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(54) **METHOD FOR POLISHING AN OPTICAL LENS**

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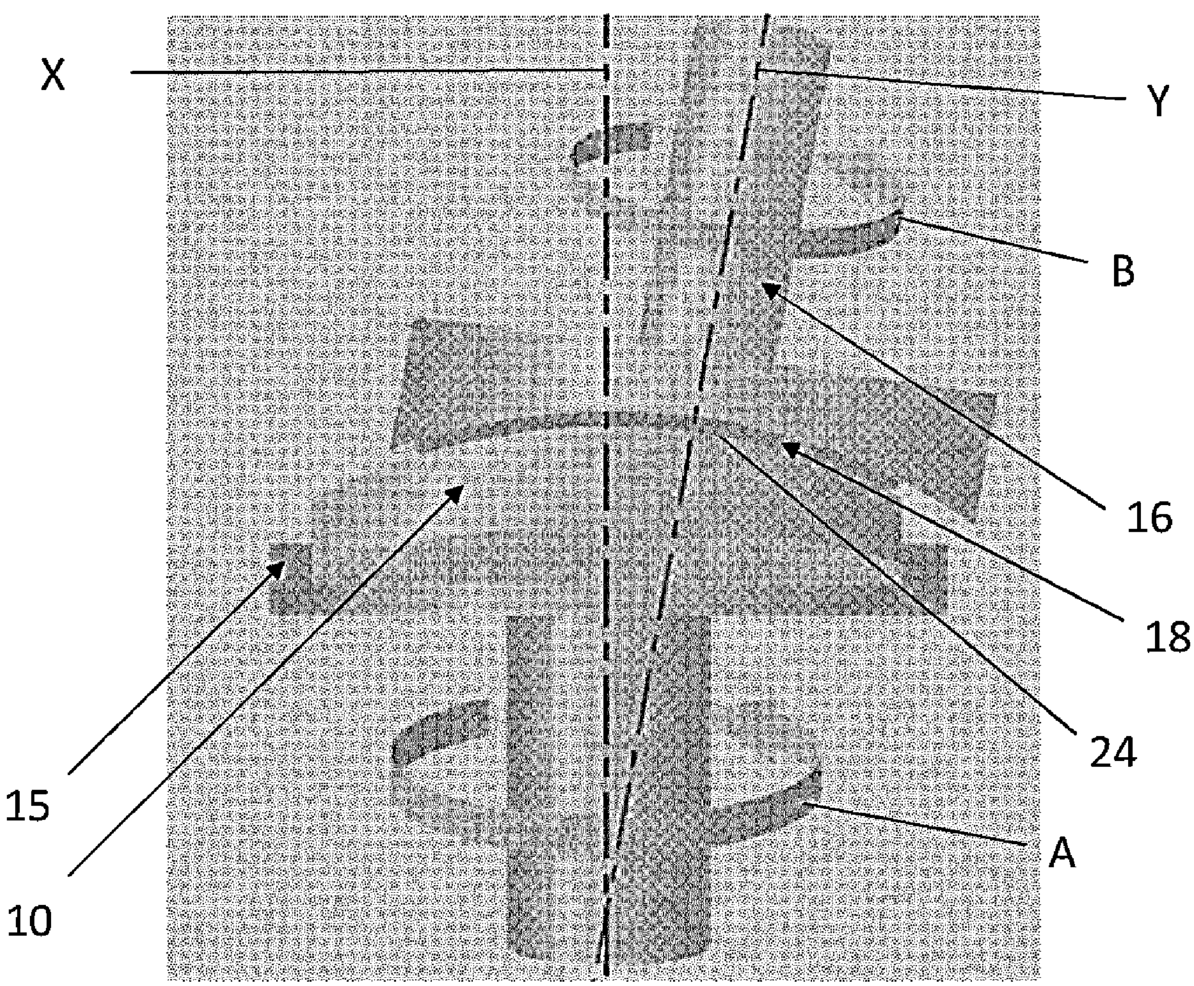
(57) **ABSTRACT**

A method of polishing a surface of an optical lens intended to be mounted in a spectacle frame includes: obtaining edging contour data representative of the edging contour of the optical lens so as to be mounted in the spectacle frame; and determining polishing tool trajectory data corresponding to the trajectory of a polishing tool so as to polish the surface of the optical lens only within the edging contour; providing the polishing tool trajectory data to a CNC machine carrying a polishing tool; and polishing, via the polishing tool, the surface of the optical lens based on the polishing tool trajectory data.



