Jan. 10, 1933. A. E. MAYNARD 1,893,955

SURFACING MACHINE

Filed April 27, 1931 2 Sheets-Sheet 1

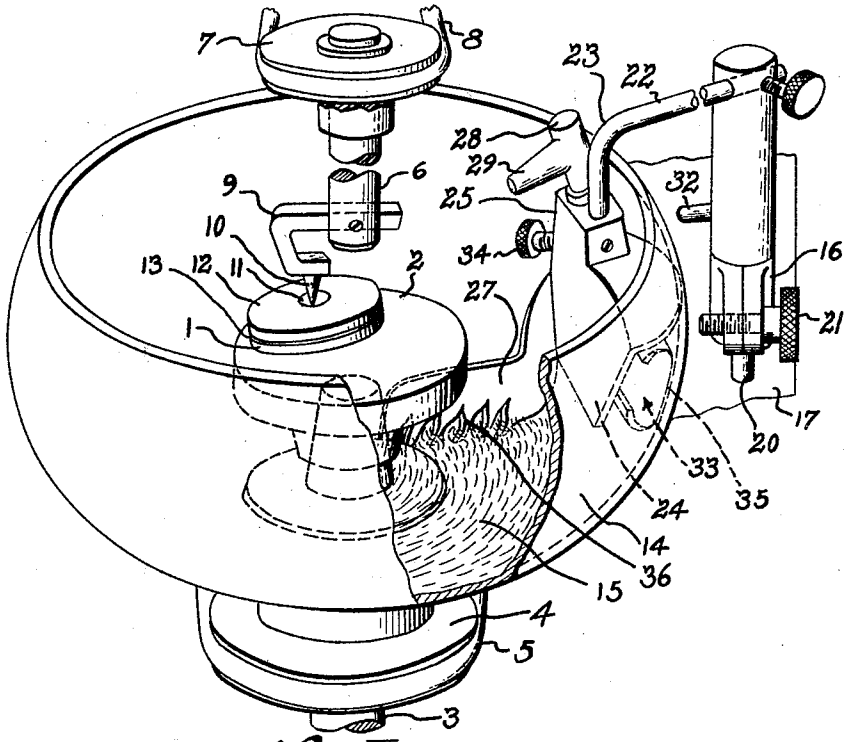


Fig. I.

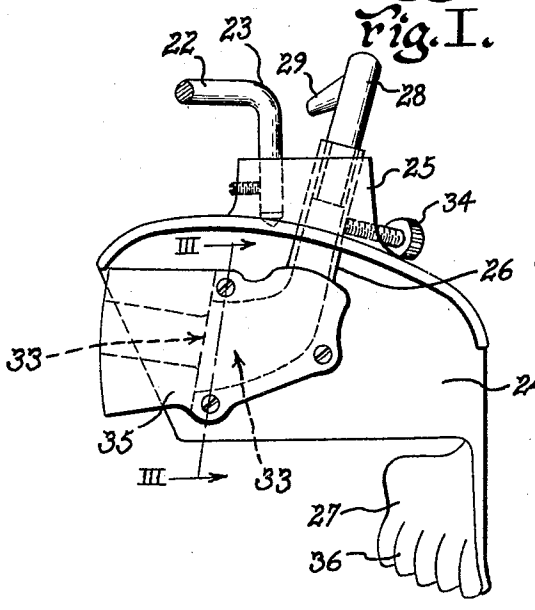


Fig. II.

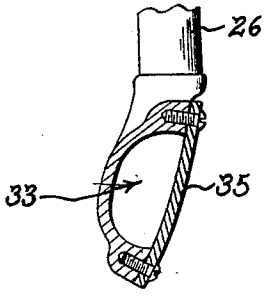


Fig. III.

