J. F. AND T. N. ASHTON.

LENS EDGE GRINDING MACHINE.

APPLICATION FILED SEPT. 4, 1919.

1,378,831. **Patented May 24, 1921.**

Fig. 1.

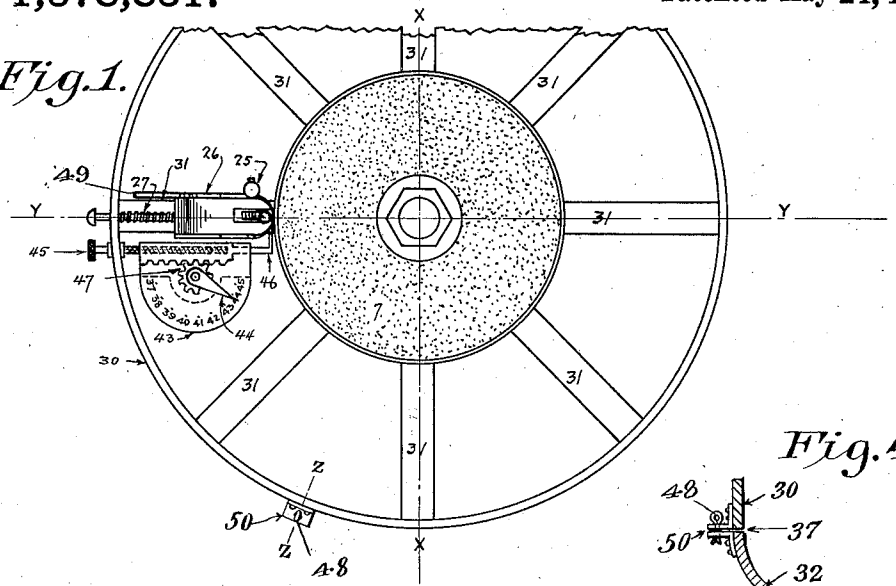


Fig. 4.

Fig. 2.

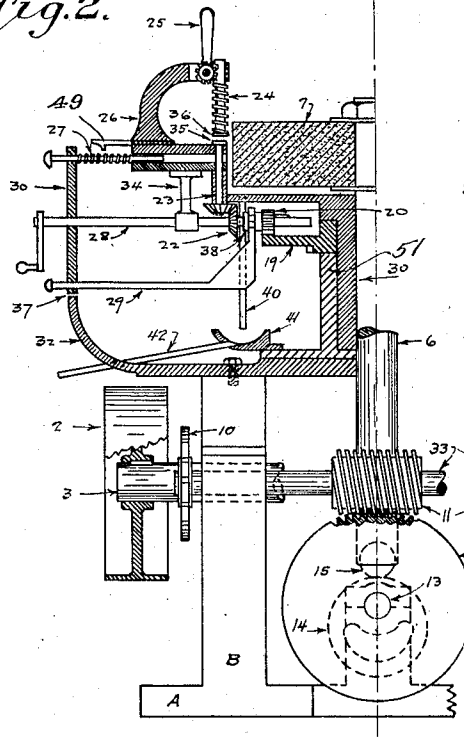
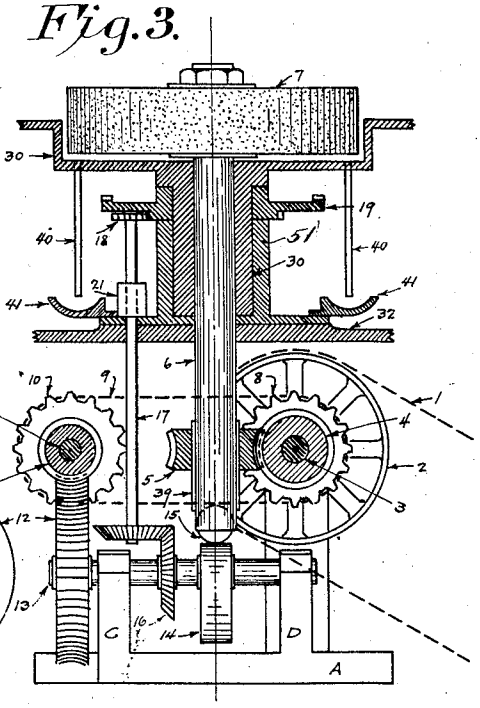


Fig. 3.



WITNESSES:- Guy A. Bryant

Simeon Leyland

INVENTORS:- John F. Ashton

Thomas N. Ashton

UNITED STATES PATENT OFFICE.

JOHN F. ASHTON, OF WORCESTER, AND THOMAS N. ASHTON, OF FALL RIVER, MASSACHUSETTS.

LENS-EDGE-GRINDING MACHINE.

1,378,831. Specification of Letters Patent. Patented May 24, 1921.