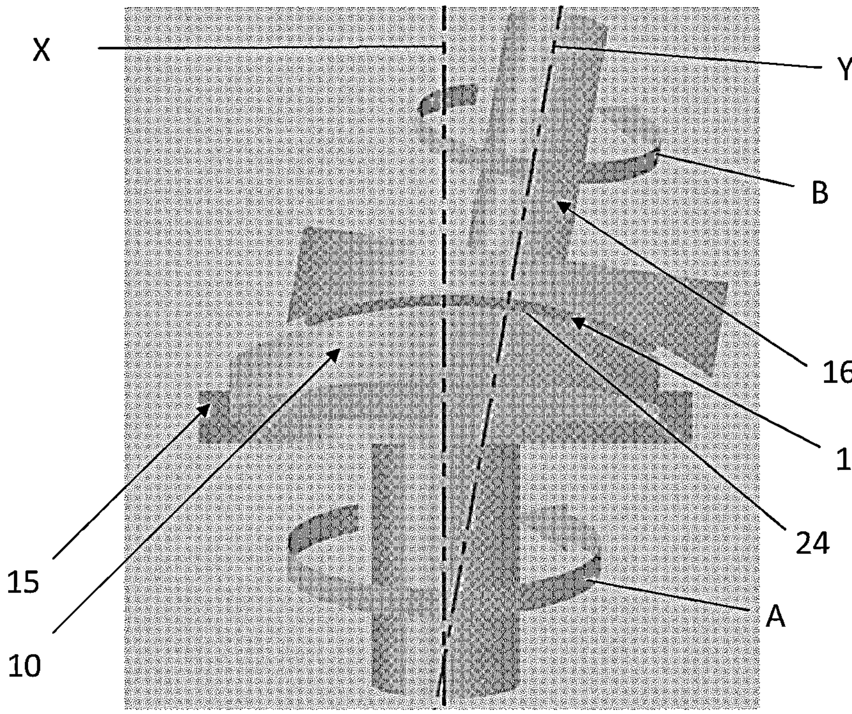


Fig. 1

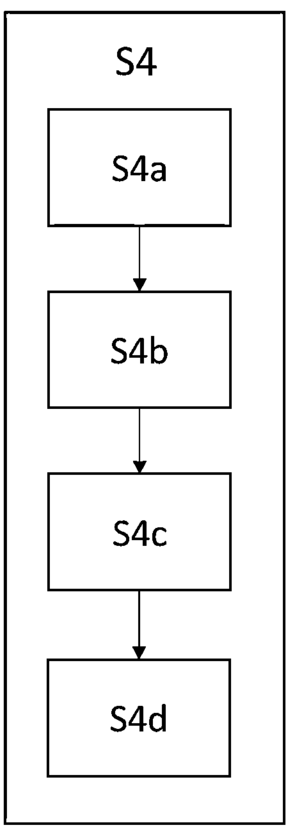


Fig. 2

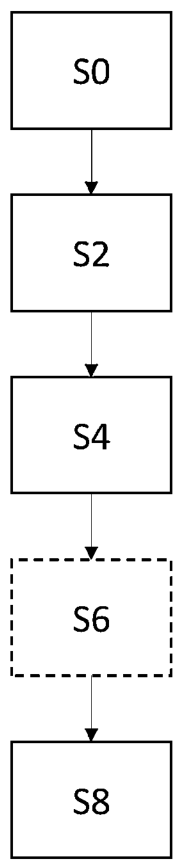


Fig. 3

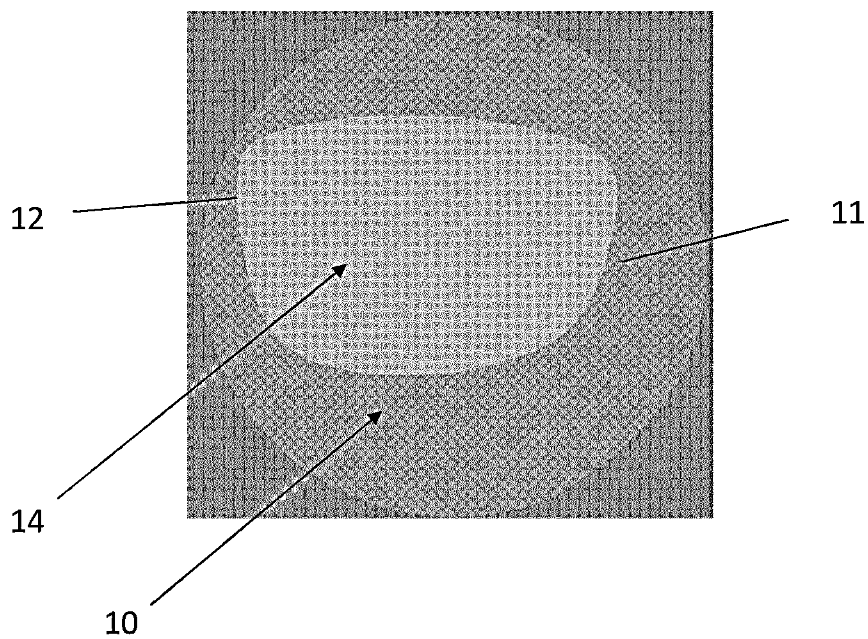


Fig. 4

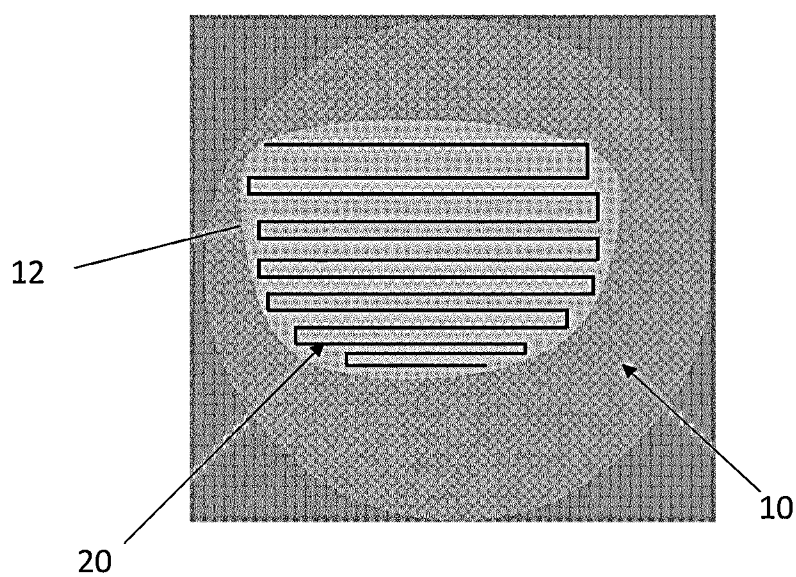


Fig. 5

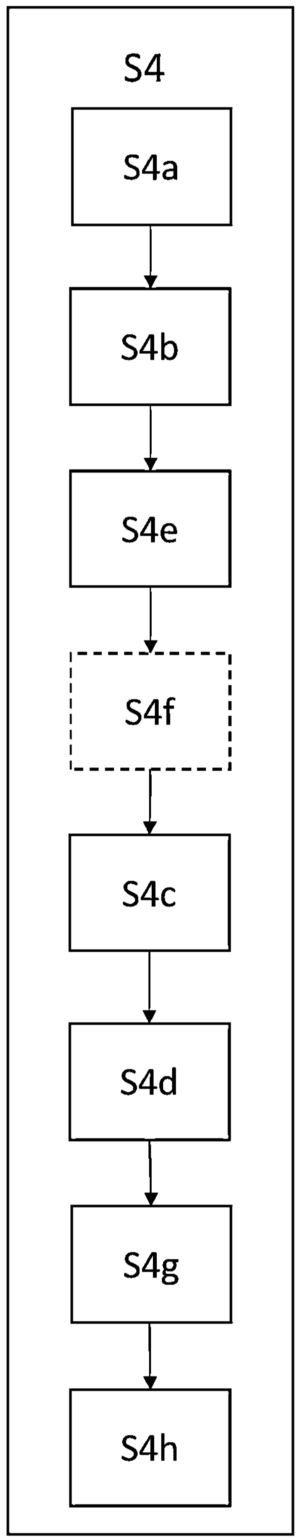


Fig. 6

METHOD FOR POLISHING AN OPTICAL LENS

TECHNICAL FIELD

[0001] The disclosure relates to a method of polishing a surface of an optical lens intended to be mounted in a spectacle frame. More particularly, the disclosure relates to defining a precise polishing trajectory of a polishing tool.

BACKGROUND OF THE DISCLOSURE

[0002] Usually, a semi-finished blank comprises an unfinished surface that is machined to perform at least an optical function.

[0003] Following the machining of the unfinished surface, a polishing tool is used to polish the surface which has been machined. The surface which has been machined is integrally polished. The polishing step involves removing the asperities present on the surface that has been machined. The polishing step enables to provide a required transparency of the optical lens to be mounted on a spectacle lens.

[0004] After polishing, one or multiple coating may be applied on the polished surface. A coating may be applied for example to filter blue light, to provide an anti-scratch or anti-reflective function.

[0005] After machining, polishing and eventually implementing coating application step, the optical lens is edged according to a shape of the spectacle frame, so as to form a final lens. The edging step may be achieved by an optical lens manufacturer or an optician.

[0006] It is known to use a polishing tool provided with a polishing pad. The polishing pad is brought in contact with the surface to be polished, the polishing pad polishes the surface and removes the undesired asperities. This method is known as shape adaptive grinding.

