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D. TAYLOR

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MACHINE FOR POLISHING OR GRINDING LENSES AND OTHER OBJECTS

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Fig. 1.

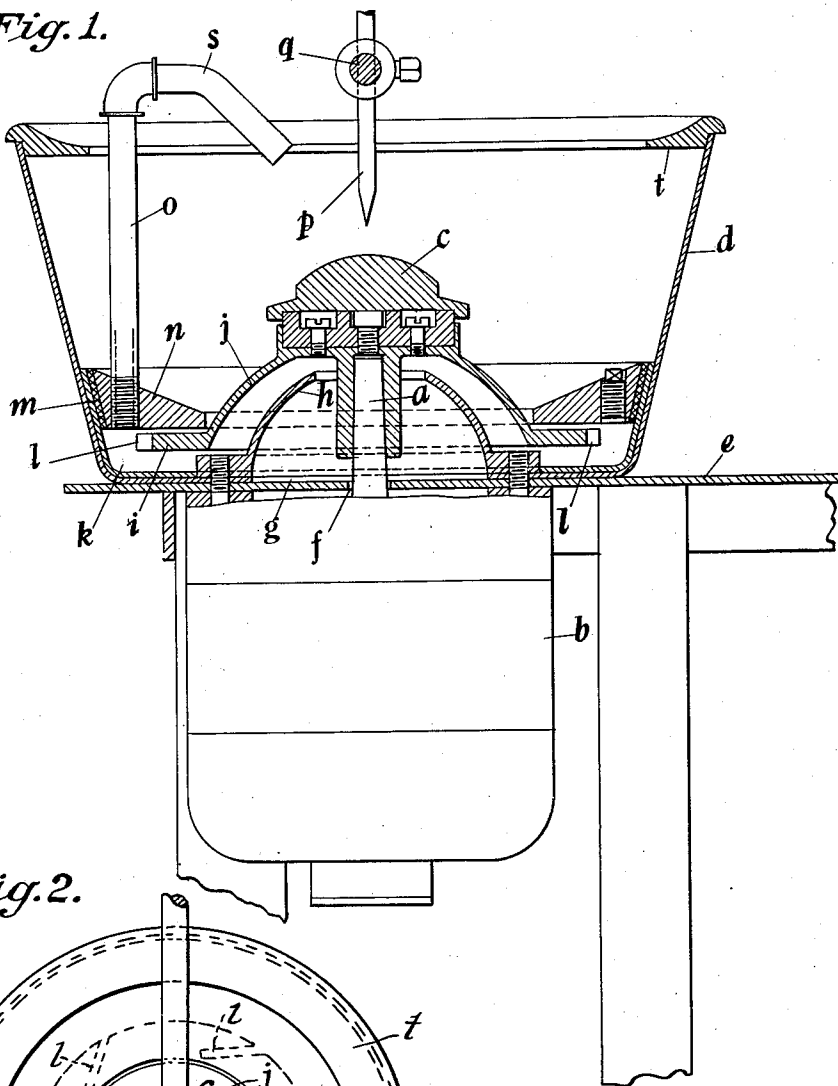
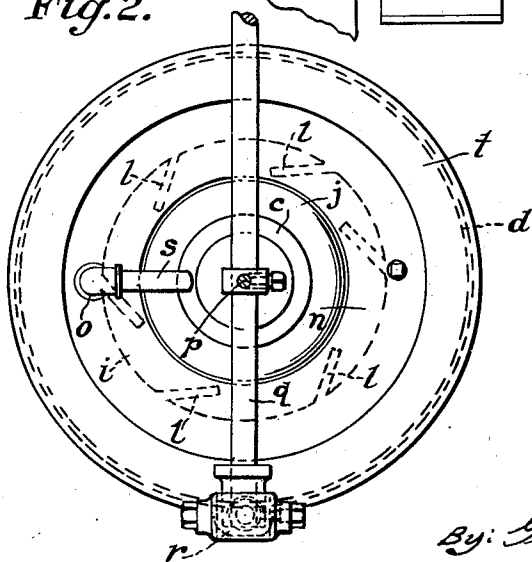


Fig. 2.



Inventor,
D. Taylor

By: Glascock Downing & Seabold
Attorneys

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MACHINE FOR POLISHING OR GRINDING
LENSES AND OTHER OBJECTS

Douglas Taylor, Ladywood, Birmingham, England

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In Great Britain November 15, 1938

4 Claims. (Cl. 51—263)

This invention relates to machines for polishing or grinding lenses and other objects, and has for its purpose to provide an improved machine adapted to maintain automatically in a simple and convenient manner a flow of fluid over the work-piece and grinding or polishing tool.

The invention comprises the combination of a vertical or substantially vertical rotary spindle adapted to carry the lap or other tool at its upper end, a pan surrounding the upper end of the spindle, a shallow chamber for fluid in the bottom and open to the interior of the pan, a centrifugal impeller on the spindle and having its peripheral portion situated in the said chamber and a pipe adapted to convey liquid from the chamber to the tool and work-piece.

