We Claim:

1) An ophthalmic lens comprising a design that includes correction factors for near and far vision based on wavefront data and pupil size wherein said the use of the lens slows or stops the progression of myopia; and
wherein the lens comprises a convex surface with a central optic zone surrounded by a peripheral zone futher surrounded by an edge zone, and a concave surface which rests on the wearer's eye; wherein the lens power at any location in the optical zone is described by the sum of the apical distance averaged wavefront derived power plus a correction which is derived from a single, partial multiple or multiple of the difference between the distance and near average wavefront derived power at each location (x) and the difference between the apical near and distance wavefront derived powers, the optical lens power being useful in controlling or slowing the progression of myopia.

2) A method of designing a contact lens comprising:
   a) Acquiring wavefront data.
   b) Converting the wavefront data to a radial power map .
   c) Generating a lens power profile that includes correction factors for near and far vision based on wavefront data and pupil size.

3) The method of Claim 1 wherein the total population wavefront data is acquired.

4) The method of Claim 1 wherein sub-population wavefront data is acquired.

5) The method of Claim 1 wherein wavefront data for an individual are acquired.

6) The method of Claim 1 wherein the wavefront data is an average of multiple wavefront files.

7) The method of Claim 1 wherein the lens design power profile is calculated by averaging all meridians to a rotationally symmetric form.

8) The method of Claim 6 wherein the lens design power profile is calculated by the inverse of the near power profile.

9) The method of Claim 6 wherein the lens design power profile is calculated by neutralizing the negative aberration of the near power profile.

10) The method of Claim 6 wherein the lens design power profile is calculated by adding the distance to the near wavefront power profiles.

11) The method of Claim 6 wherein the lens design power profile is calculated by adding a multiple of the distance to the near wavefront power profiles.

12) The method of Claim 6 wherein the lens design power profile is calculated by adding a portion of the distance to the near wavefront power profiles.

13) An article comprising computer-usable medium having computer readable instructions stored thereon for execution by a processor to perform a method comprising: converting wavefront data characterizing an eye to a radial power map and generating a lens power profile that includes correction factors for near and far vision based on wavefront data and pupil size.

14) The article of claim 13 that produces a lens design for a lens with a convex surface with a central optic zone surrounded by a peripheral zone which is further surrounded by an edge zone, and a concave surface which rests on the wearer's eye.

15) The article of claim 14 wherein in such design the lens power at any location in the optical zone is described by the sum of the apical distance averaged wavefront derived power plus a correction which is derived from a single, partial multiple or multiple of the difference between the distance and near average wavefront derived power at each location (x) and the difference between the apical near and distance wavefront derived powers, the optical lens power being useful in controlling or slowing the progression of myopia.

16) An ophthalmic lens comprising a design that includes correction factors for near and far vision based on wavefront data and pupil size wherein said the use of the lens slows or stops the progression of myopia; and wherein lens power is determined by:

$$\boxed{Pow\Pr of = RPD_{(0)} + k_{(x)}\left(\left(RPD_{(x)} + \left(RPN_{(0)} - RPD_{(0)}\right)\right) - RPN_{(x)}\right)}$$

17) An ophthalmic lens for the slowing of myopia progression comprising:

a central optical zone, a peripheral zone, and an edge zone;

wherein the peripheral zone surrounds the optical zone, the edge zone surrounds the peripheral zone; the optical power in the central optical zone comprises a power profile which progressively increases from a power required to correct distance vision to a power at least 0.5 diopters more positive than the power required to correct distance vision, said central optical zone further comprising a maximum in the optical power profile ; and wherein the optical power in the peripheral zone has a power required to correct distance vision.

18) The lens of Claim 17 wherein the outer diameter of the central optical zone is 3.5 mm or less.

19) The lens of Claim 17 wherein the outer diameter of the central optical zone is 5.3 mm or less.

20) The lens of Claim 17 wherein the outer diameter of the peripheral zone is 8.0 mm or less.

21) An ophthalmic lens for the slowing of myopia progression comprising:

a central optical zone, a peripheral zone, and an edge zone;

wherein the peripheral zone surrounds the optical zone, the edge zone surrounds the peripheral zone; the optical power in the central optical zone comprises a power profile which progressively increases from a power required to correct distance vision to a power at least 0.5 diopters more positive than the power required to correct distance vision, said central optical zone further comprising a maximum in the optical power profile; wherein the optical power in the peripheral zone has a power profile extrapolated from that of the central optical zone.

22) The lens of Claim 21 wherein the outer diameter of the central optical zone is 3.5 mm or less.

23) The lens of Claim 21 wherein the outer diameter of the central optical zone is 5.3 mm or less.

24) The lens of Claim 21 wherein the outer diameter of the peripheral zone is 8.0 mm or less.

25) The lens of Claim 21 wherein the extrapolation is linear.