[0007] FIG. **1** represents an unedged optical lens **10**, carried by a lens support **15**, polished by a polishing tool **16**. The polishing tool **16** is more particularly a mechanical polishing tool. The polishing tool **16** is provided with a polishing pad **18** to polish a surface of the unedged optical lens **10** which has been machined.

[0008] During the polishing, the lens support **15** may rotate according to a direction A around an axis X and the polishing tool may rotate according to a direction B around an axis Y.

[0009] The polishing tool **16** polishes the integrality of the unedged optical lens **10** machined surface.

[0010] The method relative to the polishing is yet not optimized and is applied on the integrality of the machined surface. This implies polishing a portion of the optical lens which will be removed during the edging step to form the final optical lens.

[0011] The prior art polishing process requires long period of polishing induces an important wear of the polishing pad. This results in a polishing step having a long duration, causing a need for frequent replacement of the polishing pad.

[0012] An aim of the present disclosure is to propose a polishing method that solves the above-mentioned problems.

SUMMARY OF THE DISCLOSURE

[0013] To this end, the disclosure proposes a method of polishing a surface of an optical device intended to be mounted in a frame, wherein the method comprises:

- [0014] obtaining edging contour data representative of the edging contour of the optical device so as to be mounted in the spectacle frame, and
- [0015] determining polishing tool trajectory data corresponding to the trajectory of a polishing tool so as to polish the surface of the optical device only within the edging contour,
- [0016] providing the polishing tool trajectory data to a CNC machine carrying a polishing tool, and
- [0017] polishing, via the polishing tool, the surface of the optical device based on the polishing tool trajectory data.

