

What is claimed is:

1. A system comprising:
 - a vacuum pump;
 - a nozzle in fluid communication with the vacuum pump, wherein the nozzle is configured to hold
 - 5 a workpiece;
 - a nozzle actuator configured to move the nozzle; and
 - an inspection module that includes:
 - a first light source;
 - a second light source;
 - 10 a first mirror that is disposed to receive light from the first light source, wherein the first mirror directs the light from the first light source at an outer surface of the workpiece;
 - a second mirror that is disposed to receive light from the second light source, wherein the second mirror directs the light from the second light source at the outer surface of the workpiece;
 - 15 a first semi-mirror disposed between the first light source and the first mirror, wherein the first semi-mirror receives the light from the first light source that is reflected from the outer surface of the workpiece and the light from the second light source that is transmitted through the workpiece;
 - a second semi-mirror disposed between the second light source and the second mirror, wherein
 - 20 the second semi-mirror receives the light from the second light source that is reflected from the outer surface of the workpiece and the light from the first light source that is transmitted through the workpiece;
 - a camera that receives the light from the first light source and the second light source;
 - a third mirror that is disposed to direct the light from the first semi-mirror to the camera; and
 - 25 a fourth mirror that is disposed to direct the light from the second semi-mirror to the camera.
2. The system of claim 1, wherein the first light source and the second light source are LEDs.
3. The system of claim 1, further comprising at least one optical lens disposed between the camera and the third mirror and the fourth mirror.

4. The system of claim 1, further comprising a camera actuator configured to move the camera relative to the third mirror and the fourth mirror.
5. The system of claim 1, wherein the first mirror and the second mirror are disposed on opposite sides of the outer surface of the workpiece.
- 5 6. The system of claim 1, further comprising a second of the inspection module, wherein the first mirror and the second mirror of the second of the inspection module are disposed at a 90° angle relative to the first mirror and the second mirror of the inspection module, respectively.
7. The system of claim 6, wherein the nozzle actuator is configured to move the workpiece between the inspection module and the second of the inspection module.
- 10 8. A method comprising:
directing light from a first light source at an outer surface of a workpiece in a first inspection module;
receiving the light from the first light source reflected from the outer surface of the workpiece at a camera, wherein the light from the first light source that is reflected from the outer surface of the workpiece is directed to the camera via a first mirror and a first semi-mirror; and
15 receiving the light from the first light source transmitted through the workpiece at the camera, wherein the light from the first light source that is transmitted through the workpiece is directed to the camera via a second mirror and a second semi-mirror.
9. The method of claim 8, further comprising, using the camera, taking an image of the light from the first light source that is reflected from the outer surface of the workpiece and an image of the light from the first light source transmitted through the workpiece in a single exposure of a sensor in the camera.
- 20 10. The method of claim 8, further comprising directing light in the first inspection module from a second light source at a point on the outer surface of a workpiece 180° from that of the first light source, wherein the directing light from the second light source is simultaneous with the directing light from the first light source, and wherein the light from the second light source is at a lower intensity than that of the first light source.
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11. The method of claim 8, further comprising:
directing light from a second light source at a point on the outer surface of a workpiece 180° from
that of the first light source in the first inspection module;
receiving the light from the second light source reflected from the outer surface of the workpiece
5 at the camera, wherein the light from the second light source that is reflected from the outer
surface of the workpiece is directed to the camera via the second mirror and the second semi-
mirror; and
receiving the light from the second light source transmitted through the workpiece at the camera,
wherein the light from the second light source that is transmitted through the workpiece is
10 directed to the camera via the first mirror and the first semi-mirror.
12. The method of claim 11, further comprising, using the camera, taking an image of the light from
the second light source that is reflected from the outer surface of the workpiece and an image of
the light from the second light source transmitted through the workpiece in a single exposure of a
sensor in the camera.
- 15 13. The method of claim 11, directing light from the first light source at a point on the outer surface
of a workpiece 180° from that of the second light source in the first inspection module, wherein
the directing light from the first light source is simultaneous with the directing light from the
second light source, and wherein the light from the first light source is at a lower intensity than
that of the second light source.
- 20 14. The method of claim 8, further comprising positioning a focal plane inside the workpiece by
adjusting a position of the camera and/or the first mirror, the first semi-mirror, and the first light
source.
15. The method of claim 8, further comprising tuning a wavelength of the light from the first light
source thereby adjusting a penetration depth of the light from the first light source in the
25 workpiece.
16. The method of claim 8, further comprising:
positioning the workpiece on a nozzle in fluid communication with a vacuum pump; and
moving the workpiece on the nozzle relative to the first mirror using a nozzle actuator.

17. The method of claim 16, further comprising moving the workpiece from the first inspection module to a second inspection module.

18. The method of claim 17, further comprising:

directing light from a first light source at the outer surface of the workpiece in a second inspection module;

receiving the light from the first light source reflected from the outer surface of the workpiece at a camera in the second inspection module, wherein the light from the first light source that is reflected from the outer surface of the workpiece is directed to the camera in the second inspection module via a first mirror and a first semi-mirror in the second inspection module;

and

receiving the light from the first light source transmitted through the workpiece at the camera in the second inspection module, wherein the light from the first light source that is transmitted through the workpiece is directed to the camera in the second inspection module via a second mirror and a second semi-mirror in the second inspection module;

wherein the first mirror and the second mirror of the second inspection module are disposed at a 90° angle relative to the first mirror and the second mirror of the first inspection module.

19. The method of claim 18, further comprising:

directing light from a second light source at a point on the outer surface of a workpiece 180° from that of the first light source in the second inspection module;

receiving the light from the second light source reflected from the outer surface of the workpiece at the camera in the second inspection module, wherein the light from the second light source that is reflected from the outer surface of the workpiece is directed to the camera in the second inspection module via the second mirror and the second semi-mirror in the second inspection module; and

receiving the light from the second light source transmitted through the workpiece at the camera in the second inspection module, wherein the light from the second light source that is transmitted through the workpiece is directed to the camera in the second inspection module via the first mirror and the first semi-mirror in the second inspection module.

20. The method of claim 8, wherein the workpiece is fabricated of one of silicon, gallium nitride, or gallium arsenide.