

Title (en)  
DEVICE AND METHOD FOR LASER MACHINING A WORKPIECE

Title (de)  
VORRICHTUNG UND VERFAHREN ZUR LASERBEARBEITUNG EINES WERKSTÜCKS

Title (fr)  
DISPOSITIF ET PROCÉDÉ D'USINAGE AU LASER D'UNE PIÈCE

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Application  
**EP 22701616 A 20220125**

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Abstract (en)  
[origin: WO2022167257A1] The invention relates to a device for laser machining a workpiece (104) which has a material (102) that is transparent to the machining laser, comprising a first beam-shaping device (106) with a beam splitting element (112) for splitting a first inlet beam (108) coupled into the first beam-shaping device (106) into a plurality of sub-beams (114) and comprising a focusing optical unit (116) which is paired with the first beam-shaping device (106) for imaging sub-beams (114) coupled out of the first beam-shaping device (106) into at least one focal zone (122), wherein the first inlet beam (108) is split by means of the beam splitting element (112) by impressing a phase onto the first inlet beam (108), the sub-beams (114) are focused onto different sub-regions (120) of the at least one focal zone (122) in order to form the at least one focal zone (122), the at least one focal zone (122) is introduced into the material (102) at at least one incidence angle ( $\alpha$ ) relative to the exterior (144; 146) of the workpiece (104) using the focusing optical unit (116) in order to laser machine the workpiece (104), and material modifications (156) are produced in the material (102) by acting on the material (102) by means of the at least one focal zone (122), said material modifications being associated with a change in the refractive index of the material (102).

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