



DESIGN AND FABRICATION OF BICYCLE POWERED REFRIGERATION SYSTEM

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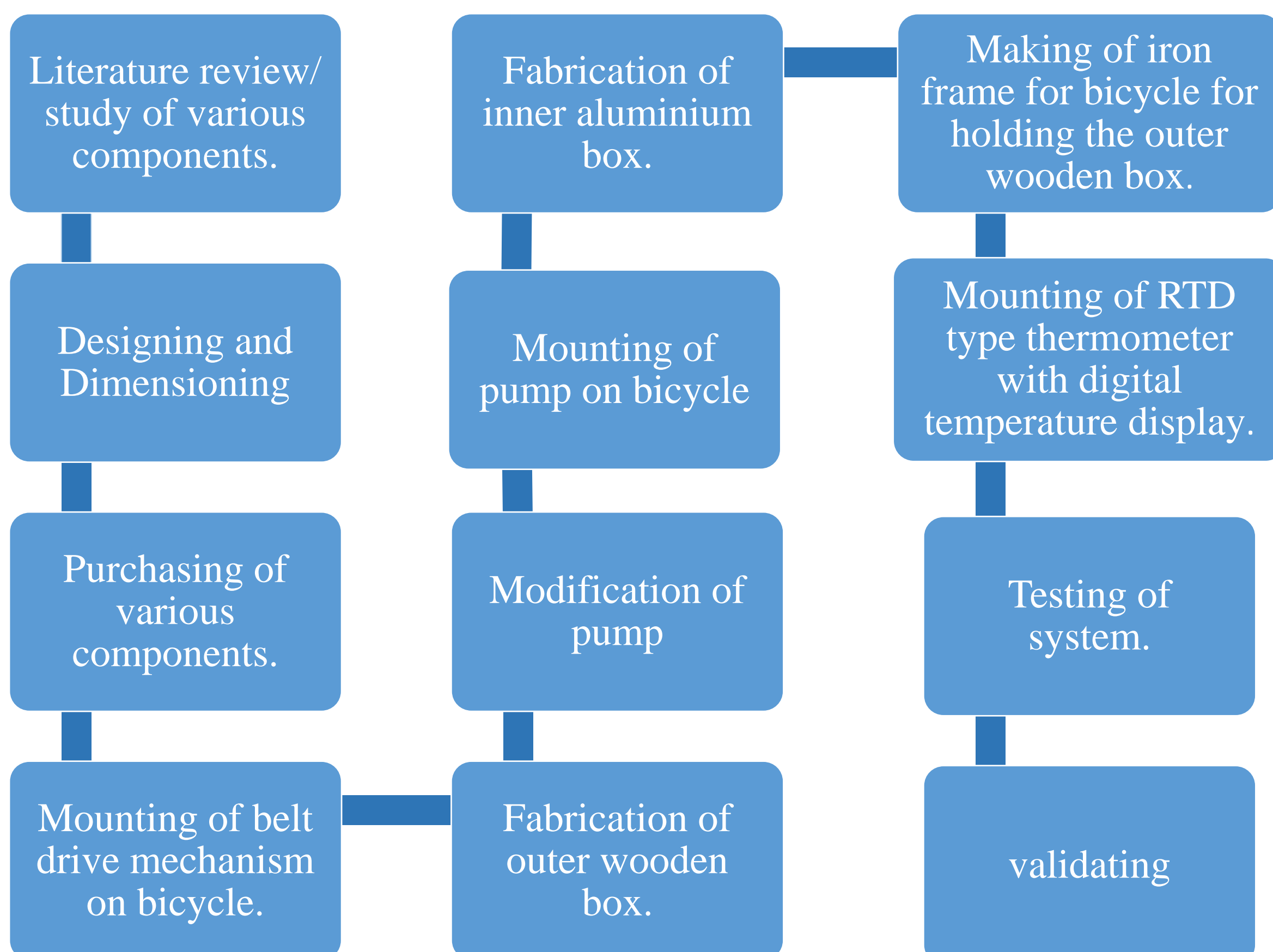
Introduction

- Refrigeration may be defined as the process of achieving and maintaining a temperature below that of the surroundings, the aim being to cool some product or space to the required temperature
- Our project is using vacuum cooling process for obtaining the cooling effect. Vacuum cooling is the most rapid cooling technique for any porous product which has free water and works on the principle of evaporative cooling. Evaporative cooling works by employing water's large enthalpy of vaporization. The temperature of dry air can be dropped significantly through the phase transition of liquid water to water vapour (evaporation), which can cool air using much less energy than refrigeration. .

Project Objectives

1. Production of cooling effect by evaporation of water done by utilization of mechanical energy of bicycle.
2. Making a compact refrigeration system for mobility.
3. Making a chemical refrigerant free refrigeration system.