26) The lens of Claim 25 wherein the linear extrapolation maintains the power slope at the boundary of the central optical zone.

27) The lens of Claim 21 wherein the extrapolation is a higher order polynomial.

28) The lens of Claim 27 where the polynomial is at least a second order function.

29) The lens of Claim 27 where the polynomial is a continuous function with a continuous second derivative.

30) A method of slowing the progression of myopia comprising:

providing a patient with lens having a central optical zone, a peripheral zone, and an edge zone; wherein the peripheral zone surrounds the optical zone, the edge zone surrounds the peripheral zone; the optical power in the central optical zone comprises a power profile which progressively increases from a power required to correct distance vision to a power at least 0.5 diopters more positive than the power required to correct distance vision, said central optical zone further comprising a maximum in the optical power profile; and wherein the optical power in the peripheral zone has a power required to correct distance vision.

31) A method of slowing the progression of myopia comprising:

providing a patient with a lens having a central optical zone, a peripheral zone, and an edge zone; wherein the peripheral zone surrounds the optical zone, the edge zone surrounds the peripheral zone; the optical power in the central optical zone comprises a power profile which progressively increases from a power required to correct distance vision to a power at least 0.5 diopters more positive than the power required to correct distance vision, said central optical zone further comprising a maximum in the optical power profile; wherein the optical power in the peripheral zone has a power profile extrapolated from that of the central optical zone.

Claims:

1. An ophthalmic lens comprising a design that includes correction factors for near and far vision based on wavefront data and pupil size wherein the use of the lens slows or stops the progression of myopia; and
wherein the lens comprises a convex surface with a central optic zone surrounded by a peripheral zone further surrounded by an edge zone, and a concave surface which rests on the wearer's eye; wherein the lens power at any location in the optical zone is described by the sum of the apical distance averaged wavefront derived power plus a correction which is derived from a single, partial multiple or multiple of the difference between the distance and near average wavefront derived power at each location (x) and the difference between die apical near and distance wavefront derived powers, the optical lens power being useful in controlling or slowing the progression of myopia.

2. A method of designing a contact lens comprising:
acquiring wavefront data;
converting the wavefront data to a radial power map; and
generating a lens power profile that includes correction factors for near and far vision based on wavefront data and pupil size.

3. The lens as claimed in Claim 1 or the method as claimed in Claim 2, wherein the total population wavefront data is acquired.

4. The lens as claimed in Claim 1 or the method as claimed in Claim 2, wherein sub-population wavefront data is acquired.

5. The lens as claimed in Claim 1 or the method as claimed in Claim 2, wherein wavefront data for an individual are acquired.

6. The lens as claimed in Claim 1 or the method as claimed in Claim 2, wherein the wave-

front data is an average of multiple wavefront files.

7. The lens as claimed in Claim 1 or the method as claimed in Claim 2, wherein the lens design power profile is calculated by averaging all meridians to a rotationally symmetric form.

8. The lens as claimed in Claim 1 or the method as claimed in Claim 6, wherein the lens design power profile is calculated by neutralizing the natural negative power shift in the group average data of a near power profile.

9. The lens as claimed in Claim 1 or the method as claimed in Claim 6, wherein the lens design power profile is calculated as being proportional to the chord diameter from the centre of the lens.

10. The lens as claimed in Claim 1 or the method as claimed in Claim 6 wherein the lens design power profile is calculated by adding a multiple of the chord diameter from the centre of the lens.

11. The lens as claimed in Claim 1 or the method as claimed in Claim 6, wherein the lens design power profile is calculated by adding a portion of the chord diameter from the centre of the lens.

12. An article comprising computer-usable medium having computer readable instructions stored thereon for execution by a processor to perform a method comprising: converting wavefront data characterizing an eye to a radial power map and generating a lens power profile that includes correction factors for near and far vision based on wavefront data and pupil size.

13. The article of claim 12, that produces a lens design for a lens with a convex surface with a central optic zone surrounded by a peripheral zone which is further surrounded by an edge

zone, and a concave surface which rests on the wearer's eye.

14. The article of claim 13, wherein in such design the lens power at any location in the optical zone is described by the sum of the apical distance averaged wavefront derived power plus a correction which is derived from a single, partial multiple or multiple of the difference between the distance and near average wavefront derived power at each location (x) and the difference between the apical near and distance wavefront derived powers, the optical lens power being useful in controlling or slowing the progression of myopia.

15. An ophthalmic lens comprising a design that includes correction factors for near and far vision based on wavefront data and pupil size wherein said the use of the lens slows or stops the progression of myopia; and wherein lens power is determined by:

$$Pow\text{PR } of = RPD_{(0)} + k_{(x)} \left((RPD_{(x)} + (RPN_{(0)} - RPD_{(0)}) - RPN_{(X)}\right)$$

16. The lens as claimed in any one of Claims 1 to 11, wherein the lens is a contact lens.