Application filed September 4, 1919. Serial No. 321,568.

To all whom it may concern:

Be it known that we, JOHN F. ASHTON, a citizen of the United States, residing at 147 June St., Worcester, in the county of Worcester and State of Masaschusetts, and THOMAS N. ASHTON, a citizen of the United States, residing at 547 Robeson St., Fall River, in the county of Bristol and State of Massachusetts, have invented a new and useful Lens-Edge-Grinding Machine, of which the following is a specification.

Our invention relates to improvements in lens-edge grinding machines in which a horizontally revolving grindstone operates in conjunction with a series of radially disposed lens-carriages; and the objects of our improvements are (1) to provide a means for grinding a variable number of lenses, of the same or different patterns, at one operation; (2) to provide for the hand-operation of individual lens-carriages, in addition to the operation by power, at any time during the grinding process; (3) to provide for the swinging of the lens-carriage table through a complete circle in order to bring any particular lens-carriage into any desired position in relation to the operator; (4) to provide for a vertical motion of the grindstone, during its revolutions, in order to maintain uniform wear on the grinding surface of the stone.

We attain these objects by the mechanism illustrated in the accompanying drawing, in which—

Figure 1 is a plan view of the lens-carriage table, showing one lens-carriage in position on one of the radial slots; Fig. 2 is a partial vertical-section, through the entire height of the machine, on the same plane and axis as is the lens-carriage shown; and Fig. 3 is a partial vertical-section, through the entire height of the machine, on a plane and axis at right angles to that of Fig. 2. Fig. 4 is a view of the means for locking table 30 against rotation. Similar numerals refer to similar parts throughout the several views. The base A and upright supports B, C, D, etc., are not shown in their entirety inasmuch as they need no complete description in relation to the mechanical working of the machine.

Belt 1 furnishes the motive power to revolve and drive pulley 2. Pulley 2 is keyed to, and in turn revolves, shaft 3. Shaft 3 carries sprocket 8 and spiral-gear 4. Spiral-gear 4 engages with gear 5 which is keyed to the grindstone shaft 6 by means of an elongated key 39. This elongated key 39 allows for the vertical movement of shaft 6. Grindstone 7 is secured to shaft 6 and revolves in a horizontal plane.

Sprocket 8 drives sprocket 10, which is keyed to shaft 33, by means of chain 9. Shaft 33 carries spiral-gear 11 which drives gear 12. Gear 12 is keyed to shaft 13 which carries bevel-gear 16 and cam 14. Upon cam 14 rides grindstone-shaft 6 by means of ball-bearing 15. The vertical throw from cam 14 insures an even wearing of the face of grindstone 7.

Bevel-gear 16 engages with its complementary beveled-gear and thus revolves shaft 17. Shaft 17 is supported by bearing 21 and carries gear 18 which engages with the lower teeth of the duplex crown-gear 19. The cylindrical stool 51 is secured to table base 32 and serves as a coaxial bearing for table-neck 30 and as a support for crown-gear 19. The upper teeth of crown-gear 19 engage with gear 20 which is keyed to shaft 28 by means of an elongated key. By pulling on the knob of rod 29, which rod rides free upon spool 38 attached to gear 20, gear 20 can be disengaged from crown-gear 19. Shaft 28 is supported by hanger 34 and carries bevel gear 22 which engages with its complementary bevel gear keyed to shaft 23. Shaft 28 provides a means for revolving bevel gear 22 and shaft 23 by hand when gear 20 is disengaged from crown-gear 19.

Shaft 23 carries friction-plate 35 upon which the lens-pattern rests. A similar friction-plate 36 is pivoted upon spring-pressed plunger 24 which acts as a compressive force to hold the friction plate 36 firmly against the top of the lens. Hand-lever 25 is supported upon lens-carriage 26 and operates to release the compression of plunger 24, thus allowing for the placing and removal of the lens. Lens-carriage 26 is forced forward into a proper position for lens-grinding by means of spring 27, and is supported upon carriage-table 30 and held and guided in one of the several radially disposed slots 31.

Carriage-table 30 is carried upon, and revolves around, shaft 6 and has a free bearing-joint 37 upon table-base 32.

A gage-dial 43, comprising a pointer 44, thumb-screw 45, guard 46 and rack and

gear 47, is attached to carriage-table 30 adjacent to each carriage 26 and slot 31. By operating thumbscrew 45, pointer 44 indicates the proper position for guard 46 to insure the proper finished diameter of the ground lens, guard 46 acting as a stop against the lens-pattern which rests upon friction-plate 35.

Drip-pipes 40 carry off water from under the grindstone 7, and drain into drip-pan 41. The water is then carried away from the entire machine through leader-pipe 42.

