

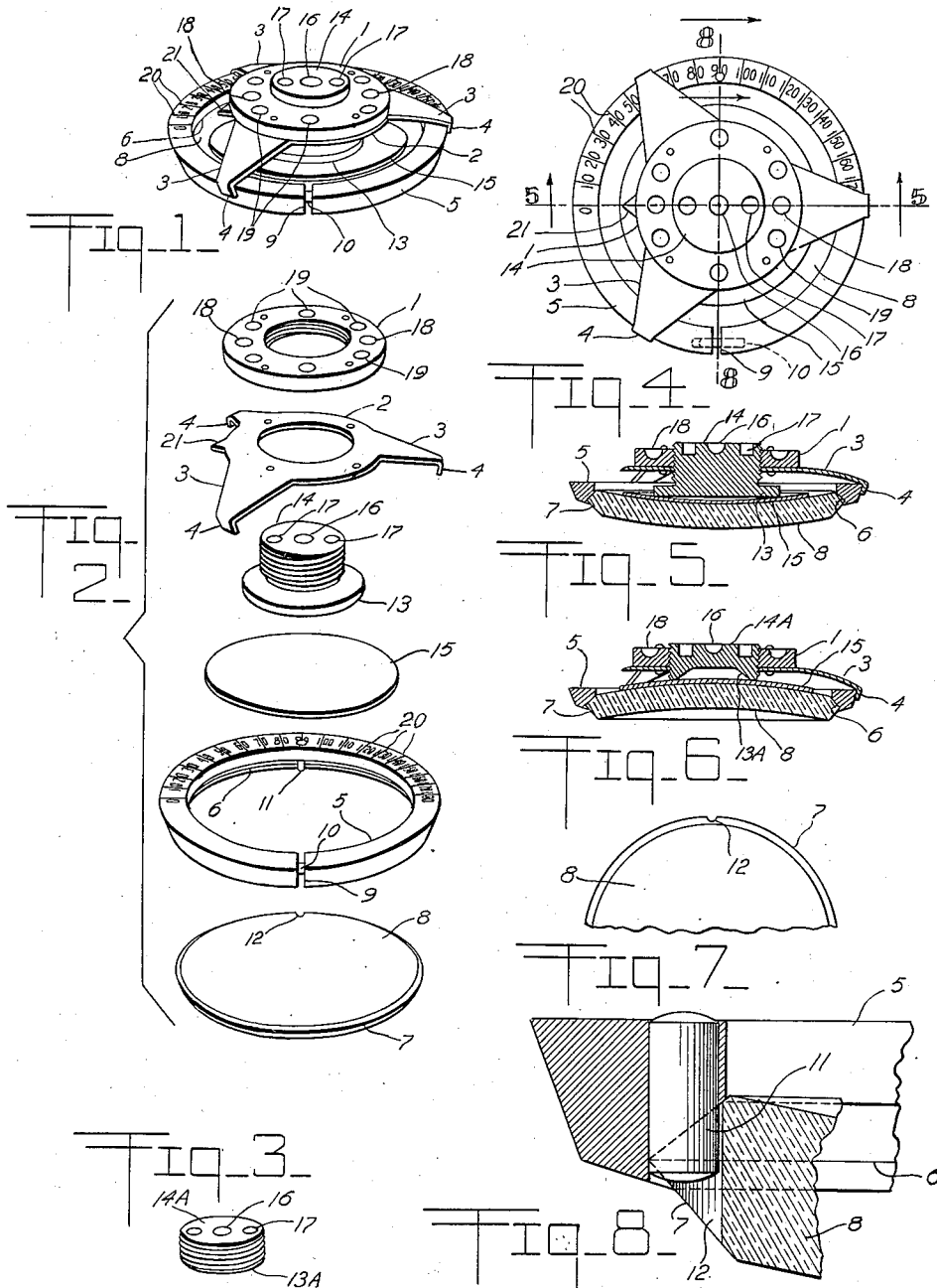
Dec. 2, 1941.

