

ELECTRICAL FORGING MACHINE

Varun hegde¹, Naveen Kumar D², Dr Vijendra Kumar³, Dr K. S Badrinarayan⁴.

1. Student, department of mechanical engineering, varunhegde278@gmail.com
2. Asst. Professor, Department of mechanical engineering, M S Engineering College, dnaveenmech@gmail.com
3. Professor and H.O.D, Department of mechanical engineering, M S Engineering College, vijendravr@gmail.com
4. Professor and Principal, M S Engineering College, principal@msec.ac.in

Abstract—Here we are going to fabricate the automated forging machine. It's a new innovative concept Forging is the term for shaping metal by using localized compressive forces, This machine has been mainly developed for a metal forming to required shape and size. The aim of our project is to eliminate the manual method of forging into automated forging machine to overcome the problems like inaccuracy and manual errors.

Keywords— Forging machine, slider crank mechanism, 2hp motor, link, hammer.

INTRODUCTION

Forging is the application of compressive forces on the work piece to get desired shape and size. Forging is a manufacturing process involving the shaping of metal using localized compressive forces. Forging has been done by Smith's for traditional products kitchenware, hardware, hand tools, edged weapons, and jewelry. Forged parts are widely used in mechanics and machines whenever a component requires high strength.

The aim of our project is to eliminate the manual method of Forging into electrical forging machine. Usually forging is the process of shaping the work piece it is done by two methods hot forging and cold forging methods. In hot forging method work piece is forged at a very high temperatures and lot of man power is required. This machine has been mainly developed for a metal forming to required shape and size.

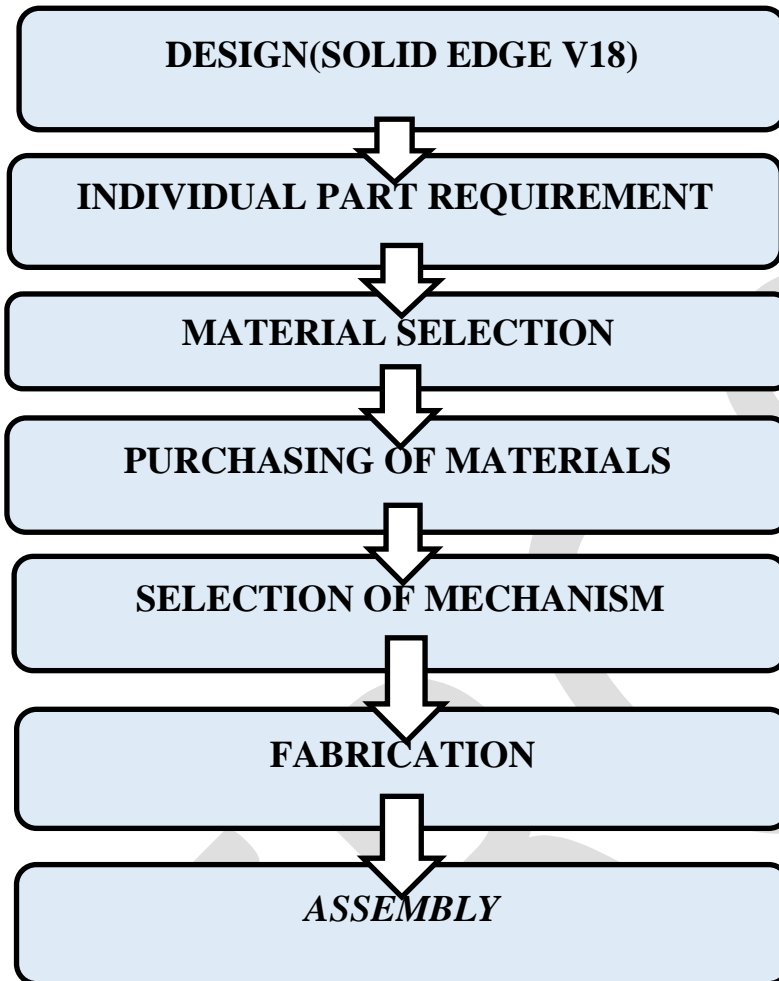
In present situation there is a problem regarding shortage of labors. To overcome these problems, we have come up with the electrical forging machine which requires zero-man power. Electrical Forging Machine helps to the labors and the students who are studying forging and laboratory.

