CLAIMS

1. A solid immersion lens unit comprising:

a solid immersion lens having a contact surface for coming into physical contact with a semiconductor device formed of a silicon substrate and a spherical surface to be disposed to face an objective lens, wherein the solid immersion lens transmits light having at least a part of wavelength in a range of 200 nm or greater and 1100 nm or lower;

a holder holding the solid immersion lens; and

an optical lens ~~element~~ held by the holder to be positioned between the objective lens and the solid immersion lens, wherein the optical lens ~~element~~ corrects aberration caused by a difference in refractive indices between the silicon substrate and the solid immersion lens

wherein the solid immersion lens is made of GaAs, GaP, SiC, or diamond,

wherein the optical lens is made of a material different from that of the solid immersion lens,

wherein the optical lens is bonded to a step portion extending so as to surround an opening of the holder, and

a surface of the optical lens faces the spherical surface of the solid immersion lens at a predetermined interval and extends along the spherical surface of the solid immersion lens.

~~2. The solid immersion lens unit according to claim 1, wherein the solid immersion lens is made of GaAs, GaP, SiC, or diamond.~~

2~~3~~. The solid immersion lens unit according to claim 1 ~~or 2~~, wherein

the holder has an attachment portion attachable to and detachable from the objective lens.

3~~4~~. The solid immersion lens unit according to claim 1~~any one of claims 1 to 3~~, wherein the optical lens ~~element~~ is made of glass.

4~~5~~. The solid immersion lens unit according to claim 1~~any one of claims 1 to 4~~, wherein the optical lens ~~element~~ is a meniscus lens.

5~~6~~. A semiconductor inspection apparatus comprising:

an stage on which the semiconductor device is to be placed;

an objective lens disposed to face the semiconductor device on the stage;

the solid immersion lens unit according to claim 1~~any one of claims 1 to 5~~ that holds the solid immersion lens between the objective lens and the semiconductor device; and

a photodetector that detects light from the semiconductor device through the solid immersion lens and the objective lens.

6~~7~~. The semiconductor inspection apparatus according to claim ~~6~~5, comprising a plurality of the solid immersion lens units, wherein the plurality of solid immersion lens units are configured to correspond to different observation depths.