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E. GRASSER

2,183,962

OFF-CENTERING DEVICE FOR LENS GRINDING MACHINES

Filed May 15, 1939

Fig. 1

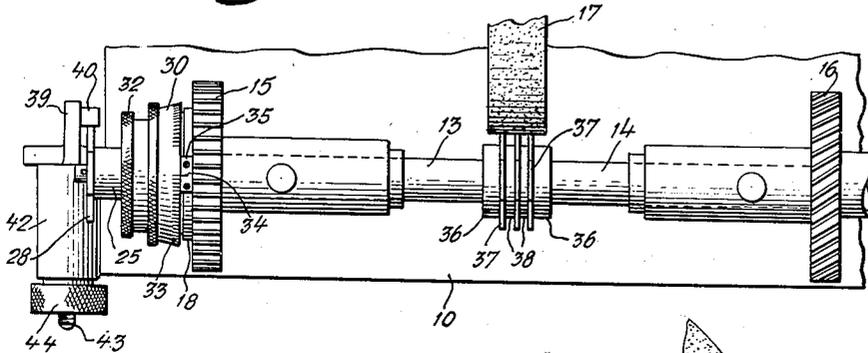


Fig. 2

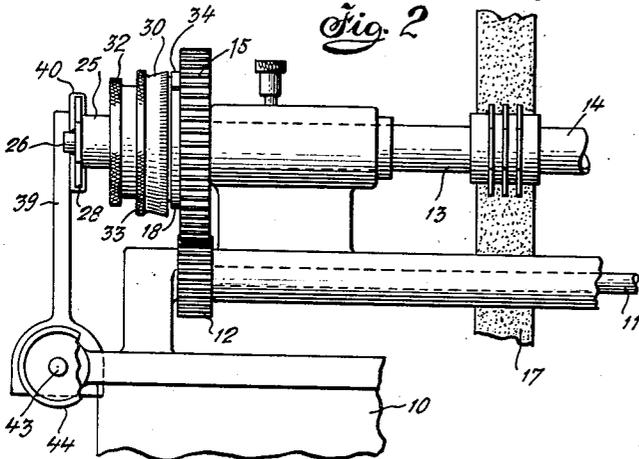


Fig. 3

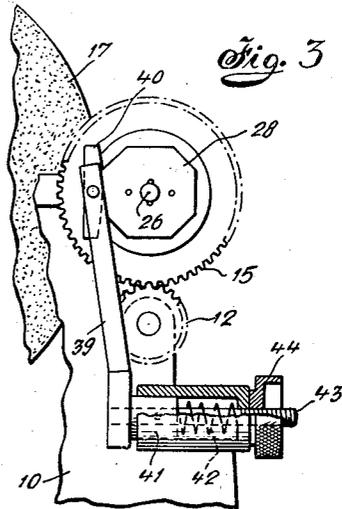


Fig. 4

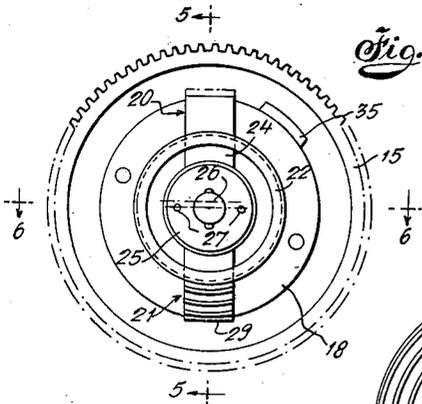


Fig. 5

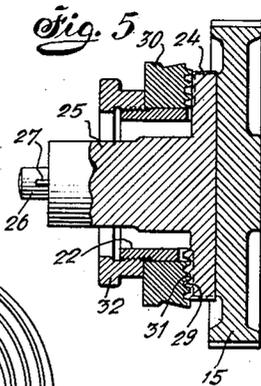


Fig. 6

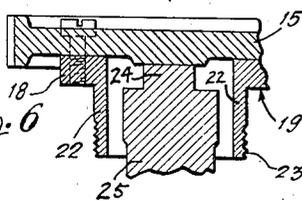
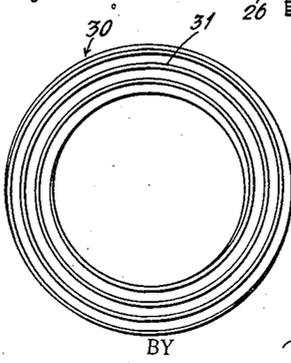


Fig. 7



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OFF-CENTERING DEVICE FOR LENS GRINDING MACHINES

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8 Claims. (Cl. 51—101)

This invention relates to lens grinding machines, and more particularly to machines for grinding the edges of lenses of the modern styles, of which a very large number of modifications are in use.

