

[54] **LENS BLOCKING DEVICE**

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[51] Int. Cl. **B22d 17/24, B22d 19/00**

[58] Field of Search **164/332, 334; 249/88; 425/808; 51/162, 216 LP; 269/7, 58**

[56] **References Cited**

UNITED STATES PATENTS

3,273,204 9/1966 Craddock 425/808

Primary Examiner—Francis S. Husar

Assistant Examiner—V. K. Rising

Attorney, Agent, or Firm—Ronald F. Ball; Charles B. Smith; Gary A. Walpert

[57]

ABSTRACT

A lens blocking device is described in which a pair of wedge-shaped prism rings may be adjusted relative to each other and relative to the base of the device for incorporating into the lens block a predetermined amount of prism at a predetermined meridional orientation. Graduations measured in diopters are marked on the prism rings. Graduations measured in degrees are marked on the base. The lens blocking device contains means for supporting a lens blank to be blocked and for aligning the cylindrical and optical axes of a premarked lens blank with the device. Means are described for introducing a low melting point blocking metal into a mold cavity defined by the prism rings, the base and the lens blank. Means for cooling the blocking metal and for the easy removal of the solidified block with attached lens blank are also described. Means are described for holding the prism rings in coaxial and rotatable contact with each other and with the base.

7 Claims, 8 Drawing Figures

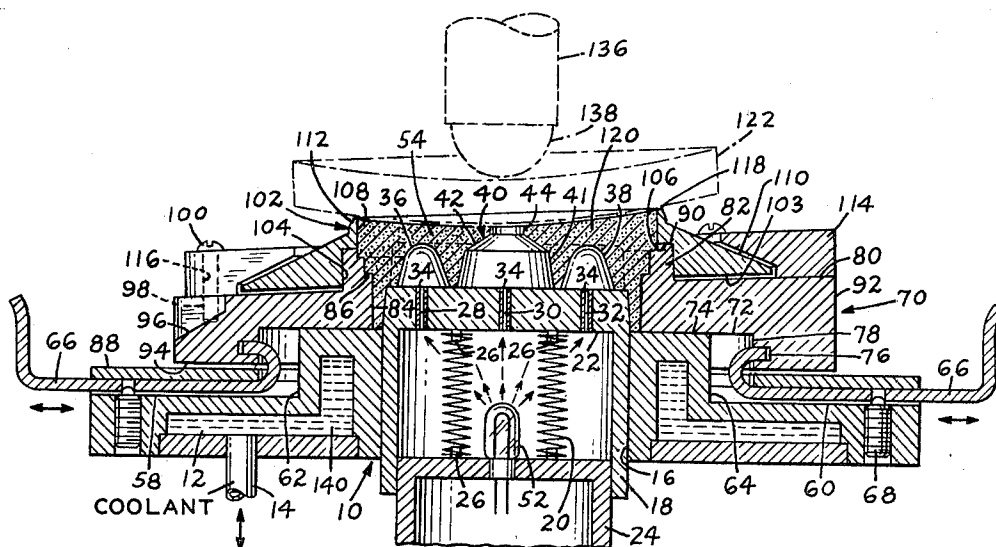


FIG. 1.