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SURFACING MACHINE

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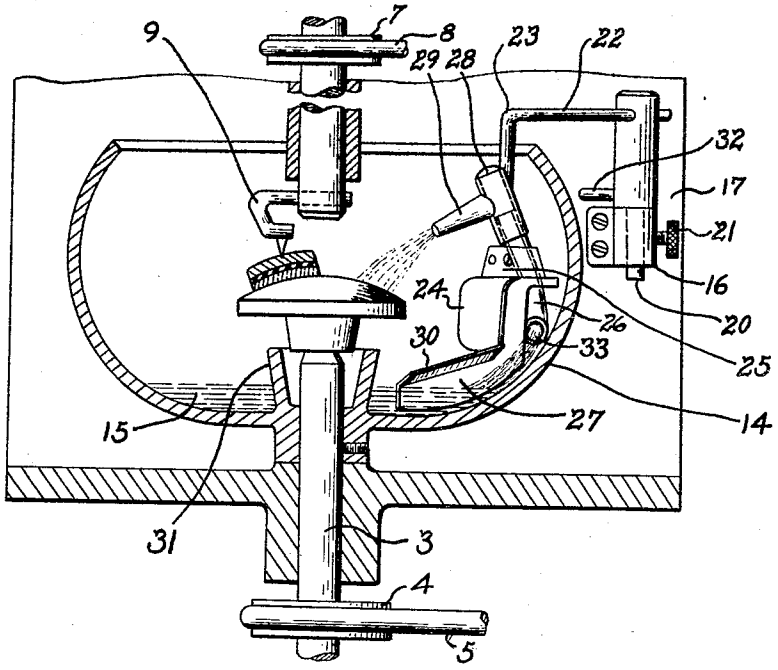


Fig. IV.

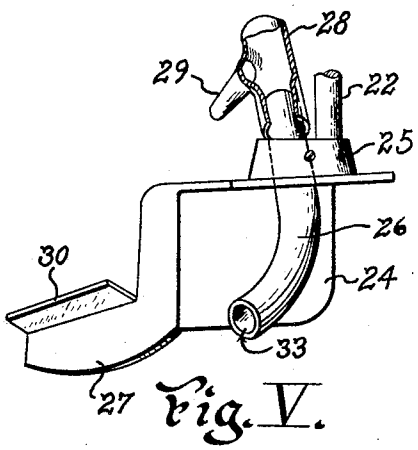


Fig. V.

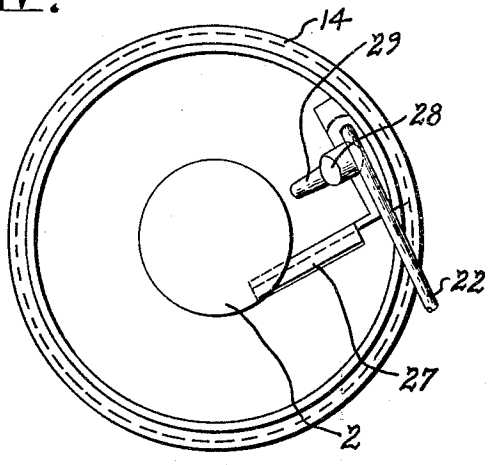


Fig. VI.

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UNITED STATES PATENT OFFICE

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SURFACING MACHINE

Application filed April 27, 1931. Serial No. 533,195.

This invention relates to surfacing machines and has particular reference to improved means for supplying liquid abradant to the surfacing portions thereof.

This application is a continuation in part of my co-pending application Serial No. 343,889, filed March 2, 1929.

A principal object of the invention is to provide improved means of supplying liquid abradant to a surfacing tool in regulated quantities.

Another object is to provide means for maintaining the abradant in liquid form and of the correct consistency.

Another object of the invention is to provide positive means for delivering the abradant in any desired quantity.

Another object is to provide improved means for directing the flow of abradant to desired points on the surfacing tool.

Another object is to provide means whereby surfacing tools of varying diameters may be equally efficiently and amply supplied with liquid abradant.

Another object of the invention is to provide means for breaking up the solid ingredients of the abrasive which settle and harden on the bottom of the abrasive bowl when the machine is not in use for a relatively long period of time, as for instance between working hours or during the night.

Another object is to provide an interchangeable abrasive scoop plate which may be removed and replaced when it becomes worn.

Another object is to provide a combined abrasive scoop member and an abrasive breakup member each of which may be adjusted independently of each other to meet varying requirements during their use.

Other objects and advantages will become apparent from the following description taken in connection with the accompanying drawings and it will be apparent that many changes may be made in the details of construction and arrangement of parts without departing from the spirit of the invention as expressed in the accompanying claims. I, therefore, do not wish to be limited to the exact details shown by way of illustration.

