

Claims:

~~1. A system for producing a high contrast image of an ophthalmic lens under inspection, comprising:~~

- ~~a) a Top camera to view the ophthalmic lens through a lens module;~~
- ~~b) Motorized mechanism for positioning the Top camera at two pre-programmed positions;~~
- ~~c) three illumination modules;~~
- ~~d) said illumination modules focusing light through the ophthalmic lens under inspection, thereby producing a high contrast image of the features of the ophthalmic lens;~~
- ~~e) wherein the ophthalmic lens is contained within a cuvette with an optical power of positive of Ten;~~
- ~~f) said cuvette mounted with two optical windows, one of them being vertical and the other at an angle;~~
- ~~g) said cuvette having a transparent bottom glass suitably designed to position the ophthalmic lens under inspection;~~
- ~~h) said cuvette designed to be filled with Saline solution;~~
- ~~i) an accurately calibrated test object positioned to achieve an image of the ophthalmic lens overlaid with the image of the pattern present on the test object;~~
- ~~j) an additional illumination source comprising a laser diode; and~~
- ~~h) a second camera to view the ophthalmic lens through a slanted optical lens module.~~

~~2. A system according to claim 1, further comprising a focusing lens.~~

~~3. A system according to claim 1, further comprising a set of beam splitters.~~

~~14. A method for determination of optical power of a test ophthalmic lens the method comprising the steps of:~~

~~mMoving athe Top camera to a first position;~~

providing an inspection cuvette designed with an optical power of positive tF_{en} , comprising an optically transparent bottom glass having a concave inner surface containing a reference~~the~~ ophthalmic lens of zero optical power immersed in a liquid, and positioning the inspection cuvette in the optical axis of the ~~Top~~ camera;

providing a set of illumination sources and ~~the a Top~~ camera for receiving illumination having passed through ~~a the~~ calibration target and subsequently through the reference ophthalmic lens contained in the inspection cuvette to produce an overlaid image;

~~providing the inspection cuvette designed with an optical power of positive T_{en} , comprising the optically transparent bottom and containing the liquid with ophthalmic lens of zero optical power positioned at the center of the —bottom glass; and~~

measuring the distance and tabulating the measurements between several pre-determined set of target points representative of the optical power of the reference ophthalmic lens;-

5. ~~The method according to claim 4, further comprising the steps of:~~

Moving the ~~Top~~ camera to a first position;

~~providing an inspection cuvette designed with an optical power of positive T_{en} , comprising an optically transparent bottom glass having a concave inner surface containing the ophthalmic lens immersed in a liquid, and positioning the inspection cuvette in the optical axis of the Top Camera;~~

~~providing a set of illumination sources and a Top camera for receiving illumination having passed through the calibration target and subsequently through ophthalmic lens contained in the inspection cuvette to produce an overlaid image;~~

~~providing the inspection cuvette designed with an optical power of positive T_{en} , comprising the an optically transparent bottom glass containing the liquid with ophthalmic lens of zero optical power positioned at the center of the glass bottom ; and~~

~~Creating a calibration chart of measurements in pixels between pre-determined set of target points using several pre-selected oOphthalmic lenses with known optical power;-~~

providing the inspection cuvette designed with an optical power of positive tF_{en} , comprising the optically transparent bottom and containing the liquid with a test ophthalmic lens of zero optical power positioned at the center of the —bottom glass;

providing the set of illumination sources and the camera for receiving illumination having passed through the calibration target and subsequently through the test ophthalmic lens to produce an overlaid image; and measuring the distance between several pre-determined set of target points and determining the optical power of the test ophthalmic lens from the calibration chart.~~and~~

26. The method according to claim 15, further comprising the steps of:

Moving the Top camera to a first position;

~~providing an inspection cuvette designed with an optical power of positive Ten, comprising an optically transparent glass bottom having a concave inner surface containing the ophthalmic lens immersed in a liquid, and positioning the inspection cuvette in the optical axis of the Top camera;~~

~~providing a set of illumination sources and a Top camera for receiving illumination having passed through the calibration target and subsequently through ophthalmic lens contained in the inspection cuvette to produce an overlaid image;~~

~~measuring the distance between several pre-determined set of target points and determining the optical power from the Calibration chart; and~~

Removing and segregating the test ophthalmic lens under inspection based on its optical power.

~~7. A method for inspecting defects of an ophthalmic lens, the method comprising the steps of:~~

~~Moving the Top camera to a second position;~~

~~providing an inspection cuvette designed with an optical power of positive ten, comprising an optically transparent bottom glass having a concave inner surface containing the ophthalmic lens immersed in a liquid, and positioning the inspection cuvette in the optical axis of the Top camera;~~

~~providing a separate set of illumination sources and a Top camera for receiving illumination having passed through ophthalmic lens contained in the inspection cuvette to produce multiple enhanced images of the defects in the Ophthalmic lens;~~

~~Inspecting for defects such as scratches, tears and air bubbles within the Ophthalmic lens; and~~

~~removing the lens if the size of the defects detected in the Ophthalmic lens is beyond a predetermined size.~~

~~8. A method for determination of lens thickness of an ophthalmic lens the method comprising the steps of:~~

~~providing an inspection cuvette designed with an optical power of positive ten, comprising an optically transparent bottom glass designed to have an optical power of positive ten, having a concave inner surface containing the ophthalmic lens immersed in a liquid, and positioning the inspection cuvette in the optical axis of the Top camera;~~

~~providing a single laser illumination source and a second camera for receiving illumination directed by a set of beam deflectors and having passed through focusing lens and ophthalmic lens contained in the inspection cuvette, to produce a laser beam scattered image formed by the reflected rays, and measuring the distance between the two extremes of reflected rays of light.~~

9. The method according to claim 8, further comprising the steps of:

~~providing an inspection cuvette designed with an optical power of positive ten, comprising an optically transparent glass bottom having a concave inner surface containing the ophthalmic lens immersed in a liquid, and positioning the inspection cuvette in the optical axis of the imaging module;~~

~~providing a single laser illumination source and a second camera for receiving illumination directed by a set of beam deflectors and having passed through focusing lens and ophthalmic lens contained in the inspection cuvette, to produce a laser beam scattered image formed by the reflected rays, and measuring the distance between the two extremes of reflected rays of light; and~~

~~Creating a chart (Length in pixels vs thickness) of measurements between the two extremes of the scattered laser beams of several pre-selected lenses of known thickness, to be used as a reference for determining the lens thickness of subsequent ophthalmic lenses to be inspected.~~

10. The method according to claim 9, further comprising the steps of:

~~providing an inspection cuvette designed with an optical power of positive ten, comprising an optically transparent bottom glass having a concave inner surface containing the ophthalmic lens immersed in a liquid, and positioning the inspection cuvette in the optical axis of the second camera;~~

~~providing a single laser illumination source and a second camera for receiving illumination directed by a set of beam splitters and having passed through focusing lens and ophthalmic lens contained in the liquid filled inspection cuvette, to produce a laser beam scattered image formed by the reflected rays, and measuring the distance between the two extremes of reflected rays of light; and~~

Removing and segregating the ophthalmic lens from the Cuvette after determining the optical thickness of the lens under inspection, based on the chart plotted for Length in pixels vs thickness.