Mar. 13, 1923. 1,448,699

H. K. PARSONS

LENS GRINDING MACHINERY

Filed June 27, 1921 2 sheets-sheet 1

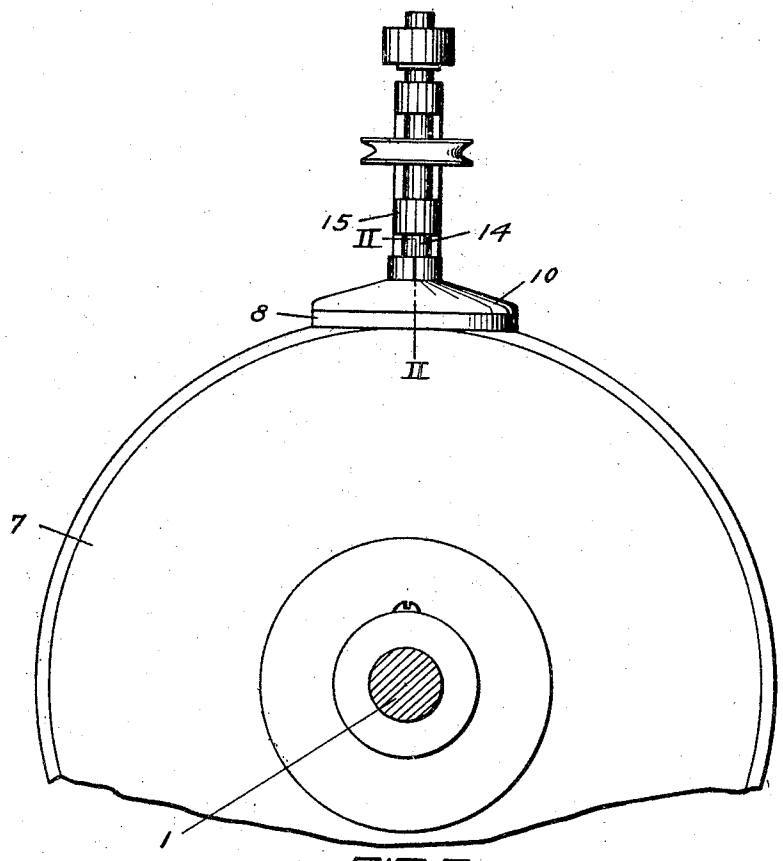


FIG. I

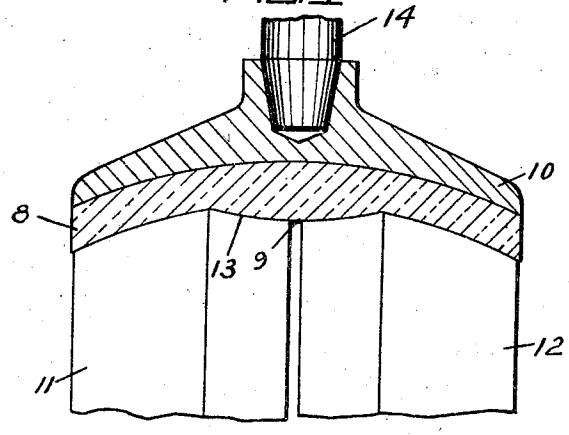


FIG. II

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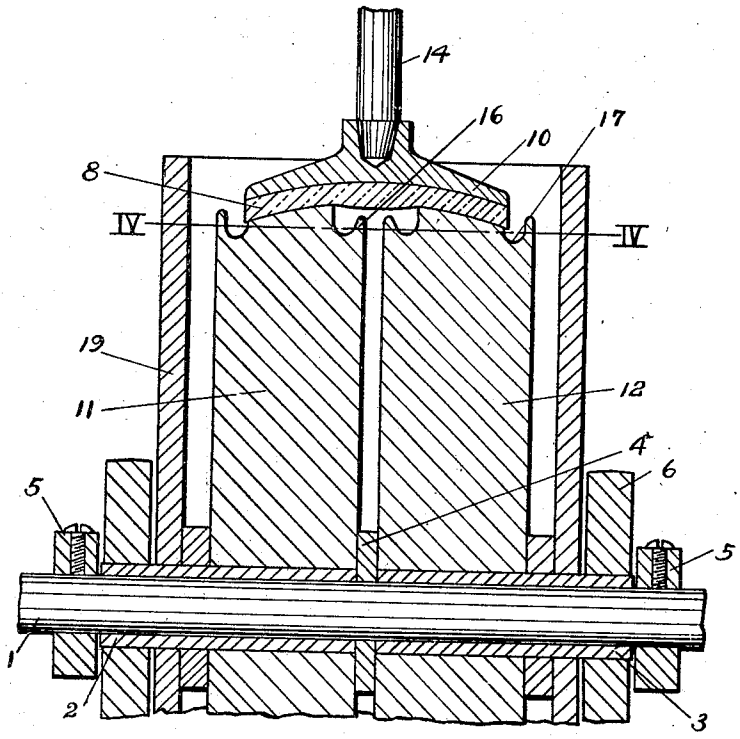


