Dec. 9, 1924. 1,518,394

G. S. DEY

LENS GRINDING MACHINE

Filed July 26, 1920

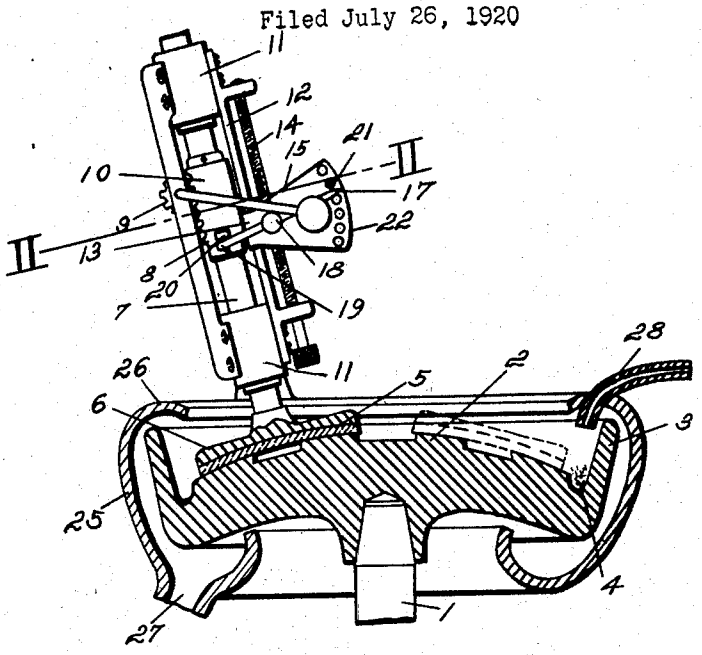


Fig. I

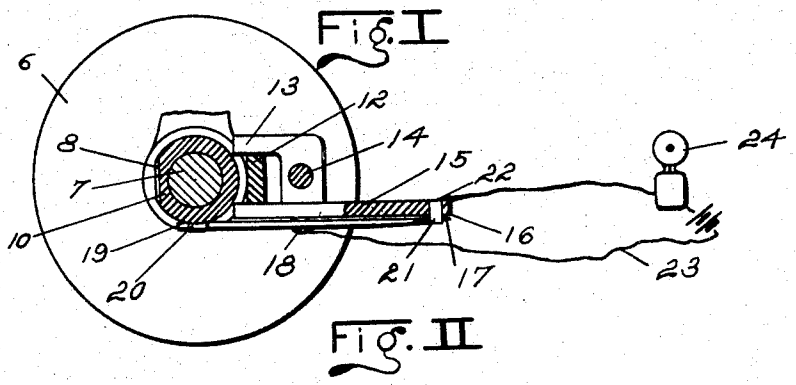


Fig. II

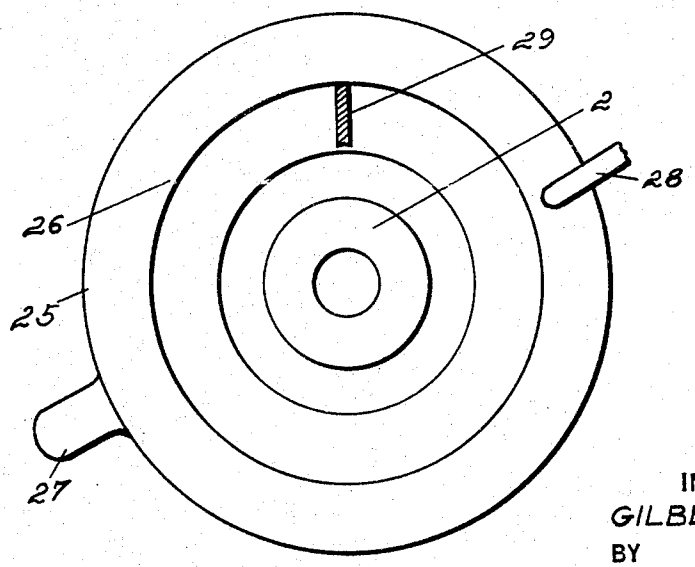


Fig. III

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UNITED STATES PATENT OFFICE.

