No. 787,405. PATENTED APR. 18, 1905.

E. C. SCHRADER.

GRINDING AND POLISHING MACHINE.

APPLICATION FILED NOV. 14, 1903.

2 SHEETS—SHEET 1.

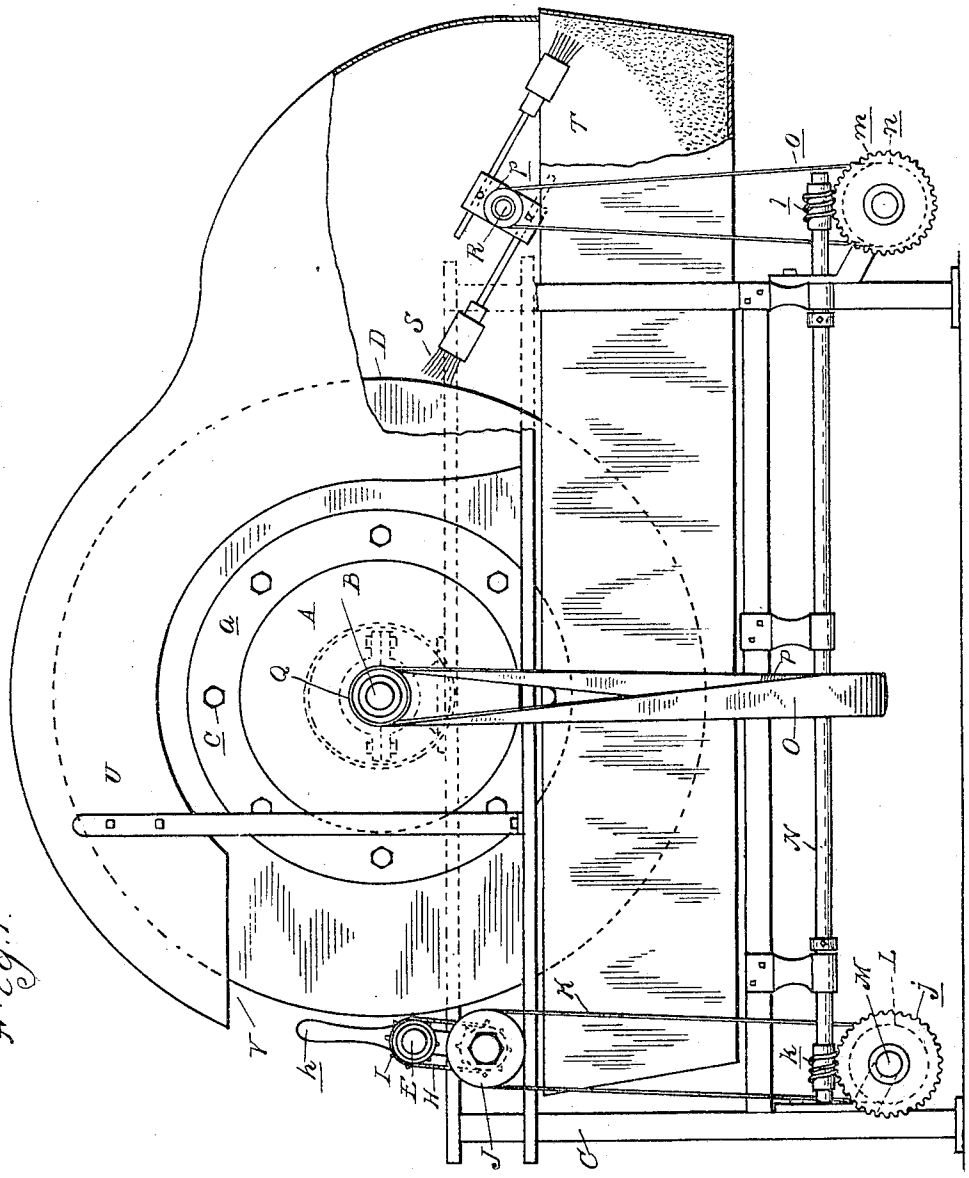


Fig. 1.

