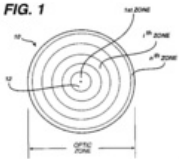
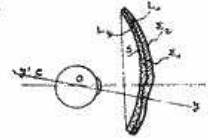
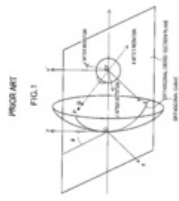
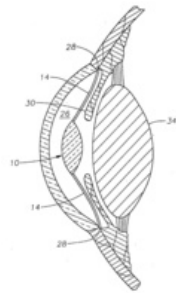
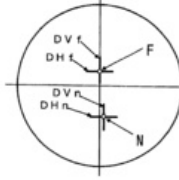
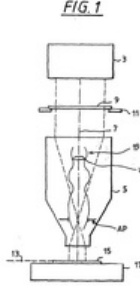
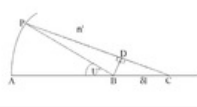
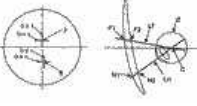
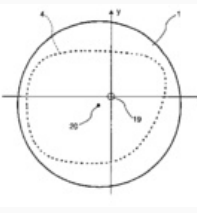
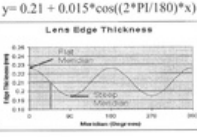
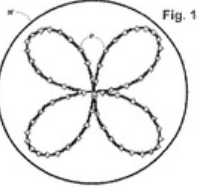
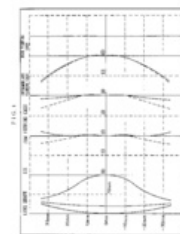


| Patent families - 625 results                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                         |                    |            |                                                                                                                                |       |                                                                                       |
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| #                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |  Title | Publication number | Publ. date | Applicant/Assignee                                                                                                             |       |                                                                                       |
| 1.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Concentric <b>aspheric multifocal lens</b>                                              | EP0741314          | 1996-11-06 | <div>JOHNSON &amp; JOHNSON VISION CARE</div> <div>JOHNSON &amp; JOHNSON</div> <div>JOHNSON &amp; JOHNSON VISION PRODUCTS</div> | 100 % |    |
| <p>Concentric <b>aspheric multifocal lens</b> designs are disclosed which use a combination of an <b>aspheric</b> front surface, which results in aberration reduction and contrast vision enhancement, along with a concentric multifocal back surface, to produce a <b>lens</b> design which affords clear vision at a distance and also near without a loss in contrast which is generally typical of prior art simultaneous vision, concentric multifocal <b>lens</b> designs. The <b>aspheric</b> surface improves the modulation transfer function (MTF) of the <b>lens eye</b> combination which improves the focus and contrast of both distance and near images. The design form is valid for contact lenses and intraocular lenses.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                         |                    |            |                                                                                                                                |       |                                                                                       |
| 2.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Anastigmatic optical systems having <b>aspherical surfaces</b>                          | FR2565358          | 1985-12-06 | <div>BACH GUY</div>                                                                                                            | 98 %  |    |
| <p>The invention relates to lenses having <b>aspherical</b> surfaces which can be used as ophthalmic lenses of progressive power which are corrected, over the entire field of vision, from deformations due to astigmatism. According to a preferred embodiment of the invention, the <b>lens</b> is a doublet. The <b>lens</b> L1, delimited by the <b>aspherical dioptic</b> elements SIGMA 1 and SIGMA 2 of revolution about the same axis y'y, has a power variation in an annular zone delimited by <b>two aspherical</b> rings connected continuously to spherical rings of opposite <b>curvatures</b>. The spherical <b>dioptic</b> element S of the <b>lens</b> L2 enables the power of the <b>lens</b> to be matched to the prescription. The spherical <b>dioptic</b> element is replaced by a toric <b>dioptic</b> element for correcting the astigmatism of the <b>eye</b>. The optical system can be applied to special objectives or to large-field eyepieces. &lt;IMAGE&gt;</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                         |                    |            |                                                                                                                                |       |                                                                                       |
| 3.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | <b>Aspherical spectacle lens</b>                                                        | EP0886166          | 1998-12-23 | <div>HOYA</div>                                                                                                                | 98 %  |   |
| <p>An <b>aspherical lens</b> by which residual aberration in all of third <b>eye</b>-positions is corrected and which the center or edge thickness can be reduced. Thus, this <b>aspherical lens</b> employs a first or second <b>curved</b> surface represented by the following <b>equation</b>: &lt;MATH&gt; where (x, y, z) represents the coordinates of a point on an <b>aspherical</b> surface and satisfies (y ELEMENT Aa, bU) INTERSECTION (z ELEMENT Ac, dU); my is an order of a spline function in the direction of the y-axis (in this case, an integer which is not less than 4); mz is an order of the spline function in the direction of the z-axis (in this case, an integer which is not less than 4); ny is the number of inner knots in Aa, bU in the direction of the y-axis (in this case, an integer which is not less than 4); Nz is the number of inner knots in Ac, dU in the direction of the z-axis (in this case, an integer which is not less than 4); Nmy,i (y) represents an ith my-th-order normalized B-spline function in the case that knots in the direction of the y-axis are xi 0, xi 1, xi 2, ..., xi ny+2my-1 (incidentally, "i" is an integer within A0, ny+my-1U and the position of each knot meets the following condition: xi 0 &lt;= xi 1 &lt;= ... &lt;= xi my-1 &lt;= a &lt; xi my &lt;= ... &lt;= xi ny+my-1 &lt;b &lt;= xi ny+my &lt;= ... &lt;= xi ny+my+1; Nmz,i (z) represents an ith mz-th-order normalized B-spline function in the case that knots in the direction of the z-axis are xi 0, xi 1, xi 2, ..., xi nz+2mz-1 (incidentally, "j" is an integer within A0, nz+mz-1U and the position of each knot meets the following condition: xi 0 &lt;= xi 1 &lt;= ... &lt;= xi mz-1 &lt;= c &lt; xi mz &lt;= ... &lt;= xi nz+mz-1 &lt;d &lt;= xi nz+mz &lt;= ... &lt;= xi nz+2mz-1; and ci,j is a coefficient. &lt;IMAGE&gt;</p> |                                                                                         |                    |            |                                                                                                                                |       |                                                                                       |
| 4.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Contrast-enhancing <b>aspheric intraocular lens</b>                                     | EP1838245          | 2007-10-03 | <div>NOVARTIS</div> <div>ALCON</div>                                                                                           | 98 %  |  |
| <p>The present inventions provides an intraocular <b>lens</b> (IOL) having an optic with a posterior and an anterior refractive surfaces, at least one of which has an <b>aspherical</b> profile, typically characterized by a non-zero conic constant, for controlling the aberrations of a patient's <b>eye</b> in which the IOL is implanted. Preferably, the IOL's <b>asphericity</b>, together with the aberrations of the patient's <b>eye</b>, cooperate to provide an image contrast characterized by a calculated modulation transfer function (MTF) of at least about 0.25 and a depth of field of at least about 0.75 <b>diopters</b>.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                                                         |                    |            |                                                                                                                                |       |                                                                                       |
| 5.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Double-sided progressive power <b>lens</b>                                              | EP1510852          | 2005-03-02 | <div>HOYA</div>                                                                                                                | 98 %  |  |
| <p>To provide a bi-<b>aspherical</b> type progressive-power <b>lens</b> which provides an excellent visual acuity correction for prescription values and a wide effective visual field with less distortion in wearing, by reducing a magnification difference of an image between a distance portion and a near portion. The <b>lens</b> is characterized in that when on a first refractive surface being an object side surface, a surface refractive power in a horizontal direction and a surface refractive power in a vertical direction, at a far vision <b>diopter</b> measurement position F1, are DHf and DVf respectively, and on the first refractive surface, a surface refractive power in a horizontal direction and a surface refractive power in a vertical direction, at a near vision <b>diopter</b> measurement position N1, are DHn and DVn respectively, relational equations, DHf + DHn &lt; DVf + DVn, and DHn &lt; DVn are satisfied, and surface astigmatism components at F1 and N1 of the first refractive surface are cancelled by the second refractive surface being an eyeball side surface so that the first and second refractive surfaces together provide a far vision <b>diopter</b> (Df) and an addition <b>diopter</b> (ADD) based on prescription values. &lt;IMAGE&gt;</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                                                         |                    |            |                                                                                                                                |       |                                                                                       |

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| 6.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | Projection <b>lens</b> comprising adjacent <b>aspheric lens</b> surfaces                                                        | EP1242843     | 2002-09-25 | <div>CARL ZEISS</div> <div>CARL ZEISS SMT</div> <div>CARL ZEISS STIFTUNG</div> <div>ZEISS STIFTUNG</div> | 97 % |
| <p>The invention relates to a projection <b>lens</b> comprising at least five groups of lenses G1 - G5 and several <b>lens</b> surfaces, in which at least <b>two</b> of the <b>lens</b> surfaces lie adjacent to one another. Said adjacent <b>lens</b> surfaces are referred to as a double <b>aspheric lens</b>. The double <b>aspheric lens</b> or lenses (21) are positioned at a minimum distance from an image plane O', said distance being greater than the maximum <b>lens</b> diameter (D2) of the <b>lens</b>.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                                                                                                                 |               |            |                                                                                                          |      |
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| 7.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | Using the light adjustable <b>lens</b> (lal) to increase the depth of focus by inducing targeted amounts of <b>asphericity</b>  | EP2756026     | 2014-07-23 | <div>RXSIGHT</div> <div>CAL HAUN VISION ROYALTY DE REI</div> <div>CALHOUN VISION</div>                   | 97 % |
| <p>In general, the present invention relates to optical elements, which can be modified post- manufacture such that different versions of the element will have different optical properties. In particular, the present invention relates to lenses, such as intraocular lenses, which can be converted into <b>aspheric</b> lenses post-fabrication. Also, the present invention relates to a method for forming <b>aspheric</b> lenses post-fabrication.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                                                                                                 |               |            |                                                                                                          |      |
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| 8.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | Both-sided progressive spectacle <b>lens</b>                                                                                    | EP1691232     | 2006-08-16 | <div>HOYA</div>                                                                                          | 97 % |
| <p>To provide a bi-<b>aspherical</b> type progressive-power <b>lens</b> which provides an excellent visual acuity correction for prescription values and a wide effective visual field with less distortion in wearing, by reducing a magnification difference of an image between a distance portion and a near portion of a <b>lens</b>, and a method of designing the same. A progressive action of a progressive-power <b>lens</b> is divided in the vertical direction and the horizontal direction of the <b>lens</b> and then an optimal sharing ratio between the front and rear <b>two</b> surfaces of the object side and the eyeball side is set in each direction to configure one bi-<b>aspherical</b> type progressive-power <b>lens</b>, a sharing ratio of a progressive action in the horizontal direction of a rear surface (eyeball side surface) is set higher so that an advantage of increasing the visual field in the horizontal direction can be obtained, a sharing ratio of a progressive action in the vertical direction of a front surface (object side surface) is set higher so that a disadvantage of increasing an eyeball turning angle between the distance and near portions in the vertical direction can be restrained, also a wide effective visual field with less distortion in wearing can be provided by reducing a magnification difference of an image between the distance portion and the near portion on the progressive-power <b>lens</b>, further making it possible to obtain a bi-<b>aspherical</b> type progressive-power <b>lens</b> capable of reducing a machining time and cost by making it possible to machine only the surface of an eyeball side as a bilaterally asymmetrical <b>curved</b> surface coping with a convergence action of an <b>eye</b> in near vision after receiving an order, by using "bilaterally symmetrical semi-finished product" as an object side surface of the progressive refractive power <b>lens</b>.</p> |                                                                                                                                 |               |            |                                                                                                          |      |
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| 9.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | <b>Aspherical</b> spectacle <b>lens</b> with geometric center spaced from framing reference point and processing method thereof | US20020089642 | 2002-07-11 | <div>HOYA LENS</div> <div>ASAHI OPTICAL</div> <div>PENTAX</div>                                          | 97 % |
| <p>Disclosed are a single-vision <b>aspherical</b> spectacle <b>lens</b> to correct eyesight and a processing method thereof. The spectacle <b>lens</b> has front and back surfaces, one of which is an <b>aspherical</b> surface. A framing reference point that is coincident with a pupil position of a user when the <b>lens</b> is installed on a frame is decentered from a geometrical center of an uncut circular <b>lens</b> (a semifinished <b>lens</b> blank or an uncut finished <b>lens</b>). Further, the symmetric axis of the <b>aspherical</b> surface passes the framing reference point. With this construction, a <b>lens</b> blank of small-size can be employed for manufacturing a spectacle <b>lens</b> for a large-size frame, and the optical performance can be kept high.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                 |               |            |                                                                                                          |      |
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| 10.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | <b>Aspheric</b> toric intraocular <b>lens</b>                                                                                   | EP2273950     | 2011-01-19 | <div>ALCON</div> <div>NOVARTIS</div>                                                                     | 96 % |
| <p>An <b>aspheric</b> toric intraocular <b>lens</b> (IOL) having toricity and <b>asphericity</b> in a single <b>lens</b>. The toricity and <b>asphericity</b> may be provided on separate surfaces, such as an anterior surface and a posterior surface, or the toricity and <b>asphericity</b> may be combined onto a single surface. The edge thickness may be varied sinusoidal to maintain equal edge thickness at 45 degree meridian.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                                                                                                                 |               |            |                                                                                                          |      |
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| 11.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Method and apparatus for universal improvement of vision                                                                        | EP2392283     | 2011-12-07 | <div>SCIENTIFIC OPTICS</div>                                                                             | 96 % |
| <p>"Universal improvement" of vision is achieved by effectively changing the shape of the anterior refracting surface of the <b>cornea</b> to an ideal "turtleback" shape, on which is imposed the necessary <b>curvature</b> adjustment to achieve correction of distance vision. In accordance with one embodiment, the <b>cornea</b> is actually formed to the turtleback shape through corneal surgery, preferably laser ablation surgery. In accordance with a second embodiment, a contact <b>lens</b> with the desired distance corrected ideal turtleback shape on its anterior surface is positioned over the <b>cornea</b>.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                 |               |            |                                                                                                          |      |
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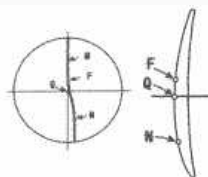
12. **Aspherical eyeglass lens** EP0990938 2000-04-05 HOYA 96 %