[0018] Advantageously, solely the surface of the optical device intended to be mounted in a frame is polished. Time is spared with respect to the optical lens manufacturing process.

[0019] According to further embodiments which can be considered alone or in combination:

- [0020] the method is implemented by computer means; and/or
- [0021] the method is implemented by computer means and comprises the execution by a processor of one or more stored sequences of instructions of a computer program, wherein when executed enable the step of the method to be carried; and/or
- [0022] the optical device is an optical lens intended to be mounted in a spectacle frame; and/or
- [0023] the optical device is intended to be worn by a wearer and the edging contour is determined based on the spectacle frame shape and wearer parameter data; and/or
- [0024] the wearer parameter data comprises at least data representative of the inter-pupillary distance of the wearer; and/or
- [0025] the polishing tool is selected so as to provide an abrasive surface on the optical device smaller or equal to 320 mm^2; and/or
- [0026] the polishing tool and/or the optical device configured to be polished are configured so as to move during the polishing of the surface within the edging contour; and/or
- [0027] the polishing tool comprises at least a nozzle projecting a jet of an abrasive liquid on the surface to be polished; and/or
- [0028] the nozzle has a characteristic dimension, for example a diameter, greater than or equal to 0.1 mm and smaller than or equal to 2 mm, preferably 1 mm; and/or
- [0029] the polishing tool comprises a mechanical tool carrying a polishing pad configured to be in contact with the surface to be polished and having a characteristic dimension, for example a diameter, smaller than or equal to 10 mm; and/or
- [0030] the polishing pad is bent, arched or curved; and/or
- [0031] the polishing pad is made of an elastic material, such as polymer covered or not with an abrasive material; and/or
- [0032] the polishing tool comprises a laser or plasma; and/or

[0033] the method further comprises after polishing the surface of the optical device:

[0034] measuring the rugosity of the polished surface,

[0035] re-polishing at least part of the surface of the optical device within the edging contour when the measured rugosity is greater than a threshold; and/or

[0036] the method further comprises prior to polishing the surface of the optical device measuring surfacing error over at least part of the surface of the optical device within the edging contour by measuring at least part of the surfaced surface of the optical device within the edging contour and comparing such measured surfaced surface with a surface of reference and the polishing tool trajectory data is determined at least based on the measured surfacing error.

[0037] The disclosure further relates to a computer program product to control a CNC machine carrying a polishing tool comprising one or more stored sequences of instructions that are accessible to a processor and which, when executed by the processor, causes the processor to carry out the steps of the method according to the disclosure.

[0038] The disclosure also relates to a computer-readable storage medium having a program recorded thereon; where the program makes the computer execute the method of the disclosure.

[0039] Unless specifically stated otherwise, as apparent from the following discussions, it is appreciated that throughout the specification discussions utilizing terms such as "processing", "computing", "calculating", or the like, refer to the action and/or processes of a computer or computing system, or similar electronic computing device, that manipulate and/or transform data represented as physical, such as electronic, quantities within the computing system's registers and/or memories into other data similarly represented as physical quantities within the computing system's memories, registers or other such information storage, transmission or display devices.

[0040] Embodiments of the present disclosure may include apparatuses for performing the operations herein. This apparatus may be specially constructed for the desired purposes, or it may comprise a general purpose computer or Digital Signal Processor ("DSP") selectively activated or reconfigured by a computer program stored in the computer. Such a computer program may be stored in a computer readable storage medium, such as, but is not limited to, any type of disk including floppy disks, optical disks, CD-ROMs, magnetic-optical disks, read-only memories (ROMs), random access memories (RAMs) electrically programmable read-only memories (EPROMs), electrically erasable and programmable read only memories (EEPROMs), magnetic or optical cards, SIM cards, or any other type of media suitable for storing electronic instructions, and capable of being coupled to a computer system bus.

[0041] The methods presented herein are not inherently related to any particular computer or other apparatus. Various general purpose systems may be used with programs in accordance with the teachings herein, or it may prove convenient to construct a more specialized apparatus to perform the desired method. The desired structure for a variety of these systems will appear from the description below.

[0042] In addition, embodiments of the present disclosure are not described with reference to any particular programming language. It will be appreciated that a variety of programming languages may be used to implement the teachings of the disclosure as described herein.

BRIEF DESCRIPTION OF THE DRAWINGS

[0043] Non-limiting embodiments of the disclosure will now be described with reference to the accompanying drawing wherein:

[0044] FIG. **1** is a schematic representation of an unedged optical lens and a polishing tool; and

[0045] FIG. **2** is a flowchart of a lens manufacturing steps;

[0046] FIG. **3** is a flowchart of a lens polishing step according to the disclosure;

[0047] FIG. **4** is a schematic representation of machined optical lens;

[0048] FIG. **5** is a schematic representation of a polishing trajectory according to the disclosure;

[0049] FIG. **6** is a flowchart of a lens polishing steps according to a particular embodiment.

