

Design of a Crimping Machine using F.E.A.

Manisha Yelane¹ A. V. Vanalkar²

¹M.Tech Student ²Professor

^{1,2}Department of Mechanical Engineering

^{1,2}KDK College of Engineering Nagpur, Maharashtra, India

Abstract— The scope of the project is design a crimping machine, using CAD modelling. The crimping machine will be used to join metal hoses from hard rubber. The project involves the detailed study and getting the information from the sources available about crimping machine. On the basis of data accumulated, making General arrangement drawings, Hand Calculations, CAD model generation, and publishing of manufacturing drawings of the final design. The result is explained on the basis of a comparative data accumulation and calculation of probable designs.

Key words: Crimping Machine, F.E.A

I. INTRODUCTION

Crimping work is the most popular worldwide among all the devices of joining metals and even some non-metals. The great importance of the crimping is proper design of crimping machines, in order to increase their performance and productivity proper design is very essential. The main aim of the project is to design and develop crimping machine working condition. Crimping machine has a various parts involved such as hydraulic cylinder, hand pump, tool holding blocks, ferrule crimping component, and base plate hose and the end fitting coupling.

Crimping is a technique which is easy, fast and cost effective method for joining and forming two or more parts. Crimping machine is machine of joining two or more parts. Crimping machines are more reliable, accurate and flexible machines with easy and fast set up times and multiple cost effective tooling options than any other joining machines, these factors to be made machines well accepted among manufactures in number of industries worldwide. The crimping process can be made more and more efficient by automating the individual process steps involved in machining.



Fig. 1: Crimping Process



Fig. 2: Crimped Metal Hose & Rubber Tube

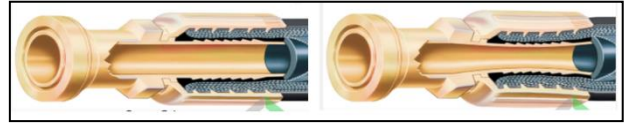


Fig. 3: Before & After Crimp

II. CAD MODELING

Cad Model of the crimping machine designed as per the design calculations presented in the previous article