In using such machines, so-called steel formers are used, there being available to the operator one former for each shape of lens which can be ground. These formers generally have a hole through the optical center, and, horizontally aligned therewith, two smaller holes on each side of the center hole. It frequently happens, however, that a lens to be ground must have its optical center shifted to accommodate it to the person for whom it is being shaped. In the common type of grinder there is no provision for such off-center adjustment, so that new formers must be especially made having the proper optical center.

It is the main object of this invention to provide such an off-center adjustment as a part of the machine, and as a result but one former is required for each lens shape, and the same former can be used for the grinding of all lenses of that shape regardless of the actual position of the center hole with respect to the optical centers.

The above and other objects will become apparent in the description below, in which characters of reference refer to like-named parts in the accompanying drawing.

Referring briefly to the drawing, Figure 1 is a fragmentary plan view of a lens grinding machine equipped with the present improvement.

Figure 2 is a fragmentary front elevational view of the same.

Figure 3 is a fragmentary side elevational view of the same, looking from left to right, Figure 2.

Figure 4 is a face view of the former supporting and off-centering member, with the adjusting ring and the lock ring removed for the sake of clarity, also looking from left to right, Figure 2.

Figure 5 is a cross-sectional view taken on the line 5—5 of Figure 4, with the above-mentioned two rings in place.

Figure 6 is a cross-sectional view taken on the line 6—6 of Figure 4.

Figure 7 is a view of the reverse side of the adjusting ring.

Referring in detail to the drawing, the numeral 10 represents the frame of the machine, above which a horizontal shaft 11 is rotatably supported. The shaft 11 has a pinion 12 at one end, and at the other end, not shown, a spur pinion in mesh

with an adjusting screw, not shown. The latter members which have been stated as not shown, are standard equipment for such machines and play no role in the present invention.

Above the shaft 11 is a divided shaft, or, a pair of axially aligned shafts 13 and 14 whose mutually adjacent ends are spaced apart. These ends of the shafts 13 and 14 are adapted to be moved toward or from each other by the usual standard means, not shown. A gear 15 on the other end of the shaft 13 is in mesh with the pinion 12, and a spur gear 16 on the other end of the shaft 14 is in mesh with the spur pinion above-mentioned but not shown. A circular grindstone 17 is rotatably positioned adjacent the space between the two shafts 13 and 14, and is driven by a belt or motor, not shown.

An annular boss 18, whose outer surface 19 is flat, is secured concentrically to the face of the gear 15, and is cut out at two diametrically opposite points to provide radial slots 20 and 21 therethrough. A sleeve 22 is integral with the boss 18 and extends outward therefrom, being further provided with external threads 23. A slide member 24 is slidably mounted in the slots 20 and 21 and extends diametrically through the boss 18. An elongated and substantially thick hub 25 is integral with the member 24, and extends outward through the sleeve 23. The inner diameter of the sleeve 23 is greater than the diameter of the hub 25, so that the latter may be moved from side to side radially within the sleeve. On the end of the hub 25 are the usual nipple 26 and pins 27, by means of which the former 28 is mounted on the hub 25 in the usual manner.

One end of the slide 24 is provided, on its face, with spiral screw threads 29. An adjusting ring 30 is loosely mounted about the sleeve 22 and is provided on its inner surface with spiral threads 31 of the same pitch as, and in mesh with, the threads 29 of the slide 24. It is apparent that as the ring 30 is turned, the slide 29 will be moved radially and, consequently, the hub 25 and nipple 26 will be moved toward or away from the center. A lock ring 32 threadably engages the threads 23 of the sleeve 22 to lock the ring 30 in position after the proper off-centering of the boss 25 has been made. The outer periphery of the adjusting ring 30 is provided with peripheral graduations, and a zero-indicating line 34 is marked on a block 35 rigid with the side of the boss 18.

The shafts 13 and 14 have on their mutually opposed ends, clamp members 36 between which

the lenses 37, separated from each other by rubber washers 38, are clamped, all of the lenses 37 having their optical centers in alignment with each other.

5 The former 28 is secured on the boss 25 in the manner just described. The standard means for limiting the movement of the former, in a given position, comprises an upright arm 39 having pivoted at its upper end a lug 40 whose face is bellied or rounded, and as the former slowly rotates its periphery rides on this surface. At its lower end the arm 39 has a boss 41 snugly slidable in one end of a sleeve 42 secured to the frame 10, and a threaded stem 43 extends through the sleeve 42 from the boss 41. A knurled nut 44 in engagement with the stem 43 serves to lock the arm 39 in position, and, hence, the lug 40 adjacent the edge of the former 28.

10 The operation of the machine is standard and well known. The grindstone 17 rotates at a speed of approximately 250 R. P. M., whereas, by means of reducing gears, not shown, the shafts 13 and 14 turn at, roughly, eight revolutions every ten minutes, and it takes about ten minutes for the lenses 37 to be ground. It is apparent that the lenses 37 thus will be ground into the identical shape of the former 28.