FIG. III

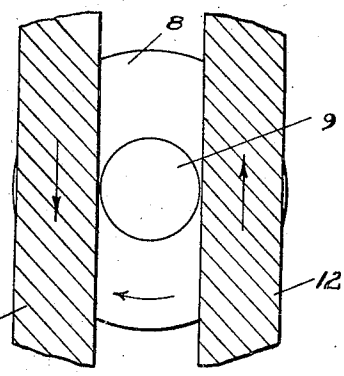


FIG. IV

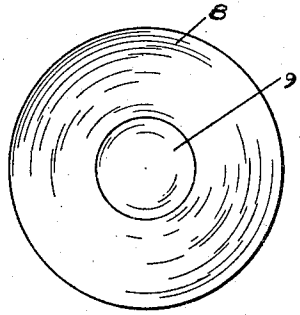


FIG. V

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UNITED STATES PATENT OFFICE.

HAROLD K. PARSONS, OF SOUTHBRIDGE, MASSACHUSETTS.

LENS-GRINDING MACHINERY.

Application filed June 27, 1921. Serial No. 480,726.

To all whom it may concern:

Be it known that I, HAROLD K. PARSONS, 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 Machinery, of which the following is a specification.

This invention relates to improvements in lens grinding machinery and has particular reference to novel and improved machinery especially adapted for use in the formation of bifocal or other high grade lenses.

One of the leading objects of the present invention is the provision of a novel and improved balanced construction of device for use in the formation of target type one-piece bifocal lenses which will greatly increase the speed of grinding of said lenses.

A further object of the present invention is the provision of a machine which will accomplish maximum grinding in minimum time and in which substantially equal grinding will occur at all points on the glass so that there will be no delay of the grinding due to high or low points, unequal abrasions, or the like.

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 illustrated within the scope of the appended claims without departing from or exceeding the spirit of the invention.

Figure I represents a side elevation of a machine embodying my improvements.

Figure II represents an enlarged fragmentary sectional view as on the line II—II of Figure I.

Figure III represents a vertical sectional view through a single surface grinding machine.

Figure IV represents a semi-diagrammatic plan view of a lens bringing out the relationship thereto of the parts shown in Figure III.

Figure V represents a plan view of the completed blank.

In the drawings, the numeral 1 designates the main horizontal shaft of my machine, having rotatably mounted thereon the driven sleeves 2 and 3 which may be held in spaced relation as by the central collar 4 and retained in position on the shaft as by the adjustable collars 5. Each of these sleeves is provided with a drive pulley 6 for rotation of the sleeve, the two sleeves being operated in opposite directions and each bearing a grinding or abrading wheel or disc member 7. This member 7 may be designed to produce either one or more than one surface on the article to be ground, as may be preferred.

Figures I and II illustrate a construction in which a bifocal lens having a distance portion or surface 8 and a central near or reading portion 9 is supported by the holder 10 in operative relation to my improved grinding discs. These discs 11 and 12 are shown in Figure II as provided with the outer curvature proper to reproduce the surface 8 and with an inner curvature as at 13 suitable to reproduce the surface 9. It will be understood that with the holder 10 rigidly carried on the spindle 14 carried by the bracket 15, if desired but a single one of the discs can be employed, the parts being so turned that the direction of rotation of the glass surface 8 in contact with the wheel 11 will be opposed to the direction of rotation of the disc. In this way maximum abrasion and cross grinding will be produced, in the event that the wheel 12 is also employed for this grinding operation, which structure gives a better balanced wheel and one putting less strain on the spindle 14. In the event that this structure is employed, however, the wheels 11 and 12 are rotated through their respective drive pulleys 6 in opposite instead of the same direction. Each will be opposed to the direction of rotation of the glass blank in immediate engagement therewith.

