

SYSTEMS AND METHODS FOR TACTILE PROFILOMETRY

Abstract of the Disclosure

Provided herein are systems and methods for performing tactile profilometry. In some aspects, a system (100) for performing tactile profilometry includes a probe (290) (102) with a profilometry sensor apparatus (108). The profilometry sensor apparatus (108) comprises a touch medium (120) having a first side (176A) adjacent to the surface (106) being inspected and a second side (176B) opposite the first side (176A), the second side (176B) having a reflective layer (136). The profilometry sensor apparatus (108) also includes a first light source (124) coupled to a first deformable waveguide (126) to illuminate the reflective layer (136) of the touch medium (120) with a first light beam at a first incidence angle and a light sensor (122) to detect reflected light. A first shaping actuator (128) is operatively coupled to the first deformable waveguide (126) to displace the first deformable waveguide (126). A controller (150) is configured to receive optical data (158) from the light sensor (122) and operate the first shaping actuator (128) to adjust the first incidence angle based on the optical data (158).

[Figure 2]