W. R. WILSON.

MACHINE FOR GRINDING LENSES.

APPLICATION FILED JAN. 18, 1916.

1,238,612.

Patented Aug. 28, 1917.

2 SHEETS—SHEET 1.

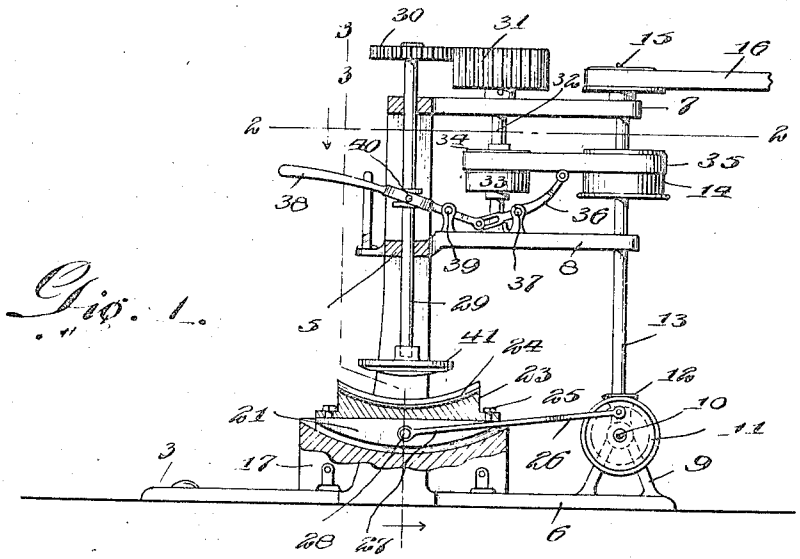


Fig. 1.

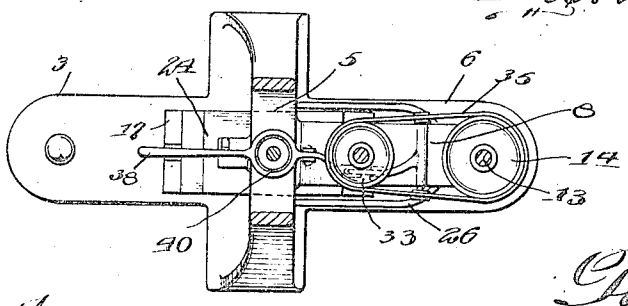
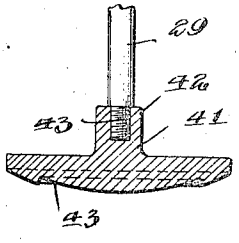
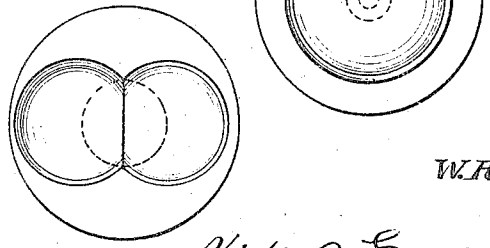


Fig. 4.

Fig. 5.

Fig. 12.





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2 SHEETS—SHEET 2.

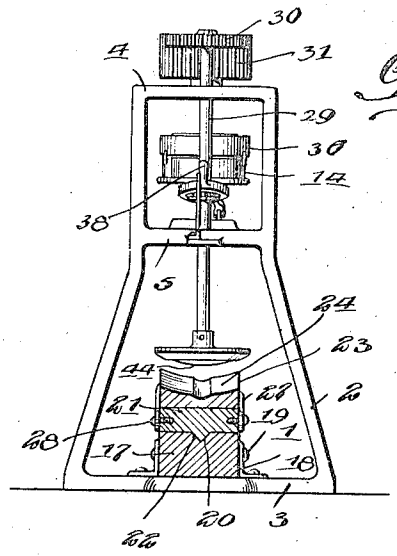


Fig. 3.

Fig. 6.

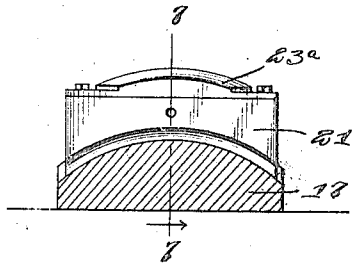


Fig. 7.

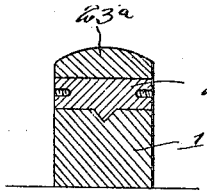


Fig. 8.