In a single-vision **aspherical** spectacle **lens** having a pair of first and second refractive surfaces, the shape of the first refractive surface and/or the second refractive surface is defined by the following **equation**, where  $m_i$  designates a real number which is not less than 2;  $n$  an integer which is not less than 1;  $X$  a length of a perpendicular dropped or drawn from a point, which is positioned on the **aspherical** surface and is located at a distance  $\rho$  from an optical axis to a tangent or tangential plane, which touches the **aspherical** surface at a vertex thereof;  $C$  **curvature** of a reference spherical surface at the vertex of the **aspherical** surface;  $\rho$  a distance from the optical axis;  $k$  a conic constant; and  $A_{mi}$  what is called an **aspherical-surface** coefficient of  $\rho^{2mi}$ . Further, in a design stage of this **aspherical lens**, the shape of the **lens** is determined by taking an oblique astigmatic error and/or a mean oblique error into consideration when decentration is caused, in such a manner as to reduce degradation in performance of the **lens**, which is caused owing to the decentration.



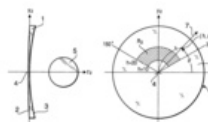
13. **Method of producing a group of double progressive spectacle lenses** EP1906227 2008-04-02 HOYA KHOJA KORPOREJSHN 96 %

There is provided a group of bi-**aspherical** type progressive-power lenses for which the processing costs are reduced. In a bi-**aspherical** type progressive-power **lens** (es), the relationships  $DH_f + DH_n < DV_f + DV_n$  and  $DH_n < DV_n$  or further,  $DV_n - DV_f > ADD/2$  and  $DH_n - DH_f < ADD/2$  are satisfied;  $DH_f$  and  $DV_f$  are designated respectively as a surface refractive power in a horizontal direction and a surface refractive power in a vertical direction at a far vision power measurement position  $F_1$  on a first refractive surface that acts as an object-side surface; with  $DH_n$  and  $DV_n$  are designated respectively as a surface refractive power in a horizontal direction and a surface refractive power in a vertical direction at a near vision power measurement position  $N_1$  on the first refractive surface; a surface astigmatism component at  $F_1$  and  $N_1$  of the first refractive surface is canceled by a second refractive surface of the **eye**-side surface; and the first and second refractive surfaces are combined to provide a far vision power ( $D_f$ ) and an addition ( $ADD$ ) on the basis of a prescription; wherein the same first refractive surface is used for at least **two** or more kinds of different addition power.



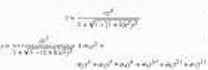
14. **Aspherical spectacle lens** US20040174494 2004-09-09 HOYA LENS PENTAS PENTAX 96 %

There is provided a spectacle **lens** having an outer surface and an inner surface, one of the outer and inner surfaces being configured to be a rotationally-asymmetrical **aspherical** surface. When a **curvature** at a coordinate  $(h, \theta)$  of the outer surface is represented by  $C_1(h, \theta)$ , a **curvature** at a coordinate  $(h, \theta)$  of the inner surface is represented by  $C_2(h, \theta)$ , and a difference between **curvatures** of the outer surface and the inner surface at the coordinate  $(h, \theta)$  is represented by  $C_2 - C_1$ , if  $C_2 - C_1(0, \theta) > 0$ , within the ranges of  $10 \text{ mm} < h[\text{mm}] < 20 \text{ mm}$  and  $30^\circ < \theta[\text{deg}] < 150^\circ$  the spectacle **lens** satisfying a condition



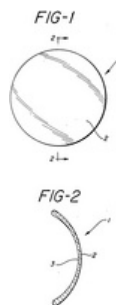
15. **Toric contact lenses with controlled optical power profile** EP2057501 2009-05-13 ALCON NOVARTIS 96 %

The present invention provides a toric contact **lens** having a controlled optical power profile. In addition, the invention provides a series of toric contact lenses, each having a series of different targeted cylindrical optical powers and a series of different targeted spherical optical powers, and each having a spherical aberration profile in which (1) the optical power deviations of the **lens** are substantially constant; (2) power deviation at a distance of 3 mm from the optical axis is from about -0.5 **diopter** to about -1.5 **diopters**; (3) power deviation at a distance of 3 mm from the optical axis is from about 0.2 **diopter** to about 1.0 **diopter** smaller than power deviations at a distance of 2 mm from the optical axis; or (4) there is a spherical aberration component described by any one of fourth order, sixth order, eighth order Zernike spherical aberration-like terms, or combination thereof, wherein the spherical aberration component has a value of -0.5 **diopter** to about -1.5 **diopters** at a distance of 3 mm from the optical axis.



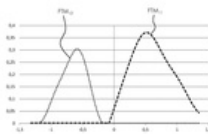
16. **Method of producing lenses.** EP0472291 1992-02-26 JOHNSON & JOHNSON VISION CARE JOHANSON & JOHANSON VISION P JOHNSON & JOHNSON JOHNSON & JOHNSON VISION PRODUCTS 95 %

An **aspheric lens** for providing improved vision and a method for generating such a **lens** is described. The **lens** provides a sharp image focus while minimizing image aberrations. The method utilizes ray tracing techniques in conjunction with Modulation Transfer functions to accurately account for the total corrective **lens-eye** system. The **lens** may be in the form of a contact **lens**, an intraocular **lens**, a natural **lens** or a spectacle **lens**, and is suitable for correcting myopia, presbyopia, astigmatism and other focusing problems. The **lens** is characterized by a hyperbolic or parabolic surface which functions to reduce spherical aberrations and minimize the retinal image spot size.



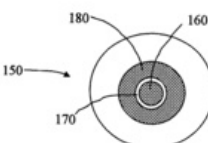
17. **Intraocular lens with an extended depth of focus** WO2018/055073 2018-03-29 PYNON JOEL 95 %

An intraocular **lens** designed to be mounted in an **eye**, said **lens** comprising at least one rear face designed to be directed towards the retina and one front face designed to be turned towards the **cornea**. The front face comprises at least one front optical surface comprising first **asphericities** that define a through-focus modulation transfer function (FTM11), for a spatial frequency of 30 cycles per millimetre, which is asymmetrical. The rear face comprises at least one rear optical surface comprising second **asphericities** defining a through-focus modulation transfer function (FTM12), for a spatial frequency of 30 cycles per millimetre, which is asymmetrical and opposite that of the front optical surface such that the **lens** has an extended depth of focus.

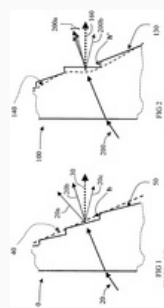
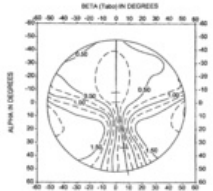
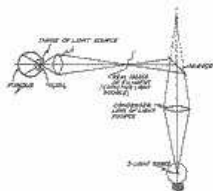
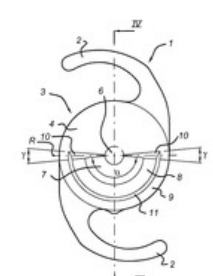
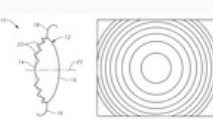


18. **Aspherical diffractive ophthalmic lens** EP1889115 2008-02-20 VISION ADVANCEMENT 95 %

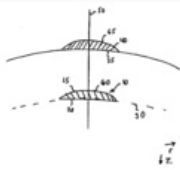
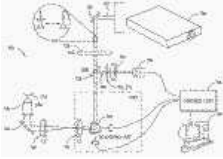
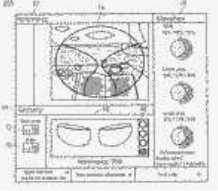
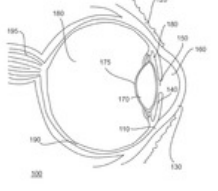
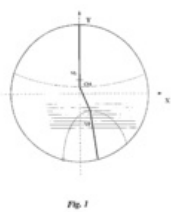
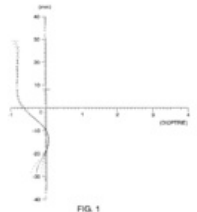
A multifocal ophthalmic **lens** includes a **lens** element having anterior and posterior surfaces with a central **aspherical** refractive zone disposed on one of the anterior and posterior surfaces; and a diffractive bifocal zone disposed outside of the **aspherical** refractive zone. The central **aspherical** refractive zone may be disposed on the anterior surface and the diffractive bifocal zone may be disposed on the posterior surface.

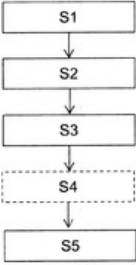
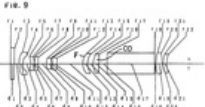
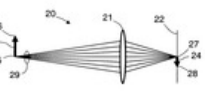
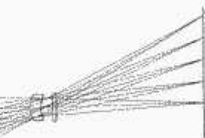
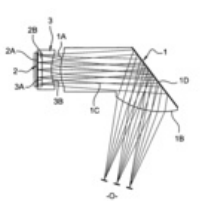
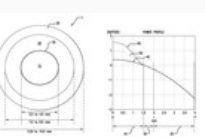
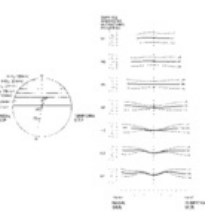




