June 23, 1931. I. G. VETTER 1,811,219

LENS GRINDING AND POLISHING MACHINE

Filed June 25, 1927

FIG. 1

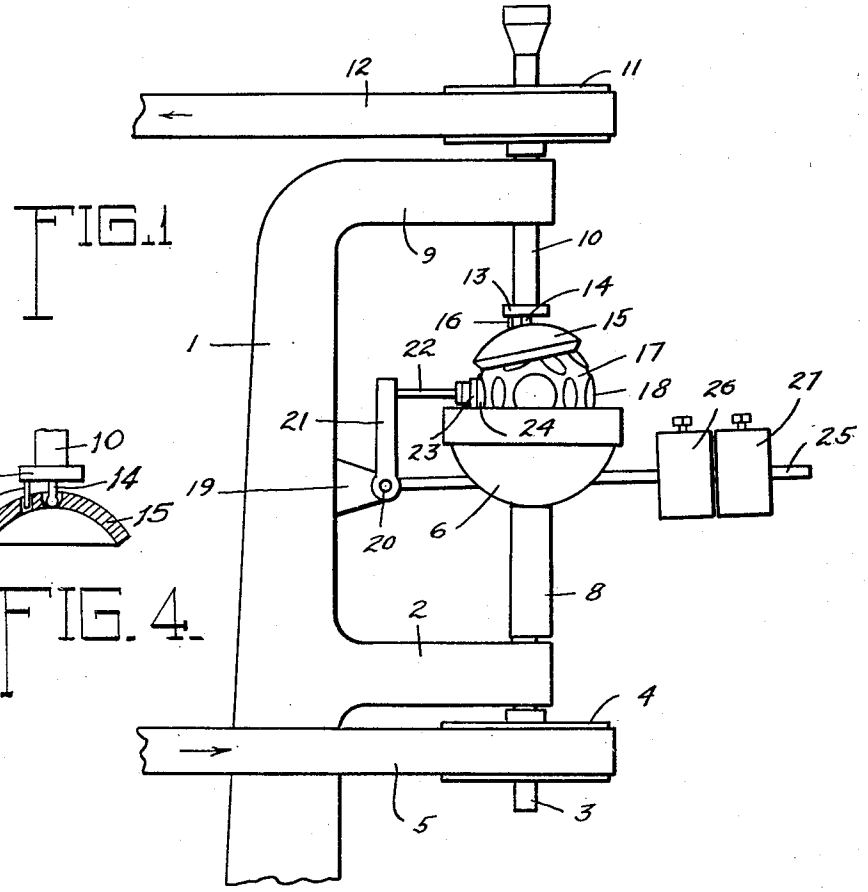


FIG. 4.

FIG. 2

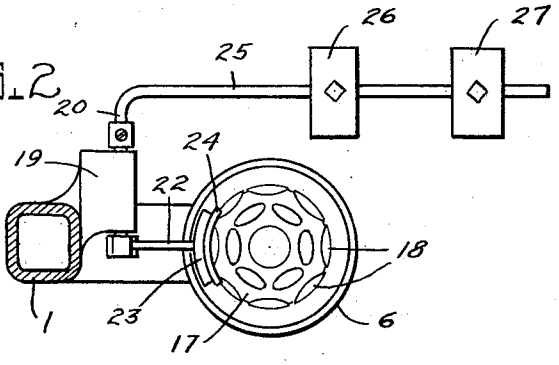
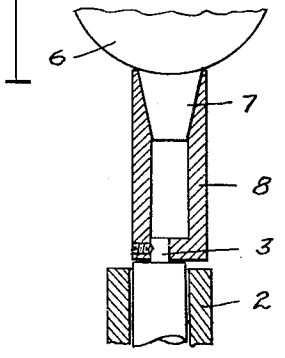


FIG. 3



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UNITED STATES PATENT OFFICE

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LENS GRINDING AND POLISHING MACHINE

Application filed June 25, 1927. Serial No. 201,354.

My invention has reference to a lens grinding and polishing machine, and pertains more specially to that type of such machines which is set forth in Letters Patent of the United States No. 1,588,435, issued to Charles A. Adams June 15, 1926. This machine makes use of a spherical or ball blocker, operating between two lens grinding tools rotating in opposite directions, and by the use of which an increase in the production of optical lenses was sought to be obtained. In the operation of the machine it is desired that the direction of movement of the blocker shall be constantly varied or shifted from a direct rotation on the vertical axis of the machine, so that the various lenses which are spotted on the surface of the ball will be in turn brought into contact with the operating faces of the tools. In practice it has been discovered that the lower tool has a dominant effect upon the blocker, causing it to spin constantly in the direction in which the tool is moving. Certain lenses were thereby caused to rotate continuously along the line of the space between the two tools, without receiving any benefit therefrom.

To remedy this defect it was undertaken to retard the movement of the blocker, by providing a brake device therefor. This was in part satisfactory, but was still ineffective, for the reason that the frictional force of the brake had to be adjusted to conform to the frictional action between the tools and blocker, and as this frictional action is constantly changing, the brake mechanism did not work successfully. In the operation of a machine of the type named it is usual to supply the grinding material with which the tools are provided with water, and immediately after being thus supplied the friction between the blocker and tools is much less than after the tools have operated for a time, and the moisture been dissipated by the action of the tools. As this occurs the friction increases, and there is a constantly growing tendency of the blocker to rotate with the lower tool. As a result if the brake mechanism is provided with a tension which will conform to the looser operation of the blocker, it will become useless as the friction on the blocker increases, and if, on the other hand, the brake is set to conform to the operation of the machine when the grinding material is dried out, it will fail to act when the material is supplied with more moisture.