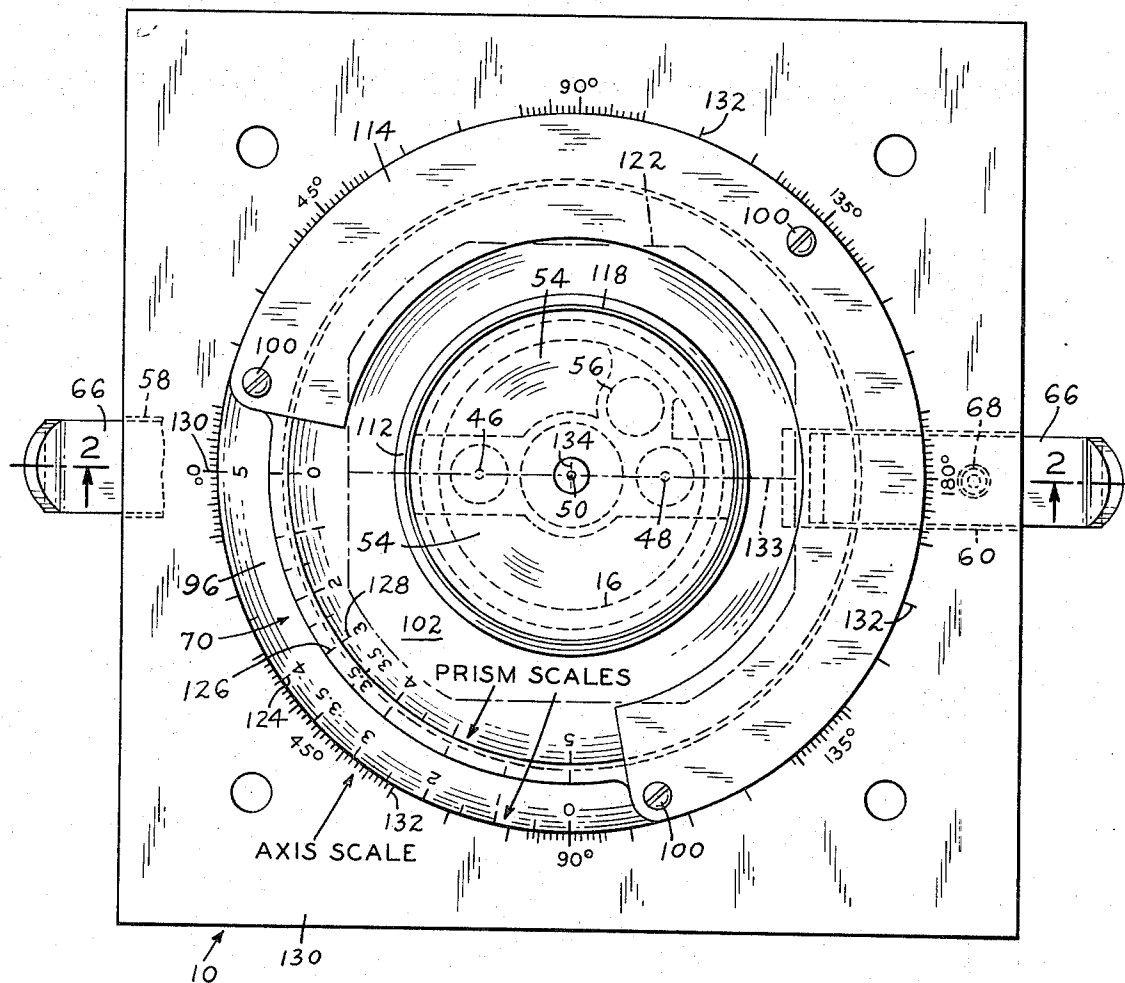


FIG. 2.

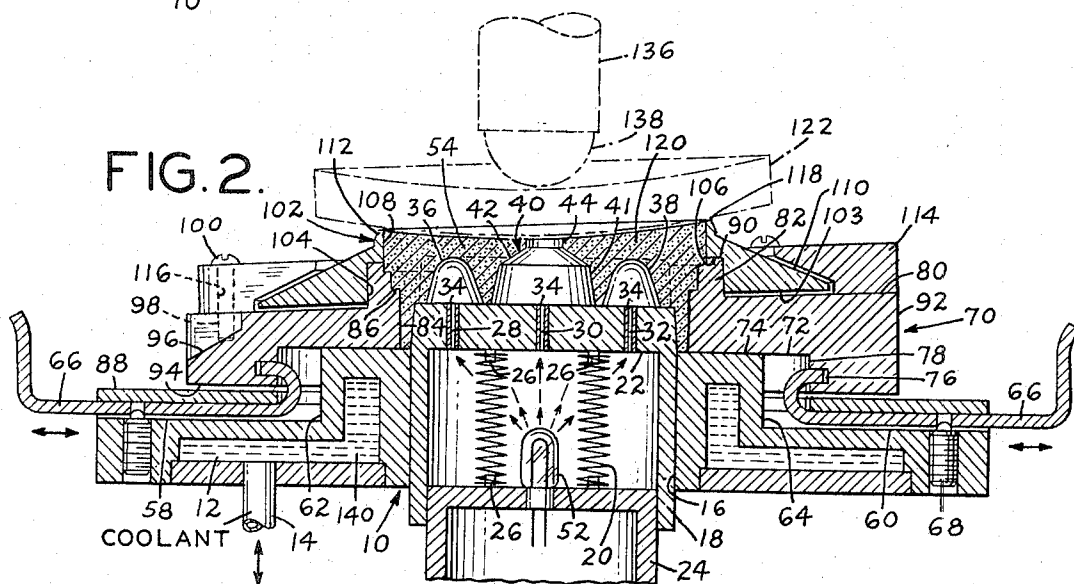


FIG. 3.

