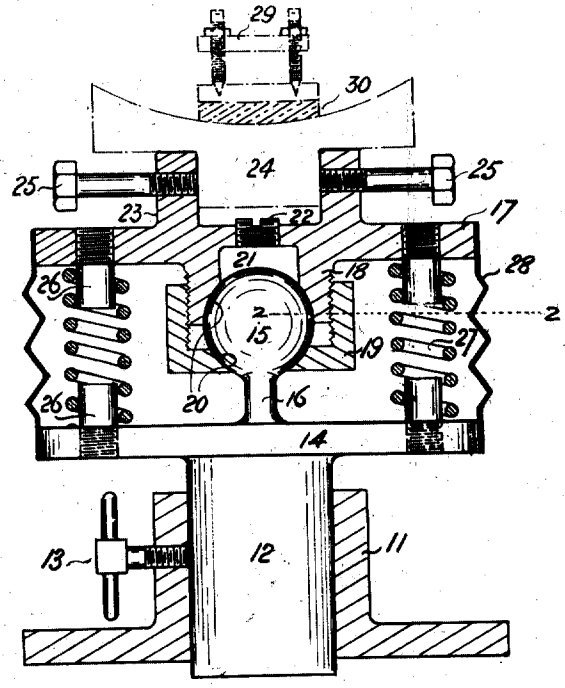
H. O. GOWLLAND.

LENS GRINDING MACHINE.

APPLICATION FILED OCT. 9, 1915.

1,217,090. Patented Feb. 20, 1917.

FIG 1



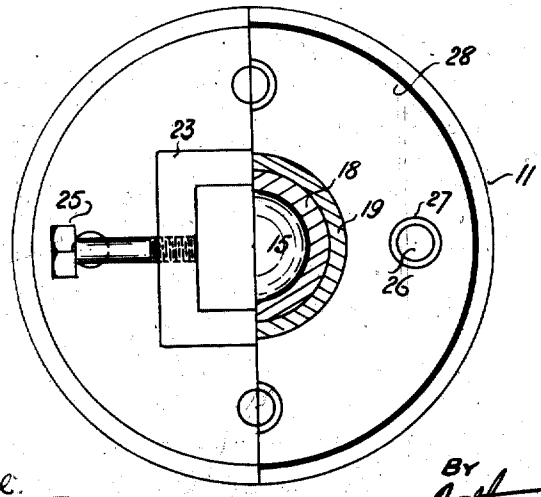


FIG 2

WITNESSES

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HENRY O. GOWLLAND, OF MONTREAL, QUEBEC, CANADA, ASSIGNOR TO NATIONAL TRUST COMPANY, LIMITED, (IN TRUST.)

LENS-GRINDING MACHINE.

1,217,090. Specification of Letters Patent. Patented Feb. 20, 1917.

Application filed October 9, 1915. Serial No. 55,025.

To all whom it may concern:

Be it known that I, HENRY O. GOWLLAND, a citizen of the Dominion of Canada, and resident of the city of Montreal, in the Province of Quebec and Dominion of Canada, have invented certain new and useful Improvements in Lens-Grinding Machines, of which the following is a full, clear, and exact description.

This invention relates to improvements in toric lens grinding machines, and the object of the invention is to provide an improved tool holder for oscillating machines of this type, which will yield on the change of direction of movement and result in more perfect grinding.

It has been found in the use of toric lens grinding machines of the oscillating types that the sudden change in direction of the arm on which the lens is carried, when operating against a rigid tool holder, results in unsatisfactory grinding, the chief characteristic of which is a wavy surface. To overcome this disadvantage, I provide a resilient or yielding tool holder which will give slightly when the lens holding device changes direction, thus overcoming the unequal pressure of the lens and eliminating the wavy grinding which ordinarily results.

The resilient holder consists briefly of a fixed pedestal and a tool holder connected with the pedestal by a ball and socket joint. A plurality of springs are mounted between the pedestal and tool holder around the ball and socket joint to normally maintain the tool holder in predetermined position. A suitable bellows arrangement may be connected between the pedestal and tool holder for the purpose of excluding grit from the springs and ball and socket joint.

