Velocity controlled extruding

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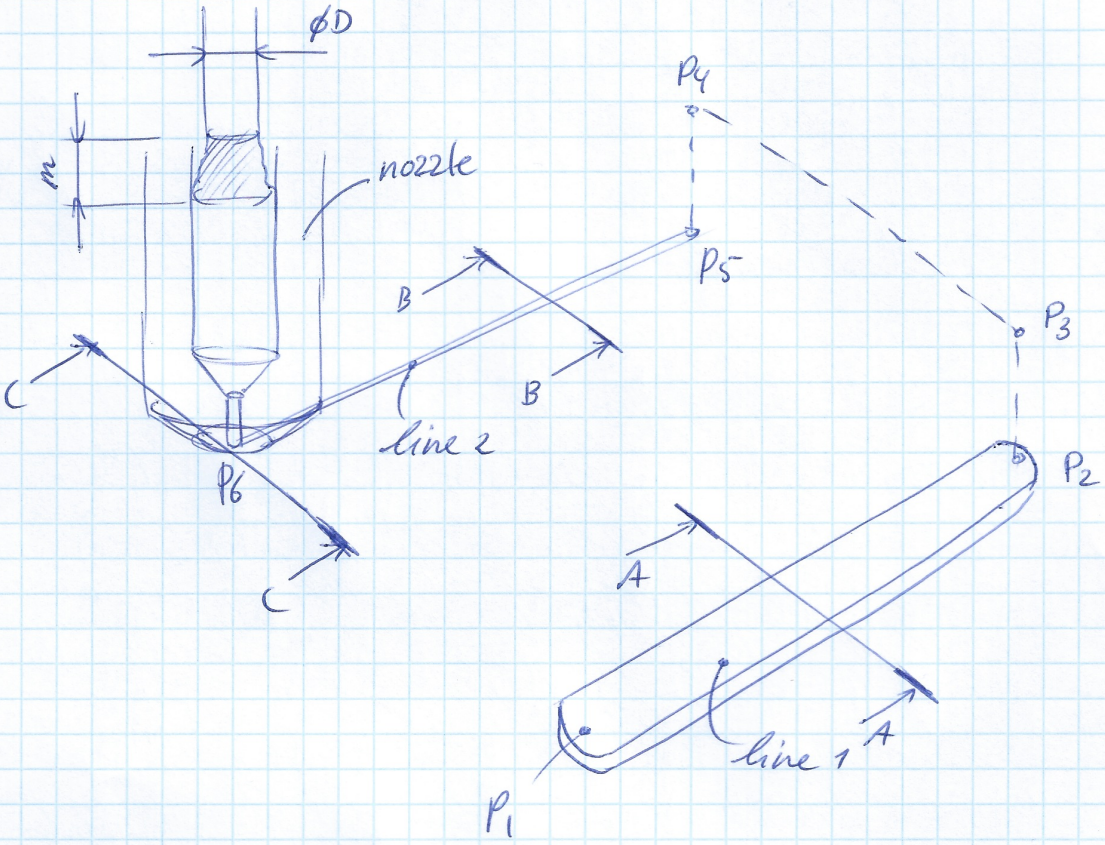
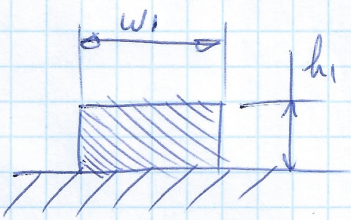
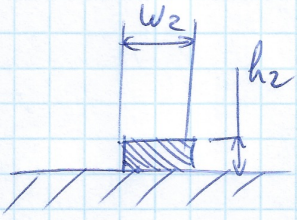


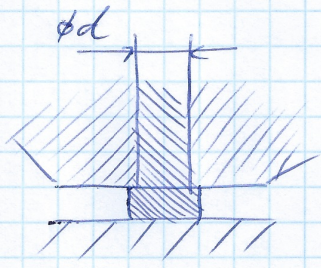
SECTION A-A



SECTION B-B



SECTION C-C



REVISION 0

workings:

- before extruding the first line, the width w_1 and height h_1 are set
- these 2 will dictate the ratio between the extruder and the xyz speed (combined)
- at P_1 the movements (read speeds/velocities) are locked with the ratio.
- moving line 1 from P_1 to P_3 the extruder speed is dependant of the achial speed of the nozzle
- At P_2 the velocities must be unlocked
- At P_2 the extruder must retract some filament to prevent oozing when travelling from P_3 to P_4
- At P_5 the extruder must prime the filament so that there is no „air" when starting line 2
- At P_5 the width w_2 and height w_2 need to be set, and the new „ratio" must be coupled by coupling the speed of extruder with the nozzle speed

Why?

when extruding, depending on speed there is a different pressure inside the nozzle.

when melting a plastic, depending on speed (force/pressure) temperature and material the length of the trajict between the glass transition temperature of the filament and the melting temperature changes and that means a hysteresis in the actual volume being extruded vs the needed volume being extruded,
when controlling the speed of the extruder vs the position (volume) being extruded it's much more easy to tweak speed depending on nozzle acceleration and/or nozzle speed.

instead of interpolating (x, y, z) and A positions we interpolate the derivative of (x,y,z) with the derivative of A.