The chief purpose of the present invention is to provide the lower tool with an eccentric movement, which, in connection with a suitable brake or control mechanism for the blocker, will produce the desired result, and impart a satisfactory movement to the blocker at all times.

The above named, and other purposes and advantages of the invention, will be more fully apprehended from the following specification, due reference being had to the accompanying drawings, in which:—

Fig. 1 shows a fragmentary portion of a machine embodying the invention, in side elevation.

Fig. 2 is a plan view of the lower tool, with the superstructure broken away.

Fig. 3 is a vertical section of the lower tool support in detail.

Fig. 4 is a sectional detail of the tool 15 and connections thereof.

The reference number 1 indicates the upper part of a frame, from which extends a support 2, in the end of which is rotatably mounted a vertical shaft 3, provided with a pulley 4, by means of which the shaft may be given rotation, as by a belt 5. On the upper end of the shaft 3 is mounted a bowl-shaped tool 6, by means of a stem 7 on the tool fixed in the upper end of an arbor 8, which is in turn fixed on the upper end of the shaft 3, in such a manner that the center line of the arbor will be out of line with the axial line of said shaft. As a result the rotary movement of the shaft 3 will be imparted to the arbor 8 and tool 6 to give a limited orbital movement thereto, for the purpose hereinafter pointed out.

At the upper end of the frame 1 is an arm 9, in line with the support 2, in the end of which arm is rotatably mounted a shaft 10, fitted with a pulley 11, so that the shaft may be driven by a belt 12. On the lower end

of the shaft 10 is fixed a disk 13, with a central pin 14 for engagement with an upper tool 15, adapted to operate in opposition to the tool 6. The disk 13 is also provided with a pin 16 for engagement with an opening in the tool 15, to compel the rotation thereof with the shaft 10, the connection of the pin 14 with said tool being of such a character as to permit a slight rocking movement of the tool during the rotation thereof.

Between the tools 15 and 6 is held a spherical blocker 17, capable of containing on its surface a plurality of lenses for grinding or polishing, as shown at 18. The downward pressure of the tool 15 is sufficient to lend the necessary amount of frictional action to the tool 6, and also to the tool 15, to have the desired operation on the lenses, and this pressure may be increased if desired by means of a weight on the upper end of the shaft 10. In the operation of the machine the shaft driving mechanism is geared so as to cause a rotation of the shafts 3 and 10 in opposite directions.

Projecting from the frame 1 at the side of the tool 6 is a bracket 19, in which is rockingly mounted a shaft 20, fixed to one end of which is a support 21. Projected from said support is a rod 22, on the end of which is a brake 23, fitted with a shoe 24 of felt or other material, adapted for engagement with the face of the blocker 17, and conforming to the shape thereof. The other end of the shaft 20 is bent forwardly into an arm 25, upon which are slidably mounted weights 26 and 27, with means for holding the same in stationary position thereon. By this means the brake is held in yieldable contact with the face of the blocker.

In the operation of the machine the tool 6 in its orbital movement carries with it the blocker 17, the brake 23 moving back and forth in response to the movement of the blocker, and being at all times in close contact therewith. The degree of pressure of the brake can be regulated by shifting the positions of the weights on the arm 25, no change having to be made therein after the operation begins. The effect of the combined orbital movement of the tool 6 and pressure of the brake on the blocker is to cause a constant shifting of the position of the blocker, bringing new lenses into operative positions in succession. In the movement of the tool and blocker the upper tool 15 is permitted a rocking rotary movement, conforming to the orbital movement of the blocker. The general effect is to make a successful operation out of what has heretofore been an unsuccessful one.

What I claim, and desire to secure by Letters Patent, is:

1. In a device of the class described, a frame and tool support mounted therein so as to be capable of an orbital movement, a lens grinding tool fixed on said support, adapted to hold a spherical blocker for grinding, an auxiliary grinding tool mounted above said blocker for operation in opposition thereto, a support rockingly mounted in proximity to said first-named tool, and pressure device carried thereby, and means for holding said last-named support with said pressure device yieldably in position to exert pressure against a blocker held in said tools.

2. In a device of the class described, a frame and pair of supports projected therefrom, in a vertical plane, a shaft rotatably mounted in one of said supports, a grinding tool mounted on said shaft so as to be given an orbital movement upon the operation thereof, a shaft in the other support, and a grinding tool carried thereby in opposition to said first-named grinding tool, means for operating said last-named shaft in a direction contrary to that of the first named shaft, a pressure device adapted for engagement with the face of a blocker contained in said first-named grinding tool, means for holding said pressure device yieldably in position, and means for adjusting the degree of pressure of said device.

3. In a device of the class described, a frame and tool support mounted therein so as to be capable of a rotary movement, a lens grinding tool fixed on said support, adapted to hold a spherical blocker for grinding, an auxiliary grinding tool mounted above said blocked for operation in opposition thereto, a support rockingly mounted in proximity to said first-named tool, a pressure device carried thereby, and means for holding said last-named support with said pressure device yieldably in position to exert pressure against a blocker held in said tools.

In testimony whereof I affix my signature.

IGNATZ G. VETTER.