Cardiopulmonary Resuscitation (CPR) device

Vikas Kumar (234103442)
Sanjay Kumar (234103434)

Vikas Kumar, Sanjay Kumar
ME 696 – Biomedical Devices and Systems
k.vikas@iitg.ac.in , sanjaykumar3434@iitg.ac.in

INTRODUCTION

- CPR is an emergency procedure for a person whose heart has stopped (called sudden cardiac arrest) or who is no longer breathing.
- In India About 4,280 people per 1 lakh population are getting cardiac arrest per year in the country.
- Every minute 112 people are succumbing to cardiac arrest.
- CPR is crucial for maintaining blood flow and oxygenation to vital organs.

TECHNICAL GAP AND OBJECTIVE

- Create automated CPR devices for rapid and effective resuscitation.
- Enhancing device feedback and adapting algorithms for precise chest compressions

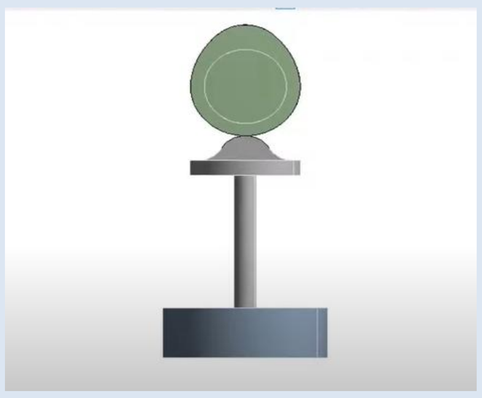
CPR Device using Piston Housing Mechanism

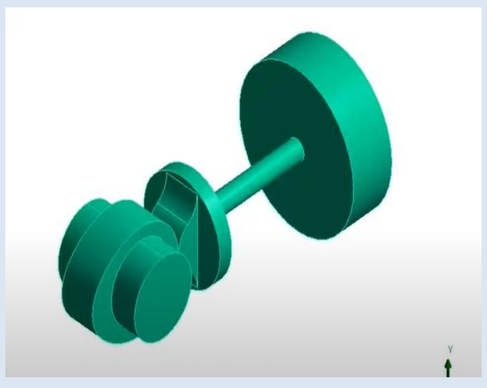
Proposed solution in one sentence

➢ Mechanism used as **Cam and Follower.**

DESIGN APPROACH/METHODOLOGY

➢Proposed CAD Model



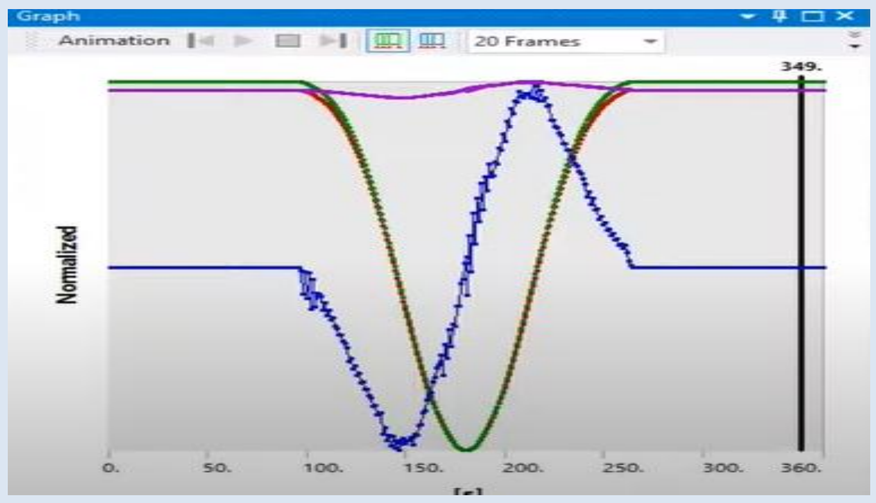


RESULTS

Result shows that how stress and total deformation change On application of load on Cam and Follower.

Details of "Total Deformation"

Scope	
Scoping Method	Geometry Selection
Geometry	All Bodies
Definition	
Type	Total Deformation
By	Time
Display Time	Last
Calculate Time History	Yes
Identifier	
Suppressed	No
Results	
Minimum	0. mm
Maximum	12.463 mm
Average	1.85 mm
Minimum Occurs On	Part1
Maximum Occurs On	Part1
Minimum Value Over Time	
Minimum	0. mm
Maximum	0. mm
Maximum Value Over Time	
Minimum	0.21853 mm
Maximum	25.042 mm
Information	



CONCLUSION

•It described cam-follower is translated compression to be supplied to the patient with uniform speed in the first direction with uniform compression speed.
•It gives better understanding of the hemodynamic and physiological response to chest compression will improve the effectiveness of Cam and follower for CPR.

Acknowledgement

Foremost, I would like to express my deep gratitude to my Course Advisior, **Dr. S. Kanagaraj, Professor, Department of Mechanical Engineering, Indian Institute of Technology Guwahati**. Besides my course advisior, I would like to extend my sincere thankfulness **to Swati Aryaa, PhD Scholar, Department of Biosciences and Bioengineering, Indian Institute of Technology Guwahati,** for his knowledgeable advice.

References

1.Glass, R. C., Jr. (2020, July 23). US20220023143A1 - Hands-Free Wearable Cardiopulmonary Resuscitation Device - Google Patents. https://patents.google.com/patent/US20220023143A1/en .
2.Wik, L. (2012, October 12). WO2014057116A1 - Chest compression device - Google Patents. https://patents.google.com/patent/WO2014057116A1/en