I am aware that prior to my invention some attempts have been made to use a wheel grinder of the general appearance of my construction. This, however, has been open to one fatal difficulty in that while theoretically the lens was balanced on the surface of the wheel and equal grinding was taking place at all points as a practical and actual fact the lens over a portion of the wheel was travelling in the opposite direction and over a portion in the same direction as the surface of the wheel. The result was

that the abrading action could take place only so fast as the opposed parts at the side moving in the same direction wore away, this side tending to hold up the glass at the opposite side, the abrading action there being slower and tending to produce an intermittent abrading action at the opposite side, since as the two opposed parts come into engagement they will tend to momentarily wear away rapidly and then as slightly held up at the other side to be a slight space in which the abrasive may collect to produce a scratching rather than proper abrading action.

By my improvement these difficulties are all done away with since the entire grinding action is with opposed parts or parts moving in the opposite direction and the two halves or sides both have an equal abrading action tending to wear away equally and to greatly increase the speed of operation.

In Figure II it is to be noted that I have shown a simultaneous generation of two surfaces upon the glass disc, but it will be understood that I may, as shown in Figure III, generate but one, or the outer surface, with this form of mechanism and form the inner or surface 9 by a separate mechanism. In this event I preferably centrally provide the trough portions 16 at the inner faces of the two wheels, and the outer trough portions 17. The purpose of these is to collect and receive abrasive forced out by the rotating lens blank or disc 8 so that the same will not work down into the bearings of the machine, but will be received in the trough and thrown off as the wheel rotates into a suitable enclosing pan 19, thus satisfactorily protecting the bearings from accidental abrading action.

Figure IV shows the general principle of operation of my improved mechanism, in that the lens blank or disc itself is being rotated in a clockwise direction, the wheel 11 being rotated toward the front and the wheel 12 toward the rear, this action serving most satisfactorily to produce the target shaped blank shown in Figure V.

I claim:

1. A lens grinding machine including a work holder, a pair of spaced abrading members opposed to the work holder for simultaneously engaging the work carried thereby, means for relatively shifting said abrading members in opposite directions, and means for rotating the work holder about an axis at right angles to the axis on which said parts are shifted.

2. A lens grinding machine including a main shaft, a pair of sleeves rotatably mounted on the shaft adjacent each other, means for rotating the sleeves in opposite directions, and an abrading disc carried by each sleeve, substantially as and for the purpose described.

3. A lens grinding machine including a main shaft, a pair of sleeves rotatably mounted on the shaft adjacent each other, means for rotating the sleeves in opposite directions, an abrading disc carried by each sleeve, and a work holder spanning the discs to present the work simultaneously to both of said discs.

4. A lens grinding machine including a main shaft, a pair of sleeves rotatably mounted on the shaft adjacent each other, means for rotating the sleeves in opposite directions, an abrading disc carried by each sleeve, a work holder spanning the discs to present the work simultaneously to both of said discs, and means for rotating the work holder to successively present the same portion of the work to the two discs.

5. In a lens grinding member, the combination with a rotary abrading disc, of flanges carried by the edges of the disc providing abrasive receiving grooves.

6. A lens grinding member in the form of a centrally split center section of a sphere, the two sections formed by the central split having a common outer spherical curve and an inner curve forming a continuous arc in transverse cross section, and means for rotating the two halves in opposite directions.

7. A lens grinding member in the form of a centrally split center section of a sphere, the two sections formed by the central split having a common outer spherical curve and an inner curve forming a continuous arc in transverse cross section, means for rotating the two halves in opposite directions, and means for rotating an article to be ground in a direction opposed to the direction of rotation of the discs and in simultaneous engagement with both of said discs.

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

HAROLD K. PARSONS.

Witnesses:
SUSAN CASAZZA,
ESTHER M. LAFLER.