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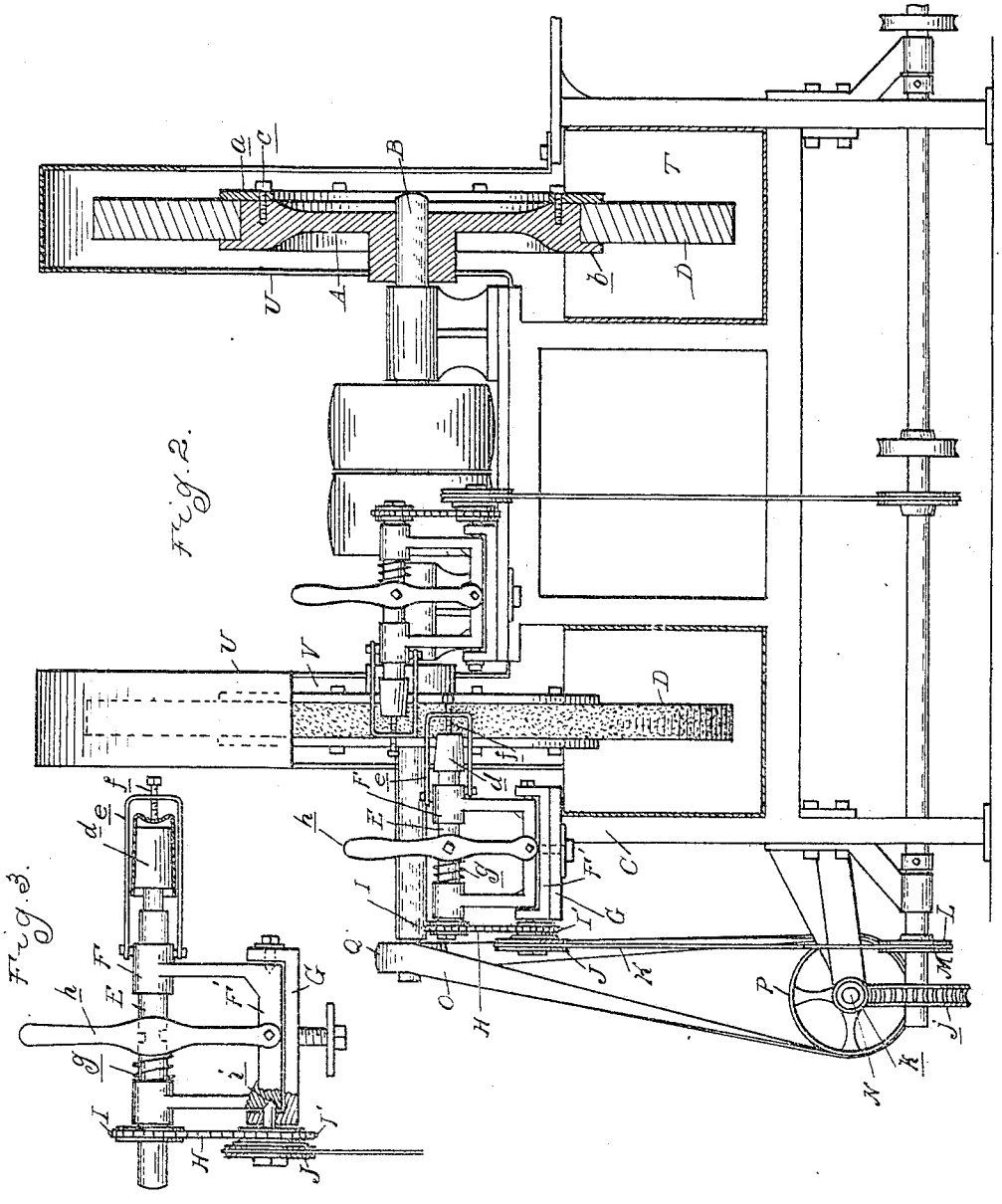


Fig. 2.

Fig. 3.

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UNITED STATES PATENT OFFICE.

ERNEST C. SCHRADER, OF PITTSBURG, PENNSYLVANIA.

GRINDING AND POLISHING MACHINE.

SPECIFICATION forming part of Letters Patent No. 787,405, dated April 18, 1905.

Application filed November 14, 1903. Serial No. 181,175.

To all whom it may concern:

Be it known that I, ERNEST C. SCHRADER, a citizen of the United States, residing at Knoxville, Pittsburg, in the county of Allegheny and State of Pennsylvania, have invented certain new and useful Improvements in Grinding and Polishing Machines, of which the following is a specification, reference being had therein to the accompanying drawings.

The invention relates to machines employed for polishing articles of glassware; and the invention consists in certain features of construction, as hereinafter set forth.

In the drawings, Figure 1 is a sectional side elevation of the machine. Fig. 2 is a front elevation thereof, and Fig. 3 is an elevation of one of the revoluble work-holders detached.

One of the features of the invention is the construction of the polishing-wheel. This comprises a rotary head A, mounted upon a suitable arbor, such as B, and supported in bearings on a frame, such as C. The head A is provided with a peripheral extension formed of a soft and somewhat resilient material adapted to form the grinding-surface upon which the abrasive or polishing material may be placed. I have found that cork formed a suitable material for this purpose, its lightness, toughness, and resiliency all being favorable to its alteration.

As shown in the drawings, D is an annular disk, of cork, which surrounds the periphery of the head A and is clamped thereto, preferably by a clamping-plate *a*, which presses the cork against the clamping-flange *b*. The plate *a* is secured to the head by screws *c*.