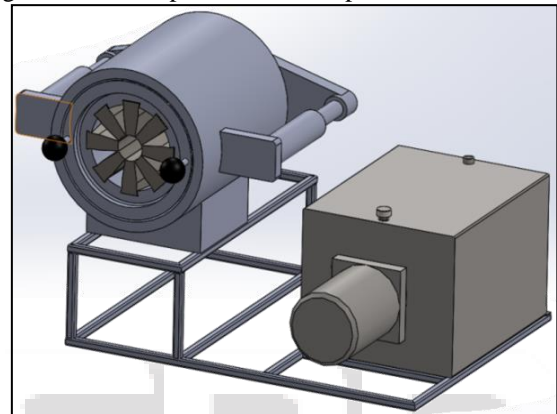


Fig. 4: Cad Model of Crimping Machine

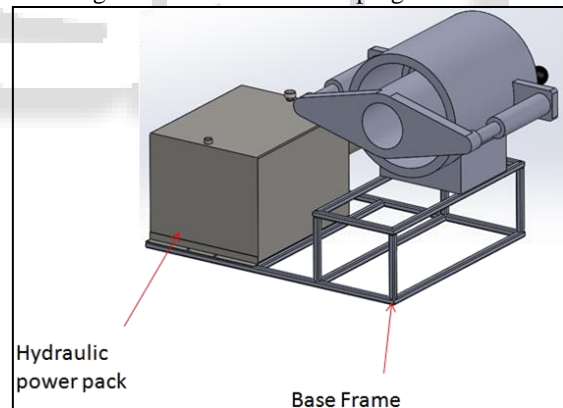


Fig. 5: Model Showing Hydraulic Power Pack and Base Frame

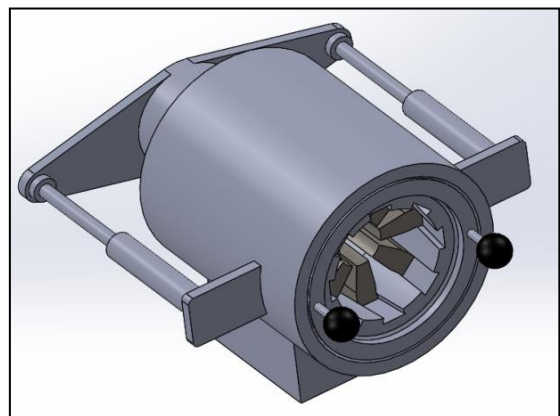


Fig. 6: Isometric View

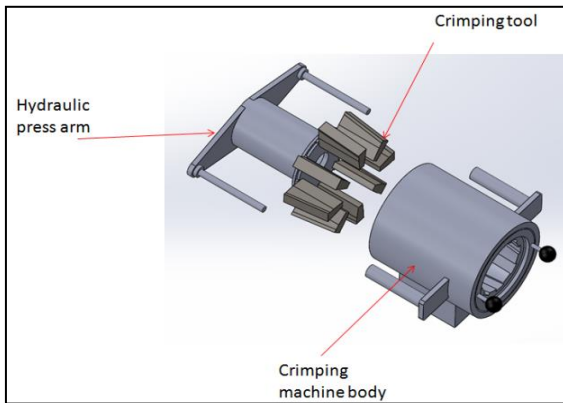


Fig. 7: Detail view

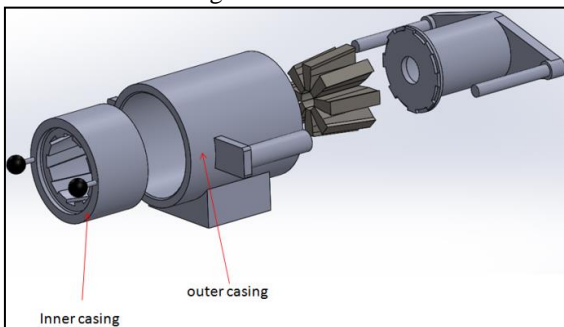


Fig. 8: Detail view

III. CONCLUSION

The main objective of crimping machine is to achieve more accuracy in joining process than manually and reduce the human efforts and save time in the operation. So there will be reduce in human efforts and it will save the time while doing operation. It results in the reduction of consumption of time for joining process. It also reduces the number of labours and labour cost required for the process. On the basis of objective, data accumulated and design calculations the CAD model of Crimping machine was design using Solidworks. Based on the data accumulation CAD model is generated as per the requirement to validate this design.

REFERENCES

- [1] Sungsoo Kim, Wonky Moon and Youngil Yooy, "An efficient method for calculating the nonlinear stiffness of progressive multi-leaf springs", Dept. of Mech. Eng., Pohang, University of Science and Technology (Postech), San , Namgu, Pohang, Kyungbuk ,South Korea.
- [2] Olugboji Oluwafemi Ayodeji, Matthew Sunday Abolarin , Jiya JonathanYisa, Alaya Garba Muftau, Ajani Clement Kehinde, "American Journal of Engineering Research Design and Construction of a Spring Stiffness Testing Machine", (Mechanical Engineering Department, Federal University of Technology, Minna, Niger State, Nigeria.
- [3] Mr. Ajay D. Dighe, "A REVIEW ON TESTING OF STEEL LEAF SPRING", International Research Journal of Engineering and Technology, Mechanical Engineering Department, Pravara Engineering College, Loni, Maharashtra, India.
- [4] Hareesh and Thillikkani, "Design and analysis of leaf springs using the FEA approach", Mechanical Engineering, Vidya Academy of Science and Technology Thrissur - 680501, India.
- [5] Ahmet Kanbolat , Murathan Soner, Mustafa Karaagaç, Tolga Erdogus, "Parabolic leaf spring optimization and fatigue strength evaluation on the base of road load data, endurance rig tests and nonlinear finite element analysis".
- [6] Ruchik Tank, Srinivas Kurna, "Investigation of Stresses and Deflection in Multi Stage Leaf Spring of Heavy Duty Vehicle by FEM and Its Experimental Verification".