In the drawings:

Fig. I is a perspective view showing the device embodying the invention applied to a surfacing machine and showing a portion of the abrasive bowl broken away and in cross section;

Fig. II is a rear elevation of the abrasive feed means showing it separated from the surfacing machine;

Fig. III is a cross section taken on line III—III of Fig. II;

Fig. IV is a partial longitudinal cross section showing a modified form of the invention applied to the surfacing machine;

Fig. V is a perspective view of the modified form of the invention showing it separated from the surfacing machine; and

Fig. VI is a top or plan view of Fig. IV.

This invention is directed towards the elimination of the drawbacks and bad features which have hitherto been associated with the abradant supplying means for ophthalmic lens surfacing tools. For certain kinds of abrading it is necessary to supply more abrasive to the tool than for other kinds. In my invention I have supplied means to produce a better finished article by using the correct amount for each kind of abrading. For heavy abrading it is necessary to supply plenty of abradant at a fast rate and both of these requirements can be accomplished readily by my novel and effective device. For light abrading a thin trickle of abradant is usually all that is required and this condition is quickly arranged by means of my invention.

Another improvement is directed towards the consistency of the abradant itself. The majority of abradants, such as emery or rouge, have a tendency to settle in the bottom of the bowl and form a caked mass with the liquid floating on the top. It is obvious that abrading is spoiled when this occurs and in my invention I have taken steps to eliminate this drawback by extending a mixer member in the abrasive so that during the operation of the machine the abrasive is kept at the

correct consistency and readily flows onto the abrading tool.

Any suitable type of mixer member may be employed with the so called light abrasives, but when a relatively heavy abrasive is used care must be taken that the caked mass formed about the mixer member is well broken up prior to starting the machine, or, as has happened in many instances in the past, the said caked mass will cause the parts to buckle or break when power is applied. This undesired feature is overcome in the present instance by the provision of plow means which, when the bowl is rotated, functions automatically to break up the caked mass and mix it with the liquid. The plow means also acts as a mixer member to keep the abrasive at the desired consistency during the use of the machine.

It is also apparent that a single bowl and feed mechanism could be used with various sizes of tools providing the position and direction of the feed flow could be regulated. This novel feature is embodied in my invention and an economical arrangement of various tools to a single bowl can be readily foreseen.

These features and others of like nature, e. g., economical, efficient and novel, will be apparent from reference to the drawings wherein similar reference numerals denote corresponding parts throughout.

The work 1 which in the present instance is an ophthalmic lens is mounted for rotation over a surfacing tool 2. The surfacing tool 2 is carried by the spindle 3 which is rotated by the pulley 4 and belt 5. The work 1 is rotated or carried over the tool 2 by means of the spindle 6 rotated by the pulley 7 and the belt 8. An offset crank arm or pin 9 is carried by the spindle 6. A locating pin 10 in the crank arm 9 loosely fits into a recess 11 in the workholder 12. The workholder 12 is preferably secured to the work 1 by means of cement or a layer of pitch 13. It will be apparent that the crank 9 being offset from the spindle 6 will tend to carry the work 1 around a circular path on the tool 2, the center of the circle being the axis of the spindle 6. The pin 10 fitting loosely into the recess 11 allows the work 1 to adjust itself to the surface of the tool 2. Surrounding the tool 2 is a pan or bowl 14 which is secured to the shaft 3 and rotates therewith. In this bowl is a supply of fluid abradant 15 such as emery or rouge in water. The means of supplying the tool 2 with abradant is positioned to one side of the bowl and specifically consists as shown in Fig. I of a bracket 16 which is attached to the framework 17 carrying the spindles 3 and 6.

A bracket rod 20 movable up and down and rotatable in the bracket 16 is locked in position by a screw 21. The bracket rod 20 has at its upper end a rod 22 which is fixedly attached thereto and bent at 23 downwardly into the bowl 14. At the lower end of this rod 22 is an apron 24 having a boss 25 into which the rod 22 projects and is fixedly attached.

