CLAIMS

1. Optical station (1) for a laser processing device having an optical path, the optical station having a positioning axis (2) that is intended to coincide with the optical path of the laser processing device, the optical station comprising:

- a plurality of holders (200) for holding respective optical elements (300);
- a positioning device (500) having a holder clamp (520) for clamping and positioning a selected one of the holders (200) such as to position the corresponding optical element in the optical path;
- a magazine (100) having a plurality of accommodation spaces (120) for accommodating the plurality of holders, wherein the magazine is configured to be displaceable in a virtual XY-plane perpendicular to the positioning axis (2), and wherein the magazine and the holder clamp (520) are configured to be displaceable with respect to each other in a Z-direction parallel to the positioning axis (2);
- a magazine XY-actuator (400) for displacing the magazine perpendicular to the positioning axis (2) with respect to the positioning device;

the optical station being characterized by:

- a magazine Z-actuator (600) for effecting a relative Z-displacement of the magazine (100) and the holder clamp (520) with respect to each other, between a relative distal extreme position and a relative proximal extreme position;

wherein, when the magazine (100) and the holder clamp (520) are in the relative distal extreme position, the magazine (100) is operative to lift a holder from the holder clamp (520) and is displaceable in the XY-direction to select another holder; and

wherein, when the magazine (100) and the holder clamp (520) are in the relative proximal extreme position, the holder clamp (520) is operative to lift the selected

holder from the magazine (100) for accurately positioning the selected holder with respect to the positioning axis (2).

2. Optical station according to claim 1, wherein the magazine (100) is a planar magazine extending in said virtual XY-plane, and the accommodation spaces are distributed in said XY-plane.

3. Optical station according to claim 2, wherein the magazine (100) is a rotatable disc-shaped magazine that is configured to rotate about a revolution axis that is parallel to the positioning axis, and the magazine XY-actuator (400) is adapted for rotating the magazine about said revolution axis.

4. Optical station according to claim 3, wherein the accommodation spaces are located at a circle that intersects the positioning axis, said circle having a center coinciding with the revolution axis.

5. Optical station according to any one of the preceding claims, wherein the holder clamp (520) is rotatable for rotating a holder around the positioning axis; and wherein, when the magazine (100) and the holder clamp (520) are in the relative proximal extreme position, the holder clamp (520) is operative to lift the selected holder from the magazine (100) and is rotatable with the selected holder about the positioning axis (2).

6. Optical station according to any one of the preceding claims, wherein each holder is provided with first type reference members (220) and with second type reference members (230), wherein the first type reference members (220) define a reference orientation of the holder (200) with respect to the corresponding accommodation space

(120), and wherein the second type reference members define a reference orientation of the holder (200) with respect to the holder clamp (520).

7. Optical station according to claim 6, wherein each of the first type reference members (220) comprises a mechanical protrusion cooperating with a recessed portion (130) of a wall of the accommodation space (120).

8. Optical station according to claim 6 or 7, wherein the second type reference members (230) include protrusions of the holder cooperating with radial grooves (522) in a front face (521) of the holder clamp (520), or wherein the second type reference members include radial grooves of the holder cooperating with protrusions on a front face of the holder clamp.

9. Optical station according to any one of the preceding claims, wherein a holder is held in an accommodation space by first magnetic holding members.

10. Optical station according to claim 9, wherein the first magnetic holding members include permanent magnets.

11. Optical station according to any one of the preceding claims, wherein a holder is held by the holder clamp by second magnetic holding members.

12. Optical station according to claim 11, wherein the second magnetic holding members include permanent magnets.

13. Optical station according to any one of the preceding claims, wherein an accommodation space (120) has a radial opening extending towards a perimeter of the magazine (100), for easy exchange of holders.

14. Optical station according to any one of the preceding claims, further comprising:

- a control device for controlling the positioning device, the magazine XY-actuator and the magazine Z-actuator;

wherein the control device is adapted to perform an optical element exchange procedure, in which the control device:

- in a first step, when the magazine Z-actuator (600) is in the relative proximal position, controls the positioning device (500) for rotating the holder clamp (520) about the positioning axis to a predefined takeover position;
- in a subsequent second step, controls the magazine Z-actuator (600) to shift from the relative proximal position to the relative distal position such that a free accommodation space (120) contacts the holder (200) held by the holder clamp (520) and lifts this holder from the holder clamp;
- in a subsequent third step, controls the magazine XY-actuator (400) to displace the magazine to another position in which a selected other one of the holders is aligned with the positioning axis;
- in a subsequent fourth step, controls the magazine Z-actuator (600) to shift from the relative distal position to the relative proximal position such that the holder clamp contacts the holder corresponding to said selected other one of the optical elements and lifts this holder from its accommodation space;

and wherein the control device is adapted in a possible subsequent fifth step in the optical element placement procedure to control the positioning device (500) for

rotating the holder clamp (520) with the optical element about the positioning axis..

15. Laser processing apparatus comprising an optical station according to any of the previous claims; wherein the laser processing apparatus preferably is a semiconductor laser grooving apparatus and/or a semiconductor laser dicing apparatus for grooving/dicing of wafers.