[0050] Elements in the figures are illustrated for simplicity and clarity and have not necessarily been drawn to scale. For example, the dimensions of some of the elements in the figure may be exaggerated relative to other elements to help to improve the understanding of the embodiments of the present disclosure.

DETAILED DESCRIPTION OF EMBODIMENTS OF THE DISCLOSURE

[0051] The disclosure relates to a method for polishing a surface of an optical device intended to be mounted in a spectacle frame.

[0052] The optical device is a device which is intended to be brought in front of the eye of a wearer.

[0053] The optical device may have different forms according to the frame receiving the optical device.

[0054] The optical device may be an optical lens intended to face an eye of a wearer.

[0055] The optical device may be a pair of optical lenses, wherein each optical lens is intended to face an eye of the wearer.

[0056] The optical lens or the pair of optical lenses may be configured to be housed each in an opening of a spectacle frame.

[0057] The optical device may be a lens intended to face both eyes of the wearer. The optical device may be for example ski goggles, motorcycle goggles or a motorcycle helmet visor.

[0058] The optical device may be formed by a pair of optical lenses or a single optical lens facing both eyes of the wear, intended to be mounted in a virtual reality device.

[0059] The following disclosure relates to optical lens intended to be mounted in a spectacle frame. However, the scope of the disclosure is not limited to this aspect. The disclosure applies to other types of optical devices, such as the exemplary embodiments mentioned above.

[0060] FIG. **2** illustrates a flowchart corresponding to a computer implemented method of polishing according to the disclosure. The method of polishing according to the disclosure defines a lens polishing step S**4**, wherein the at least one surface which has been machined is polished to remove the asperities of the machined surface. More particularly, the lens polishing step S**4** comprises the following plurality of sub-steps:

[0061] an edging contour data obtaining step S**4***a*, wherein edging contour data representative of the edging contour of the optical lens so as to be mounted in the spectacle frame are obtained, and

[0062] a polishing tool trajectory determination step S**4***b*, wherein data corresponding to the trajectory of a polishing tool so as to polish the surface of the optical lens only within the edging contour are determined,

[0063] a polishing tool trajectory providing step S**4***c* data to a CNC machine carrying a polishing tool, and

[0064] a surface polishing step S**4***d*, wherein the machined surface of the unedged optical lens is polished based on the polishing tool trajectory data determined at the step S**4***b* within the edging contour provided at the step S**4***a*.

[0065] FIG. **3** illustrates a flowchart relative to a method for manufacturing an optical lens.

[0066] The method for manufacturing an optical lens may comprise a polishing step S**4** according to the disclosure, as illustrated in FIG. **2** and explained above.

[0067] The method for manufacturing an optical lens may comprise:

[0068] a lens blank providing step S**0**, wherein a lens blank, for example obtained by molding, is provided,

[0069] a lens machining step S**2**, wherein at least one surface of the lens blank is machined to form an unedged optical lens having at least one optical function corresponding to the prescription of a wearer,

[0070] the lens polishing step S**4**, wherein the polishing step S**4** may comprise the steps S**4***a*, S**4***b*, S**4***c* and S**4***d* described above,

[0071] a lens edging step S**8**, wherein the unedged optical lens is edged according to an edging contour, the edging contour being determined so that the edged optical lens may be received in an opening of a spectacle frame.

[0072] The method for manufacturing an optical lens may also comprise an eventual coating application step S**6**, wherein one or more coating is applied on the polished surface of the optical lens.

[0073] FIG. **4** represents an unedged optical lens **10**. The unedged optical lens **10** comprises a first surface **11** and a second surface opposed to the first surface (not shown). The first surface **11** and the second surface provide, in combination an optical function.

[0074] The optical lens **10** is intended to be mounted in a spectacle frame. The spectacle frame comprises at least one opening designed to receive an optical lens. The unedged optical lens **10**, following the polishing and the eventual application of one or more coatings, requires to be edged according to a contour so as to be fitted into the opening of the spectacle frame. Once edged according to an edging contour **12**, the unedged optical lens **10** forms an edged optical lens **14**.

[0075] The edging contour **12** is determined based on the shape of the spectacle frame, and more particularly the at least one opening intended to receive the edged optical lens **14**. The edging contour **12** defines the contour of the optical lens once the unedged optical lens has been edged prior to being mounted in a spectacle frame.

[0076] In a preferred embodiment, the edging contour **12** is defined by the shape of a spectacle frame, and more particularly the at least one opening intended to receive an edged optical lens **14** and wearer parameter data.

[0077] Wearer parameter data may comprise wearer's wearing conditions.

[0078] The wearing conditions are to be understood as the position of the ophthalmic lens with relation to the eye of a wearer, for example defined by a pantoscopic angle, a Cornea to lens distance, a Pupil-cornea distance, a centre of rotation of the eye (CRE) to pupil distance, a CRE to lens distance and a wrap angle.

[0079] The Cornea to lens distance is the distance along the visual axis of the eye in the primary position (usually taken to be the horizontal) between the cornea and the back surface of the lens; for example equal to 12 mm.

[0080] The Pupil-cornea distance is the distance along the visual axis of the eye between its pupil and cornea; usually equal to 2 mm.

