July 10, 1923.

1,461,094

A. PELLOW

LENS GRINDER

Filed Dec. 4, 1919

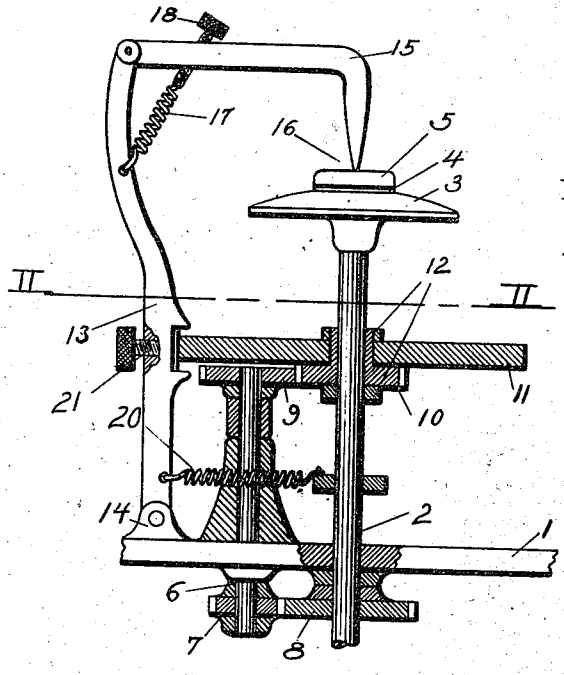


FIG I

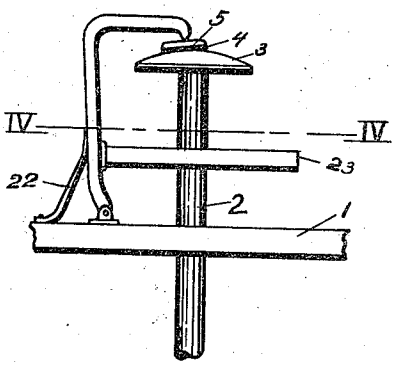


FIG III

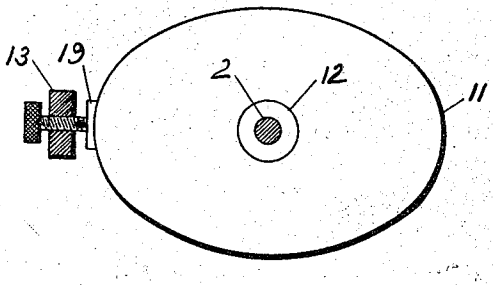


FIG II

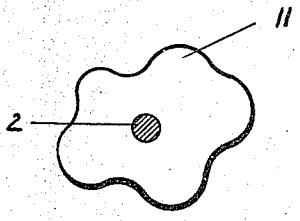


FIG IV

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Patented July 10, 1923. 1,461,094

UNITED STATES PATENT OFFICE.

ARTHUR PELLOW, OF SOUTHBRIDGE, MASSACHUSETTS, ASSIGNOR TO AMERICAN OPTICAL COMPANY, OF SOUTHBRIDGE, MASSACHUSETTS, A VOLUNTARY ASSOCIATION OF MASSACHUSETTS.

LENS GRINDER.

Application filed December 4, 1919. Serial No. 342,392.

To all whom it may concern:

Be it known that I, ARTHUR PELLOW, a citizen of the United States, residing at Southbridge, in the county of Worcester and State of Massachusetts, have invented certain new and useful Improvements in Lens Grinders, of which the following is a specification.

This invention relates to improvements in grinding machinery and has particular reference to an improved simplified form of machine particularly adapted for use in the grinding of ophthalmic lenses.

One of the leading objects of the present invention is the provision of a novel and improved structure by the use of which upper spindles and similar mechanism on grinding machines may be eliminated and the entire grinding apparatus positioned at or near the bench or support for the grinder, eliminating complicated overhead mechanism and rendering access to the lens for purposes of examination or for application of abrasives much simpler.

A further object of the invention is the provision of a simple and compact machine which shall occupy a minimum of space, a feature of particular importance in small grinding establishments having limited work-room facilities.

Another object of the invention is the provision of an improved structure which may be readily applied to ordinary types of grinding machines now in use, and which will render said machines capable of automatic production of lenses at a minimum of expense to their owners.

Other objects and advantages of my improved construction should be readily apparent by reference to the following specification taken in connection with the accompanying drawings forming a part thereof, and it will be understood that I may make any modifications in the specific details of construction shown and described within the scope of the appended claims without departing from or exceeding the spirit of my invention.

Figure I represents a vertical sectional view of one embodiment of my invention.

Figure II represents a section view on the line II—II of Figure I.

Figure III represents a side elevation of a still simpler form of my invention.

Figure IV represents a sectional view taken on the line IV—IV of Figure III.

In the drawings, in which similar characters of reference have been employed to denote corresponding parts throughout the several views, the numeral 1 designates the bench or base member of my improved grinding machine having rotatably mounted therein the suitably driven vertical spindle 2 bearing at its upper end the grinding tool 3 for acting on the lens 4 carried by the block 5, these parts being of any desired ordinary type of construction, such as that commonly used in connection with the well known commercial hand grinder.