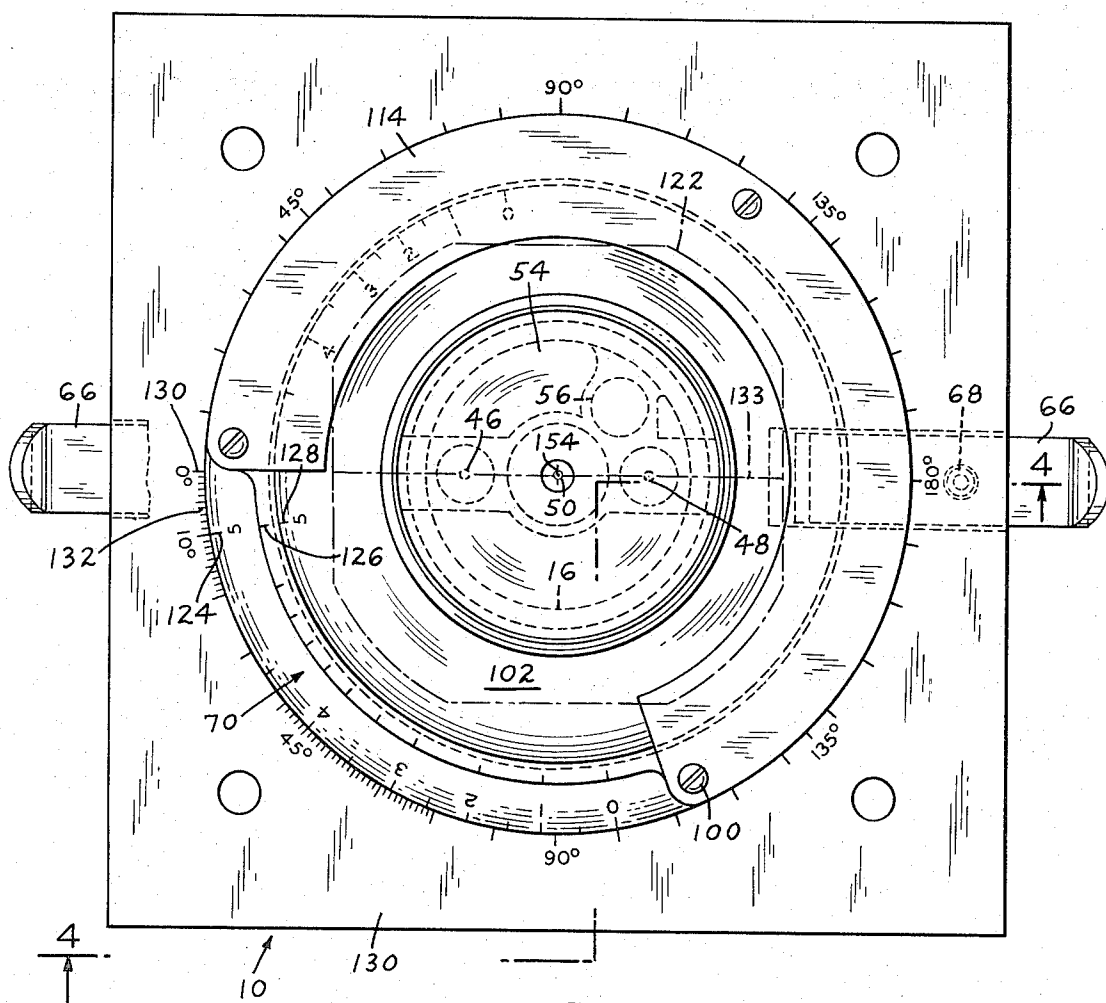
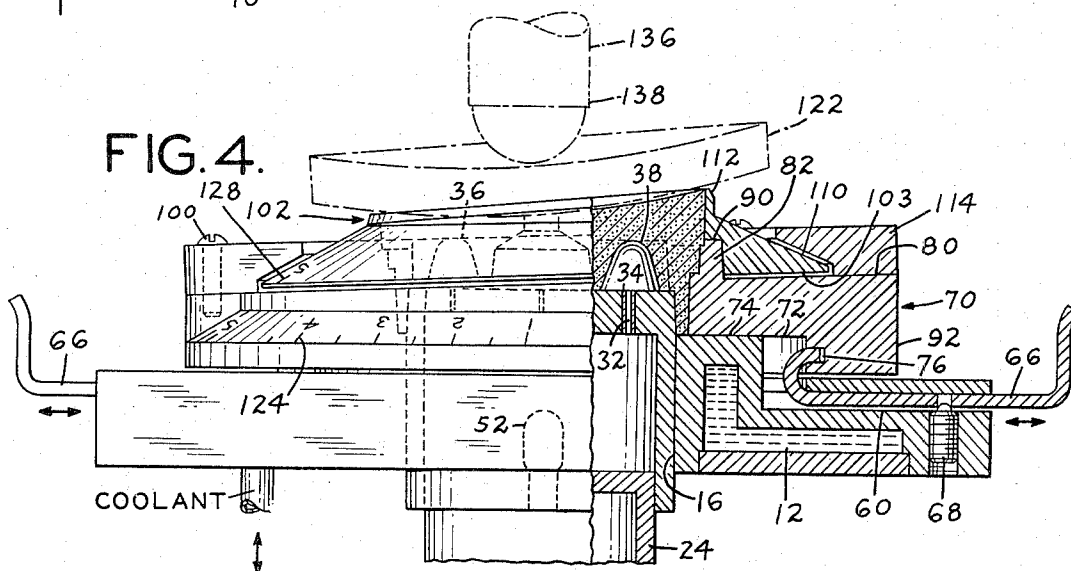


FIG. 4.



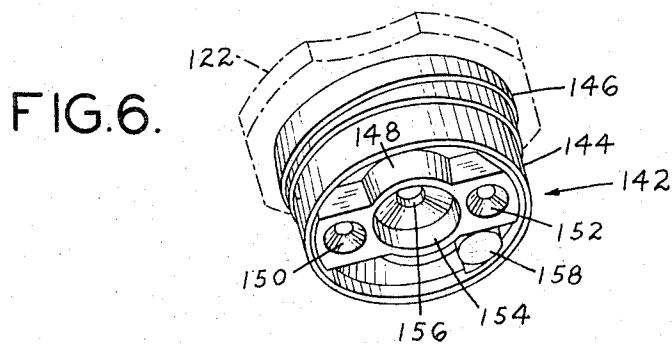
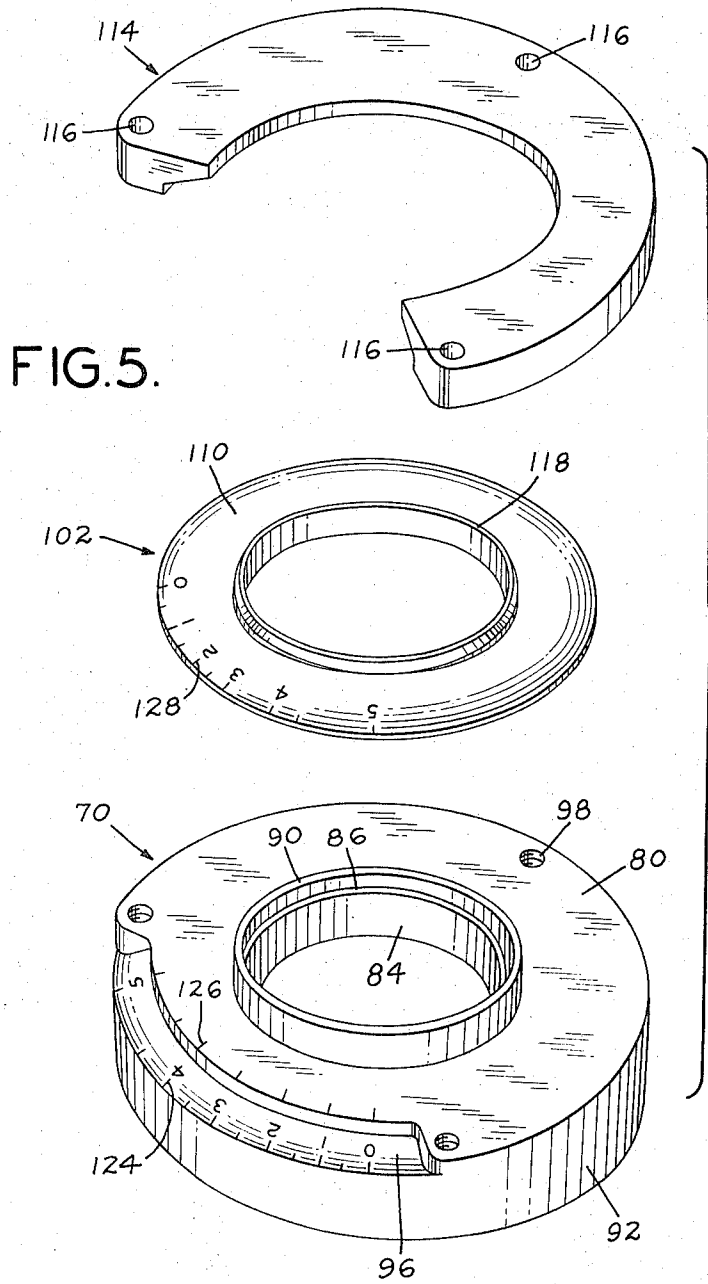


FIG. 7.