[0081] The CRE to pupil distance is the distance along the visual axis of the eye between its center of rotation and cornea; for example equal to 11.5 mm.

[0082] The CRE to lens distance is the distance along the visual axis of the eye in the primary position (usually taken to be the horizontal) between the CRE of the eye and the back surface of the lens, for example equal to 25.5 mm.

[0083] The pantoscopic angle is the angle in the vertical plane, at the intersection between the back surface of the lens and the visual axis of the eye in the primary position (usually taken to be the horizontal), between the normal to the back surface of the lens and the visual axis of the eye in the primary position; for example equal to −8°.

[0084] The wrap angle is the angle in the horizontal plane, at the intersection between the back surface of the lens and the visual axis of the eye in the primary position (usually taken to be the horizontal), between the normal to the back surface of the lens and the visual axis of the eye in the primary position for example equal to 0°.

[0085] An example of standard wearer condition may be defined by a pantoscopic angle of −8°, a Cornea to lens distance of 12 mm, a Pupil-cornea distance of 2 mm, a CRE to pupil distance of 11.5 mm, a CRE to lens distance of 25.5 mm and a wrap angle of 0°.

[0086] Wearer parameter data may comprise the prescription of the wearer.

[0087] The prescription is a set of optical characteristics of optical power, of astigmatism and, where relevant, of addition, determined by an ophthalmologist in order to correct the vision defects of an individual, for example by means of a lens positioned in front of his eye. Generally speaking, the prescription for a progressive addition lens comprises values of optical power and of astigmatism at the distance-vision point and, where appropriate, an addition value.

[0088] The wearer parameter data may relate to the inter-pupillary distance (IPD) which is the distance between the center of the pupils of the two eyes of the user.

[0089] The edging contour **12** may be defined considering one of the above wearer parameter data or any combination of them

[0090] According to the edging contour data providing step S**4***a*, the edging contour **12** defines a zone within which the polishing occurs during the method of polishing according to the disclosure. The polishing is limited to the zone defined by the edging contour **12** to reduce the duration of the polishing.

[0091] By limiting the duration, polishing tool consumable can be spared, for example less abrasive fluid is required if the polishing is accomplished by abrasive fluid, slurry, oil or the polishing pad itself if the polishing is accomplished by adaptive shape grinding.

[0092] FIG. **5** relates to polishing tool data defined by the trajectory **20** of a polishing tool (not shown) according to the polishing tool trajectory determination step S4*b* of the disclosure. The polishing tool trajectory may be based on the edging contour **12**. Preferably, the polishing tool trajectory data take into consideration the edging contour **12** to limit the displacement of the polishing tool and optimize the duration of the polishing.

[0093] In a particular embodiment, the trajectory **20** of the polishing tool may be of any form different from a spiral. The trajectory **20** may have a serpentine shape, as shown in FIG. **5**.

[0094] In a preferred embodiment, the polishing tool can be brought in motion in according to any direction of the six degrees of freedom.

[0095] Additionally, the polishing tool may be mounted on an arm via a ball-and-socked joint enabling also additional rotational degrees of freedom.

[0096] In a preferred embodiment, the lens support is enabled to be brought in motion according to any direction of the six degrees of freedom.

[0097] Advantageously, the ability of the unedged optical lens **10** configured to be polished and/or the polishing tool to move enables to perform a great variety of trajectories. In such manner the polishing tool trajectory **20** can be optimized in order to reduce the time necessary to polish the zone defined by the edging contour **12**, adapting the polishing trajectory **20** to the edging **12**.

[0098] After the determination of the edging contour **12** according to step S4*a* and the polishing tool trajectory **20** according to step S4*b*, the polishing of the unedged optical lens occurs. The polishing tool trajectory **20** is provided according to step S4*c* to a CNC machine carrying the polishing tool so as to perform the polishing according to step S4*d* of the zone delimited by the edging contour **12**.

[0099] "CNC" stands for "Computerized Numerical Control". It is a computerized manufacturing process in which pre-programmed software and code controls the movement of production equipment. CNC machining controls a range of complex machinery, such as grinders, lathes, and turning mills, all of which are used to cut, shape, and create different parts and prototypes.

[0100] A CNC machine, also called Computer Numerical Control machine, is and automated machine, which is operated by a computer executing pre-programmed sequences of controlled commands.

[0101] In an embodiment, a CNC machine is a machine using computer-aided design and/or computer-aided manufacturing programs to proceed to manufacturing. These programs are configured to control features like polishing tool trajectory and displacement speed of the polishing tool. Programs are written and uploaded into the machine's computer memory, as mentioned in the step S4*c*.

[0102] During the polishing step, the unedged optical lens **10** configured to be polished and/or the polishing tool are configured so as to move during the polishing the zone defined by the edging contour **12**.

[0103] The polishing tool provides an abrasive surface on the unedged optical lens **10**.

[0104] The abrasive surface may be formed by the surface of a polishing pad brought into contact with the unedged optical lens **10**. The contact surface between the unedged lens **10** and the polishing pad forms the abrasive surface.

[0105] The abrasive surface may be formed on a portion of the surface **11** within the edging contour **12** when being impacted by a laser, plasma or an abrasive liquid projected by a nozzle.