F. H. McCLERNON

2,264,392

LENS BLOCK

Filed Aug. 9, 1940



Witness
Francis H. McClernon

Inventor
Francis H. McClernon

UNITED STATES PATENT OFFICE

2,264,392

LENS BLOCK

Francis H. McClernon, Springfield, Mo.

Application August 9, 1940, Serial No. 351,998

9 Claims. (Cl. 51—217)

My invention relates to a lens block for use in grinding and polishing lenses, particularly ophthalmic lenses, and especially pertains to a lens block which may be attached to the lens without the use of pitch or other cement.

A brief description of the usual method of lens grinding will lend to a better understanding of my invention. Ordinarily lenses are mounted by cementing with pitch to a lens block which consists of a simple metal disc carrying a centrally located center for engaging the pin of the machine if the latter be of the spherical type. The spherical grinder comprises a rotating lap (either concave, plano or convex) against which the lens is held by bringing pressure on the block through the pin. Abrasive materials are used between the lap and the lens to affect grinding. The lens together with the block being free to turn on the pin, a complementary rotation is obtained between the lens and the lap by positioning the lens eccentrically with the rotative axis of the lap. In the case of cylindrical grinding machines the lap carries a curvature of one radius longitudinally and a curvature of a different radius at right angles thereto. In this case the lens does not rotate against the lap but is carried about over the lap in a figure-eight movement while being held in parallelism therewith. The machine in this case carries two pins for engaging corresponding centers in the block, the pins and the centers being aligned in parallelism with the major axis of the lap.

The use of the conventional lens block necessitates heating the lens and the block and mounting them together with hot pitch. This process has burdened the lens grinding trade with a number of inherent disadvantages which my device is designed to overcome as will be particularly pointed out herein. In cylinder grinding, the lens, when pitch blocked, is marked on the side opposite to that to be ground with a line or series of dots indicating the direction of the axis to be ground. This indicating line must be aligned parallel with the pin centers on the block and as this setting must be done quickly while the pitch is hot it is a quite difficult operation inasmuch as the lens together with the block must be turned over to check the setting. As the pin centers and the line on the lens are on opposite sides they are not visible at the same time and the accuracy of the setting depends upon the operator's skill in aligning the remotely located indicators. It is very essential, especially in cylinder grinding bi-focals and

prisms that the proper axis setting be maintained in order to fulfil a given prescription.

Considerable time is required in preparing and blocking lenses with pitch and several minutes must elapse before the lens is cool enough to start grinding; much care must be exercised in blocking to properly locate the lens concentrically with the block center in order to prevent off-center grinding and consequent misalignment in the case of spherical grinding, and in blocking lens for cylinder grinding even greater caution is required in order to properly locate the lens; the pitch may become soft through heat generated in polishing, resulting in slippage; considerable time is consumed in removing the pitch from the lens after grinding each side; there is considerable danger of injury by burns through the use of pitch; and the muss and dirt accompanying the use of pitch are undesirable from the standpoint of probable injury to the lens as well as the operator.

The principal object of my invention is to provide a quick and easy means of blocking and unblocking the lens.

Another object of my invention is to provide a means of easily and securely mounting the lens on the block in an accurately centered position.

Another object of my invention is to provide a means for preventing slippage of the lens on the block during grinding and polishing.

A further object of my device is to provide a means of easily locating and maintaining proper axial setting in cylinder grinding.

An additional object of my device is to provide a means of blocking the lens without the use of pitch, and whereby the undesirable features inherent in the use of pitch are eliminated.

Other objects and advantages will be apparent from the following description, the accompanying drawing and the appended claims.

In the drawing:

Fig. 1 is a perspective view of my device with the lens in position.

Fig. 2 is an exploded perspective view showing the disassembled relationship of the various parts.

Fig. 3 is a perspective view of one form of central adjusting screw.

Fig. 4 is a plan view of my device.

Fig. 5 is a sectional elevation taken on line 5—5, Fig. 4.

Fig. 6 is a sectional elevation similar to Fig. 5 but showing the use of the adjusting screw disclosed in Fig. 3.

Fig. 7 is a fragmentary plan view of a lens adapted for use with my device.