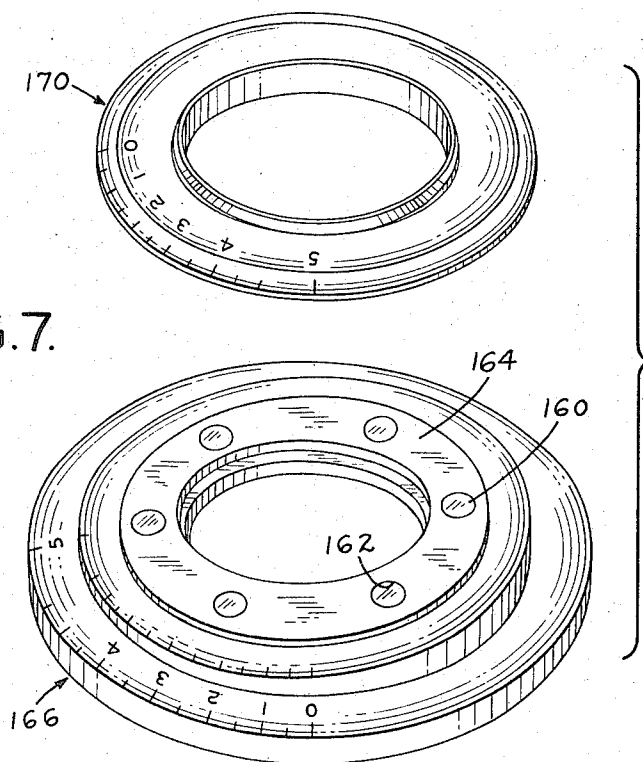
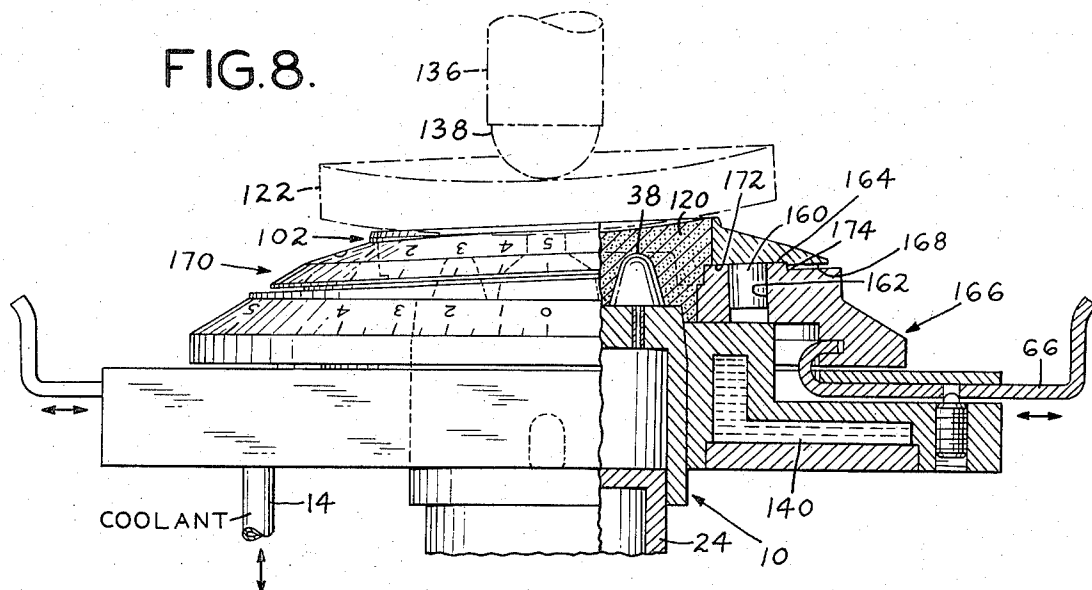


FIG. 8.



LENS BLOCKING DEVICE

BACKGROUND OF THE INVENTION

This application relates to the blocking of lens blanks and more particularly relates to an improved apparatus for the blocking of lens blanks so that in subsequent generating operations a desired prism can be ground into the lens.

In the manufacture of ophthalmic lenses, a lens blank is formed into a finished lens by successively grinding and then polishing first one surface and then the other. Usually one surface is concave and the other convex, and the two surfaces have different curvatures, so that the thickness of the lens varies at different points. This variation in thickness gives the optical refraction necessary to provide the desired correction in vision.

A lens blank having one of its two surfaces ground and polished is termed a semi-finished lens. The subsequent generation of the opposite surface is a more exacting operation because the second surface must not only have the correct curvature, but must bear an exact and precise relation to the previously finished surface, in order for the lens to have the ophthalmic properties desired. This precise location of the second surface with respect to the first may require either or both of two adjustments or settings, one called "prism" and the other called "axis." Setting for prism involves a tilting of the second surface with respect to the first, and setting for axis involves a rotation of the second surface with respect to the first.

The problem of correctly relating the second surface to the first has heretofore been met by mounting a lens blank on a lens block in a conventional manner and then adjusting the block in the chuck of a generating machine so that the desired amount of prism at the correct meridian could be ground into the lens. One device for incorporating prism into the lens in this manner is disclosed in U.S. Pat. No. to Allen et al. 2,879,632.