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|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------|-----------|------------|----------------------------------------------------------------------------------------------------------------------------------------------------------|------|---------------------------------------------------------------------------------------|
| 25.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | <b>Aspheric multifocal diffractive ophthalmic lens</b>                        | EP2021914 | 2009-02-11 | <div><div>AAREN SCIENTIFIC</div><div>VISION ADVANCEMENT</div><div>PORTNEY VALDEMAR</div></div>                                                           | 94 % |    |
| <p>A multifocal ophthalmic <b>lens</b> includes a <b>lens</b> element having an anterior surface and a posterior surface, a refractive zone, or base surface having <b>aspherically</b> produced multifocal powers disposed on one of the anterior and posterior surfaces; and a near focus diffractive multifocal zone disposed on one of the anterior and posterior surfaces.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                                               |           |            |                                                                                                                                                          |      |                                                                                       |
| 26.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | <b>Ophthalmic lens</b>                                                        | EP1791014 | 2007-05-30 | <div><div>ESSILOR INTERNATIONAL</div><div>ESILOR ENTEREL NATIONAL</div></div>                                                                            | 94 % |    |
| <p>The progressive multifocal ophthalmic <b>lens</b> with a complex surface including a prism reference point, a cross mounting unit located at 8[deg] above the reference point, and an umbilicated progression meridian with a power addition value of <math>\geq 1.5</math> <b>diopter</b>. The power addition value lies between the reference point of far and near vision. Radius of <b>curvature</b> of the <b>lens</b> is adjusted for the far vision using a reduced root mean square deviation with the power addition lower than 0.65 <math>\mu\text{m}</math> by <b>diopter</b>. The progressive multifocal ophthalmic <b>lens</b> with a complex surface including a prism reference point, a cross mounting unit located at 8[deg] above the reference point, and an umbilicated progression meridian with a power addition value of <math>\geq 1.5</math> <b>diopter</b>. The power addition value lies between the reference point of far and near vision. Radius of <b>curvature</b> of the <b>lens</b> is adjusted for the far vision using a reduced root mean square deviation with the power addition lower than 0.65 <math>\mu\text{m}</math> by <b>diopter</b>, a zone bounded by a centered circle on the prism reference point and by a diameter of the circle corresponding to sweep angle of 80[deg], a progression length is <math>\approx 25</math>[deg], and a difference in reduced root mean square deviation is lower than 0.12 <math>\mu\text{m}</math> by <b>diopter</b>. The reduced root mean square deviation is determined by calculating the nullified coefficient of orders of 1 and 2 correspond to defocalization in Zernike polynomial decomposition of a wave front face passes through the <b>lens</b>. The progression length is defined as lower common angle of the cross mounting unit up to the point of the meridian for which an optical power carrier reaches 85% of the power addition value. The difference in the reduced root mean square deviation is calculated by an absolute value. The zone comprises a control point of far vision in which the zone is bounded by the half centered circle on the cross mounting unit and by radius of the circle corresponds to an elevation of 25[deg]. The difference in the reduced root mean square deviation between <b>two</b> symmetrical points in half circle is <math>\approx 0.12</math> <math>\mu\text{m}</math> by <b>diopter</b> below a horizontal line located at 8[deg] above the cross mounting unit. The half circle has a horizontal base that passes through the cross mounting unit. The symmetrical axis of the half circle is scattered with the progression meridian. Independent claims are included for: (1) a visual equipment; (2) a long-sighted vision correction process; and (3) a <b>lens</b> assembling process.</p> |                                                                               |           |            |                                                                                                                                                          |      |                                                                                       |
| 27.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | <b>Indirect ophthalmoscopy lens for use with slit lamp biomicroscope</b>      | EP0221145 | 1987-05-13 | <div><div>TRUST UNDER THE WILL OF DAVID VOLK</div><div>VOLK OPTICAL</div><div>BAND JORDAN C</div><div>VOLK DAVID</div><div>VOLK MYRON</div></div>        | 94 % |   |
| <p>A very strong plus symmetrical double <b>aspheric lens</b> (L) is used as a condensing-image-forming <b>lens</b> for indirect ophthalmoscopy with the slit lamp biomicroscope. The patient is seated at the slit lamp biomicroscope with his head held firmly in position by the chin rest and head support. The light beam from the slit lamp, with its slit open fully, is directed at the indirect ophthalmoscopy <b>lens</b> of this invention which converges the light beam to an image of the light source at or near the center of the pupil (P) of the <b>eye</b>. The light beam then diverges to illuminate the fundus (F) of the <b>eye</b>. An inverted aerial image (I) of the fundus of the <b>eye</b> is then formed by the <b>lens</b> of this invention of the light emerging from the <b>eye</b> and is viewed monocularly or binocularly and stereoscopically with the binocular biomicroscope of the slit lamp which can magnify the aerial image from 7 to 40 times. The <b>lens</b> of this invention is a small diameter symmetrical double <b>aspheric lens</b> whose coaxial surfaces are of decreasing <b>curvature</b> from the apices peripheralward with the sum of the axial <b>dioptric</b> powers of the front and back surfaces ranging from 60 <b>diopters</b> to 130 <b>diopters</b>. The design of the surfaces of the <b>lens</b> is such that a flat aerial image of the fundus of the <b>eye</b> is formed from the light emerging from the <b>eye</b> in which the aberrations including field <b>curvature</b>, astigmatism, and distortion are corrected.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                               |           |            |                                                                                                                                                          |      |                                                                                       |
| 28.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | <b>Intraocular lens with optical sectors</b>                                  | EP2219065 | 2010-08-18 | <div><div>OCULENTIS HOLDING</div><div>OCULENTIS</div><div>OCULENTIS B V</div><div>OCULENTIS</div><div>OKULENTIS KHOLDING</div><div>1 more...</div></div> | 94 % |  |
| <p>The invention relates to an An intra ocular <b>lens</b> (IOL) (1) comprising a <b>lens</b> (3) with a main <b>lens</b> part (4) having a surface, a recessed part (7, 8) having a surface which is recessed with respect to said surface of said main <b>lens</b> part (4), an optical centre, and an optical axis (R) through said optical centre, said main <b>lens</b> part (4) having at least one boundary with said recessed part, said main <b>lens</b> part (4) having an optical power of between about -20 to about +35 <b>dioptré</b>, said recessed part (7, 8) positioned at a distance of less than 2 mm from said optical centre and comprising a near part having a relative <b>dioptra</b> of about +1.0 to about +5.0 with respect to the optical power of said main <b>lens</b> part (4), said boundary or boundaries of said recessed <b>lens</b> part with said main <b>lens</b> part form a blending part or blending parts (10, 11) shaped to refract light away from said optical axis, said IOL (1) further comprising a central part (6) which has a relative optical power of about -2.0 to +2.0 <b>dioptré</b> with respect to said main <b>lens</b> part (4), wherein said central part (6) fits within a circumscribing circle with a diameter of about 0.60-1.20 mm.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                                               |           |            |                                                                                                                                                          |      |                                                                                       |
| 29.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | <b>Lens surface with combined diffractive, toric, and aspheric components</b> | EP2190384 | 2010-06-02 | <div><div>ALCON</div><div>ALCON MANUFACTURING</div><div>ALCON RESEARCH</div><div>NOVARTIS</div></div>                                                    | 94 % |  |
| <p>In one aspect, the present invention provides an intraocular <b>lens</b> (IOL) that includes an optic comprising an anterior surface, a posterior surface, and a plurality of diffractive zones disposed on one of those surfaces. The surface having the diffractive zones has a profile characterized by a combination of <b>aspheric</b> and toric components.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                               |           |            |                                                                                                                                                          |      |                                                                                       |

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|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------|---------------|------------|------------------------------------------------------------------------------------------------------|------|
| 30.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | <b>A method of modifying an <b>dioptric</b> function of an ophthalmic <b>lens</b> surface</b>                                          | EP3143457     | 2017-03-22 | ESSILOR INTERNATIONAL                                                                                | 94 % |
| <p>A method implemented by computer means of modifying an initial <b>dioptric</b> function of an initial ophthalmic <b>lens</b> surface, for manufacturing an ophthalmic <b>lens</b>, the method comprising: - an initial surface providing step (S1), during which an initial surface Sini associated with a first coordinate system is provided, said initial surface Sini comprising a plurality of surface points P1, each surface point P1 having a mean sphere Sph(P1) and a cylinder Cyl(P1), said initial surface Sini providing said initial <b>dioptric</b> function, - a modifying surface selection step (S2), during which a number n of nonzero modifying surfaces Smod1,..., Smod n is selected, said modifying surfaces Smod1,..., Smod n being associated with a second coordinate system, the modifying surface Smod 1 comprising a plurality of surface points P i1, ...P i j, ..., P i mi, each surface point P i j having a mean sphere Sph(P i j) and a cylinder Cyl(P i j), n, i, j, m i being integers with <math>n \geq 1</math>, <math>1 \leq i \leq n</math>, <math>1 \leq j \leq m i</math> and <math>m i \geq 1</math>, - an orientation step (S3), during which the relative position and orientation of the first coordinate system and the second coordinate system is determined, a combining step (S4), during which the initial surface Sini and the n modifying surfaces are combined to obtain a functionalized ophthalmic <b>lens</b> surface according to the expression : <math>S_{func} = S_{ini} + \sum_{i=1}^n \alpha_i S_{mod i}</math>, wherein the normalized sphere standard deviation of the normalized sphere values Sph' Smodi of a normalized modifying surface SNmod i is smaller than or equal to 0.2, with : the normalized modifying surface SNmod i corresponding to the modifying surface Smod i to which the best sphero-toric surface has been subtracted, and the normalized sphere values over the normalized modifying surface SNmod i at a point P i j of Smod i having the coordinate (x,y,z) being : (I) Sph N Smod,i (x,y) being the sphere over the normalized modifying surface SNmod i, at the point of SNmod i having the coordinate (x,y), 30 max(Sph N Smod,i) being the greatest value of sphere over the normalized modifying surface SNmod i, min(Sph N Smod,i) being the smallest value of sphere over the normalized modifying surface SN mod i, alpha i being a nonzero weighting coefficient.</p> |                                                                                                                                        |               |            |                                                                                                      |      |
| 31.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | <b>Intraocular <b>lens</b> having extended depth of focus</b>                                                                          | EP2334260     | 2011-06-22 | JOHNSON & JOHNSON SURGICAL VISION<br>ABBOTT MEDICAL OPTICS<br>AMO GRONINGEN<br>AMO REGIONAL HOLDINGS | 94 % |
| <p>An ophthalmic <b>lens</b> for providing enhanced or extended depth of focus includes an optic having an aperture disposed about an optical axis. The optic includes a first surface having a first shape and an opposing second surface having a second shape, the first and second surfaces providing, a base power and, in some embodiments an add power. The optic further includes an extended focus mask disposed upon at least one of the first shape and the second shape that is configured to provide the enhanced or extended depth of focus for one or more foci of the optic, as compared to a similar optic not having the extended focus mask.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                                        |               |            |                                                                                                      |      |
| 32.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | <b>Method for designing a pair of progressive refractive power <b>lens</b></b>                                                         | EP2224276     | 2010-09-01 | HOYA                                                                                                 | 94 % |
| <p>An object is to reduce the inconvenience given to the binocular vision function when wearing and using spectacles making use of a pair of progressive power lenses having different distance <b>dioptric</b> power for right and left. For this reason, the present invention associates, in a pair of progressive power lenses corresponding to the right and left eyes, an average <b>dioptric</b> power distribution and an astigmatism distribution determined from prescribed <b>dioptric</b> power and a wear state of one of the progressive power lenses with an average <b>dioptric</b> power distribution and an astigmatism distribution determined from prescribed <b>dioptric</b> power and a wear state of the other progressive power <b>lens</b>, and thereby average <b>dioptric</b> power distributions and astigmatism distributions of the respective progressive power lenses are changed.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                        |               |            |                                                                                                      |      |
| 33.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | <b>Aspheric lenses and <b>lens</b> family</b>                                                                                          | WO2007/047427 | 2007-04-26 | BAUSCH & LOMB                                                                                        | 94 % |
| <p>The invention is directed to a multi-component accommodating intraocular <b>lens</b> (A-IOL) . In a particular embodiment, the A-IOL introduces substantially no residual spherical aberration to a wavefront incident upon and passing through the A-IOL. According to an aspect, the A-IOL will have substantially no inherent spherical aberration. In an aspect, the posterior <b>lens</b> component of the A-IOL may have a diffractive or Fresnel optical surface to control a physical characteristic of the A-IOL.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                                                                                                        |               |            |                                                                                                      |      |
| 34.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | <b>Contact <b>lens</b></b>                                                                                                             | EP0990191     | 2000-04-05 | SCIENTIFIC OPTICS                                                                                    | 94 % |
| <p>A contact <b>lens</b> for use with an asymmetric <b>aspherical cornea</b>. The <b>lens</b> includes an anterior surface, a posterior surface and a base. The posterior and anterior surfaces each include a center optical portion (36) and an outer peripheral corneal portion (34). The posterior surface is divided into a plurality of local surface segments (66) by a plurality of radially extending boundaries that originate from a common center point on the posterior surface of the <b>lens</b>. Each of the local surface segments (66) conforms to the shape of a corresponding local surface portion of the <b>cornea</b> that lies under the respective <b>lens</b> local surface segment when the <b>lens</b> is worn on the <b>eye</b>.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                                                                                                        |               |            |                                                                                                      |      |
| 35.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | <b>Aspherical spectacle <b>lens</b> and method of manufacture</b>                                                                      | EP0053780     | 1982-06-16 | DENSO<br>SUMITOMO ELECTRIC INDUSTRIES<br>BMC INDUSTRIES                                              | 94 % |
| <p>The invention relates to <b>aspherical eye</b> lenses (10) and a method of manufacturing these <b>eye</b> lenses (10). It relates in particular to aphakia lenses having a cylindrical ocular surface, the meridians (11, 12) being perpendicular to one another. In the method according to the invention, a <b>lens</b> having a known spherical refractive power is selected, and the tangential <b>curve</b> for this is determined. The second <b>lens</b> surface is selected such that the differential between the refractive power of the first and second <b>lens</b> surfaces has a specific value which is approximately equal to the cylindrical value of the aphakia <b>lens</b>. The <b>two</b> tangential <b>curves</b> are then compared with one another, in order to determine the distance (A) which effects the essentially equal values of the tangential <b>curves</b>. Subsequently, a <b>lens</b> is manufactured whose pole is offset with respect to the normal line of sight through the <b>lens</b> by an amount which is approximately equal to the distance (A) mentioned. &lt;IMAGE&gt;</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                                                                                                        |               |            |                                                                                                      |      |
| 36.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | <b>Method and device for generating retinal images using the stigmatism of the <b>two</b> foci of a substantially elliptical sight</b> | EP1714179     | 2006-10-25 | LASTER<br>HAMDANI RACHID<br>LA SOCIÉTÉ LASTER<br>LASITE<br>LIU ZILE<br>1 more...                     | 93 % |
| <p>A method for generating retinal images using the stigmatism of the <b>two</b> foci (F, F') of a substantially elliptical sight (E) with a semi-reflective surface, wherein a so-called object focus consisting of the diaphragm of a pinhole disc forming the convergence point of an image generated by a light-emitting display or a collimated light source is positioned adjacent to the first focus (F) of the substantially elliptical sight (E), a so-called image focus consisting of the pupil or the centre of the user's <b>eye</b> (OE) is positioned adjacent to the second focus (F') of said substantially elliptical sight (E), and the image generated by said light-emitting display or said collimated light source and reflected by the semi-reflective surface of the substantially elliptical sight (E) is projected adjacent to the retina of the user's <b>eye</b>.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                                                                                        |               |            |                                                                                                      |      |

