

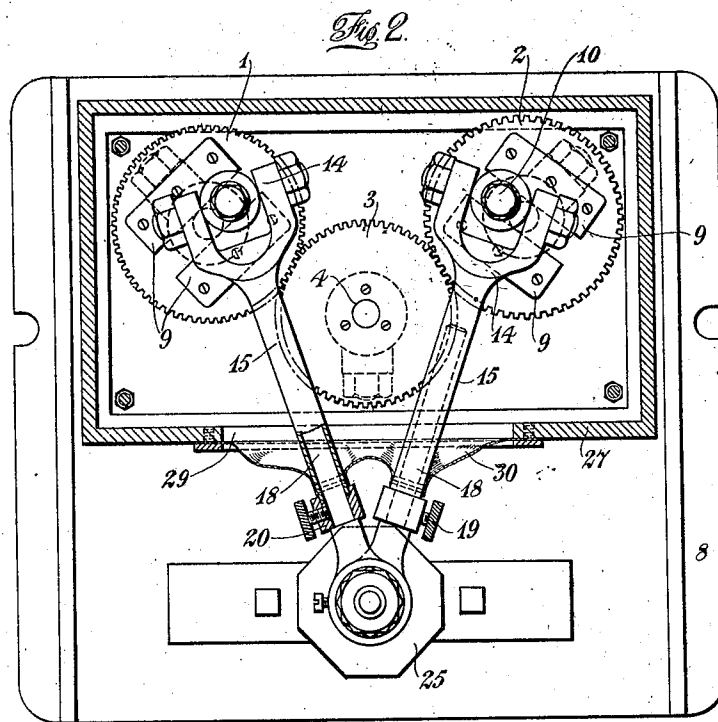
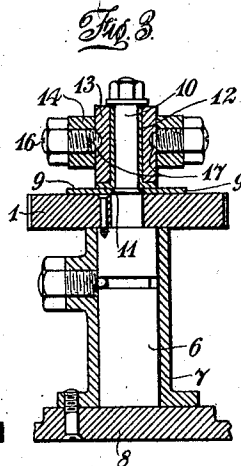
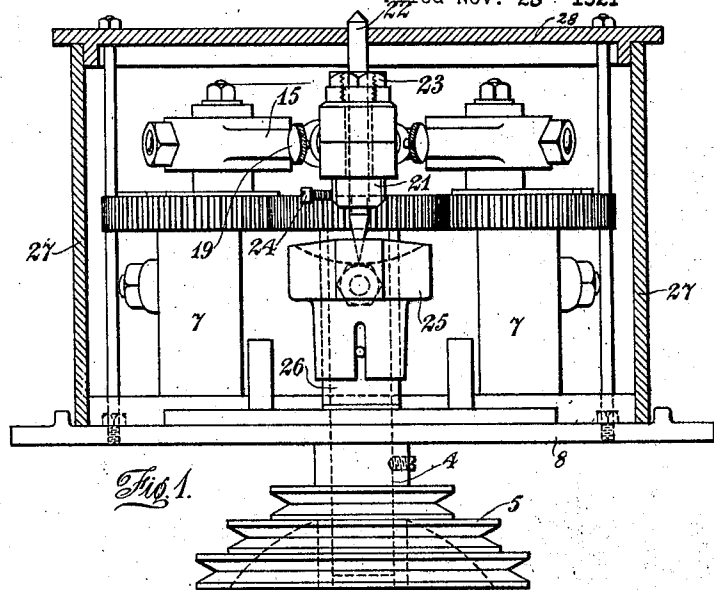
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H. W. HILL

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LENS SURFACING MACHINE AND THE LIKE

Filed Nov. 23 1921



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UNITED STATES PATENT OFFICE.

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LENS-SURFACING MACHINE AND THE LIKE.

Application filed November 23, 1921. Serial No. 517,271.

To all whom it may concern:

Be it known that I, HENRY WILLIAM HILL, a subject of His Majesty the King of England, and resident of Clapham, in the county of London, Kingdom of England, have invented certain new and useful Improvements in and Relating to Lens-Surfacing Machines and the like, of which the following is a specification.

10 This invention relates to improvements in surfacing machines and the like.

The object of this invention is to provide a machine which will move the work upon a surfacing tool or the like or a surfacing tool upon the work in an arcuate path in any direction so that the surfacing operation can be performed in a very efficient manner whereby preventing all sleek during the surfacing operation.

20 A further object is to move the work to and fro on a surfacing tool or vice versa in a substantially oval or elliptical direction, the major and minor axes of the elliptical path being varied and changed in direction during the surfacing operations.

25 A further object is to so arrange the machine that the arcuate path of the work or the tool can be lengthened and varied in all directions.

30 With these and other objects in view, the invention consists in providing a surfacing machine or the like in which the work is adapted to be moved on a surfacing tool or the surfacing tool upon the work in a path including two movements at right angles to each other and in an arcuate path partaking of these two movements.

35 The invention also consists in providing a surfacing machine or the like wherein the work is moved on a surfacing tool or vice versa through the medium of arms moved by rotatably mounted members driven at different speeds.

40 The invention will now be described with reference to the accompanying drawings, in which:—

Figure 1 is a sectional side elevation of one form of the machine constructed in accordance with this invention and particularly adapted for surfacing lens or the like.