RESEARCH METHOD

OBJECTIVE

1. The main objective of our project is to eradicate the manual methods of forging and replace it into the electrical system. Usually the forging machine is done by manual methods like hammering.
2. To minimize the labor availability problems and other financial expenditures spent on the labor. The cost spent on the labors are now a day increasing hence to minimize the labor cost Electrical Forging Machine is helpful.
3. To get the good surface finish compared with manual methods. The surface finish obtained by manual methods is not good hence to have a better surface finish this project can be used

METHODOLOGY



Flow chart: 4.1 methodologies

In the design and fabrication of any product the role of each and every part play a vital role. Each and every part is required for the final assembly of the project. The main objective of our project is to eradicate the manual methods of forging and replace it into the electrical system. Usually the forging is done by manual methods like hammering. To minimize the labor availability problems and others financial expenditures spent on the labors. The cost spent on the labors are nowadays increasing hence to minimize the labor cost Electrical Forging machine is helpful.

Some of the individual parts of the Electrical Machine is listed below.

- Motor
- Bearings
- V- Belts
- Pulley
- Hammer

- Base- C –Channel
- Links
- Anvil
- MS Pipe
- Supporting frame

Material Selection

Material selection is a step in the process of designing any physical object. In the context of product design, the main goal of material selection is to minimize cost while meeting product performance goals. Systematic selection of the best material for a given application begin with properties and costs of the candidate materials. For example, a thermal blanket must have poor thermal conductivity in order to minimize heat transfer for a given temperature difference. In the design and fabrication of any product the role of each and every part plays a vital role. Each and every part is required for the final assembly of the project. The main objective of our project is to eradicate the manual methods of forging and replace it into the automated system Materials selected for the automatic forging machine based on their characteristics is given below

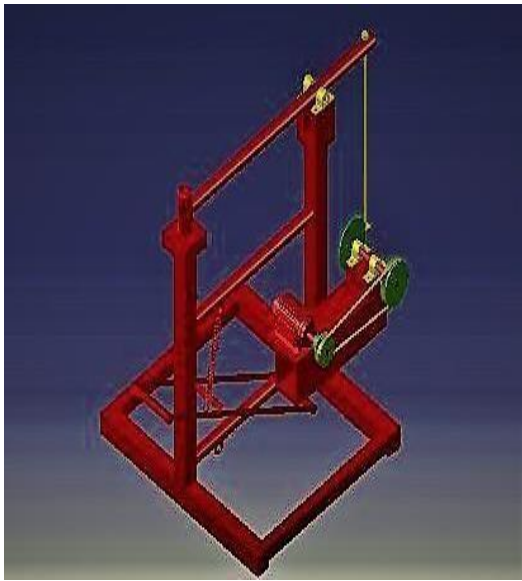
- Motor- Seamless Steel (Treated with Epoxy Coatings).
- Bearings- Stainless Steel and Ceramic Material.
- V-belts- Rubber Impregnated Fabric.
- Pulley- Cast Iron.
- Hammer- High Carbon Steel.
- Base- C-Channel- Mild Steel (0.05%-0.025% Carbon).
- Links- polyurethane. > Anvil- wrought Iron.
- MS Pipe- Hollow Steel.
- Supporting Frame- MS Steel (0.05%-0.025% carbon).

Purchasing of Materials

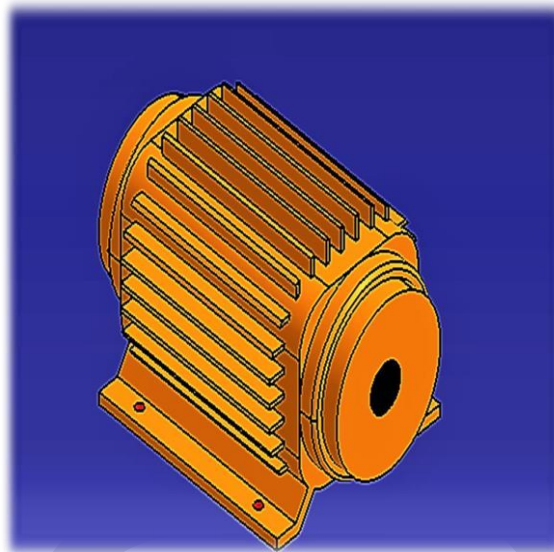
Purchase is the main activity in area of material management. Purchasing refers to the procurement of the raw materials required for the particular objective. Purchase management is one of the most crucial are of the project.

Purchasing involve acquiring materials of right quality in a right quantity at a reasonable price and at right time.