In the drawings which illustrate the invention:—

Figure 1 is a vertical sectional view of the device.

Fig. 2 is a view half in plan and half in section on the line 2—2, Fig. 1.

Referring more particularly to the drawings, 11 designates a base in which the pedestal 12 of the tool holder is revolubly and slidably mounted, and in which it may be locked at any desired adjustment by means of the set screw 13. The upper end of the pedestal carries a table 14 preferably circular in form, in the center of which a sphere 15 is mounted on the short neck 16, of a diameter considerably less than the diameter of the sphere. The tool holder proper comprises a plate 17 preferably circular in form, and of the same size as the table 14, and having projecting from the lower surface thereof a centrally disposed hollow neck 18 externally threaded for the reception of a nut 19. The neck 18 and nut 19 are provided with surfaces 20 ground to spherical curvature conforming exactly to the sphere 15, so that the tool holder will have free oscillating movement in any direction. The bore of the neck 18 above the sphere 15 forms a reservoir 21 for the reception of a lubricant which may be inserted by removal of the filling plug 22. The upper surface of the plate 17 is provided with a hollow neck 23 in which the grinding tool 24 may be mounted by means of set screws 25. Adjacent their peripheries, the plate 17 and table 14 are provided with studs 26 arranged equidistantly from one another and equidistantly from the centers of the table 14 and plate 17, those of the table 14 being upwardly projecting and those of the plate 17 being downwardly projecting and arranged axially in line with the ones below. The springs 27 of equal length and strength are mounted between the table 14 and plate 17 in suitable compression, and are held in position by the studs 26. These springs and their supporting studs are not limited to the number shown, as either a greater or lesser number of same may be used if desired. Peripheries of the table 14 and plate 17 are connected by a bellows 28 of suitable material, which will prevent an accumulation of dust and grit from the grinding operations on the springs and ball and socket joint. The lens holder which operates in conjunction with the tool 24 is designated 29 and the lens held thereby is indicated at 30.

The operation of the device is extremely simple.

It will be obvious that when the lens is located directly above the ball and socket joint, the entire pressure is supported by the joint, but that as the lens moves toward the periphery of the tool 24, the load is supported partly by the joint and partly by the springs 27. During the grinding operation, the lens carrier and lens travel in an irregular path, which is carefully designed to insure uni-

form grinding. The constant changes in direction of the tool have been found to produce an irregular grinding action when the tool is mounted in a rigid holder, owing to the variations in pressure occasioned by the change of direction and the curvature of the tool. In the present invention, these changes of pressure are minimized by the resilient mounting of the tool holder, which yields as required when the lens holder changes direction, so that a uniform grinding results. The tool being mounted concentrically above the ball and socket joint and the springs being of equal strength and located equidistant from the center, the resiliency of the holder is uniform at all points equidistant from the center.

Having thus described my invention, what I claim is:—

1. In a device of the class described, a tool holder having a depending socket, a plate supporting pedestal, a ball carried by said plate upon which said socket is adapted to rest, and springs carried near the periphery of said plate adapted to yieldingly support the peripheral portion of said tool holder.

2. In a device of the class described, a tool holder, a plate supporting pedestal, a rockable connection and yieldable spring supporting said holder from said plate, and a bellows between said holder and said plate.

3. In a device of the character described, an adjustable rigidly mounted pedestal, a tool holder, a ball and socket joint connecting the pedestal and tool holder, springs arranged in uniform compression between the pedestal and tool holder, and disposed equidistant from the center of connection, studs on the pedestal and tool holder maintaining said springs in position, and a flexible casing connected between the pedestal and tool holder.

In witness whereof, I have hereunto set my hand, in presence of two witnesses.

HENRY O. GOWLLAND.

Witnesses:
R. W. ALLEN,
G. M. MORELAND.