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                                                   |           |            |                                                                                                                                 |                                                                                       |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------|-----------|------------|---------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|
| 37.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Design of inlays with intrinsic <b>diopter</b> power                                              | EP2019651 | 2009-02-04 | REVISION OPTICS                                                                                                                 | 93 %                                                                                  |
| <p>Described herein are designs and design methods for intracorneal inlays with intrinsic dioper power (i.e., index of refraction different from the surrounding <b>cornea</b> tissue). The designs and design methods achieve a desired refractive change by a combination of the intrinsic <b>diopter</b> power of the inlay and the physical shape of the inlay, which alters the shape of the anterior <b>cornea</b> surface.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                   |           |            |                                                                                                                                 |    |
| 38.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | System for forming and modifying lenses and lenses formed thereby                                 | EP2542183 | 2013-01-09 | PERFECT IP<br>AAREN SCIENTIFIC<br>PERFECT LENS<br>PERFECT PUSHUP 2 BELVEDERE<br>PLACE SUITE 330 MILL VALLEY<br>CALIFORNIA 94941 | 93 %                                                                                  |
| <p>A <b>lens</b> for placement in a human <b>eye</b>, such as an intraocular <b>lens</b>, has at least some of its optical properties modified with a laser. The <b>lens</b> preferably contains at least 5% by weight UV absorber so commercially feasible rates of manufacture can be achieved. The laser forms modified loci in the <b>lens</b> where the modified loci have a different refractive index than the refractive index of the material before modification. The same laser modification technique can be used on the <b>cornea</b> in situ.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                                                   |           |            |                                                                                                                                 |    |
| 39.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Method for calculating a spectacle <b>lens</b> having a variable position of the reference points | EP2115524 | 2009-11-11 | RODENSTOCK                                                                                                                      | 93 %                                                                                  |
| <p>The invention relates to a method for producing a progressive spectacle <b>lens</b> and to a corresponding device, a computer program product, a storage medium and to the use of a progressive spectacle <b>lens</b>. The invention also relates to a method for producing a progressive spectacle <b>lens</b> for correcting defective vision of a spectacle wearer, comprising the following steps: the vertical and/or the horizontal spatial position of a remote reference point and/or a near reference point is specified or determined in accordance with individual data of the spectacle wearer; the spectacle <b>lens</b> is optimised or calculated such that the required <b>dioptric</b> effect of the spectacle <b>lens</b> is obtained in the individually determined remote reference point and/or the near reference point.</p>                                                                                                                                                                                                                              |                                                                                                   |           |            |                                                                                                                                 |    |
| 40.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Implantable ophthalmic device with an <b>aspheric lens</b>                                        | EP2577388 | 2013-04-10 | ELENZA                                                                                                                          | 93 %                                                                                  |
| <p>Implantable ophthalmic devices with <b>aspheric</b> lenses and dynamic electro-active elements offer excellent depth of field and image quality while providing high optical throughput. An exemplary implantable ophthalmic device includes an <b>aspheric lens</b> with a negative spherical aberration that varies with radius. The <b>aspheric lens</b> can have peak optical powers at its geometric centers surrounded by a region of varying optical power (with varying slope) that extends radially from its center. When implanted, these <b>aspheric</b> lenses provide an incremental optical power that varies as a function of pupil diameter, which changes with object distance, for viewing far, intermediate, and near objects. The <b>aspheric lens</b> may also bonded or integrally formed with a spherical <b>lens</b> that provides fixed optical power for viewing far objects and/or a dynamic electro-active element that with <b>two</b> or more states (e.g., on and off) for increasing the effective optical power when viewing near objects.</p> |                                                                                                   |           |            |                                                                                                                                 |   |
| 41.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Progressive ophthalmic multifocal <b>lens</b>                                                     | EP2278386 | 2011-01-26 | ESSILOR INTERNATIONAL<br>ESLORE ANTER NAZI ONAL                                                                                 | 92 %                                                                                  |
| <p>The <b>lens</b> has a mean sphere and a cylinder at each of points of an <b>aspherical</b> surface of the <b>lens</b>. A main progression meridian passes through far, near and intermediate vision regions. Differences between maximum cylinder values over a distance of 20 mm at both sides of the meridian have an absolute value less than or equal to 0.30 <b>diopters</b>. An absolute value of difference between maximum and minimum values of cylinder at each side of the meridian is less than or equal to the product of power addition and a constant having a value of 0.10. The power addition is defined as a difference in the mean sphere between a reference point (VP) of the near vision region and a reference point (VL) of the far vision region, and is greater than or equal to 2.50 <b>diopters</b>.<br/>(From EP2278386 A1)</p>                                                                                                                                                                                                                   |                                                                                                   |           |            |                                                                                                                                 |  |
| 42.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Multifocal ophthalmic <b>lens</b>                                                                 | EP0911671 | 1999-04-28 | ESSILOR INTERNATIONAL                                                                                                           | 92 %                                                                                  |
| <p>The <b>lens</b> has an <b>aspherical</b> surface with a geometrical center, a reference point for near vision, and a virtually umbilical and vertical meridian line with a mean spherical and cylindrical value at each point. The area formed by points at a distance of less than 20 mm from the geometrical center and with a cylindrical value of between 0.42 and 0.84 <b>diopter</b> is greater than the area formed by points at a distance of less than 20 mm from the geometrical center and with a cylindrical value of less than 0.42 <b>diopter</b>.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                                                                                   |           |            |                                                                                                                                 |  |

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                                             |             |            |                                        |      |                                                                                       |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------|-------------|------------|----------------------------------------|------|---------------------------------------------------------------------------------------|
| 43.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | A method for modifying a non-dioptic parameter of an optical system         | EP3304180   | 2018-04-11 | ESSILOR INTERNATIONAL                  | 92 % |    |
| <p>A method implemented by computer means for modifying a non-dioptic parameter of an optical system comprising a first and a second surface, wherein the method comprises a modifying step (S0) during which the first surface and second surface are modified so as to obtain a modified optical system such that the dioptic function of the modified optical system is substantially the same as the dioptic function of the optical system.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                             |             |            |                                        |      |                                                                                       |
| 44.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Variable power view finder                                                  | GB9422927   | 1995-01-04 | ASAHI OPTICAL                          | 92 % |    |
| <p>A real image type of variable power view finder has an objective lens system r3 - r12, an image erecting optical system r17 - r18, and an eyepiece lens system r19 - r22, located in this order as viewed from an object to be photographed. The objective lens system includes a first lens group r3 - r8 having negative power and a second lens group r9 - r12 having positive power located in this order from an object side. A distance d8 between the first and the second lens group is varied to change magnification and the first lens group comprises a first negative lens element r3 - r4, a second negative lens element r5 - r6, and a third positive lens element r7 - r8, located in this order from the object side. F is a field flattened lens. Co is a condenser lens. r3, r4, r8, r9, r12, r13, r15 and r20 as shown are aspheric surfaces and r1 - r2 is a cover glass.</p>                                                                                                                                                                                                                                                                                                                         |                                                                             |             |            |                                        |      | <IMAGE>                                                                               |
| 45.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Aspheric glasses lens determination method for myopic presbyopia correction | CN102662252 | 2012-09-12 | UNIVERSITY OF NANKAI                   | 92 % |                                                                                       |
| <p>The patent refers to the field of 'pectacles and sunglasses or goggles insofar as they have the same features as spectacles'. The invention relates to an aspheric glasses lens based on the wavefront technology and physiological data of human eyes and aims to correct shortsightedness and farsightedness of people with presbyopia. By measuring wavefront aberration and eye axis data of human eyes practically, combining a Liou ideal human eye model and utilizing optical design software, a personalized eye model according with practical optical characteristics of human eyes is built. Considering quite weak accommodative strength of people eyes with presbyopia, goggling of eyeballs when people eyes are in far sight and short sight and adjustment of crystalline lens during short sight, the lens is designed into a spheric-cylindrical and aspheric type, the integral lens-eyes system is optimized at different vision field, and finally, the aspherical lens structure and diopter parameters in accordance with vision characteristics of normal eyes. The aspheric glasses lens is practical and has the advantages of objectiveness, correctness, simple design and high accuracy.</p> |                                                                             |             |            |                                        |      |                                                                                       |
| 46.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Intraocular lens for correcting corneal coma                                | EP1940318   | 2008-07-09 | AMO GRONINGEN<br>ABBOTT MEDICAL OPTICS | 92 % |    |
| <p>When fitting a patient for an intraocular lens, a series of measurements is taken on the patient's eye that determines a required lens power. Next, a range of preferred shape factors may be found, which determine the base (i.e., spherical) radii of the two lens surfaces, essentially independent of the lens power. The preferred shape factor adjusts the third-order coma of the lens to largely offset the coma of the cornea, so that the image at the retina has a reduced amount of third-order coma. Once a preferred shape factor is determined, the base radii of curvature of the anterior and posterior surfaces are determined from the shape factor and the lens power by algebraic formulas. Finally, one or more aspheric terms are added to one or both of the surfaces in the lens, so that the spherical aberration of the lens largely offsets the spherical aberration of the cornea.</p>                                                                                                                                                                                                                                                                                                        |                                                                             |             |            |                                        |      |                                                                                       |
| 47.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Compact objective lens with two lens groups                                 | EP0634023   | 1995-01-18 | POLAROID                               | 92 % |   |
| <p>A lens system for a folding reflex camera is provided. The system includes: (a) a first group on the object side of the system's stop which (i) has a positive dioptic power, (ii) includes an aspheric surface, and (iii) has a concave surface adjacent to the stop; and (b) a second group on the image side of the stop consisting of either a single positive component or the combination of a single positive component and one or more focusing elements. The system includes at least two elements made of materials differing in dispersive powers where at least one of the elements is of plastic. The system may comprise one or more aspheric surfaces. The system can comprise just two plastic elements and even with such a simple configuration achieves excellent optical performance including a relatively flat field, relatively low distortion and at least partial correction for lateral chromatic aberration.</p>                                                                                                                                                                                                                                                                                 |                                                                             |             |            |                                        |      |                                                                                       |
| 48.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Electronic display assembly agencement d'affichage électronique             | EP2064584   | 2009-06-03 | ESSILOR INTERNATIONAL                  | 91 % |  |
| <p>The invention relates to an electronic display assembly comprising an optical conductor (1) from transmitting light signals emitted from a miniature screen (2) from one end or inlet surface (1A) thereof to the other end or outlet surface (1B) towards the eye (O) of a user for visualising a virtual image, comprising a field lens (3) provided between said screen (2) and said inlet surface (1A), comprising a flat utility surface (3A) having a rectilinear cross-section and provided so as to face the screen (2) and centred about the optical axis (L3) of said field lens as well as an aspherical utility surface (3B). According to the invention, the aspherical surface is arranged so as to face the inlet surface (1A), the optical axis of the field lens and that of the conductor overlapping each other, and said flat utility surface (3A) is bonded to the screen (2).</p>                                                                                                                                                                                                                                                                                                                     |                                                                             |             |            |                                        |      |                                                                                       |
| 49.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Presbyopic treatment system                                                 | EP2183639   | 2010-05-12 | ALCON<br>NOVARTIS                      | 91 % |  |
| <p>A method and system for treating Presbyopia and pre-Presbyopia are provided that do not compromise the wearer's intermediate or distance vision. The system is a lens and a lens series, wherein the power profiles of the lenses are tailored to provide an amount of positive ADD power in the near vision zone that is slightly less than that which is normally required for near vision accommodation, while also providing an amount of negative spherical aberration in the peripheral optical zone. The dynamic ocular factors of the wearer's eye work in conjunction with the positive ADD power provided by the central optical zone and with the effective ADD gained from the negative spherical aberration provided by the peripheral optical zone to induce a minimally discernible amount of blur that is tuned to maximize the wearer's depth of focus.</p>                                                                                                                                                                                                                                                                                                                                                |                                                                             |             |            |                                        |      |                                                                                       |
| 50.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Progressive power multifocal lens                                           | EP1158337   | 2001-11-28 | NIKON ESSILOR                          | 91 % |  |
| <p>A series of progressive power multifocal lenses having a plurality of base curves which are designed to have substantially the same basic lens specifications and substantially the same optical characteristics in the worn state with respect to all of the base curves, so as to have an excellent optical performance in the worn state. The progressive power multifocal lens secures a wide clear vision range with a smaller amount of astigmatism in the far portion and a smaller amount of blur of the image due to a dioptic power error.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                             |             |            |                                        |      | <IMAGE>                                                                               |

51.