[0106] In a particular embodiment, the polishing tool may be selected so as to provide an abrasive surface on the unedged optical lens **10** smaller or equal to 320 mm^2. Preferably, providing an abrasive surface smaller or equal to 320 mm^2 enables to ensure that the polishing tool only provides polishing within the edging contour **12**.

[0107] Preferably, the polishing tool is brought perpendicular to the surface of the unedged optical lens **10** to be polished during the polishing step S4*d*. Bringing the polishing tool perpendicularly to the surface to be polished enables to perform a more precise polishing.

[0108] In a particular embodiment relative to adaptive shape grinding, the polishing tool is a mechanical polishing tool carrying a polishing pad. The polishing pad is configured to be brought in contact with the machined surface of the unedged optical lens **10** to polish the zone delimited by the edging contour **12**. More particularly, the abrasive surface defines a portion of the polishing pad which is the portion of the polishing pad brought in contact with the unedged optical lens **10**.

[0109] As a smaller portion of the unedged optical lens **10** is polished with regard to conventional optical lens polishing, the wear of the polishing pad is less important. In such manner the polishing pad mounted on a polishing tool can polish more optical lenses using the polishing method according to the disclosure than the conventional polishing method for an identical wear.

[0110] The diameter of the polishing pad may be smaller or equal to 10 mm.

[0111] Advantageously, a polishing pad of small dimension enables to provide a reduced surface of contact between the polishing tool and the unedged lens **10**. This also enables to ensure polishing only within the edging contour. More particularly, a polishing pad of small dimension enables to match the shape of the edging contour **12** and ensuring a precise polishing, only within the edging contour **12**.

[0112] In a particular embodiment, the polishing pad may be bent, arched or curved. In such manner, the contact surface formed by the abrasive surface may be reduced and enables a more precise polishing.

[0113] The polishing pad being bent, arched or curved enables to provide a reduced surface of contact between the polishing tool and the unedged lens **10** and enables to ensure a polishing only within the edging contour.

[0114] The polishing may be point-by-point polishing.

[0115] In a particular embodiment, the polishing pad is made of an elastic material. The elastic material may be a polymer, for example covered with an abrasive material.

[0116] The use of an elastic material enables more flexibility in the trajectory to be achieved by the polishing tool.

[0117] An oil may be applied on the polishing pad prior accomplishing the polishing on the unedged optical lens for not creating additional asperities during the polishing step.

[0118] In a particular embodiment, the mechanical polishing tool comprises a non-polishing pad. In the embodiment wherein the pad is a non-polishing pad, a slurry is used which is either applied on the non-polishing pad and/or the machined surface of the unedged lens **10**.

[0119] In a particular embodiment relative to the fluid jet polishing, the polishing tool may comprise a nozzle projecting a jet of abrasive liquid on the surface of the unedged lens **10** to be polished.

[0120] The polishing tool comprises a single or a plurality of nozzles projecting abrasive liquid.

[0121] The projection of the abrasive liquid enables to perform polishing without requiring bringing the polishing tool in contact with the unedged lens **10** to be polished.

[0122] By means of a high-speed collision of particles of the abrasive jet liquid projected on the surface of the lens to be polished, the surface of the lens encounters a high stress causing erosion and/or shearing enabling material removal.

[0123] In a preferred embodiment, the nozzle has a characteristic dimension which may be defined by the diameter of the nozzle. Preferably, the diameter of the nozzle is larger or equal to 0.1 mm, and preferably smaller or equal to 2 mm. In a more preferred embodiment, the diameter of the nozzle is 1 mm.

[0124] Advantageously a nozzle having a small diameter enables to have more precision with respect to the zone to be polished. The polishing is restrained solely to the zone formed by the edging contour **12**.

[0125] In a preferred embodiment, the fluid jet polishing enables a point-by-point polishing.

[0126] The detailed polishing performed by a polishing tool having a nozzle of small diameter enables the polishing of micro-lenses formed on the machined surface of the unedged optical lens **10**.

[0127] In a particular embodiment, the polishing tool may comprise more than one nozzle to project simultaneously an abrasive liquid. For example, a polishing tool may comprise 2, 3, 4, 10, 12, or even 16 nozzles.

[0128] Advantageously, the multi jet polishing enables to reduce the time required to polish the zone formed by the edged contour **12**, requiring a fewer number of strokes.

[0129] The more than one nozzle may project simultaneously an abrasive liquid on at least two unedged optical lens to be polished.

[0130] In particular embodiment, the trajectories of the different nozzles of a polishing tool are different.

[0131] In another embodiment relative to laser polishing or plasma polishing, the polishing tool comprises an laser or plasma. The laser or plasma affects the chemical properties of particles of unedged optical lens **10** causing erosion and/or shearing enabling material removal.

[0132] Advantageously, plasma polishing may be used to polish thermoplastic materials, for example polycarbonate.

[0133] FIG. **6** illustrates a flowchart regarding the polishing step comprising particularly a polishing control substeps.

[0134] In a particular embodiment, the polishing method comprises a control step S4*g* to determine if the polished surface meets the polishing requirement. The rugosity of the polished surface of the optical lens **10** is measured in at least one point of the zone delimited by the edged contour **12**.