GILBERT S. DEY, OF SOUTHBRIDGE, MASSACHUSETTS, ASSIGNOR TO AMERICAN OPTICAL COMPANY, OF SOUTHBRIDGE, MASSACHUSETTS, A VOLUNTARY ASSOCIATION OF MASSACHUSETTS.

LENS-GRINDING MACHINE.

Application filed July 26, 1920. Serial No. 399,045.

To all whom it may concern:

Be it known that I, GILBERT S. DEY, 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-Grinding Machines, of which the follow is a specification.

This invention relates to improvements in lens grinding machinery and has particular reference to machinery of the precision grinding type.

One of the principal objects of the present invention is the provision of an improved means for determining in a lens grinding machine the exact amount of glass which is being removed by the grinding operation.

A further object of the present invention is the provision in connection with means for determining the amount of glass being removed of improved means for audibly indicating the completion of removal of a predetermined portion of glass or of stopping the operation of the machine or both indicating the completion of the work and stopping the machine, as may be desired.

A further object of the present invention is the provision in a machine of this character of novel and improved mechanism for insuring proper automatic feeding of the abrasive fluid during the grinding operation, which mechanism shall also be adapted to cleanse the tool and lens of a particular grade of abrasive fluid or from all abrasive fluid, as may be desired, thus preventing any collecting or hardening of the material upon the parts.

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 and it will be understood that I may make any modifications in the specific details of construction described within the scope of the appended claims without departing from or exceeding the spirit of the invention.

Figure I represents a front view partially in section illustrating the improved features of my machine.

Figure II represents a fragmentary sectional view taken as on the line II—II of Figure I.

Figure III represents a plan view illustrating certain portions of my mechanism.

In the drawings, the numeral 1 designates the lower rotatable spindle bearing the lap or grinding tool 2 provided with the integral surrounding trough 3, which is adapted to receive the abrading mixture 4 which is preferably of a composition of rouge, emery or the like, in suspension in water, thus forming a fluid which will readily flow into and form a film between the grinding parts and aid in the wearing away of the particles of the lens 5. This lens may be of any desired form, it being shown in the present instance, however, as of the bifocal type, the lap being used to grind the distance portion of the bifocal. This lens is carried by the holder 6 on the rotatable shaft 7 which is fed toward the work as through the rack 8 on the collar or sleeve 10 carried by the shaft 7 engaged by the weight actuated pinion 9, forcing of the collar and thus of the shaft 7 toward the lap holding the lens in close engagement therewith so it will be worn off as the parts are rotated.

In the construction of bifocal lenses it is particularly important that some means be provided for determining the exact amount of glass which is being removed, this being essential on account of the fact that these lenses when made from a single piece of glass are an extremely high grade article and are frequently made with the reading and distance portions exactly merging one into the other so that there is no perceptible difference in their height at the line of joinder, or in the case of ridge bifocals being made with a very slight ridge. It is, therefore, desirable that the progress of the grinding may be accurately determined at all times to prevent undue grinding away of one surface or the other and thus requiring re-grinding of the opposed surface in order to bring the parts into proper relation. To enable me to accomplish this result in a satisfactory manner I preferably secure to the journals 11 for the spindle 7 the bracket 12 bearing a device which as an entirety may be designated as an indicator and includes a slide block 13 adjustable along the bracket 12 as by rotation of the set screw member 14. This slide block 13 has rigidly secured thereto the plate 15 having an arcuate scale or protractor portion 16 with which cooperates

