

Title (en)

SYSTEM FOR MACHINING A MATERIAL USING ULTRASHORT LASER PULSES

Title (de)

SYSTEM ZUM BEARBEITEN EINES MATERIALS MITTELS ULTRAKURZER LASERPULSE

Title (fr)

SYSTÈME D'USINAGE D'UN MATÉRIAU AU MOYEN D'IMPULSIONS LASER ULTRACOURTES

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Application

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Abstract (en)

[origin: WO2022122237A1] The invention relates to a system (1) for machining a material (2) using ultrashort laser pulses of an ultrashort pulse laser (3), comprising an ultrashort pulse laser (3) for generating the ultrashort laser pulses and for providing a laser beam (32), a hollow-core fiber (4) which is designed to transport the laser beam (32) to an outlet (42) of the hollow-core fiber (4), and an optical coupling unit (41) which is designed to couple the laser beam (32) into an inlet (40) of the hollow-core fiber (4), wherein the outlet (42) of the hollow-core fiber (4) is designed to couple the laser beam (32) out of the hollow-core fiber (4) at a divergence angle (α), and the system is also equipped with a lens device (8), on which the laser beam (32) coupled out of the hollow-core fiber (4) is incident at the divergence angle (α), a beam-shaping element (6), on which the laser beam (32) exiting the lens device (8) is incident, and a focusing optical unit (7). The lens device (8) is designed to adapt the divergence angle (α) of the decoupled laser beam (32) in order to adapt the beam diameter (D) of the laser beam (32) on the beam-shaping element (6); the beam-shaping element (6) is designed to imprint the laser beam (32) with a virtually non-diffracting beam shape, having a focal zone (322) which is elongated in the beam propagation direction, upstream or downstream of the focusing optical unit (7); and the focusing optical unit (7) is designed to adjust the insertion depth of the focal zone (322) in or on the material (2).

IPC 8 full level

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