CLAIMS

1. A method of examining a lens, the method comprising;

   a. displaying on a plane surface a test pattern comprising at least one set of dots arranged to define a first ellipse in which the major and minor axes are equal, the first ellipse being an ellipse of best fit joining all the dots in the at least one set;

   b. positioning a lens to be examined between the displayed test pattern and a camera and using the camera to capture an image of the test pattern through the lens ("the lens image");

   c. deriving a second ellipse which is an ellipse of best fit joining the dots in said at least one set of dots in the test pattern from the lens image captured in step b;

   d. comparing characteristics of the second ellipse with corresponding characteristics of the first ellipse to determine the degree and nature of distortion to the test pattern and from this determining at least one parameter of the lens, including the power of the lens.

2. A method as claimed in claim 1, wherein the number of dots in said at least one set is no more than twenty, or no more than fifteen, or no more than twelve, or no more than ten, or no more than eight, or no more than six.

3. A method as claimed in claim 1, wherein said at least one set of dots comprises six dots arranged at the apexes of a notional regular hexagon.

4. A method of examining a lens as claimed in any one of claims 1 to 3, the method comprising determining the major axis and the minor axis of the second ellipse and comparing these with the major axis and the minor axis respectively of the first ellipse to determine the degree and nature of distortion to the test pattern.

5. A method as claimed in claim 4, wherein when the major and minor axes of the second ellipse are not equal, the method comprises determining a degree of astigmatism correction (cylindrical power) of the lens and the axis angle of the astigmatism correction.

6. A method as claimed in any one of the preceding claims, wherein the method is used to determine the at least one optical parameter at a single point in the lens, the method comprising aligning the optical centre of the lens with the axis of the camera and with the centre of one of said at least one set of dots before capturing the lens image and then performing the analysis in steps c and d of claim 1 in respect of said one of said at least one set of dots.

7. A method as claimed in any one of claims 1 to 5, wherein the method is used to determine said at least one optical parameter of the lens at multiple locations within an area of interest of the lens, the method comprising:

   a. in step a of claim 1, displaying a test pattern comprising a plurality of said sets of dots distributed over an area of the surface;

   b. in step b of claim 1, positioning the lens so that at least the area of interest of the lens is between the test pattern and the camera before capturing the lens image; and

   c. performing the analysis in steps c and d of claim 1 in respect of each of said sets of dots in the test pattern recorded in the lens image within the area of interest to determine said at least one optical parameter at various locations with the area of interest of the lens.

8. A method as claimed in claim 7, wherein step c of claim 7 comprises deriving a respective second ellipse for each of said sets of dots in the test pattern recorded in the lens image within the area of interest, determining a major axis and a minor axis for each respective second ellipse and comparing these with the major and minor axes respectively of a first ellipse defined by the corresponding set of dots in the original test pattern.

9. A method as claimed in any one of claims 7 and 8, wherein the test pattern comprises a plurality of dots arranged in an array of rows and columns, wherein the dots in each row are equally spaced apart by a distance which is equal to the spacing between adjacent rows, and wherein alternate rows are off-set so that the dots in any given row lie midway between the dots in adjacent rows, such that each dot (other than those at the edges of the array) is surround by six other

dots located at the apexes of a notional regular hexagon centred on the dot, wherein each set of six other dots comprises one of said sets of dots.

10. A method as claimed in claim 9, wherein the analysis in steps c and d of claim 1 is carried in respect of each set of six other (surrounding) dots within the area of interest.

11. A method as claimed in any one of the preceding claims, wherein the method comprises calibrating a system used to display the test pattern and capture the digital image by:

a. using the camera to capture a digital image of the test pattern displayed on the surface without a lens between the camera and the surface ("the system image");

b. comparing the test pattern in the system image with the original test pattern to determine the degree of distortion to the original test pattern produced by the system;

c. deriving a transform algorithm which applied to the test pattern in the system image will substantially restore it back to the original test pattern and saving the transform algorithm; and

d. subsequently when examining a lens, applying the transform algorithm to the test pattern in the lens image before carrying out the analysis in steps c and d of claim 1.

12. A system for carrying out the method according to any one of the preceding claims, the system comprising a computing device having a planar display screen, a camera mounted above the screen with the axis of the camera perpendicular to the plane of the screen, the camera being operatively connected to the computing device for storing and processing data relating to images captured by the camera; and a glasses mount for holding a pair of glasses with at least one lens located between the camera and the display screen in use; wherein the computing device is programmed to carry out the image processing and analysis steps of the method of any one of claims 1 to 11.

13. A system as claimed in claim 12, wherein the computing device is configured in use to display the test pattern in a first section of the display screen below the camera and to display the results of the examination in another section of the display screen.

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