The apron 24 is so positioned that splashes of abradant will be prevented from reaching the underside of the surfacing tool 2 and penetrating to the spindle 3. If desired, as shown in Fig. IV, a flange 31 extending from the inside of the bowl 14 and having sufficient height above the level of the abradant to prevent it from reaching the spindle 3 may be provided.

The boss 25 as shown in Fig. I is also adapted to adjustably support a tubular member 26 which projects downwardly in the form of an open mouth portion 33 towards the abradant 15. The tube is locked in adjusted position in the boss 25 by a thumb screw 34. One of the side walls 35 of the open mouth portion 33 is interchangeable so that it may be renewed when it becomes worn. This portion of the device is constantly in close proximity with the side wall of the abrasive pan or bowl 14 during the operation of the machine and is the only portion which is subject to wear. The adjustability of the tube 26 is to provide means whereby the side wall 35 may be placed in desired relation with the side wall of the abrasive pan or bowl 14.

A projecting flange 27 having a toothed portion 36 thereon is attached to the apron 24 and serves as a combined plow and mixer member to break up and keep the abrasive 15 in a state of desired consistency during the surfacing operation by projecting into it at all times and being held against the movement thereof.

The flange 27 as shown in Fig. IV is for use with light abrasives and is not provided with the toothed portion 36. In this instance a smaller mouthed portion 33 is employed.

On the flange 27 as shown in Fig. IV is a lip 30 positioned at an angle calculated to prevent the abrasive stirred up by the mixer from reaching the tool 2 without passing up the tubular member 26.

At the upper end of the tubular member 26 is a cap 28 rotatable thereon and having a spout 29 allowing the abrasive 15 to escape. It will readily be seen that rotation of the bowl 14 will cause the abradant 15 to be whirled around and have a tendency to be flung upwards by the action of centrifugal force.

In the operation of the device the tool and bowl are rotated by the spindle 3. The abradant 15 is thereupon whirled around the inside of the bowl 14. The abradant at the edge of the bowl 14 will obviously be travelling at a greater speed than that at the center and this has been adapted to one of the objects of the invention. When a large

amount of abrasive is needed to be quickly delivered the screw 34 is operated to loosen the tubular member or spout 26 to allow it to turn and move the side wall 35 of the mouth portion 33 close to the inner surface of the bowl as shown in Fig. I. This can also be accomplished by loosening and adjusting the bracket rod 20. The stop 32 is so adjusted that when the mouth portion 33 is in close relation but not touching the inner surface of the bowl 14 it will butt against the back support and so prevent rubbing of the mouth portion 33 against the bowl 14. This is only true when the parts are in normal relation with each other. When a thin trickle only is required the side wall 35 of the mouth portion 33 may be positioned further away from the side wall of the bowl 14 and thus take advantage of the slower movement of the abrasive at this point or may be positioned where it will scoop up less abrasive. When the necessary position has been found the screw 21 or 34 can be tightened onto the bracket rod 20 or tube 26 thus locking them in position. The fluid abrasive travels up the mouth portion and tube member 26 and is emitted through the downwardly projecting tube 29 onto the tool 2.

The cap member 28 is rotatable upon the tubular member 26 and when different size tools are to be used all that is necessary to direct the flow of abradant is to rotate the cap member 28 on the tube. The cap member 28 is also movable up and down on the tubular member thus allowing the abradant to be directed either far over the tool or directly at the nearest edge. The cap can also be removed for cleaning purposes by pulling it all the way off the tube and this feature is novel over the prior art machines which soon clogged up owing to lack of accessibility for cleaning purposes.

It is quite apparent that the side portion 35 of the device shown in Figs. I, II and III can be adjusted to desired relationship with the side wall of the abrasive pan or bowl 14 without changing the relationship between the mixer 27 and the bottom of the pan or bowl 14. This is accomplished by loosening the thumb screw 34 and moving the mouth portion 33 towards and away from the side wall of the abrasive pan or bowl 14. This provides means whereby the amount of abrasive which is emitted from the tube 29 may be varied without disturbing the adjustment of the mixer 27. Both the mixer 27 and mouth portion 33 must be in accurate relation with the bowl 14 to produce the desired results.

