

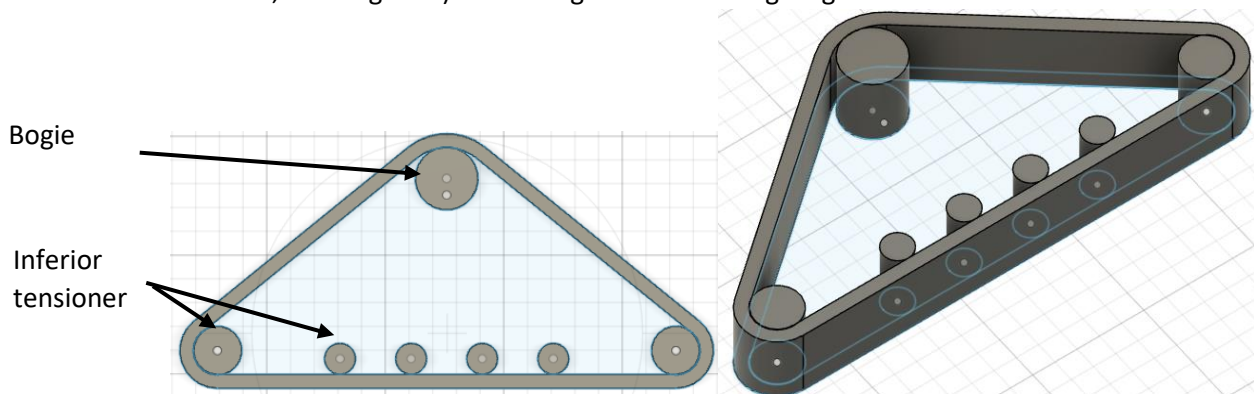
Session Report n°1 (14/10/2022)

Session's Subject: Mechanical displacement

Goal: Search for the most optimized shape of wheels and the most adapted reduction and transmission system

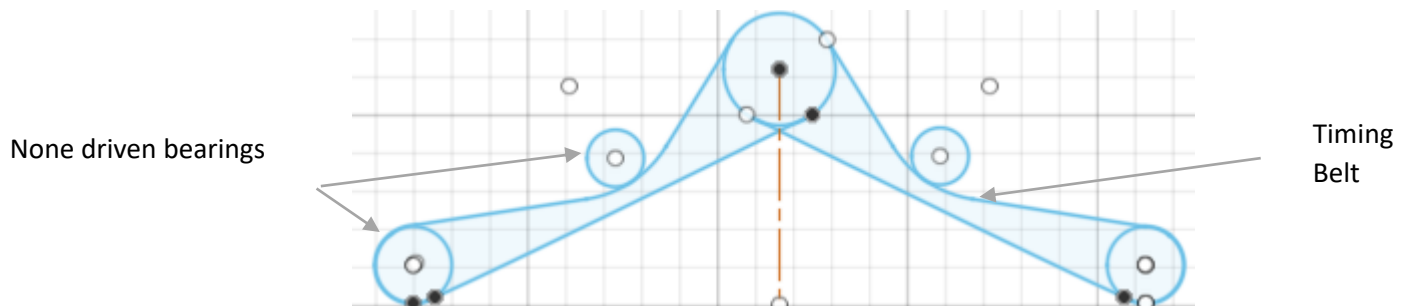
1) Role and distribution

The robot will move thanks to a 3-axis caterpillar system (one axis in agreement with that of the motor, 2 rolling axes). According to the following diagram:



If the movement of the robot is ensured by the tracks, that of the two bearings which are not "motors" will perhaps have to be ensured by belts.

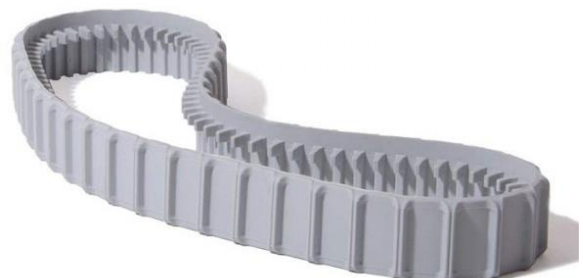
Indeed, the caterpillar track is not necessarily "driving". A belt system must be designed to transfer the rotational movement of the motor shaft to the front and rear bearings. Here is a diagram of the belt system :



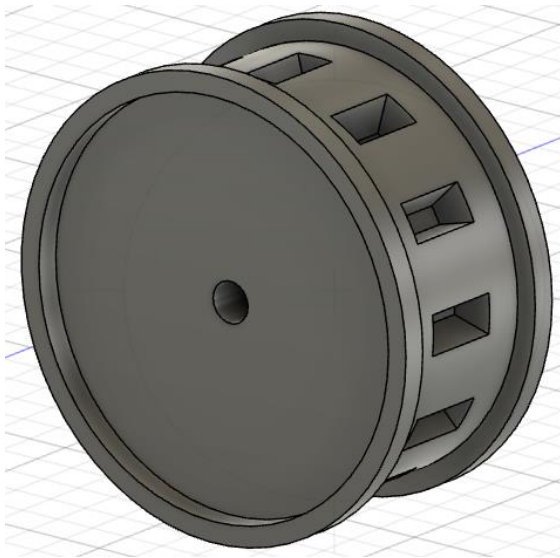
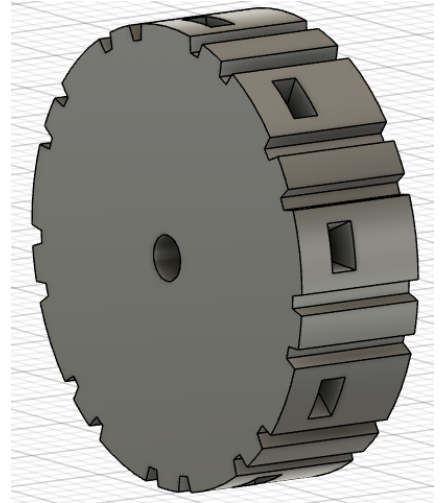
It will be necessary to wait to receive the caterpillar to define the size of each bearing axis as well as the interval of the notches so that they adapt perfectly and to see if a timing belt is necessary. Nevertheless, it is already possible to determine their shape as well as the materials that compose them.

2) Shape of bearings, Track

The caterpillar used will be a fairly thin silicone caterpillar. We decide to use that of the Z Series Poolside robots, Reference (MAY-201-1300.9983152) :



-The bogie must be notched to be able to put the caterpillar in motion, while having holes to accommodate the notches that will activate the movement:



-The two main non-motor bearings must take care of guiding the track on the rotating axles, so they must be larger than the lower rollers and be able to maintain the drive of the track.

-As for the lower rollers, non-motorized, their role is simply to guide the track. They can be designed from an already existing model.



Each element can be designed on Fusion 360 (where the images come from) and 3D printed in PETG.

Conclusion de la séance :

We were able to get a better view of the robot's movement system. In particular the operation of the tracks, with the option of a belt system if the drive of these by the motor and the bogie is not powerful enough.

The shape of each element is quite simple and follows the same model, it will just be necessary to readjust according to the caterpillar that we will receive.

During the next session we will focus on the transmission system, the operation, the skeleton of this "gearbox" and the materials of the components.