TA211 project [GROUP 1] : Even Semester 2024
Indian Institute of Technology, Kanpur

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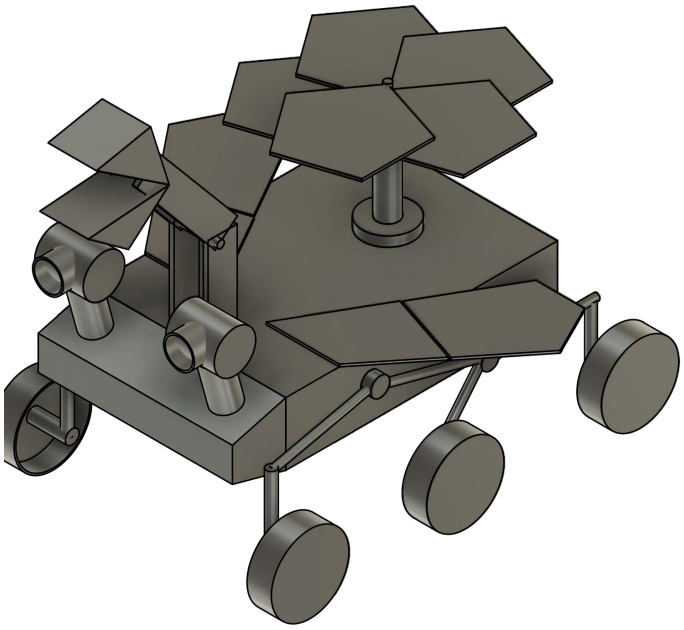
Staff-in-charge: Mr. I.P Singh and Mr. A.K. Verma
Tutor:Dr.Shivam Tripathi
Project name:Mars explorer Rover



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INTRODUCTION

What's the name suggest?

The 'Mars Explorer Rover' is a self explanatory name. It is built to demonstrate a possible mechanical design for prospective exploratory rovers on extra terraneous planets.

MECHANISM

The rover has various mechanical features like foldable solar panels, all terrain wheel-rod assembly and a retractable gripper arm.

The solar panels have hinges and flower unfolding format. The gripper arm has 2 degrees of Freedom and additional string based opening-closing claws. 6 wheels with flexibility at the rod end have been chosen to overcome hilly terrains and craters.

MOTIVATION

We came across this idea of making a rover while seeking some inspiration for our TA211 project. When we drew a rough image of this idea, it caught our attention and we then became clear by just looking at it. At that instant, we had decided that we would apply our TA211 theory to make this rough image into its 3D form.