Another technique that has been used is that in which the desired amount of prism at the prescribed meridian is incorporated directly into the lens block so that when the block is mounted in a conventional manner in a grinding machine the desired prism is ground into the lens. Prior art devices of this type are exemplified by U.S. Pat. Nos. to Buckminster 3,049,766 and Prunier 3,195,197. These latter devices use a blocking system in which molten metal of low melting point, while constrained in a mold, is cast directly on the lens surface. The desired amount of prism is incorporated into the block by either tilting the lens with pins as the lens is presented to the mold, or by selecting and inserting into the device one of several support rings which provide the desired amount of tilt to the lens as it is presented to the mold. These devices are complicated and expensive to construct and maintain. In addition, in the tilting pin device molten metal may infiltrate into the pin sleeve areas and interfere with the blocking operation. In the selected support ring device, in order to incorporate the desired amount of prism into the block, a large inventory of support rings is required and the constant handling thereof results in undesirable wear and replacement problems.

SUMMARY OF THE INVENTION

It is an object of the present invention to provide a mechanism for incorporating prism directly into a lens

block of the low melting point metal type which is precisely accurate, simple to operate, free of substantially all maintenance problems and requires no substitution of parts.

The present invention is for a device for blocking lens blanks which are ultimately to be provided with a prescriptive prism correction, i.e., where one side of the lens blank is to be finished thicker than its diametrically opposed side along a predetermined axis through the optical center of the lens blank.

When blocking a lens that is to be finished with a cylinder and prismatic correction it is important that the amount of prism, measured in diopters, be accurately introduced into the lens. It is equally important that the prism axis be oriented in the prescribed meridian and in proper relation to the cylinder axis of the lens.

In the present invention a low melting point blocking metal is introduced into a water-cooled, generally cylindrically-shaped mold cavity. The upper portion of the mold incorporates a lens support ring, and a lens blank is positioned on the lens support ring and serves as the upper closure of the mold. The blocking metal is such that when the cavity is filled, and as the metal hardens, it becomes attached to the lens blank. The hardened metal also forms the block for the blank. The lens support ring may be adjusted relative to the axis of the mold to position the lens blank in a manner such that when the blocking metal is introduced into the mold, the prescribed amount of prism may be incorporated into the block at the desired meridional orientation. The cast block is also provided with aligned recesses which serve properly to position the block, with the attached lens blank, in the chuck of the surfacing machines subsequently used to grind and polish the lens to the desired finish.

The semi-finished lens blank which serves as the upper closure for the mold is first marked on the finished surface in a conventional marking device to designate the optical center and cylindrical axis of the lens. The support ring, which is integral with the upper one of a pair of wedge-shaped prism rings mounted on the blocking device, is then rotated with respect to its mating wedged shaped prism ring to align graduations on the two rings and provide the required amount of diopter prism. The two aligned prism rings are then rotated together with respect to the blocking device until the prism axis is located in the required meridian. The pre-marked lens blank is then placed on the lens block mold cavity with its finished side against the support ring. The blank is adjusted manually on the support ring until the marks on the blank are aligned with reference indicia incorporated in the blocking device. Metal blocking alloy is then introduced into the cavity beneath the lens and solidified. The resulting lens block assembly with the desired axis and degree of diopter prism accurately incorporated therein is readily removed from the blocking device for subsequent finishing of the lens.

There is a minimum number of moving parts to the device. Molten blocking metal cannot penetrate into the prism adjusting mechanism. The blocking device may be used to introduce prism of any amount and at any axis into the block for any lens without requiring a change or substitution of parts in the device. Adjustments for the degree and axis of prism are made using direct readings from graduations provided on the de-

vice. Either concave or convex lens surfaces may be presented to the device for blocking.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a plan view of a blocking device showing a lens blank in dash line positioned on the device.

FIG. 2 is a vertical section, taken generally along the line 2—2 of FIG. 1, and showing a lens blank being blocked to incorporate a predetermined amount of prism at a predetermined axis.

FIG. 3 is a view similar to FIG. 1, but showing a different setting for prism and axis.

FIG. 4 is a front elevational view, partly in vertical section, taken along the line 4—4 of FIG. 3.

FIG. 5 is an exploded perspective view of the adjustable wedge-shaped prism rings of my invention together with a C-shaped retaining ring.

FIG. 6 is a perspective view of a lens blocked in accordance with my invention.

FIG. 7 is an exploded perspective view of the wedge-shaped prism rings showing a modified means for maintaining the rings in contact with one another.

FIG. 8 is a front elevation, partly in vertical section, of a blocking device embodying the modification shown in FIG. 7.

DETAILED DESCRIPTION OF THE INVENTION

Referring now to the drawings, a base, generally designated 10, having cooling passages 12 connected to cooling water inlet-outlet 14 has a central, cylindrically shaped bore 16. A piston 18 is slidably mounted for axial reciprocation within bore 16. Coil springs 20 are interposed between the head 22 of piston 18 and the top of hollow mandrel 24. Springs 20 serve constantly to urge piston 18 to its uppermost position within bore 16. Springs 20 are held in place by bosses 26.

The head 22 of piston 18 has three diametrically aligned cylindrical passages 28, 30, 32, in each of which is disposed a light transmitting medium 34, such as a bundle of fiber optics. Mounted on head 22 is a pair of generally conically-shaped protrusions 36, 38. These protrusions 36, 38 are in diametral alignment and are coaxial with passages 28 and 32, respectively. Intermediate protrusions 36, 38 and diametrically aligned therewith is centrally located hollow protrusion 40 having a lower frusto-conical wall section 41 and an upper frusto-conical wall section 42 connecting wall section 41 with cylindrical section 44. Section 44 has a small bore (FIG. 1) axially aligned in the center thereof. Bore 50 is axially aligned with passage 30. Within each of the protrusions 36, 38 is a small bore 46, 48, respectively, axially aligned with passages 28 and 32, respectively.