50 Figure 2 is a sectional plan thereof, and

Figure 3 is a longitudinal sectional view showing the end of one of the arms and its connection to one of the driven members.

55 As shown, a pair of wheels 1 and 2 are mounted each side of a driven wheel 3. This

driven wheel 3 is secured upon a vertical shaft 4 which has keyed or otherwise secured on its lower end a suitable pulley 5 which is driven in any suitable manner and at any desired speed. The wheel 3 is provided on its periphery with a plurality of teeth to co-operate with teeth provided on the periphery of the driven wheels 1 and 2. All these wheels are preferably of different diameters but it will be understood that only the driven wheels 1 and 2 need be of different diameters, so as to be rotated at different speeds. The wheels 1 and 2 are secured on the upper end of stub shafts 6 which are rotatably mounted in standards 7 secured on a suitable base plate 8. On the upper face of each of the wheels 1 and 2 is secured a pair of guide plates 9 and between each pair of guide plates 9 are slidably mounted vertical pins or studs 10. The lower ends of these vertical pins or studs 10 are dovetailed at 11 to co-operate with similar surfaces formed on the opposite faces of the guide plates 9. On each of the pins or studs 10 is mounted a flanged bush 12 and on each bush 12 is rotatably mounted a sleeve member 13. Each pin or stud 10 is locked in its adjusted position by means of a nut screwed on the threaded end of the pin and engaging the flanged bush 12. To each of these sleeve members 13 is connected in any suitable manner the forked end 14 of an arm 15. The forked ends 14 of the arms are preferably connected to the sleeve 13 by means of a pair of screwed studs 16 having reduced ends 17 freely engaging in oppositely arranged holes in sleeve members 13. Within each of these arms 15 is adapted to telescope a rod member 18 and each of these rod members 18 is retained within the other portion of the arm 15 by means of adjusting screws 19 threaded into enlargements 20 formed on the outer ends of the said arms 15. The outer end of each of these rod members 18 is enlarged and bored for the reception of a sleeve member 21 in which is adjustably carried a vertical column 22 upon the lower end of which is placed the lens or other work which is adapted to be surfaced. The outer ends of the arms or rods 18 which freely embrace the sleeve member 21 are held in position one above the other by means of lock-nuts or the like 23 screwed on the upper portion of the sleeve member 21.

A set screw or the like 24 is threaded

into the lower end of the sleeve member so that the vertical column 22 can be adjustably held in position. The two arms which move in a substantially horizontal plane and linked together form two sides of a triangle, the third side of which is an imaginary line drawn between the two pins or studs 10 carried by the two driven wheels 1 and 2. These pins or studs 10 are arranged at some distance from the centre of rotation as shown, but if necessary the pins or studs 10 may be arranged on extensions when a larger movement is required. Below this vertical column 22 is arranged any suitable surfacing tool or the like 25. This tool or the like 25 which is curved as desired in the usual manner is preferably detachably mounted on an upright post 26 which is secured on the base plate 8. The operating mechanism is preferably enclosed in a suitable casing 27 and the upper end of this casing 27 is closed by detachable cover plate 28. An opening 29 is provided in the front of the casing 27 for the reception of the arms 15 and to these arms 15 and the casing 27 is secured in any suitable manner a flexible dust excluding screen member 30.

In operation a lens or the like to be surfaced is secured in any suitable and usual manner on the lower end of the vertical column 22 and the abrasive material is placed on the surfacing tool 25. This surfacing tool is of any desired curvature. When the pulley 5 is rotated the wheels 1 and 2 are rotated at different speeds through the medium of the wheel 3 on the upper end of the driven shaft 4. The rotation of the driven wheels 1 and 2 will work the vertical column 22 to and fro in an arcuate path through the medium of the arms 15 and 18. Thus the lens or the like will be very efficiently surfaced and hand finishing will be eliminated or reduced to the minimum.

When cylindrical or toric curves are desired any of the usual methods may be em-

ployed in order that the axis of curvature on the surface being worked may be kept co-incident with the axis of the curvature of the tool.

It will be understood that motion may be conveyed to the two driven wheels through the medium of intermediate wheels running as idlers, or that the wheels may be frictionally driven and it is preferable that the difference in the speeds of the two driven wheels should be reduced to the minimum as only a slight difference is necessary for efficient surfacing.

It will be understood that the above described surfacing machine may be used to surface any material, such as lithographic stones, metal surface plates or other articles.

What I claim is:—

In a device of the class described a tool holding member, a work holding member and a pair of revoluble members, all of said members mounted with their respective axes parallel, said revoluble members being adapted to rotate at different speeds, means for positively connecting each of said revoluble members with one of said holding members, said means including a pitman on each of said revoluble members having journaled connection around the axis of said work holding member, said pitman being telescopic for adjusting the distance between the axes of said work holding member and each of said revoluble members, a journal for each pitman, a guide on each of said revoluble members for the respective journal, and a clamping element for each journal permitting the securing of said journal eccentrically to the axis of the respective revoluble member, said revoluble members comprising gear wheels of different diameters and a pinion meshing with both of said gear wheels.

In testimony whereof I have hereunto signed my name.

HENRY WILLIAM HILL.