Aug. 14, 1923. 1,465,117

G. S. DEY

GRINDER

Filed Oct. 14, 1919

Fig. 1.

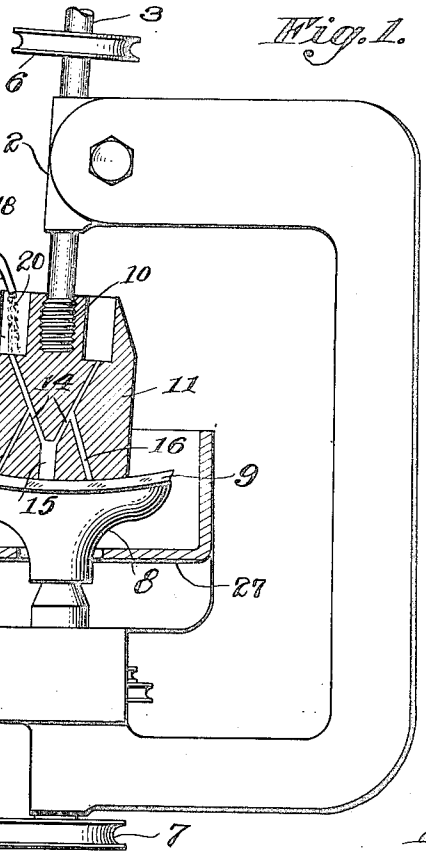


Fig. 5.

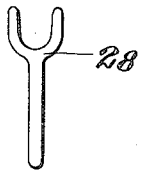


Fig. 3.

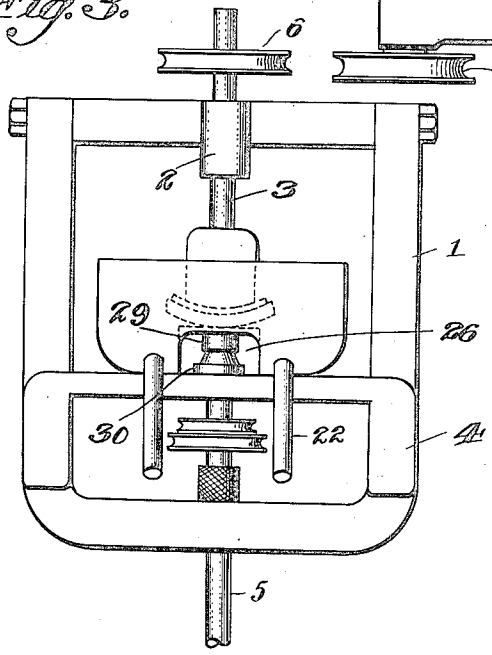
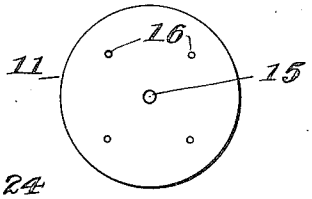


Fig. 2.



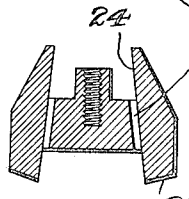


Fig. 4.

Inventor.

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Patented Aug. 14, 1923. 1,465,117

UNITED STATES PATENT OFFICE.

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

GRINDER.

Application filed October 14, 1919. Serial No. 330,571.

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 Grinders, of which the following is a specification.

This invention relates to improvements in grinders and has particular reference to novel and improved apparatus particularly adapted for use in the grinding of ophthalmic lenses.

One of the principal objects of the present invention is the provision of novel and improved apparatus to facilitate the roughing out or forming of the initial curvature on a piece of glass designed for use in the production of an ophthalmic lens.

A further object of the present invention is the provision of a novel and improved construction for use in the supplying of an abrasive or lubricating fluid in proper relation to the surface being operated upon to permit of continuous operation of the machine in an automatic manner and reduce to a minimum stopping and starting of the machine or constant attention of an operator to supply the abrasive fluid or lubricant.

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 shown and described within the scope of the appended claims without departing from or exceeding the spirit of my invention.

Figure I is a vertical sectional view through a machine embodying my improvements.

Figure II is a bottom plan view of one form of tool for use in carrying out the principles of my invention.

Figure III is a front view of a machine embodying my improvements.

Figure IV is a vertical sectional view through a different structure of tool.

Figure V is a plan view of the tool remover for use in connection with my invention.

In the drawings, the numeral 1 designates the main frame of my machine, having the bearing 2 for the upper driven spindle 3 and the bearing 4 for the lower spindle 5, these bearings being preferably relatively adjustable to vary the angular relationship of the spindles 2 and 5. Suitable pulleys 6 and 7 on the spindles afford means by which the spindles may be rotated during the grinding operation. It will be noted that the spindle 5 is illustrated as provided on its upper end with the lens block 8 bearing the piece of glass 9 to be operated upon, while the spindle 3 is received in the socket portion 10 of the tool 11, which is illustrated as provided with the curve which is to be produced on the glass, this tool being preferably in the form of an emery block or cup grinder, diamond charged lap, or the like, which is self contained as respects the abrasive to be employed, although it will be understood that if preferred it may be made of iron or other material, and that the liquid supplied may carry abrasive such as emery, rouge or the like in a suspended state, in place of being merely a lubricating fluid, both conditions falling within the spirit of the present invention.