A source of illumination such as light bulb 52 is mounted atop mandrel 24 and is connected to a conventional current source, not shown. Light emitted from bulb 52 passes through light transmitting medium 34 and is visible through bores 46, 48 and 50 when viewed directly from above.

The head 22 of spring mounted piston 18 also contains protruding segments 54 through one of which extends a cylindrical conduit 56 (FIG. 1) which serves as an inlet for molten metal.

Base 10 also contains horizontally disposed slots 58, 60 terminating in upwardly extending apertures 62, 64, respectively. A J-shaped clamping member 66 is disposed within each of the slots 58, 60. A ball plunger 68

is disposed within base 10 beneath each clamping member 66. The ball on the head of plunger 68 seats in an aperture in clamping member 66.

A wedge-shaped lower prism ring, generally designated 70, having a counterbored portion 72 seats on the upper annular surface 74 of base 10. An annular groove 76 is cut into the wall 78 of counterbored portion 72. Groove 76 is adapted to receive the inner end of J-shaped clamping members 66. When the inner end of J-shaped clamping member 66 is seated in groove 76, the lower prism ring 70 is held in axial alignment with and is in rotatable contact with base 10.

Lower prism ring 70 is coaxial with the reciprocable piston 18. The flat annular bottom surface 94 and the flat annular surface of counterbored portion 72 of lower prism ring 70 are normal to the axis of prism ring 70. Upper generally annular surface 80 of lower prism ring 70 is inclined with respect to the bottom surface 94 of the lower prism ring, thus giving the ring a wedge shape.

The upper surface 80 of lower prism ring 70 has an upwardly extending, centrally located annular flange portion 82. The lower prism ring has a generally cylindrical central bore 84, the wall of which is inclined outwardly with respect to the axis of the lower prism ring in the upward direction for purposes to be explained more fully hereinafter. As shown in FIGS. 2 and 5, the wall of bore 84 is stepped to present a shoulder 86 within the bore.

The upper annular flange portion 82 of lower prism ring 70 has a flat upper annular surface 90. Surface 90 is parallel to surface 80 and both surfaces are inclined with respect to the axis of lower prism ring 70. Surface 90 serves as a seat for upper prism ring, generally designated 102, as described hereinafter. For approximately 270° of its circumferential outer edge, upper flat surface 80 connects with cylindrical wall 92. Wall 92 extends downwardly and connects directly with the bottom annular flat surface 94 of lower prism ring 70. For the remaining segment of about 110° of its circumference, flat surface 80 is separated from wall 92 by sloping surface 96. A 90° segment of the surface 96 has prism scale graduations 124 marked thereon. That portion of flat surface 80 that is angularly coextensive with sloping surface 96 has corresponding prism scale graduations 126 marked thereon for purposes to be described more fully hereinafter. Lower prism ring 70 has threaded apertures 98 adapted to receive screws 100 (FIG. 1).

Axially aligned with lower prism ring 70 is wedge-shaped upper prism ring, generally designated 102, having a flat annular bottom surface 103 and a counterbored portion 104. Flat annular surface 106 of the counterbored portion of ring 102 is parallel to surface 103 and seats on the flat annular surface 90 of lower ring 70. The wall of counterbored portion 104 of the upper ring is slightly larger in diameter than the outer wall of annular flange 82 of the lower ring and forms a sliding fit therewith. Upper ring 102 is rotatable with respect to lower ring 70 about the axis of ring 70. Contact between the wall of counterbored portion 104 and the outer wall of flange 82 holds rings 70 and 102 in axial alignment with one another. Flat annular surface 106 of ring 102 is contiguous with flat annular surface 90 of ring 70. These faces are inclined with respect to the axis of lower prism ring 70.

Upper ring 102 has a centrally located bore 108. The wall of bore 108 is inclined outwardly with respect to the axis of the ring in the upward direction. The upper annular surface 110 of ring 102 is inclined with respect to the bottom surface 103. The inner edge of upper surface 110 connects with upwardly extending annular flange portion 112 having a thin annular upper edge 118 which serves as a support ring for a lens blank 122. Prism scale graduations 128 extend through a segment of 90° of the surface 110 of the upper prism ring, as will be more fully described hereinafter.

Coaxial with the upper and lower prism rings is C-shaped retaining ring 114. As shown in FIGS. 1 and 5, ring 114 extends in an arc of about 270°, and is of the same diameter as lower prism ring 70. The inner diameter of ring 114 is less than the outer diameter of upper prism ring 102. Holes 116, adapted to receive screws 100, are drilled in ring 114.

The exploded view of FIG. 5 shows the relative positions of the C-shaped retaining ring 114, upper prism ring 102 and lower prism ring 70. As shown in FIG. 2, when assembled, screws 100 pass through holes 116 and into threaded apertures 98 of the lower ring, thus securing ring 114 to lower prism ring 70. Ring 102 is held between rings 114 and 70 and is rotatable with respect to rings 114 and 70 about an axis common to all three rings.

As shown in FIG. 2, base 10 and piston 18 form the bottom wall of mold cavity 120, and the upper and lower prism rings 102 and 70, respectively, form the side wall of the cavity. Lens blank 122, supported on the upper edge 118 of upper prism ring 102, forms the top of the mold cavity.

Referring again to FIG. 1, base 10 has a flat upper surface 80. Axis scale graduations 132 extend completely around base 10 on circle having a diameter that is equal to the outer diameter of lower prism 70. The axis scale graduations are in degrees and run from 0° through 180° in the upper, clockwise direction, as well as from 0° through 180° in the lower, counterclockwise direction. The 0° and 180° markings are on a diameter 130 that is coincident with the diametrically aligned protrusions on piston 18. I refer to diameter 130 as the base apex line. The lower, counterclockwise axis scale graduations 132 are used when a convex lens blank surface is presented to the blocking device as shown in FIG. 2. The upper, clockwise axis scale graduations are used when a concave lens blank surface is presented to the blocking device.