The mixer 27 must be located in a position where it will intercept the moving abradent so that the liquid and solid ingredients thereof will be held to the desired consistency during the use of the machine.

The mouth portion 33, as shown in Figures I and II, is positioned on the side of the apron 24 opposite the mixer 27 and is definitely located above the normal level of the abrasive. During the operation of the machine the mouth portion 33 is adapted to scoop up only that portion of the abrasive which, through the action of centrifugal force, is flung upwards of the inner wall of the pan or bowl 14, into the path of said mouth portion. With this arrangement the abrasive is thoroughly mixed prior to its being scooped up and thereby obviates the possibility of scooping up that portion of the abrasive which settles and forms a caked mass in the bottom of the pan or bowl 14 when the machine is not in use, as has been previously described. This eliminates the possibility of clogging the spout 29 as has been usual in most prior art abrasive feed devices, particularly when a heavy abrasive was employed. The reason for this clogging, in most instances in the past, was because of the fact that the scoop member was positioned directly in the main abrasive supply and, when the machine was started, it scooped up the caked mass and could not force it through the spout. Applicant has carefully avoided this by placing the mouth or scoop portion above the abrasive and thence forcing the abrasive upwardly into the path of said mouth or scoop portion. It is apparent with this arrangement, that if the abrasive was not thoroughly mixed when the machine was started no harm would be done as only the liquid portion of the abrasive would move upwardly in the path of the scoop. A few turns of the bowl or pan causes the mixer 27 to break up the solid ingredients and cause them to be forced upwardly with the liquid, in which position abrasive of the desired consistency will be scooped up and directed to the abrading tool.

From the foregong it will be seen that I have provided extremely simple, inexpensive and efficient means for carrying out the objects of this invention and particularly for regulating the amount and force of the flow of liquid abradant to a surfacing tool and for breaking up and mixing the abrasive to the desired consistency.

Having described my invention I claim:

1. An attachment for use in abrading comprising a support, a shield member on the support, a projection on the shield having a toothed edge thereon and a scoop member on said shield on the side opposite the projection, said scoop member having an open mouth portion adjacent one end thereof and a spout adjacent its opposite end.

2. An attachment for use in abrading comprising a support having a depending shield thereon, a blade projection on the shield, said blade projection having a toothed edge, a scoop member having an open mouth portion adjacent one end thereof adjustably supported in spaced relation with the shield on

the side opposite the blade projection and means for securing the scoop member in desired relation with the shield.

3. An attachment for use in abrading comprising a support, a shield member on the support, a projection on the shield lying in a plane substantially normal to the plane of the shield and having a toothed edge thereon, and a scoop member on said shield on the side opposite the projection, said scoop member having an open mouth portion adjacent one end thereof supported in spaced relation with the shield and having a spout member adjacent its opposite end.

4. For use in combination with a rotatable bowl containing a fluid abrasive, a support having a shield member thereon, a projection on the shield normally extending into the abrasive and a scoop member adjacent the shield on the side opposite the projection, said scoop member being positioned above the normal level of the abrasive and adapted to scoop up that portion of the abrasive which, through the action of centrifugal force, is flung upwardly of the wall of the bowl and into the path of said scoop.

5. For use in combination with a rotatable bowl containing a fluid abrasive, a support having a shield member thereon, a blade projection on the shield having a toothed edge normally extending into the abrasive and a scoop member adjacent the shield on the side opposite the blade projection, said scoop member being adapted to be positioned above the normal level of the abrasive and adapted to scoop up that portion of the abrasive which, through the action of centrifugal force, is flung upwardly of the wall of the bowl and into the path of said scoop.

6. For use in combination with a rotatable bowl containing a fluid abrasive, a shield member having a blade projection thereon normally extending into the abrasive, a scoop member having an open mouth portion adjacent one end thereof adjustably supported in spaced relation with the shield and on the side opposite the blade projection, said scoop member being adapted to be positioned above the normal level of the abrasive and adjacent the wall of the bowl and adapted to scoop up that portion of the abrasive which, through the action of centrifugal force, is flung upwardly of said wall and into the path of said mouth portion.

