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(54) Title: METHOD AND SYSTEM FOR DETERMINING THE LOCAL POSITION OF AT LEAST ONE OPTICAL ELEMENT
IN A MACHINE FOR LASER PROCESSING OF A MATERIAL, USING LOW-COHERENCE OPTICAL INTERFEROMETRY
TECHNIQUES

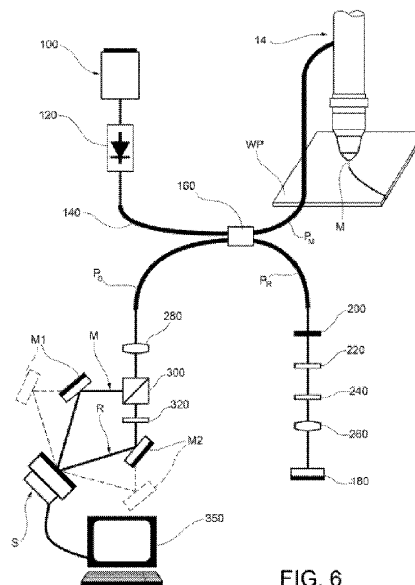


FIG. 6

(57) Abstract: A method and a system are described for determining the local position of at least one optical element associated with an optical path for transporting a laser beam in a working head of a machine for laser processing of a material, comprising: - generating a respective measurement low coherence optical radiation beam, leading the measurement beam towards the optical element and leading the reflected or diffused measurement beam from the optical element towards an optical interferometric sensor arrangement; - generating a respective beam of the reference low coherence optical radiation and the leading of the reference beam towards the interferometric optical sensor arrangement; - superimposing the measurement beam and the reference beam on a common region of incidence of the sensor means; - detecting the position of a pattern of interference fringes between the measurement beam and the reference beam on

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the region of incidence; and - determining a difference in optical length between the measurement optical path and the reference optical path as a function of the position of the interference pattern along an illumination axis of the region of incidence, or of the frequency of the interference pattern in the frequency domain, which is indicative of a difference between (a) the current local position of the optical element and (b) the predetermined nominal local position of the optical element.