

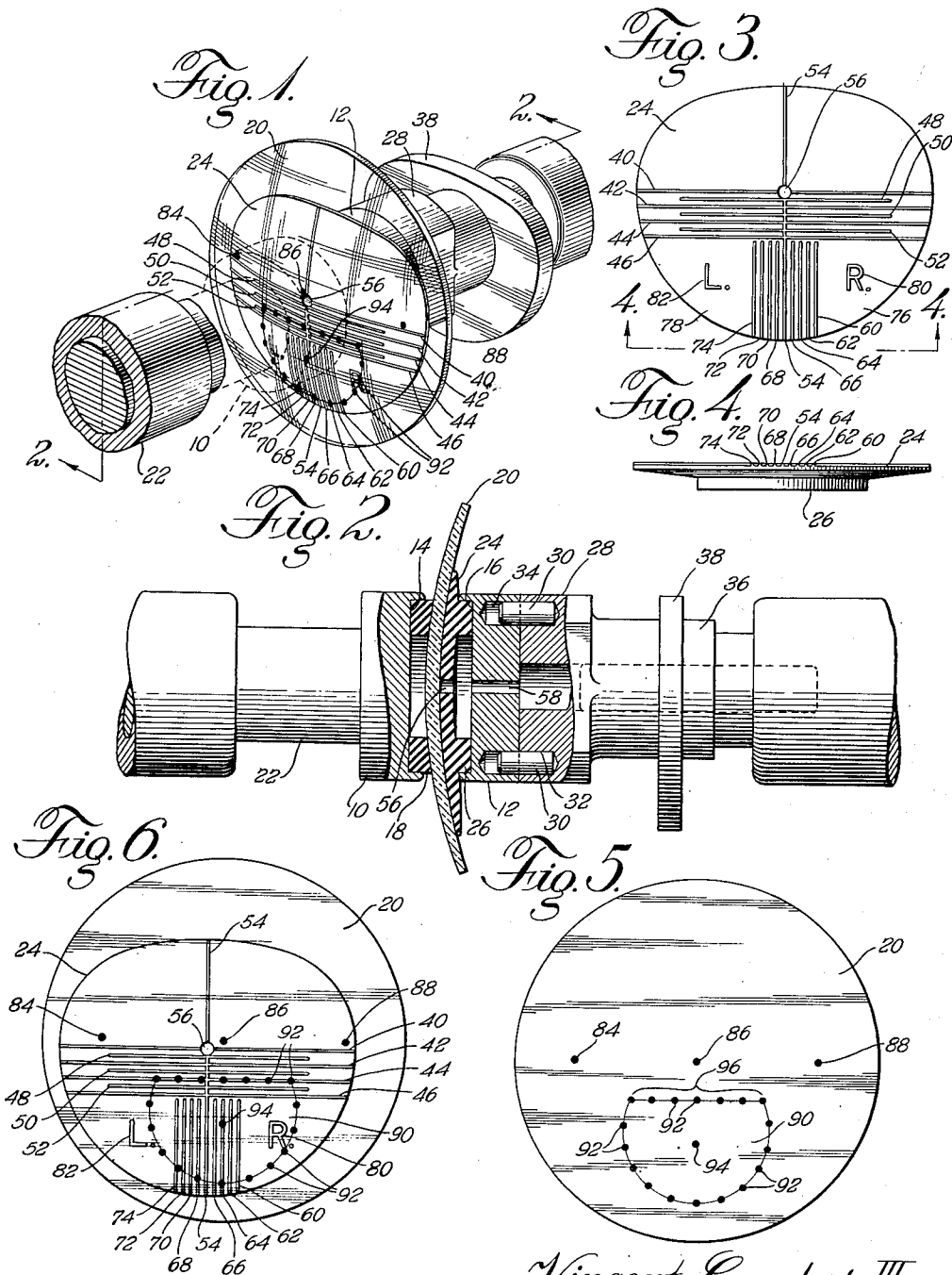
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BIFOCAL HEIGHT AND DECENTRATION DEVICE

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BIFOCAL HEIGHT AND DECENTRATION
DEVICE

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4 Claims. (Cl. 51-217)

My invention relates to the manufacture of optical lenses and includes among its objects and advantages the provision of an improved method of and means for facilitating the manufacture of bifocal lenses.