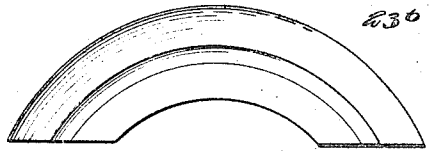


Fig. 9.

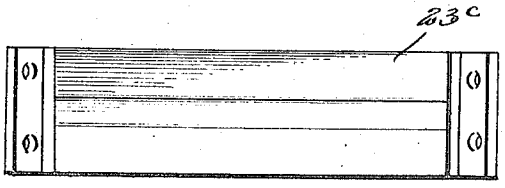


Fig. 10.

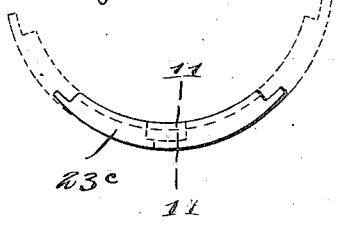
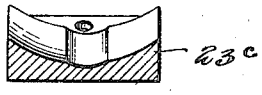


Fig. 11.



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UNITED STATES PATENT OFFICE.

WALTER R. WILSON, OF DOUGLAS, GEORGIA.

MACHINE FOR GRINDING LENSES.

1,238,612. Specification of Letters Patent. Patented Aug. 28, 1917.

Application filed January 18, 1916. Serial No. 72,800.

To all whom it may concern:

Be it known that I, WALTER R. WILSON, a citizen of the United States, residing at Douglas, in the county of Coffee and State of Georgia, have invented new and useful Improvements in Machines for Grinding Lenses, of which the following is a specification.

This invention is an improved machine for grinding both fields of bifocal lenses simultaneously and forming the same upon a solid piece of ground or other glass, the object of the invention being to provide an improved machine of this character which is simple in construction, which may be readily operated, and by means of which bifocal lenses may be ground rapidly and with accuracy.

The invention consists in the construction, combination and arrangement of devices hereinafter described and claimed.

In the accompanying drawings:—

Figure 1 is a side elevation partly in section of a lens grinding machine constructed in accordance with my invention.

Fig. 2 is a plan of the same partly in section on the plane indicated by the line 2—2 of Fig. 1.

Fig. 3 is partly an end elevation of the same and partly a vertical sectional view of the same on the plane indicated by the line 3—3 of Fig. 1.

Fig. 4 is a detail sectional view of the lens holding block.

Fig. 5 is a detail plan of the same.

Fig. 6 is a detail elevation of a modified construction of the lap especially adapted for use in my machine for grinding a lens with a reading portion on the inside, the head being also shown in elevation and the bearing block being shown in central longitudinal section.

Fig. 7 is a vertical transverse sectional view of the same on the plane indicated by the line 7—7 of Fig. 6.

Fig. 8 is a detail plan of a form of lap of semi-circular form adapted to run from side to side in a semi-circle instead of backward and forward.

Fig. 9 is a detail plan of another form of lap adapted for cutting the entire surface of a lens and forming the reading portion on the outside.

Fig. 10 is a side elevation of the same.

Fig. 11 is a vertical transverse section of the same.

Fig. 12 is a detail plan of the lens holding block provided with two blanks.

In the embodiment of my invention here shown, I provide a vertical frame 1 which comprises a pair of standards 2, a connecting base 3, a connecting cross bar 4, and a connecting lower cross bar 5 which is spaced a suitable distance from the bar 4. An arm 6 extends rearwardly from the center of the base. A similar arm 7 extends rearwardly from the center of the upper cross bar 4 and an arm 8 extends rearwardly from the center of the lower cross bar 5.

A standard 9 is secured on the arm 6 and is provided with a stub shaft 10 on which a crank wheel 11 is mounted for rotation, said crank wheel having a beveled gear face on one side which is engaged by a beveled gear 12 at the lower end of a shaft 13 which has its bearings in the arms 7, 8 and also in the standard 9, said shaft 13 being vertical. A pulley 14 is secured on the shaft 13 at a point between the arms 7, 8 and a pulley 15 is secured at the upper end of said shaft and is engaged by a driving belt 16.

