Claims

1. A laser apparatus comprising:

an imaging device having an optical path for capturing an image of a workpiece surface;

an laser-emitting device configured to direct laser along a laser path to the workpiece surface, the laser path of the laser-emitting device being separate from the optical path of the imaging device; and

a controller coupled to the imaging device and the laser-emitting device, the controller being configured to adjust the laser path of the laser-emitting device based on an image of the workpiece surface as captured by the imaging device.

2. The laser apparatus of claim 1, wherein the controller is configured to compare the captured workpiece surface image against a prestored reference template.

3. The laser apparatus of claim 1, wherein the imaging device is mounted to the laser-emitting device.

4. The laser apparatus of claim 3, wherein the imaging device is inclined at an angle with respect to the laser-emitting device.

5. A method of directing laser to a workpiece surface, the method comprising the steps of:

an imaging device capturing a workpiece surface image along an optical path;

a controller receiving the captured workpiece surface image as captured by the imaging device, and adjusting a laser path of a laser-emitting device for directing laser to the workpiece surface, the laser path of the laser-emitting device being separate from the optical path of the imaging device;

the laser-emitting device directing laser to the workpiece surface along the adjusted laser path.

6. The method of claim 5, wherein the step of adjusting the laser path of the laser-emitting device comprises comparing the captured workpiece surface image against a reference template prestored in the controller.

Claims

1. A laser apparatus comprising:

an imaging device having for capturing one or more images;

a first lighting device for emitting light;

a first mirror arranged with respect to the lighting device to reflect the light emitted from the lighting device towards a workpiece surface to thereby define a light path for illumination, and a second mirror arranged with respect to the imaging device to reflect an image of the illuminated workpiece surface towards the imaging device to thereby define an optical path for image capturing;

a second lighting device for emitting an illumination lighting directly onto the workpiece surface, wherein the second lighting device is located between the mirrors and the workpiece surface;

a laser-emitting device configured to direct laser along a laser path to the workpiece surface for laser marking, the laser path of the laser-emitting device being separate from the light path and the optical path;

and

a controller coupled to the imaging device and the laser-emitting device, the controller being configured to adjust the laser path of the laser-emitting device based on the image of the illuminated workpiece surface as captured by the imaging device.

2. The laser apparatus of claim 1, wherein the controller is configured to compare the captured workpiece surface image against a prestored reference template.

3. The laser apparatus of anyone of the preceding claims, wherein the imaging device is mounted to the laser-emitting device.

4. The laser apparatus of claim 3, wherein the imaging device is inclined at an angle with respect to the laser-emitting device.

5. A method of directing laser to a workpiece surface, the method comprising the steps of:

a first lighting device emitting light;

a first mirror reflecting the light emitted from the lighting device towards a workpiece surface to thereby define a light path for illumination, and a second mirror reflecting an image of the illuminated workpiece surface towards the imaging device to thereby define an optical path for image capturing;

emitting an illumination lighting from a second lighting device directly onto the workpiece surface, wherein the second lighting device is located between the mirrors and the workpiece surface;

the imaging device capturing the image of the illuminated workpiece surface image;

a controller receiving the captured workpiece surface image as captured by the imaging device, and adjusting a laser path of a laser-emitting device for directing laser to the workpiece surface based on the image of the illuminated workpiece surface as captured by the imaging device; and;

the laser-emitting device directing laser to the workpiece surface along the adjusted laser path to laser mark the workpiece surface, the laser path of the laser-emitting device being separate from the light path and the optical path.

6. The method of claim 5, wherein the step of adjusting the laser path of the laser-emitting device comprises comparing the captured workpiece surface image against a reference template prestored in the controller.