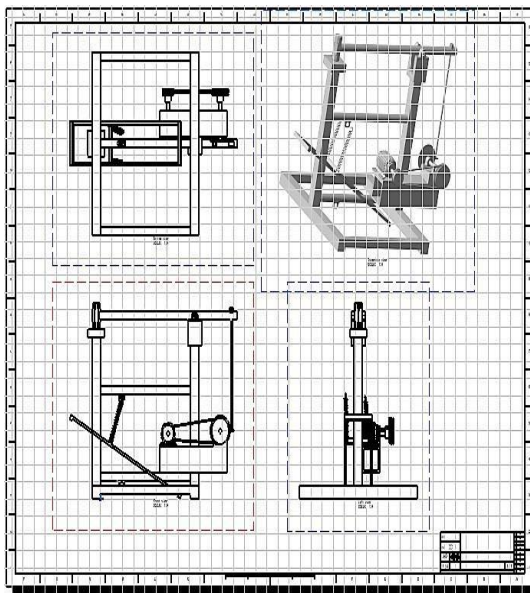
DESIGN OF COMPONENTS



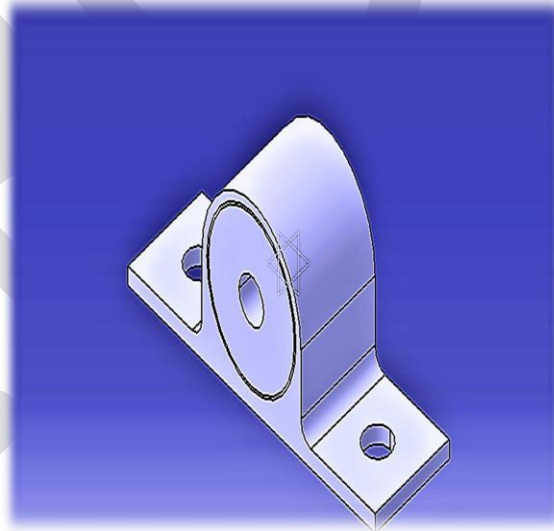
Machine model



Motor



Drafting



Bearing

ACKNOWLEDGMENT

The successful completion of any work will be incomplete without complementing those who made it possible and whose encouragement made my effort successful. At the very outset, Firstly I would like to be highly grateful towards the college, M S Engineering College, Bangalore, for providing us with all the necessary help and grooming up in to being Bachelor of Engineering.

I express my sincere gratitude to Dr. K S Badarinarayan, Principal, MSEC, and Professor Department of Mechanical Engineering, Bangalore, for providing the required facility.

I express my sincere gratitude to Dr. Vijendra Kumar, HOD, MSEC, and Professor Department of Mechanical Engineering, Bangalore, for providing the required facility.

I also extend my sincere thanks to our Guide NAVEEN KUMAR D, assistant Professor, Mechanical Engineering, MSEC, Bangalore, for his encouragement and support throughout the project.

Last but not least I extend, my thanks to the entire Teaching and Non-teaching faculty members of Department of Mechanical Engineering, MSEC Bangalore, who has encouraged us directly and indirectly throughout the course of my Bachelor Degree. Finally I thank my parents and friends for their continuous encouragement and support.

CONCLUSION

During working on project we have been gone through learning of many feasibility study production process and controlling with team work. Thus this project work is much useful in forging lab. For practical applications this is designed and fabricated for forging the work piece. In any manufacturing industries time is an important parameter and it should be utilized properly in order to reduce delivery lag time. This machine can save the processing time. Labor availability is a major problem faced nowadays hence the forging machine which is being automated can reduce the labor problems. The effort required by the man for the forging operation is high hence this machine can reduce the human efforts. This experience and knowledge will be further helpful to our professional career.

REFERENCES:

- [1]. **J. Kupta Et Al, united** states patent office journals, application – December 2,1995, serial no. 550718, patented Oct 23,1957, published no.US2789540
- [2]. **Howard Terhune, Cleveland, Ohio, united states Patent office journals, application – September 27,2994, serial no. 555977, patented Oct 28,1947, published no. US2429780** [3]. **David A.Giardino, utica; William K.Wallace,barneveld; Joseph R.Groshans,clinton,all of N.Y,united states patent office journals,application – September 25,1989,patented Jan.28,1992,patent no. 5083619 published no. US 5083619**
- [5]. **Ulrich demuth, erbach- ernsbach; winrich hakbedane,diez, both of** Germany, united states patent office journals, application – November 30, 2996, patent August 39, 2000, patent no.6109364, published no. US006109364A
- [6]. **James kepnar , Lawrenceville,GA(US),united states patent office journals,application filled – March 23,2001,serial no.09/815,677,patented September 26,2002,published no.US 3002/0133997A1**
- [7]. Theory of machines by R.S.khurmi and J.K.gupta(pg. No.774to 832)4th edition
- [8]. A textbook of machine design by R. S. Khurmi and J.K.gupta (pg.no 509 to 557, chapter 14.shaft, pg,no. 759 to 775,chapter21.chain drive,pg. No.996 to 1020,chapter 27. Bearings, pg no.1021 to 1124, chapter 28, 29,30,31)
- [9]. Design data for machine elements by B.D.Shiwalker (pg.125to 132,pg.150 to 154.pg. 255 to 160,pg.39