We were extremely fascinated by its image, so we started to wonder how it would feel to have this thing physically and control it. We thus embarked a small journey of ours to see how it works in the flesh.
Space research is a great leap for mankind, and this rover model is our first step in it.This rover idea was inspired by many of the real time rovers like Perseverance, Spirit and Opportunity. We hope to resemble them at our best.
Also, our desire to share this excitement of journey with others, especially with the instructor and the TAs of the course also had some part in our project.

ACKNOWLEDGEMENT

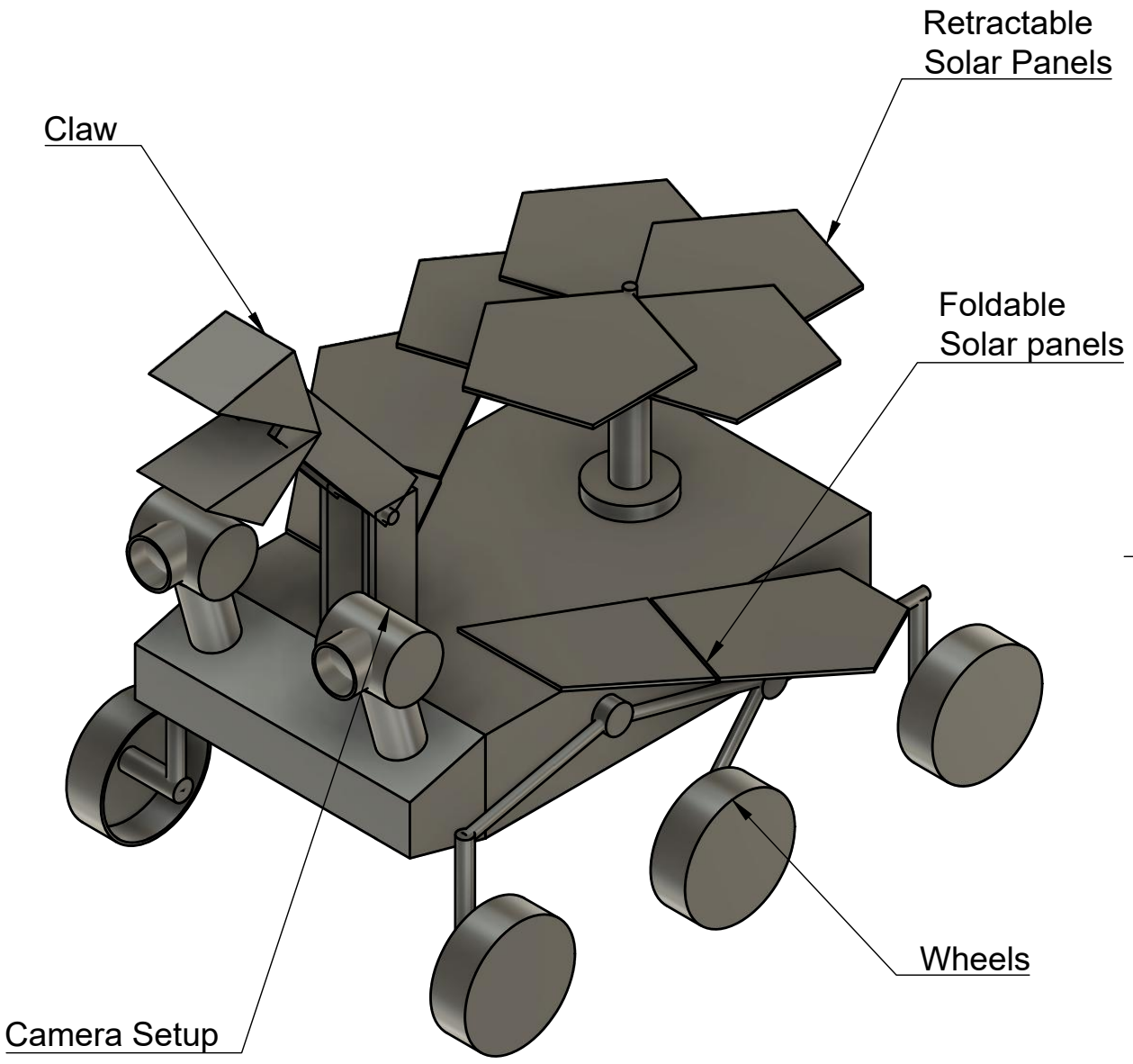
We are deeply grateful to Prof. Shashank Shekhar for their valuable and constructive suggestions during the planning and development of this project. Without their guidance and technical support, we would not have been able to complete this effortful task.
We would like to express our great appreciation towards all lab staff for their constant supervision and encouragement which helped us in the completion of the project.
Special thanks to our TA's Dr. Murli Kumar,Manglam, Lakshmi Dinesh and Alka Jangidfor giving us their valuable time.
Overall, we thank our course instructor Prof. Shashank Shekhar and Lab in-charge Mr. Anil Kumar Verma for providing us with this opportunity to learn and do something valuable using different manufacturing processes.

