CLAIMS

1. A light emitting apparatus, comprising a light source and an aperture limiting unit arranged in a light emitting path of the light source, wherein:

the light source is configured to emit light; and

the aperture limiting unit comprises a first stop module, wherein the first stop module is configured to enter and leave the light emitting path of the light source, and limit an aperture of the light emitted by the light source when the first stop module is in the light emitting path of the light source, to block light at a large angle with a normal direction of an object to be detected; wherein

the aperture limiting unit comprises a control module, the control module is configured to control the first stop module to enter the light emitting path of the light source in a case that a current detection area of the object to be detected has a specific detection structure, and control the first stop module to leave the light emitting path of the light source in a case that the current detection area of the object to be detected has no specific detection structure.

2. The light emitting apparatus according to claim 1, wherein

the control module is configured to control the first stop module to enter the light emitting path of the light source in a case that a current detection area of the object to be detected has a high aspect ratio structure, and control the first stop module to leave the light emitting path of the light source in a case that the current detection area of the object to be detected has no high aspect ratio structure.

3. The light emitting apparatus according to claim 2, further comprising an objective lens,

wherein the objective lens is configured to receive light from the first stop module or the light source and project the received light onto a surface of the object to be detected;

wherein the first stop module comprises a first stop, wherein in a case that the first stop module is in the light emitting path of the light source, the first stop is at an entrance pupil of the objective lens; or

the first stop module comprises a first stop and a matching lens, wherein in a case that

the first stop module is in the light emitting path of the light source, the matching lens forms an image of the first stop at the entrance pupil of the objective lens.

4. The light emitting apparatus according to claim 2 or 3, wherein the control module comprises a controller and a first movable device, and

the controller is configured to determine whether the current detection area has a high aspect ratio structure based on pre-stored structure data of the object to be detected, send a first control instruction to the first movable device in a case that the current detection area has a high aspect ratio structure, to control the first movable device to drive the first stop module to enter the light emitting path of the light source, and send a second control instruction to the first movable device in a case that the current detection area has no high aspect ratio structure, to control the first movable device to drive the first stop module to leave the light emitting path of the light source.

5. An optical detection system, comprising the light emitting apparatus according to any one of claims 1 to 4 and a receiving device, wherein

light emitted by the light emitting apparatus is reflected by the object to be detected; and

the receiving device is configured to receive light reflected by the object to be detected and obtain structure information of the object to be detected based on the received light.

6. The optical detection system according to claim 5, wherein the light emitting apparatus comprises an objective lens and the optical detection system further comprises a first lens group, a beam splitter and a second lens group, wherein

the first lens group is configured to perform beam expansion and shaping on the light emitted by the light source;

the beam splitter is configured to reflect emergent light from the first lens group or the aperture limiting unit;

the objective lens is configured to focus the emergent light from the first lens group or the first stop module on the object to be detected and collect reflected light from the object to be detected;

the beam splitter is further configured to transmit emergent light from the objective lens to the second lens group; and

the second lens group is configured to converge the emergent light from the objective lens to the receiving device.

7. The optical detection system according to claim 6, wherein the objective lens is an interference objective lens, the receiving device is a photoelectric detector, and the optical detection system further comprises a second movable device, wherein

the interference objective lens is further configured to, after collecting the reflected light from the object to be detected, cause the reflected light to interfere with reference light, and transmit interference light to the beam splitter;

the second movable device is configured to drive the interference objective lens or the object to be detected to move along a direction perpendicular to the object to be detected; and

the photoelectric detector is configured to reconstruct a three-dimensional surface contour of the object to be detected based on received interference light.

8. The optical detection system according to claim 6, wherein the objective lens is an imaging objective lens, the receiving device is a spectrometer, and a second stop is arranged at a light inlet of the spectrometer, wherein

the second stop is configured to limit an aperture of emergent light entering the spectrometer; and

the spectrometer is configured to obtain film thickness information of the object to be detected based on the emergent light.

9. An optical detection method applied to the optical detection system according to any one of claims 5 to 8, wherein the method comprises:

emitting light by the light source;

moving the first stop module in the aperture limiting unit into the light emitting path of the light source to limit the aperture of the light emitted by the light source, to block light at a large angle with the normal direction of the object to be detected;

controlling, by the control module in a case that the current detection area of the object to be detected has a specific detection structure, the first stop module to enter the light emitting path of the light source; or

controlling, by the control module in a case that the current detection area of the

object to be detected has no specific detection structure, the first stop module to leave the light emitting path of the light source.