Improved intraocular **lens** and corresponding manufacturing method

EP2806827

2014-12-03

HEHN Frederic

HEHN, FREDERIC

91 %

The invention relates to an intraocular **lens** having an optical axis (y), and a central area (Z1) and a peripheral area (Z2, Z3, Z4) which are substantially symmetrical relative to said optical axis and extend substantially perpendicular thereto, said central area extending up to a first distance, and the peripheral area extending from the first distance until the end of the intraocular **lens**, wherein the central area has nominal optical power, and the peripheral area has a radius of **curvature** that varies in a continuous, monotonic manner in accordance with the distance to the optical axis, such that a target **asphericity** value is obtained at a second distance from the optical axis, the first distance and the second distance being calculated from a photopic pupil diameter and a mesopic pupil diameter of a patient, respectively.

52.

Progressive addition lenses

EP0987578

2000-03-22

ESSILOR INTERNATIONAL

ETHIROL ANTERINTERNACIONAL  
FRANCE CHARENTON LE PONT LE  
PARIS 14 7

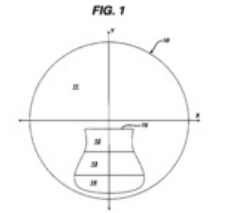
JOHNSON & JOHNSON

JOHNSON & JOHNSON VISION CARE

JOHNSON & JOHNSON VISION  
PRODUCTS

91 %

The invention provides progressive addition lenses in which **lens** unwanted astigmatism is reduced and channel width through the intermediate and near vision zones is increased as compared to conventional progressive addition lenses. This result is achieved by combining a progressive addition surface with a first **dioptric** add power with at least one optical element that provides additional **dioptric** add power to the **lens**.



53.

Real-image finder optical system

US6282022

2001-08-28

RICOH

ASAHI OPTICAL

PENTAX TOKIO TOKYO

91 %

In a real-image finder optical system, at least **two** reflection surfaces are utilized for **dioppter** adjustment, and wherein first and second **dioppter-adjusting** reflection surfaces form a right angle therebetween; an optical axis from the objective optical system to the first **dioppter-adjusting** reflection surface and an optical axis from the second **dioppter-adjusting** reflection surface are parallel with each other; the **two** optical axes are perpendicular to the optical axis being incident from the object to the objective optical system; **dioppter** adjustment is performed by integrally moving the first and second **dioppter-adjusting** reflection surfaces so that the optical path length from the image forming plane of the objective optical system to the eyepiece optical system is varied; and the following condition is satisfied:  $0.1 < L1/L2 < 0.4$ ; L1: the distance between the optical axis from the second **dioppter-adjusting** reflection surface and the final surface of the eyepiece optical system; and L2: the distances between the most-object side surface of the objective optical system and the final surface of the eyepiece optical system.

54.

Accommodating intraocular **lens** and **lens** series

EP0419451

1991-04-03

JORDAN C BAND

TRUST UNDER THE WILL OF DAVID  
VOLK

VOLK OPTICAL

BAND JORDAN C

MYRON VOLK

1 more...

91 %

This invention relates to an improved **aspheric** posterior chamber intraocular **lens** (Fig. 2) and **lens** series of said novel intraocular **lens** (Fig. 2), which **lens** (Fig. 2) is used as a replacement within the **eye** (Fig. 7A) for the absent human crystalline **lens**, and a simplified method of selecting a **lens** (Fig. 2) from said **lens** series for use in a given **eye** (Fig. 1). The novel **lens** (Fig. 2) of this invention is designed to have a continuously and regularly increasing refractive power from its axis (Fig. 2) peripheralward in its optically active area and to achieve the following results: the correction of the axial refractive error of the aphakic **eye** (Fig. 1) in which it is placed, and the production of clear central vision over a continuous range of distances from far to near, where far (Fig. 7A) is defined as six meters and beyond, and near (Fig. 7B) or reading distance is defined as generally 40 cm from the **eye** but may be as close as 33 cm.

55.

Contact **lens** product

EP3290994

2018-03-07

LARGAN MEDICAL

91 %

A contact **lens** product includes a multifocal contact **lens** and a buffer solution. The multifocal contact **lens** is immersed in the buffer solution. The multifocal contact **lens** includes a central region and at least **two** annular regions. The annular regions surround the central region, and a **dioppter** of each of the annular regions is different from a **dioppter** of the central region. The multifocal contact **lens** is made of silicone hydrogel or hydrogel.

56.

Real time type viewfinder

US5550674

1996-08-27

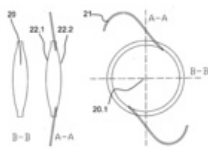
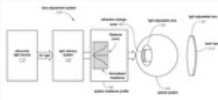
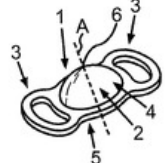
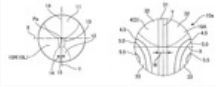
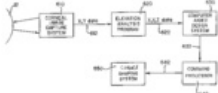
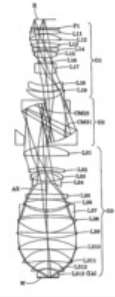
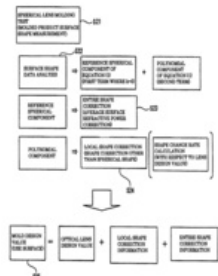
RICOH

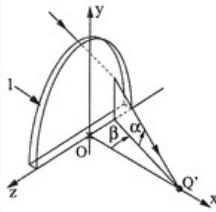
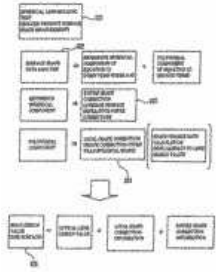
ASAHI OPTICAL

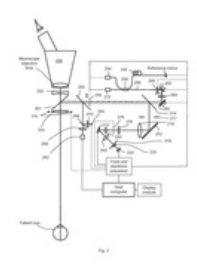
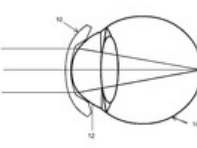
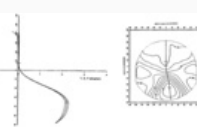
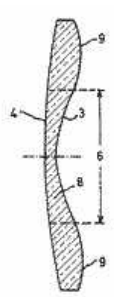
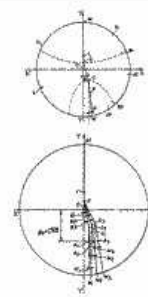
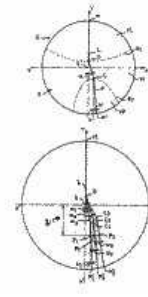
PENTAX TOKIO TOKYO

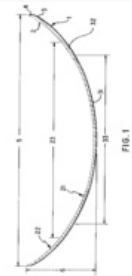
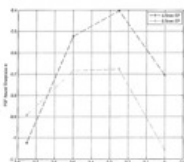
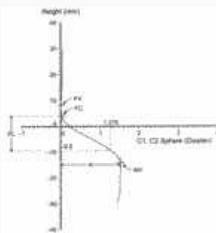
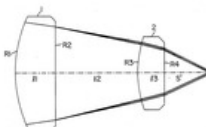
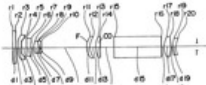
91 %

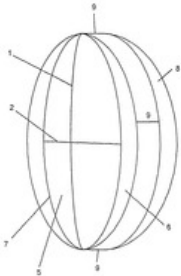
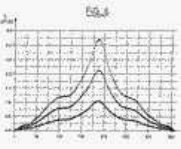
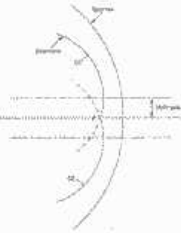
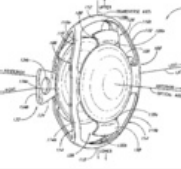
A real image type viewfinder is provided with, in the following order from the object side: an objective **lens** group, a condenser **lens** group which transmits the image of the object formed by the objective **lens** group towards an eyepiece **lens** group, an image erecting optical system that erects an inverted image, and, the eyepiece **lens** group. The eyepiece **lens** group consists of a negative **lens** and a positive double-convex **lens**, in this order from the **eye** side, and satisfies the following three relationships:  $-0.5 < fE/fE1 < 0$  (1)  $-1.5 < fE/rE1 < 1.0$  (2)  $0.03 < dE1-2/fE < 0.1$  (3) wherein fE designates the overall focal length of the eyepiece **lens** group; fE1 designates the focal length of the negative **lens** of the eyepiece **lens** group; rE1 designates the radius of the **eye**-side surface **curvature** of the negative **lens** of the eyepiece **lens** group; and dE1-2 designates the distance between the negative **lens** and the positive double-convex **lens** of the eyepiece **lens** group.

