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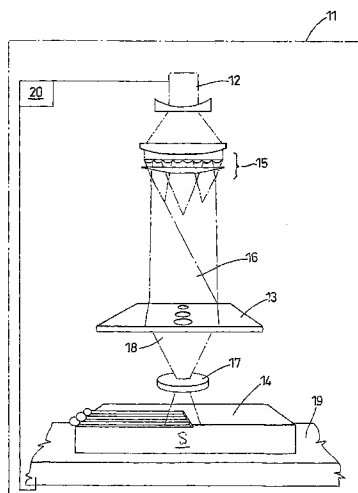
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(54) Title: METHOD AND UNIT FOR MICRO-STRUCTURING A MOVING SUBSTRATE



(57) Abstract: A method for exposing a polymer or other substrate (S) to patterned illumination from a pulsed laser source (12) at a suitable energy density in order to cause ablation of the surface to form a dense, regular array of 2-D or 3-D microstructures, characterised by the steps of: locating a mask (13) containing a series of identical or different features on a fixed pitch relative to a target area (14) of the substrate (S); projecting a uniform laser beam (18) through the mask (13) in order to project an image made up of a multiplicity of the features of the mask (13) onto the target area (14), de-magnifying the image carried by the beam (18) between the mask (13) and the target area (14); locating a substrate (S) for ablation in the target area (14); moving the substrate (S), at least while in the target area, in a first direction (D1) parallel to one axis of the projected array of microstructures and also in a second direction (D2) perpendicular to the first direction; and controlling (20) the firing of the pulsed laser (12) in relation to the exact position of the substrate (S) in the target area (14). The invention further comprises a unit for ablating the surface of a polymer or other substrate (S) to form a dense, regular array of 2D or 3D microstructures by patterned illumination comprising: a pulsable laser source (12); a mask (13) containing a series of identical or different features on a fixed pitch and disposed between the laser source (12) and a target area (14); an illumination system (15) for creating a uniform laser beam (16) that exposes a multiplicity of the features on the mask (13)

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and disposed between the laser source (12) and the mask (13); an optical projection system (17) to de-magnify the mask image onto the target area (12) and disposed between the mask (13) and the target area (12); a 2- axis stage system (19) for the substrate (s) adapted to move the substrate (S) in the target area (14) in a first direction parallel to one axis of the regular array of microstructures and also in a second direction perpendicular to the first direction; and a control system (20) that links the firing of the pulsed laser (12) to the exact position of the substrate (S) in the target area (14).