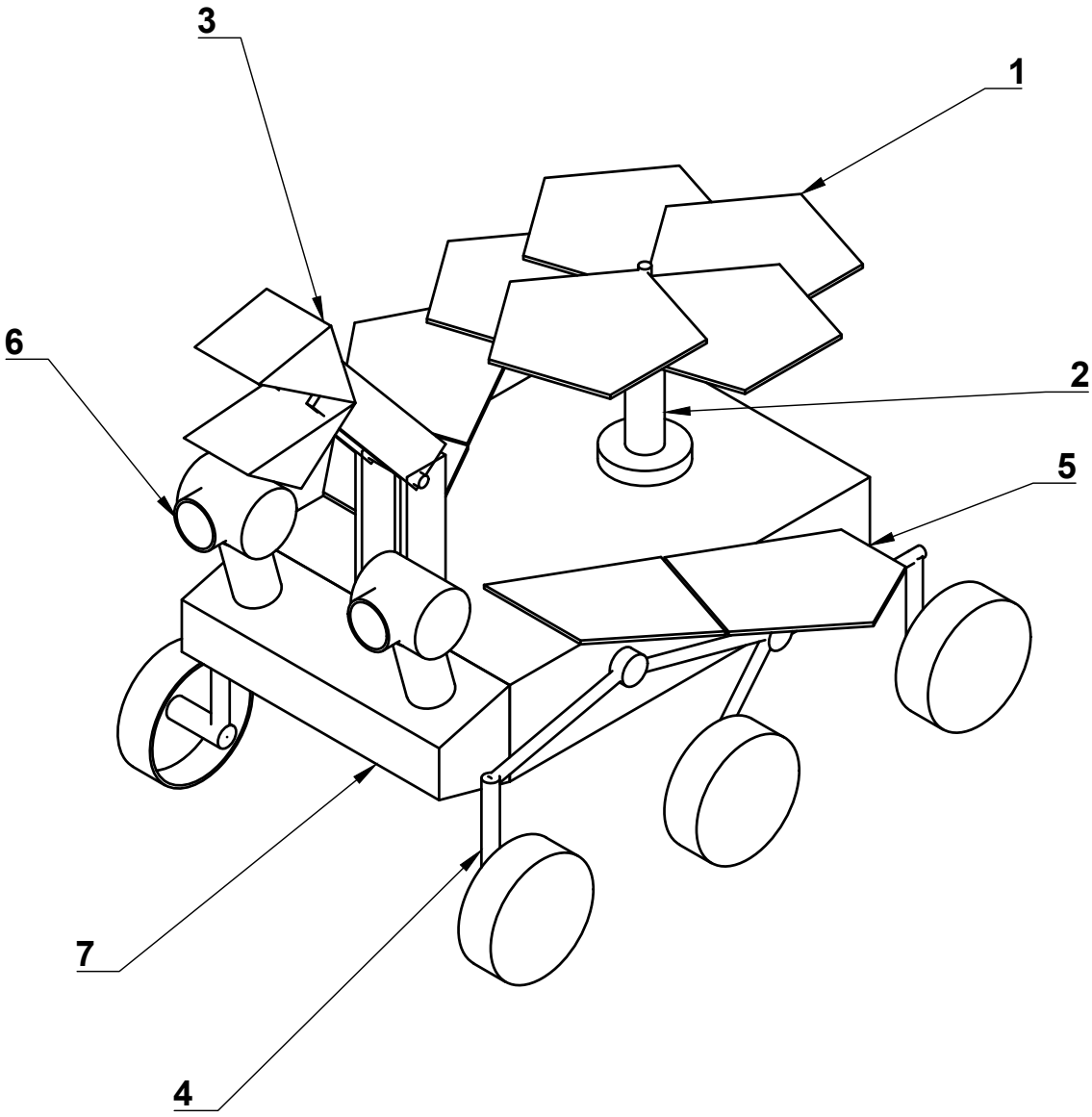
WORK DISTRIBUTION

AAYUSH SINGH/ABHIMANYU	Cutting Solar Panel	Cutting Solar Panel	Cutting Solar Panel	Finishing Solar Panel	Assembly	Assembly
ABHISHEK SAHU/SNEHA	Cutting Main body	Cutting Main body	Joining Mainbody	Joining Main body	Assembly	Assembly
ADESH SINGH/HARSH	Cutting Eyes	Cutting Eyes	Finishing Eyes	Finishing Eyes	Assembly	Assembly
ADITYA GAUTAM	Wheel Supporter	Wheel Supporter	Wheel Supporter	Wheel Supporter	Assembly	Assembly
AKASH PAIJWAR	Cutting Hexagonal panel	Finishing Hexagonal panels	Fitting on stand	Fitting on stand	Assembly	Assembly
MANVI BENGANI	Axle Making	Axle Making	Axle Making	Axle Making	Assembly	Assembly

LIST OF MATERIALS

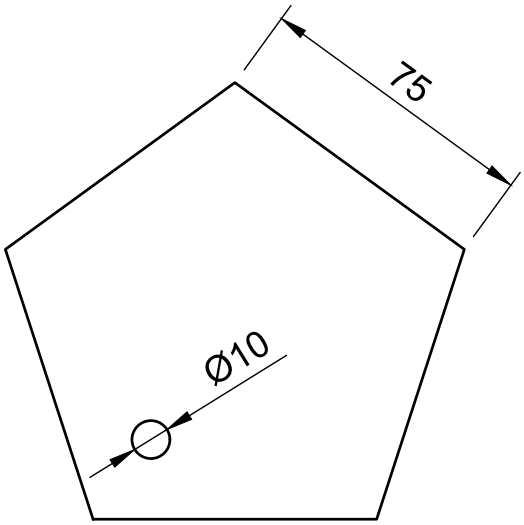
S No.	Part Name	Material	Dimension	Quantity
1	Hexagonal solar panel	GI	80 X 80	5
2	Panel Axis	MS		2
3	Gripper	GI	300 X 150	1
4	Solar wing	GI	150 X 70	2
5	Wheels	Casting/ GI		6
6	Rod Assembly	MS/Casting		2
7	Eyes	GI	120 X120	2
8	Main Body	GI	500 X 500	2