Many methods and devices have been devised for edging bifocal lenses. Recently, the appearance of many different types of bifocals have created many problems and difficulties with respect to proper positioning of the lenses in an edging machine to the end that the edged lens will have its reading segment in correct position. Improper location results in a large waste of lens material and time. At the present time it is common practice to employ a centering tool in the nature of clamping jaws, one of which is provided with locating pins arranged for connection with a pad holder. The pad holder is provided with a small central opening which serves as a guide for centering the lens. One of the jaws of the centering tool is provided with two small holes which serve as guides for locating the axis position. After a lens has been aligned, the jaws are released for bringing them into pressure relation with the lens, after which the lens is clamped in an edging machine for edging to shape. In present equipment it is a difficult problem to properly align the lens with the guides on the centering tool. The guide marks are located underneath the lens, and the operator attempts to secure proper alignment by checking the marks on the lens with the marks on the tool by viewing the same from a true vertical point. In lens centering tools, the guide marks thereon are spaced a considerable distance from the lens, and it is difficult to view the guide marks from a true vertical position. If viewed from a slight angle, the lens will be decentered. In many cases the lens shifts relatively to the pads which clamp the lens in the edging machine so that the lens must be discarded.

An object of my invention is to provide a novel method and means for facilitating edging of bifocal lenses to the end that the reading segment may have proper location with respect to height and decentration in accordance with the required prescription.

Another object is to provide a pad designed for attachment to a pad holder in a conventional edging machine and in which the pad embodies novel means for accurately locating the reading segment with respect to height and decentration.

A further object is to provide a pad designed to facilitate location of the reading segment with respect to height and decentration and in which the

pad is so designed as to support the blank in an efficient manner, thereby eliminating the possibility of accidental shifting which frequently necessitates discarding of the blank.

A further object is to provide a pad having locating means facilitating proper positioning of the height of the reading segment as well as decentration thereof and in which the guide means is located in such close relation with the guide marks on the lens blank as to eliminate error incident to centering of lenses through the medium of present equipment.

In the accompanying drawing:

Fig. 1 is a perspective view illustrating my invention associated with the clamping mechanism of a conventional edging machine.

Fig. 2 is a side elevational view of the structure of Fig. 1 with certain parts shown in section for the purpose of clearness;

Fig. 3 is an elevational view of my invention; Fig. 4 is a view taken from the position indicated by line 4-4 of Fig. 3;

Fig. 5 is a plan view of a lens blank showing the blank marked for the 180° line or axis and reading segment area; and

Fig. 6 is a plan view illustrating the manner in which my invention may be utilized for accurately locating the height of the reading segment as well as decentration thereof.

In the embodiment selected to illustrate my invention, I make use of chucks 10 and 12 which are recessed at 14 and 16, respectively, for the reception of pads. A conventional pad 18 is illustrated in association with the chuck 10 and comprises resilient material such as rubber in the nature of a washer. The pad 18 is thicker than the depth of the recess 14 so as to bring the pad 18 in pressure relation with the lens 20. Chuck 10 is carried by a member 22 which is movable toward and away from the chuck 12 for separating the two chucks, as when positioning the lens 20 therebetween. My invention is in the nature of a pad 24 of resilient material, which pad is provided with a short neck 26 of such diameter as to be frictionally retained within the socket 16. Chuck 12 is keyed to a head 28 by means of two pins 30. These pins are fixedly anchored in openings 32 in the head 28 as by a pressed fit while the opposite ends of the pins are loosely receivable within bores 34 in the chuck 12. Between the head 28 and an abutment 36 is positioned a lens former 38 which determines the shape of the edged lens. For edging purposes, the lens 20 is firmly pressed between the pads 18 and 24 while the entire structure so far described is

rotated as a unit. With the exception of my pad 24, the structure so far described is old and well known in the art of edging machines and need not be described in further detail.

