

ABSTRACT
LIGHTING APPARATUS

A lighting apparatus 1 has a convex lens 11 arranged so that its optical axis is at an angle θ with respect to the normal of an observation portion 3a (e.g., a semiconductor substrate or the like), with a camera 5 arranged in the path of the reflected light rays. When a light-emitting portion 13 is arranged along the optical axis of the lens 11, a bright field illumination takes place. If a knob 29 is turned, the light-emitting portion 13 moves along a ball screw 25, thereby changing the illumination from a bright field illumination to a dark field illumination. When a knob 37 is turned, the light exiting the lens 11 will diverge if the light-emitting portion 13 is moved close to the lens 11, converge if the light-emitting portion 13 is moved far away from the lens 11, and be parallel if the light-emitting portion 13 is positioned at the focal point of the lens 11. By changing the position of the light-emitting portion 13 in this way, it is possible to change the illuminating angle and the illuminating angle distribution, and by adjusting the position of the light-emitting portion 13 in accordance with the optical characteristics of the object 3, it is possible to obtain a high contrast image. It is also possible for these adjustments to be carried out automatically by using an actuator, microcomputer or the like.

(Figure 3)