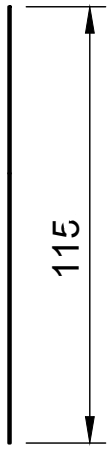

Retractable
Solar Panels
Claw
Foldable
Solar panels
Wheels
Camera Setup

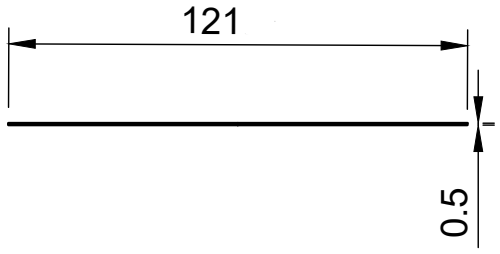


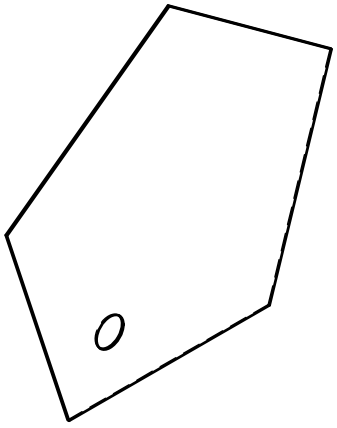
ISOMETRIC VIEW

ALL DIMENSIONS ARE IN MM









HEXAGONAL SOLAR PANEL

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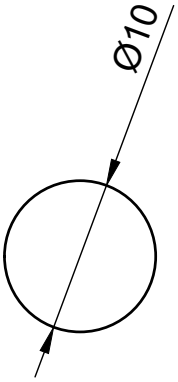
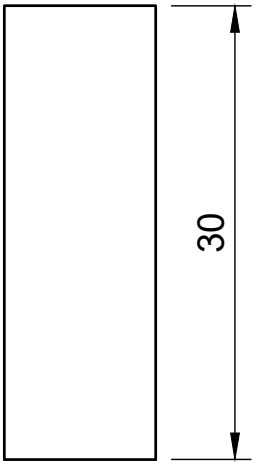
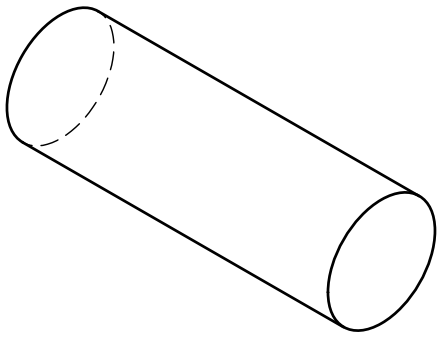
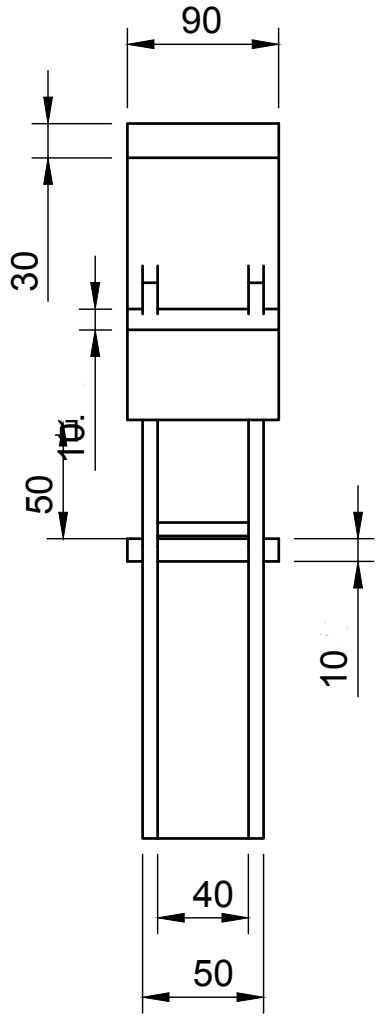
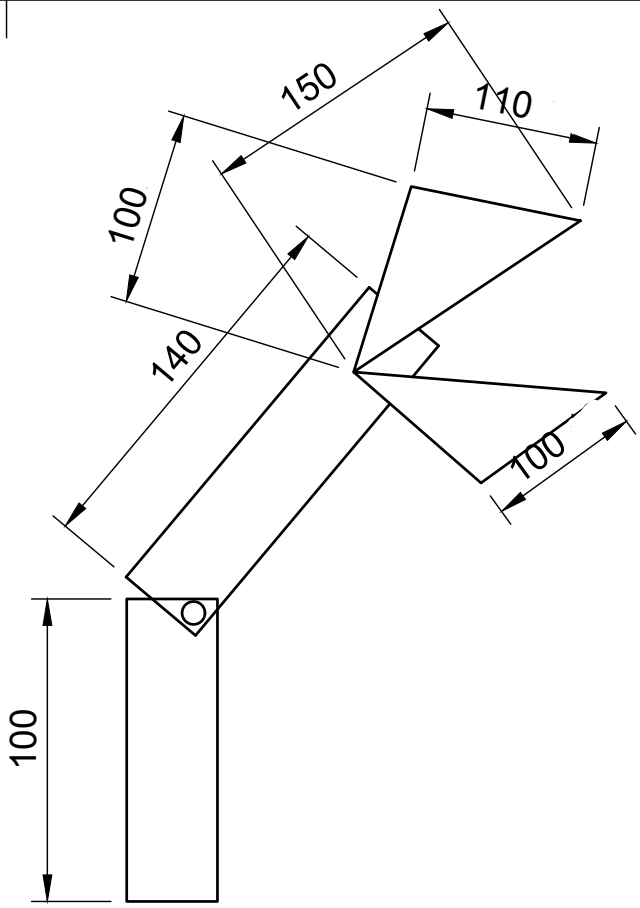


