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K. V. HILL ET AL

LENS GRINDING APPARATUS

Filed April 18, 1922

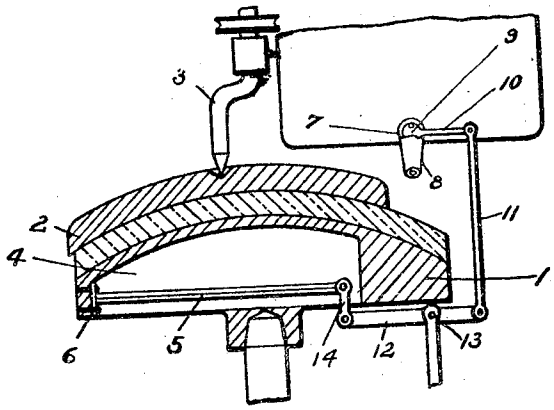


FIG. I

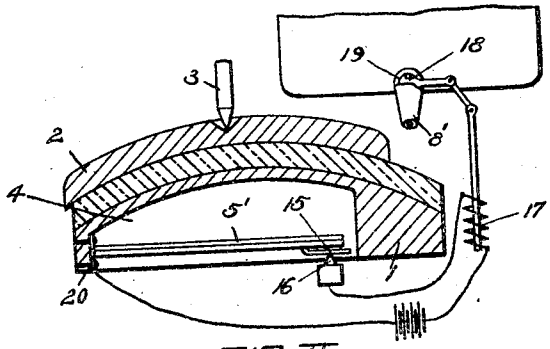


FIG. II

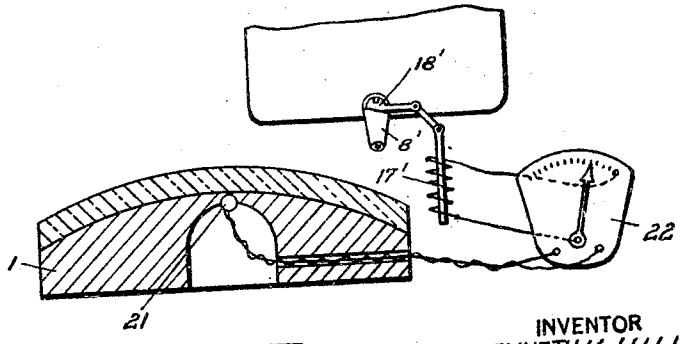


FIG. III

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UNITED STATES PATENT OFFICE.

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LENS-GRINDING APPARATUS.

Application filed April 18, 1922. Serial No. 554,762.

To all whom it may concern:

Be it known that we, KENNETH V. HILL and EDGAR D. TILLYER, citizens 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 Apparatus, of which the following is a specification.

This invention relates to new and useful improvements in feed controls for lens grinding machines, and more particularly to a thermostatically operated control whereby to regulate the control of rouge or other abrasive material with respect to the temperature during the grinding operation.

It is a well known fact that during the grinding of lenses in the present method the friction between the polishing block and the lens in a great many instances provides considerable high temperature during the grinding due to the friction between the lens and polisher, especially when the supply of rouge or other abrasive material has become nearly exhausted during the grinding operation.

It is, therefore, another object of our invention to provide means whereby when the temperature caused by the friction as set forth above reaches a certain height a supply of rouge or other abrasive material will be automatically fed between the polishing block and the lens.

A further object of the invention is the provision of an automatic feed control for lens grinding or polishing machines wherein an electric control is actuated through a thermostatic member, which in itself is actuated through the rise and fall of temperature due to the friction during the grinding or polishing operation, whereby when the temperature rises to a certain degree, rouge or other abrasive materials will be fed onto the work and eliminate the unnecessary friction and high temperature.

Other objects and advantages of our 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 we 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 our invention.

Figure I represents a semi-diagrammatic sectional view illustrating one embodiment of our invention.

Figure II represents a similar view showing an electrically controlled form.

Figure III is a similar view illustrating the employment of a thermo couple for controlling the abrasive discharge.

In carrying out our invention we use any well known form of grinding or polishing machine, which includes a lens supporting head 1, a movable polishing block 2, which is controlled through the crank 3. The block 1 is provided with a chamber 4, and arranged within this chamber is a thermostatic bar 5 which may be of any commercial dual bar used for this purpose, the said bar being rigidly connected at one end of the chamber, as shown at 6, the other end of the bar being free to move in accordance with the temperature of the chamber.

Attention is called to the fact that this chamber 4 is arranged directly beneath the upper face of the block 1, whereby the high or low temperature reached during the grinding or polishing operation will readily control the movements of the bar 5.