The polishing of the work is performed, preferably, on the periphery of the disk D. To this end rotary work-holders are provided, preferably of the following construction: E is a rotary arbor or spindle journaled in bearings F and provided at one end with a holding-head *d*, on which the work is placed. *e* is a bail or strap pivotally secured to the bearings F and extending around the work on the holder *d*. *f* is a set-screw engaging with the end of the bail and adapted to bear centrally upon the work to hold the latter upon the head *d*. *g* is a spring sleeved upon the spindle and adapted to yieldingly press the same longitudinally, so as to hold the work on the head *d* against the set-screw *f*. *h* is a handle embracing the spindle and engaging with a grooved bearing therein, said handle being adapted to retract the spindle against the tension of the spring *g* for inserting or removing the work from the head *d*. The bearings F are secured to a rock-frame F', and the latter is pivotally secured at *i* to a frame or bearing G, adjustably secured to the main frame C.

H is a drive belt or chain which passes over pulleys or sprockets I and I' on the spindle E and the pivot *i*.

J is a pulley connected to the sprocket I' and driven by a belt K, which passes over a pulley L on a shaft M. This shaft is driven by suitable means, such as a worm-wheel *j* and worm *k*. The shaft N is preferably driven from the arbor B through the medium of a belt O, passing over the pulleys P and Q, respectively, on the shaft N and arbor B.

I preferably provide automatic means for drawing the abrasive material on the periphery of the grinding-disk D. As shown, this comprises a rotary shaft R, which carries one or more brushes S. These brushes are passed in the rotation of the shaft R through a receptacle, such as the trough T, which contains the abrasive material, and in the rotation of said brush the material is thrown into contact with the periphery of the revolving disk D. The shaft R is also driven by the shaft N by means of the worm *l*, meshing with the worm-gearing *m*, which drive the pulley *n*, connected by the belt *o* with the pulley *p* on the shaft R.

To prevent the scattering of the abrasive material about the centrifugal connection during the rotation of the disk D, the grinder is preferably incased by a surrounding shield U, which is cut away at B for the insertion of the work. This shield U, together with the trough-shaped receptacle T, surrounds the periphery of the grinder with the exception of a small portion where the work is being operated upon.

The machine being constructed as shown and described the operation is as follows: Motion is first communicated to the arbor B through the medium of a drive-pulley W

thereon. This will cause the rotation of the grinder, and at the same time the shafts N and M are driven through the medium of the connections described. These shafts, as has been described, respectively, drive the rotary brushes S and revolve the spindle E, which supports the work-holder. The operator first places the article to be polished upon the head *d* of the spindle E and then secures it in this position by turning the bail *e*, so that the set-screw *f* will bear againstthe end of the work at its center of rotation. By reason of the constant operation of the brushes S the periphery of the grinding-disk will be coated with the abrasive material, so that the work when pressed against the disk will be ground or polished while it is constantly revolved on the spindle E.

If desired, the machine may be provided with more than one work-holder, so that a number of articles may be simultaneously operated upon by the grinder. As shown, a second work-holder is arranged on the frame with the axis of its spindle arranged slightly above the spindle of the other holder, so as not to interfere therewith. A plurality of grinder-disks may also be secured to the same arbor, and, as shown, the machine is provided with two of said disks.

It will be understood that the rock-frame F′ permits of rocking the work toward or from the periphery of the grinder-wheel to throw it in or out of operative relation thereto.

What I claim as my invention is—

1. In a polishing-machine of the character described, the combination with a grinding-wheel, of a work-holder in operative relation thereto, means for depositing abrasion material on said wheel at a point spaced from said operative position of the work-holder, and connecting means for automatically imparting simultaneous movement to said wheel, holder and depositing means.

2. In a machine of the character described, the combination with a polishing member, of means for holding the work in operative relation thereto, including a rotary arbor, adapted to support the work at one end thereof, and a bail extending around said work-supporting end and secured at its respective ends to one of said bearings, and means on said bail for retaining the work against said end.

3. In a machine of the character described, the combination with a polishing member, of means for holding the work in operative relation thereto, including a rotary arbor, adapted to support the work at one end thereof, and a bail extending around said work-supporting end and pivotally secured at its respective ends to one of said bearings, and means on said bail for retaining the work against said end.

4. In a machine of the character described, the combination with a polishing member, of means for holding the work in operative relation thereto, including a rotary arbor adapted to support the work at one end thereof, and a bail extending around said work-supporting end and secured at its respective ends to one of said bearings, and adjustable means on said bail for retaining the work against said end.

5. In a machine of the character described, the combination with a polishing member, means for holding the work in operative relation thereto, including a longitudinally-movable rotary arbor, bearings for the arbor, a bail secured to one of said bearings and extending around one end of the arbor, and resilient means on said arbor intermediate said bearings for normally retaining said arbor in adjacence to the end of said bail.

In testimony whereof I affix my signature in presence of two witnesses.

ERNEST C. SCHRADER.

Witnesses:
A. BEYER,
B. L. SUCCOP.