Lock-pin 48 locks the adjacent lugs 50 at joint 37, and thus prevents table 30 from rotating with either crown-gear 19 or any other part of the revolving mechanism, crown-gear 19 having a free bearing against the table-neck with which it is in contact, and table base 32 being bolted to the upright supports B, etc., of the machine.

Carriage 26 is held back from the grindstone 7, when not in use, by means of spring-catch 49 which is fastened to the carriage 26, on one end, the lug-end of the catch engaging with the edge of the table 30. Access-holes are provided for oiling.

Believing that our invention provides new facilities for multiple grinding of lens-edges, and having thus described our invention, we wish to secure by Letters Patent and claim as new:—

1. In a machine for grinding lens-edges, the combination of a horizontally arranged revoluble shaft; a cam for imparting a vertical movement therefrom; a vertically arranged grindstone shaft having a ball-bearing socketed at the lower end of said grindstone shaft and riding upon said cam; means for revolving said horizontal shaft; means for revolving said grindstone shaft; a stationary table-base coaxial with, and serving as a bearing for, said grindstone shaft and having a locking-lug secured to the peripheral surface; a rotatable work-table having a circular basin at the central portion, and having a plurality of radial slots arranged around said basin, and being coaxially arranged with, and serving as a bearing for, said grindstone shaft, and having a locking-lug secured to the peripheral surface adjacent to the lug on said table-base; means for locking said lugs; a plurality of lens-holding carriages slidably mounted in said work-table slots.

2. In a machine for grinding lens-edges, the combination of a vertically arranged grindstone shaft; means for revolving said grindstone shaft; a stationary table-base having a free bearing around said grindstone shaft, coaxial therewith, and having holes for drain-pipes; a supporting stool having a free bearing around said grindstone shaft, coaxial therewith, and secured to said table-base; a rotatable work-table having a circular basin adjacent to, around and under, said grindstone, said basin having a plurality of holes for drip-pipes, and said work-table having a cylindrical bearing-neck coaxial with said vertically arranged grindstone shaft, and said work-table having a plurality of radially disposed slots; lens-holding carriages slidably mounted in said slots in the work-table.

3. In a machine for grinding lens-edges, the combination of a horizontally arranged revoluble shaft; a vertically arranged revoluble shaft operated from said horizontal shaft, a gear secured to the upper end of said vertical shaft; a horizontally disposed grindstone, a vertical shaft therefor; a horizontally arranged duplex crown-gear surrounding said grindstone shaft and revoluble from said gear at the upper end of said vertical shaft; a plurality of horizontally arranged radial shafts, gears loosely splined on said radially arranged shafts and meshing with said crown-gear; means for disengaging each of said radial-shaft gears from said crown-gear; a plurality of lens-holding carriages, each having means for clamping and rotating lenses and being driven from one of said radial shafts; a rotatable work-table on which said lens-holding carriages are slidably mounted and radially arranged about said grindstone.

4. In a machine for grinding lens-edges, the combination of a horizontally revoluble grindstone supported on a vertically arranged shaft; a coaxially disposed table-base; a coaxially disposed supporting stool; a coaxially disposed drip-pan secured to said stool; a coaxially disposed rotatable work-table having a basin at the central portion and having a plurality of drip-pipes secured to said basin, and having a plurality of radial slots; a plurality of radially arranged lens-carriage bodies supported and guided in the radial work-table slots; a plurality of compression springs arranged so that one spring presses each carriage-body toward said grindstone; an adjustable stop mounted on the work-table adjacent each carriage and adapted to limit movement of the carriage toward the grindstone.

5. In a machine for grinding lens-edges, the combination of a horizontally revoluble grindstone supported on a vertically arranged shaft; a coaxially disposed table-base; a coaxially disposed rotatable work-table having a basin at the central portion and a plurality of radial slots around said basin; a plurality of lens-holding carriages slidably mounted in said slots in work-table; each carriage having a vertically arranged revoluble lens-spindle carrying a lens-friction plate secured to the upper end, and having a spring-pressed plunger vertically alined with said lens-spindle and carrying a revoluble lens-friction-plate pivoted at the lower end of said plunger; means for re-

volving said lens-spindle; means for raising said plunger.

6. In a machine for grinding lens-edges, the combination of a revoluble grindstone; a work-table slotted plurally and radially around said grindstone and coaxial therewith; a plurality of carriages slidably mounted in said radial slots in said work-table; means for adjustably limiting movement of each carriage toward said grindstone; a plurality of work-holding revoluble shafts in said carriages; manually operable means for independently revolving each of said work-holding shafts; common power-driven means for revolving all of said work-holding shafts; means for engaging each of said means, for independently revolving said work-holding shafts, with said common power-driven means.

JOHN F. ASHTON.
THOMAS N. ASHTON.