The feeding operation, which is connected with the bar 5, includes an inlet pipe 7 having a feed nozzle 8 at its outer end, and further provided with a valve 9 to control the outlet of the abrasive material through the nozzle. The valve is provided with an arm 10 and pivotally connected with the outer end of this arm is a link member 11, the lower end of which is pivotally connected to a movable bar 12. The bar 12 is preferably pivoted as at 13 and connected at one end by means of a link 14 to the free end of the thermostat bar 5. From this it will be apparent that movement on the part of the bar 5 will readily impart a rocking movement to the lever 12 for opening or closing the valve 9. In the present arrangement which we have illustrated upward movement on the part of the bar 5 will close the valve, while downward movement will open the valve. Thus when the temperature within the chamber 4 reaches a certain height the bar 5 will move downwardly actuating the lever 11 for opening the valve 9 and releasing rouge and

water or other similar abrasive material from the nozzle 8, where the same is conveyed onto the work being carried out.

In Figure II, we have illustrated a modified form of the invention wherein a suitable electric circuit forms connection between the thermostat control and the feed control. In this form of the invention a contact member 15 is carried by the bar 5′ adapted to engage the contact point 16 upon downward movement on the part of the bar 5′, and as this contact point 16 is connected through the solenoid 17, to the valve 18, the valve 18 will be actuated to open communication in the inlet pipe 19 and the nozzle 8′, whereby to inject a supply of water and rouge or other abrasive material onto the work.

In this form of the invention the regular commercial dual bar is used, as in the main form of the invention, and is rigidly connected at 20 and the other or free end of the bar being provided with the contact 15 which upon downward movement of the bar will engage the contact 16 and complete a circuit for actuating the valve 18. Upon upward movement of the bar 5′ the valve member 18 will be actuated through the solenoid 17 to close communication between the inlet pipe 19 and the nozzle 8′.

In Figure III we have illustrated another form of the invention wherein we use a commercial thermo-coupling and attach the same to the under face of the lens supporting block, as indicated at 21, and connect the same with an ordinary temperature indicator 22, said indicator being set whereby to make or break a circuit at a certain temperature. Suitable connections are provided between the indicator 22 and the solenoid 17′ whereby when the indicator reaches its highest set point the solenoid 17′ will be actuated for operating the valve 18′ for controlling the feed onto the work being carried out. Upon disengagement of the indicator from the highest set point the solenoid 17′ will operate to close the valve 18′ and cut off the supply of abrasive material. From this it will be apparent that when the amount of friction between the lens polishing block and the lens becomes sufficient to produce a temperature of a certain degree, means is operated through thermostatic control, whereby to supply a sufficient amount of water and rouge or other abrasive material for reducing the temperature and eliminate the friction caused by the absence of the abrasive material so that the work can be readily carried on without the necessity of stopping which has heretofore been principally due to the lack of proper feeding of the abrasive material on the work.

We claim:

1. Lens grinding apparatus including a lens support, fluid supplying means adjacent the lens support, and a thermostatic control connecting the support and fluid supply for automatically operating the fluid supply as the support is heated.

2. Lens polishing apparatus including abradant supplying means and a thermostatic control for regulating the discharge of abradant therefrom.

3. In lens grinding mechanism, the combination with a lens holder, of an abradant supply device adjacent said holder and heat operated means between the holder and said supplying device for increasing the supply of abradant therefrom as the temperature of a lens on the holder is raised by the grinding action.

4. Lens grinding apparatus of the character described comprising a lens support, a lens surfacing tool arranged in proximity to the support, means to rotate the lens surfacing tool, an abradant supply receptacle arranged in proximity to the lens support, a supply pipe extending from the said receptacle so as to overlie the lens support, a valve in the supply pipe, and a thermostat connected between the lens support and the valve whereby to open and close the supply pipe valve at predetermined temperatures.

5. Lens grinding apparatus of the character described comprising a lens support, a lens surfacing tool arranged in proximity to the support, means to rotate the lens surfacing tool, an abradant supply receptacle arranged in proximity to the lens support, a supply pipe extending from the said receptacle so as to overlie the lens support, a valve in the supply pipe, a heat responsive element carried by the lens support, and link means connected between the valve and the heat responsive means whereby to open and close the valve at predetermined temperatures.

6. A lens polishing apparatus of the character described comprising a lens support having a recess formed in the lower face thereof, a lens grinding tool arranged in proximity to the support and adapted to be rotated, an abradant supply device, an outlet pipe carried thereby adapted to overlie the lens support, a control valve arranged within the supply pipe, a heat responsive member arranged in the recess in said lens support in such position as to be affected by the heat generated between the contact of the lens and grinding tool, and link means connected between the control valve and heat responsive means whereby to open and close the valve at predetermined temperatures.

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