In my improved form of construction there is journaled in the bench or support 1 near the spindle 2 the shaft 6, having at its lower end the pinion 7 in mesh with and driven by the gear 8 on the spindle 2, and having at its upper end a gear 9 which drives the pinion 10 of the former or lens arm controlling member 11. This member 11 is loosely mounted for rotation upon the spindle 2, being retained in position as by the collars 12, and may be of any desired form, the form here shown being that of an ellipse and the ratio of gearing being such that the member 11 will rotate with the spindle 2 and lens grinding tool 3 and at the same time will have an accelerated motion. This, however, may be varied as desired by the individual user so that the member 11 will move either faster or slower than does the grinding tool, although it will be understood that quite satisfactory results may be obtained when the two parts are moving at the same rate of speed, the advantage in speed differential residing in the fact that in this way a more uniform wear on the tool and less necessity of truing up the tool is insured.

Cooperating with this former or cam 11 is the lens actuating member comprising the upright arm 13 pivoted to the table or base 1, as at 14, and preferably having pivoted to its upper end the angular arm 15 provided with the lens block engaging point 16 being held in tight engagement therewith and supplying the necessary pressure on the block, as through the spring 17, whose tension may be varied as by adjustment of the spring tension controlling nut 18. It will thus be seen that the spring 17 supplies the necessary

pressure against the lens block to hold the lens firmly in engagement with the tool, while the arm 15 may be swung upward when desired for removal of the lens. It is a well recognized principle of lens grinding that in order to secure the most generally satisfactory results it is desirable that a certain cross motion be given to the lens when held against a rotating tool, and it is for the purpose of securing this cross motion that I make use of the cam 11. The arm 13 is provided with the contact shoe 19 adapted to bear against the cam 11 so that the arm will move in and out as actuated by the cam, a spring 20 serving to hold these parts in engagement, while to vary the movement of the arm the contact shoe may be adjusted relative to the arm, as by the set screw or adjusting member 21, the effect of this being that when the screw and contact are adjusted inward the movement of the point 16 will be over the outer portion of the tool, for example, between its center and edge, while as the contact and shoe are adjusted outwardly the arm will move to operate more toward the center of the tool, this adjustment permitting of equalizing of wear of the parts as desired. To facilitate securing the best results in connection with this mechanism if preferred the point 16 may be adjustably secured to the arm 15 so that its angle may be varied to set it substantially to the normal of the curve to be operated upon at the mean of movement.

Substantially the same structure is employed in Figure III with the exception that in place of the cam 11 being loosely mounted on the spindle 2 and separately driven, a cam 23 is secured on the spindle and directly driven thereby, while in place of a tension spring 20, a blade spring 22 is shown as urging the arm inward toward the cam. I have also here illustrated a different form of cam which is of irregular in place of regular outline securing probably better break-up movement when used rotating at the same rate of speed as the spindle 2.

I claim:

1. A lens grinding machine including a support, a shaft journaled in the support and projecting therefrom, an arm pivoted to the support and projecting therefrom in the same direction as the shaft, the shaft having a terminal lens grinding tool engaging portion, an angular arm pivoted to the first arm and projecting into overlying relation to the shaft at its terminus, means for actuating the first arm about its pivot in the direction of the shaft, additional means for relatively shifting the arms to urge the angular arm axially toward the shaft, and means on the shaft and engaging one of the arms for variably limiting the movement of said arm toward the shaft.

2. A lens grinding machine including a support, main and supplemental shafts journaled in the support and projecting therefrom in parallel relation, means for driving the supplemental shaft from the main shaft, a cam member on the main shaft, driving connections between the supplemental shaft and the cam for rotating the latter at a different rate of speed from the rate of speed of the main shaft, said main shaft being adapted to terminally support a lens grinding tool, and a work holding member for cooperation therewith having a portion pivoted to the support and a portion overlying the shaft, and means for actuating the work holding member about its pivot, said member having an adjustable contact engaging the cam to variably limit the movement of the member in the direction of the shaft.

3. A lens grinding machine, including a support, a rotatable shaft and a pivoted arm carried by the support and projecting therefrom in spaced relation, said members having substantially aligned portions for engagement with a grinding tool and a lens holder, means for swinging the arm about its pivot in a direction toward the shaft, a former on the shaft for limiting the movement of the arm in the direction of the shaft, and driving connections between the former and shaft to insure their concomitant rotation.

4. A lens grinding machine including a driven spindle, a pivotally mounted lens block engaging arm adjacent the spindle, a cam on the spindle engaging the arm to vary its position, resilient means for holding the arm in engagement with the cam, means for adjusting the position of the arm with respect to the cam, means for driving the cam at a different rate of speed from the speed of revolution of the spindle, a lens grinding tool carried by the spindle, and means for pressing the lens block engaging portion of the arm toward the tool.

In testimony whereof I have affixed my signature, in presence of two witnesses.

ARTHUR PELLOW.

Witnesses:
ALICE G. HASKELL,
ESTHER M. SAFLER.