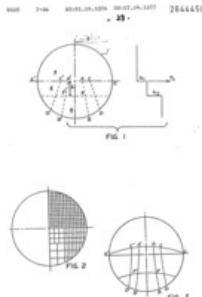
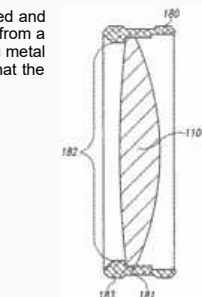
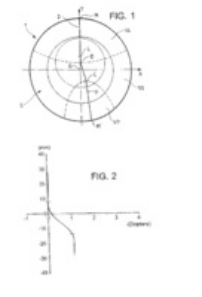
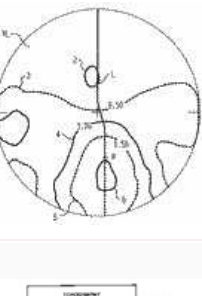
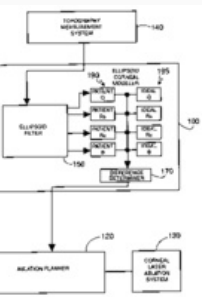
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| 57.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Progressive spectacle <b>lens</b> with <b>two</b> non-spherical progressive surfaces                                    | EP1488274 | 2004-12-22 | RODENSTOCK                                                                                | 90 % |    |
| The invention relates to a progressive spectacle <b>lens</b> comprising <b>two</b> non-spherical surfaces, more particularly <b>two</b> progressive surfaces, which contribute to the enhancement of the effectiveness (addition add) of the long distance vision part to the reading distance part. The invention is characterized in that the sagittas $z_i = z_i(x, y)$ of at least one (i) progressive surface (i=1,2) are selected in such a way that the sagittas (z) of the respective surface have predetermined values in the edge of the glass spectacles defined by $y_1 = f_1(x)$ for $y = 0$ or $y_1 = f_2(x)$ for $y < 0$ without this surface (i) or the other surface (j) having a <b>curvature</b> inversion serving to form a margin, etc.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                                                                                         |           |            |                                                                                           |      |                                                                                       |
| 58.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | <b>Aspheric</b> intraocular <b>lens</b> and method for designing such iol                                               | EP2034928 | 2009-03-18 | CARL ZEISS MEDITEC<br>CARL ZEISS JENA                                                     | 90 % |    |
| The invention discloses a novel Intraocular <b>lens</b> (IOL) and a method for improvement of such lenses in the field of ophthalmology, which comprise surface shape modifications that differ from perfect spherical geometries. The design of the novel intra ocular <b>lens</b> takes into account the natural optical configuration of the human vision apparatus e.g. visual axis tilt and pupil decentration. In addition the design method accounts for potential positioning errors caused by implantation and surgery effects.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                         |           |            |                                                                                           |      |                                                                                       |
| 59.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Method for modifying power of light adjustable <b>lens</b>                                                              | EP3210070 | 2017-08-30 | RXSIGHT<br>CALHOUN VISION<br>R X SITE                                                     | 90 % |    |
| A method for adjusting a light, adjustable <b>lens</b> in an optical system includes providing a light adjustable <b>lens</b> in an optical system; providing an ultraviolet light source to generate an ultraviolet light; aid irradiating die generated ultraviolet light with a light delivery system onto the light adjustable <b>lens</b> with a center wavelength and with a spatial irradiance profile to change a <b>dioptric</b> power of the light adjustable <b>lens</b> by changing a refraction of the light adjustable <b>lens</b> in a refraction-change zone, thereby causing a wavefront sag, defined as half of a product of the change of the <b>dioptric</b> power and the square of a radius of the refraction-change zone, to be within 10% of its maximum over an ultraviolet spectrum.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                                                                                         |           |            |                                                                                           |      |                                                                                       |
| 60.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | <b>Eye lens</b> having a toric refractive surface profile and a surface structure that is stepped in a radial direction | EP3033042 | 2016-06-22 | CARL ZEISS MEDITEC                                                                        | 90 % |    |
| The invention relates to an <b>eye lens</b> (1), comprising an optical part (2), which has a first optical side (4) and an opposite second optical side (5) with respect to a direction of an optical principal axis (A) of the <b>eye lens</b> (1), wherein a toric refractive surface profile (7) is formed on at least one of the <b>two</b> sides (4, 5), wherein the <b>eye lens</b> (1) has a surface structure (8) that is stepped in a radial direction of the optical part (2) in addition to the toric refractive surface profile (7), and the stepped surface structure (8) is formed on at least one side (4, 5).                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                                                                                         |           |            |                                                                                           |      |                                                                                       |
| 61.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Progressive power <b>lens</b> and method for manufacturing of the progressive-power <b>lens</b>                         | EP2492740 | 2012-08-29 | EHS LENS PHILIPPINES<br>HOYA LENS MANUFACTURING<br>LIMITED COMPANY OF EHS LENS PHILIPPINE | 90 % |  |
| A progressive-power <b>lens</b> includes an eyeball-side surface including a distance portion and a near portion having different values of <b>dioptric</b> power and an intermediate portion that connects the distance portion and the near portion to each other, and an object-side surface including a first region extending along a principal meridian and having a spherical shape having a first <b>curvature</b> , a second region facing the distance portion and having a spherical shape having a second <b>curvature</b> equal to the first <b>curvature</b> , and a third region located outside the first region and below the second region and having a third <b>curvature</b> greater than the first <b>curvature</b> .                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                                                         |           |            |                                                                                           |      |                                                                                       |
| 62.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Method for diagnosing and improving vision                                                                              | EP1119300 | 2001-08-01 | SCIENTIFIC OPTICS<br>SCIENTIFIC OPTICS INK                                                | 90 % |  |
| Methods, and apparatus are disclosed for performing corneal ablation procedures of the <b>eye</b> (12) in a manner which does not interfere with the natural shape of the <b>cornea</b> or its orientation relative to the remainder of the <b>eye</b> , but which changes its surface <b>curvature</b> appropriately to achieve the required correction of vision. Three preferred embodiments are described, which model the <b>cornea</b> to different degrees of accuracy. Once the model of the <b>cornea</b> is obtained (610, 620, 630), surface <b>curvature</b> is modified (650) to achieve the degree of correction in refraction that is necessary, as determined by an <b>eye</b> test of the patient. The modified model of the <b>cornea</b> is then utilized to control the removal of material from the surface of the <b>cornea</b> in a corneal ablation operation.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                         |           |            |                                                                                           |      |                                                                                       |
| 63.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Cata- <b>dioptric</b> imaging system, exposure device, and device manufacturing method                                  | EP1980890 | 2008-10-15 | NIKON                                                                                     | 89 % |  |
| A catadioptric imaging optical system of a high numerical aperture in which various aberrations are properly corrected without using a reflection surface having an <b>aspherical</b> shape of high order or a reciprocal optical element. The catadioptric imaging optical system forms an image of a first plane (R) on a second plane (W) and includes a first imaging system (G1) for forming a first intermediate image of the first plane based on light from the first plane, a second imaging system (G2) having <b>two</b> concave reflection mirrors (CM21, CM22) for forming a second intermediate image of the first plane based on light from the first intermediate image, and a third imaging system (G3) for forming a final image of the first plane on the second plane based on light from the second intermediate image. The <b>two</b> concave reflection mirrors have prolate spheroidal-shaped reflection surfaces.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                                                         |           |            |                                                                                           |      |                                                                                       |
| 64.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Mold designing method                                                                                                   | EP1752271 | 2007-02-14 | HOYA                                                                                      | 89 % |  |
| A mold with which a molded product in a desired shape with an <b>aspherical curved</b> surface is molded can be designed with high precision by correcting shape deformation of the molded product molded from the mold. A mold 10 in which use surfaces 16 of an upper mold 11 and a lower mold 12 are formed to be design <b>curved</b> surfaces of the optical <b>lens</b> in a spherical shape is prepared. A <b>curved</b> surface shape of the optical <b>lens</b> molded from the mold is measured, a measured value is approximated by an <b>equation</b> (1) which is an <b>equation</b> of an <b>aspherical</b> surface and a <b>curved</b> surface of the molded optical <b>lens</b> is specified as an <b>aspherical</b> surface. Information corresponding to an error between the <b>curved</b> surface of the optical <b>lens</b> specified by the <b>equation</b> of the <b>aspherical</b> surface and the above-described design <b>curved</b> surface is compiled into database for each of characteristics of the optical <b>lens</b> as correction information for molding the optical <b>lens</b> of which <b>curved</b> surface is in the spherical shape. By using the correction information compiled into database, design values of the use surfaces in the upper mold and the lower mold of the mold with which the optical <b>lens</b> of which <b>curved</b> surface in the <b>aspherical</b> shape is molded are corrected to design them. Mathematical Expression $10 \ Z = C \diamond \phi \ A \ 2 \ 1 + 1 - 1 + K \diamond \phi \ C \ 2 \diamond \phi \ A \ 2 + \sim i = 2 \ n \ A \ 2 \diamond \phi \ i \diamond \phi \ A \ 2 \diamond \phi \ i$ |                                                                                                                         |           |            |                                                                                           |      |                                                                                       |

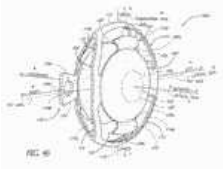
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                                                                         | A spectacle ophthalmic lens, method for determining a spectacle ophthalmic lens | EP3201684 | 2017-08-09 | ESSILOR INTERNATIONAL | 89 % |  |
| <p>A spectacle ophthalmic lens having a front surface and a back surface, the spectacle ophthalmic lens comprising a nasal lateral zone and a temporal lateral zone, wherein the front surface comprises a progressive or regressive front surface which provides at least a magnifying function in the nasal and/or the temporal lateral zone of the lens, and wherein the back surface substantially compensates dioptric effects of the magnifying function of the a progressive or regressive front surface.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   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                                                                         | Mold designing method                                                           | EP1752272 | 2007-02-14 | HOYA                  | 89 % |  |
| <p>On an occasion of molding a molded product from a mold, the mold for molding a molded product in a desired shape can be designed with high precision by correcting a shape change of the molded product. A mold 10 in which use surfaces 16 of an upper mold 11 and a lower mold 12 are formed to be design curved surfaces of an optical lens is prepared. A curved surface shape of the optical lens molded from this mold is measured, and a measured value is approximated by equation (1) which is an equation of an aspherical surface to specify a curved surface of the above-described optical lens as an aspherical surface. The curved surface of the above-described optical lens specified by the equation of the aspherical surface and a design curved surface of the above-described optical lens are compared to obtain an error between both the curved surfaces. Information corresponding to the error is used as correction information (entire shape correction information, local shape correction information), and the use surfaces in the upper mold and the lower mold in the above-described mold are corrected and designed. Mathematical Expression 14 <math>Z = C \cdot \rho^2 + 1 - 1 + K \cdot C^2 \cdot \rho^4 + \dots</math> <math>\rho^2 = x^2 + y^2</math> <math>\rho^4 = (x^2 + y^2)^2</math> <math>\rho^6 = (x^2 + y^2)^3</math> <math>\rho^8 = (x^2 + y^2)^4</math> <math>\rho^{10} = (x^2 + y^2)^5</math> <math>\rho^{12} = (x^2 + y^2)^6</math> <math>\rho^{14} = (x^2 + y^2)^7</math> <math>\rho^{16} = (x^2 + y^2)^8</math> <math>\rho^{18} = (x^2 + y^2)^9</math> <math>\rho^{20} = (x^2 + y^2)^{10}</math> <math>\rho^{22} = (x^2 + y^2)^{11}</math> <math>\rho^{24} = (x^2 + y^2)^{12}</math> <math>\rho^{26} = (x^2 + y^2)^{13}</math> <math>\rho^{28} = (x^2 + y^2)^{14}</math> <math>\rho^{30} = (x^2 + y^2)^{15}</math> <math>\rho^{32} = (x^2 + y^2)^{16}</math> <math>\rho^{34} = (x^2 + y^2)^{17}</math> <math>\rho^{36} = (x^2 + y^2)^{18}</math> <math>\rho^{38} = (x^2 + y^2)^{19}</math> <math>\rho^{40} = (x^2 + y^2)^{20}</math> <math>\rho^{42} = (x^2 + y^2)^{21}</math> <math>\rho^{44} = (x^2 + y^2)^{22}</math> <math>\rho^{46} = 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| 71.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Apparatus and method for operating a real time large dioptr range sequential wavefront sensor | EP2903499 | 2015-08-12 | CLARITY MEDICAL SYSTEMS<br>CLARITY MEIDCAL SYSTEMS<br>KLERITI MEDICAL SYSTEMS | 89 % |    |
| <p>A sequential wavefront sensor including a light source (172), a beam deflecting element (112), a position sensing detector (122) configured to output a plurality of output signals and a plurality of composite transimpedance amplifiers (see Figure 11) each coupled to receive one of the detector output signals. The output of each composite transimpedance amplifier is phase-locked to a light source drive signal and a beam deflecting element drive signal.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                               |           |            |                                                                               |      |                                                                                       |
| 72.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Multi-focal optical lenses                                                                    | EP2795395 | 2014-10-29 | GLOBAL VISION<br>GLOBAL OKAY VISION                                           | 88 % |    |
| <p>A multi-focal lens having a center optical zone for creating a first focal point within 2° of the optical axis and a peripheral optical zone adjacent the center optical zone for creating a second focal point from 2° to 10° of the optical axis, the peripheral optical zone having a correction of at least 2 diopters more than the center optical zone.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                                                               |           |            |                                                                               |      |                                                                                       |
| 73.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Procedure for determining an ophthalmic lens                                                  | EP2302442 | 2011-03-30 | ESSILOR INTERNATIONAL                                                         | 88 % |    |
| <p>The method involves choosing a starting lens having a fitting cross marking a primary viewing direction under wearing conditions and an umbilical progression meridian. The meridian is provided with a power addition greater than or equal to two diopters between far and near vision reference points. A current lens used as target is optimized under wearing conditions. A progression length is defined as the angle of lowered viewing from the fitting cross to a point of the meridian at which a wearer's optical power reaches 85 percentages of a prescription. Independent claims are also included for the following: (1) a progressive multifocal ophthalmic lens with a complex surface (2) a visual device comprising a progressive multifocal ophthalmic lens (3) a method for correcting a vision of a presbyopic subject. (From EP1798590 A1)</p>                                                 |                                                                                               |           |            |                                                                               |      |                                                                                       |
| 74.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Spectacle lens for extremely poor-sighted persons                                             | EP0101972 | 1984-03-07 | CARL ZEISS<br>CARL ZEISS STIFTUNG<br>ZEISS STIFTUNG                           | 88 % |   |
| <p>Eyeglass lenses for persons suffering from severe ametropia. The lenses have a convexly shaped object-side front surface (4) and an eye-side rear surface (3) which is aspherically corrected in the central region (6) which comprises at least the main field of view. From this region the rear surface passes into a region in which its meridional inclination approaches the inclination of the front surface. The entire rear surface of the lens is continuously differentiable twice. Such a lens has an appearance which is fully satisfactory esthetically and makes it possible to keep the overall magnification of the system consisting of the eye and the eyeglass lens closer to 1 than in the case of previously known lenses. Aberrations are optimally corrected within a sufficiently large region, and no disturbing discontinuities in the fields of view occur. (From US4561736 A)</p>          |                                                                                               |           |            |                                                                               |      |                                                                                       |
| 75.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Progressive multifocal ophthalmic lens                                                        | US5270745 | 1993-12-14 | ESSILOR INTERNATIONAL<br>ESSILOR ANTONENASIJONAL                              | 88 % |  |
| <p>The lens has an aspherical surface having a zone for far vision, a zone for near vision, and between these two zones, a zone for intermediate vision, with a meridian curve along which the curvature of the surface varies progressively and which is inclined from top to bottom towards the nose side of the lens, at least in the intermediate zone. A portion of the meridian curve situated in the intermediate and near zones is divided into a first segment at an angle alpha to the vertical where the value of alpha is an increasing function of the power addition A of the lens, and a second segment at an angle omega to the vertical where omega is smaller than alpha. At the point where the two segments meet, the mean sphere value of the surface corresponds to a power addition lying in the range 0.8 to 0.92 times the nominal power addition of the lens.</p>                                |                                                                                               |           |            |                                                                               |      |                                                                                       |
| 76.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Progressive multifocal ophthalmic lens                                                        | US5272495 | 1993-12-21 | ESSILOR INTERNATIONAL<br>ESSILOR ANTONENASIJONAL                              | 88 % |  |
| <p>The lens has an aspherical surface having a zone for far vision, a zone for near vision, and between these two zones, a zone for intermediate vision, with a meridian curve along which the curvature of the surface varies progressively and which is inclined from top to bottom towards the nose side of the lens, at least in the intermediate zone. The portion of the meridian curve situated in the intermediate and near zones includes a segment at an angle alpha to the vertical where the value of alpha is an increasing function of the power addition A of the lens. In a horizontal and vertical system of coordinates, a point of the segment has an ordinate whose value is also an increasing function of the power addition A. At said point, the mean sphere value of the surface corresponds to a power addition lying in the range 0.8 to 0.92 times the nominal power addition of the lens.</p> |                                                                                               |           |            |                                                                               |      |                                                                                       |