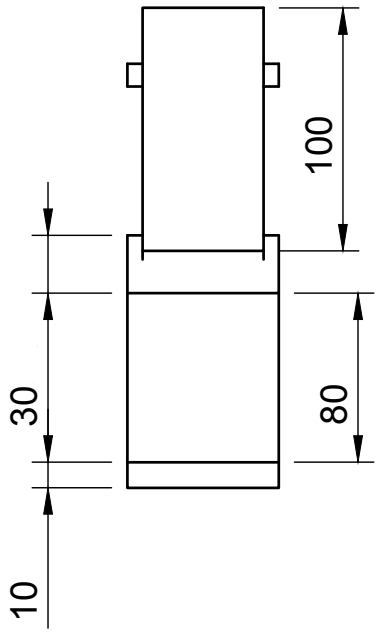


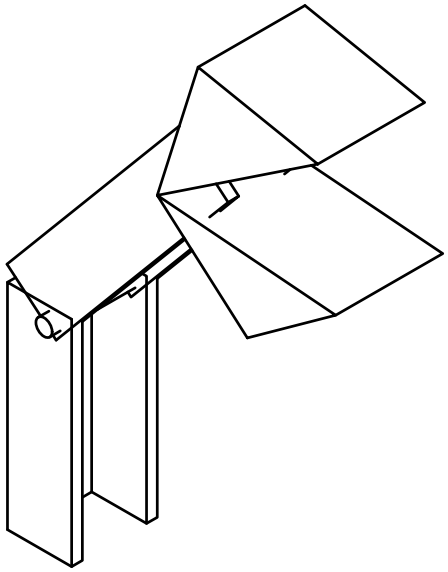


SOLAR PANEL AXIS

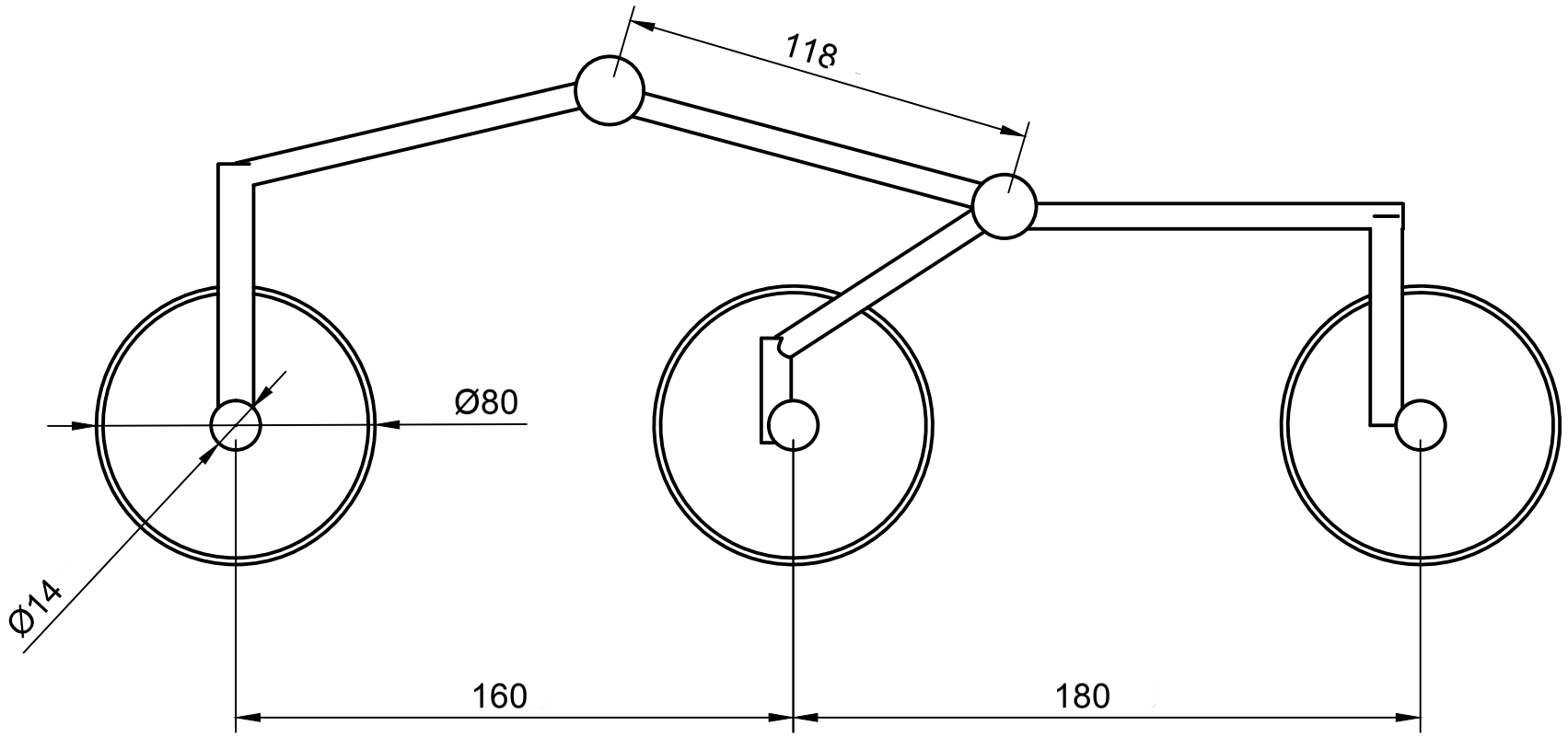


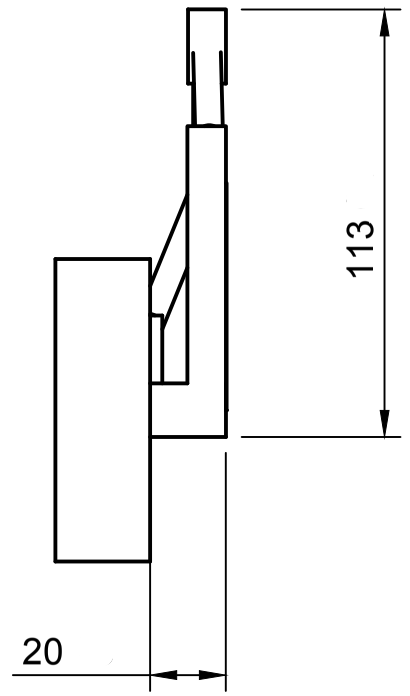


