Claims

1. A manufacturing method of an optical element (10) of an augmented reality eyewear, c h a r a c t e r i z e d by

depositing (800), on a waveguide (106), at least one layer (300) of a material (200) through perforations (204) of a plate (202) that is curved at a non-zero distance (D) from the waveguide (106); and

making (802) a height of the at least one layer (300) to vary in response to cross sectional areas of the perforations (204), which are configured to vary based on a location of the perforations (204) in the plate (202) for forming at least one diffractive grating (100, 102, 104) on the waveguide (106) from the at least one layer (300), the at least one diffractive grating (100, 102, 104) being configured to perform in-coupling and/or out-coupling of visible light between the waveguide (106) and environment.

2. The manufacturing method of claim 1, c h a r a c t e r i z e d by varying the non-zero distance (D) between the plate (202) and the waveguide (106).

3. The manufacturing method of claim 1, c h a r a c t e r i z e d in that the material (200) has a refractive index equal to or higher than that of the waveguide (106) in a visible range of light.

4. The manufacturing method of claim 1, c h a r a c t e r i z e d by performing depositing by at least one of the following: sputtering, chemical vapor deposition and physical vapor deposition.

5. The manufacturing method of claim 1, c h a r a c t e r i z e d by forming (804) ridges (304) of the at least one diffractive grating (100, 102, 104) by removing the material (200) from the at least one layer (300) at locations of grooves (306) between the ridges (304).

6. The manufacturing method of claim 1, c h a r a c t e r i z e d by tilting the plate (202) with respect to the waveguide (106).

7. The manufacturing method of claim 1, c h a r a c t e r i z e d by a refractive index of the material is higher than 1.8.

8. The manufacturing method of claim 1, c h a r a c t e r i z e d in that the cross sectional areas of the perforations (204) are configured to vary in two dimensions for making the heights of the depositions (300) vary in the two dimensions.

9. An optical component (10), c h a r a c t e r i z e d in that the optical component (10) comprises at least one diffractive grating (100 to 104) formed on a surface of a waveguide (106), the at least one diffractive grating (100 to 104) comprising at least one layer (300) of a material (200) having a height that varies in response to variations in cross-sectional areas of perforations (204) of a plate (202), the perforations (204) being arranged in the plate (202) such that their cross-sectional areas vary according to respective locations in the plate (202), the plate (202) being curved and positioned at a non-zero distance (D) from the waveguide (106) during deposition of the material (200), and the at least one diffractive grating (100 to 104) being configured to perform in-coupling and/or out-coupling of visible light between the waveguide (106) and an external environment.

10. An apparatus for manufacturing an optical component (10), c h a r a c t e r i z e d in that

the apparatus comprises a plate (202) with perforations (204), each of the perforations (204) having a cross sectional area depending on its location in the plate (202), the plate (202) and a waveguide (106) of the optical component (10) being configured to have a non-zero distance therebetween; and

the apparatus is configured to deposit, on the waveguide (106), at least one layer (300) of solid material (200) through the perforations (204) of the plate (202) for causing a height of the layer (300) on the waveguide (106) to vary in response to the cross sectional areas of the perforations (204),

wherein the plate (202) is curved with respect to the waveguide (106).

11. The apparatus of claim 10, c h a r a c t e r i z e d in that the apparatus is configured to allow the distance (D) between the plate (202) and the waveguide (106) to vary.

12. The apparatus of claim 10, c h a r a c t e r i z e d in that the apparatus has an adjusting means (210) configured to adjust the distance (D) between the plate (202) and the waveguide (106) based on the cross sectional areas of the perforations (204).

13. The apparatus of claim 10, c h a r a c t e r i z e d in that the apparatus is configured to remove the solid material (200) from locations for gaps (306) between ridges (304) of the at least one diffractive grating (100, 102, 104) and keep the solid material (200) at locations of the ridges (304) of the at least one diffractive grating (100, 102, 104).