A bearing block 17 is arranged on the center of the base of the frame and is detachably secured thereto by angle irons 18 and bolts 19. Said bearing block is provided in its upper side, which is longitudinally concaved, with a centrally arranged V-shaped guide way or groove 20. A head 21 which is shown in Figs. 1 and 3 as segmental in form, is arranged for longitudinal reciprocating motion on the block 17, its convex side being fitted in the concave face of the bearing block and being provided with a V-shaped longitudinally arranged tongue 22 which operates in the guide way or groove 20. This head carries the lap 23 which is shown in Figs. 1 and 3 as provided with a longitudinally and transversely concave face 24 and is especially adapted for grinding a lens with the reading portion on the outside such as a lens with a plus 7.00 D curve on the outside of distance portion and plus 9.00 D on the outside of reading portion. This lap is a toric shape and its curves may vary as required. The lap is detachably secured on the head by bolts 25. The head is connected to the crank wheel 11 by a pitman 26 which has forked arms 27 pivotally connected to opposite sides of the head as at 28 and hence when the crank wheel rotates, the head has reciprocating motion on the

bearing block so that the lap which is carried by the head is reciprocated in the same way.

A spindle 29, which is vertical, is mounted in bearings in the cross bars 4, 5, and is provided with a spur gear 30 at its upper end. Said spur gear engages a wider spur gear 31 on the upper end of a countershaft 32 which is mounted in bearings in the arms 7 and 8 and is provided with a fast pulley 33 and a loose pulley 34. An endless belt 35 which is driven by the pulley 14 may be engaged with either the pulley 33 or the pulley 34 by a shipper 36 which is pivotally mounted as at 37 on the arm 8 and is operated by a lever 38, said lever being also mounted as at 39 on the arm 8 and being swivelly connected as at 40 to the spindle so that said lever serves to raise the spindle when the belt 35 is engaged with the loose pulley and to lower said spindle when said belt is engaged with the fast pulley and the spindle is being driven. In practice suitable means such as a segment or the like is provided to hold the lever 38 in adjusted position. A head 41 is provided on one side with a centrally arranged stem 42 which has a threaded bore for engagement by the lower threaded end 43 of the spindle so that the head may be attached to the lower end of the spindle for vertical movement and also for rotation by the spindle. This head is provided with a countersink as at 43 for the reception of the lens or work 44 and which in practice is cemented or otherwise secured to the head for rotation therewith and for movement thereby to and from the lap. The countersink may be constructed if desired to permit the grinding of two lenses at the same time.

It will be understood that when the spindle is lowered to present the work or lens to the face of the lap and the spindle is in rotation and the lap is reciprocating by the movement of the block or head 21, a double cutting effect is exhibited on the lens and the grinding thereof is greatly facilitated and rapidly effected. Emery is used in the grinding of the lens as usual.

The lap may be made of any suitable shape, either concave or flat, the concave shapes serving to make lenses with reading addition on the outside and the flat shapes serving to make lenses either with reading additions on the inside or outside.

In Figs. 6 and 7 I show a lap 23^a especially adapted for grinding a lens with a plus 7.00 D curve on the outside of distance portion and plus 9.00 D on the outside of reading portion, the lap being of toric shape and there being a difference of half a diopter in each of the curves. These variations may be more or less as required. The nearer these curves are the same, the larger abrasion area is effected. Hence if one curve is 7.00 each way and the other 9.00, then the entire surface of the lens would be cutting at the same time. It will be seen that the straighter the curve, the long way, the less area of the lens surface will abrade. Another reason for varying these curves is to adapt them to conform to the different lenses to be ground.

In Fig. 8 I show a lap 23^b illustrating another modified construction in which the lap is semi-circular in shape and is arranged to run from side to side in a semi-circle if desired.

In Figs. 9, 10 and 11 I show another modified form of lap 23^c which is arcuate in form longitudinally and which is adapted for cutting the entire lens at the same time and described oscillatory movement, left and up and right and up.

Having described the invention, what is claimed is:

In a lens grinding machine, a frame, a work head carrying spindle arranged for rotation and also for vertical movement in the frame and provided with a gear, a countershaft parallel with the spindle and having a long gear engaged by the first named gear and also having a fast pulley, a driving shaft having fast and loose pulleys, a belt shiftable on the pulley of the countershaft and arranged to engage with the fast or loose pulley of the driving shaft, means to shift said belt, means to raise and lower said spindle, said spindle raising and lowering means operating the belt shifting means, a lap carrying head mounted for reciprocating movement and means actuated by the driving shaft to operate said head.

In testimony whereof I affix my signature in presence of two witnesses.

WALTER R. WILSON.

Witnesses:
R. C. WILSON,
R. A. MOORE.