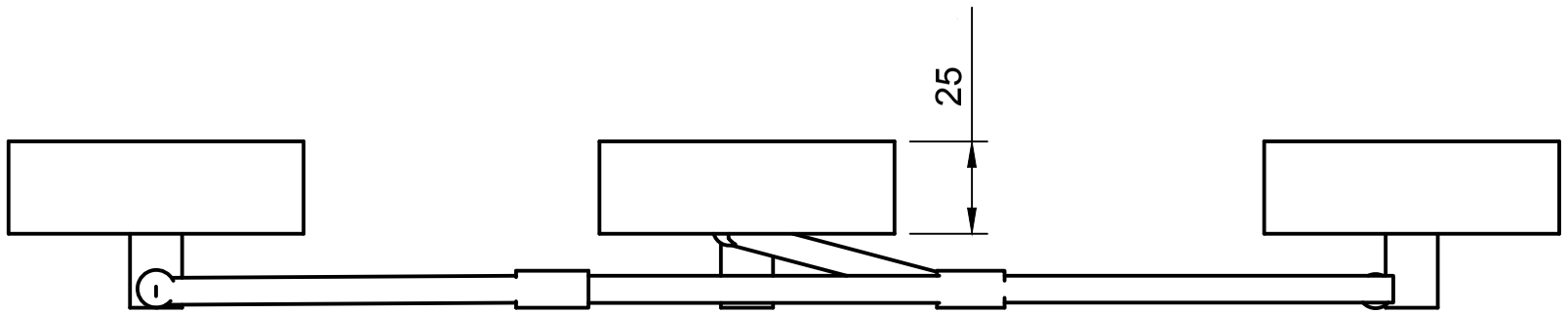


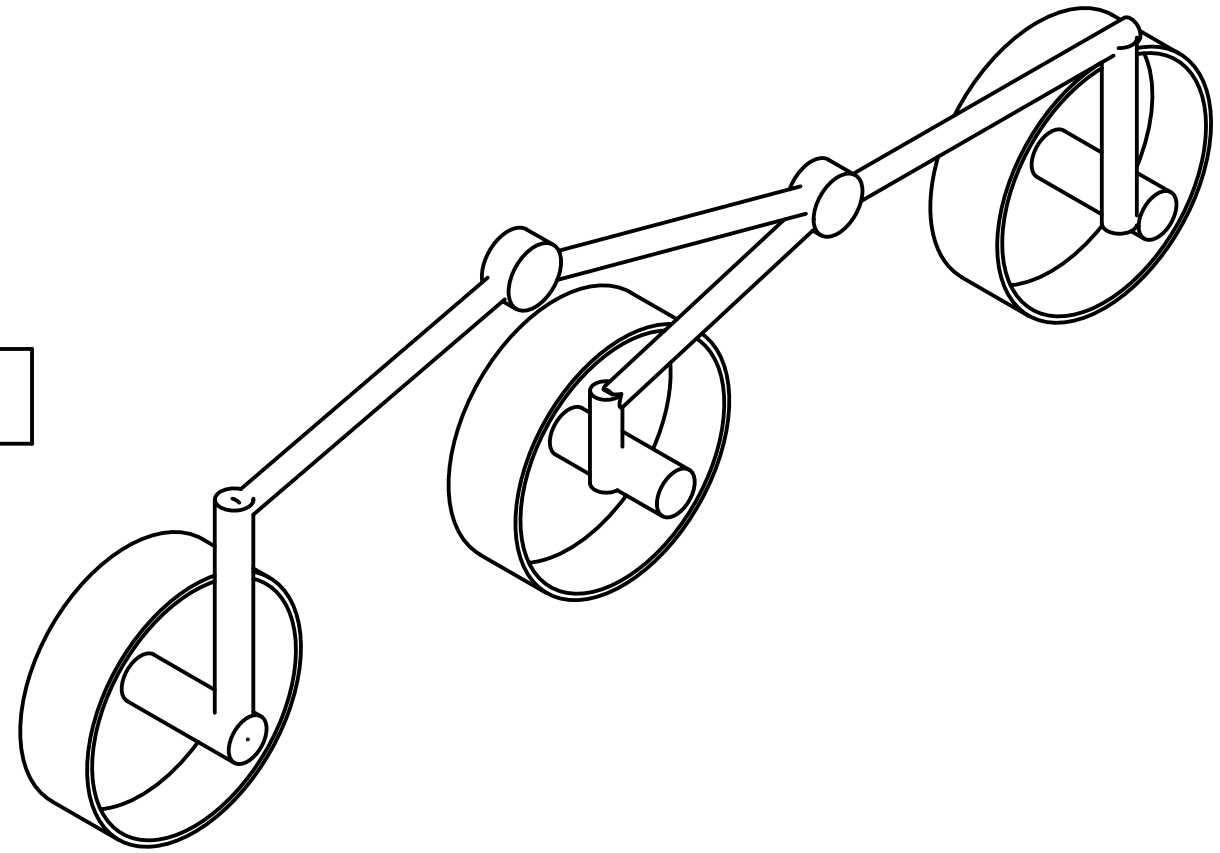


Gripper

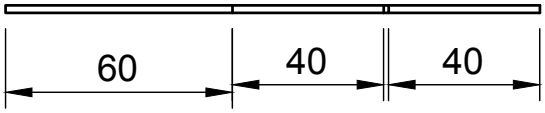


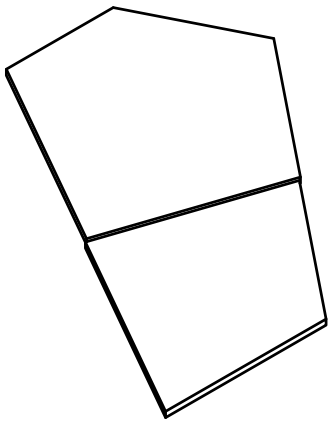