10. The optical detection method according to claim 9, wherein the aperture limiting unit comprises a control module and the method further comprises:

controlling, by the control module in a case that the current detection area of the object to be detected has a high aspect ratio structure, the first stop module to enter the light emitting path of the light source; or

controlling, by the control module in a case that the current detection area of the object to be detected has no high aspect ratio structure, the first stop module to leave the light emitting path of the light source.

11. The optical detection method according to claim 10, wherein

the light emitting apparatus comprises an objective lens and the first stop module comprises a first stop, the step of controlling the first stop module to enter the light emitting path of the light source comprises: arranging the first stop at an entrance pupil of the objective lens; and

in a case that the light emitting apparatus comprises an objective lens and the first stop module comprises a first stop and a matching lens, the step of controlling the first stop module to enter the light emitting path of the light source comprises: rendering an image of the first stop formed by the matching lens at the entrance pupil of the objective lens.

12. The optical detection method according to claim 10 or 11, wherein the control module comprises a controller and a first movable device, and the method further comprises:

determining, by the controller based on pre-stored structure data of the object to be detected, whether the current detection area has a high aspect ratio structure;

sending, by the controller in a case that the current detection area has a high aspect ratio structure, a first control instruction to the first movable device, to control the first movable device to drive the first stop module to enter the light emitting path of the light source; and

sending, by the controller in a case that the current detection area has no high aspect ratio structure, a second control instruction to the first movable device to control the first movable device to drive the first stop module to leave the light emitting path of the light source.

13. An optical detection apparatus, comprising a light source module, a projecting unit, and a receiving unit, wherein the light source module comprises a light source and an aperture limiting module, wherein:

the light source is configured to emit detection light;

the aperture limiting module is configured to enter and leave a light emitting path of the light source, and limit an aperture of the detection light emitted by the light source when the aperture limiting module is in the light emitting path of the light source, to block light at a large angle with a normal direction of an object to be detected;

the projecting unit comprises at least one projecting device, wherein the projecting device is configured to project the detection light emitted by the light source module to a surface of the object to be detected, collect reflected light from the object to be detected, and emit detection signal light; and

the receiving unit is configured to receive the detection signal light and obtain image information and structure information of an area to be detected of the object to be detected based on the detection signal light;

a first movable device and a controller,

wherein the first movable device is configured to control the aperture limiting module to enter and leave the light emitting path of the light source; and

wherein the controller is configured to determine, based on the image information, whether the area to be detected of the object to be detected has a specific detection structure, and send, in a case that the area to be detected has the specific detection structure, a first control instruction to the first movable device, to control the first movable device to drive the aperture limiting module to enter the light emitting path of the light source.

14. The apparatus according to claim 13, wherein

the projecting device is an objective lens,

wherein the aperture limiting module comprises a first stop, wherein in a case that the aperture limiting module is in the light emitting path of the light source, the first stop is at an entrance pupil of the objective lens; or

the aperture limiting module comprises a first stop and a matching lens, wherein in a

case that the aperture limiting module is in the light emitting path of the light source, the matching lens forms an image of the first stop at the entrance pupil of the objective lens.

15. The apparatus according to claim 13, wherein the specific detection structure comprises a high aspect ratio structure.16. The apparatus according to claim 13, wherein the projecting unit comprises a switching device and at least two projecting devices,

the switching device is configured to switch between projecting devices in the light emitting path of the light source module, and

different projecting devices emit different detection signal light.

17. The apparatus according to claim 16, wherein the at least two projecting devices comprise a first projecting device and a second projecting device,

the first projecting device is configured to project part of the detection light emitted by the light source module to the surface of the object to be detected, transform part of the detection light into reference light, collect reflected light formed by the object to be detected reflecting the detection light, cause the reflected light to interfere with the reference light, and transmit interference light to the receiving unit, wherein the interference light is detection signal light emitted by the first projecting device, and

the second projecting device is configured to project the detection light emitted by the light source module to the surface of the object to be detected, collect reflected light from the object to be detected, and transmit the reflected light to the receiving unit, wherein the reflected light is detection signal light emitted by the second projecting device.

18. The apparatus according to claim 17, wherein the structure information comprises three-dimensional coordinate information of the object to be detected,

the receiving unit comprises a first receiving device, and

the first receiving device is configured to generate the three-dimensional coordinate information of the object to be detected based on the detection signal light from the first projecting device and generate the image information of the object to be detected based on the detection signal light from the second projecting device.

19. The apparatus according to claim 18, wherein the structure information further comprises film thickness information of the area to be detected,

the receiving unit further comprises a second receiving device, and

the second receiving device obtains the film thickness information of the area to be detected of the object to be detected based on the detection signal light from the second projecting device.

