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Extruder

(Patent Application No P.422114)

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The invention presents an extruder with a unique construction, which allow to change the length of cylinder and screw during extrusion process. The extruder is designed primarily for extrusion thermoplastic polymers, but also nanocomposites or cosmetic and food products.

There are many known constructional solutions which allow to control the intensity and time of polymer plasticization, but presented invention is the first in the world that allow to modify the length of the plasticizing system while machine is operational.

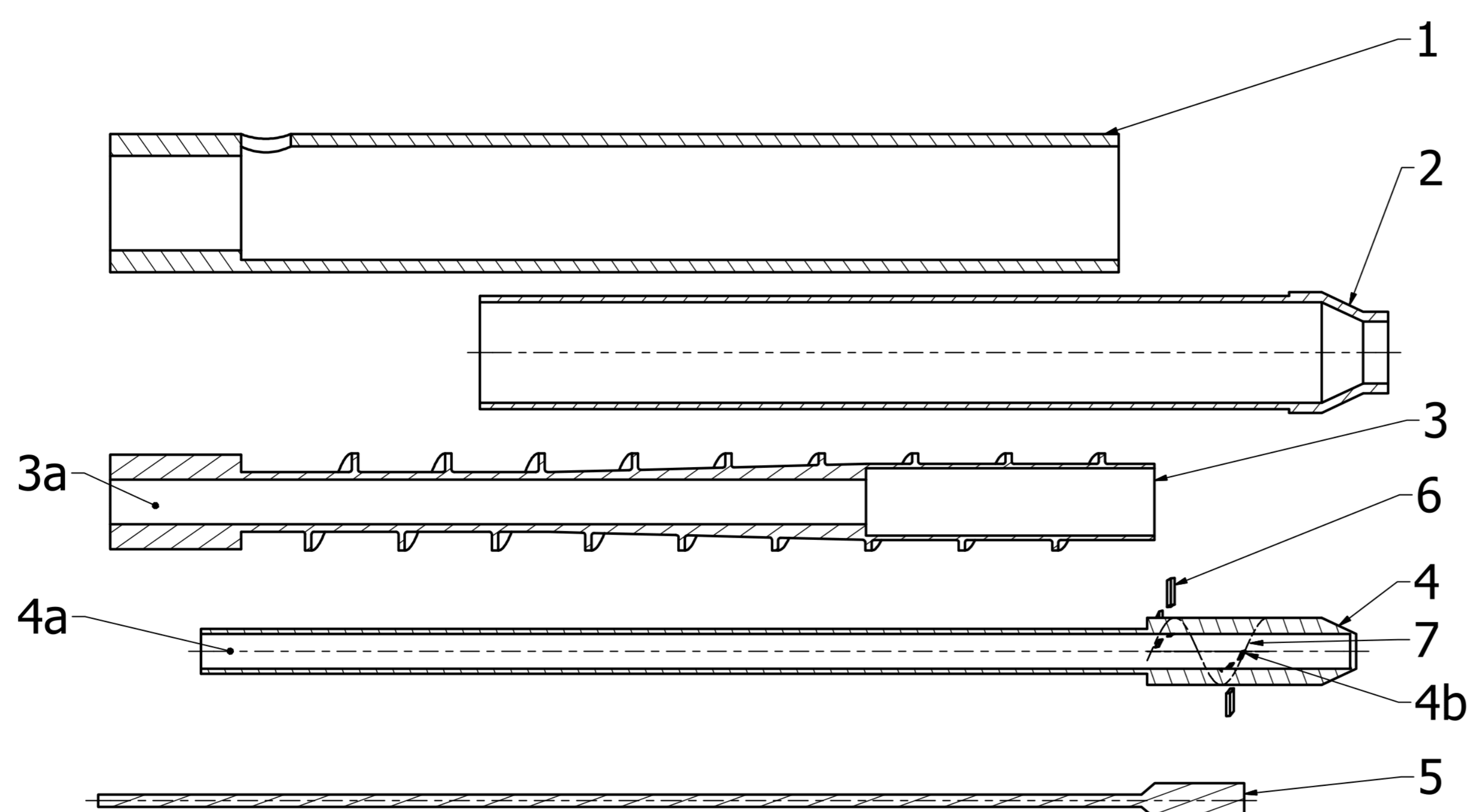


Fig. 1. All important parts and components of the extruder

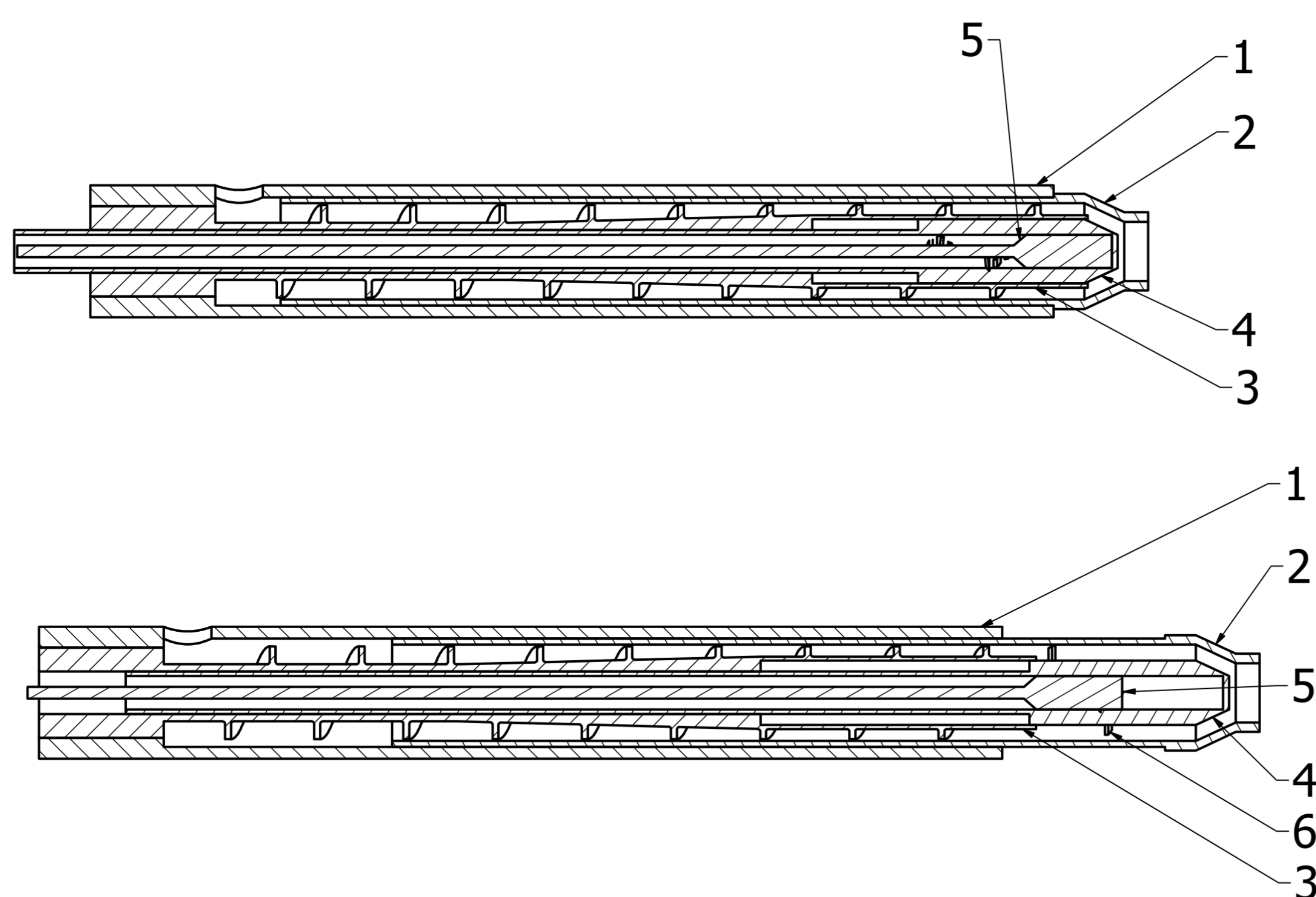


Fig. 2. Mechanism of elongation of the plasticizing system

The use of such a unique solution allows to control the residence time of the plastic in the plasticizing system without changing the rotational speed of the screw. The extension of the cylinder of the plasticizing system does not significantly affect the shear intensity of the material and does not cause excessive temperature increase due to friction intensification, as it is in the case with changing the rotational speed of the screw. An additional advantage is the quality of homogenisation, thanks to the presence of dowels on which the material splits and then rejoins.

The invention consists of six different elements (Fig. 1). The extension of the plasticizing system takes place by pulling the internal cylinder (2) out of the main cylinder (1) (Fig. 2). The more the internal cylinder is pulled out, the greater the overall length of the plasticizing system will be. The extension of the screw (3) is done in the same way, the inner screw shaft (4) extends from the cylindrical hole inside the screw (3a) to the required length. The wedge (5) movement in the cylindrical hole inside the inner screw shaft (4a) is responsible for the ejection of the dowels (6) located on the surface of the inner screw shaft (4) along the helical line (7), that intensify mixing of the material.



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