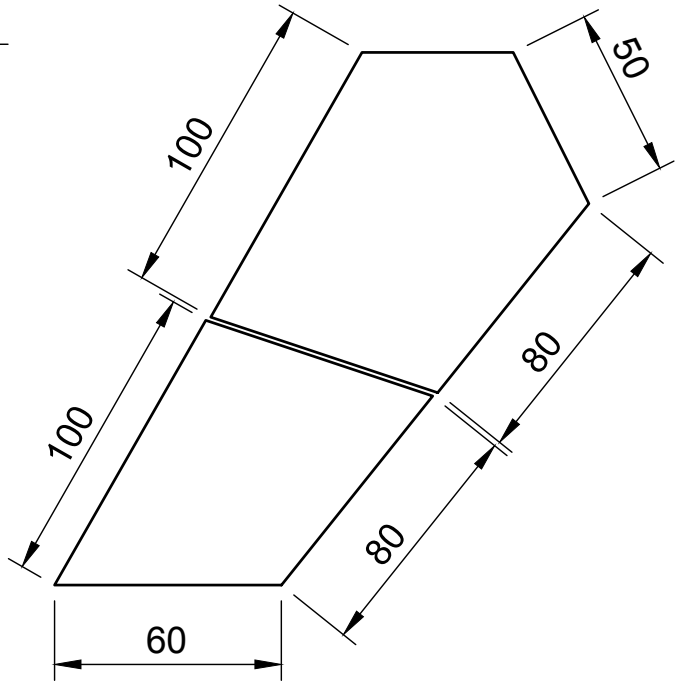


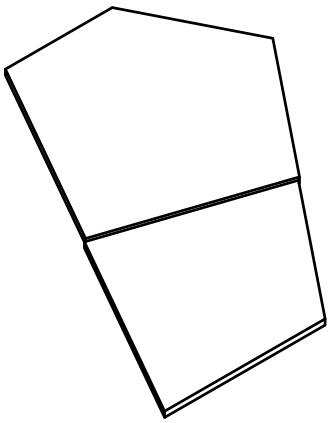


Wheel and Rod Assembly

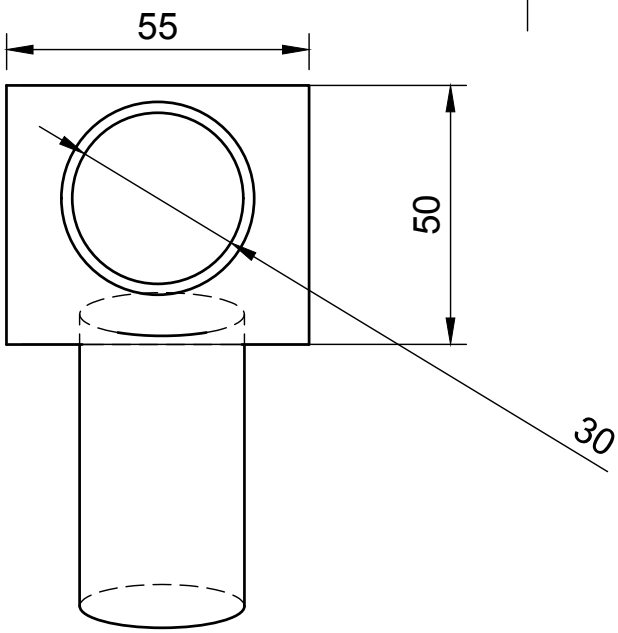


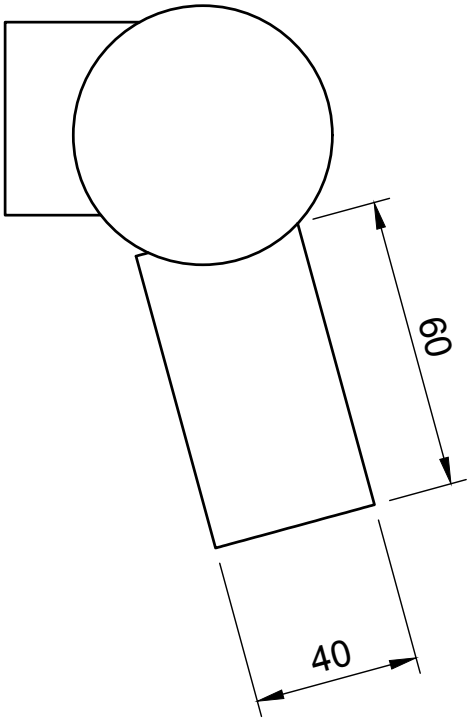