7. In combination with a rotatable bowl containing a fluid abrasive, a shield member having a toothed projection thereon normally extending into the abrasive and a scoop member on the shield on the side opposite the projection and having an open mouth portion adjacent one end thereof adjustably supported relative to the inner wall of the bowl and positioned above the normal level of the abrasive, said scoop member being adapted to scoop up that portion of the abrasive which, through the action of centrifugal force, is flung upwardly of said inner wall and into the path of said open mouth portion.

8. In combination with a rotatable bowl containing a fluid abrasive, a support having a toothed projection thereon normally extending into the abrasive and a scoop member on the support having a mouth portion adjacent one end thereof adjustably supported relative to the inner wall of the bowl and positioned above the normal level of the abrasive and an adjustable spout member on the scoop member adjacent its end opposite the mouth portion.

9. In combination with a rotatable bowl containing a fluid abrasive, a support adjacent the bowl and a blade projection on said support extending internally of the bowl and adapted to be positioned adjacent the bottom thereof, said blade projection having a toothed edge normally extending into the abrasive and held against the movement thereof and being adapted to break up hard deposits of said abrasive on the bottom of the bowl.

10. In combination with a rotatable bowl containing a fluid abrasive, a support adjacent the bowl, a blade projection on said support having a toothed edge thereon extending into the abrasive and held against the movement thereof and a channeled member on said support for scooping up the abrasive and directing it to any point desired.

11. In combination with a rotatable bowl containing a fluid abrasive, a support adjacent the bowl, a blade projection on said support having a toothed edge thereon extending into the abrasive and held against the movement thereof, a channeled member on said support for scooping up the abrasive and spout means on said channeled member for directing the said abrasive to any point desired.

12. In a device of the character described, a rotatable abrading member, a rotatable container surrounding the abrading member, a fluid abrasive in the container, a support in non-rotatable relation to the abrading member, and container and means carried by the support for leading the abrasive from the container to the abrading member comprising a scoop the mouth of which is located above the level of the fluid abrasive when the container is not rotating and positioned in the path of the abrasive displaced by the rotation of the container and a stirring blade extending into the abrasive.

13. For use in combination with a rotatable abrading member in a rotatable container having a fluid abrasive therein, a support, and means carried by the support for leading the abrasive from the container to the abrading member comprising a scoop the mouth of which is adapted to be located above

the level of the fluid abrasive when the container is not rotating and to be positioned in the path of the fluid abrasive displaced by the rotation of the container, a spout leading from the scoop and arranged to direct the abrasive from the scoop to the abrading member and an extending stirring blade adapted to extend into the abrasive when the scoop is in operative position.

14. In a device of the character described, a rotatable abrading member, a rotatable container surrounding the abrading member, a fluid abrasive in the container, a support in non-rotatable relation to the abrading member and container and means carried by the support for leading the abrasive from the container to the abrading member comprising a scoop the mouth of which is located above the level of the fluid abrasive when the container is not rotating and positioned in the path of the fluid abrasive displaced by the rotation of the container, a spout leading from the scoop and arranged to direct the abrasive from the scoop onto the abrading member and a stirring blade extending into the abrasive.

15. For use in combination with a rotatable abrading member in a rotatable container having a fluid abrasive therein, a support, and means carried by the support for leading the abrasive from the container to the abrading member comprising a scoop the mouth of which is adapted to be located above the level of the fluid abrasive when the container is not rotating and to be positioned in the path of the fluid abrasive displaced by the rotation of the container, and an extending stirring blade adapted to extend into the abrasive when the scoop is in operative position.

16. In combination with a rotatable bowl containing a fluid abrasive, a support having a blade projection thereon normally extending into the abrasive and held against the movement of said abrasive, a scoop member on the support and having an open mouth portion normally positioned above the level of the abrasive in the bowl and adjacent the wall of the bowl and adapted to scoop up that portion of the abrasive which, through the action of centrifugal force, is flung upwardly of said wall and into the path of said mouth portion.

17. In combination with a rotatable bowl containing a fluid abrasive, a support adjacent the bowl, a scoop member on the support extending internally of the bowl, said scoop member having a removable lip portion thereon on the side toward the bowl, said lip portion being shaped substantially to the shape of the adjacent surface of the bowl and being adapted to be removed and replaced when worn.

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