20. The apparatus according to claim 17, wherein the first projecting device is an interference objective lens, the second projecting device is an imaging objective lens, and the first receiving device is an image sensor.

21. The apparatus according to claim 13, wherein

the projecting unit comprises a projecting device, wherein the projecting device is configured to, after collecting the reflected light from the object to be detected, transmit the reflected light to the receiving unit, and the reflected light is detection signal light emitted by the projecting device,

the structure information comprises film thickness information of the area to be detected of the object to be detected,

the receiving unit comprises a first receiving device and a second receiving device,

the first receiving device is configured to obtain the image information of the object to be detected based on detection signal light, and

the second receiving device is configured to obtain the film thickness information of the object to be detected based on the detection signal light.

22. The apparatus according to claim 21, wherein the projecting device is an imaging objective lens, the first receiving device is an image sensor, and the second receiving device is a spectrometer.

23. An optical detection method, comprising:

obtaining image information of an area to be detected of an object to be detected;

determining whether the area to be detected has a specific detection structure based on the image information; and

performing a detection process on the object to be detected, wherein the detection process comprises: performing a specific detection on the area to be detected in a case that the

object to be detected has the specific detection structure, wherein the specific detection comprises: emitting first detection light to the area to be detected, limiting an aperture of the first detection light to block light at a large angle with a normal direction of the object to be detected, entering a light path of the first detection light when the area to be detected has the specific detection structure, leaving the light path of the first detection light when the area to be detected has no specific detections structure, and obtaining structure information of the specific detection structure after the first detection light is limited.

24. The optical detection method according to claim 23, wherein

the object to be detected comprises a plurality of areas to be detected,

wherein before the detection process is performed on the object to be detected, the optical detection method further comprises: repeating the steps of obtaining image information and determining whether an area to be detected has a specific detection structure,

the specific detection further comprises: obtaining position information of the specific structure based on the image information, and obtaining the structure information of the specific structure based on the position information; or

wherein the optical detection method comprises: repeating the steps from obtaining image information of an area to be detected of an object to be detected to performing a detection process, comprising:

determining, after obtaining image information of a previous area to be detected and before obtaining image information of an area to be detected following the previous area to be detected, whether the previous area to be detected has the specific detection structure based on the image information of the previous area to be detected, and performing the specific detection on the previous area to be detected in a case that the previous area to be detected has the specific detection structure.

25. The optical detection method according to claim 23, wherein the optical detection method is applied to the optical detection apparatus according to any one of claims 13 to 22, the detection light comprises the first detection light or second detection light, and the step of obtaining the image information of the area to be detected of the object to be detected comprises:

emitting, by the light source, the second detection light,

projecting, by the projecting device, the second detection light to the surface of the object to be detected, collecting reflected light formed by the object to be detected reflecting the detection light, emitting detection signal light, and

receiving, by the receiving unit, the detection signal light and obtaining the image information of the area to be detected of the object to be detected based on the detection signal light, and

the step of obtaining the structure information of the specific detection structure in the specific detection comprises:

collecting, by the projecting device, detection signal light formed by the specific detection structure reflecting the first detection light, and

obtaining, by the receiving unit, the structure information of the specific detection structure based on the detection signal light.

26. The optical detection method according to claim 25, wherein the step of limiting the aperture of the first detection light comprises:

moving the aperture limiting module into the light emitting path of the light source, to limit the aperture of the first detection light.

27. The optical detection method according to claim 25 or 26, wherein

the projecting unit comprises a first projecting device, a second projecting device and a switching device,

before the detection light is projected to the surface of the object to be detected, the step of obtaining the image information comprises: controlling the second projecting device to enter the light emitting path of the light source, and

the specific detection further comprises: controlling, by means of the switching device, the first projecting device to enter the light emitting path of the light source and the second projecting device to move out of the light emitting path of the light source.

28. The optical detection method according to claim 25, wherein the receiving unit comprises a first receiving device and a second receiving device, the projecting unit comprises a second projecting device, the structure information comprises film thickness information, and

the optical detection method includes:

projecting, by the second projecting device, the second detection light to the surface of the object to be detected, collecting the reflected light formed by the object to be detected reflecting the second detection light, and emitting detection signal light;

receiving, by the first receiving device, the detection signal light, and obtaining the image information of the area to be detected of the object to be detected based on the detection signal light; and

collecting, by the second projecting device, the detection signal light formed by the specific detection structure reflecting the first detection light, and obtaining, by the second receiving device, film thickness information of the specific detection structure.