Abstract

Method and apparatus for detection of mechanical defects in an ingot piece composed of semiconductor material

The subject matter of the invention is a method for detection of mechanical defects (4) in an ingot piece (1) which is composed of semiconductor material and has at least one planar surface (6) and a thickness, measured at right angles to this surface, of 1 cm to 100 cm, with the planar surface (6) of the ingot piece (1) being scanned during the method by at least one ultrasound head (2) which is coupled via a liquid coupling medium (3) to the planar surface (6) of the ingot piece (1) and, at each measurement point (x,y) produces at least one ultrasound pulse (8) which is directed at the planar surface (6) of the ingot piece (1), and the ultrasound-pulse echo originating from the ingot piece (1) is recorded as a function of time, such that an echo (9) from the planar surface (6), an echo (11) from a surface (7), opposite the planar surface, of the ingot piece (6) and, possibly, further echoes (10) are detected, with the positions (x_p, y_p, z_p) of mechanical defects (4) in the ingot piece (1) being determined from the further echoes (10).

The subject matter of the invention also includes an apparatus for carrying out the method according to the invention, and to the integration of the method in the process chain for production of semiconductor wafers.