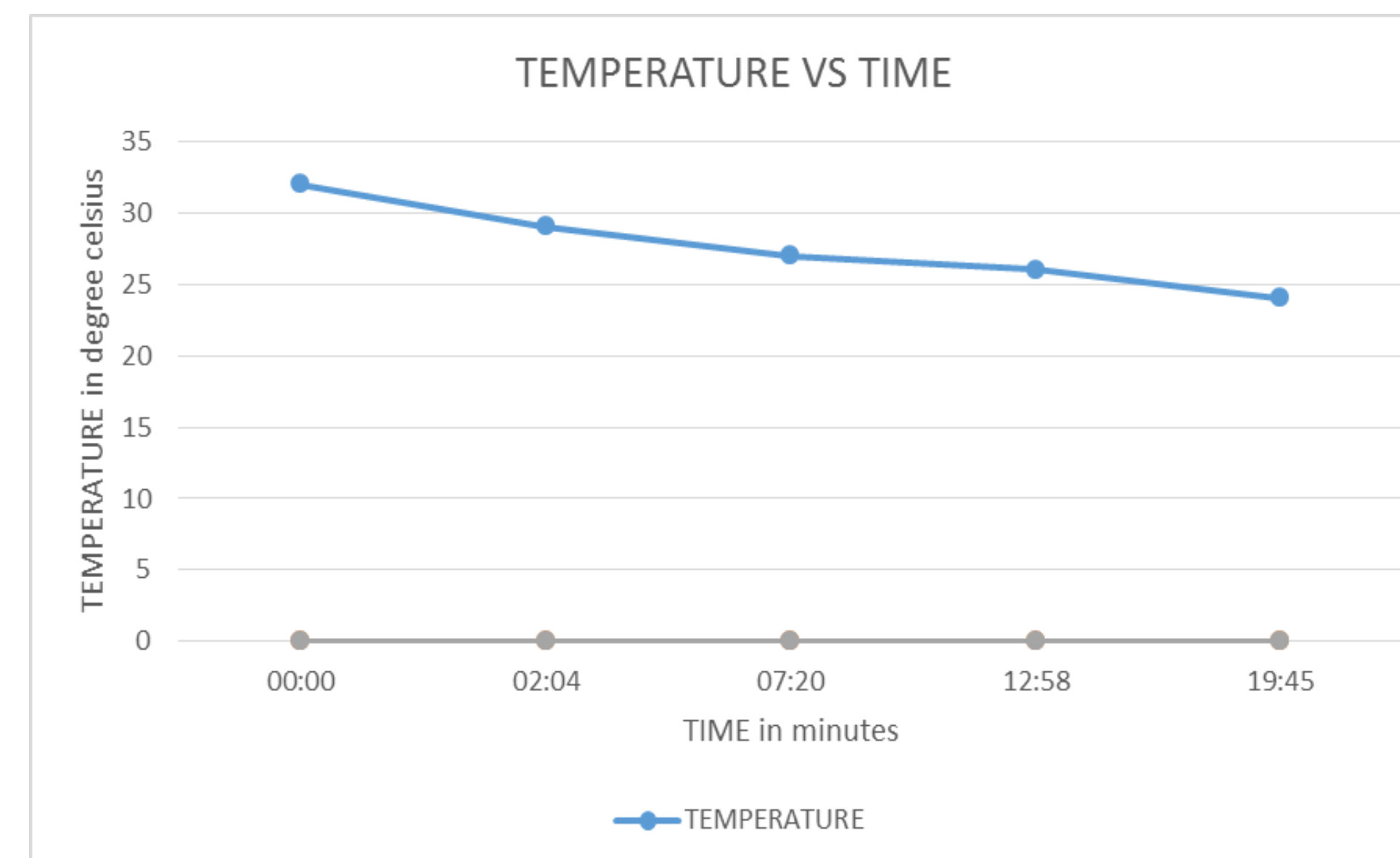
Methodology



Results and Discussion

After performing the experiment and testing we came to following results:-

- A final temperature of 24°C was able to achieve from the initial temperature which was 32°C.
 - The above fall of temperature shows that cooling effect was able to produce upto some extent
 - The coefficient of performance obtained was 0.0954.
- With the help of testing we obtained following graph:-



Validation was done by comparing the above result by the result which was taken using pump connected via electricity as we had done it by connecting the pump by a bicycle . By validation we came to following result:-

- Coefficient of performance by running the pump via electricity is 0.2031.
- Coefficient of performance when running the pump via electricity is more than that obtained when running the pump via mechanical effort.
- This basically happens due to the fact the speed of the pump obtained by electricity is much more than that by bicycle.
- Also the material of the refrigeration box used while pump is connected to the electricity was different one.

IMAGES



Conclusions

- Production of cooling effect by evaporation of water by utilizing the mechanical effort of bicycle was achieved.
- A compact refrigeration system was made for mobility.
- A chemical free refrigerant system was established

References

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2. S.W Zhang¹, A.R Abu Talib^{1,*}, A.S Mokhtar¹ "DESIGN IMPROVEMENT IN VACUUM COOLING SYSTEM" in International Journal of Engineering and Technology, Vol. 6, No. 1, 2009, pp. 51-59

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