In the accompanying sheet of explanatory drawings, Figure 1 is a sectional elevation and Figure 2 a plan of a machine constructed in accordance with the invention for use in the grinding or polishing of lenses, or for performing analogous operations on other objects.

In carrying the invention into effect as shown, I employ a vertical or substantially vertical spindle *a*. This may be the spindle of an electric motor *b*. Alternatively the spindle may be driven by an electric motor connected to its lower end, or by any other convenient means.

The upper end of the spindle *a* is adapted for the attachment to it of a lap or other like tool *c*, and is surrounded by a pan *d* in which the tool *c* is situated. The pan *d* may be carried on a table or other support *e* to the underside of which the motor *b* is secured, the support being provided with a hole *f* through which the spindle *a* passes. Also a hole *g* is provided in the bottom of the pan *d* to allow the upper end portion of the spindle *a* to pass through it. This hole *g* is surrounded by a hemispherical or like baffle *h* which is open at both ends and which extends sufficiently above the bottom of the pan *d* to prevent escape from the pan of the liquid contained in the lower part of the pan, this liquid usually consisting of water charged with a powdered abrasive or other material required in the polishing or grinding operation.

On the upper end of the spindle *a* and at a position immediately beneath the tool *b* is secured a centrifugal impeller. This is in the form of a disc *i* having a centrally arranged hemispherical or like hollow boss *j*, extending from the upper side of the disc, the latter being formed with slots *l* which extend in inclined directions from the periphery of the disc to positions near

the boss *j*. The boss *j* surrounds the baffle *h* above mentioned, and the disc *i* lies in a shallow chamber *k* formed by the bottom of the pan *d* or a liner *m* in the bottom of the pan, and a ring or annular shoulder *n* extending inwardly from the wall of the pan. This ring or shoulder *n* is secured in any convenient manner to, or formed integrally with the pan *d*, and its upper surface is sloped downwardly so that any liquid falling on it can drain into the chamber *k* at a position adjacent to the impeller boss *j*.

The impeller disc *i*, which lies in the chamber *k* between the shoulder *n* and the pan bottom or liner *m*, is separated from the adjacent surfaces of those parts by clearance spaces. When the machine is in use the impeller disc *i* is immersed in the liquid in the chamber *k*, and drives the liquid towards a narrow space in the chamber surrounding the outer edge of the impeller disc. From this region the liquid is supplied under the action of the impeller to the tool *c* and work piece (not shown) through a pipe *o* the work piece being held in position by an adjustable arm *p* on a horizontal spindle *q* which is pivotally supported by a bearing *r* on one side of the upper edge of the pan *d*. Preferably the pipe *o* extends upwardly from a hole in one side of the shoulder *n* above mentioned and lies wholly or mainly within the pan *d*, its upper end being provided with a downwardly directed spout or nozzle *s* through which the liquid is delivered on to the tool *c* and work piece. The liquid delivered by the spout or nozzle *s* returns to the chamber *k* through the gap between the inner edge of the shoulder *n* and the exterior of the impeller boss *j*. For most purposes it is sufficient to provide the impeller disc *i* with flat upper and lower surfaces, but if desired the centrifugal action of the impeller may be augmented by providing spiral or like grooves or shallow vanes on one or each side of the impeller disc.

To minimize loss of liquid by splashing from the inner surface of the pan *d* the upper edge of the latter may be formed or provided with an inwardly extending lip or flange *t*.

By this invention I am able to maintain automatically the required flow of liquid to the tool and work piece while the machine is in action in a very simple and satisfactory manner. Moreover the machine is of a very convenient form and well adapted to facilitate the grinding or polishing of lenses and other objects.

The invention is not limited to the particular example above described as subordinate construc-

tional details may be varied to suit different requirements.

Having thus described my invention what I claim as new and desire to secure by Letters

5 Patent is:

10 1. A machine for polishing or grinding lenses and other objects, comprising the combination of a vertical or substantially vertical rotary spindle adapted to carry the tool at its upper end, a stationary pan surrounding the upper end of the spindle, a shallow chamber for fluid in the bottom and open to the interior of the pan, a centrifugal impeller on the spindle and having its peripheral portion situated in the said chamber, and a pipe through which liquid from the chamber can be supplied under the action of the impeller to the tool and work-piece.

2. A machine as claimed in claim 1, in which

the impeller is secured to the upper end of the spindle at a position beneath that of the tool, and comprises a disc having a hollow boss extending from its upper side, the disc being situated in the shallow chamber in the bottom of the pan.

3. A machine as claimed in claim 1, in which the shallow chamber in the bottom of the pan is formed in part by an annular member extending inwardly from the wall of the pan, the upper surface of the said member being sloped downwardly for the purpose described.

4. A machine as claimed in claim 1 and having a baffle which surrounds a hole formed in the bottom of the pan for enabling the spindle to pass through it, the baffle being adapted to prevent escape of liquid from the bottom of the pan.

DOUGLAS TAYLOR.