Referring to Fig. 3, the face of the pad 24 opposite the neck 26 is provided with a series of parallel lines 40, 42, 44 and 46 which may extend the full width of the pad. The lines may take the form of ribs molded integrally with the pad. Between the lines 40 to 46 I position shorter lines 48, 50 and 52. Thus, the short lines are alternately located between the long lines and may be of the same formation as the longer lines. The lines 40 to 52 are spaced one millimeter apart.

Upon the face of the pad 24 I provide a right angular line 54 which may extend the full height of the pad. Lines 40 and 54 intersect the axis of an opening 56, the axis of which opening corresponds to the axis of an opening 58 in the chuck 12.

On each side of the line 54 underneath the line 46 and paralleling the line 54, I provide a series of lines 60, 62, 64, 66, 68, 70, 72 and 74. Lines 54 and 60 to 74 may be in the nature of ribs, and all these lines are spaced one millimeter apart. The general outline of the pad 24 when viewed according to Fig. 3 may conform generally to the configuration of the former 38. The areas 76 and 78 are designated right and left, respectively, as at 80 and 82.

Fig. 5 illustrates the lens blank 20 as being provided with three dots 84, 86 and 88 which are aligned in a straight line and represent the 180° line or axis of the lens. Dot 86 corresponds to the optical center or axis of the lens. It is common practice to employ ink for dotting the lens, and accurate location is determined through the medium of conventional lens markers. The reading segment area 90 is outlined by a series of dots 92 and a dot 94 which represents the optical center of the reading segment. All the dots may comprise ink which is easily removed.

The axis of the opening 56 in the pad 24 aligns with the axis of the opening 58, and the axis of the latter corresponds to the axis of rotation of the clamp mechanism of the edging machine. Fig. 6 illustrates the manner in which the height of the reading segment as well as its decentration may be accurately determined through the medium of my pad 24. The group 96 of dots 92 defines the upper line of a flat top reading segment. In locating the lens 20 on the pad 24, the chuck 12 is removed from the head 30 to facilitate manipulation. The lens is placed on the pad 24 and shifted relatively thereto by manual manipulation.

In Fig. 6, I illustrate the top of the reading segment as being located four millimeters beneath the line 40 on the pad 24. The optical center 94 of the reading segment 90 is located two millimeters to the right of the line 54. Since the optical center 94 of the reading segment is shifted to the right of the line 54, the lens is of the right order, since a lens of the left order would be shifted to bring the reading segment center 94 to the left of the line 54.

The group 96 of the dots 92 forms a straight line which serves as a guide to alignment with any of the lines 40 to 52. However, the dots 84, 86 and 88 are always aligned in a straight line which may be observed with respect to any of the lines 40 to 52 depending upon the degree of shift in a vertical direction. It is a relatively easy matter to maintain parallel relation be-

tween the line defined by the dots 84, 86 and 88 and the horizontal lines 40 to 52. At the same time, it is an easy matter to shift the lens for bringing the reading segment center 94 to the proper degree of decentration with respect to the vertical lines 54 and 60 to 74. In spacing all the guide lines on the pad 24 one millimeter apart, I provide means whereby accurate location may be secured with respect to height of the reading segment as well as to the degree of decentration.

The series of parallel lines in right angular relation greatly facilitates the proper edging of cylindrical lenses. In edging a lens of this type, decentration cannot be determined through rotation of the lens about a predetermined axis. With my pad, the decentration may be located as desired, and the pad provides means whereby shifting of the lens is consummated through the medium of bodily shifting in true vertical or horizontal lines. While the reading segment 90 is illustrated as having a straight upper edge, reading segments of variable degree of curvature may be accurately decentrated through the medium of the pad 24. Assuming that the reading segment is curved in a sharp degree, the height is determined by maintaining parallel relation between the axis dots 84, 86, 88 and the horizontal lines while moving the lens upwardly or downwardly for bringing the highest point of the reading segment to the proper height with respect to the horizontal lines. The horizontal lines are alternately shorter and longer so as to distinguish their numerical order, thus facilitating observation and placement of the lens.

