CLAIMS

1. An optical apparatus comprising, a light source and a diffractive lens for diffracting a light from the light source,

wherein the diffractive lens includes an optical surface with a plurality of areas defined by a plurality of steps,

wherein the light source is set on an optical axis of the diffractive lens and at a focal point of the diffractive lens,

wherein a spectral intensity of the light source has a first peak at a first wavelength and a second peak lower than the first peak at a second wavelength longer than the first wavelength,

wherein a blaze wavelength λ_B of the diffractive lens is within a wavelength spectral range of the light source,

wherein when the wavelength spectral range of the light source is defined by a range $2\Delta\lambda$ with a spectral intensity that is $1/e^2$ of a spectral intensity of the first wavelength, an optical path difference between adjacent areas is equal to or more than $\lambda_B{}^2/\Delta\lambda$ with respect to a blaze wavelength λ_B,

wherein a first envelope enveloping the steps on the optical surface with the plurality of areas has an on-axis curvature different from an on-axis curvature of a surface opposing the optical surface and a diffractive lens power component of the optical surface with the plurality of areas defined by the plurality of steps has a sign identical to a sign of power of the diffractive lens, and

wherein, in a cross section which passes the optical axis and is parallel to the optical axis, a second envelope connecting respective intermediate points of the optical surfaces of the plurality of areas and respective intermediate points of the plurality of steps has an aspheric shape.

2. The optical apparatus according to claim **1**, wherein the light source is a non-laser light source in which the wavelength spectral range is at least 200 nm, and the optical path difference is at least five times as large as the blaze wavelength.

3. The optical apparatus according to claim **1**, wherein the areas are concentric annulus areas.

4. The optical apparatus according to claim **1**, wherein the diffractive lens is a meniscus lens generally shaped to comprise a convex surface and a concave surface.

5. The s optical apparatus according to claim **1**, wherein the areas defined by the plurality of steps are at least 20 μm in a width from one step to another step.

6. The optical apparatus according to claim **1**, wherein the plurality of steps are at least 4 μm in depth.

7. The optical apparatus according to claim **1**, wherein the light source is a white LED irradiating a white light by irradiating a blue light from a blue LED to a phosphor.

8. The optical apparatus according to claim **1**, wherein the first wavelength corresponding to blue.

9. The optical apparatus according to claim **1**, wherein the surface opposing to the optical surface has an aspheric shape.

10. The optical apparatus according to claim **1**, wherein the optical surface provides a negative phase difference to light passing through the optical surface.

11. An optical apparatus comprising, a light source and a diffractive lens for diffracting a light from the light source, wherein the diffractive lens includes an optical surface with a plurality of areas defined by a plurality of steps,

wherein the light source is set on an optical axis of the diffractive lens and at a focal point of the diffractive lens,

wherein a spectral intensity of the light source has peaks at a first wavelength corresponding to blue, at a second wavelength corresponding to green, and at a third wavelength corresponding to red,

wherein a blaze wavelength λ_B of the diffractive lens is within a wavelength spectral range of the light source,

wherein when the wavelength spectral range of the light source is defined by a range $2\Delta\lambda$ with a spectral intensity that is $1/e^2$ of a spectral intensity of a peak wavelength, an optical path difference between adjacent areas is equal to or more than $\lambda_B^2/\Delta\lambda$ with respect to a blaze wavelength λ_B and the peak wavelength is one of the first wavelength, the second wavelength and the third wavelength,

wherein a first envelope enveloping the steps on the optical surface with the plurality of areas has an on-axis curvature different from an on-axis curvature of a surface opposing the optical surface and a diffractive lens power component of the optical surface with the plurality of areas defined by the plurality of steps has a sign identical to a sign of power of the diffractive lens, and

wherein, in a cross section which passes the optical axis and is parallel to the optical axis, a second envelope connecting respective intermediate points of the optical surfaces of the plurality of areas and respective intermediate points of the plurality of steps has an aspheric shape.

12. The optical apparatus according to claim **11**, wherein the surface opposing to the optical surface has an aspheric shape.

13. The optical apparatus according to claim **11**, wherein the optical surface provides a negative phase difference to light passing through the optical surface.