15 Assuming that the former 28 which is being used has the desired shape of the lenses to be ground but, instead of having its central hole through the desired optical center of the lens being ground, has that hole offset therefrom. Then, after applying the former 28 to the boss 25, the latter is moved off-center to the same degree as the central hole is off-set from the optical center of the former 28 (as measured by the graduations 33), and the lenses ground will have the desired shape of the former 28 but will have their optical foci in the desired positions.

20 Obviously, modifications in form and structure may be made without departing from the spirit and scope of the invention.

I claim:

1. In a lens grinding machine having a pair of spaced-apart axially-aligned shafts provided with lens-clamping means on their mutually adjacent ends, and the other end of one of said shafts having a hub loosely mounted thereon and provided with means for securing a former thereon, and means for moving said hub radially with respect to the axis of said shafts.

2. In a lens grinding machine having a pair of spaced-apart axially-aligned shafts provided with lens-clamping means on their mutually adjacent ends, the other end of one of said shafts having a hub loosely mounted thereon and provided with means for securing a former thereon, and means for moving said hub radially with respect to the axis of said shafts, and means for locking said hub in fixed position with respect to said axis.

3. In a lens grinding machine having a pair of spaced-apart axially-aligned shafts provided with lens-clamping means on their mutually adjacent ends, the other end of one of said shafts having a hub loosely mounted thereon and provided with means for securing a former thereon, and means for moving said hub radially with respect to the axis of said shafts, said means comprising a slide integral with and at right angles to said hub, said slide being positioned to intersect said axis diametrically, means for constraining said slide to diametrical movement with respect to said axis, and means for sliding said slide longitudinally.

4. In a lens grinding machine having a pair of spaced-apart axially-aligned shafts provided with lens-clamping means on their mutually adjacent ends, the other end of one of said shafts having a hub loosely mounted thereon and provided with means for securing a former thereon, and means for moving said hub radially with respect to the axis of said shafts, said last-named means comprising spiral threads on said slide, a sleeve secured to said shaft and surrounding said hub, a ring loosely mounted on said sleeve and having spiral threads thereon in mesh with said spiral threads of said slide.

5. In a lens grinding machine having a pair of spaced-apart axially-aligned shafts provided with lens-clamping means on their mutually adjacent ends, the other end of one of said shafts having a gear thereon adapted to be rotated to rotate said last-named shaft, said gear having an annular boss on its outer face, said boss having a pair of diametrically opposed radial slots therein, a sleeve integral with and extending outward from said boss, a slide extending diametrically through and slidably mounted in said slots, said slide having a hub thereon extending outward through said sleeve, said hub having means for securing a former thereon, and means for moving said slide longitudinally to shift said hub toward or from the center of said boss.

6. In a lens grinding machine having a pair of spaced-apart axially-aligned shafts provided with lens-clamping means on their mutually adjacent ends, the other end of one of said shafts having a gear thereon adapted to be rotated to rotate said last-named shaft, said gear having an annular boss on its outer face, said boss having a pair of diametrically opposed radial slots therein, a sleeve integral with and extending outward from said boss, a slide extending diametrically through and slidably mounted in said slots, said slide having a hub thereon extending outward through said sleeve, said hub having means for securing a former thereon, a ring loosely mounted on said sleeve and having spiral threads thereon, said slide having spiral threads thereon in engagement with said ring threads, rotation of said ring causing radial longitudinal movement of said slide and radial movement of said hub.

7. In a lens grinding machine having a pair of spaced-apart axially aligned shafts provided with lens-clamping means on their mutually adjacent ends, the other end of one of said shafts having a gear thereon adapted to be rotated to rotate said last-named shaft, said gear having an annular boss on its outer face, said boss having a pair of diametrically opposed radial slots therein, a sleeve integral with and extending outward from said boss, a slide extending diametrically through and slidably mounted in said slots, said slide having a hub thereon extending outward through said sleeve, said hub having means for securing a former thereon, and means for moving said slide longitudinally to shift said hub toward or from the center of said boss, a ring loosely mounted on said sleeve and having spiral threads thereon, said slide having spiral threads on one end thereof in engagement with said ring threads, rotation of said ring causing radial movement of said slide and said hub.

8. In a lens grinding machine having a pair of spaced-apart axially-aligned shafts provided with lens-clamping means on their mutually adjacent ends, the other end of one of said shafts having a gear thereon adapted to be rotated to rotate said last-named shaft, said gear having

an annular boss on its outer face, said boss having a pair of diametrically opposed radial slots therein, a sleeve integral with and extending outward from said boss, a slide extending diametrically through and slidably mounted in said slots, 5 said slide having a hub thereon extending outward through said sleeve, said hub having means for securing a former thereon, a ring loosely mounted on said sleeve and having spiral threads thereon, said slide having spiral threads thereon in engagement with said ring threads, rotation of said ring causing radial longitudinal movement of said slide and radial movement of said hub, and a locking ring threadably mounted on 5 said sleeve for locking said first-named ring in position against said slide.

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