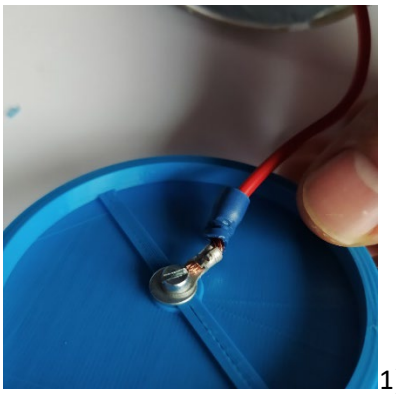
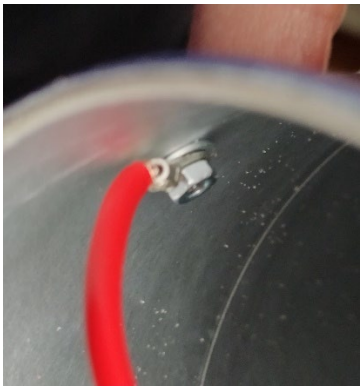
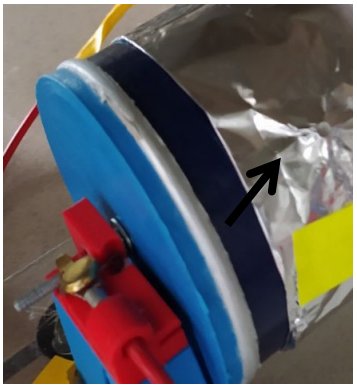
Mounting details

Preparation of the rotating collector

Preparation of the cylinder

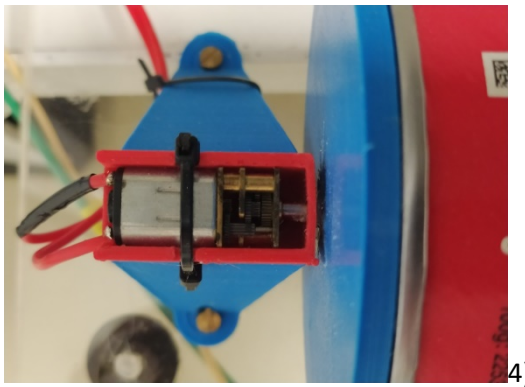
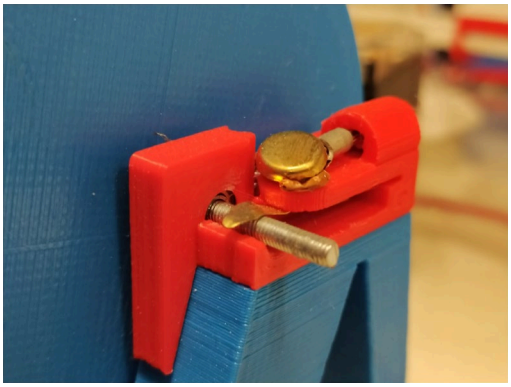
Since the surface of the cylinder is made of paperboard, it is necessary to cover it with aluminium foil, in order to connecting it with the ground. Use a 10-cm cable connecting the fixed screw at the end of the cylinder (1) to a short screw on the surface of the cylinder (2). To make sure that the latter one will be the contact to the aluminium foil (3).


1)

2)

3)

The two 3D-printed ends are then glued to the cylinder.

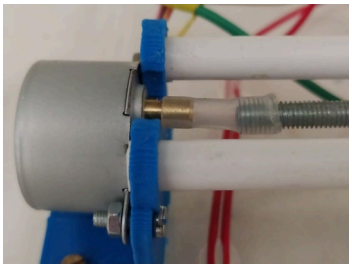
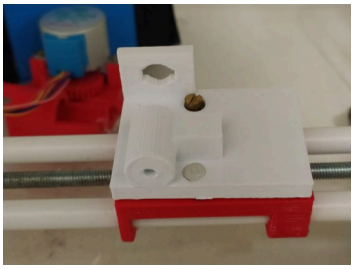
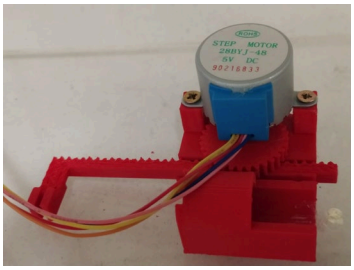
Cylinder supports

At one end of the cylinder, the motor is inserted inside the hole (4). To create a rotary contact, the ground cable is connected to a brass fastener, which extremity is touching the cylinder screw (5).


4)

5)

Spinneret slider

Two 20cm-long rigid plastic pipes (Φ6mm) are assembled on the two 3D-printed holders. In the middle is passed the threaded bar (Φ5mm) (6). On the bottom part of the slider (7, red part), a m5 nut is passed through the threaded rod and it allows to transfer the rotational to a translational movement. The syringe pump part is assembled as in picture 8. The module can be placed both directly on the slider or kept separated, in case of electrical interference with the high voltage needle.

 6)  7)  8)

Controller and arduino code

Arduino nano has been used as microcontroller. The connection between the microcontroller, the OLED display, the rotary encoder and the stepper drivers is reported in the Arduino file. The menu UI follow the sequence

1 – Set ORIGIN: how many mm to move the slider in the left direction.

2 – Set LENGTH: set the distance by which the slider will move forward and backward while spinning.

3 – Set SPEED: set the speed by which the slider will move forward and backward while spinning.

4 – OPEN syringe: open the syringe pump (in mm)

5 – CLOSE syringe: close the syringe pump (in mm)

6 – Syringe flow: set the flow syring pump speed

7 – RUN: the electrospinning apparatus is running.

The cylinder collector rotational speed is controlled by a potentiometer in a separate module.