Fig. 8 is an enlarged fragmentary sectional elevation taken on 8—8, Fig. 4, showing the lens positioning feature.

In further detail in the drawing in which like characters of reference designate like parts throughout the several views, the numeral 1 indicates the body portion having a central threaded opening. 2 is a thin plate secured to the body portion and having resilient radial arms 3, the outer ends of which terminate in downwardly and inwardly disposed portions forming hooks 4, which engage the annular lens ring 5. The outside wall of the lens ring inclines outwardly at the top and the inner wall carries a V groove 6 in which the double bevel edge 7 of the lens 8 is disposed. This lens ring is split at 9 and is designed to resiliently grip the lens and has a guide pin 10 for maintaining alignment of the ends of the ring. A lens positioning lug is provided at 11 and consists of a pin inserted in a vertically disposed opening in the ring and projecting into the V groove to engage the notch 12 provided in the lens. Fig. 8 shows this feature in detail while Fig. 7 shows the notched lens.

The arms 3 are inclined downwardly and resiliently grip the lens ring between the hooked ends 4. The lower portion 13 of the central screw 14 is brought into adjustment against the lens 8, whereby the ring 5 is brought into firm gripping relation with the lens through the hooks 4. A protective pad 15 is provided between the screw and the lens to prevent damage to the lens in grinding. This protective pad preferably carries an adhesive whereby it may be removably attached to the lens. A narrow space marginally of the lens is left uncovered for measuring purposes.

The central screw 14 (or 14A) is provided with a center 16 for engaging the pin of a spherical grinding machine and also carries openings 17 for accommodating a wrench for adjusting the screw.

The body portion 1 is provided with oppositely disposed depressions 18 forming centers which engage the pins of a cylindrical grinding machine and other depressions 19 provide auxiliary centers for use with a spherical grinder when it is desired to increase the grinding on one side of the center.

The lens ring 5 is provided with indicia 20 for use with cylindrical grinding machines whereby any degree of angularity of the axis may be obtained by aligning the desired division of the scale with the pointer 21 which is in alignment with the depressions 18. The angularity thus produced carries a definite relation to the notch 12 in the lens and eliminates the usual marking of the lens. If the lens is cylinder-ground on both sides this feature assures the proper alignment of the axis on both sides.

Fig. 5 shows the use of the central screw 14 with a lens mounted for grinding the convex side, while Fig. 6 shows the use of the screw 14A with a lens mounted for grinding the concave side. The lower end 13A of the screw 14A is concave in order to better distribute the pressure against the lens.

In operation the lens is attached to my device by first fitting the ring 5 in place on the lens with the lug 11 engaging the notch 12 in the lens (the ring being resilient and springing inward will hold the lens in place in the groove 6),

next the pad 15 is placed on the lens and the ends 4 of the arms 3 are hooked in place over the ring (the arms spring downward and inward to bring additional pressure of the ring against the lens), and finally the central screw 14 is tightened against the lens which urges the hooks 4 into firm engagement with the ring 5 resulting in a firmly blocked lens which will not slip. The lug 11 engaging the notch 12 in the lens prevents any angular movement between the ring and the lens.

If the lens is to be ground cylindrically the ring is turned (before tightening the screw 14) to bring the proper graduation on the scale 20 (indicating the desired axis setting) into alignment with the pointer 21. This setting provides the proper angularity with reference to the notch 12 in the lens, the latter being a point in the vertical diameter of the lens, preferably at the bottom of the lens.

It will be noted that I have provided a means for blocking lenses in which the use of pitch is eliminated along with such attendant disadvantages as improper centering, improper axis setting, slipping while polishing due to heat softened pitch, waste of time consumed while waiting for pitch to cool, labor involved in cleaning pitch from lens as well as in preparing pitch, the cost of the pitch and the disagreeable muss and dirt accompanying the use of pitch.

My device provides a quick and easy means of securely blocking the lens and assures the proper centering of the lens. In cylinder grinding I have provided a means whereby the lens may be quickly and accurately located with reference to the axis without marking the lens and whereby no slippage will occur to disturb the proper alignment of the axis.

