Bachelor's Thesis Engineering Technology

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Automatic FDM filament splicer

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Specialization Electromechanical Engineering Technology /Preparation programme for Master of Electromechanical Engineering Technology

Situation

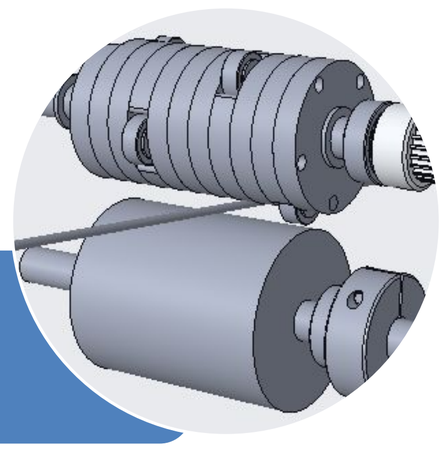
When using FDM 3D printers, at some point a remnant remains that is too short to be used for projects, although the quality is fine. These then must be manually spliced which is time consuming and generally not easy.

Objective

To prevent waste, a machine must be designed for the Maker Space that is able to splice their residual 3D printer filament into a new usable roll.

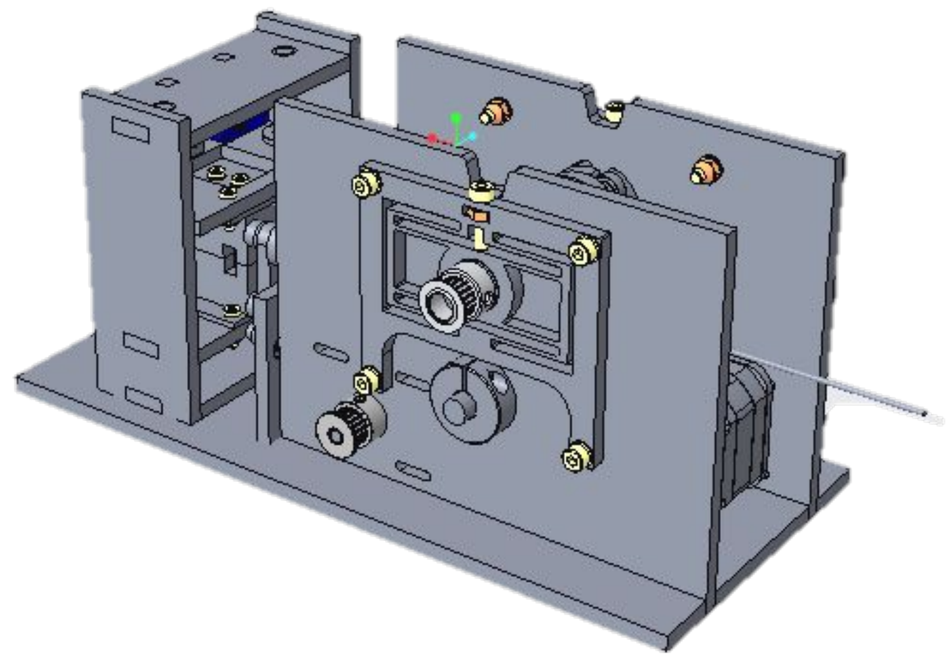
Design process

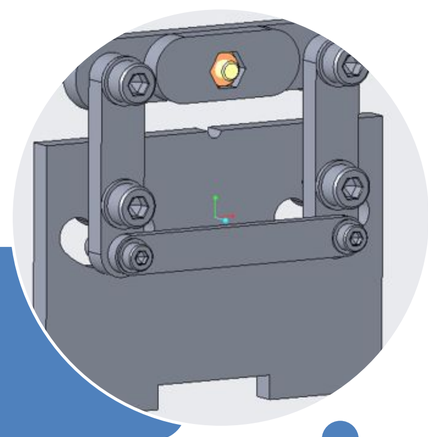
At the beginning of this process, various solutions were sought. Subsequently, choices were made here, and these were further refined and elaborated in order to arrive at the final design.



Supply

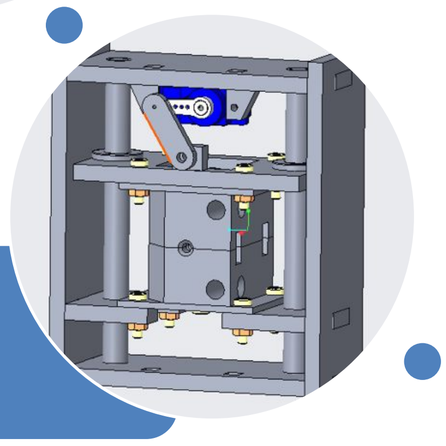
The supply of the machine is done by means of a selector roller. Here, bearings press the desired filament string against the drive roller. This has been chosen so that as few motors as possible are needed to control multiple inputs.





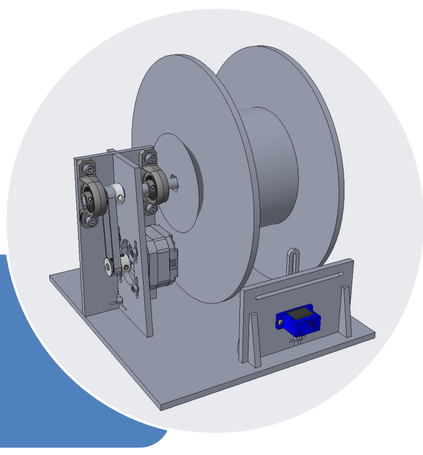
Cutting unit

Because the ends of each filament can be cut differently, there is a need for a cutting unit. In this one a razor blade is used to cut the filament.



Splice unit

The splice unit serves to firmly attach the pieces of filament together. Two modules have been developed for this that can be interchangeably mounted on the machine. The first module uses a mold mounted on a press, while the second uses a heater block from a 3d printer with a PTFE-tube mounted in it.



Spooling

The spooling unit takes care of neatly winding up the new filament. This is necessary so that there are no knots in the roll that can cause problems later in use.

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