the pointer 17 intermediately pivoted to the plate 15 as at 18. This protractor portion has suitable indicating points which may be in the form of lines or circles, or as shown may comprise circular apertures over which the pointer moves, and which serve as designations indicating the amount of movement of the pointer, and also, as hereinafter described, may serve to receive a suitable contact plug or stop. This pointer has the inwardly extending contact end 19 adapted to engage the lug 20 on the sleeve 10 so that as the sleeve 10 moves downward with the spindle 7 the pointer will be rocked to cause the same thereof to rise and move over the face of the dial portion 16 on the plate. In the use of my machine the same is properly set up with the lens 5 to be ground resting upon the surface of the grinding tool 2, it having been previously determined the amount of glass that is desired to be removed from the lens during the particular operation to take place. The parts having been set up as indicated for example in Figure I the slide block 13 is adjusted through rotation of the screw 14 until the inward end of the pointer is bearing against the end of the lug 20 on the sleeve 10 and its other end pointing to the zero indication on the plate 16, the parts therefore being adjusted as is shown in connection with Figure I. The parts having been so adjusted I may if desired determine the amount of glass to be removed and set the contact plug 21 in the proper aperture 22 on the face of the plate 15, this plug then serving as a stop limiting the swinging movement of the pointer 17 and thus through the lug 20 the downward movement of the sleeve 10 and spindle 7, stopping the grinding operation when the proper point has been reached. This may be a purely mechanical matter or might if preferred be electrically accomplished, as the connection between the pointer and plug was completed, in any event the plug and pointer preferably forming two terminals of an electric circuit as indicated at 23, which may if desired have the enunciator or bell 24 therein audibly indicating when the work has been ground to a predetermined point.

There is another difficulty attendant upon the grinding and completing of lenses in machines of the general type here illustrated, in that preferably different grades of abrasive are employed during the grinding operation. To facilitate the changing of the abrasive or to clean out the trough portion 3 at any desired time I preferably enclose the lap and its surrounding rim within the pan 25 which has the portion 26 curling upwardly and inwardly above the upper edge of the tool rim and has a discharge spout 27, while there is secured to the rim the inlet 28 which may be used for directing either a mixture of water and abrasive or water only onto the lap. In ordinary operation the mixture of abrasive and water may be fed to the lap through this inlet flowing into the channel at the edge of the lap, from which it is thrown up onto the lap as the latter rotates, as by the scraper 29 which serves to stir up the abrasive at the bottom of the channel and prevent the same from hardening or solidifying at that point, the centrifugal action of the rotating lap combined with the action of the scraper keeping the surface of the lap at all times moistened or covered with a film of the fluid. When it is desired to clean off one grade of abrasive so as to make use of another it is merely necessary to put a heavier flow through the nozzle when the liquid as forcibly ejected from the nozzle and under centrifugal action will be thrown up and out of the bowl portion of the lap into the enclosing rim or pan 25, splashing being prevented by the overhanging portion 26 of the pan, new abrasive being supplied as through the nozzle 28 for the completion or furtherance of the grinding or polishing operation.

I claim:

1. In a machine of the character described, including a longitudinally shiftable spindle, a contact engaging member on the spindle, a slide member adapted to slide longitudinally with respect to the spindle having a series of recesses, screw means to move the slide, a shiftable plug adapted to fit in the recesses, and a lever pivoted on the slide, having one end adapted to engage the contact member on the spindle as it advances and the other end adapted to engage the plug to stop the advance of the spindle when the lever is forced against the plug through the action of the advancing contact on the spindle.

2. In a machine of the character described, including a longitudinally shiftable spindle, a contact engaging member on the spindle, a slide member adapted to slide longitudinally with respect to the spindle, having a series of recesses, screw means to move the slide, a shiftable plug adapted to fit in the recesses, a lever pivoted on the slide, having one end adapted to engage the spindle contact, and the other end the plug, as the spindle with its contact member advances, an electric circuit containing the plug and the spindle contact, and an electric sounding device in the circuit.

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

GILBERT S. DEY.

Witnesses:

ALICE G. HASKELL,

ESTHER M. LAFLER.