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| 77.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Contact lenses providing improved visual acuity                                                  | EP0943118   | 1999-09-22 | BAUSCH & LOMB                                                               | 88 % |
| A method for obtaining contact lenses having optimized visual acuity involves providing the anterior surface or the posterior surface of the contact <b>lens</b> with a conic section having a shape factor value within the range of about 0.3 to 2.0, the shape factor value being selected so as to adjust spherical aberration in the central optical zone to a value within the range of about -0.2 <b>diopter</b> to about -0.6 <b>diopter</b> and to a value that provides optimal visual acuity.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                  |             |            |                                                                             |      |
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| 78.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Lens design and methods for minimizing visual acuity variation experienced by myopia progressors | EP2988162   | 2016-02-24 | JOHNSON & JOHNSON VISION CARE                                               | 88 % |
| Contact lenses incorporate power profiles that minimize visual acuity variation for progressing myopes based upon minimization of the variation of neural sharpness image quality over a specific time period. The contact <b>lens</b> includes a center and at least one peripheral zone surrounding the center and having a different <b>dioptric</b> power than at the center. The <b>lens</b> has power profile selected from the group consisting of a power profile with spherical aberration, a multifocal power profile, a freeform power profile, and a segmented freeform power profile. The power profile is based on an initial paraxial power of a myopia progressor and a defined myopia progression rate over a specific time period, resulting in controlled change of the neural sharpness, thereby minimizing changes in changes in visual acuity at a beginning of the time period and at an end of the time period.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                  |             |            |                                                                             |      |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                                                                  |             |            |                                                                             |      |
| 79.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Progressive spectacle lens                                                                       | EP1744202   | 2007-01-17 | ESSILOR INTERNATIONAL<br>TELL ANNE NATIONAL ESSILOR                         | 88 % |
| Ophthalmic <b>lens</b> for use by presbyopic hypermetropic wearer, consists of complex surface having specific cylinder value, rebound and progression length. The <b>lens</b> has a complex surface having a cylinder value normalized to the addition of less than 0.8 in a circle of radius 20mm with respect to the center of <b>lens</b> . The rebound in the sphere quantity normalized to the addition on the circle is less than 0.04, and the progression length defined between fitting cross and a point on the meridian at which the mean sphere reaches 85% of progression of the addition, is 14mm or less. Independent claims are also included for the following: (1) method for correcting vision of presbyopic subject; and (2) method for fitting ophthalmic <b>lens</b> in visual equipment.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                                                                  |             |            |                                                                             |      |
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| 80.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Scanning objective                                                                               | US4645311   | 1987-02-24 | OPTISCHE WERKE G RODENSTOCK<br>OPTISCHE WERKE G RODENSTOCK<br>8000 MUENCHEN | 88 % |
| A scanning objective with <b>two</b> optical elements, which includes at least one <b>aspherical</b> surface; the <b>aspherical</b> surface is so constructed that in comparison with a spherical surface with the same vertex radius of <b>curvature</b> , the thickness of the <b>lens</b> increases toward the outside. By this construction of the <b>aspherical</b> surface in accordance with the present invention, for example, a scanning objective with <b>two</b> lenses and an <b>aspherical</b> surface can be obtained which is limited in diffraction for small image scales.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                                  |             |            |                                                                             |      |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                                                                                  |             |            |                                                                             |      |
| 81.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Design method for cornea contact lens based on wave front technology                             | CN102129132 | 2011-07-20 | UNIVERSITY OF NANKAI                                                        | 88 % |
| The patent refers to the field of 'pectacles and sunglasses or goggles insofar as they have the same features as spectacles'. The invention provides a design method for a <b>cornea</b> contact <b>lens</b> based on a wave front technology. The method is a technology for obtaining a surface type structure of the <b>cornea</b> contact <b>lens</b> according to an objective measurement data of <b>eye</b> vision light; according to actually measured corneal topography data, optimum spherical or circular fitting is processed for the <b>cornea</b> front surface by MATLAB software programming to design the surface type structure of an optical region on the back surface of the <b>cornea</b> contact <b>lens</b> . The spreading of the wave front that is transmitted to the <b>cornea</b> front surface from the exit pupil plane through a tear <b>lens</b> and a <b>cornea</b> contact <b>lens</b> medium is calculated according to the actually measured wave front aberration data of human eyes based on a diffractive angular spectrum theory so as to obtain the equivalent wave front aberration of the front surface of the <b>cornea</b> contact <b>lens</b> and then fit to figure out the optimum <b>curved</b> surface type of the optical region on the front surface of the <b>cornea</b> contact <b>lens</b> for correcting the wave front aberration of <b>eye</b> ; and the optimum sphericity, column degree and parallactic angle of an astigmatism axis of the <b>cornea</b> contact <b>lens</b> are figured out for the <b>cornea</b> contact <b>lens</b> by calculating and fitting the designed surface type structures for optical region on the front and back surfaces of the <b>cornea</b> contact <b>lens</b> . |                                                                                                  |             |            |                                                                             |      |
| 82.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Variable power view finder                                                                       | US5410430   | 1995-04-25 | RICOH<br>ASAHI OPTICAL                                                      | 88 % |
| A real image type of variable power view finder is disclosed which has an objective <b>lens</b> system, an image erecting optical system, and an eyepiece <b>lens</b> system, located in this order as viewed from an object to be photographed. The objective <b>lens</b> system includes negative and positive <b>lens</b> groups located in this order from the object side, so as to vary the distance therebetween, to change the magnification. The negative <b>lens</b> group of the objective <b>lens</b> system has at least <b>two</b> negative lenses.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                                                  |             |            |                                                                             |      |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                                                                                  |             |            |                                                                             |      |
| 83.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Progressive power intraocular lens, and methods of use and manufacture                           | EP3413839   | 2018-12-19 | AMO GRONINGEN                                                               | 88 % |
| Apparatuses, systems and methods for providing improved intraocular lenses (IOLs), include features for reducing side effects, such as halos, glare and best focus shifts, in multifocal refractive lenses and extended depth of focus lenses. Exemplary ophthalmic lenses can include a continuous, power progressive <b>aspheric</b> surface based on <b>two</b> or more merged optical zones, the <b>aspheric</b> surface being defined by a single <b>aspheric equation</b> . Continuous power progressive intraocular lenses can mitigate optical side effects that typically result from abrupt optical steps. <b>Aspheric</b> power progressive and <b>aspheric</b> extended depth of focus lenses can be combined with diffractive <b>lens</b> profiles to further enhance visual performance while minimizing dysphotopsia effects. The combination can provide an increased depth of focus that is greater than an individual depth of focus of either the refractive profile or the diffractive profile.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                                  |             |            |                                                                             |      |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                                                                                  |             |            |                                                                             |      |

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| 84.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Astigmatic intraocular lens                                       | EP1903986     | 2008-04-02 | <div>ACRI TEC GESELLSCHAFT FUER OPHTHALMOLOGISCHE PRODUKTE</div> <div>CARL ZEISS SURGICAL</div> <div>ACRI TEC</div> <div>ACRI TEC GES FUER OPHTHALMO</div> <div>ACRI TEC GES FUR OPHTHALMOL</div> <div>2 more...</div> | 88 % |    |
| <p>The invention relates to an intraocular lens for correcting astigmatic ametropia, said lens having a toroidal refractive front face and a toroidal refractive rear face. The intraocular lens also has a toroidal refractive lens surface, whose intersection curve is aspherical on at least one primary meridian (1, 2). The intraocular lens also comprises a toroidal refractive lens surface with two primary meridians running at an angle to one another that does not equal 90°.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                   |               |            |                                                                                                                                                                                                                        |      |                                                                                       |
| 85.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Multifocal ophthalmic lens                                        | EP0911672     | 1999-04-28 | <div>ESSILOR INTERNATIONAL</div> <div>ESILOR ANTEL NATIONAL FRANCE 9 4 2 2 7 SHARON TONSEED LOU DE PARIS 1 4 7</div>                                                                                                   | 88 % |    |
| <p>The lens has an aspherical surface (S) presenting at any point a mean sphere and cylinder, having a distance vision zone (VL), a near vision zone (VP), an intermediate vision zone (VI) and a main meridian of progression (MM') passing through all three zones. The length of the meridian is less than 16 mm, and the distance vision zone encompasses an angular sector centered on the geometrical center of the lens and having an angle at its center of over 150 degrees. The sphere varied smoothly as a function of the angle over a circle of radius 20 mm centered on the geometrical center of the lens and on either side of the meridian.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                                   |               |            |                                                                                                                                                                                                                        |      |                                                                                       |
| 86.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Intraocular lens system                                           | EP3033044     | 2016-06-22 | <div>LEH PHARMA</div> <div>LEH PHARMACEUTICAL</div> <div>LONDON EYE HOSPITAL PHARMA</div>                                                                                                                              | 88 % |   |
| <p>An intraocular lens system comprising at least one intraocular lens having an anterior surface and a posterior surface, wherein at least one surface of the lens is aspherical to provide for a continuum of retinal images to be focused at the retina in an area between two retinal eccentricities. The system may include an anterior light-converging intraocular lens (16) for positioning within the eye, the anterior lens having an anterior surface and a posterior surface; and a posterior light-diverging intraocular lens (17) for positioning within the eye posterior to the anterior lens, the posterior lens having an anterior surface and a posterior surface; wherein one or both surfaces of the anterior lens and/or one or both surfaces of the posterior lens are aspherical.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                                   |               |            |                                                                                                                                                                                                                        |      |                                                                                       |
| 87.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Indirect ophthalmoscopy lens for use with slit lamp biomicroscope | WO94/10899    | 1994-05-26 | <div>VOLK OPTICAL</div>                                                                                                                                                                                                | 88 % |  |
| <p>The lens (18) of the invention is specifically designed for use with a slit lamp biomicroscope (22, 24) in the examination of a patient's eye (10). One or more lens elements may be used with each lens element having first and second convex aspheric surfaces (60, 62) of revolution. The first and second aspheric surfaces are coaxial and non-symmetrical with respect to one another. The aspheric surfaces are chosen to correct astigmatic imagery of the lens, with the formed aerial image free of excessive field curvature and astigmatism. The lens is held at a distance from the patient's eye pupil (40) corresponding to the secondary focal length of the lens. If the examined eye is emmetropic, and the lens is held in a position wherein the entrance pupil of the lens is conjugate with that of the examined eye, an image of the entrance pupil of the patient's eye will be formed at the pupil aperture of the optical system of the slit lamp biomicroscope used to observe the aerial image of the fundus as produced by the lens. The ratio of the apical radius of curvature of each surface and the ratio of the apical eccentricities of each surface are chosen to optimally correct for astigmatic imagery as well as pupil imagery of the lens, being dependent upon the index of refraction of the optical quality glass or plastic used in the production of such lenses. The indirect ophthalmoscopy lens of the invention therefore provides a sharper, focused fundus image and extremely wide field of view by optimally correcting for the primary image quality of the lens, as determined by astigmatism and image flatness, as well as the spherical aberration of the conjugate pupil image, specific to the pupil of the objective lens system of the observing slit lamp biomicroscope.</p> |                                                                   |               |            |                                                                                                                                                                                                                        |      |                                                                                       |
| 88.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Multi-focusing off-axis aspherical optical lens                   | KR20040103230 | 2004-12-08 | <div>BEL MORE</div>                                                                                                                                                                                                    | 87 % |  |
| <p>PURPOSE: An off-axis poly-focal point optical lens is provided to improve an eyesight correction capability of the lens by enhancing focusing on a focal region wider than that of conventional non-curved lenses.<br/>CONSTITUTION: An off-axis poly-focal point optical lens forms at least one of a concave surface(Sconcave) and a convex surface(Sconvex) as an off-axis non-curved region. A cross section of the off-axis non-curved region is formed as one of either side besides the cross points of two curves(C1,C2) each having its center at two points spaced from a predetermined distance(off-axis distance) from a center of the lens. The either side besides the cross points of two curves is formed by an inner symmetrical region of two curves joining at one point(cross point). The off-axis non-curved region has a substantial cone shape as a whole.<br/>(C) KIPO 2005</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                   |               |            |                                                                                                                                                                                                                        |      |                                                                                       |
| 89.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Intraocular lens system                                           | EP1524953     | 2005-04-27 | <div>VISIOGEN</div> <div>BIJIOGEN INK</div> <div>NGUYEN TUAN ANH</div> <div>PHAM HAI-MINH</div> <div>PORTNEY VALDEMAR</div> <div>5 more...</div>                                                                       | 87 % |  |
| <p>An accommodating intraocular lens, comprising : an anterior viewing element; a posterior portion having a posterior viewing element said viewing elements positioned to move relative to each other along in optical axis in response to action of the ciliary muscle of the eye, wherein said anterior and posterior portions comprise a single piece of material.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                   |               |            |                                                                                                                                                                                                                        |      |                                                                                       |