In either event I preferably form the tool or lap with the upstanding annular skirt portion 12, forming a groove or recess 13 from which lead the passages 14 extending to the central aperture 15 and ducts 16. In those cases where a diamond charged lap or similar tool is used for grinding of glass it is found desirable to produce satisfactory results that a continuous film of water or similar fluid be supplied to the surface undergoing the abrading action, and this in practise has proved extremely difficult in those cases where the lap or glass are rotating elements, due to the fact that the abrasive action being performed by the surface of the tool, the tool is resting in very close engagement with the work and the centrifugal action of the rotating member tends to throw off my liquid exteriorly supplied, so

it has been necessary to very frequently stop the grinding machine to disengage the parts and introduce an abrasive or lubricating substance therebetween, requiring practically constant attention of an operator, and very much slowing up the possible production of the machine.

It is the purpose of my invention to eliminate this difficulty, therefore, by automatically supplying the required fluid to the parts without stopping the machine. In the accomplishment of this result I preferably make use of a tank 17 and pipe 18, terminating in a nozzle 19, so held as to discharge into the space 13 enclosed by the skirt 12. The passages 14, aperture 15 and duct 16 will then supply the outlets for the fluid from the tank 17 which will be carried outwardly from these various points by centrifugal action, gradually working out to the edge of the work in a film between the lap and glass and thus fulfil the conditions necessary to satisfactory grinding. As before stated, this fluid indicated at 20 may be either a plain lubricant or may have in suspension therein emery, rouge or the like, as preferred, and while I have shown one form of passage 14 and ducts 16 it will be understood that any desired form may be employed so long as the general desired result is arrived at, namely, that of the fluid being interiorly supplied to the tool so that it may work out toward the edge and insure proper grinding action. In any event the continued automatic flow thus provided will be found to supply an excess of fluid 20 and I, therefore, surround the spindle 5 with the tub portion 21 provided with the outlet connection 22 adapted to drain off the fluid where it may be conveyed to a suitable separator in case the abrasive is carried in suspension therein, or if it is desired to preserve the particles produced by the grinding operation which are also carried off from the face of the work by the fluid supply.

It is, of course, to be understood in this connection that one of the essential features of my invention is the provision of my improved skirted perforated tool, which while particularly adapted for automatic use can be manually supplied with the fluid 20 if preferred, automatic operation not being essential to the operation of my machine, although preferable and advantageous. It is further to be understood that the form and arrangement of the several detail parts are capable of modification to suit particular conditions or individual preferences without departing from the generic principles of the invention.

In certain instances it is desirable that the tool 11 rotate at a high rate of speed and in this case difficulty may be experienced in getting the fluid to feed into a small central aperture 15. In this event I may make use of the tool illustrated in Figure IV, having its lower face at 23 formed with the curve which it is desired to produce, and having the inner face of the skirted portion as at 24 flaring downwardly, while the passages 25 are outwardly flared. This construction is of advantage in that as the space enclosed by the wall 24 is filled with fluid the centrifugal action of the highly rotated tool will tend to turn the fluid outward and the centrifugal action will force the fluid down into the interior of the tool and thence outwardly between the tool and surface being operated on, insuring thorough lubrication of the surface, in those instances where otherwise the high speed of the tool might interfere with proper inward circulation of the lubricating fluid.

I would further call particular attention to another improvement in my construction, in that the pan or retainer 21 may be formed with the central arched recess 26 interiorly closed by the wall 27, this recess being open at the front to permit of insertion of the fork 28 between the lower edge of the lens grinding tool or block 29 and the collar 30 on the lower spindle, so that the tool may be readily wedged upward or loosened from its spindle for removal.

I claim:

1. A lens grinding machine, including cooperative abrasive lap and lens block, upper and lower spindles operatively and respectively carrying said elements, a bearing for the spindle carrying said block, an abrasive lubricant container supported on said bearing and substantially housing said block and provided with a central arched wall for the reception of the lower extremity of the block, said arched wall adapted for the reception of a tool, with which the lens block may be wedged upwardly whereby said block may be removed.

2. In a lens grinding machine, the combination with a lens block, of a lap having a lower grinding face for operating upon a lens to be supported on the block and provided with an upper central recess for the reception of abrasive lubricant, said lap having passages converging downwardly from the outer portion of the central recess, said lap provided with additional passages diverging downwardly from the first passages, and a central passage coextensive with the converged ends of the first passages, whereby the central passage and the diverging passages may convey abrasive lubricant to the grinding face.

3. A lens grinding machine, including upper and lower spindles substantially endwise disposed, a lens block operatively mounted on the lower spindle, a lap operatively mounted on the upper spindle and in-

cluding means for supplying abrasive lubricant to the grinding face of the lap, a bearing for the lower spindle, and a lubricant container supported on the bearing to substantially house said block, and provided with draining outlets for carrying off abrasive lubricant, said container having a central arched wall for the reception of the lower extremity of the block to permit of the insertion of a tool with which the lens block may be wedged upwardly, whereby said block may be removed.

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

GILBERT S. DEY.

Witnesses:
H. E. COLEMAN,
ALICE G. HASKELL.