[0135] The measured rugosity is compared to a rugosity threshold value. If the measured rugosity is more important than the threshold value. A second polishing step S4*h* occurs on at least a part of the surface of the optical lens within the edging contour **12**.

[0136] Prior to the polishing according to the step S4*d*, a lens rugosity measurement step S4*e*, wherein a rugosity measurement is performed over at least a part of a surface of the optical lens within the edging contour **12**.

[0137] During a rugosity comparison step S4*f*, the rugosity measurement of the unedged optical lens **10** is compared with a surface of reference for an optical lens having the same optical function.

[0138] Based on this comparison, a zone requiring a polishing within the edging contour **12** is determined. And based on the zone requiring to be polished, the polishing tool trajectory **20** is determined.

[0139] This technical solution is compatible with progressive lenses and complex freeform shapes, thanks to the multi-axis nature of the equipment. The amount of material removal in a specific area can be varied to adjust the amount of polishing or correct defects.

[0140] The disclosure has been described above with the aid of embodiments without limitation of the general inventive concept.

[0141] The disclosure also relates to a computer program product comprising one or more stored sequences of instructions. The one or more sequences of instructions comprise edging contour data and polishing tool trajectory data. A processor executes the sequences of instructions so as to command the polishing tool to perform polishing according to the disclosure.

[0142] Based on the edging contour data, the zone to be polished by the polishing tool is provided to the processor commanding the polishing tool.

[0143] The polishing trajectory data correspond to sequences of instruction to be performed by the polishing tool, to define the displacement and the trajectory **20** of the polishing tool **16** during the polishing step.

[0144] In a specific embodiment, based on the sequences of instructions relative to the trajectory data, a support, onto which is resting the unedged lens **10**, follows a trajectory in accordance to the polishing tool trajectory **20** to perform the polishing in the unedged lens **10** within the edging contour **12**.

[0145] Many further modifications and variations will be apparent to those skilled in the art upon making reference to the foregoing illustrative embodiments, which are given by way of example only and which are not intended to limit the scope of the disclosure, that being determined solely by the appended claims.

[0146] In the claims, the word "comprising" does not exclude other elements or steps, and the indefinite article "a" or "an" does not exclude a plurality. The mere fact that different features are recited in mutually different dependent claims does not indicate that a combination of these features cannot be advantageously used. Any reference signs in the claims should not be construed as limiting the scope of the disclosure.

1. Method of polishing a surface of an optical lens intended to be mounted in a spectacle frame, wherein the method comprises:

obtaining edging contour data representative of the edging contour of the optical lens so as to be mounted in the spectacle frame, and

determining polishing tool trajectory data corresponding to the trajectory of a polishing tool so as to polish the surface of the optical lens only within the edging contour,

providing the polishing tool trajectory data to a CNC machine carrying a polishing tool, and polishing, via the polishing tool, the surface of the optical lens based on the polishing tool trajectory data.

2. The method according to claim **1**, wherein the optical lens is intended to be worn by a wearer and the edging contour is determined based on the spectacle frame shape and wearer parameter data.

3. The method according to claim **2**, wherein the wearer parameter data comprises at least data representative of the inter-pupillary distance of the wearer.

4. The method according to claim **1**, wherein the polishing tool is selected so as to provide an abrasive surface on the optical lens smaller or equal to 320 mm^2.

5. The method according to claim **1**, wherein the polishing tool and/or the optical lens to be polished are configured so as to move during the polishing of the surface within the edging contour.

6. The method according to claim **1**, wherein the polishing tool comprises at least a nozzle projecting a jet of an abrasive liquid on the surface to be polished.

7. The method according to claim **5**, wherein the nozzle has a characteristic dimension a diameter, greater than or equal to 0.1 mm and smaller than or equal to 2 mm.

8. The method according to claim **1**, wherein the polishing tool comprises a mechanical tool carrying a polishing pad configured to be in contact with the surface to be polished and having a characteristic dimension, for example a diameter, smaller than or equal to 10 mm.

9. The method according to claim **8**, wherein the polishing pad is bent, arched or curved.

10. The method according to claim **8**, wherein the pad is made of an elastic material.

11. The method according to claim **1**, wherein the polishing tool comprises a laser or plasma.

12. The method according to claim **1**, wherein the method further comprises after polishing the surface of the optical lens:

measuring the rugosity of the polished surface,

re-polishing at least part of the surface of the optical lens within the edging contour when the measured rugosity is greater than a threshold.

13. The method according to claim **1**, wherein the method further comprises prior to polishing the surface of the optical lens measuring surfacing error over at least part of the surface of the optical lens within the edging contour by measuring at least part of the surfaced surface of the optical lens within the edging contour and comparing such measured surfaced surface with a surface of reference and the polishing tool trajectory data is determined at least based on the measured surfacing error.

14. A non-transitory computer-readable medium on which is stored one or more sequences of instructions that are accessible to a processor and which, when executed by the processor, causes the processor to carry out the method of claim **1**.

15. (canceled)

16. The method according to claim **5**, wherein the nozzle has a characteristic dimension a diameter, greater than or equal to 0.1 mm and smaller than or equal to 1 mm.

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