It will be noted also that I have provided a protective member for the lens which is quickly and easily attached to and removed from the lens and which affords protection to the lens from damaging effects of abrasive which may accumulate on top of the lens in grinding or polishing.

I claim:

1. A lens block comprising an annular lens gripping ring, said ring carrying on its inner wall a groove in which the lens may be engaged, said ring being split radially and having a guide pin interconnecting the adjacent ends thereof whereby the ends are held in alignment, said ring being designed to slightly grip the lens when the latter is in place, a body portion, resilient radial arms attached to said body portion, said arms carrying at their outer ends hooks for engaging the lens ring, a central screw carried by said body portion, said screw being adapted to be adjusted against the lens, a pad designed to be interposed between the screw and the lens, indicia disposed on said ring, a pointer carried by said body portion and a lug disposed within the inner groove of the ring for engaging a notch in the lens, said screw carrying a center for engaging a pin of a spherical grinding machine, said body portion carrying an annularly disposed series of pin centers, two of which are located diametrically opposite each other for engaging the pins of a cylinder grinding machine.

2. A lens block comprising an annular lens holder, a body portion, resilient radial arms carried by said body portion, said arms having pendant outer ends forming hooks, said body portion being adapted to be removably attached to said lens ring by engaging said pendant hooks

outwardly of the lens ring, a central adjusting screw carried by said body portion, said screw being adapted to engage a lens carried by said lens ring whereby the resultant pressure against the lens will cause the hooked arms to grip the lens ring by converging inwardly, a central pin-center carried by said screw, a series of annularly disposed pin-centers, two of which being disposed diametrically opposite each other, indicia carried by said lens ring, a pointer carried by said body portion and an inwardly projecting lug carried by said lens ring for engaging a notch in said lens.

3. A lens block comprising an annular lens gripping ring, a body portion, resilient radial arms carried by said body portion, said radial arms carrying at their outer ends hooks for engaging the lens gripping ring, a central adjusting screw carried by said body portion, said screw being adapted to engage a lens carried by said ring, pin centers carried by said screw and said body portion, and indicia for indicating the angular relation between said ring and said body portion.

4. A lens block comprising an annular lens gripping member, a body portion, radial arms carried by said body portion, means carried by said arms for removably securing said arms to said lens gripping member and a central screw carried by said body portion, said screw being adapted to engage a lens carried by said lens gripping member.

5. A lens block comprising an annular lens gripping ring, a body portion, radial arms carried by said body portion, means carried by said arms for removably securing said arms to said lens gripping ring, a central screw carried by said body portion, said screw being adapted to engage a lens carried by said lens gripping ring, and indicia for indicating the angular relation between said body portion and said ring.

6. A lens block comprising an annular lens gripping ring, a lug disposed inwardly of said ring for engaging a notch in a lens blank, a body portion, interconnecting means for securing said ring to said body portion whereby said ring may be positioned in any angular relation to said body portion, indicia for indicating said angular relation, a central adjusting screw carried by said body portion, said screw being adapted to engage a lens blank carried by said ring and pin centers carried by said screw and said body portion for engaging the pins of a lens grinding machine.

7. A lens block comprising a lens gripping ring, a body portion, interconnecting means for removably securing said body portion to said ring in any angular relation, indicia for indicating said angular relation, a central adjusting screw, said screw being adapted to engage a lens blank carried by said ring, and pin centers carried by said screw and said body portion.

8. A lens block comprising a lens gripping ring, a body portion, means connecting said ring to said body portion, said means carrying openings to provide admittance of lens gauging instruments, and a central lens abutting member, said member being adapted to be adjustably secured against a lens when the latter is positioned in said ring, said member being substantially smaller diametrically than said lens.

9. A lens block comprising an annular lens gripping member, a central body portion, radial arms connecting said lens gripping member with said central body portion and a centrally disposed adjustable member for supporting a lens when the latter is positioned in said gripping member, said adjustable member and said central body portion being substantially smaller diametrically than said lens.

FRANCIS H. McCLERNON.