TITLE: Optical station for exchanging optical elements

FIELD OF THE INVENTION

BACKGROUND OF THE INVENTION

Miniaturization of electronic components has led to various improvements in semiconductor technology to make electronic components ever-smaller. Such components may include simple components such as diodes, up to complex components such as integrated circuits. Apart from electronic components, mechanical components can also be manufactured using the same technology.

In the art of semiconductor technology, it is commonly known that a wafer of semiconductor material, typically silicon, is processed to form the components in a surface area of the wafer. The wafer is macroscopic, having a diameter ranging in the order of 20 - 300 mm, while the components are microscopic, typically having a size in the sub-millimeter range. Each component is made in a small wafer portion, with the various wafer portions being located at a small distance from each other. After the processing steps, the wafer is cut to separate the various wafer portions from each other, so that the components become available independent from each other. After separation, each separated wafer portion is referred to as a die, and the separation process is known as dicing. The present invention relates particularly to the field of laser dicing.

The various wafer portions are typically arranged in a matrix pattern, separated by mutually orthogonal lanes, also indicated as "dicing streets". The separation process involves applying a cut in each dicing street. At least part of the cutting is done by radiation: radiation, typically a high power laser beam, is used to remove the top layer of the dicing streets; this is also indicated as "radiative grooving", or more conveniently as "laser grooving". The present invention relates also to a method of laser grooving.

In the process of laser grooving and/or lacer dicing, a laser beam and a wafer are moved with respect to each other. This relative movement may be practiced by holding the wafer stationary and moving the laser beam, or by holding the laser beam and moving the wafer, or both. In practice, it is more convenient to hold the optical system stationary and move the wafer; nevertheless, the movement will be indicated as a "scribing" movement of the laser beam.

Scribing is done in two directions. For instance, after having scribed a first groove in one direction, the next groove is scribed in the opposite direction. For optimum processing, an optical element in the laser path is then rotated over 180°; thus, it is desirable to be able to quickly rotate the optical element. It may also be

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The present invention relates in general to the field of processing by means of a laser beam, more particularly the field of laser grooving and/or laser dicing of wafers.

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