In my invention, the lens may be accurately positioned for edging purposes without the aid of a centering tool such as is necessary under present methods. Normally, the pad 24 is flat, as illustrated in Fig. 4, but when the neck 26 is pressed into the chuck 12, the pad will assume a slightly convex configuration which conforms in general to the curvature of the lens 20, as illustrated in Fig. 2. The neck 26 may be fixedly anchored in the chuck 12 as by cementing.

After the lens 20 has been properly positioned on the pad 24 for locating height and decentration of the reading segment, the lens and the pad may be clamped in the centering tool for holding purposes only. With the lens and pad clamped in the centering tool, the assembly is placed in the edging machine. The pins 30 determine the proper positioning of the chuck 12 with respect to the head 28 so that the lens to be edged will at all times be properly positioned with respect to the lens former 38. In other words, the pins serve as keys which restrain the chuck 12 from relative rotation with respect to the head 28 so that the outline of the lens will always accurately correspond to the outline of the former 38.

In view of the fact that the height and decentrating markings on the pad 24 are closely related with the lens 20, I attain an exceedingly high degree of accuracy as against locations attained through the medium of conventional centering tools. The guide lines on the pad have direct contact with the lens, thus reducing to a minimum the distance between the lens and the markings. In this way, I eliminate inaccuracies due to improper viewing because of angularity. Under present methods it is difficult, if not impossible, to determine accurately when the alignment is being viewed from true perpendicular lines. A slight angle in viewing results in a

large degree of inaccuracy in the finished lens. The pad 24 in being made of rubber deforms easily to conform to the specific shape of the lens incident to pressure in the edging machine.

5 The pad 24 is characterized by a relatively large area which increases the holding relation between the pad and the lens. Conventional pads are of the type such as that illustrated at 18. Such pads have limited frictional relation with
10 the lens. Because of the frictional relation between the pad 24 and the lens, I entirely eliminate accidental shifting or rotation of the lens about the axis of the chuck 12. Any slight relative rotation between the lens and its pad naturally throws the axis line and the bifocal center
15 out of line with their original registration. My pad holder supports the lens in such a manner as to prevent accidental shifting so that when the lens has been ground to the shape determined
20 by the lens former 38, the decentration as well as other prescription factors will be properly located within the contour of the edged lens.

In the drawing, I have illustrated the pad 24 as being provided with a central opening 56
25 which corresponds to the axis of the opening 58. The pad may be accurately manufactured while the opening 56 provides means for checking whether the axis of the pad is properly located with the axis of the opening 58.

30 Without further elaboration, the foregoing will so fully explain my invention that others may, by applying current knowledge, readily adapt the same for use under various conditions of service.

35 I claim:

1. The combination with a lens edging chuck, of a pad fixedly secured to said chuck, said pad being provided with means for indicating the

position of the lens center relative to the pad center, said means comprising groups of parallel lines arranged in right-angular relation.

2. The combination with a lens edging chuck, of a pad fixedly secured to said chuck, said pad
5 being provided with means for indicating the position of the lens center relative to the pad center, said means comprising groups of parallel lines arranged in right-angular relation, said
10 pad having indicia for indicating the direction of shift for right or left lenses.

3. In a lens edging machine, including a lens edging chuck, a resilient pad adapted to be secured to said chuck to have pressure relation
15 with a bifocal lens to be edged, said pad being provided with means on the face thereof engaging the lens for indicating the position of the optical center of the reading segment of the lens relative to the pad center, and said pad
20 being yieldable to conform to the face of the lens engaged thereby.

4. In a lens edging machine including first and second edging chucks, the first edging chuck being provided with a pad arranged to be brought into pressure relation with a lens to be edged, a
25 second resilient pad adapted to be operatively connected with the second chuck arranged to engage the opposite face of the lens to be edged for clamping the lens between the two pads, said second pad being provided with means on
30 the face thereof engaging the lens for indicating the position of the optical center of the reading segment of a bifocal lens to the pad center, and said second pad being detachable from the second chuck to facilitate location of
35 the lens thereon.

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