The prism scales 128 on upper prism ring 102 are calibrated in prism diopters. The calibrations run from 5 to 0. The 5 mark is placed at the thinnest point on the ring. A plane in contact with the upper edge 118 of ring 102 for the full circumference thereof forms an angle of 2° 44' with the plane of the bottom 103 of the ring 102.

Prism scales 124 and 126 on lower prism ring 70 are also calibrated in prism diopters, the calibrations running from 5 to 0. The 5 mark on the lower prism ring is also at the thinnest point on the ring. A plane in contact with the flat annular surface 90 of lower prism ring 70 for the full circumference thereof forms an angle of 2° 44' with the plane of bottom surface 94 of the ring 70.

The prism scale markings on both the upper and lower prism rings are graduated from 5 to 0 with 5 at

the thinnest point on each of the rings, through an angle of 90°, as follows:

Marking	Corresponding Angle
5.00	0° 0'
4.75	18° 12'
4.50	25° 51'
4.25	31° 47'
4.00	36° 52'
3.75	41° 25'
3.50	45° 34'
3.25	49° 28'
3.00	53° 08'
2.75	56° 38'
2.50	60° 0'
2.25	63° 15'
2.00	66° 25'
1.75	69° 30'
1.50	72° 32'
1.25	75° 31'
1.00	78° 28'
.75	81° 23'
.50	84° 17'
.25	87° 9'
0.00	90° 0'

It will be apparent from an examination of FIG. 1 that not all of the markings of the prism scales 124, 126 and 128 are shown on the drawing, the number of graduations shown being reduced for clarity. Similarly, not all of the degree markings of the axis scale 132 are shown; again, the number illustrated being reduced for clarity.

In order to introduce the proper amount of prism at the correct prism orientation into a lens to be blocked on the lens blocking device of the invention, the upper prism ring 102 is first rotated with respect to the lower prism ring 70 to register the desired prism scale graduation 128 on the upper ring 102 with the appropriate prism scale graduation 126 on the lower ring 70. The upper and lower rings are then rotated as a unit to the appropriate axis scale graduation 132 to orient the prism angle in the proper meridian.

As stated above, prism scales 124 and 126 are marked on lower prism ring 70. The angular placement of the graduations is the same for each scale 124 and 126. Scale 126 is used to align the graduations on the upper prism ring 102 with the graduations on the lower prism ring 70. Scale 124 is then used to align the amount of prism with the graduations on the axis scale 132.

As a specific example, and as shown in FIGS. 1 and 2, if a lens is to be blocked to generate a minus curve of 3.5 diopters of prism at an angle of 43°, the amount of prism is obtained by aligning the 3.5 marking on scale 128 with the 3.5 marking on scale 126. The aligned prism rings are then rotated as a unit relative to the base to a point where the 3.5 marking on scale 124 is aligned with the 43° graduation on the axis scale 132. This 43° point will be the apex of the prism that will be incorporated into the lens in subsequent blocking and generating operations.

Another example is illustrated in FIGS. 3 and 4. There the lens is to be blocked to generate a minus curve of 5 diopters of prism at an angle of 10°. The marking 5 on scale 128 of upper prism ring 102 is aligned with the marking 5 on scale 126 of lower prism ring 70. The upper and lower rings 102 and 70, respectively, are then rotated as a unit relative to base 10 until the 5 marking on scale 124 is aligned with the 10° graduation on the axis scale 132. This 10° point will be the

apex of the prism that will be incorporated into the lens.

Once the proper amount and orientation of the prism has been established by rotating the prism rings as described, a lens blank 122 previously given a thin coating of material that will assure good adhesion thereto of the metal blocking alloy and marked in a manner well known to those skilled in the art to designate the cylinder axis (indicated by the dash line 133 in FIG. 1), as well as the optical axis of the lens (indicated by the intersection of short vertical line 134 and line 133), is brought into contact with protrusion 40 extending upwardly from the head 22 of spring mounted reciprocable piston 18. The lens blank is then urged downwardly against the resistance of coil springs 20, until the lens blank seats on the upper edge 118 (lens support ring) of upper prism ring 102. The previously marked cylinder axis of the lens is then aligned with the diametrically aligned bores 46, 48 of the protrusions 36, 38, respectively, and the optical axis of the lens is aligned with bore 50. This alignment is facilitated by observing light emitted by light bulb 52 and transmitted upwardly through passages 28, 30 and 32 of the head 22 by the bundles of light transmitting fiber optics 34 disposed therein. This light will, of course, pass through the lens 122 and is visible when viewed from above the lens. It will be noted that when aligned, the cylindrical axis 133 of the lens is also aligned with the base axis line 130.

After the axis and optical center of the lens are properly positioned, a holding member 136 having a pressure pad 138 of resilient material at the lower end thereof secures the lens blank to the blocking device. The finished surface of the lens blank now forms the upper wall of mold cavity 120. Molten metal blocking alloy is then injected through conduit 56 into the mold cavity 120 beneath the lens. Cooling liquid 140 circulating through base 10 causes the blocking metal to solidify, resulting in a lens-block assembly with the desired amount of prism and prism axis incorporated in the assembly.

Upon solidification of the blocking metal, reciprocable head 18 is withdrawn downwardly into the base a short distance by means, not shown, and then returned under the force of slightly compressed coil springs 20 against the solidified block. This causes the solidified block and attached lens blank to be jarred loose from the blocking device. The removal of the block and attached lens blank is facilitated by the outward inclination of bore 84 of the lower prism ring 70 and the outward inclination of bore 108 of upper prism ring 102, as described above. Shoulder 86 within bore 84 of the lower prism ring prevents jamming of the solidified block against the outer wall of bore 84 on withdrawal of the head 18 as described.