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| 90.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Trifocal spectacle <b>lens</b> with cosmetic appearance - where there is no distortion of vertical lines viewed through the <b>lens</b> | FR2326718     | 1977-04-29 | AMERICAN OPTICAL<br>AO  | 87 % |
| <p>A multifocus spectacle <b>lens</b>, esp. a trifocal <b>lens</b> uses a vertical meridional <b>curve</b> (C) dividing the <b>lens</b> into <b>two</b> halves and forming three horizontal zones with no unsightly jumps in the <b>curve</b> (C). The top zone is for viewing distant objects, whereas the other <b>two</b> zones are subdivided along their widths into &gt;=3 parts, <b>curve</b> (C) running down the centre of the middle part, the other parts being <b>aspherical</b>. The surface of each outer side part forms part of a surface of revolution with a vertical axis of rotation in the main meridional plane. A <b>lens</b> with a cosmetic appearance, and where observed vertical lines seen through the <b>lens</b> are unbroken over the entire field of view.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                                                                         |               |            |                         |      |
| 91.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Optimized <b>lens</b> for indirect ophthalmoscopy                                                                                       | WO2007/044193 | 2007-04-19 | VOLK OPTICAL            | 87 % |
| <p>A <b>lens</b> system comprising a biconvex <b>lens</b> element and a housing in which the biconvex <b>lens</b> element is mounted. The biconvex <b>lens</b> element is configured to display an inverted and magnified indirect image of a retinal surface of an <b>eye</b> of a patient in a region external to the <b>eye</b>. The biconvex <b>lens</b> element comprises front and rear surfaces and is fabricated from a glass having an index-of-refraction greater of 1.7 or greater. The glass composition meets the following parameters: (% SiO2 (by weight) + % B2O3) is less than 50 %; % of alkali metal compounds + % of alkaline earth metal compounds is less than 10%; and (% SiO2 + % B2O3)/(% rare earth compounds) is less than 1. The <b>lens</b> system is configured such that the optical power of the <b>lens</b> element is between about 10 and about 40 <b>diopters</b>.</p>                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                                         |               |            |                         |      |
| 92.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Multifocal ophthalmic <b>lens</b>                                                                                                       | EP0911673     | 1999-04-28 | ESSILOR INTERNATIONAL   | 87 % |
| <p>The <b>lens</b> has an <b>aspherical</b> surface (S) presenting at any point a mean sphere and cylinder, having a distance vision zone (VL), a near vision zone (VP), an intermediate vision zone (VI) and a main meridian of progression (MM') passing through all three zones. The relationship between a maximum cylinder within a circle of 20 mm radius centered on the geometrical center of the <b>lens</b> and the distance from the center to a point inside the circle or maximum cylinder is less than or equal to half the maximum inclination of the mean sphere on the main meridian of progression.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                                         |               |            |                         |      |
| 93.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | <b>Lens</b> of <b>aspheric</b> surface                                                                                                  | CN1916696     | 2007-02-21 | SHANGHAI UNIVERSITY     | 87 % |
| <p>A no-spherical surface <b>lens</b> confirms basic arc of <b>lens</b> according to Tscherning oval of non-spherical surface and it is necessary to change <math>r_1</math> and <math>r_2</math> but to remain <math>[(1/r_1)-(1/r_2)]</math> unchanged if <b>diopter</b> F of <b>lens</b> is basically not changed according <b>lens</b> formula. The way for preparing said <b>lens</b> is suitably to be used to prepare <b>lens</b> made of low reflectively material.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                                                                                                                         |               |            |                         |      |
| 94.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Progressive multifocal ophthalmic <b>lens</b>                                                                                           | US5488442     | 1996-01-30 | ESSILOR INTERNATIONAL   | 87 % |
| <p>A progressive multifocal ophthalmic <b>lens</b> is provided having an <b>aspherical</b> surface comprising a distance vision portion, a near vision portion and an intermediate vision portion, in which the maximum mean sphere gradient value is situated in the intermediate vision portion of the principal meridian of progression of the <b>lens</b>, and the cylinder gradient over the whole <b>aspherical</b> surface of the <b>lens</b> is less than the product obtained by multiplying the power addition value at each point by a constant value coefficient.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                                                                                                         |               |            |                         |      |
| 95.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Prolate shaped corneal reshaping                                                                                                        | EP1265544     | 2002-12-18 | LASERSIGHT TECHNOLOGIES | 87 % |
| <p>Apparatus (300) and techniques for performing prolate shaped corneal reshaping. In accordance with the techniques, an ablation scanning (380) laser system includes fitter (320) modules to fit input refractive or topographical measurement data to a three (3) variable ellipsoid model. This provides pre- and post-operative approximations of a <b>cornea</b>. A desired prolate shaped ablation profile is determined based on a desired prolate ellipsoidal shape. In accordance with the principles of the present invention, the sphereequivalent ellipsoid model has only three degrees of freedom (not four as in a conventional biconic technique) to define a desired ablation profile, providing extremely accurate and predictable long term vision correction. To arrive at an ellipsoid model having only three numbers of freedom, a sphereequivalent (SEQ) value of <b>asphericity</b> QSEQ is generated. The sphereequivalent eccentricity QSEQ value replaces <b>two</b> degrees of freedom (i.e., eccentricities) in an otherwise conventional biconic modeling system, leaving only three (3) variables to determine for a best fit ellipsoidal modeling of a <b>cornea</b> possible, and to limit results to regular astigmatism that can be corrected with optical spherocylinders.</p>  |                                                                                                                                         |               |            |                         |      |

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| 96.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | Accommodating intraocular <b>lens</b> with multiple viewing elements and enhanced depth of focus | WO2010/054255 | 2010-05-14 |    | 87 % |
| <p>An intraocular <b>lens</b> (100A) can comprise first and second viewing elements ( 106. 1 18). At least one of the viewing elements can comprise an optic having an anterior surface and a posterior surface. The anterior surface can comprise an <b>aspheric</b> region (164) having increased longitudinal aberration as compared to a spherical <b>lens</b> (100) to increase depth of focus. Alternatively, the <b>aspheric</b> region (164) can be located on the posterior surface of the optic, or both the anterior surface and the posterior surface can comprise <b>aspheric</b> regions.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                                                  |               |            |                                                                                    |      |
| 97.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | Progressive spectacle <b>lens</b>                                                                | EP0191831     | 1986-08-27 |  | 87 % |
| <p>A description is given of a progressive spectacle <b>lens</b> which has one convex <b>aspherical</b> front surface (1) and one concave <b>aspherical</b> inner surface (2), of which at least one surface contributes to the increased efficiency of the distant part (3) across the progression zone (4) to the near part (5). The progressive spectacle <b>lens</b> according to the invention is characterized by the fact that the surface (1) or surfaces contributing to the increased efficiency are so designed that the main portion of the astigmatism is kept in a region (3) in which the action does practically not increase, and that the surface astigmatism of the <b>two</b> surfaces (1) or (2) is essentially compensated in these regions (3) or (6).</p>                                                                                                                                                                                                                                                                                                                                                                                 |                                                                                                  |               |            |                                                                                    |      |
| 98.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | Super-large field-of-view fish <b>eye lens</b>                                                   | CN104793321   | 2015-07-22 |   | 87 % |
| <p>The invention discloses a super-large field-of-view fish <b>eye lens</b>. An optical system is of a four-set five-piece structure, the super-large field-of-view fish <b>eye lens</b> is composed of a first <b>lens</b> set with negative <b>diopter</b> and a second <b>lens</b> set with positive <b>diopter</b> from left to right, the first <b>lens</b> set is composed of a first negative <b>lens</b> and a second negative <b>lens</b> sequentially from object space to image space, the second <b>lens</b> set is composed of a third positive <b>lens</b>, a fourth positive <b>lens</b> and a fifth negative <b>lens</b>, each of the fourth positive <b>lens</b> and the fifth positive <b>lens</b> is a balsaming <b>lens</b>, and a diaphragm is positioned between the third positive <b>lens</b> and the fourth positive <b>lens</b>. Parameters of the first <b>lens</b> set are acquired through an optimization method, and aberration of the second <b>lens</b> set is ensured to equally offset aberration caused by the first <b>lens</b> set. The optical system has the advantages of simple structure and good imaging quality.</p> |                                                                                                  |               |            |                                                                                    |      |
| 99.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | A method for manufacturing a semi-finished <b>lens</b> blank                                     | EP2893393     | 2015-07-15 |   | 86 % |
| <p>A method for determining a progressive ophthalmic <b>lens</b> comprising a near and a far vision area, a main meridian separating the <b>lens</b> into a nasal and a temporal area, the method comprising: determining a first and a second surface of the <b>lens</b>; determining the second surface to provide, in combination with the first surface, the vision correcting properties; determining a spherical area on the first surface of the <b>lens</b> having a constant sphere value and including a far vision <b>diopter</b> measurement position, wherein the far and a near vision <b>diopter</b> measurement position have substantially the same mean sphere value; and determining the first surface to reduce the <b>lens</b> distortion by defining a toric area extending outside the spherical area on the first surface in at least one of the nasal and the temporal area, wherein characteristics of the toric area are related to the <b>lens</b> astigmatism.</p>                                                                                                                                                                   |                                                                                                  |               |            |                                                                                    |      |
| 100.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | Optical <b>lens</b>                                                                              | US20190025558 | 2019-01-24 |   | 86 % |
| <p>On embodiment of the invention provides an optical <b>lens</b> including, in order along a direction, an aperture stop and a <b>lens</b> group with a positive refractive power. The aperture stop is disposed at an outermost side of all lenses of the optical <b>lens</b>, and the <b>lens</b> group has at least four lenses. At least one of the four lenses is an <b>aspheric lens</b>, and each of the four lenses has a clear aperture of smaller than 14 mm.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                                                                  |               |            |                                                                                    |      |