

CLAIMS

1. Method for inspecting an ophthalmic lens using Optical Coherence Tomography comprising
illuminating a defined sample volume including the ophthalmic lens to be inspected with a sample light beam which is provided from a light source having a power of at least 2 mW at a wavelength of 1040 nm to 1080 nm and which does not exceed 5 W, the ophthalmic lens having been manufactured such that it comprises scattering centers embedded in and/or on an anterior surface and in and/or on a posterior surface thereof, respectively, and/or distributed throughout a bulk material being delimited by the anterior surface and the posterior surface of the ophthalmic lens,
detecting signals corresponding to an interference pattern resulting from a superposition of back-scattered light from the defined sample volume including the ophthalmic lens to be inspected and a reference light beam provided from the light source,
analyzing the detected signals and segmenting raw data corresponding to the ophthalmic lens from signals corresponding to the surrounding sample volume,
removing refractive effects of the ophthalmic lens and of the surrounding sample volume from the segmented raw data corresponding to the inspected ophthalmic lens in order to obtain geometrical data of the inspected ophthalmic lens, and transforming the geometrical data of the inspected ophthalmic lens, and
transforming the geometrical data into CAD-readable data representing the inspected ophthalmic lens.
2. The method according to claim 1, wherein the scattering centers are formed by one of phase interfaces, boundary surfaces in between components of which the ophthalmic lens is made, scattering particles, and combinations thereof.
3. The method according to claim 1, wherein the scattering centers are formed by particles including pigments.
4. The method according to claim 3, wherein the pigments have been selected to have a particle size of 0.1 μm to 2 μm .
5. The method according to claim 1, wherein the sample light beam and the reference light beam are generated by a superluminescence diode.
6. The method according to claim 1, wherein for the inspecting the ophthalmic lens is held within a container allowing unobstructed access of the sample light beam to the ophthalmic lens and unobstructed leaving of back-scattered light from the container, which container is filled with an aqueous liquid

selected from the group consisting of water, deionized water, an aqueous buffered solution, a buffered saline solution, or mixtures thereof.

7. The method according to claim 6, wherein for the inspecting of the ophthalmic lens a probe head comprising an interferometric setup and a scanning mirror and having a water dip window is used.
8. The method according to claim 1, wherein prior to evaluation of the interference pattern signals resulting therefrom are subjected to a signal enhancement.
9. The method according to claim 8, wherein the signal enhancement is accomplished using an optical amplifier.
10. The method according to claim 1, wherein from the evaluation of the interference pattern a two-dimensional section model of the ophthalmic lens is computed.
11. The method according to claim 1, wherein from the evaluation of the interference pattern a three-dimensional model of the ophthalmic lens is computed.
12. The method according to claim 1, wherein the geometrical data representing the inspected ophthalmic lens are subjected to an inverse raytracing.
13. The method according to claim 1, wherein the geometrical data representing the inspected ophthalmic lens are evaluated to determine a feature of the ophthalmic lens selected from the group consisting of a thickness profile of the ophthalmic lens, a shape of the anterior surface and/or the posterior surface of the ophthalmic lens, a curvature of the ophthalmic lens, a power of the ophthalmic lens, an edge profile of the ophthalmic lens, and combinations thereof.
14. The method according to claim 1, wherein the CAD-readable data representing the inspected ophthalmic lens are used to provide an image of at least the anterior surface and/or the posterior surface of the ophthalmic lens, respectively, and for inspecting the respective image for defects.
15. The method according to claim 1, wherein the ophthalmic lens is a contact lens.
16. The method according to claim 15, wherein the contact lens is a toric contact lens.
17. The method according to claim 15, wherein the contact lens is a silicone hydrogel lens.

18. The method according to claim 15, wherein the contact lens is a hydrated contact lens.