The completed lens-block assembly when removed from the blocking device is shown in FIG. 6 with the lens blank 122 attached to the block, generally designated 142. The shank 144 of block 142 is of uniform dimension in the axial direction. The head 146 of the block is thicker, i.e., has a greater dimension in the axial direction, on one side thereof than on its diametrically opposed side. This difference in thickness represents the amount of prism that is incorporated in the lens-block assembly. It will be understood, of course, that the upper and lower prism rings may be adjusted so that no prism is introduced into the block. This, for

example, will be the case where the 0 graduation on the prism scale 128 is aligned with the 0 graduation on the prism scale 126.

The tang portion 148 of block 142 has diametrically aligned conically-shaped recesses 150 and 152 corresponding to protrusions 36 and 38 on piston 18. Center recess 154 having center opening 156 that extends completely through the block, and corresponding to protrusion 40 on piston 18, is diametrically aligned with recesses 150 and 152. The three recesses function as axis aligning means when the block is presented to the chuck of a lens grinding machine for subsequent generation of the desired surface on the unfinished surface of the lens blank. Sprue 158, through which the molten blocking metal flowed into mold cavity 120 through conduit 56, is shown adjacent the tang of the block.

A modification of the means for maintaining the upper and lower prism rings in axial alignment, and without the necessity of retaining ring 114, is shown in FIGS. 7 and 8. A plurality of cylindrically shaped permanent magnets 160 are shrunk fit into correspondingly shaped openings 162 drilled into the slightly raised, upper flat annular surface 164 of wedge-shaped lower prism ring 166. The bottom surface 168 of wedge-shaped upper prism ring 170 is countersunk to form an annular recess having a corresponding flat annular surface 172 that seats against surface 164 and is rotatably held in place thereon by magnets 160. Shoulder 174 which has a sliding fit in the annular recess of bottom surface 168 maintains the two rings in axial alignment. The two contiguous flat surfaces 164 and 172 are inclined with respect to the axis of lower prism ring 166. Lower ring 166 is held in axial alignment and in rotatable contact with base 10 by J-shaped clamping members 66 in the same manner as described in connection with the embodiments shown in FIGS. 1 through 5.

Operation of the modified embodiment illustrated in FIGS. 7 and 8 is identical with that described in connection with the embodiment shown in FIGS. 1 through 6. It will be understood that while the strength of magnets 160 is great enough to maintain the upper and lower prism rings 170 and 166, respectively, in rotatable engagement with one another, the magnets are not so strong as to interfere with the rotation of the two rings with respect to each other to align the graduations on the prism scales as desired, nor do the magnets interfere with the rotation of the aligned prism rings with respect to base 10 in order to orient the prism to the desired meridian.

The terms and expressions which have been employed here are used as terms of description and not of limitation, and there is no intention, in the use of such terms and expressions, of excluding equivalents of the features shown and described, or portions thereof, it being recognized that various modifications are possible within the scope of the invention claimed.

I claim:

1. A lens blocking device comprising a pair of wedge-shaped prism rings, one of which is rotatably adjustable relative to the other about the axis of said one of said rings, said rings having contiguous plane faces which are inclined with respect to the axis of said one of said rings, means for holding said rings in axial alignment and in rotatable contact with one another,

indicia on each of said rings for selecting a predetermined amount of prism in diopters by rotating said rings relative to each other,

a base,

means for holding said one of said rings in axial alignment and in rotatable contact with said base,

indicia on said base for selecting a predetermined prism axis by rotating said rings relative to said base,

means on the distal face of the other of said rings for engaging the surface of a lens blank to be blocked, said rings, base and lens blank surface defining a cavity shaped to form a lens block,

and means for supplying molten metal to said cavity for molding said lens block in said cavity and adhering it to said lens blank, whereby a predetermined amount of prism in diopters and a predetermined meridional orientation of said prism may be incorporated into said lens block.

2. A lens blocking device as defined in claim 1 wherein said lens blank is provided with indicia designating the optical axis and cylinder axis thereof and said base comprises means for aligning said lens blank with respect to said base.

3. A lens blocking device as defined in claim 1 wherein said base further comprises means for removing said block from said cavity including a piston recip-

rocable in the direction of the axis of said one of said rings.

4. A lens blocking device as defined in claim 1 wherein said means for holding said rings in axial alignment and in rotatable contact with one another comprise a C-shaped retaining ring and means for fixedly attaching said retaining ring to said one of said pair of rings with the other of said pair of rings being rotatably disposed axially between said retaining rings and said one of said pair of rings.

5. A lens blocking device as defined in claim 1 wherein said means for holding said rings in axial alignment and in rotatable contact with one another comprise a plurality of permanent magnets disposed in said one of said rings, said other of said rings being of material attracted by said magnets.

6. A lens blocking device as defined in claim 1 wherein said means for holding the distal face of said one of said pair of rings in rotatable contact with said base comprise a J-shaped clamping member in said base, the inner end of said member being adapted to be received in an annular groove in said one of said pair of rings.

7. A lens blocking device as defined in claim 1 further comprising means for holding said lens blank in contact with said lens engaging means.

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UNITED STATES PATENT OFFICE
CERTIFICATE OF CORRECTION

PATENT NO. : 3,866,667
DATED : Feb. 18, 1975
INVENTOR(S) : Lloyd F. Knight

It is certified that error appears in the above-identified patent and that said Letters Patent are hereby corrected as shown below:

In abstract, lines 15-16, change "solidified" to --solidified--.

Col. 3, line 49, insert "50" after --bore--.

Col. 9,

In claim 1, line 19, change "siad" to --said--.

Col. 10,

In claim 4, line 9, change "rings" to --ring--.

Signed and Sealed this

eleventh Day of May 1976

[SEAL]

Attest:

RUTH C. MASON
Attesting Officer

C. MARSHALL DANN
Commissioner of Patents and Trademarks