should ready to get ready machine that will guarantee the proficient twisting of transformer alongside confinement.

PROPOSED WORK

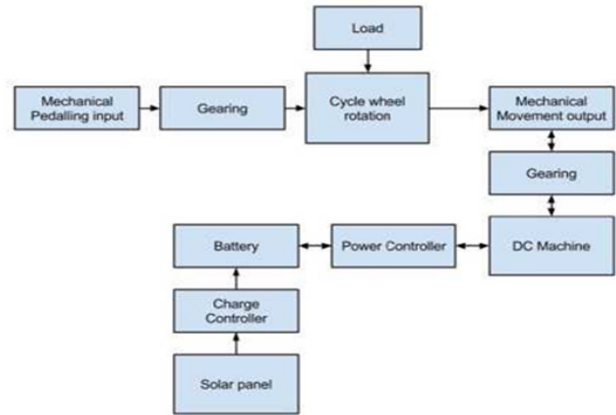
We are interested to make a fully automatic winding machine for transformer which will eliminate the dependency

on skilled /trained worker requirement and also will reduce required time and cost significantly.

The desired machine will have smooth and controlled rotations as provided by induction motor. The machine should avoid delays in delivery by following up with the existing manufacturing method i.e. manual winding method and also avoid accidents that occurs during manual winding.

III.CONSTRUCTION

Primary component of task are driving system, winding instrument. Meter for getting number of turns, spring for obtaining perfect tension and arms for the support the object. The power is transmitted through chain to sprocket number which mounted on shaft. Through another chain to the wheel which connected by other chain.



Types of Coil Winding Machines

There are diverse kinds of curl winding machines accessible.

1) Coil Winders

Coil winders are generally used for smaller jobs. They can be hand worked or have a winding drive that is controlled by a foot pedal. These loop winding machines are utilized as a part of the creation of solenoid curls, multi-segment loops, and other such complex curls. In spite of the fact that they are little, they can reach up to rates of 9000 RPM.

2) Medium-Duty Coil Winding Machines

These machines are more capable than curl winders and go up against higher creation requests. Most of them are driven by potentiometers. They can wind different sorts of wires.

3) Heavy-Duty Coil Winding Machines

Overwhelming obligation engine loop winding machines can deal with to great degree extensive sums and are likewise exceptionally flexible in nature. For higher accuracy, the greater part of these machines is outfitted with LCD touch-screen screens. These screens enable administrators to have more control over speed.

IV. BLOCK DIAGRAM

V. WORKING

- When operator move the pedal power through the chain is transmitted to the shaft, sprocket mounted on the shaft rotate the wheel, which contact with ring.



Fig.4 Pedal operated winding machine.

- Due to the friction between the ring and the wheel start rotating.

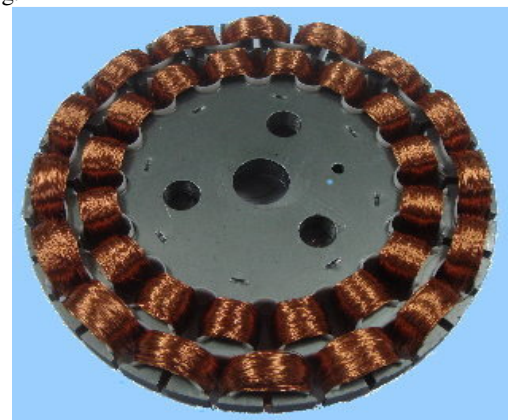


Fig5. Coil winding

- This ring is rotated around the object to wound due to this equal tension is obtain in all side.
- Bench adjustment is provided for other type of wound.



Fig.6 coil winding

Tension of the coil is maintained with the help of spring.

VI. SCOPE AND OBJECTIVES

As we are proposing method of pedal operated winding, so the primary goals and objectives are as follows.

1. To reduce the cost of product.
2. To prepare machine that will assure the efficient winding.
3. To avoid delays in delivery by following up with the existing manufacturing method i.e. manual winding method.
4. To complete short work and reduction in cost.

VII. CONCLUSION

This paper present the detailed study of manual operated winding machine will be able to eliminate the drawback of high cost , high maintenance. The main objective of this machine is to minimize the cost of conventional winding machine and replace the manual labour and optimize the process. The inference is that, this automated system has increased the production and also provided solution for lack of human labour for such hectic jobs is compensated.

A better user interface has been provided with a number of turns meter. This project automatic coil winding machine, can operate several accurate than manual process.

However this machine usually has material tension limitations, operator intervention and low productivity and as motors are the basic need for the stator winding becomes the growing and essential process in automation solution.

Implement the idea of automation in coil winding machine at minimum manufacturing cost also in increases productivity of automated machine.

This work will provide low operational cost, low power consumption, accuracy and flexibility to the system.

REFERENCES

1. *Automatic Coil Winding Machine* by Sundar Ganesh CCS*, Minu S*, Niveta R*, Nivethitha AC*,Padmini R*, Gokul Krishna K*, Joe Breslin J*
2. *Design of Automatic Transformer Winding Machine* by Nishad S.Joshi, Chetan B. Bulbule, Sagar D.Domale,Prof. Jayashree Deka.
3. *Automation in Manufacturing of Winding* by Ms. Priya Ikhankar| Ms. Rakhi Golhar Ms. Ankita Kamdi Ms. Trupti Banarase Mr. Sanjeet S. Kashyap
4. *boosting Power Density of Electric Machines by Combining Two Different Winding Types* by RolandKasper*NormanBorchardt
5. *boosting Power Density of Electric Machines by Combining Two Different Winding Types* by RolandKasper*NormanBorchardt
6. *Analysis of filament winding processes and potential equipment technologies* by N. Minscha,*, F.H. Herrmanna , T. Gerekeb, A. Nockeb, C. Cherifb
7. *Analysis of tension analysis ofwinding processes and N. Minscha,*, F.H. Herrmanna , T. Gerekeb, A. Nockeb, C. Cherifb*
8. V.V.Athani, “*StepperMotorsFundamentals,Application and Design*”, ch. 4, pp. 31-65, NewAge International (P) Limited, New Delhi,2000
9. V.V.Athani, and J.C. Mundha, “*High Performance Controller for High Torque PM Stepping Motor*”, *IEEETrans. on Industrial Electronic. Vol. IECI-25, No. 4,pp.343-346, 1978*
10. Reston Condit, Dr. Douglas W. Jones, *SteppingMotors Fundamentals” (AN907), pp. 10-14, Microchip, 2004*
11. [4] M.H. Rasid, “*Power Electronics, Circuits, Devices and Applications*”, ch. 9, pp. 406-430, Prentice-Hall, India,2007
12. http://www.ijetae.com/files/Volume3Issue9/IJETAE_0913_88.