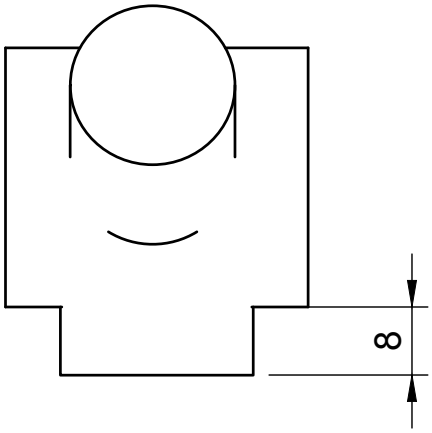


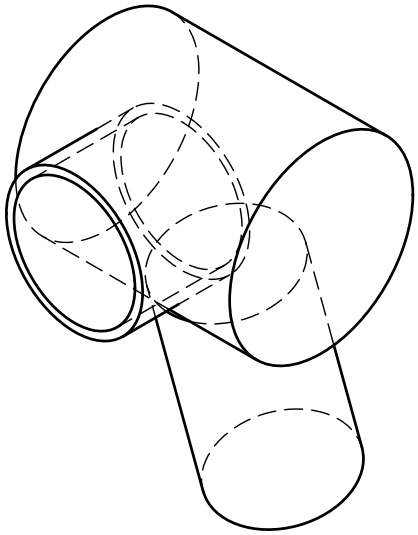


Solar Wing

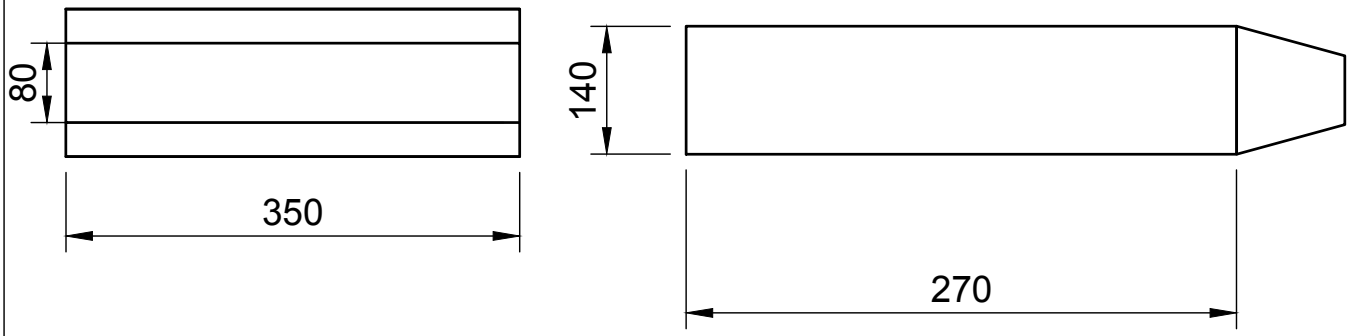


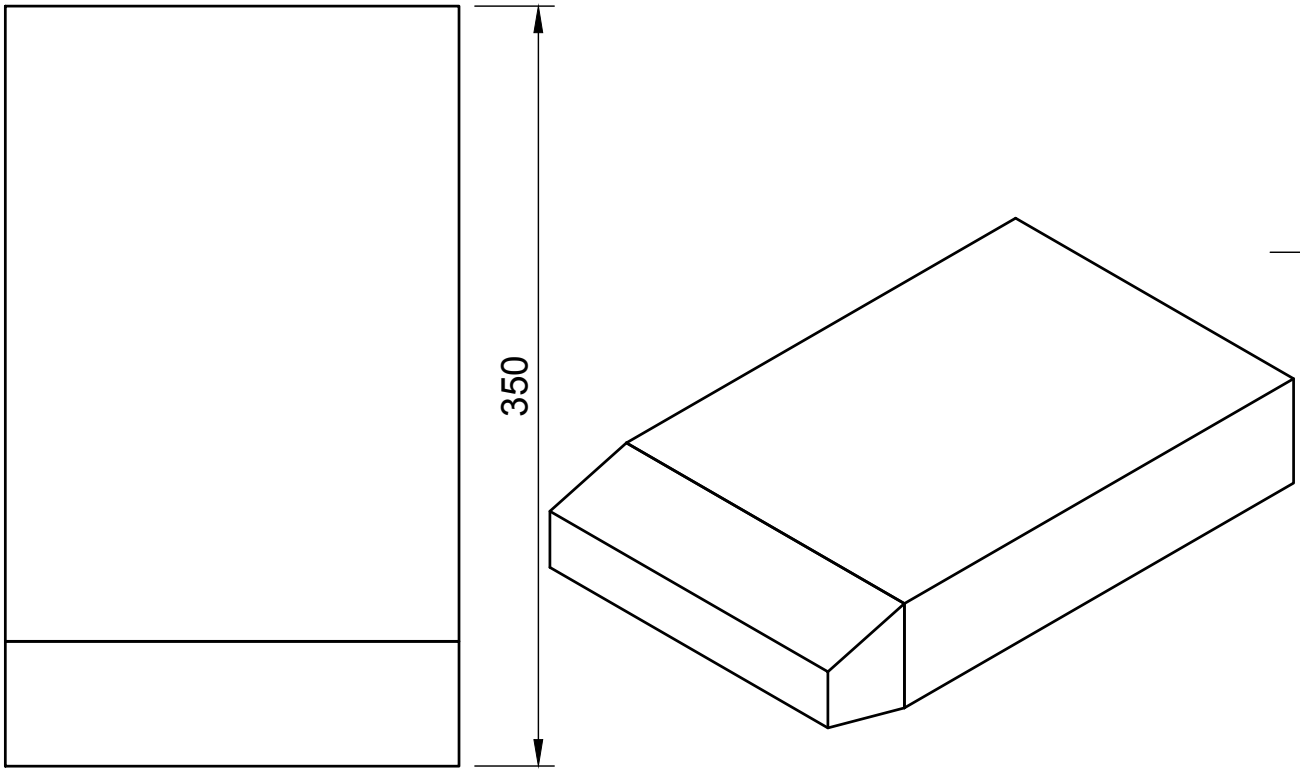






EYE





MAIN BODY